



ÓBUDAI EGYETEM  
ÓBUDA UNIVERSITY

FIKUSZ '23 SYMPOSIUM FOR YOUNG RESEARCHERS  
30 November 2023 | Óbuda University | Budapest, Hungary



# PROCEEDINGS



**FIKUSZ** is an annual international conference organised by the Óbuda University Keleti Károly Faculty of Business and Management: advanced Masters Students, PhD Students and young postdoctors, and other researchers are welcome.

**Conference Chair**  
Monika Garai-Fodor

**Conference Co-chair**  
Agnes Csiszarik-Kocsir  
Anett Popovics

**Honorary Committee**  
Jozsef Fogarasi  
Andras Keszthelyi  
Orsolya Szigeti  
Gyozo Szilagyi  
Istvan Takacs  
Katalin Takacsne Gyorgy  
Janos Varga

**Steering Committee**  
Szilard Berke  
Eniko Korcsmaros  
Drita Kuja  
Csilla Mizser  
Viktor Nagy  
Nargiz Hajiyeva  
Noemi Piricz  
Peter Szikora  
Andrea Tick  
Mehmet Ozeslan  
Ahmet Kiray  
Monika Foszto  
Izabella Krajnik  
Damir Tokic  
Edit Veres  
Elizabeta Tomevska-Illievska  
Andrej Illievski

**Programme Committee**  
Jozsef Csernak  
Gabor Gyarmati  
Reka Saary

**Organising Committee**  
Pal Feher-Polgar  
Valeria Szekeres

**Conference Secretary**  
Beatrix Kollar-Buzdogany  
buzdogany.beatrix@kgk.uni-obuda.hu



[kgk.uni-obuda.hu/fikusz](http://kgk.uni-obuda.hu/fikusz)



ÓBUDA UNIVERSITY  
KELETI KÁROLY FACULTY OF BUSINESS  
AND MANAGEMENT

UNEC  
1930





ÓBUDAI EGYETEM  
ÓBUDA UNIVERSITY



## **XVII. FIKUSZ 2023 International Conference**

**Proceedings**

**ISBN 978-963-449-341-9**

**Editors: Mónika Garai-Fodor, Ágnes Csiszárík-Kocsir, Anett Popovics,  
Tímea Edőcs**

**Keleti Faculty of Business and Management  
Óbuda University**

**MMXXIII.**

## Table of Contents

Secure Storage of Financial Data in the Blockchain.....	6
<i>Krisztián Bálint</i>	
Inflation targeting in emerging market economies .....	14
<i>Oltjana Zoto, Sidita Mema</i>	
Practical aspects of influencer marketing .....	29
<i>Anett Popovics</i>	
An overview into the literature on the concept of eco/green hotel .....	39
<i>Silvana Gashi, Denada Liça, Ermira Qosja</i>	
Economic Assessment of the transport-logistics infrastructure in Karabakh and Eastern Zangezur economics regions.....	57
<i>Muhammad Gulahmadov</i>	
Business, Sleep and University Students .....	62
<i>Laszlo Ling</i>	
Is there still a need for teachers at higher educational institutions? .....	75
<i>Kornélia Lazányi</i>	
Estimation of job quality in Albania using the 2007 - 2013 LFS: low quality (“bad”) employment arrangements mean less security and pay.....	89
<i>Elvisa Drishti</i>	
The importance of transparency in online communication: Focus on higher education institutions .....	99
<i>Judit Bilinovics-Sipos, Regina Zsuzsanna Reicher</i>	
The security of the organization - the trust of the employees? .....	122
<i>Balázs Molnár, Csilla Ilona Mizser</i>	
The transfer of HRM practices across countries: case of Albania .....	133
<i>Alba Berberi, Emirjeta Bejleri, Mario Çurçija</i>	
Entrepreneurial skills as a development perspective in the tourism sector .....	144
<i>Mónika Fosztó, Izabella Krájník</i>	
Strategic management approaches used in the banking sector by adopting digital technologies .....	155
<i>Izabella Krájník, Mónika Fosztó</i>	

Thematic Analysis on Immersive Technologies and Metaverse in Tourism .....	171
<i>Pipih Nurjamilah</i>	
Research on Chinese Municipal Solid Waste Management Based on Greenhouse Gas Emissions.....	191
<i>Wang Chao, Wu Yue</i>	
Challenges and opportunities for the digital transformation of Hungarian companies .....	205
<i>Anita Plötz</i>	
Entrepreneurial solutions for social good: Examining the fusion of Corporate Entrepreneurship and Corporate Social Responsibility .....	225
<i>Daniela Tzvetkova</i>	
Fuel consumption as an indicator of economic changes in Hungary .....	235
<i>Zoltán Váradi</i>	
Meat, protein and food supplement consumption in Hungary .....	249
<i>Gréta Újvári</i>	
Key success factors for youth entrepreneurs.....	259
<i>Maria Vasilska</i>	
Usage of self-assessment questionnaires in safety and security sciences - a literature review .....	268
<i>Pál Fehér-Polgár</i>	
Young people's knowledge of the second industrial revolution - evaluation of a questionnaire survey .....	273
<i>Anna Krisztina Fekete, Gábor Gyarmati</i>	
Consumer behaviour related to products with environmental friendly packaging materials.....	283
<i>Kornélia Sára Szatmáry</i>	
Changes in project success factors and success criteria in a given company during COVID-19 .....	302
<i>János Balogh</i>	
Factors can influence the roles of fuels used in some Central European countries.....	319
<i>Gábor Gyarmati</i>	



The Spread of the Concept of Wellbeing Economy .....	327
<i>Valéria Szekeres</i>	
What is your firm's readiness for sustainable effectiveness? A descriptive analysis of a UAE-based healthcare firm. ....	336
<i>Hima Parameswaran</i>	
Examining the evolution of controlling attitudes in Hungarian SMEs .....	351
<i>Ferenc Katona</i>	
Testing ICT security risk attitude questions on a small scale level for future use .....	362
<i>Pál Fehér-Polgár</i>	
<b>E-Posters</b>	
Green banking in Albania. A customer perspective.....	369
<i>Krisdela Kaçani, Luis Miguel López- Bonilla, Elena Kokthi, Myriam Luisa González-Limón</i>	
Safe working in healthcare.....	370
<i>Mátyás Simon, Jolán Velencei</i>	
Comparative analysis of regional meat traceability Information sharing practices .....	371
<i>Ma Linfei, Jolán Velencei</i>	
Asszociációs kapcsolatok érzékenysége .....	372
<i>Nagy Viktor</i>	
A zenei hangrögzítő eszközök helyettesítési folyamatának dinamikai vizsgálat logisztikus analízissel .....	373
<i>Szilágyi Győző Attila</i>	

# Secure Storage of Financial Data in the Blockchain

**Krisztián Bálint**

Óbuda University, Keleti Károly Faculty of Business and Management,  
balint.krisztian1@uni-obuda.hu

*Abstract: The secure storage of data has become a key issue these days. Traditional centralized solutions do not provide sufficient protection when it comes to the storage of sensitive data, since there have been many cases in the past where unwanted financial data was made public. The purpose of the research is to examine the decentralized data storage options and present a solution suitable for financial data storage that is as secure as possible, with the help of which database security can be significantly increased. As part of the practical implementation, a private blockchain will be created where financial data will be uploaded. During the creation of the blockchain, its operating policy and security configuration stations are also presented. To further increase security, the data will be encrypted before sending, and then all of them will be provided with a fingerprint, thus ensuring that the financial data will not be compromised during the sending. By creating and configuring the blockchain, it is possible to safely store several sensitive financial data, which can significantly reduce the number of malicious attacks in the future.*

*Keywords: Blockchain; Financial data security; Centralized storage*

## 1 Introduction

The rapid and dramatic development of information technology, over the recent decade, cannot be denied. The company's sensitive data was transferred from the offline space to the digital space for saving (Tick - Mai, 2021). There are numerous ways to maintain the confidentiality of data in such cases, including anonymization and pseudonymization techniques or including a trusted third party (Bogdanov et al. 2012). The protection of sensitive information is crucial for the company's system (Katona-Kis 2016). In order to create optimal database security, it is necessary to examine what possible solutions can be used to create financial data security. Financial security has become particularly relevant (Reznik et al. 2020) because if important company data is leaked, it has a negative impact on the perception of the company in more than one case. The most common nowadays is the centralized data storage solution, when the data is saved in the cloud. The application of a cloud-based solution is currently one of the most convenient

solutions, since in many cases the various apps enabling centralized data storage are already pre-installed on the smart devices, and only one registration is required to use them. It is easily accessible, requiring only an Internet connection. However, the convenience comes at a price, as you have to accept the data storage rules set by the third party, while trusting that you will do everything you can to keep your data safe. Decentralized distributed databases provide greater security, but their application is more difficult since few people know the structure of their operation and there are currently few easy-to-use blockchain user interfaces available.

The research is structured according to the following structure:

- Centralized Data Storage Solutions
- Examining Different Blockchain Types
- The creation of a private FDSC (Financial Data Storage Chain) blockchain Protection of critical infrastructures,

Company financial data is considered sensitive data, the protection of which must be ensured in any case.

## **2 Centralized Data Storage Solutions**

In the case of centralized cloud data storage, there have been several undesirable events in the past that may cause concern. The data leak did not occur in one case. In the case of financial data storage, the goal is to achieve the highest possible security, so it is necessary to examine the available data storage options and search for new solutions that can provide the most effective security possible. Centralized data storage solutions are characterized by:

- Increasing storage costs. With the advent of IoT and Industry 4.0, the amount of data has increased significantly, requiring greater bandwidth and storage capacity.
- Censorship and surveillance. Many people are concerned about the fact that others can observe, read, and in some cases even modify their data.
- As a result of DDoS attacks, the servers of many large companies were attacked. With decentralized storage, this cannot happen, since there is no central server that can fall victim to a directed attack (Medium, 2020).

The local storage of financial data is more and more in the background, as the amount of information increases, so do the amounts of data. The capacity of hard drives is limited, and access to local computers from a distance is difficult. Thanks to the centralized cloud-based solution, personal data can be accessed from almost

anywhere, which requires an Internet connection. As a result of centralized storage, data loss due to hardware errors can be reduced, as backup copies are saved not only on the hard drive but also in the cloud. The first figure below shows the centralized data storage scheme.

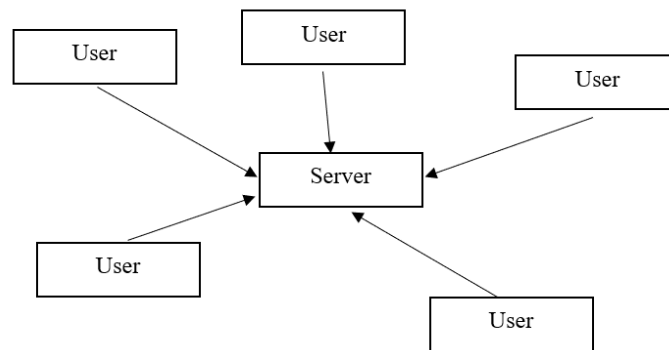


Figure 1  
Centralized data storage solution

In the case of cloud-based data storage, the basic assumption is that the third party is a reliable service provider whose goal is to ensure that the data is always secure and available 24 hours a day. The third party may harm the data for their benefit. You can modify them, release them to different bodies, or delete them. To prevent this, several cloud-based storage platforms are used at the same time. The disadvantage is that this method generates a lot of network traffic and bandwidth (Huige et al. 2019).

In order to protect the data from third parties, it is recommended to encrypt it and upload it to the cloud. Centralized storage systems have the following weaknesses:

- Safety. If an unauthorized person has access to the server data, it can be compromised.
- Reliability. The server may become overloaded if too many requests are received at once. This is how DDoS attacks work.
- Data transfer speed. A fast connection to the server is essential. If users' computers are in different countries (which is usually the case), the data transfer speed may decrease, and some countries may impose restrictions.
- Scalability. Due to the centralized design, the capacity of the server is limited and the data traffic is also regulated (Andrew 2020). It can be concluded that the centralized data storage solution has weaknesses and shortcomings. Therefore, its use for storing financial data is not recommended. It is therefore necessary to examine the possibility of decentralized data storage.

### 3 Examining Different Blockchain Types

Thanks to the decentralized data storage solution, the data is more securely stored than in the case of cloud-based storage, since it is distributed across many nodes. Furthermore, storage systems use public key encryption. Data is distributed flexibly between nodes, and smart contracts are also used for automatic execution (Peng et al 2017). The advantages of decentralized data storage:

- Performance is balanced as nodes share data volumes proportionally,
- High availability. Most of the nodes are available 24 hours a day. If some nodes become unavailable, the other nodes will continue to serve the user.
- A high degree of independence. Each node is independently responsible for following the rules, thus forming the blockchain ecosystem. An external person or authority does not limit or regulate its operation.
- It breaks up the users' data and sends it encrypted to the nodes. In the event of a DDoS attack, the system remains operational.

Before storing data in the blockchain, it is necessary to examine whether the private or public blockchain is more beneficial for storing financial data. The first table below shows the difference between a private and a public blockchain.

<b>Blockchain types</b>		
Properties	Public	Private
Access	Accessible to anyone	For invited users only
Who can write to the blockchain?	Anyone	Registered users with access permission
Number of users	Million users	A few hundred users
Safety	Proof of Work, Proof of Stake	Pre-approved participants
Speed	Slow (transaction approval can take up to 10 minutes)	Fast (just a few seconds for approval)
Résztevők	Névtelen	Known, identified

Table 1  
Properties of private and public blockchain types

As can be seen in the table, public data can be accessed by everyone, even though it cannot be modified by strangers. For this reason, it is advisable to choose a private blockchain for storing financial data.

## 4 FDSC (Financial Data Storage Chain) Blockchain

As part of the practical implementation, I created a private university blockchain called FDSC. Only the administrator I defined in advance had access to this blockchain. For the sake of the speed of the blockchain, I set the size of the blocks to 1 MB, so that the data stored in the blocks can be accessed quickly enough in practice. The second figure shows the steps involved in creating the FDSC blockchain.

<i>Financial chain-util generate FDSC</i>
the default settings would be used:
<i>/default ~ university chain/FDSC/chainsettings.dat chainsettings.dat include:</i>
<i>Database addresses [database (cloud storage) IP address, sender (company) IP address],</i>
<i>Terms of GDPR database.</i>
Next, the FDSC blockchain would be initialized, and the genesis block would be created
<i>university chain FDSC</i>
The server will be started in those few seconds after the genesis block has been found, then the node address needs to be connected:
<a href="mailto:FDSC@192.168.0.1:8008">FDSC@192.168.0.1:8008</a>
After these steps, the connection can be attempted from a second server:
<i>university chain <a href="mailto:FDSC@192.168.0.1:8008">FDSC@192.168.0.1:8008</a></i>
After the message confirming the chain has been initialized, the permission is not given for connection to the database. The address would be copied and pasted: 192.168.0.2

Figure 2

The creation of a private FDSC (Financial Data Storage Chain) blockchain (Bálint, 2021, 2022, 2023) In the case of the constitution of an independent, university-based blockchain, the educational institution could define the favorable data storage conditions itself.



These may be the following:

- Wider based access to the given blockchain,
- The definition of the blocks' size,
- The definition of the terms of use,
- The genesis block, to which all the other blocks are connected, stays in the property of the university,
- The limiting of the access to the blockchain (only the entitled should use it),
- The definition of data protection policy,
- For increased security, the blockchain may be started on multiple servers,
- The nodes are more easily supervised,
- The system becomes more transparent,
- The eventual attacks are more easily reconnaissance.
- It provides a possibility for rapid reaction, in case of a hacker attack,
- The conditions contained within the smart contract are primarily defined by the faculty (Bálint, 2021, 2022, 2023).

### **Conclusions**

A company's success is greatly affected by how and in what way it protects its financial data. In the IT world, when all devices are connected to the Internet, this is extremely important. It is easy to see that it is much easier to properly design the protection of financial data than to restore the company's reputation after a data breach incident. However, for this purpose, it is recommended to examine decentralized data storage solutions. Even to this day, many people reject blockchain technology, as they consider its application risky and foreign. Using blockchain, data is saved in blocks that are closely related to each other. For a hacker to modify even one block, all blocks must be modified retroactively, which is an almost impossible task. As part of the practical implementation, the created private blockchain called FDSC can meet even the strictest financial database criteria.

## References

- [1] Andrew T. (2020): Decentralized and Distributed Databases, Explained. <https://bit.ly/2ZEBqtl> (downloaded: 2023.11.02.)
- [2] Bálint K. (2021): Possibilities for the Utilization of an Automatized, Electronic Blockchain-based, Students' Attendance Register, using a Universities' Modern Security Cameras. *Acta Polytechnica Hungarica*, DOI: 10.12700/APH.18.2.2021.2.7, 18(2), pp.127-142.
- [3] Bálint K. (2021): The connection of a Blockchain with Students' Attendance Register based on Security Cameras. *IEEE 19th International Symposium on Intelligent Systems and Informatics, SISY*, Subotica, Serbia, 191 p. pp. 67-70.
- [4] Bálint K. (2022): Creating a Private University Blockchain for More Secure Data Storage, *XVII. FIKUSZ International Conference: Proceedings* Budapest, Magyarország : Óbuda University Keleti Károly Faculty of Business and Management, pp. 301-308.
- [5] Bálint K. (2023): Creation of a Unified University Blockchain for the Purpose of Storing the University's Teaching Materials, *IEEE 17th International Symposium on Applied Computational Intelligence and Informatics SACI 2023: Proceedings* Budapest, Magyarország : Óbudai Egyetem, IEEE Hungary Section, pp. 159-164.
- [6] Bogdanov D. - Talviste R. - Willemsen, J. (2012): Deploying Secure Multi-Party Computation for Financial Data Analysis: (Short Paper). In *Financial Cryptography and Data Security: 16th International Conference*, FC Kralendijk, Bonaire, Revised Selected Papers, Springer Berlin Heidelberg, 16 pp. 57-64.
- [7] Huige L. - Zhang F. - Peiran L. - Haibo T. - Jiejie H. (2019): How to retrieve the encrypted data on the blockchain, *KSII Transactions on Internet and Information System* 13(11), pp. 5560-5579.
- [8] Katona K. V. (2016): Neptun System Security Questions at Óbuda University. *Obuda University e-Bulletin*, 6(1), 29, pp. 29-35.
- [9] Medium (2020): Medium, What Is Decentralized Storage? <https://bit.ly/2UK9jaG> (downloaded: 2023.11.02.)
- [10] Peng J. - Fuchun G. -Kaitai L. - Jianchang L. - Qiaoyan W. (2017): *Searchain: Blockchain-based Private Keyword Search in Decentralized Storage*, Elsevier, 107, pp. 781-792.
- [11] Reznik, O. M. - Hetmanets, O. P. - Kovalchuk, A. - Nastyuk V. - Andrichenko, N. (2020): Financial security of the state. *Journal of Security and Sustainability Issues*, 9(3). pp. 843-852.

- [12] Tick A. Mai P. T. (2021): Cyber Security Awareness and behavior of youth in smartphone usage: A comparative study between university students in Hungary and Vietnam. *Acta Polytechnica Hungarica*, 18(8), pp. 67-89.

# **Inflation targeting in emerging market economies**

## **Oltjana Zoto**

Lecturer at Agricultural University of Tirana, Department of Economy and Rural Development Policies, Faculty of Economics and Agribusiness, ozoto@ubt.edu.al

## **Sidita Mema**

Assistant Lecturer at Epoka University ,Department of Banking and Finance, Faculty of Economics and Administrative Science, Sreshketa@gmail.com

*Abstract: The aim of the research is to study the performance of emerging economies under the inflation targeting as a framework. This framework is characterized by the direct target that it has on inflation which should be achieved within a period. Inflation targeting was initially adopted by industrialized economies, and the outcomes throughout the years have been substantially good for other economies to join this framework. The dataset used is updated with data from after the financial crises allowing space for us to test another hypothesis about the importance of inflation targeting during the financial crises. We used difference to difference model to test the our hypothesis and we concluded that inflation targeting does not have any significant statistical effect on the output growth, but it does have a statistical significant effect in the inflation rate. We also pointed out that the economies that were targeting inflation during the financial crises performed much better compared to the ones which did not.*

*Keywords: emerging economies, monetary policies, inflation, inflation targeting.*

## **1 Introduction**

The aim of the thesis is to study the performance of emerging economies under the inflation targeting as a framework. This framework is characterized by the direct target that it has on inflation which should be achieved within a period. Inflation targeting was initially adopted by industrialized economies, and the outcomes throughout the years have been substantially good for other economies to join this framework.

Inflation targeting is adopted by countries which are emerging and furthermore developing but also by industrialized economies. Many studies are conducted to understand how inflation targeting has impacted growth and development. Even though this study itself is based on emerging economies, we decided to compare the research result of different group of countries including here industrialized economies as well. The division of this chapter is based on the group of countries of different studies and the purpose of the study as well. Most of these studies use the same approach for reaching the conclusions. But, we should keep in mind that because of the differences in sample size, countries taken into consideration or methodologies used the results might contradict one another. Also since inflation targeting as a monetary policy has shown different impacts in different economies, might be a reason for these differences in results.

## **2 Literature review**

The developed countries were the ones which initially adopted inflation targeting. The outcomes are different depending on the methodology but also the impact that inflation targeting had on the countries chosen in the sample data.

Mike Dotsey in 2006, (Michael Dotsey, 2006) examined 5 developed countries which had already adopted inflation targeting for the past 10 years, Australia, Canada, New Zealand, Sweden and UK. The outcome of his research found no proof that the implementation of inflation targeting as a monetary policy has diminished the economic performance of these countries, instead the policymakers of these countries have seen inflation targeting as a considerably flexible framework wellmatched with the robust economic activity. What Dotsey pointed out was that the dataset used in these models is limited due to the short time period of the adaptation of inflation targeting, creating so not too much space for the economies to fully experience all the cycle.

Manfred J. M. Neumann & Juergen von Hagen, (2002) through their paper try to understand if inflation targeting matters or not. They conduct their study based on 9 countries of choice, 6 of them are inflation targeting economies and the other three are non-targeting ones throughout 2 periods, pre and post adaptation of inflation targeting as monetary policy. The period pre-adaptation includes the data from 1978 till 1992 and the period post adaptation includes period 1993 till 2001. The study had three main points of focus: 1. How inflation targeting effect the stability 2. Reaction to large supply shocks through comparison of the central bank reaction to oil prices climb 3. Interest rate policies reactions to inflation shocks by the central banks.

The results were very positive. Inflation targeting as a framework played a great role in increasing the credibility of central banks. Central banks became more

reliable from year to year since the implementation of inflation targeting, inflation expectations has lowered, inflation rate declined each year and together with it the framework allowed space for the inflation volatility and interest rate volatility to be handled as needed. Similar positive results were seen in the paper from Alex Cukierman,( 2000) and Petra M. Geraats, (2013) and also Mishkin, (1999) who supported the decline of both expected inflation and inflation rate for adoption countries.

Though, none of the results showed that inflation targeting has fully advantage if compared with other monetary policies.

Another study that tried to compare the policies was written by Frederic S. Mishkin, (2000) in his paper he conducted a study on two of the monetary policies; monetary targeting and inflation targeting. He concluded that as successful as monetary targeting was in Switzerland and Germany, the chances that the conditions that make this framework effective to be met in any other country are very low. On the other hand specifically for the countries that have chosen to have a domestic monetary policy, inflation targeting is suggested to be a better choice.

Johnson, (2002) using the panel data sample on the other hand brought some new perspective as he pointed out that inflation rate declined sharply for developed countries which had adopted inflation targeting as a monetary policy by up to 2% per year, though the decline was also seen in countries which had not adopted the framework. Raising so a question whether the reason for this decline inflation is indeed targeting framework.

Ball & Sheridan,( 2003) wrote an article questioning the matter of inflation targeting. the final data sample is composed of 20 countries of OECD. Countries which were outliers in terms of high inflation rate and the ones which lacked an independent currency are left out of the sample. Out of 20 countries, 7 of them are targeting inflation and the other 13 are not. The results completely contradict the previous mentioned studies, the data showed that there is no significant positive impact of inflation targeting into interest rate, inflation rate and output growth. Though, this study did not conclude that inflation targeting affected negatively any of the macroeconomic variables. The results are reached through the reversion to the mean. Initially they used a simple difference in difference model, but they concluded that the results might be misleading since countries which have been facing very high inflation rate before 1990 will show a faster and greater decline in inflation rate compared to countries that had an initial lower rate of inflation. That is why they introduced another variable in the model that would capture their initial position. With their new model they concluded that there is no impact of the framework in inflation rate, interest rate and output growth. The authors considered the positive impact of inflation targeting in two other different aspects: political aspect and possible future impact. The political aspect is mainly related



with the principle of the democratic society which implies that through this framework the central banks are much more transparent to the public. And the second aspect is related with the future impact, since the dataset is until 2001, Ball and Sheridan suggest that there might be some impact in macroeconomic indicators due to inflation targeting in the future years with a more updated dataset.

Using the exact same data sample and the same methodology though with a more updated dataset Markus Hyvonen,( 2004) criticized the results from Ball and Sheridan concluding that during the sample period the inflation targeting as a monetary policy has at least some impact in the convergence of the inflation rates.

Lin & Ye, (2009) conducted two papers using the variety of prosperity score matching method, in the first paper they considered 21 industrialized economies and in the second one 51 emerging economies. They concluded that there is no significant proof that inflation targeting impacts inflation rate and volatility for developed countries, but they found different results in emerging ones. But positive results in both inflation and output growth for target economies using the same methodology were presented by Jerry Brito,( 2011).

### **3 Hypothesis**

Hypothesis #1: Output growth performance is improved through Inflation Targeting

The output volatility and growth rate has been studied in many research papers to conclude whether or not inflation targeting has an impact in the improvement of the macroeconomic conditions. Most of the studies concluded that inflation targeting does not have a significant statistical effect on the output growth. Mainly the results from Ball & Sheridan, (2003)suggest that both targeting and non-targeting economies have faced a declining rate of output growth from the period before the targeting to the one after the targeting, but no statistical background supports that inflation targeting has a negative effect on the economic growth. What we expect from our results is to see that inflation targeting dummy variable is statistically insignificant against the output growth rate. In other words, we expect that inflation targeting does not have any significant effect on the output growth rate and it's. This will be tested through difference in difference model and explained through the graphs.

Hypothesis #2: Inflation rate is lower after implementing inflation targeting .

The focus of inflation targeting is to maintain the inflation rate within some announced target by the central bank. Many studies have been made to measure the real impact that inflation targeting as a monetary policy has on the inflation

rate and the inflation volatility. Ball & Sheridan, (2003) concluded that inflation targeting does not impact the inflation rates, and his results were also supported by Lin & Ye, (2009) who found the same results for developed. But they supported the result of Alex Cukierman, (2000) and also Mishkin, (1999) for the decline of both expected inflation and inflation rate for adoption emerging countries. Same result was found by Petra M. Geraats, (2013). Generally, countries that have been facing higher inflation rate have a greater chance of adopting inflation targeting and as a result the decline in the average inflation rate will be higher for these specific countries compared to the ones which faced initially a lower rate. From the description it is visible that the decline in inflation rate for targeting economies is higher than non-targeting one, but the question arises if this decline is statistically significant or not. We will test this hypothesis through difference in difference model and expect to find positive and significant results for the impact that inflation targeting has in emerging economies inflation rate.

Hypothesis #3: Inflation targeting is predominant in terms of issued stability in the post-crises period .

The last hypothesis relates with the financial crises of 2008/2009. Many recent studies after the crises were conducted to analyze whether inflation targeting economies have been coping with the crises better than the ones who have not targeted inflation targeting. We do expect from our testing that countries which have been targeting inflation will show a smoother transition and improvement after the financial crises. The dataset until 2016 will capture the financial crises impact. Jeffrey Frankel, (2012) concluded that the fault for the crises related with the inflation targeting as a monetary policy, but his outcomes were strongly rejected by José De Gregorio, (2009). Positive results were also seen from other writers like De Carvalho Filho, (2011) and Armand Fouejieu A. and Scott Roger, (2013).

## **4 Empirical Analysis**

The effect of inflation target has been studied through different econometric methods, where the most common ones are VAR analysis, difference in difference model and panel estimation and many others. These approaches have been used to measure statistically the effect of inflation targeting and point out mainly these differences through comparison to a control group of non targeters. The most common of these methods and the one that we are going to use in this paper is difference in difference model. Difference in difference method has been commonly used since 1985 to provide the necessary evidences on many policy questions. This paper will test the hypothesis through the usage of this specific model. In other words, this method will allow us to compare the changes in inflation for a specific set of countries before and after the implementation of

inflation targeting to the changes in control group's variable. Also, this method will be used to compare the performance of treatment and control group during and after the crises period. This model has been criticized mostly for the revision to mean bias. This has been very well explained in the paper of Ball & Sheridan,(2003) "Does inflation targeting matters?", where both of the writers point out that countries which are targeting inflation had a higher inflation rate prior to targeting it, and that is easily explained as generally these countries which showed problems with inflation rate are the ones that prefer to target inflation. And just because initially they did not perform good, after targeting they will show better results compared to the countries which do not target inflation and have a difference initial performance. All these statistical results might be confusing. That is why both authors encourage as a solution to include the average in the model and this would eliminate the revision to mean bias and provide more convincing results. These suggestions had been followed from further more authors Edward Gemayel, (2011), Gonçalves & Salles, (2008).

#### **4.1 Inflation and output description**

The descriptive statistics for the group of targeters and non-targeters is presented below. The mean and the standard deviation results are calculated for 27 countries in total from which 8 are targeting inflation and the other 19 are not. The results are not completely conclusive. Inflation rate for the targeting countries are calculated as average of 1990 until the year when the specific country announced inflation targeting as their monetary policy. The average is 17.52 % and it has declined after the adopting inflation targeting to 5.06%. This is a sharp decline if compared to the statistics from the countries which are not targeting inflation rate. The average for non targeters prior to adaptation of inflation targeting was 13.09%. For this statistic we used year range of 1990-2004 (2004 considered to be the average year used in our calculations for control group as the year of adopting inflation targeting ). The calculations show that this statistic declined for non-targeting economies 6.19%. The decline in inflation rate is also considerable for non-targeting economies, but the relative decline for targeting economies is higher.

**Table 1- Average percentage for Inflation Rate and Output Growth**

	<b>Inflation Pre</b>	<b>Inflation Post</b>	<b>Output Growth Pre</b>	<b>Output Growth Post</b>
NIT	13.09%	6.19%	5.71%	4.04%
IT	17.52%	5.06%	4.76%	3.12%



*Source: IMF webpage (World Economic Outlook download)*

Table 1

Average percentage for inflation rate and output growth

While, inflation volatility also decreased from 9.23 % to 4.53% for non-targeting economies and declined from 10.04% to 4.12 % for non-targeting economies. The relative decline is higher in targeting economies. But as both the groups has shown improvements in terms of volatility and inflation rate nothing can be said conclusively. Output growth rate has started almost the same for both groups and has shown a higher declining rate for targeting economies, from 4.76 % to 3.12% if compared to nontargeting economies where the percentage decreased from 5.71% to 4.04%. These calculations, same as inflation ones are based on range of years from 1990-2003 for the pre-results and from 2003-2016 for the post results. Output volatility has decreased from 4.73% to 3.47% for targeting economies, but it has increased for non-targeting economies from 4.13 % to 4.38%. To sum up in terms of output growth and volatility both targeting and non-targeting economies faced a decline in the rates relatively close to each other, but the output growth volatility had increased for non-targeting economies by less than 0.25% but decreased by more than 1% for inflation targeting economies.

**Table 2- Average Percentage for Inflation Volatility and Output Growth Volatility**

	<b>Inflation Volatility Pre</b>	<b>Inflation Volatility Post</b>	<b>Output Growth Volatility Pre</b>	<b>Output Growth Volatility Post</b>
NIT	9.23%	4.53%	4.13%	4.38%
IT	10.40%	4.12%	4.73%	3.47%

*Source: IMF webpage (World Economic Outlook download)*

Table 2  
Average percentage for inflation volatility and output growth volatility

Affected the statistics we split the time range into two groups the pre and the post inflation targeting group. Countries which have adopted inflation targeting have as a breakpoint of this range the year that they have announced inflation targeting as their monetary policy. While for the non targetors 2004 is the breakpoint year. The same year is going to be used for the Dummy variable. We are interested to see the impact that inflation targeting has on our four main variables: inflation rate and output growth. The data are download from IMF webpage.

## 5 Methodology

Difference in difference model is a statistical approach which is commonly used to analyze the impact that a treatment has on treated group. In other words this approach which uses panel data investigates whether the treatment has any significant effect on the group which has adopted it by comparing it to the group which has not adopted this treatment (control group). Difference to difference model has been commonly used by economists to reach some conclusive opinions regarding the impact of inflation targeting in different economies. One of the key papers which brought up a different perspective of this model is written by Ball and Sheridan in 2005. Trying to answer the question whether inflation targeting matters or not they pointed out the importance of revision to the mean. The initial model which was not considering the revision to the mean is as follows:

$$X_{post} - X_{pre} = \alpha_0 + \alpha_1 D + \epsilon$$

Where:

$X_{post}$  : is the mean value of the variable X after IT implementation

$X_{pre}$  : is the mean value of the variable X before IT implementation

$\alpha_0$  : Constant

$\alpha_1$  : Measures the coefficient of the variable D (Dummy variable, if a country is targeting inflation then it is 1 and if not it is 0)

$\epsilon$  : Error term

$X_{post}$  and  $X_{pre}$  are the mean values of the variable X after and before the adoption of IT respectively. Calculating these two variables is the first step of conducting this model, we first calculate the average of each of the countries being studied and from the first outcomes without regressing the model it is visible that the inflation rates have declined from the pre to the post period. But this decline is also seen for non-targeting economies as well. This will be explained in much more details in the Empirical results part.

The most important variable is  $\alpha_1$  which measures the effect of inflation targeting in the economies.  $\alpha_1$  is the coefficient of the variable D, which is the dummy variable equaling 1 in case the country is targeting inflation or 0 in case the country is not. If variable X would be inflation and the dummy coefficient would be negative and significant, this would mean that targeting economies faced a sharper decline in inflation rate compared to non-targeting economies. And if the X variable would be output and the dummy coefficient would be negative and significant, then this would mean that targeting economies are facing lower improvement in output growth compared to non-targeting economies.

This model is our first model in this paper. It is regressed using as data set period 1997- 2016. In order to improve the results, as this is believed to be a misleading model, we conducted a series of regressions but this time taking into consideration the revision to the mean. The models follow the below formula:

$$X_{post} - X_{pre} = \alpha_0 + \alpha_1 D + \alpha_2 X_{pre} + \epsilon$$

Where,  $\alpha_2$  is the coefficient of the average values before the adaptation of inflation targeting. As mentioned before in this paper, Ball and Sheridan (2005), suggested that countries which have been performing poorly in terms of output and inflation, will have a higher tendency of adopting inflation



## 5.1 Dataset

Dataset used in our model is composed of 29 countries from which 20 are not targeters of inflation and the rest has adopted inflation targeting as a monetary policy. Eight of these countries are in Europe and the rest are part of Commonwealth. Apart from taking into consideration if they have adopted inflation or not another reason why we choose these countries relate with the possibility of reducing the bias as it is believed that being in the same region plays an important role. The original data range is 1990 until 2016, were every period of this range which includes values of inflation more than 50% are automatically excluded. For this reason, our base model will include the dataset from 1997 to 2016. In this way the observations which have more than 50 % of inflation rate do not impact the role of inflation targeting, in other words, it is known that countries which are facing very high inflation will have a higher chance of adopting this framework. Because of the convergence factor, this country will face a sharper decline in inflation rate and in this way, it will inflate the impact of inflation targeting. To capture how the implementation of this framework has targeting as a monetary policy and as a result will show higher improvement if compared to other countries which are not targeting inflation at all or were performing better before targeting it. So adding this variable in the model will amortize a bit the regression to the mean bias. Model 2 in this thesis uses dataset of 1990-2016 excluding all of the values which have a higher inflation rate above 50%. Considering that some of the countries did not have all the data for inflation and output we conducted Model 3 based on the logic of Model 1 dataset but this time including the average values before the adoption of IT as an explanatory variable. Model 3 is our base model. The last model we run excludes countries like Montenegro, Kosovo and Bosnia Hercegovina for the lack of the data for a period of three year.

## 5.2 Empirical Results

**Table 3- Results for Inflation Rate**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
DID	-3.836 (0.233)*	-1.693 (0.888)*	-2.088 (0.851)**	-3.568 (1.103)**
Pre-Inflation		-0.983 (0.002)**	-0.984 (0.0028)*	-0.987 (0.003)**
Constant	3.242 (0.124)*	3.726 (0.211)**	3.834 (0.299)**	5.209 (0.620)**
Prob >F	0.000	0.000	0.000	0.000
R Square	0.01	0.89	0.90	0.89

*Note: Standard Error are in the parentheses*

*\*\*\* statistically significant at 1% level of significancy*

*\*\* statistically significant at 5 % level of significancy*

*\*statistically significant at 10% level of significancy*

Table. 3  
Results for inflation rate

In all the models run in this paper inflation dummy is statistically significant and has a negative sign. Analyzing first the third model as it is our main model, we have regressed the data of period 1997-2016 excluding all the values of inflation that are above 50%, we see that our outcomes are statistically significant at 90% significance level and have an R square of 0.9. The coefficient for the difference in difference shows that if non-targeting economies would have targeted inflation then they would have faces a decrease in the inflation rate by 2.08 percentage points more than they do. Also, the coefficient of pre-inflation rate is significant and relatively strong -0.98 percentage points. If comparing so the results from this model which includes the regression to mean to the first model where the regression to mean is not considered we see that R square is relatively small in model 1, equaling to 0.1. The difference in difference coefficient is still statistically significant though the value is different from our core model. The sample used in Model 1 and Model 3 show that the average inflation for group of inflation targeting economies was quit higher compared to the group of noninflation targeting economies. And after implementation of inflation targeting

it is seen that the average inflation rate for both targeting and non-targeting economies move around 5 to 6 percentage points.

On the other hand, the last model regresses the same dataset as Model 1 and Model 3 though it excludes countries like Kosovo, Montenegro and Bosnia and Hercegovina since these countries do not have all the data until 2001. The coefficient for difference in difference variable for this model is relatively high compared to the Model 1 and Model 3 results, though it is still significant and negative. Standard errors are higher compared to Model 3 and the R square is 89%.

Following the same method, we regressed the models once again using now GDP growth rate as the independent variable. As expected the impact of inflation targeting in GDP is not high. We analyzed the GDP growth rate in the previous parts of this chapter and concluded that based on the descriptive table GDP growth rate has declined for both, targeting and non-targeting economies. This decline raises the question whether it is statistically significant or not? The results for output show that the variables have a negative sign, meaning that the effect of inflation targeting in output is not positive, but none of the coefficients are statistically significant leading us to conclude that even though the growth has slowed down, a lower inflation rate is not significantly reached through a decline in growth rate. The R squares are relatively low.

### **Conclusion and Remarks**

Importantly based on the location of these countries, because through this way we tend to decrease as much as possible the selection bias. Most of the countries being studied in detail are in the Balkan, Central and Eastern Europe Region considering that the macroeconomic environment is relatively flowing around the same levels. Applying the same logic, we decided to go with Commonwealth countries as well. As mentioned this dataset has been used before up to 2011 and our results are reached based on an addition of 5 more years in the dataset including here the longer effect that financial crises might have had on these economies. What also characterizes these countries is the similar framework of inflation targeting. It is obvious that the differences between the countries are not only in cultural and economic terms but also in political and policy making terms. Despite these differences still the policy makers have chosen a similar framework for adaptation of inflation targeting though a different transition path.

As literature review supports inflation targeting is not proven to be affecting the economy of a country in a negative way. In other word maybe, the effect is not as positive as desired in terms of economic growth and inflation rate stability, but indeed none of the studies have proven that countries that are adopting inflation targeting are becoming worst off. The same case is for our paper as well.

We concluded that based on the graphical point of view for inflation targeting countries volatility has shown improving trend and improvements are also seen in inflation rate by dropping it from average two-digit numbers to relatively small average values of 3- 4%. These graphical outcomes are supported by our empirical results as well. We run four different models and for all of them we concluded that inflation targeting has a statistical significance on inflation rate. Also based on Ball and Sheridan (2005) results revision to the mean bias is reduced with the inclusion of the average inflation rate for the pre-adoption phase as a explanatory variable. This variable was statistically significant for inflation rate results and as seen also in the graph the declining trend supports the negative relation between these variable, emphasizing so the relevance and importance of revision to the mean in our calculations.

On the other hand, as per the graphical point of view results for output growth and volatility we reached to very non-inclusive results since the trends were not that much visible. Our empirical results have shown also that inflation targeting has a negative effect in output growth rate, as we understood from the graphs and the descriptive data, though from the econometrics point of view this effect was not statistically significant. Inflation targeting, as supported also by the literature, does not affect the economy negatively.

Lastly but not least, the impact of inflation targeting during the financial crisis have been a very interesting topic as well, which has been studied thought the recent years. As per the results of Fouejieu (2012) and Filho (2010) inflation targeting economies have been performing better in terms of inflation rate but not the output growth, results supported also by our dataset.

Inflation targeting benefits as mentioned in this paper but also in the paper by Ball and Sheridan (2005) are not seen only in the economical point of view, but also in the political one. Adopting inflation targeting comes with the promise to the economy for a stable targeted rate, which indirectly infuses trust to the central banks and adjust inflation expectations rate. Inflation targeting has shown to be a preferable framework chosen not only by economies which are facing double digit inflation rates, but also from developed countries, at the end of the day, no harm is proven to be done to the economy if this framework is adopted.

## References

- [1] Alex Cukierman. (2000). *Establishing a reputation for dependability by means of inflation targets*.
- [2] Armand Fouejieu A. and Scott Roger. (2013). *Inflation Targeting and Country Risk: An Empirical Investigation*.

- [3] Ball, L., & Sheridan, N. (2003). *Does Inflation Targeting Matter?* (w9577; p. w9577). National Bureau of Economic Research. <https://doi.org/10.3386/w9577>
- [4] De Carvalho Filho, I. E. (2011). 28 Months Later: How Inflation Targeters Outperformed Their Peers in the Great Recession. *The B.E. Journal of Macroeconomics*, 11(1). <https://doi.org/10.2202/1935-1690.2272>
- [5] Edward Gemayel. (2011). *What Can Low-Income Countries Expect from Adopting Inflation Targeting?*
- [6] Frederic S. Mishkin. (2000). *FROM MONETARY TARGETING TO INFLATION TARGETING: LESSONS FROM THE INDUSTRIALIZED COUNTRIES.*
- [7] Gonçalves, C. E. S., & Salles, J. M. (2008). Inflation targeting in emerging economies: What do the data say? *Journal of Development Economics*, 85(1–2), pp.312–318. <https://doi.org/10.1016/j.jdeveco.2006.07.002>
- [8] Jeffrey Frankel. (2012). *The Death Of Inflation Targeting.*
- [9] jerry brito. (2011). *Loving the Cyber Bomb? The Dangers of Threat Inflation in Cybersecurity Policy.*
- [10] Johnson, D. R. (2002). The effect of inflation targeting on the behavior of expected inflation: Evidence from an 11 country panel. *Journal of Monetary Economics*, 49(8), pp.1521–1538. [https://doi.org/10.1016/S0304-3932\(02\)00181-2](https://doi.org/10.1016/S0304-3932(02)00181-2)
- [11] José De Gregorio. (2009). *Implementation of Inflation Targets in Emerging Markets.*
- [12] Lin, S., & Ye, H. (2009). Does inflation targeting make a difference in developing countries? *Journal of Development Economics*, 89(1), pp.118–123. <https://doi.org/10.1016/j.jdeveco.2008.04.006>
- [13] Manfred J. M. Neumann & Juergen von Hagen. (2002). *Does inflation targeting matter?*
- [14] Markus Hyvonen. (2004). *Inflation Convergence Across Countries.*
- [15] Michael Dotsey. (2006). *A review of inflation targeting in developed countries.*
- [16] Mishkin, F. S. (1999). International experiences with different monetary policy regimes ). Any views expressed in this paper are those of the author only and not those of Columbia University or the National Bureau of Economic Research. *Journal of Monetary Economics*, 43(3), pp.579–605. [https://doi.org/10.1016/S0304-3932\(99\)00006-9](https://doi.org/10.1016/S0304-3932(99)00006-9)

- [17] Petra M. Geraats. (2013). *The Effect of Inflation Targeting: A Mean-Reverting Mirage?*



# Practical aspects of influencer marketing

**Anett Popovics**

Óbuda University; Keleti Károly Faculty of Business and Management  
popovics.anett@uni-obuda.hu

*Abstract: Influencer marketing is a popular and effective strategy for promoting products or services by leveraging the reach and influence of people who have a significant following on social media or other online platforms. Influencer marketing can be used in different situations and to achieve different objectives. However, it is important to note that influencer marketing does not make sense for every company or product. The target group and the nature of the product are key factors in the effectiveness of influencer marketing. Choosing the right influencers and designing campaigns are key to using this strategy successfully. Influencer marketing can be a powerful tool when executed effectively. The key is to select the right influencers, create authentic and engaging content, and measure the impact of campaigns to continually improve the strategy. Influencer marketing is effective across a wide range of industries and sectors, and can help brands increase and grow their online presence.*

*Keywords: influencer, consumer behaviour, increase visitor numbers, opinion leader*

## 1 Introduction

Influencer marketing has grown and evolved significantly in recent years, with a wide range of different practices and strategies being adopted in the international market. The aim of influencer marketing is usually to involve celebrities, opinion leaders or experts in the promotion of a particular brand or product through social media platforms.

Below are some international practices and trends in influencer marketing:

1. Micro- and macro-influencers: micro-influencers are people who have a smaller number of social media followers, but are more closely and actively connected to their followers. Macro-influencers are traditional celebrities or established public figures who have a larger following. Companies are also increasingly focusing on micro-influencers, as they can target more effectively and create more personalised content despite their smaller followings.

2. Transparency and honesty. In the international market, more and more countries are regulating collaborations between influencers and brands, and expect such content to clearly indicate if it is paid content.
3. Diversity of content: influencers are not only sharing posts and photos, but are also increasingly producing videos, live streams, stories and podcasts. The use of different formats helps companies to connect with their followers in a more diverse and intimate way.
4. Global campaigns. Such campaigns are usually designed to make the content easily adaptable to different cultures and languages.
5. Data-driven decision-making: the role of data and analytics is growing in influencer marketing. Companies tend to select influencers whose target audience matches the target audience for their own products or services. Data also helps to measure effectiveness and optimise collaborations.
6. Long-term relationships. This allows for ongoing content creation and deeper engagement with followers.

It's important to note that the field of influencer marketing is constantly changing and evolving, so the above points may be expanded or modified in practice over time.

## **2 Application of influencer marketing**

In digital communication today, the dominance of visual content and video content is an unstoppable trend. Digitalisation has brought about significant changes in many areas, from communication to our everyday decisions and the way we choose our jobs. Its impact is complex, complex and multi-dimensional (Garai-Fodor et al., 2023; Garai-Fodor, 2022; 2023).

There are several definitions of influencer marketing. According to Papp-Váry's definition, opinion leaders are usually prominent members of a community and possess personality traits that can guide the behaviour and consumer decisions of others. They can become opinion leaders based on their expertise, recognition or unique style of addressing and influencing their followers (Papp-Váry, 2020).

In their 2020 study, Oliveira et al. grouped influencers by the number of followers:

- nano influencers, those with less than 1,000 followers,
- micro influencers, who have between 1,000 and 10,000 followers,
- macro influencers, who have between 10,000 and 100,000 followers, and
- mega influencers, who have more than 100,000 followers.

The three most important areas of influencer marketing where professionals use influencers are content promotion, product launch and the creation of the content itself (Szakály 2022).

Influencers are therefore influencers (celebrities, bloggers, industry experts) who are tasked with filtering information based on their own experience and beliefs to a level that they can then transmit to consumers/followers through various social media platforms, thereby inspiring them to consume a product or service (Szakály 2023).

There are many ways to use influencer marketing and the strategy can vary depending on the target audience, the product or service and the resources available. Below are some of the steps and methods that companies typically follow when using influencer marketing:

*Setting objectives and strategy:* First, companies need to define what they want to achieve with their influencer marketing campaign. The first step is to define their influencer marketing strategy. Based on the definition of these goals, they develop a campaign strategy.

*Selecting influencers.* Influencers' connection with the target audience and their alignment with the brand or product is crucial. The demographics and interests of the influencer's followers can be used to select the most appropriate individuals.

*Establishing contact and building cooperation:* once the influencers have been selected, companies need to establish contact with them. This usually includes clarifying the aims and conditions of the collaboration and agreeing on a payment structure.

*Content concept and creation:* Together with the influencers, they design the content that will feature the brand or product. This could be a post, video, photo, blog entry, etc. It is important that the content is natural and authentic, and that it fits well with the influencer's style and the expectations of his/her audience.

*Sharing content:* influencers share the content they create on their social media channels such as Instagram, YouTube, Facebook, etc. It is important that the influencer indicates in the content if it is a paid collaboration, in order to maintain transparency and honesty.

*Monitoring and analysis:* it is important to monitor and analyse results throughout the campaign. This can include follower activity, content reach, spend and potential conversions. The data will help measure the effectiveness of the campaign and optimise future collaborations.

*Long-term relationship building:* Companies can strive to build longer-term partnerships with influencers, which can increase authenticity and credibility in the eyes of followers (Campbell-Farell, 2020; Kovács et al. 2019, Papp-Váry, 2020; Popovics, 2023; Szűcs, 2023).

These are just general steps and methods for applying influencer marketing. Each campaign can be unique and adapted to the needs, goals and opportunities.

### **3 Practical aspects of influencer marketing**

In practice, influencer marketing can take many forms, and the specific examples depend largely on the company, the product or service, the influencer and the platform. Below are some examples of how influencer marketing can be implemented in practice:

*Product showcase posts:* a company works with an influencer to create posts or photos of products. The influencer presents and explains the use and features of the product and shares his/her opinion about it. In this way, the product's visibility and credibility can be increased.

*Unboxing videos:* This video format provides an excellent opportunity to show the product in detail and give a sense of how the influencer reacts to the product.

*Usage guides:* the influencer produces a how-to video or post on how followers can use the product or service. This can help potential customers make a decision and promote a positive user experience.

*Events and promotions:* influencers can participate in company events or promotions and document them on social media. This can increase attendance at the event and increase the conversation around the event on social media.

*Affiliate marketing:* an influencer can share referral links to a product or service page and receive a commission for each sale that they generate.

*Instagram Stories and Live videos:* This content format can make engagement with followers more interactive and personal.

*Challenges and games:* an influencer can set up challenges or games that followers can participate in about the product or brand. This can increase interaction and content sharing.

*An inside look at product development:* the influencer can participate in the development of the product or service and document the process for followers. Ez az átláthatóságot és a követőkkel való kapcsolatot erősítheti (Biaudet, 2017; Levin, 2020).

It's important to note that the success of influencer marketing depends not only on the quality of the content, but also on the authentic and genuine relationship between the influencer and the brand. The opinions and trust of the influencers' loyal followers are essential for successful partnerships.

People who will listen to influencers' opinions or take action on what they have seen them do are those who feel trust in them and are open to the topics they post. Prior knowledge of the product or brand is also essential to target the influencer's message (Tessényi-Kovács, 2023).

In order to be an effective and competitive tool, a brand needs a well-constructed marketing strategy that includes a credible and trustworthy opinion leader who reaches followers with his or her own words. Opinion leaders are highly effective in reaching Generation Z, socialised in the digital world, especially on TikTok and Instagram. These are video-sharing platforms where users are constantly stimulated, which is probably part of the reason for the platform's success among its members. They do not have a favourite type of influencer, it always depends on their interests, who they follow and how they can be persuaded, but it is important to highlight that they prefer sponsorships that are different from the usual, especially if it is spiced with humour (Rimóczi-Kozik, 2023).

The distribution of social media followers by age is shown in the graph below (Figure 1.).

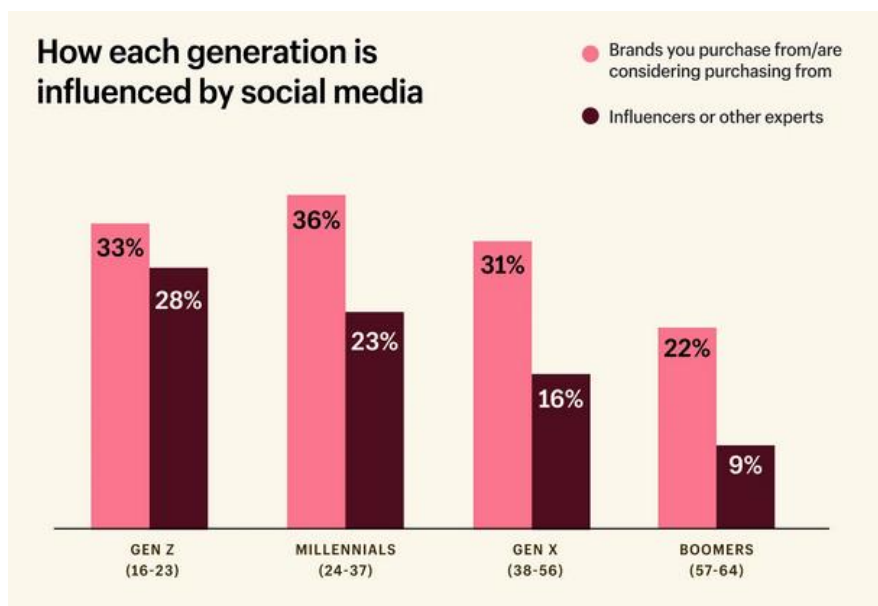


Figure 1

Distribution of social media followers by age

Source: <https://www.shopify.com/blog/influencer-marketing-statistics>

The main differences between Instagram and TikTok are:

- Instagram is a visual platform for images, carousels, ephemeral content (Stories), short-form videos (Reels), long-form videos (IGTV), streaming (Live), and listicles (Guides).
- TikTok is the established vertical, short-form video social channel online.

The age-specific visitation of the two platforms is as follows:

Instagram's user base in Hungary is growing steadily. According to the latest data, it has more than 3 million active users. This is a remarkable number considering that the country has a population of around 10 million people. Instagram therefore represents a significant part of the Hungarian digital community.

There is a wide age diversity among Hungarian Instagram users. Although the 18-29 age group still represents the largest proportion, older generations are also increasingly joining the platform. There is also a growing number of people over 50 who enjoy sharing images and content on Instagram (Kovács, 2023a).

Below are the demographic data of TikTok Hungarian users: nearly 70% of users are between 18 and 34 years old. The largest user group is between 18 and 24 years old, with 37% of users aged between 18 and 24. The age group between 25 and 34 years is 29% (Kovács, 2023b).

Research has shown that practitioners should consider the match between the image of the brand to be promoted and the image of the influencer of choice, as in general, congruence between brand and influencer increases the effectiveness of the sponsored post (Hódi et al., 2022).

Influencers can have an impact in many areas. For example, they can help businesses to engage young people through volunteering. In addition to providing a form of socialisation for young people into the world of work, it can also be an effective tool for recruiting and attracting staff, not only in our country but also internationally. Attracting Generation Z to the world of work is a major challenge for employers. Voluntary work can be seen as a motivational tool for retention, both in the present and in the future (Garai-Fodor et al., 2021).

In influencer marketing practice, it is also worth paying attention to how mega-, macro- and micro-influencers complement each other in a campaign. While the reach of megainfluencers can be huge, microinfluencers lead the way in terms of targetability and higher activity, making a social media campaign even more effective, the efficiency and effectiveness of which is a key issue in reaching many target groups (Kovács et al., 2019).

Research shows that since the early 2000s, with the emergence of online tools, the role of the family and school in communicating values has been steadily declining, and opinion leaders and influencers play an important role in the lives of Generation Z (Csiszárík-Kocsir, 2022; Csiszárík-Kocsir et al., 2021; Garai-Fodor et al., 2016; 2021).

There are influencers who encourage their followers not only to buy a product, but also to use a service. According to national research, 50% of young people surveyed follow opinion leaders who promote cultural content, i.e. encourage the younger generation to read or attend theatre performances (Mohos, 2020).

In addition to consumer goods and culture, the promotion of luxury products is of course also reflected in the content of influencers. In her research, Kucsera-Neulinger investigated the perception of luxury by Generation Z and whether their perception is more product- or experience-oriented (Garai-Fodor - Csiszárík-Kocsir, 2016; 2018b).

Using content analysis and interviews, it was found that the posts of the influencers studied included luxury brands in the form of cars, technical goods, clothes and accessories, and exclusive experiences. The interviewed young people preferred the experience-oriented luxury but only if it was represented by an authentic genuine luxury content in the influencer (Kucsera-Neulinger, 2021).

The credibility of influencers is therefore key to influence, as consumers are willing to follow and trust those who they perceive as experts in a particular field. However, this influence is not just a one-way process, as it also feeds back to them, shaping their content (Brown-Hayes, 2008).

## **Conclusions**

The success of influencer marketing campaigns depends on choosing the right influencers, producing creative content and tracking ongoing performance. Influencer marketing can be a powerful tool for brand building, market penetration and audience engagement.

Like any other marketing strategy, influencer marketing has its drawbacks. These include: loss of control, lack of credibility, high costs, one-sided content, limitations in measuring reach, short-term effects. These disadvantages do not mean that influencer marketing is ineffective. But it is important to be aware of these challenges and to plan campaigns properly and measure results.

The success of influencer marketing depends on the quality of the influencers selected, the content creation and campaign design, and the effectiveness of tracking and evaluation.

In addition to understanding the basics, flexibility and the ability to react quickly to change are essential for influencer marketing to succeed. The field of influencer marketing is evolving rapidly, and successful campaigns are constantly adapting to new trends and audience needs.

## References

- [1] Biaudet, S. (2017). *Influencer marketing as a marketing tool: The process of creating an Influencer Marketing Campaign on Instagram*.
- [2] Brown, D., & Hayes, N. (2008). *Influencer marketing*. Routledge.
- [3] Campbell, C., & Farrell, J. R. (2020). More than meets the eye: The functional components underlying influencer marketing. *Business horizons*, 63(4), pp. 469-479.
- [4] Csiszárík-Kocsir, Á. (2022): Socialisation Determining Individual Financial Decisions from the Aspect of Financial Literacy. *Public Finance Quarterly*, (67) 4 pp. 567-584.
- [5] Csiszárík-Kocsir, Á., Garai-Fodor, M., & Varga, J. (2021): What has Become Important during the Pandemic? – Reassessing Preferences and Purchasing Habits as an Aftermath of the Coronavirus Epidemic through the Eyes of Different Generations. *Acta Polytechnica Hungarica*, 18(11), pp. 49-74.
- [6] Garai-Fodor, M., Varga, J. & Csiszárík-Kocsir, Á. (2016). The value based analysis of the financial culture. *The Journal of Macro Trends in Social Science*, 2 (1) pp. 89-100
- [7] Garai-Fodor, M., & Csiszárík-Kocsir, Á. (2018b). Miért fontos a pénzügyi ismeretek oktatása a Z generáció véleménye alapján?. *Polgári Szemle*, 14 : 1-3 pp. 107-119.
- [8] Garai-Fodor, M., Csiszárík-Kocsir, Á., & Varga, J. (2021). Az önkéntesség motivációs ereje értékrendalapú megközelítés a Z generációs fiatalok körében. *Vezetéstudomány-Budapest Management Review*, 52(10), pp. 42-56.
- [9] Garai-Fodor, M. (2022): The Impact of the Coronavirus on Competence, from a Generation-Specific Perspective. *Acta Polytechnica Hungarica*, 19(8), pp.111-125.
- [10] Garai-Fodor, M. (2023). Digitalisation trends based on consumer research. IEEE 17th International Symposium on Applied Computational Intelligence and Informatics SACI 2023. Proceedings. Budapest. IEEE Hungary Section, pp. 349-352.
- [11] Garai-Fodor, M., Vasa, L., Jäckel, K. (2023): Characteristics of segments according to the preference system for job selection, opportunities for effective incentives in each employee group. *Decision Making: Applications in Management and Engineering* 6(2) pp. 557-580.
- [12] Hódi, B., Barkász, D. A., & Buvár, Á. (2022). “Mindegy, mit reklámoz; lényeg, hogy szeretem”: A paraszociális kapcsolat és az influencers-márka kongruencia együttes hatása a szponzorált közösségi posztok



- hatékonyságára. *Marketing & Menedzsment*, 56(EMOK Különszám), pp.7-17.
- [13] Kovács, A., Lőrincz, A., Papp, V., & Veres, I. (2019). Influencer marketing a turizmusban–trendek és gyakorlat. *Turisztikai és Vidékfejlesztési Tanulmányok*, 4(4).
- [14] Kovács D. (2023a): Instagram felhasználók száma Magyarországon (2023); <https://davidkovacs.com/instagram-felhasznalok/> (Download: 03/11/2023)
- [15] Kovács D. (2023b): TikTok felhasználók száma Magyarországon és világszerte (2023); <https://davidkovacs.com/tiktok-felhasznalok/> (Download: 03/11/2023)
- [16] Kucsera, M., & Neulinger, Á. (2021). Megvenni vagy megélni?-Magyar Z generációs fiatalok luxus észlelése. *Marketing & Menedzsment*, 55(4), pp. 61-70.
- [17] Levin, A. (2020). *Influencer marketing for brands*. Apress.
- [18] Mohos E.-Ponyi L. (2020): Az ifjúság szabadidő-felhasználási és kultúrafogyasztási szokásai. *KULTURÁLIS SZEMLE*, 152. 7(2).
- [19] OLIVEIRA M. – BARBOSA, R. – SOUSA, A. (2020): The Use of Influencers in Social Media Marketing. In: ROCHA. Á. – REIS, J. – PETER, M. – BOGDANOVIĆ, Z.(eds): Marketing and Smart Technologies. *Smart Innovation, Systems and Technologies*, pp. 112-124.
- [20] Papp-Váry Á.F. (2020): Az influencer marketing alapjai-gyakorlati áttekintés; [http://www.papp-vary.hu/reklam\\_marketing/Az\\_influencer\\_marketing\\_alapjai\\_Gyakorlati\\_a\\_ttekintes.pdf](http://www.papp-vary.hu/reklam_marketing/Az_influencer_marketing_alapjai_Gyakorlati_a_ttekintes.pdf) (utolsó letöltés, megtekintés dátuma: 2023.08.25.)
- [21] Popovics A. (2023): Az influencers marketing hatása fogyasztói döntésekre; *Vállalkozásfejlesztés a XXI. században 2023/1. kötet*
- [22] Rimóczi, C., & Kozik, E. (2023). Influencerek hatása a Z-generáció fogyasztási szokásaira–feltáró kutatás. *Jelenkori Társadalmi és Gazdasági Folyamatok*, 18(Különszám), pp. 397-409.
- [23] SZAKÁLY, O. (2022): Segmentation of gastronomic consumers following Instagram influencers based on destination preferences. *Marketing & Management*, 56(2), pp. 35-46. DOI: 10.15170/MM.2022.56.02.04.
- [24] Szakály, O. (2023). Hogyan befolyásolják a gasztronómiai influencerek a fogyasztói döntést?—A fogyasztói aktivitás szerepe a döntéshozatali folyamat során a gasztronómiai turizmusban, az Instagram példáján keresztül [védés előtt] (Doctoral dissertation, Budapesti Corvinus Egyetem).

- [25] Szűcs M. (2023): Influencer marketing – részletes útmutató; <https://features.hu/influencer-marketing/> (utolsó letöltés, megtekintés dátuma: 2023.08.25.)
- [26] Tessényi, J., & Kovács, J. (2023). *Influenszerek hatásának vizsgálata különös tekintettel az élelmiszervásárlásra. GRADUS, 10(1).*

# **An overview into the literature on the concept of eco/green hotel<sup>1</sup>**

**Silvana Gashi**

“Aleksander Moisiu” University of Durres, silvanagashi@uamd.edu.al

**Denada Liça**

“Aleksander Moisiu” University of Durres, denadalica@uamd.edu.al

**Ermira Qosja**

“Aleksander Moisiu” University of Durres, eqosja@yahoo.com

*Abstract: In contemporary discourse, sustainability has assumed paramount significance within global and local policy frameworks, constituting an integral facet of the UN Agenda 2030. Noteworthy is the tourism industry's substantial contribution to the world economy, representing 9% of global GDP and employing 8% of the global workforce. Concurrently, it stands as the fifth-largest contributor to worldwide pollution, responsible for approximately 5% of global greenhouse gas emissions. The hospitality sector, operating at an accelerated growth rate on both global and local fronts, is characterized by an expanding portfolio of properties and an ever-increasing influx of tourists. These trends, compounded by international climate agreements, underscore the pressing imperative for stakeholder groups within the sector to safeguard natural resources and promote the sustainable utilization of the environment. Of particular significance is the recognition that eco/green practices have emerged as pivotal determinants shaping the consumer choices of the millennial demographic, who constitute the largest cohort of tourism consumers. This paper centers its focus on a comprehensive review of the literature surrounding the concepts of sustainability, eco-friendliness, and green initiatives within the realms of both the economy and tourism. Furthermore, it places a particular emphasis on eco/green hotels and their distinctive attributes. The methodology employed herein is predominantly descriptive in nature, aiming to provide a nuanced understanding of these concepts.*

---

<sup>1</sup> This paper is part of the project "Eco-hotels as a model of environmental responsibility and innovation in the hotel industry" financially supported by the National Research Agency Scientific and Innovation of Albania.

*Additionally, this paper underscores the tangible advantages associated with the adoption of eco-friendly labels within the accommodation sector.*

*Keywords: sustainable development, tourism industry; environmental responsibility, eco/green hotel*

## **1 Introduction**

During the EU Green Week (European Commission, 2021), the President of the European Commission reaffirmed that climate change is a top priority for the European Union, underscoring the significance of the European Green Deal (EGD). The EGD emphasizes the imperative shift towards European sustainability, aiming to mitigate the adverse health effects of pollution, foster responsible production and consumption, and align with the Sustainable Development Goals set by the United Nations (Trincado, Sánchez-Bayón, & Vindel, 2021). The EU is actively concentrating on the rapidly expanding employment opportunities in the green economy and is committed to enhancing the EGD, extending its reach to every economic sector, with a focus on well-being economics (García Vaquero, Sánchez-Bayón, & Lominchar, 2021).

In 2019, the Travel & Tourism sector stood as one of the world's largest, contributing significantly to the global economy with a share of 10.4% in the Gross Domestic Product (GDP), equivalent to USD 9.2 trillion. It also played a pivotal role in employment, representing 10.6% of all jobs, totalling 334 million (World Travel and Tourism Council, 2021). However, juxtaposed against these economic benefits is the stark reality that this industry ranks as the fifth-largest contributor to global pollution (Geossling, Hall, Peeters, & Scott, 2010).

The environmental impact of tourism becomes even more pronounced when considering that it constitutes 8% of global greenhouse gas emissions and contributes significantly to the overall carbon footprint (Asadi, 2020). Despite the undeniable economic returns generated by the tourism industry, the environmental toll it exacts remains a cause for concern. The environmental issues are becoming more sensitive for the costumers, the demand for green products and services is growing, and the companies have pressure to go green and to be more environmentally friendly. In these circumstances the tourism industry should design sustainable strategies and to take technological steps (Songur, Turktarhan, & Cobanoglu, 2022).

This paper aims to underscore the significance of understanding the concept of green/eco hotels and elucidates the key aspects of their integration into the hospitality industry. It serves as a foundational contribution to fostering environmental responsibility and sustainable development within this sector. This

endeavour marks the initial phase of the project titled "Eco-hotels as a Model of Environmental Responsibility and Innovation in the Hotel Industry," which has received support from the National Agency for Scientific Research and Innovation of Albania. This initiative is part of a broader framework of research projects, representing a tangible outcome of collaborative efforts between the academic realm and the hotel industry.

The research strives to offer comprehensive insights into the following key areas:

- A thorough examination of existing literature concerning the concepts and definitions of sustainable development, as well as sustainable/eco/green tourism.
- A focused literature review, particularly emphasizing the definition of green/eco hotels and elucidating their implementation features.

The central research question guiding this paper is: What is the current state of knowledge regarding the definition and features of green/eco hotels?

The paper employs a descriptive methodological approach, intending to offer a nuanced comprehension of green/eco/sustainable concepts and their characteristics within the tourism and accommodation industry. By doing so, the paper posits that such knowledge can enhance awareness within the tourism sector, potentially prompting adjustments to strategies. This, in turn, could foster the adoption of more environmentally friendly and sustainable business practices within the accommodation industry.

## 2 Literature Review - Core Concepts

In this section, we undertake a comprehensive review of the literature pertaining to sustainable/green/eco concepts within the domains of the economy and tourism. The concept of sustainable development rose to substantial prominence following the publication of the seminal report "Our Common Future" in 1987, commonly known as the Brundtland Report (Brundtland, 1987). This report underscored the imperative of striking a balance between economic development, environmental preservation, and social equity. It articulately defined *sustainable development* as the pursuit of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The Rio+20 conference, the United Nations Conference on Sustainable Development held in Rio de Janeiro, Brazil, in June 2012, featured a central theme: "Green Economy in the Context of Sustainable Development and Poverty Eradication." This theme placed a primary emphasis on the concept of a green economy, aiming to realize sustainable development by seamlessly integrating economic, social, and environmental dimensions.

Another pivotal concept is that of the *circular economy*, which centers on an economic model intentionally designed to be restorative and regenerative. The primary objective is to retain the maximum value from products, components, and materials (EMF, 2015). The *circular economy* not only offers substantial competitive advantages for businesses but also delivers notable environmental benefits. This concept signifies a departure from the conventional linear economic model of "take, make, dispose." Instead, it advocates for a more circular and sustainable approach (Axhami, Ndou, Milo, & Scorrano, 2023).

The *circular economy* constitutes an economic system grounded in business models that replace the traditional 'end-of-life' concept. Instead, it prioritizes the reduction, reuse, recycling, and recovery of materials throughout the production, distribution, and consumption processes. This approach operates at multiple levels, including the micro-level (individual products, companies, consumers), meso-level (eco-industrial parks), and macro level (city, region, nation, and beyond). Its overarching aim is to realize sustainable development, encompassing environmental quality, economic prosperity, and social equity, thereby benefiting both current and future generations (Kirchherr et al., 2017).

A *green economy* aspires to reconcile economic growth and human well-being with environmental sustainability. It concentrates on generating economic opportunities and enhancing the quality of life while respecting the limitations of the planet's natural systems. Achieving these objectives often involves policy adjustments, investments in clean technologies, and transformations in consumption and production patterns.

The European Commission recognizes the *green economy* as more than a mere aggregation of existing commitments. Emphasizing sustainability, environmental protection, and the efficient use of resources, it signifies a fundamental shift in economic structures and business operations (Lavrinenko, Rybalkin, Danileviča, & Sprüde, 2022).

The transforming landscape of tourism, increasingly centered on nature, heritage, and sustainability, presents substantial challenges and opportunities for both governmental bodies and private enterprises. *Sustainable tourism* development has emerged with the objective of enhancing the efficient utilization of natural resources, reducing waste, and addressing the challenges posed by climate change and biodiversity (UNWTO, 2020).

The term "*ecotourism*" was introduced by Héctor Ceballos-Lascuràin in 1983. Initially, it denoted a type of nature-based travel to relatively undisturbed or pristine natural areas, emphasizing education and conservation. Over time, the concept of ecotourism has matured into a scientifically grounded approach guiding the planning, management, and development of tourism products and activities that prioritize environmental and cultural sustainability (GDRC, 2023).

According to UNWTO, *ecotourism* encompasses forms of tourism characterized by the following criteria (WTO, 2001):

1. *Primary Motivation*: Tourists are primarily motivated by the observation and appreciation of nature, as well as the traditional cultures found in natural areas.
2. *Educational and Interpretation Features*: Elements to enhance visitors' understanding of the environment and local cultures.
3. *Organized by Specialized Tour Operators*: It is typically organized by specialized tour operators catering to small groups.
4. *Minimization of Negative Impacts*: Ecotourism endeavours to minimize negative impacts on both the natural and socio-cultural environment.
5. *Support for Natural Area Maintenance*: It supports the maintenance of natural areas used as ecotourism attractions by generating economic benefits for host communities, organizations, and authorities managing these areas for conservation purposes. This is achieved through providing alternative employment and income opportunities for local communities and fostering increased awareness regarding the conservation of natural and cultural assets, among both locals and tourists.

The International Eco-tourism Society defines *ecotourism* as "responsible travel to natural areas that conserves the environment and improves the well-being of local people." Similar terms such as "green tourism," "ecologically responsible tourism," "carbon-free tourism," or "carbon-neutral tourism" share the same fundamental principles as ecotourism (ESCAP, 2012).

The *paramount objective of ecotourism* is to engender a positive and sustainable impact on both the environment and local communities, all while delivering a meaningful and educational experience for travelers. It represents an approach to tourism that seeks to strike a delicate balance between promoting tourism and safeguarding the natural and cultural assets of a destination (World Seas, 2018).

A well-managed ecotourism program should consider and integrate several key elements: (1) the preservation of natural areas and cultural resources; (2) the advancement of environmental and ecological sustainable development; (3) the provision of environmental and ecological education to stakeholders; (4) the stimulation of local economic development, and (5) the assessment of residents' satisfaction with ecotourism (Zareba, 2017).

This approach not only contributes to diminishing the environmental impact of tourism but also harbors the potential to yield economic and social benefits. It aligns seamlessly with the broader objectives of sustainability and responsible tourism development. When thoughtfully and responsibly implemented, ecotourism holds the potential to be a win-win for developing countries—providing economic opportunities, preserving natural environments, and enhancing the well-being of local communities (ESCAP, 2012).

In summary, *ecotourism* stands out as a distinct form of tourism characterized by a heightened emphasis on nature conservation. On a broader scale, *sustainable tourism* encompasses all forms of tourism with the overarching goal of ensuring environmental and social responsibility. In tandem, *responsible travel* refers to the individual actions and choices made by travelers to minimize their impact on the environment and local communities (TIES, 2023).

### 3 Eco/Green Hotel - Definition

The shift towards sustainability in the hospitality industry not only aligns with the heightened awareness of environmental issues but also mirrors evolving consumer preferences. Moreover, the hospitality sector is increasingly acknowledging that adopting eco/green practices is not solely an exercise in environmental responsibility but also a savvy business strategy (Merli, Preziosi, Acampora, Lucceti, & Ali, 2019). Eco/green hotels, by embracing such practices, can enhance their competitiveness, meet evolving consumer expectations, attain resource efficiency, and foster positive relationships with diverse stakeholders. These factors collectively contribute to their enduring success in the marketplace.

Eco hotels often integrate a range of eco-friendly initiatives, encompassing energy-efficient lighting, water conservation measures, waste reduction and recycling programs, and the utilization of renewable energy sources (Ecotravelist, 2018). Additionally, they may incorporate green building and design principles to minimize their environmental impact. These establishments might further opt to source their products and services locally, thereby supporting the community and curbing transportation-related carbon emissions. Consequently, eco-hotels not only play a role in environmental preservation but also elevate their brand image and appeal to a broader customer base. It is imperative for these hotels to obtain green/eco certification from an independent third party or the relevant state authorities. Table 1 offers a summary of the definitions of eco/green hotels along with the pertinent authors and references.

No	Author	Definition	Reference
1	Patrick Landman	A type of hotel which heavily emphasises <i>sustainability</i> in all its services and products delivered.	<a href="https://www.xotels.com/en/glossary/eco-hotel">https://www.xotels.com/en/glossary/eco-hotel</a>
2	Tourism Council Australia (1998)	The hotel provides <i>natural accommodation and facility</i> including green services, green products, and fresh and comfortable environment	<a href="https://www.tourism.australia.com/en">https://www.tourism.australia.com/en</a>



3	Lee Ni (2002)	A hotel which provides both <b>facilities and services with the idea of environmental protection</b>	Cited in Chen, Ying Chang., & Chen, Yu-Ta. (2012). The Advantages of Green Management for Hotel Competitiveness in Taiwan: In the Viewpoint of Senior Hotel Managers. <i>Journal of Management and Sustainability</i> , vol. 2, No. 2
4	Iwanowski (2003)	An environmentally sensitive hotel that operates its business in a manner that <b>minimizes degradation of the environment</b>	Iwanowski, K., Rushmore, C. (2003). Introducing the eco-friendly hotel. <i>Cornell hotel and restaurants administration quarterly</i> , 35(1), 34-38
5	Kasim (2004)	Incorporates socio-economic factors where the hotel <b>operates in a responsible manner towards its employees, the local community, the local culture, and the surrounding ecology.</b>	Azilah Kasim (2004), Socio-Environmentally Responsible Hotel Business: Do Tourists to Penang Island, Malaysia Care? <i>Journal of Hospitality &amp; Leisure Marketing</i> , 11(4):5-28
6	Manaktola and Jauhari (2007)	As a lodging facility committed to <b>ecological practices such as saving of water, energy and waste</b>	Manaktola, K, Jauhari, V. (2007). Exploring consumer attitudes and behaviour towards green practices in the lodging industry in India. <i>International Journal of Contemporary Hospitality</i> , 19(5), 364-377.
7	Proven Partners	One that is built or operated in such a way as to <b>minimise both the carbon footprint</b> of the business operation as well as the carbon footprint of those who work and stay there. They are designed and run to have a <b>positive impact on the environment as well as the local community.</b>	<a href="https://www.proven.partners/blog/eco-friendly-hotel">https://www.proven.partners/blog/eco-friendly-hotel</a>
8	Kim, Y., & Han, H. (2010)	Pro-environmental lodging properties which <b>implement different green practices such as saving water and energy, reducing solid waste, and recycling and reusing durable service items</b> (e.g., bins, towels, etc.) to protect the earth we live in	Kim, Y., & Han, H. (2010). Intention to pay conventional-hotel prices at a green hotel - a modification of the theory of planned behavior. <i>Journal of Sustainable Tourism</i> , 18, 997-1014. <a href="https://doi.org/10.1080/09669582.2010.490300">https://doi.org/10.1080/09669582.2010.490300</a>
9	Green	Environmentally-friendly	<a href="https://greenhotels.com/index.php">https://greenhotels.com/index.php</a>

	Hotel Association (2014)	properties whose managers are eager to <i>institute programs that save water, save energy and reduce solid waste—while saving money—to help protect our one and only earth</i>	
10	Kim, S.-H., Lee, K., & Fairhurst, A. (2017).	A value-added business strategy that benefits a hospitality operation that <i>engages in environmental protection initiatives</i> (p.236), embracing the evidence that they are commercially-driven actions that provide both financial and commercial added value while reducing the environmental impact.	Kim, S.-H., Lee, K., & Fairhurst, A. (2017). The review of “green” research in hospitality, 2000-2014 - current trends and future research directions. <i>International Journal of Contemporary Hospitality Management</i> , 29, 226–247. <a href="https://doi.org/10.1108/IJCHM-11-2014-0562">https://doi.org/10.1108/IJCHM-11-2014-0562</a>
11	Academic Accelerator	A hotel that fully <i>integrates into the environment without harming it and contributes in some way to the progress and improvement of local communities</i> and the sustainable growth of the tourism industry. An environmentally responsible accommodation that follows green living practices.	<a href="https://academic-accelerator.com/encyclopedia/eco-hotel">https://academic-accelerator.com/encyclopedia/eco-hotel</a>
12	Abdou et al (2020)	There are designed and constructed in a way to <i>save resources; reduce pollution and operating costs, while increasing profit margins</i>	Abdou, A.H., Hassan, T.H., Dief, E. and Moustafa, M. (2020), “A description of green hotel practices and their role in achieving sustainable development”, <i>Sustainability</i> , Vol. 12, No. 22, pp. 1-20.

Table. 1  
Summary of definitions of eco/green hotel

Hotels derive advantages from the implementation of eco/green practices/business models/strategies primarily through two avenues: *firstly*, it enables organizations to realize the benefits of resource efficiency in consumption, thus averting fines and interventions driven by legislation (Bonilla Priego, Najera, & Font, 2011); *secondly*, it serves to legitimize various stakeholders and unlocks new market

opportunities arising from the increasing consumer focus on sustainability (Chen, Chen, Zhang, & Xu, 2018). By incorporating eco/green initiatives, hotels can effectively showcase their commitment to sustainability, thereby enhancing their reputation and attracting environmentally conscious customers.

## **4 Features of eco/green hotels**

Eco-friendly hotels prioritize minimizing their carbon footprint and making positive contributions to the environment and local communities. Essential factors for sustainability in the context of hotels and tourism include the implementation of energy and water conservation projects, advocating a zero-waste approach, and engaging in effective solid waste disposal management alongside food waste management (Aldieri & Vinci, 2021). Here are some key aspects of what makes a hotel eco-friendly:

### *Feature 1# Energy Efficiency*

Use of energy-efficient appliances and lighting. Implementation of energy-saving technologies like LED lighting and motion sensors to reduce energy consumption. Adoption of renewable energy sources such as solar panels or wind turbines (Thac Dang-Van et al, 2022).

### *Feature 2# Water Conservation*

Installation of low-flow showerheads, faucets, and toilets to reduce water usage. Implementation of water recycling and rainwater harvesting systems. Encouragement of guests to participate in water conservation efforts through signage and initiatives (Ecotourism World, n.d.).

### *Feature 3# Waste Reduction and Recycling*

Establishment of recycling programs for paper, plastic, glass, and other recyclables. Implementation of composting for food waste and organic materials. Reduction of single-use plastics with the provision of alternatives such as reusable water bottles and containers (Ecotourism World, n.d.).

### *Feature 4# Sustainable Building Design*

Utilization of eco-friendly building materials, including reclaimed wood and recycled materials. Designing for natural ventilation and daylight to minimize the reliance on artificial lighting and air conditioning. Integration of green roofs to enhance insulation and decrease stormwater runoff (Thac Dang-Van et al., 2022).

### *Feature 5# Sustainable Transportation*

Promotion of eco-friendly transportation options, such as bike rentals and electric vehicle charging stations. Strategic location in proximity to public transportation to diminish the reliance on private cars.

*Feature 6# Sustainable Local Products*

Food items, toiletries, linens and décor can all be sourced locally for immediate carbon footprint production (reduced transport costs and fuel usage) as well as the ability to highlight and support local businesses, artisans, farmers and producers who utilise eco-friendly and sustainable practices. This approach extends beyond eco-friendliness, serving as an effective means of grounding the business in the community. It fosters tourist interest in the local culture and offerings, creating a sustainable local economy that becomes a unique attraction in itself (Proven Partners, n.d.).

*Feature 7# Carbon Neutrality*

While minimizing the carbon footprints is crucial, achieving carbon neutrality requires a concerted effort towards some level of carbon offsetting.

*Feature 8# Community Engagement*

Demonstrating support for local communities through partnerships with local businesses and artisans. Active engagement in community service and philanthropic initiatives. Integration of local culture and heritage into the overall hotel experience.

*Feature 9# Green Certification*

Striving for certifications like LEED (Leadership in Energy and Environmental Design) or Green Globe to visibly demonstrate a commitment to sustainability. Maintaining transparent reporting on environmental and social performance.

*Feature 10# Education and Awareness:*

Keeping guests informed about the hotel's sustainability initiatives and offering suggestions for reducing their individual environmental impact. Hosting eco-awareness events and workshops for both guests and staff (Academic-accelerator, n.d.).

*Feature 11# Continuous Improvement*

Regular monitoring and assessment of environmental practices to identify areas for improvement. Ongoing commitment to adopting new technologies and practices for ongoing sustainability.

Eco-friendly hotels not only exemplify environmental responsibility but also provide guests with a unique and often more meaningful experience that fosters a connection to the local environment and culture. Travelers can enjoy their stay

with the assurance that they are contributing to a more sustainable and responsible tourism industry (Green Hotels Association, 2020).

## 5 Eco – label

Environmental certification is a voluntary procedure that establishes, assesses, monitors, and provides written assurance that a business, product, process, service, or management system adheres to specific environmental requirements, standards, or criteria (Leroux & Pupion, 2018). These certifications are purposefully designed to showcase a commitment to environmentally responsible practices and can encompass a diverse array of aspects, including sustainability, energy efficiency, carbon emissions, waste reduction, and more.

Environmental certifications can be important for various reasons: Consumer Trust; Regulatory Compliance; Market Access; Competitive Advantage; Environmental Improvement (Academic-accelerator, n.d.). Geerts (2014) underscores key goals and benefits of environmental certification schemes in the hospitality industry, emphasizing three main objectives: 1. *Promoting and Marketing Sustainability Practices*; 2. *Increasing Profitability*. 3. *Provision of Accurate Information to Hotel Guests*.

The **EU Ecolabel** stands as an official environmental certification established in the European Union back in 1992, aiming to endorse environmentally-friendly products and services. The framework for implementing the EU Ecolabel is outlined in Regulation (EC) No 66/2010 of the European Parliament and of the Council, with oversight managed by the European Commission and national competent bodies (CE, 2009). Each European Economic Area member state has a designated competent body. In the realm of hotels and tourist accommodations in Europe, the EU Ecolabel is bestowed upon operators meeting specific environmental and health standards. Eco/green hotels must undergo certification by an independent third party or the state of residence.

The **Global Sustainable Tourism Council (GSTC) Criteria**, introduced in 2008, aim to establish global standards for sustainability within the travel and tourism industry, encompassing both destinations and the tourism sector as a whole (Global Sustainable Tourism Council, 2023). These criteria are structured around four pillars: sustainable management; socioeconomic impacts; cultural impacts; and environmental impacts (which include resource consumption, pollution reduction, and the conservation of biodiversity and landscapes). The GSTC Criteria draw upon decades of prior global work and experience, being grounded in ISO standards.

While **sustainable certifications** are not mandatory for hotels, their associated costs can present challenges, particularly for smaller accommodations. Here are

some of the most prevalent and globally recognized sustainable certifications for hotels:

**Green Key:** Regarded as the hospitality industry's premier standard for excellence, Green Key is established by the Foundation for Environmental Education (FEE), the world's largest environmental organization. This certification assesses a spectrum of environmental and sustainability criteria, spanning from energy and water conservation to waste management and responsible purchasing (Green Key, 2023).

**Green Globe:** Green Globe stands out as one of the most stringent eco-certifications for eco-hotels worldwide. Comprising 44 criteria categorized into four groups, it is fortified by over 385 compliance indicators (Green Globe, 2023).

**LEED:** LEED certification is the acknowledged benchmark for assessing building sustainability. Obtaining LEED personal certification or project certification serves as the most effective means to demonstrate a project's genuine commitment to being "green." This certification is particularly applicable to newly constructed hotels designed from the ground up with sustainable practices in mind (Kubba, 2009).

**Travel Sustainable Programs:** While not technically classified as official certifications, various travel booking platforms, including TripAdvisor and Booking.com, now feature programs enabling diverse accommodations, ranging from B&Bs to hotels and resorts, to receive recognition as eco-friendly. These programs follow a criteria model verified by independent sustainability experts (Preferred by Nature, 2023).

## **Discussions and Conclusions**

It is undoubtedly recognized that hotels and the hospitality industry involved constitute major centres of resource consumption and waste. The growing awareness of sustainability within the hotel industry has led to a substantial body of academic research that focuses on addressing the practical challenges and opportunities linked with eco/green hotels. This research is crucial for understanding and implementing sustainable practices in the hospitality sector, as it helps identify and tackle the unique issues and benefits related to environmentally friendly and sustainable hotel operations. It serves as a valuable resource for informing the industry, policymakers, and consumers about optimal practices and innovations in the field. Ultimately, this contributes to fostering a more eco-conscious and responsible approach to hotel management (Ulker-Demirel & Ciftci, 2020).

Researchers approach this topic from diverse perspectives, employing a range of methodologies, drawing upon different theoretical frameworks, and examining various geographical contexts. The ultimate goal of this academic research is to

offer valuable insights and practical solutions for hotel managers in their pursuit of sustainable practices for accommodations.

The domain of eco-efficient research can be categorized into four subfields: (1) green supply chain management, (2) precautions for water-savings, (3), sustainable best practices and (4) other environmental technology applications such as indoor air quality, solar energy, etc (Sharma et al, 2020).

Implementing eco/green friendly practices can lead to cost savings in the long run. Energy-efficient technologies, waste reduction, and water conservation measures not only contribute to environmental well-being but also enhance operational efficiency, leading to significant cost reductions.

By obtaining and maintaining eco/green certifications, hotel industry can ensure compliance with local and international environmental regulations, avoiding potential legal issues and negative publicity. Furthermore, the adoption of eco-friendly practices within the accommodation structure can create avenues for partnerships with similarly aligned organizations, thereby potentially broadening their sphere of influence.

In the hotel industry, while traditional factors such as brand, price, service, and location continue to hold significance, the incorporation of eco/green certification into the framework of competitiveness represents a forward-thinking approach. This aligns seamlessly with the escalating global awareness of environmental sustainability.

Travelers, especially Millennials and Generation Z, are increasingly environmentally conscious, actively seeking accommodations that align with their values. Through the acquisition and promotion of eco/green certifications, hotels can strategically appeal to this expanding market segment.

On the other hand, there is an ongoing debate and interest among business practitioners and researchers regarding the adoption and impact of eco/green practices in the hospitality industry, particularly within the realm of green hotel practices. The inconsistency in findings from prior studies has raised questions about the investment and implementation of such practices as well as effective strategies for encouraging consumers to embrace environmentally friendly choices. Further research is needed on the impact of green practices on consumer behaviour within the hospitality industry.

Thereby the literature review emphasizes the need for more comprehensive investigations into the factors that drive positive consumer motivation in this context (Hameed et al., 2021; Han, 2021; Moise et al., 2021).

In conclusion, incorporating eco/green certification into the competitiveness strategy of the hotel industry is a strategic decision that only responds to the

increasing demand for sustainable practices but also fosters long-term business success and a positive social impact.

Collaboration among governments, local authorities, and businesses is crucial as it enables the development and enforcement of regulations that strike a balance between economic interests and social and environmental responsibility. Through joint efforts, these stakeholders can establish a framework that promotes the growth of sustainable tourism in developing countries while concurrently safeguarding their natural and cultural resources.

## References

- [1] Abdou, A.H., Hassan, T.H., Dief, E. & Moustafa, M. (2020), “A description of green hotel practices and their role in achieving sustainable development”, *Sustainability*, 12(22), pp. 1-20
- [2] Axhami, M., Ndou, V., Milo, V., & Scorrano, P. (2023). Creating Value via the Circular Economy: Practices in the Tourism Sector. *Administrative Sciences* 13: 166. <https://www.mdpi.com/2076-3387/13/7/166>.
- [3] Academic-accelerator. (n.d.). *Encyclopedia, Science News & Research Reviews*. Retrieved from Eco Hotel: <https://academic-accelerator.com/encyclopedia/eco-hotel>
- [4] Aldieri, L., & Vinci, C. (2021). Scalability and commercialization in support of sustainable development goals . *Industry, Innovation and Infrastructure Encyclopedia of the UN Sustainable Development Goals*, Springer, New York, NY, pp. 979-1158.
- [5] Asadi, S. e. (2020). “Investigating influence of green innovation on sustainability performance: a case on Malaysian hotel industry . *Journal of Cleaner Production*, 258(17), pp. 253-269.
- [6] Azilah Kasim (2004), Socio-Environmentally Responsible Hotel Business: Do Tourists to Penang Island, Malaysia Care? *Journal of Hospitality & Leisure Marketing*, 11(4):5-28
- [7] Bonilla Priego, M., Najera, J., & Font, X. (2011). Environmental management decision-making in certified hotels. *Journal of Sustainable Tourism*, 19, 361–381. *Journal of Sustainable Tourism*, 19, pp. 361–381. <https://doi.org/10.1080/09669582.2010.530350>.
- [8] Brundtland, G. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. United Nations General Assembly document A/42/427.



- [9] CE. (2009). REGULATION (EC) No 66/2010 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. *Official Journal of the European Union*, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010R0066>.
- [10] Chen, S., Chen, H., Zhang, K., & Xu, X. (2018). A comprehensive theoretical framework for examining learning effects in green and conventionally managed hotels. *Journal of Cleaner Production*, 174, pp. 1392–1399. <https://doi.org/10.1016/j.jclepro.2017.10.321>.
- [11] Ecotourism World. (n.d.). *ecotourism-world.com*. Retrieved from ECO HOTEL / ECO LODGE: <https://ecotourism-world.com/7-features-of-eco-friendly-hotels/>
- [12] Ecotravelist. (2018, March 5). *ecotravelist.com*. Retrieved from What is an eco-hotel and how can you tell if it's legit?: <https://www.ecotravelist.com/blog/tips/eco-hotel-can-tell-legit>
- [13] EMF—Ellen MacArthur Foundation Growth. (2015). *A Circular Economy Vision for a Competitive Europe. Isle of Wight*. Ellen MacArthur Foundation. Available online: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/>.
- [14] ESCAP (2012). Retrieved from Low Carbon Green Growth Roadmap for Asia and the Pacific : Fact Sheet - Ecotourism: <https://www.unescap.org/sites/default/files/20.%20FS-Ecotourism.pdf>
- [15] European Commission. (2021, June 4). *European Union*. Retrieved from Environment: [https://environment.ec.europa.eu/news/eu-green-week-2021-zero-pollution-conclusions-2021-06-04\\_en](https://environment.ec.europa.eu/news/eu-green-week-2021-zero-pollution-conclusions-2021-06-04_en)
- [16] Geossling, S., Hall, C., Peeters, P., & Scott, D. (2010). The future of tourism: can tourism growth and climate policy be reconciled? A mitigation perspective. *Tourism Recreation Research* 35(2), pp. 119-130.
- [17] García Vaquero, M., Sánchez-Bayón, A., & Lominchar, J. (2021). European Green Deal and Recovery Plan: Green Jobs, Skills and Wellbeing Economics in Spain. *Energies* 2021, 14, 4145, <https://doi.org/10.3390/en14144145>.
- [18] GDRC. (2023). *The Sustainable Tourism Gateway*. Retrieved from Sustainable Tourism Info-Sheets: [www.gdrc.org/uem/eco-tour/etour-define.html](http://www.gdrc.org/uem/eco-tour/etour-define.html)
- [19] Geerts, W. (2014). Environmental certification schemes: Hotel managers' views and perceptions. *International Journal of Hospitality Management*, 39, pp. 87-96.

- [20] Global Sustainable Tourism Council. (2023, November 3). <https://www.gstcouncil.org/>. Retrieved from GSTC Criteria Overview: <https://www.gstcouncil.org/gstc-criteria/>
- [21] Green Globe. (2023, November 3). *greenglobe.com*. Retrieved from green-globe-certification: <https://www.greenglobe.com/>
- [22] Green Hotels Association. (2020). *Why hotels should be green*. Retrieved from <https://greenhotels.com/index.php>
- [23] Green Key. (2023, November 3). *GreenKey.Global*. Retrieved from <https://www.greenkey.global/>
- [24] Hameed, I., Hyder, Z., Imran, M. and Shafiq, K. (2021), “Greenwash and green purchase behaviour: an environmentally sustainable perspective”, *Environment, Development and Sustainability*, 23(9), pp. 13113-13134
- [25] Kasim, A, (2004), Socio-Environmentally Responsible Hotel Business: Do Tourists to Penang Island, Malaysia Care? *Journal of Hospitality & Leisure Marketing*, 11(4):5-28
- [26] Kirchherr, J., & et al. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resource, Conservation and Recycling* 127, pp. 221-32.
- [27] Kim, S.-H., Lee, K., & Fairhurst, A. (2017). The review of “green” research in hospitality, 2000-2014 - current trends and future research directions. *International Journal of Contemporary Hospitality Management*, 29, 226–247. <https://doi.org/10.1108/IJCHM-11-2014-0562>
- [28] Kim, Y., & Han, H. (2010). Intention to pay conventional-hotel prices at a green hotel - a modification of the theory of planned behavior. *Journal of Sustainable Tourism*, 18, pp. 997–1014. <https://doi.org/10.1080/09669582.2010.490300>
- [29] Kubba, S. (2009). *LEED Practices, Certification, and Accreditation Handbook*. Butterworth-Heinemann, ISBN: 9781856176910.
- [30] Lavrinenko , O., Rybalkin , O., Danileviča, A., & Sprūde , M. (2022). Green economy: Content and methodological approaches. *Entrepreneurship and sustainability issues*, ISSN 2345-0282 (online) <http://jssidoi.org/jesi/> 2022 10(2) pp. 635-653.
- [31] Leroux, E., & Pupion, P.-C. (2018). Factors of adoption of eco-labelling in hotel industry. *Technological Forecasting and Social Change*, 129, <https://doi.org/10.1016/j.techfore.2017.09.018>, 194-209.
- [32] Iwanowski, K., Rushmore, C. (2003). Introducing the eco-friendly hotel. *Cornell hotel and restaurants administration quarterly*, 35(1), pp. 34-38;

- [33] Manaktola, K, Jauhari, V. (2007). Exploring consumer attitudes and behaviour towards green practices in the lodging industry in India. *International Journal of Contemporary Hospitality*, 19(5), pp. 364-377.
- [34] Merli, R., Preziosi, M., Acampora, A., Luccetti, M., & Ali, F. (2019). The impact of green practices in coastal tourism: An empirical investigation on an eco-labelled beach club. *International Journal of Hospitality Management*, 77, 471–481. <https://doi.org/10.1016/j.ijhm.2018.08.011>.
- [35] Preferred by Nature. (2023, november 3). <https://preferredbynature.org/>. Retrieved from Sustainable Travel Programme: <https://preferredbynature.org/certification/travel>
- [36] Proven Partners. (n.d.). [www.proven.partners](http://www.proven.partners). Retrieved from eco-friendly-hotel: <https://www.proven.partners/blog/eco-friendly-hotel>
- [37] Sharma, & et al. (2020). Challenges, opportunities, and innovations for effective solid waste management during and post COVID-19 pandemic. *Resource, Conservation and Recycling*, 162, <https://doi.org/10.1016/j.resconrec.2020.105052>.
- [38] Sharma, T., Chen, J., & Lie, W. (2020). Eco-innovation in hospitality research (1998-2018): a systematic review”. *International Journal of Contemporary Hospitality Management*, 32, pp. 913-933.
- [39] Simeone, L., Secundo, G., & Schiuma, G. (October 2017). Arts and design as translational mechanisms for academic entrepreneurship: The metaLAB at Harvard case study. L. Simeone, G. Secundo & G. Schiuma, “Arts and design as translational mechanisms for academic entrepreneurship: *Journal of Business Research*, 85, pp 434–443, 2018. Retrieved from <https://doi.org/10.10>.
- [40] Songur, A., Turktarhan, G., & Cobanoglu, C. (2022). Progress on green technology research in hotels: a literature review. *Journal of Hospitality and Tourism*, DOI 10.1108/JHTI-10-2021-0280.
- [41] Thac Dang-Van, Jianming Wang, Tan Vo-Thanh, Xinru Jiang, & Ninh Nguyen. (2022). Green practices as an effective business strategy to influence the behavior of hotel guests in the luxury hotel sector: Evidence from an emerging market. *Business Strategy and the Environment; WILEY*, 1-19; DOI: 10.1002/bse.3318.
- [42] TIES (2023). *The International Ecotourism Society*. Retrieved from ecotourism.org: <https://ecotourism.org/what-is-ecotourism/>
- [43] Trincado, E., Sánchez-Bayón, A., & Vindel, J. (2021). The European Union Green Deal: Clean Energy Wellbeing Opportunities and the Risk of

- the Jevons Paradox . *Energies* 2021, 14, 4148, <https://doi.org/10.3390/en14144148>.
- [44] Ulker-Demirel, E., & Ciftci, G. (2020). A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research. *Journal of Hospitality and Tourism Management*, 209–219. <https://doi.org/10.1016/j.jhtm.2020.04.003>.
- [45] UN. (2023, Novemebr 27). *Sustainable Development Knowledge Platform*. Retrieved from <https://sustainabledevelopment.un.org/rio20>
- [46] UNWTO. (2020). *One Planet Vision for a Responsible Recovery of the Tourism Sector*. Available online:.
- [47] World Seas. ( 2018). *An Environmental Evaluation*. Jean-Francois Hamel; Paperback ISBN: 9780128050521; eBook ISBN: 9780128052044.
- [48] World Travel and Tourism COuncil. (2021). *Travel & Tourism Economic Impact 2021*. <https://wtcc.org/Portals/0/Documents/Reports/2021/Global%20Economic%20Impact%20and%20Trends%202021.pdf>.
- [49] WTO. (2001). *The British Ecotourism Market*. eISBN: 978-92-844-0486-5.
- [50] Zareba, D. (2017). *Women and ecotourism the role of women leaders in supporting development of ecotourism in rural areas of Central and Eastern Europe*. European Ecotourism Conference in Safranbolu, Proceedings.

# **Economic Assessment of the transport-logistics infrastructure in Karabakh and Eastern Zangezur economics regions**

**Muhammad Gulahmadov**

Ph.D. student, Institute of Economics, Azerbaijan National Sciences of Academy (ANAS), Baku, Azerbaijan gulahmadovmahammad@gmail.com

*Abstract:* The restoration of the transport corridor in the areas liberated after the Second Karabakh War is considered vital for the economic development and social well-being of Azerbaijan. Currently, Azerbaijan is rapidly implementing a policy of restoration in the liberated territories. In this regard, the restoration of the trade and transport system in Karabakh and adjacent regions will make these regions an important transport hub in the region. The country is taking decisive measures to develop the main transport projects in these territories, focusing mainly on the formation of transport and transit systems in two main regions: the Karabakh and Zengezur economic regions, which are considered the transit hub of the region. Thus, the article also considers the potential economic potential/aspects of a transport corridor in these areas, provided that in the future Karabakh and Zengezur become the main transport corridor connecting East and West.

*Keywords:* economic aspects, transport hub, Karabakh, East Zangazur corridor, logistics, Azerbaijan

## **1 Introduction**

The paper mainly discusses the core economic aspects of the future transformation of Karabakh into a major regional transport hub between East and West. After the Second Karabakh War, the balance of power in the South Caucasus region changed, a new geostrategic situation arose. At present, Azerbaijan is taking appropriate measures to turn the Karabakh and East Zangezur regions into a major transport hub connecting Central Asia with the South Caucasus and Europe. The author will mainly analyze the main economic factors that may affect the formation of potential transport corridors in Karabakh and Eastern Zangezur, which may also affect the states of the region. [6] The condition of the roads intended for the movement of vehicles is the main factor that indicates the level of economy, culture and work that needs to be carried out in this area. The transport infrastructure created in Karabakh will turn Azerbaijan into a logistics hub

between Central Asia and Europe. All transport projects promise to accelerate the economic development of Karabakh and turn this war-torn region into an important regional transport hub. Connecting new and reconstructed transit routes in and around Karabakh with existing road and rail links in eastern Azerbaijan, as well as the Zangezur Corridor, will not only expand the regional transport network, but will also have a positive impact on regional cooperation.

### **1.1 Importance and relevance of the research topic**

In recent years, the reconstruction of the country's transport system within the framework of a targeted policy of the state contributes to the development of internal transport infrastructure and turns Azerbaijan into a transport hub of Eurasia. In recent years, the opening of new international airports in various regions of the country, the construction of new roads, playing a leading role in the implementation of regional projects contribute to the development of domestic transport infrastructure within the targeted policy of Azerbaijan, which also turns Azerbaijan into a transport hub of Eurasia. For Azerbaijan, the main goal in the first stage of the recovery process is to create all the necessary transport routes and infrastructure, which can subsequently accelerate the implementation of other projects and economic development in the Karabakh region. [1]

The result of the second Karabakh war with the victory of Azerbaijan and the end of the conflict created the basis for the emergence of new relations in the region. The tripartite statement, signed on November 10, 2020, included a provision on the construction of new transport links linking Nakhchivan with the main territory of Azerbaijan. Currently, active work is underway in the direction of the Zangezur corridor, and the implementation of this corridor will play an important strategic role in trade and economic exchange and increase the potential of not only Azerbaijan, but also the region and neighboring states. [7] The implementation of Article 9 of the November 10 statement, which provides for the restoration of economic and transport links, is the main and decisive stage in the development of Karabakh. Armenia's obligations are stated in the statement: "...guarantees the security of transport links between the western regions of the Republic of Azerbaijan and the Nakhchivan Autonomous Republic." In this regard, the opening of the Zangezur corridor is quite legal and is a historical necessity. [2]

With the opening of the Zangezur corridor, all transport and economic ties in the region will be released from the blockade, and the distance for establishing communication between the regions of Azerbaijan will be reduced. Thus, Azerbaijan will have to connect with Turkey by rail and road through Nakhchivan. On the other hand, the opening of the Zangezur corridor will seriously affect the economy of the Turkic peoples, especially Turkey. As a result, East-West and North-South transport corridors will be formed, and Azerbaijan will become a transport hub and an important economic and strategic center for the whole world.

The implementation of road and rail projects in the northern, southern and eastern directions, the road to the villages of Sugovushan and Talysh, the Ahmedbeyli-Fizuli-Shusha road, the Horadiz-Agband railway, the Barda-Agdam railway are the main part of the Karabakh development strategy. [3]

## **1.2 The main goal of the article**

The main goal of the article is to analyze the formation of transport infrastructures and routes in the liberated territories of Azerbaijan, taking into account mainly its future economic potential and trade aspects in the region.

## **2 Object and subject of research**

The purpose of the paper is to analyze the formation of a transport corridor in the liberated territories of Azerbaijan and the economic and commercial benefits that the use of this corridor can bring to the country and the region. The main direction of the diploma work is the reconstruction of the transport infrastructure of the Karabakh and East Zangezur economic regions and the determination of their transit potential. The transformation of the de-occupied territories of Azerbaijan into an important transport and transport hub connecting East and West will be further substantiated by relevant facts and arguments in the article

## **3 The novelty of the article**

Azerbaijan is the country that will benefit the most from the infrastructure projects that will be built in accordance with the terms of the post-war agreement. Because Azerbaijan will receive an economic benefit, as well as a geopolitical advantage over Nakhchivan. The realization of existing economic opportunities in the liberated territories through a new division of economic regions will make a significant contribution to the development of not only the economy of Karabakh and Azerbaijan, but also the trade and transport systems. [4] The economic development of the Karabakh and East Zangezur economic regions and their access to the international north-south and east-west transport corridors, as well as the Zangezur corridor, will make Karabakh an economic locomotive for the entire South Caucasus. As a result, Karabakh will become a symbol of regional cooperation, and not a zone of conflict, as it was during the Armenian occupation. The emerging transport hub in Karabakh will strengthen the position of the entire South Caucasus in the context of trans-Eurasian transport projects, such as the Middle Corridor and the North-South International Transport Corridor - another

example of how the outcome of the Second Karabakh War corrects the geopolitical realities of this region of the world. [5]

## **4 Literature review**

In the chosen article, the researcher will mainly use various scientific articles from electronic databases, including materials related to Oxford Journal Online, SAGE, JSTOR, Cambridge Journal, Carnegie Europe and Taylor & Francis groups, Oxford Gas Journal, statistical data, published by international organizations and institutions. In addition, strategic plans, framework laws, statistical data, newsletters, information booklets, World Bank Logistics Performance Index reports, data from the Census and Economic Information Center will be used to conduct a fundamental analysis of the paper. Including the statistical database of the State Statistics Committee of Azerbaijan on Transport and Transportation, news of the President's Office on the reforms carried out in the territories liberated from occupation, annual reports of European Union journals, United Nations statistics, information will also be mentioned received from state and non-governmental organizations and resources. In this case, the author will refer to the information and reports of the State Committee for Urban Planning and Architecture, Azerbaijan Railways CJSC, the State Automobile Roads Agency of Azerbaijan, Azerbaijan Airlines CJSC and the National Demining Agency of Azerbaijan. Due to the limitations of the monograph and literature, this paper will be based on a kind of "longitudinal case" research method, and the author will mainly empirically analyze the relevant reforms carried out in the transport sector in the liberated territories and the formation of transport corridors will conduct a study by analyzing relevant existing facts and events. This, in turn, gives grounds to turn in the article more to the quantitative method of research than to the qualitative one. Therefore, research work relies on both quantitative and qualitative research methods to collect reliable data from various sources.

### **Limitation**

The main limitation in the paper is related to the lack of literature, scientific monographs and publications, as it covers the last 2 years and the modern period. After the end of the second Karabakh war, news about the holding of relevant events in the territories liberated from occupation can only be obtained from the official websites of state bodies, from publications of the research centers. For the development of theoretical knowledge, there are practically no indexed scientific articles that reflect important proposals and opinions of domestic scientists. This can complicate the work of the author. So, in this regard, the selected paper is based on a longitudinal case study, and as a result, the author will analyze the



relevant works and processes in a comparative manner. At the same time, the author should organize a traditional interview with employees of the relevant government agencies and specialists from scientific centers in order to obtain more complete information and highlight the issue in the paper. On the other hand, there is little information about the transport potential of the territories liberated from occupation in foreign magazines and news bases, and they are mainly published on the pages of the media. From this point of view, the effective application of successful transport and transport-transit models of the relevant foreign countries for the formation of a transport-transit system in the liberated territories of Azerbaijan can be implemented as one of the solutions to the problem.

## References

- [1] Air center. Zangazur corridor will stimulate regional cooperation, (2021). Available at: <https://aircenter.az/en/post/zangazur-corridor-will-stimulate-regional-cooperation-652>
- [2] Dr. Mehmood Ul Hassan Khan, Strategic Importance of Zangazur Corridor, ANKASAM – Ankara Center for Crisis and Policy Studies, (2021). Available at: <https://www.ankasam.org/strategic-importance-of-zangazur-corridor/?lang=en>
- [3] MENAFN, Paving of highways to liberated Azerbaijani Sugovushan, Talysh villages continue, 2020, Available at: <https://menafn.com/1101258796/Paving-of-highways-to-liberated-Azerbaijani-SugovushanTalysh-villages-continues>
- [4] Orkhan Baghirov, Karabakh: An Emerging Regional Transport Hub, Publication: Eurasia Daily Monitor Volume: 18 Issue: 87, (2020). Available at: <https://jamestown.org/program/karabakh-an-emerging-regional-transport-hub/>
- [5] Paul Goble, A ‘Railway War’ Is About to Break out in the South Caucasus, Publication: Eurasia Daily Monitor Volume: 17(172), (2020). Available at <https://jamestown.org/program/a-railway-war-is-about-to-break-out-in-the-south-caucasus/>
- [6] Paul Goble, Growing Azerbaijani–Central Asian Ties Likely to Trigger Conflicts With Russia and Iran, Publication: Eurasia Daily Monitor 18(28), (2020). Available at <https://jamestown.org/program/growing-azerbaijani-central-asian-ties-likely-to-trigger-conflicts-with-russia-and-iran/>
- [7] Vasif Huseynov, Zangazur Corridor is the Cornerstone of the Post-War Regional Cooperation Projects in the South Caucasus, Valdai Discussion Group, (2022). Available at: <https://valdaiclub.com/a/highlights/zangazur-corridor-is-the-cornerstone-of-the-post/>

# Business, Sleep and University Students

Do we really value our sleep?

**Dr. Laszlo Ling**

Chemin de Pont-Céard 21, CH - 1290 Versoix/GE, Switzerland

*Abstract: Sleep related business (the market for sleep-related products and services) is growing exponentially. The global market for sleep aids was USD 89,6 billion in 2022. In recent years, a lot of research has proven the fundamental importance of sleep in maintaining good health. At the same time - unfortunately - large number of people sleep less than their body needs. In addition, many people regret the time spent on sleep. The purpose of this mini-review is to increase our consciousness: the time allocated to sleep is actually an "investment" in maintaining good health.*

*Keywords: sleep related business; microsleep; university students*

## 1 Introduction

### 1.1. Sleep related business

Sleep related business is growing exponentially. "The global market for sleep aids is estimated to increase from USD 89.6 billion in 2022 to reach USD 125.3 billion by 2027, at a Compound Annual Growth Rate (CAGR) of 6.9% from 2022 through 2027." (BCC Research, 2023). Some examples for sleep aids: mattresses, pillows, special gadgets like smart alarms, wake-up lights, white noise machines, special applications for smartphones, CPAP (Continuous Positive Airway Pressure) machines - used for treatment a potentially serious sleep disorder in which breathing repeatedly stops and starts -, pharmaceutical products as sleeping pills, etc.

The global Sleep Apnea Devices Market size was USD 7.00 Billion in 2021 and is anticipated to reach the a CAGR of 6.9% over the foreseen period (EMERGEN Research 2023). The Europe Sleep Aids Market is estimated to be growing at CAGR of 6,5 % from 2023 to 2028 and be worth USD 21,71 billion by 2028 from USD 15,84 billion in 2023. (Market Data Forecast, 2023). Commercially available smartphone apps represent an ever-evolving and fast-growing market (Doty et al, 2023). The key factors driving the sleep aids market are the growing number of

sleep-related disorders in the young population and the growing aging population. (BCC Research, 2023).

## **1.2 Sleep problems**

It is confirmed by large number of medical scientific studies that, unfortunately, the rate of sleep disorders is also increasing in the young adult age group. For example, in an Australian cross-sectional observational study, researchers analyzed young adults sleep-related specific data. Among 836 young adults (mean age 22 years) at least one sleep disorder (e.g.: difficulty falling or staying asleep; after sleep not feeling well-rested; excessive sleepiness during daytime; sleep-related breathing problems; etc.) was present in 41.0% of females and 42,3% of males. This surprising number confirms, sleep disorders are very common in young adults (McArdle et al 2020). The key factors driving the sleep aids market are the growing number of sleep-related disorders in the young population and the growing aging population. (BCC Research, 2023).

## **1.3 Our current knowledge about sleep**

Sleeping is an incredibly complex process that goes beyond relaxing body resting. The exact purpose of sleep is still not fully understood (Lihabi AA, 2023). In recent years, a lot of research has proven the fundamental importance of sleep in maintaining good health. At the same time - unfortunately - large number of (still) healthy people sleep less than their body needs. Some people even regret the time spent on sleep... "Millions of people regularly obtain insufficient sleep" (Vecsey et al 2009). "Unfortunately poor sleep health has become a normalized experience of our modern society" (Thompson et al 2022). Dimitriou and Halstead analyzed 23 sleep-related studies, and found that sleep is influenced and shaped also by cultural values, beliefs and practices (Dimitriou & Halstead, 2021). "Daytime sleepiness has become pervasive, and it is becoming a serious concern in modern society" (Yi-Man et al, 2022). Maki and her research team reviewed 28 studies in order to synthesize knowledge about sleep, fatigue, and performance in pilots, commercial truck drivers, and astronauts. Result: "Collectively, the data demonstrated how shorter sleep durations, short off-duty time, and early-morning start times were associated with slower reaction times, more lapses in attention, and premature responses on psychomotor vigilance tests." (Maki et al 2022).

## 2 Sleep-related facts in a nutshell

### 2.1 What happens in our body during sleep ?

Sleep is an active process and plays a central role in our physiology. Science has found a reciprocal relationship between good sleep and immune regulation. Healthy sleep is key for proper functioning of our immune system. (Irwin MR, 2019). Sleep plays a crucial role in memory stabilization and integration (Cousins & Fernández, 2019). Professor C.A. Espie summarizes in one sentence, what happens in our human body during sleep: "These include the renewal and repair of our body's tissues, our metabolism, our physical growth and development, our ability to fight infection, our learning skills and memory, and our ability to regulate our emotions" (Espie CA, 2022).

### 2.2 Sleep regulation

Based on our today's knowledge sleep is regulated by the so called homeostatic and the circadian process. The *homeostatic process* means that when we are awake during the day, the feeling of pressure to sleep, the "sleep-drive" is continuously increasing during the entire day. After a good full night's sleep, in the morning of the new day, this homeostatic process begins to build up again, which means that the lowest level of sleep-drive right after spontaneous awakening starts to grow gradually as the day is passing. The *circadian process* refers to the physiology of the "internal biological clocks". These two processes together determine most aspects of sleep and related variables like sleepiness and alertness. (Borbély 2016; Deboer 2018; Borbély 2022). The circadian system (frequently called circadian rhythm) allows living organisms on the Earth to accommodate the continuous changes in their environment (sunshine during the day and darkness during night) and it regulates their physiology and behavior.

### 2.3 Some sleep-related definitions and facts

**Sleep duration** refers to "total amount of sleep obtained, either during the nocturnal sleep episode or across the 24-hour period" (Kline, 2013a).

**Sleep quality** can be defined as the amount of time it takes to fall asleep, the number of awakenings during night, the wake after sleep onset (Bacaro et al 2023). Zhang's research team performed a cross-sectional study and enrolled 1,928 university students in China. Based on the result they recommend preventive strategies like to quit smoking and drinking alcohol, eat more vegetables, avoid midday rest, treat chronic disease, and alleviate anxiety and stress may be considerably beneficial in improving sleep quality (Zhang L. et al 2022).

**Sleep pattern** refers to the personal schedule of bedtime and wake-up time. It is influenced by lot of external facts, like cultural tradition. Coutrot's team made the largest single study on self-reported sleep duration including 730,187 participants spread over 63 countries across the life-course and its modulation (Coutrot et al, 2022).

**Sleepiness** involve a subjective feeling of drowsiness, objective behavioral and cognitive (attentional) impairment or “lapses” (Peiris et al 2006).

**Sleep deprivation** is a term used loosely to describe a lack of appropriate/sufficient amount of sleep (Levesque 2018). In our days an increasing number of people are suffering from sleep deprivation. It damages the physical and mental health of the individual and seriously affects work performance, causing errors, incidents and even accidents (Peng Z. et al 2020)

**Sleep health** is "a multidimensional pattern of sleep-wakefulness, adapted to individual, social, and environmental demands, that promotes physical and mental well-being. Good sleep health is characterized by subjective satisfaction, appropriate timing, adequate duration, high efficiency, and sustained alertness during waking hours"(Buysse, 2014). Poor sleep health is defined by dissatisfactory levels of sleep duration, sleep quality, or the timing of sleep (Murawski et al 2018). "Sleep health influences every facet of human function and is essential to optimize cardiometabolic, immune, brain, and mental health. We recommend developing sleep health educational programs and awareness campaigns; increasing, standardizing, and centralizing data on sleep quantity and quality in every country across the globe; and developing and implementing sleep health policies across sectors of society"(Lim et al, 2023).

## 2.4 Recommended hours of sleep for adults per night

The American Academy of Sleep Medicine and Sleep Research Society have a Consensus Statement: "Adults should sleep 7 or more hours per night on a regular basis to promote optimal health "(Watson et al, 2015). Sufficient quantity and quality of sleep are essential for maintaining the best possible mental alertness (Olaganathan et al, 2021).

## 2.5 Chronotypes

Chronotype (defined by Roenneberg) describes "individual differences in sleep timing, and it is determined by genetic background, age, sex, and environment - e.g. light exposure-" (Ronneberg et al, 2012). Individuals' chronotype can be divided into three groups: Morningness (frequently called "larks"), Eveningness (frequently called "owls") types and the so called Intermedia (Roennenberg at al 2003; Aktas et al 2023). In one sentence: chronotype refers to the personal preferences of scheduling the sleep-wake cycle, and it is influenced by the

individual's biology. Chronotype might change with age; Morningness chronotype is generally dominant in childhood. The majority of university students are in the group of Eveningness chronotype (Druiven et al 2021).

### **3 Daytime sleepiness and microsleep**

#### **3.1 Daytime sleepiness**

Daytime sleepiness is a serious concern in our today's society. Excessive daytime sleepiness is estimated to be prevalent in around 20 % of the general population (Skorucak et al, 2020). It is obvious that sleepiness is a safety hazard in many 24/7 industries (transport services like buses, trains, airports, airlines, ferry boats; emergency medical providers, police, firefighters, etc.) Maki and her research team reviewed 28 studies in order to synthesize knowledge about sleep, fatigue, and performance in pilots, commercial truck drivers, and astronauts. *"Collectively, the data demonstrated how shorter sleep durations, short off-duty time, and early-morning start times were associated with slower reaction times, more lapses in attention, and premature responses on psychomotor vigilance tests"* (Maki et al 2022).

#### **3.2 Microsleep**

Imagine the following situation. Lecture hall. Twilight. The speaker, who is otherwise very knowledgeable, reads her/his lecture in a monotone voice. You didn't count, but you feel so, like the hundredth slide is already on the screen. You yawn. You look around in boredom. The person sitting next to you drops his head forward and starts snoring. After a few second, he raises his head, looking around confused... Some minutes later YOU to find that your neighbor on the other side nudged you... because YOU fell asleep for a moment...

Microsleep refers to short periods of sleep intrusion during wakefulness, lasting from 1 to 15 s, includes several electro-encephalography (EEG) changes with no blink on the electro-oculogram (EOG) and sometimes associated with slow eye movements, may occur altogether with fall of the head, eyelids and associated with cognitive and psychomotor lapses (de Boishebert et al, 2021). Recent evidence describes microsleep in terms of intermediate states between sleep and wakefulness (Hertig-Godeschalk et al, 2019).

Observable symptoms of microsleep are transient eye closure, lack of response to external stimuli, and often by head nodding (Davidson et al, 2005). This state is often subjectively perceived by the person as "simple sleepiness" (Malafeev et

al, 2021). It is especially dangerous that the individual does not realize that she/he has fallen asleep for those few seconds!!! While such episodes aren't big problem in a lecture hall, it can lead to fatal accidents if it happens when somebody drives a car.

There exists a plethora of scientific studies, which confirm microsleeps occurs frequently when people are performing dull, repetitive, monotonous tasks which lead to boredom, when given activity need to maintain sustained attention for extended periods of time. The frequency of microsleep increases if the person slept poorly/shortly the previous night (Paul et al, 2005, Peiris et al 2006; Skorucak et al 2020; Zaleha et al 2021.)Microsleep episodes are frequent during afternoon and late night (if the person is forced to stay awake at night).

**Warning signs of microsleep** are: feeling of sleepiness, yawning, blinking, difficulty to keep eyes open, increased desire for drinking coffee/energy drink or eating some sugar. *If you feel this when you are doing an important task, like driving a car: stop the car where you find a safe place for parking, and take a rest!*

**Practical advice** Because of microsleep is related mostly to sleep deprivation and sleepiness, the best possible prevention is to prioritize good sleep health. Even if you feel relaxed when driving on a highway, *take regular breaks, get out of the car, move around.*

## 4 University students and sleep

There are large number of studies which confirm, that good sleep play essential role in learning and memory, and there is inverse relationship between sleep and academic performance at high-school and university students. Many students are sleep-deprived because of both early school start times and changing sleep patterns during the new way of life in the campus of the university. (Carrell et al 2011; Bacaro et al 2023). Gallengo-Gómez's research team analyzed the sleep habits of 401 university nursing students in Spain. More than 30 % of them had bad sleep habits (Gallengo-Gómez et al 2021). In another study, the sleep habits and exam performance of 364 pharmacy students in one university of United States were investigated. Half of student pharmacists obtained less than 7 hours of sleep at night. At the same time, those students' performance who regularly had longer sleep duration the night prior to an examination were associated with higher course grades and semester grade point averages (Zeek et al 2015). Niño García and colleagues implemented and observational, cross-sectional study of 458 medical students. 80 % of then suffered from excessive daytime sleepiness. The authors recommend to implement campaigns to establish sleep hygiene recommendations and warning the risk of taking energy drinks (Niño García

2019). Stefan L's team in Croatia analyzed the association between sleep quality and physical activity in 2100 university students. Results showed that "poor sleep quality was associated with insufficient physical activity "(Stefan et al 2018).

#### **4.1 Thought-provoking studies - starting time of lectures at the Universities**

In 2013 Perkinson-Gloor and colleagues publishes a study, related more than 2700 adolescents' performance behavior related to different times when the school starts in Switzerland. Result: those students who started school 20 min later received reliably more sleep and reported less tiredness (Perkinson-Gloor et al 2013).

"Early morning university classes are associated with impaired sleep an academic performance" published at 30 February 2023 in the journal "Nature Human Behavior" (Yeo et al 2023). Yeo's research team in Singapore analyzed 33'618 students' Wi-Fi connection data, log-ins to University's digital learning platforms, as well as their academic performance. Students went to bed at around the same time but woke up earlier to attend morning classes. Results: 1. Wi-Fi-confirmed lecture attendance was lower for early morning classes; 2. Students with morning classes on more days of the week had a lower grade point average - poorer academic performance. So early morning classes may contribute to a university-wide sleep debt and circadian misalignment.

#### **4.2 More rested people perform better**

As we have seen majority of university students are in the group of "Eveningness chronotype". (Druiven et al 2021). And we know even the "Morningness chronotype" students are forced by social activities to be awake into late night. Knowing these biological and behavioral facts, it would be desirable for educational institutions and employers to take into account the Chronotype of their students and employees.

#### **Conclusions**

We live in a flood of information. Our world is getting faster and faster every day. All tasks seems urgent. Even though we know healthy sleep plays a key role in the maintenance of good health and wellbeing, we still don't appreciate enough the blessings of sleep in our own lives... We try to reduce our sleepiness by drinking coffee, tea, energy drinks... Research confirms there is no substitute for restorative sleep. Healthy diet, regular breathing- and physical exercises, and good social interactions are as well important for our health.



Aristotle the Ancient Greek philosopher (384-322 BC) wrote: the success depends on three components: attitude, knowledge and skills. Our personal attitude is one core component that can shape our health behaviors toward sleep (Ruggiero et al, 2019; Zendels et al, 2021). Science confirmed that good sleep health is one of the most important component of our health. Is up to us, modify our behavior. Recommendation of Colin A Espie, Professor of Sleep Medicine at the University of Oxford: "value, prioritize, personalize, trust and protect your sleep" (Espie, 2022). He briefly summarized his five mentioned principles in YouTube video "Simple Tips for Better Sleep from Every Mind Matters": <https://www.youtube.com/watch?v=OvQTjAllvI8>. Freingold & Smiley publication in the *International Journal of Environmental Research and Public Health* can be the best closing sentence for this mini-review: "**Healthy Sleep Every Day Keeps the Doctor Away**" (Freingold & Smiley, 2022).

### Acknowledgement

I would like to express my deepest appreciation to Mr. Prof. Lajos Bogár MD, PhD, DSc, who proofread this review. Professor Bogár, as an anaesthesiologist has an enormous knowledge of sleep. His advice and clarifying comments greatly contributed to making this overview easy to understand even for those who do not work in the health sector.

Special thanks to Dr. Joshua J. Gooley PhD - Assistant Professor at Duke-NUS Medical School of Singapore, Principal Investigator of the Chronobiology and Sleep Laboratory - for explaining some research method of his working group during our personal meeting.

### References

- [1] Aktas S, Özdemir PG.: Effects of Chronotype and Social Jet-Lag on Neurocognitive Functioning Psikiyatride Güncel Yaklaşımlar-Current Approaches in Psychiatry (2023); 15(3) pp. 407-417.
- [2] Bacaro V, Carpentier L, Crocetti E.: Sleep Well, Study Well: A Systematic Review of Longitudinal Studies on the Interplay between Sleep and School Experience in Adolescence. *Int J Environ Res Public Health* (2023) Mar; 20(6) pp. 4829
- [3] BCC Research\_Mar\_2023 <https://www.bccresearch.com/market-research/healthcare/sleep-aids-techs-markets-report.html#:~:text=Report%20Highlights,6.9%25%20from%202022%20through%202027.>
- [4] de Boishebert LDC, Pradat P, Bastuji H, Ricordeau F, Gormand F, Le Calm P, Stauffer E, Petitjean T, Peter-Derex L.: Microsleep fersus Sleep

- Onset Latency during Maintenance Wakefulness Tests: Which One Is the Best Marker of Sleepness? *Clocks Sleep* (2021) Jun; 3(2): 259-273. doi: 10.3390/clockssleep3020016
- [5] Borbély AA, Daan s, Wirz\_Justige S, Deboer T.: The two-process model of sleep regulation: a reappraisal *Journal of Sleep Research* (2016) <https://doi.org/10.1111/jsr.12371>
- [6] Borbély AA.: The two-process model of sleep regulation: Beginnings and outlook *Journal of Sleep Research* (2022) <https://doi.org/10.1111/jsr.13598>
- [7] Buysse DJ.: Sleep Health: can We Define It? Does It Matter? *Sleep* (2014 ) ; 37(1) pp.9–17.doi: 10.5665/sleep.3298
- [8] Carrell SE, Maghakian T, & West JE.: A’s from zzzz’s? The causal effect of school start time on the academic achievement of adolescents. *Am. Econ. J. Econ. Policy* (2011) 3, pp. 62–81
- [9] Cousins JN & Fernández G (2019). Chapter 2 - The impact of sleep deprivation on declarative memory *Progress in Brain Research* 246 pp. 27-53.
- [10] Coutrot A, Lazar AS, Richards M, Manley E, Wiener JM, Dalton RC, Hornberger M, Spiers HJ.: Reported sleep duration reveals segmentation of the adult life-course into three phases. *Nat Commun* (2022)13, 7697. <https://doi.org/10.1038/s41467-022-34624-8>
- [11] Craig CM, Morris NL, Schwieters KR, Iber C.: Pink Elephants on the Road: Visual Illusions and Distorsions when Driving during Significant Sleep Deprivation (Proceedings of the Human Factors and Ergonomics Society Annual Meeting) *Design, Architecture and Ergonomics* (2021) 64(1). <https://doi.org/10.1177/1071181320641325>
- [12] Davidson PR, Jones RD, Peiris MTR.: Detecting Behavioral Microsleeps using EEG and LSTM Recurrent Neural Networks. *IEEE Xplore,Conference 2005*
- [13] Deboer T.: Sleep homeostasis and the circadian clock: Do the circadian pacemaker and the sleep homeostat influence each other's functioning? *Neurobiology of Sleep and Circadian Rhythms*. (2018) Jun; 5 pp. 68-77. doi: 10.1016/j.nbscr.2018.02.003
- [14] Dimitriou JM. Halstead EJ: A Systematic Review on Cross-Cultural Comparative Studies of Sleep in Young Populations: The Roles of Cultural Factors, *Int. J. Environ. Res. Public Health* (2021) 18(4), 2005; <https://doi.org/10.3390/ijerph18042005>
- [15] Doty TJ, Steki EK, Bohn M, Klosterman G, Simonelly G, Collen J.: A 2022 Survey of Commercially Available Smartphone Apps for Sleep: Most Enhance Sleep. *Sleep Med Clin*. (2023) Sep;18(3) pp. 373-384. doi: 10.1016/j.jsmc.2023.05.008.

- [16] Druiven SJM, Riese H, Kamphuis J, Haarman BCM, Antypa N, Penninx BWJH, Schoevers RA; Meesters Y.:Chronotype changes with age; seven-year follow-up from the Netherlands study of depression and anxiety cohort *Journal of Affective Disorders* (2021) December, 295 pp 1118-1121
- [17] EMERGEN Reserach 2022. <https://www.emergenresearch.com/blog/top-10-companies-in-sleep-apnea-devices-market-in-2022>
- [18] Espie CA.: The '5 pinciples' of good sleep health, *Journal of Sleep Research* (2022):31:e13502
- [19] Feingold CL, Smiley A.: Healthy Sleep Every Day Keeps the Doctor Away. *Int J Environ Res Public Health*. (2022) Sept; 19(7) 10740 doi: 10.3390/ijerph191710740
- [20] Gallego-Gómez JI, González-Moro MTR, González-Moro JMR. et al. Relationship between sleep habits and academic performance in university Nursing students. *BMC Nurs* (2021)20, 100.<https://doi.org/10.1186/s12912-021-00635-x>
- [21] Hertig-Godeschalk A, Skorucak J, Malafeev A, Achermann P, Mathis J, Schreier DR.: Microsleep episodes in the borderland between wakefulness and sleep. *Sleep* (2020) jan 13;43(1):zst163. doi:10.1093/sleep/zsz163
- [22] Irwin MR.: Sleep and Inflammation: Partners in Sickness and in Health. *Nat. Rev.* (2019) 19, 702–715.
- [23] Keyes KM, Maslowsky J, Hamilton A, et al.. The great sleep recession: changes in sleep duration among US adolescents, 1991-2012. *Pediatrics* (2015)135:460–8. 10.1542/peds.2014-2707
- [24] Kline C (2013a) Sleep duration. In: Gellman MD, Turner JR (eds) *Encyclopedia of behavioral medicine*. Springer, pp. 1808–1810
- [25] Levesque RJR,Sleep deprivation. In: Levesque RJR (ed) *Encyclopedia of adolescence*. Springer International Publishing (2018) pp. 3606–3607
- [26] Lihabi AA.: A literature review of sleep problems and neurodevelopment disorders *Frontiers in Psychiatry*, (2023), 23 February, Volume 14 <https://doi.org/10.3389/fpsy.2023.1122344>
- [27] Lim DC, Najafi A, Afifi L, Bassetti CLA, Buysse DJ, Han F, Hégl B, Melaku YA, Morin CM, Pack AI, Pyares D, Somers VK, Eastwood PR, Zee PC, Jackson CL, on behalf of the World Sleep Society Global Sleep Health Taskforce.: The need to promote sleep health in public health agendas across the globe *The Lancet Public Health* (2023) 8(10), E820-E826, october 2023
- [28] Maki KA, Fink AM, Weaver TE.: Sleep, time, and space—fatigue and performance deficits in pilots, commercial truck drivers, and astronauts; *SLEEP Advances*, (2022) Sep 15. 3(1):zpac033

- [29] Malafeev A, Hertig-Godeschalk A, Schreier DR, Skorucak j, Mathis J, Achermann P.: Automatic Detection of Microsleep Episodes With Deep Learning. *Front Neurosci* (2021) Mar 24;15:564098. doi: 10.3389/fnins.2021.564098. eCollection 2021.
- [30] Market Date Forecast, Europe Sleep Aids Market\_March (2023) <https://www.marketdataforecast.com/market-reports/europe-sleep-aids-market>
- [31] McArdle N, Ward SV, Bucks RS, Maddison K, Smith A, Huang RC, Pennell CE, Hillman DR, Eastwood PR.: The prevalence of common sleep disorders in young adults: a descriptive population-based study. *Sleep* (2022) 43(10), zsaa072, <https://doi.org/10.1093/sleep/zsaa072>
- [32] Murawski B, Wade L, Plotnikoff RC, Lubans DR, Duncan MJ.: A systematic review and meta-analysis of cognitive and behavioral interventions to improve sleep health in adults without sleep disorders. *Sleep Med Rev.* (2018);40 pp. 160-169.
- [33] Niño García JA, Barragán Vergel MF, Ortiz Labrador JA, Ochoa Vera ME, González Olaya HL. Factors Associated with Excessive Daytime Sleepiness in Medical Students of a Higher Education Institution of Bucaramanga. *Rev Colomb Psiquiatr.* (2019);48(4):222–231. doi: <https://doi.org/10.1016/j.rcp.2017.12.002>.
- [34] Olaganathan R, Holt TB, Luedtke J, Bowen BD.:Fatigue and its management in the aviation industry, with special reference to pilots *Journal of Aviation Technology and Engineering* (2021) 10(1), pp. 45-57
- [35] Paul A, Boyle LN, Tippin J, Rizzo M.: Variability of driving Performance During Microsleeps. University of Iowa, Iowa Research Online, 2005 Driving Assessment Conference
- [36] Peiris M.T.R., Jones R.D., Davidson P.R., Carroll G.J., Bones P.J. Frequent lapses of responsiveness during an extended visuomotor tracking task in non-sleep-deprived subjects. *J. Sleep Res.* (2006)15:291–300. doi: 10.1111/j.1365-2869.2006.00545.x.
- [37] Peng Z, Dai C, Ba Y, Zhang L, Shao Y, Tian J.: Effect of Sleep Deprivation on the Working Memory-Related N2-P3 Components of the Event-Related Potential Waveform, *Frontiers in Neuroscience* 14 - 2020 <https://doi.org/10.3389/fnins.2020.00469>
- [38] Perkinson-Gloor N, Lemola S, Grob A.: Sleep duration, positive attitude toward life, and academic achievement: the role of daytime tiredness, behavioral persistence, and school start times *J Adolesc* (2013) Apr;36(2):311-8. doi: 10.1016/j.adolescence.2012.11.008.

- [39] Roenneberg T, Wirz-Justice A, Mellow M.: Life between clocks: Daily temporal patterns of human chronotypes. *J. Biol. Rhythm.* (2003);18, pp.80–90.
- [40] Roenneberg T, Allebrandt KV, Mellow M, Vetter C.: Social jetlag and obesity. *Curr. Biol.* (2012); 22 pp. 939
- [41] Ruggiero AR, Peach HD, Zendels P, Gaultney JF.: 0417 Indirect Effect of Sleep Attitudes on Sleep Duration and Quality Via Arousal Behaviors, *Sleep*, 42(1) (2019) Page A169, <https://doi.org/10.1093/sleep/zsz067.416>
- [42] Skorucak J, Hertig-Godeschalk A, Achermann P, Mathis J, Schreier Dr.: Automatically Detected Microsleep Episodes in the Fitness-to-Drive Assessment *Front. Neurosci* (2020) 14| <https://doi.org/10.3389/fnins.2020.00008>
- [43] Štefan L, Sporiš G, Krističević T, Knjaz D.: Associations between sleep quality and its domains and insufficient physical activity in a large sample of Croatian young adults: a cross-sectional study. *BMJ Open* (2018) 8(7):e021902. <https://doi.org/10.1136/bmjopen-2018-021902>
- [44] Suardiaz-Muro M, Morante-Ruiz M, Ortega-Moreno M, Ruiz MA, Martín-Plasencia P, Vela-Bueno A. Sleep and academic performance in university students: a systematic review. *Rev Neurol.* (2020) 71(2) pp. 43–53. doi: <https://doi.org/10.33588/rn.7102.2020015>.
- Thompson KI, Chau M, Lorenzetti MS, Hill LD, Fins AI, Tartar JL.: Acute sleep deprivation disrupts emotion, cognition, inflammation, and cortisol in young healthy adults. *Frontiers in Behavioral Neuroscience* (2022) 23 September, DOI 10.3389/fnbeh.2022.945661
- [45] Yeo SC, Laci CKY, Tan J, Lim S, Chandramoghan Y, Tan TK, & Gooley JJ.: Early morning university classes are associated with impaired sleep and academic performance. *Nat Hum Behav* (2023) 7, pp. 502–514. <https://doi.org/10.1038/s41562-023-01531-x>
- [46] Yi-Man M, Xiao-Dan H, Sui Z, Zheng-Fang H, Kwok-Fai S, Chao-Ran R, Quian T.: Alerting effects of light in healthy individuals a systematic review and meta-analysis. *Neural Regeneration Research* (2022) September 17(9) pp. 1929-1936. DOI: 10.4103/1673-5374.335141
- [47] Vecsey CG, Baillie GS, Jaganath D, Havekes R, Daniels A, Wimmer M, Huang T, Brown KM, Li X-Y, Descalzi G, Kim SS, Chen T, Shang Y-Z, Zhuo M, Houslay MD, Abel T (2009) Sleep deprivation impairs cAMP signalling in the hippocampus. *Nature* 461(7267) pp. 1122–1125.
- [48] Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, Dinges DF, Gangwisch J, Grandner MA, Kushida C, Malhotra RK, Martin JL, Patel SR, Quan SF, Tasali E. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of

- Sleep Medicine and Sleep Research Society. *SLEEP* (2015); 38(6) pp. 843–844
- [49] Zaleha SH et al.: Microsleep Accident Prevention for SMART Vehicle via Image Processing Integrated with Artificial Intelligent (2021) *J.Phys.:* Conf. Ser. 2129 012082
- [50] Zeek ML, Savoie M J, Song,M. Kennemur LM, Qian J, Jungnickel PW, Westrick SC.: (2015). Sleep duration and academic performance among student pharmacists. *Am. J. Pharm. Educ.* 79:63. doi: 10.5688/ajpe79563
- [51] Zendels P, Ruggiero A, Gaul JF.: Gender differences affecting the relationship between sleep attitudes, sleep behaviors and sleep outcomes *Cogent Psychology* (2021), 8: 1979713  
<https://doi.org/10.1080/23311908.2021.1979713>
- [52] Zhang L, Zheng H, Yi M, Zhang Y, Cai G, Li C, Zhao L.: Prediction of sleep quality among university students after analyzing lifestyles, sports habits, and mental health. *Frontiers in Psychiatry* (2020) 13.<https://doi.org/10.3389/fpsy.2022.927619>

# Is there still a need for teachers at higher educational institutions?

**Prof. Dr. Kornélia Lazányi**

Óbuda University, lazanyi.kornelia@nik.uni-obuda.hu

*Abstract: As an influence of the rapid and turbulent changes in the macro environment, and the expectations of the "customers", higher educational institutions are facing challenges and have to realise that past methods might not fit the new era. Current article revolves around the teaching methods that might provide more value not only for the recipients but also for the teachers; and endeavours to introduce pros and cons related to the changing role of teachers. While the paper is mostly theoretical by nature, the statements are supported by real life examples that intend to underline the validity of the suggested change. The enveloping environment, the institutional sphere, is also analysed in regard to the suggested change.*

*Keywords: teaching practice, change, higher education*

## 1 Introduction

The dynamic landscape of higher education in Western Europe has witnessed a constant state of change over the last four decades, reflecting the evolving needs of society and the increasing number of students seeking advanced education (Kyvik, 2004). Historically, the prevailing model was one where universities dominated the higher education sphere, a paradigm that persisted until the 1960s. However, responding to a surge in student enrollment and evolving workforce demands, the system underwent a significant transformation. The shift led to the emergence of various organizational models, ranging from university-dominated and dual systems to binary, unified, and stratified systems (Scott, 1995).

In this context of continual evolution and adaptation, our focus today shifts to the transformative role of mentoring in higher education. While the historical trajectory has seen the dominance of specific models (Huisman and Kaiser, 2001), notably the university-dominated and dual systems, the contemporary landscape is marked by the prevalence of binary systems in several Western European countries (Davies, 1992). As we explore the topic of mentoring, it is crucial to recognize that change has been a constant, and the direction has shifted from traditional, rigid structures toward more flexible and dynamic models. The emphasis now lies on cultivating mentorship as a fundamental aspect of the

educational ethos, aligning with the diverse needs and aspirations of students in a rapidly changing world.

Higher education is yet again in the midst of a profound transformation, shaped by a myriad of macro-level environmental factors that are compelling educators to reevaluate their traditional roles. In this essay, we will delve into the complexities of these environmental influences, examining the imperative for teachers to adopt mentoring roles as an essential response to the evolving needs of students in the contemporary higher education landscape.

## **2 The impact of the environmental changes**

The operational landscape of higher educational institutions in Western countries, as well as across the globe, is profoundly influenced by a myriad of factors. A comprehensive analysis can be conducted through the lens of a PESTEL framework, examining the Political, Economic, Social, Technological, Environmental, and Legal factors that shape the higher education sector.

Political decisions and legislative frameworks wield substantial influence over higher education institutions. Governments play a pivotal role in shaping the direction of education through policies, reforms, and funding structures. In Western countries, political decisions often impact the autonomy of universities, funding allocations, and the overall structure of academic programs. The recent trends towards more conservative or liberal ideologies in different regions can also influence the ethos of higher education, shaping curricula and campus dynamics.

The political landscape in higher education has witnessed a transformative shift from an elite model to a mass system across many OECD states. In the 1950s, publicly subsidized higher education was limited to a privileged few, but today, enrollment rates often exceed fifty percent. This transition has triggered varied funding reforms, with some countries like Australia and the United Kingdom reducing public subsidization significantly. In contrast, nations such as Sweden and Finland have responded to mass enrollment by substantially increasing public investment in higher education. However, certain states, primarily in Continental Europe, have retained the elite, public higher education structure from the postwar era, reflecting divergent political decisions and funding approaches. This evolution underscores the dynamic interplay of political factors in shaping the contemporary higher education landscape (Ansell, 2008).

Economic considerations are central to the operations of higher education institutions (Rosinger et al., 2022). The demand for education is intertwined with economic conditions, and the economic landscape of Western countries significantly influences the financing and accessibility of higher education (Pincus et al, 2017). Economic downturns may lead to changes in government funding, affecting the financial stability of institutions and the ability of students to afford



education. Conversely, economic prosperity may result in increased investment in research and development within universities.

The social landscape plays a crucial role in shaping the expectations and demographics of students. Evolving societal norms, changing demographics, and cultural expectations contribute to the dynamic nature of higher education. In Western countries, an aging population and increasing cultural diversity impact the student body and necessitate a more inclusive and personalized approach to teaching (Kaputa, Loučanová, Tejerina-Gaite, 2022). Social expectations also influence the emphasis on specific disciplines and the demand for certain types of skills in the job market.

The rapid advancement of technology is a transformative force in higher education. Online education, artificial intelligence, and digital tools have reshaped the learning environment. The integration of technology into pedagogical approaches is not just an option but a necessity for higher education institutions (Benavides et al., 2020). The ability to provide instant feedback, foster interactive learning experiences, and tailor educational content to individual needs has become a defining factor in the competitiveness and relevance of educational institutions in the digital age (Abad-Segura et al., 2020).

While not always at the forefront of discussions, environmental considerations increasingly influence higher education institutions. Sustainability practices, environmental awareness, and green initiatives are gaining prominence. Universities are expected to demonstrate a commitment to environmental responsibility through their operations, research, and curriculum (Orecht, Feodorova, Rosi, 2022). Climate change and related environmental challenges may also impact the availability of resources and the overall stability of institutions.

Legal considerations encompass a broad spectrum of issues for higher education institutions. Compliance with local and international regulations, accreditation standards, and evolving laws related to academic freedom and student rights are critical. Changes in immigration policies and visa regulations, particularly in Western countries, can affect the diversity of the student body and the ability of institutions to attract international talent (Jacobs, 2022).

Globalization, with its elements of competition and cooperation, underscores the necessity for educators to prepare students for a globally connected world. The ability to impart not just academic knowledge but also a global perspective and cultural competence becomes a vital aspect of teaching in the 21st century (Akour, Alenezi, 2022). Additionally, periods of crises, wars, and pandemics emphasize the need for adaptable and resilient educational systems, compelling teachers to navigate disruptions and support students emotionally and academically during challenging times (Krishnamurty, 2020).

In a global context, the interplay of political, economic, social, technological, environmental, and legal considerations varies across different regions and

cultures. For example, in developing countries, economic factors may have a more direct impact on the affordability and accessibility of education, while political factors might shape the level of academic freedom. Nonetheless, whether in Western countries or on a global scale, higher education institutions must continuously assess and respond to these factors to ensure their relevance, sustainability, and contribution to societal progress.

### **3 The Evolving Role of Higher Education**

The landscape of higher education is undergoing a profound metamorphosis, driven by a multitude of environmental factors that are reshaping the very essence of academic institutions. These changes are not merely external pressures but intrinsic shifts that have manifested in the core functions, roles, and structures of higher education.

One of the primary areas undergoing transformation is the content and delivery of education. The advent of technology has facilitated the integration of online platforms, artificial intelligence, and interactive learning experiences into the educational landscape. This shift has not only expanded the accessibility of education but has also prompted a reevaluation of the traditional classroom setting. Institutions are increasingly exploring blended learning models, recognizing the need for flexibility and personalized educational content to cater to diverse student needs (Akour, Alenezi, 2022).

Moreover, there is a noticeable transformation in the evaluation and assessment methodologies. Adaptive assessments, predictive analytics, and automated administration tools are becoming integral to the educational process (Rudolph, Tan, Tan, 2023). This shift towards data-driven decision-making not only enhances the efficiency of administrative tasks but also enables a more nuanced understanding of student performance and potential areas of improvement.

The institutional perspective is also undergoing a paradigm shift. Higher education institutions are now placing a greater emphasis on student retention, recognizing its significance in maintaining a positive institutional reputation and attractiveness. This involves not only academic support but also fostering a supportive environment that contributes to the personal development and well-being of students (Gupta, Gupta, 2022). This institutional commitment to holistic student success reflects a departure from a purely academic focus to a more comprehensive approach that considers the broader aspects of student life.

Recently, more and more institutions are fostering a culture of mutual support and knowledge exchange, recognizing that learning is not confined to a unidirectional flow from teacher to student but is enriched through diverse perspectives and experiences (Colvin, Ashman, 2010). What is more, the notion of learning by teaching is applied more frequently as a way of enriching the skillset of the ones

teaching while broadening the knowledge of those on the receiving end (Raccanello et al., 2022).

In essence, the changes in higher education institutions are multidimensional. They encompass shifts in teaching approaches, the incorporation of technology, redefined assessment methodologies, and a reimagining of institutional priorities. These changes are not mere responses to external triggers but represent a fundamental evolution in the understanding of education as a holistic and dynamic process. As higher education continues to adapt to these changes, it is poised to foster a generation of students who are not just academically proficient but also equipped with the skills, attitudes, and support systems necessary for success in a rapidly evolving world.

#### **4 Mentoring instead of teaching?**

As higher education evolves, so too does the role of educators within this dynamic landscape. Beyond the traditional mandate of knowledge transfer, teachers are now expected to facilitate professional training, engage in applied research, and play a pivotal role in the development of competencies, attitudes, and a sense of responsibility in students. The modern teacher is tasked with delivering a combination of knowledge and skills that are directly relevant to the rapidly changing job market.

In response to these changing dynamics, mentoring has emerged as a key component of the educator's role. This entails not only academic guidance but also active involvement in students' personal development, academic success, and career planning. From a student's perspective, mentoring contributes to increased self-confidence, emotional intelligence, and the development of effective learning strategies (Law, Hales, Busenbark, 2020). Academic support, career development, and personal counseling become integral facets of the teacher-student relationship.

Mentoring, a concept deeply woven into the fabric of human history, has evolved over the centuries, reflecting the intricate interplay between experienced individuals guiding the development of their mentees. The roots of mentoring can be traced back to ancient Greece, where the term "mentor" finds its origin in Homer's epic poem, the *Odyssey*. Within this classical narrative, Mentor stands as a trusted friend and advisor to Odysseus, assigned the critical task of guiding and advising Odysseus' son, Telemachus, in his father's absence (Wright, 1992). This archetypal mentor-mentee relationship, characterized by wisdom, guidance, and knowledge transfer, lays the foundation for the enduring concept of mentoring (Ragins, Kram, 2007).

The concept of mentoring is not confined to ancient Greece; rather, it resonates across various cultural and religious traditions. In Judaism, the mentoring dynamic is evident in the relationship between a rabbi and disciples (Bretan, n.d.).

Similarly, in Confucian philosophy, the importance of a wise teacher guiding a student's learning journey is a central theme.

The Middle Ages and the Renaissance witnessed a formalized structure of mentoring through apprenticeship, particularly in the crafts and arts. Skilled artisans, as mentors, passed down their knowledge to apprentices, ensuring the preservation and advancement of specialized skills. The guild system exemplified the mentor-mentee dynamic, emphasizing hands-on learning and the cultivation of expertise (Garbutt, 2006).

As societies progressed into the modern era, mentoring adapted to the changing dynamics of education and professional development. In the 20th century, mentoring gained prominence in academia, with professors assuming the role of mentors for their students (Allen, Finkelstein, 2003). This extension of the mentoring model beyond the traditional master-apprentice relationship signalled a broader spectrum of guidance, support, and career advice.

In today's higher education landscape, mentoring plays a multifaceted role, addressing the complex needs of students beyond the confines of the traditional classroom. The potential applications of mentoring in higher education are vast and transformative, encompassing academic, personal, and professional dimensions.

Mentoring provides a scaffold for academic success by offering personalized guidance in learning strategies, study habits, and overcoming learning challenges (Lunsford et al., 2017). Mentors, often faculty members, serve as valuable resources for students navigating the academic terrain, fostering an environment where intellectual curiosity is nurtured. Beyond academics, mentoring contributes significantly to students' personal development. Mentors act as sounding boards for ideas, helping to build self-confidence, manage emotions, and develop emotional intelligence. The mentor-mentee relationship fosters a sense of belonging and support, crucial for a student's overall well-being. Mentoring in higher education also extends into career planning and development. Mentors guide students in exploring potential career paths, establishing professional connections, and navigating the intricacies of the job market (Andersen, West, 2020). This aspect of mentoring bridges the gap between academic knowledge and real-world application, preparing students for a seamless transition into their chosen professions.

The mentor-mentee relationship often evolves into a trusted and confidential space for personal counselling. Students, facing the challenges of academia and life, find solace in mentors who offer empathetic ears and valuable advice. This personalized support contributes to a positive and supportive campus culture. Long-term, trusting relationships form the cornerstone of effective mentoring (Ertem, Aytemur, 2008). As mentors guide students through their academic journeys, these relationships extend beyond the classroom, creating a network of support that endures beyond graduation. This sense of connection fosters a strong alumni network and contributes to institutional loyalty.

In conclusion, the historical roots of mentoring demonstrate its enduring significance in guiding individuals through their educational and professional journeys. In higher education, mentoring has evolved into a powerful tool for academic, personal, and professional development. The archetypal mentor-mentee relationship, rooted in ancient narratives, has seamlessly adapted to contemporary contexts, becoming a cornerstone of student success and institutional strength. As higher education continues to evolve, mentoring stands as a testament to the enduring value of one generation guiding the next, fostering growth, resilience, and a commitment to lifelong learning. However, while the potential benefits of mentoring in higher education are evident, challenges exist that must be acknowledged and addressed.

## **5 The Teacher's Perspective on mentoring**

The transition from a traditional teaching role to that of a mentor is laden with potential benefits for educators (Holloway, 2001). Embracing a mentoring role represents a significant avenue for professional development. As mentors, educators find themselves continually refining their teaching skills, honing their ability to communicate effectively, and adapting to the diverse needs of their mentees. This evolution is not a one-way street; it is a reciprocal process where mentors also become learners. The act of guiding others allows educators to gain fresh perspectives on their subject matter and teaching methodologies, fostering a dynamic and enriching intellectual environment. Moreover, the establishment of long-term, trusting relationships with students is a source of intrinsic motivation and fulfilment for educators turned mentors (Wilhelm, et al., 2020). Witnessing the success and development of their mentees becomes a source of pride, reinforcing the profound impact that a mentor can have on a student's academic journey and personal growth. The emotional rewards derived from playing a pivotal role in a student's life contribute to a sense of purpose and job satisfaction that transcends the traditional confines of teaching (Mrstik et al., 2019).

However, despite the evident advantages, not all teachers readily embrace the evolving role of a mentor. The shift involves a profound change in mindset, from a more didactic approach to a collaborative and supportive one. This transition demands an investment of time, effort, and emotional energy (Burrow, Williams, Thomas, 2020). Time constraints pose a significant hurdle, as educators are already juggling multiple responsibilities, including lesson planning, grading, and administrative tasks. The additional commitment required for effective mentoring can be overwhelming, raising questions about the feasibility of incorporating this role into an already demanding workload (Mijakoski et al., 2022).

What is more, diverse student needs present a complex challenge. Each student brings a unique set of strengths, weaknesses, and learning styles to the table. Catering to this diversity requires a flexible and adaptive approach to mentoring.

Teachers must be prepared to tailor their guidance to individual requirements, addressing not only academic concerns but also personal and emotional challenges (Mahmoodi-Shahrebabaki, 2019). This level of personalized attention demands a heightened emotional investment, and educators may find themselves navigating uncharted territory as they confront the intricacies of their mentees' lives (Pogere et al., 2019).

The lack of training and support further complicates the adoption of a mentoring role. Traditional teacher training programs often focus on pedagogical skills, neglecting the nuanced art of mentoring. Educators may find themselves unprepared for the emotional intricacies involved in guiding students through personal and academic challenges (Saloviita, Pakorinen, 2021). The absence of a structured support system can leave mentors feeling isolated and ill-equipped to address the complex needs of their mentees.

The concept of remote mentoring, while presenting opportunities for flexibility, introduces a new set of challenges. The digital realm demands careful consideration of effective communication and engagement strategies. Building rapport and establishing a sense of trust become more challenging when interactions are mediated through screens (de Oliveira Malaquias, de Souza, 2023). The nuances of non-verbal communication may be lost, requiring mentors to develop alternative methods for gauging and addressing the emotional well-being of their mentees.

Beyond the logistical challenges, the emotional and psychological costs of mentoring should not be underestimated. Educators may find themselves shouldering the weight of their mentees' struggles and successes, experiencing vicarious stress and joy. The emotional investment required for effective mentoring can be draining, particularly when mentors become deeply involved in the personal and academic challenges faced by their mentees (Cook, 2018). Striking a balance between empathy and professional detachment becomes a delicate dance, and mentors may find themselves grappling with the emotional toll of this dual role.

In conclusion, the journey from educator to mentor offers a wide variety of potential benefits, including professional development, fresh perspectives, and the intrinsic rewards of guiding students to success. However, this evolution comes at a cost—both tangible and intangible. Time constraints, diverse student needs, lack of training, and the emotional demands of mentoring pose significant challenges. Educators must carefully weigh these costs against the rewards, considering their own capacity for adaptation and the institutional support available. As the landscape of higher education continues to evolve, the role of the mentor will likely become increasingly pivotal, necessitating a thoughtful and comprehensive approach to supporting educators in this critical aspect of their profession.

## 6 Institutional Perspective

From an institutional perspective, the embrace of mentoring within higher education brings forth a spectrum of advantages that contribute to the overall success and reputation of the institution. Higher retention rates and lower attrition, stemming from effective mentoring programs, create a positive institutional image. This positive perception enhances the attractiveness of the institution, making it a preferred choice for prospective students and contributing to a robust and engaged student community (Law, Hales, Busenbark, 2021). Moreover, the establishment of mentoring relationships fosters the creation of a professional network and community within the institution. This interconnected web of mentor-mentee relationships extends beyond the academic realm, creating a supportive environment that transcends traditional classroom boundaries. The formation of such a network enhances the overall educational quality, as students feel a sense of belonging and support, contributing to their personal development and success.

However, the adoption of mentoring roles within the institutional framework necessitates a significant transformation. The educational system, historically rooted in traditional teaching methods, must evolve to meet the changing needs of students. This evolution is not a mere adjustment but a comprehensive adaptation, where mentoring becomes a fundamental aspect of the institution's ethos. The institutional commitment to providing a supportive environment for both teachers and students becomes paramount in this transformative process (Garza et al., 2019).

Cultivating mentoring competencies among educators becomes a central focus for institutions aiming to embrace this evolving role. Traditional teacher training programs may need to be restructured to incorporate mentoring skills, ensuring that educators are equipped to navigate the complexities of guiding students through academic and personal challenges (Ageria et al., 2019). This transformation requires an investment in professional development programs that foster the acquisition of mentoring skills, emphasizing effective communication, empathy, and adaptability.

As educational processes become more intricate, demanding additional resources, institutions must prioritize the creation of a supportive infrastructure. This involves not only financial investments but also a re-evaluation of institutional priorities. The commitment to providing resources for mentoring programs, including training sessions, ongoing support, and networking opportunities, becomes a crucial aspect of institutional strategy (Garccia – Penalvo, 2021). This commitment signals to educators that their role as mentors is valued and supported, fostering a culture where mentoring is integrated seamlessly into the fabric of the institution. Furthermore, the institution's commitment to creating a supportive environment extends to the students (Bond, Blevins, 2020). The establishment of mentoring programs should be accompanied by mechanisms that ensure equitable access and participation. Institutions need to recognize and

address the diverse needs of their student body, offering tailored mentoring opportunities that consider individual backgrounds, learning styles, and aspirations. This inclusivity not only enhances the effectiveness of mentoring but also contributes to a more vibrant and diverse educational community.

In conclusion, from an institutional standpoint, embracing mentoring offers tangible benefits in terms of positive reputation, higher retention rates, and the creation of a supportive community. However, this adoption requires a fundamental transformation of the educational system. The cultivation of mentoring competencies among educators, the provision of necessary resources, and a commitment to creating a supportive environment for both teachers and students are essential components of this institutional evolution. As higher education institutions navigate these changes, they position themselves not only as centres of academic excellence but also as nurturing environments that foster the holistic development and success of their students.

### **Summary and conclusions**

Current essay delved into the evolving landscape of higher education, considering both the teacher's and institutional perspectives in the context of mentoring. From the teacher's standpoint, the adoption of mentoring roles offers a wealth of benefits. It enhances professional development, providing educators with opportunities to refine their teaching skills, explore new communication strategies, and gain satisfaction from the success and development of their students. The reciprocal nature of learning through teaching enriches perspectives and fosters the establishment of long-term, trusting relationships, contributing to a sense of motivation and fulfilment. However, not all teachers readily embrace this evolving role due to challenges such as time constraints, diverse student needs, and a lack of training and support. The concept of remote mentoring introduces additional complexities, demanding careful consideration of effective communication and engagement strategies in the digital realm.

From an institutional standpoint, embracing mentoring offers advantages such as higher retention rates, lower attrition, a positive institutional reputation, and the creation of a professional network and community that enhances educational quality. Yet, the adoption of mentoring roles requires significant institutional transformations. The educational system must adapt to changing student needs, and mentoring competencies need to be cultivated among educators. As educational processes become more complex, demanding additional resources, the commitment to providing a supportive environment for both teachers and students becomes paramount.

In conclusion, the journey from educator to mentor is marked by a transformative shift that extends beyond the transmission of knowledge to a more holistic approach that nurtures the personal and academic development of students. While the benefits are evident, challenges exist, necessitating a careful balance between



the demands of mentoring and the existing responsibilities of educators. On an institutional level, the embrace of mentoring necessitates a comprehensive re-evaluation of structures and priorities, signalling a commitment to providing not only academic excellence but also a nurturing environment for the holistic development and success of students. As the landscape of higher education continues to evolve, the role of mentoring emerges as a critical aspect, shaping the future of education and the experiences of both

### References

- [1] Abad-Segura, E., González-Zamar, M. D., Infante-Moro, J. C., & Ruipérez García, G. (2020). Sustainable management of digital transformation in higher education: Global research trends. *Sustainability*, 12(5), 2107.
- [2] Akour, M., & Alenezi, M. (2022). Higher education future in the era of digital transformation. *Education Sciences*, 12(11), 784.
- [3] Alegría, M., Fukuda, M., Lapatín Markle, S., & NeMoyer, A. (2019). Mentoring future researchers: Advice and considerations. *American Journal of Orthopsychiatry*, 89(3), pp. 329.
- [4] Allen, T. D., & Finkelstein, L. M. (2003). Beyond mentoring: Alternative sources and functions of developmental support. *The Career Development Quarterly*, 51(4), pp. 346-355.
- [5] Andersen, C. L., & West, R. E. (2020). Improving mentoring in higher education in undergraduate education and exploring implications for online learning. *Revista de Educación a Distancia (RED)*, 20(64).
- [6] Ansell, B. W. (2008). University challenges: Explaining institutional change in higher education. *World politics*, 60(2), pp. 189-230.
- [7] Benavides, L. M. C., Tamayo Arias, J. A., Arango Serna, M. D., Branch Bedoya, J. W., & Burgos, D. (2020). Digital transformation in higher education institutions: A systematic literature review. *Sensors*, 20(11), 3291.
- [8] Bond, M. A., & Blevins, S. J. (2020). Using faculty professional development to foster organizational change: A social learning framework. *TechTrends*, 64(2), pp. 229-237.
- [9] Bretan, G. H. (n.d.). Mentoring for Ministry in Judaism. *Reflective Practice: Formation and Supervision in Ministry*, 43(43).
- [10] Burrow, R., Williams, R., & Thomas, D. (2020). Stressed, depressed and exhausted: Six years as a teacher in UK state education. *Work, Employment and Society*, 34(5), pp. 949-958.

- [11] Colvin, J. W., & Ashman, M. (2010). Roles, risks, and benefits of peer mentoring relationships in higher education. *Mentoring & tutoring: partnership in learning*, 18(2), pp. 121-134.
- [12] Cook, J. P. (2018). Online education and the emotional experience of the teacher. *New Directions for Teaching and Learning*, 2018(153), pp. 67-75
- [13] Davies, S. "Binary Systems of Higher Education", in, Clark, B. and Neave, G., eds. *The Encyclopedia of Higher Education*. Oxford: Pergamon Press, 1992, pp. 1066–10
- [14] de Oliveira Malaquias, F. F., & de Souza Júnior, R. C. (2023). Technostress, burnout and job satisfaction Among teachers during the COVID-19 pandemic: The role of literacy facilitation. *Information Development*, 02666669231208100.
- [15] Erdem, F., & Aytumur, J. Ö. (2008). Mentoring—A relationship based on trust: Qualitative research. *Public Personnel Management*, 37(1), pp. 55-65.
- [16] Garbutt, K. (2006). Moving from medieval apprenticeships to reflective practice. *CBE—Life Sciences Education*, 5(1), pp. 39-40.
- [17] García-Peñalvo, F. J. (2021). Avoiding the dark side of digital transformation in teaching. An institutional reference framework for eLearning in higher education. *Sustainability*, 13(4), 2023.
- [18] Garza, R., Reynosa, R. J., Werner, P. H., Duchaine, E. L., & Harter, R. A. (2019). Developing a mentoring framework through the examination of mentoring paradigms in a teacher residency program. *Australian Journal of Teacher Education (Online)*, 44(3), pp. 1-22.
- [19] Gupta, P. B., & Gupta, B. (2022). Role of Strategic Human Resource Management Practices (SHRMPs) for Gearing up Higher Education Institutions to Achieve Vision of National Education Policy. *Amity Journal of Management Research*, 5(1).
- [20] Holloway, J. H. (2001). The benefits of mentoring. *Educational leadership*, 58(8), pp. 85-85.
- [21] Huisman, J., & Kaiser, F. (2001). Fixed and fuzzy boundaries in higher education. A comparative study of (binary) structures in nine countries. The Hague: Adviesraad voor het Wetenschaps-en Technologiebeleid.
- [22] Jacobs, E. (2022). The homogenizing and diversifying effects of migration policy in the internationalization of higher education. *Higher Education*, 83(2), pp. 339-355.
- [23] Kaputa, V., Loučanová, E., & Tejerina-Gaite, F. A. (2022). Digital transformation in higher education institutions as a driver of social oriented innovations. *Social innovation in higher education*, 61, pp. 81-85.

- [24] Krishnamurthy, S. (2020). The future of business education: a commentary in the shadow of the Covid-19 pandemic. *J. Bus. Res.* 117, pp. 1–5. doi: 10.1016/j.jbusres.2020.05.034
- [25] Kyvik, S. (2004). Structural changes in higher education systems in Western Europe. *Higher education in Europe*, 29(3), 393-409.
- [26] Law, D. D., Hales, K., & Busenbark, D. (2020). Student success: A literature review of faculty to student mentoring. *Journal on Empowering Teaching Excellence*, 4(1), 6.
- [27] Lunsford, L. G., Crisp, G., Dolan, E. L., & Wuetherick, B. (2017). Mentoring in higher education. *The SAGE handbook of mentoring*, 20, pp. 316-334.
- [28] Mahmoodi-Shahreabaki, M. (2019). Teacher burnout. *The TESOL encyclopedia of English language teaching*, pp. 1-8.
- [29] Mijakoski, D., Cheptea, D., Marca, S. C., Shoman, Y., Caglayan, C., Bugge, M. D., ... & Canu, I. G. (2022). Determinants of burnout among teachers: a systematic review of longitudinal studies. *International journal of environmental research and public health*, 19(9), pp. 5776.
- [30] Mrstik, S., Pearl, C., Hopkins, R., Vasquez III, E., & Marino, M. T. (2019). Combating special educator attrition: Mentor teachers' perceptions of job satisfaction, resiliency, and retention. *Australasian Journal of Special and Inclusive Education*, 43(1), pp. 27-40.
- [31] Obrecht, M., Feodorova, Z., & Rosi, M. (2022). Assessment of environmental sustainability integration into higher education for future experts and leaders. *Journal of Environmental Management*, 316, 115223.
- [32] Pincus, K. V., Stout, D. E., Sorensen, J. E., Stocks, K. D., & Lawson, R. A. (2017). Forces for change in higher education and implications for the accounting academy. *Journal of Accounting Education*, 40, pp. 1-18.
- [33] Raccanello, D., Balbontín-Alvarado, R., da Silva Bezerra, D., Burro, R., Cheraghi, M., Dobrowolska, B., ... & Aristovnik, A. (2022). Higher education students' achievement emotions and their antecedents in e-learning amid COVID-19 pandemic: A multi-country survey. *Learning and Instruction*, 80, 101629.
- [34] Ragins, B. R., & Kram, K. E. (2007). The roots and meaning of mentoring. *The handbook of mentoring at work: Theory, research, and practice*, 3-15.
- [35] Rosinger, K. O., Ortagus, J., Kelchen, R., Cassell, A., & Brown, L. C. (2022). New evidence on the evolution and landscape of performance funding for higher education. *The Journal of Higher Education*, 93(5), pp. 735-768.

- [36] Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of Applied Learning and Teaching*, 6(1).
- [37] Saloviita, T., & Pakarinen, E. (2021). Teacher burnout explained: Teacher-, student-, and organisation-level variables. *Teaching and Teacher Education*, 97, 103221.
- [38] Scott, P. (1995). Unified and binary systems of higher education in Europe. HIGHER EDUCATION POLICY SERIES-LONDON-JESSICA KINGSLEY PUBLISHERS LIMITED-, 32, pp. 37-54.
- [39] Wilhelm, A. G., Woods, D., del Rosal, K., & Wu, S. (2020). Refining a Professional Network. *Teacher Education Quarterly*, 47(3), pp. 96-119.
- [40] Wright, K. S. (1992). From the Odyssey to the University: What Is This Thing Called Mentoring?. *ACA Bulletin*, 79, pp. 45-53.

# **Estimation of job quality in Albania using the 2007 - 2013 LFS: low quality (“bad”) employment arrangements mean less security and**

**Elvisa Drishti**

Faculty of Economy, University of Shkodra “Luigj Gurakuqi”, Albania, CERGE - EI, Prague

*Abstract* The hypothesis in terms of whether non-standard forms (and typically more precarious) of employment facilitate transition to permanent employment, or as an entrapment into these low quality jobs, has not been explored for the case of Albania. In this paper, the above hypothesis is considered from a microeconomic perspective. The data used for this analysis is from the 2007 to 2013 waves of the Albanian Labour Force Survey (ALFS) microdata. These seven cross-sectional waves are a nationally representative random sample of private households.

To establish the relationship between the previous year labour market status and incidence of non-standard employment, a logistic model in which the dependent variable distinguishes two categories of employment, standard and non-standard employment arrangements, was used. For the case of voluntary and involuntary non-standard work an ordered logit regression with the reference category being standard work was used.

The findings suggest that earnings are negatively associated with undesired working conditions contradicting Smith's (1776) compensating wage differentials hypothesis, which suggests that when employees give up the quality of their working conditions they should be able to receive benefits in earnings.

*Keywords* casual employment; contingent employment; temporary employment; pathways; segmented labour markets; sequence analysis

## **1 Introduction**

Non-standard forms of employment (NSFE) have been attracting extensive interest over the past few decades due to the evident distinction from standard ones. In developing countries, NSFE represent a significant share of paid employment but what is more striking is that NSFE have known an increased prevalence in those sectors where standard employment was the norm, i.e. manufacturing or the public sector (ILO, 2016).

For the case of the transition country of Albania, the post-communist era brought along important social changes over a rather short period. Consequently, uncertainty in the Albanian labour market has increased rapidly. The instruments that steer the labour market policy – in Albania in particular and in post-communist countries in general – are simultaneous use of strong labour market regulation and high levels of flexibilization (Drishti et al., 2021). This blending of past legacies with neoliberal approaches has resulted in little differences between Albania – an European Union (EU) candidate country since 2014 - and existing EU members in terms of NSFEE.

This study investigates two main issues. Firstly, the analyses seeks to establish whether individuals' prospects of working in standard forms of employment (full-time and permanent) (SFE) are influenced by their previous labour market status (e.g. employed, unemployed, student, intern, trainee, or unpaid household worker). Past labour market status/performance is linked to personal characteristics of the individual, not easily identifiable and measurable, that make that worker more or less susceptible to non-standard employment (Green and Livanos, 2017). Therefore, an empirical analysis which enables to incorporate the last transition path is conducted to understand whether the 'steppingstone' or the 'entrapment' scenario (Babos, 2014; Baranowska et al., 2011; Bollé, 1997; Booth et al., 2002; Gash, 2008; Scherer, 2004) are the best fit for the Albanian labour market.

Subsequently, a second comparison of SFE with NSFEE is made with regards to earnings. The reason for this is to assess whether NSFEE imply substandard earnings and in-work poverty (Green, 2011). Other things being equal, in a competitive labour market, workers on NSFEE should receive higher earnings that just offset the value of the absent job security. In practice, however, in the majority of OECD countries, standard jobs have been progressively disappearing in the middle of the earnings and skill distribution while non-standard jobs have crowded the ends of the distribution.

The results suggest that NSFEE are more of a dead-end than steppingstone to SFE. Moreover, earnings are negatively associated with undesired working conditions, i.e. NSFEE, contradicting Smith's (1776) compensating wage differentials hypothesis which suggests that when employees give up the quality of their working conditions they should be able to receive benefits in earnings.

## 2 Data

The available<sup>2</sup> data at the individual level is the Albanian LFS data with 2007 – 2013 waves<sup>3</sup>. The dataset includes basic demographic, labour market, and human capital individual level data. The annual LFS surveys were pooled into a single database, including the ‘year of observation’ in the control variables.

The analysis is restricted to respondents who reported their professional status as ‘employee.’ The set of control variables included in the estimation of job quality and earnings models relate to main demographic, human capital and labour market information on the employee characteristics<sup>4</sup>. Fixed effects included the year of survey.

## 3 Results from multivariate analysis

### 3.1 Job quality and effects of previous activity status

From the Table 1 below, it can be seen that being in unemployment, school/university, in an internship, or attending a training, the year before decreases/increases significantly the probability of working in standard/non-standard employment in the current year when compared to those in employment the year before (the reference category).

The figures confirm that if a person was unemployed the year before, the chances of him or her of working in NSFE are around 3 to 5 times higher than someone who had been employed in the year before.

- 
- 2 The choice of research design is driven by data availability. In the case of Albania, methods and policy evaluation are restricted simply by unavailability of appropriate data from which to develop a complete – or at least useful from a policy standpoint – investigation.
  - 3 The main disadvantage of this dataset is its cross-sectional nature, which impedes an appropriate longitudinal assessment of the steppingstone versus entrapment hypotheses. Moreover, it does not include important individual information such as maternal and paternal education, number of persons financially dependent on the person, tenure, and labour market experience – variables generally included in labour market analysis. Key advantages consist of its very large sample size, compared to carrying out our own survey and annual update that provide chronological time series.
  - 4 Education, age category, whether a person is single or married, occupational group and whether the person has supervisory responsibilities) and main variables on the employer characteristics (e.g. industry group, size of firm measured in number of workers, whether the job position was in the public or private sector) which are desired features of any source of data for the research of job quality and wage estimation equations.

These results are in accordance with previous studies, suggesting that past non-employment experience diminishes the chances of current work stability, measured here as NSFE (Green and Livanos, 2017). These directions of effects are stronger for men than for women. Labour market entry into standard employment is moderately easier for females who were unemployed, studying, in an internship or being trained than for their male counterpart.

Independent variable	Men		Women	
	Odd ratios	Robust SE	Odd ratios	Robust SE
Labour market status 1 year	<i>Reference category: Employed</i>			
Unemployed (UNEM)	0.223***	0.027	0.314***	0.057
Student, Intern, Trainee (STU)	0.116***	0.037	0.300**	0.115
Housekeeper (HOUS)	5.459*	4.368	0.647	0.2167
Other controls	Yes #		Yes #	
Constant	0.532	0.231	3.145*	1.604
Number of observations	7253		4333	

Table 1.

Job Quality – Logit: The probability of working in standard employment arrangements, conditional on labour market status the year before (Reference group is: Non-standard employment)<sup>5</sup> (Odd Ratios)

\*, \*\*, \*\*\* Significant at  $p < 0.1, 0.05, 0.001$  level respectively

# Other controls include: (i) Employee characteristics: Age segment, education level, civil status, occupation; (ii) Employer characteristics: Industry, firm size, sector and supervisory responsibilities; and (iii) Year fixed effects.

Unsurprisingly, for a woman who in the previous year (t-1) was engaged in unpaid house work, the chances of securing a regular permanent job are lower compared to those who were in employment. The opposite is true for men whose chances of regular employment are boosted by their previous unpaid housework.

<sup>5</sup> The categories ‘in retirement or early retirement or has given up business,’ ‘permanently disabled,’ ‘in compulsory military service,’ and ‘other inactive person’ have an insignificant share and would automatically be dropped by the logit estimations as they would perfectly predict the ‘non-standard’ employment outcome.



### 3.2 Earnings and non-standard work arrangements

Ordinary least squares regression analysis of the logarithmic hourly wage (earnings) will be reported. The aim is to estimate the penalty that different types of non-standard employment arrangements (full-time temporary FTTE, part-time permanent PTPE, and part-time temporary PTTE) have on earnings compared to the reference category, standard employment, FTPE. Temporary and part-time employment has been found to cause significant earnings penalties compared to standard work (Bentolila and Dolado, 1994; Hölscher et al., 2011; McGinnity and Mertens, 2002; OECD, 2015) and inequality of earnings is the main cause of inequality.

The results are reported after controlling for the established set of worker and employer characteristics<sup>6</sup> and most importantly for the selection bias labour market participation for women in order to keep account the latent differences in behaviour between working and non-working women which if neglected have significant profound methodological issues (Heckman, 1993)<sup>7</sup>.

Independent variable	Men		Women	
	Odd ratios	Robust SE	Odd ratios	Robust SE
<i>Employment</i>	<i>Reference category: Standard – Full-time permanent</i>			
Full-time temporary	- 0.066***	0.002	- 0.111***	0.004
Part-time permanent	- 0.078	0.061	- 0.146**	0.042
Part-time temporary	- 0.116**	0.038	- 0.197*	0.078
Other controls	Yes #		Yes #	
Constant	7.603***	0.108	6.864***	0.237
Number of observations	5,331		5,819	

Table 2.  
Earnings Specification 1 – OLS: Log earnings gap between non-standard and standard forms of employment

<sup>6</sup> That are: age segment, marital status, educational level, occupational status, supervisory responsibilities and for employer characteristics such as industry, firm size (number of workers), and sector (the full effects of the control variables can be found in Appendix 3.C)

<sup>7</sup> The Heckman two-step procedure has enabled to correct for the self-selection problem of non-working women (See Appendix 3.A).

\*, \*\*, \*\*\* Significant at  $p < 0.1, 0.05, 0.001$  level respectively

# Other controls include: (i) Employee characteristics: Age segment, education level, civil status, occupation; (ii) Employer characteristics: Industry, firm size, sector and supervisory responsibilities; and (iii) Year fixed effects.

Source of data: Labour Force Survey (LFS) 2007 - 2013, INSTAT (own elaborations)

Earnings are the main indicator of job quality in economic terms and have the largest share of reward structure. Previous studies have determined significant effects of employment arrangements on compensation structures (Kalleberg et al., 2000; McGovern et al., 2004). The results suggest that all forms of non-standard employment arrangements impose significant penalties on earnings, however the most pronounced negative effect remains that of workers in ‘full-time temporary’ jobs – which might also be a consequence of the largest subsample among all forms of non-standard employment.

Female workers in ‘part-time permanent’ jobs have 15% lower hourly wages than their ‘full-time permanent’ counterparts, which is not significant for males. Part-time permanent work has different occupational distribution between genders and this form of non-standard work is predominantly a female characteristics.

The worst type of employment arrangements are part-time and temporary arrangements which have the lowest level of occupational status, job security, and low pay as results can show. The fact that, relative to the other categories, part-time temporary workers are a small subsample may explain why the insignificant results above. However, the direction of effects and size are in concordance with other authors’ findings, albeit not as robust in terms of statistical significance. Men and women in these jobs earn around 12 and 20% less than the standard full-timers and their earnings penalty are also higher compared to permanent part-timers.

## **Discussion and Conclusion**

This investigation contributes to the earlier literature by considering whether individual and employer related characteristics have an impact on the probability of working in non-standard or standard jobs from the perspective of whether non-standard work serves as a transition to the core labour market of permanent full-time jobs or whether it is a dead end. This paper regards standard and non-standard employment arrangements as outcomes of different employee and employer (i.e. firm) related characteristics.

The results from the econometric analysis confirm the common and previously documented findings that individuals who have a history of exiting the labour market in the form of unemployment, for human capital investment purposes or to

be engaged in unpaid family work, faced higher risks of working in low/"bad" quality jobs in the current year compared to those who were previously employed the year before. This means that if a person was unemployed last year, the chances of him or her working in a non-standard job are around 3 - 5 times higher compared to someone who had been employed the year before. Therefore, past non-employment experience diminishes the chances of current work stability. Results also indicated that female workers with low levels of education who were unemployed, studying, attending an internship or training, or engaged in unpaid family work a year ago are more susceptible to work in non-standard employment arrangements in the current year.

Contrary of what the theory of human capital depreciation predicts, the social capital translated in party or political forums memberships might be an explainable cause of why men, whose labour market status in the previous year was unpaid house work, are found working in standard jobs in the current year. Similarly, young individuals (aged between 15 and 29) who were unemployed the past year showed to be more/less prone to work in standard/non-standard employment in the current year but this effect was significant only for men. In this case, the latent distorting effect of social capital in the public sector was revealed. What happens in Albania is that each 2 years either central or local elections take place, and the winning party's militants are rewarded with public administration and civil servants jobs, a highly corrupted and inefficient sector. As explained in Chapter 2, the 'partisan politicization' mode of civil servants employment is at the root of this approach and can be taken as a proxy of the 'jump' from housework to standard employment.

Labour market entry into standard employment is moderately easier for females who were unemployed, studying, in an internship or being trained than for their counterpart males.

Fixed-term (temporary) jobs – which is the largest category of NSFE – robustly have lower earnings than permanent ones and workers systematically are faced with hourly wages penalty, all other things being equal. These effects are stronger for women.

Part-time workers are also penalised however the highest earnings reduction were reported by part-time temporary workers, i.e. 12 and 20% lower earnings compared to full-time permanent while part-time permanent workers reported 8 and 15% earnings penalty, for men and women respectively. The robustness of the results for part-time workers is highly affected by the small size of the subsample that they represent, 2 and 2.7% permanent and temporary part-time.

Non-standard jobs are more a dead end or a trap than a steppingstone to regular standard employment in Albania. They for what is referred to as 'bad jobs' in terms of job quality. Individuals who work in these jobs are usually locked in repeated spells of non-standard employment and/or keep exiting into

unemployment. The growth of nonstandard employment is problematic due to low quality of these non-standard jobs (Kalleberg et al. 2000). There is empirical evidence from different countries of the less-favourable treatment of temporary and part-time workers compared to permanent and full-time workers as regards the quality of their jobs, in that they often have lower job security, reduced access to both statutory and employer-provided social security benefits, and disadvantages in access to firm-funded training (e.g. The European Foundation for the Improvement of Living and Working Conditions 2002; De Graaf-Zilj 2005; Leschke 2007; Kauhanen 2009)

These results make two important points for policy. Even in a largely unregulated labour market, the use of temporary contracts and part-time hours has costs in terms of lower job satisfaction and by extension lower life satisfaction; lower wages that reflect lower specific human capital investment (Booth et al., 2002).

One important division here might be whether these NSFE are exercised involuntarily. Regarding the voluntary and involuntary acceptance of non-standard jobs, previous research puts forward the argument that the larger share of 'bad' jobs offer acceptance will be met by individuals involuntarily since a 'bad' job still makes a worker better off than unemployment (Grün et al., 2010). In fact job search theory (Mortensen, 1986) and related findings (Abraham et al., 2013) are in line with these findings. In the psychological literature differences have been found in job satisfaction and health outcomes by the contract preferences. For example, Krausz (2000) found with Canadian data that voluntary temporary help employees were more satisfied and involved and less stressed compared to involuntary temporary help employees. Isaksson and Bellagh (2002) found that contract preferences appeared to be negatively related to both health outcomes (distress and somatization)

## References

- [1] Abraham, M., Auspurg, K., Bähr, S., Frodermann, C., Gundert, S., Hinz, T., 2013. Unemployment and willingness to accept job offers: results of a factorial survey experiment. *J Labour Market Res* 46, pp. 283–305. <https://doi.org/10.1007/s12651-013-0142-1>
- [2] Babos, P., 2014. Step or trap? Transition from fixed-term contracts in Central Eastern Europe. *Post-Communist Economies* 26, pp. 39–52. <https://doi.org/10.1080/14631377.2014.874230>
- [3] Baranowska, A., Gebel, M., 2010. The Determinants of Youth Temporary Employment in the Enlarged Europe. *European Societies* 12, pp. 367–390. <https://doi.org/10.1080/14616690903165434>
- [4] Baranowska, A., Gebel, M., Kotowska, I.E., 2011. The role of fixed-term contracts at labour market entry in Poland: stepping stones, screening

- devices, traps or search subsidies? *Work, Employment and Society* 25, pp. 777–793. <https://doi.org/10.1177/0950017011419705>
- [5] Bentolila, S., Dolado, J.J., 1994. Labour flexibility and wages: lessons from Spain. *Econ Policy* 9, pp. 53–99. <https://doi.org/10.2307/1344458>
- [6] Bollé, P., 1997. Perspectives - Part-time work: Solution or trap? *International Labour Review - Publications* 136.
- [7] Booth, A.L., Francesconi, M., Frank, J., 2002. Temporary Jobs: Stepping Stones or Dead Ends? *The Economic Journal* 112, F189–F213. <https://doi.org/10.1111/1468-0297.00043>
- [8] Booth, A.L., Francesconi, M., Frank, J., 2000. Temporary jobs: who gets them, what are they worth, and do they lead anywhere? (Working Paper No. 2000–13). *ISER Working Paper Series*.
- [9] Brown, S., Sessions, J.G., 2003. Earnings, Education, and Fixed-Term Contracts. *Scottish Journal of Political Economy* 50, pp. 492–506. <https://doi.org/10.1111/1467-9485.5004007>
- [10] Drishti, E., Kalaj, E.H., Kopliku, B.D., 2021. Efficiency and distributional effects of the two-tracked labour market institutions in Albania, in: Faghieh, N., Samadi, A.H. (Eds.), *Legal-Economic Institutions, Entrepreneurship, and Management*. Springer [Forthcoming].
- [11] Gash, V., 2008. Bridge or Trap? Temporary Workers' Transitions to Unemployment and to the Standard Employment Contract. *Eur Sociol Rev* 24, pp. 651–668. <https://doi.org/10.1093/esr/jcn027>
- [12] Green, A., Livanos, I., 2017. Involuntary non-standard employment in Europe. *European Urban and Regional Studies* 24, pp. 175–192. <https://doi.org/10.1177/0969776415622257>
- [13] Green, F., 2011. Unpacking the misery multiplier: How employability modifies the impacts of unemployment and job insecurity on life satisfaction and mental health. *Journal of Health Economics* 30, pp. 265–276. <https://doi.org/10.1016/j.jhealeco.2010.12.005>
- [14] Grün, C., Hauser, W., Rhein, T., 2010. Is Any Job Better than No Job? Life Satisfaction and Re-employment. *J Labor Res* 31, pp. 285–306. <https://doi.org/10.1007/s12122-010-9093-2>
- [15] Heckman, J.J., 1993. What Has Been Learned About Labor Supply in the Past Twenty Years? *The American Economic Review* 83, pp. 116–121.
- [16] Hölscher, J., Perugini, C., Pompei, F., 2011. Wage inequality, labour market flexibility and duality in Eastern and Western Europe. *Post-Communist Economies* 23, 271–310. <https://doi.org/10.1080/14631377.2011.595119>

- [17] ILO, 2016. *Non-standard employment around the world: Understanding challenges, shaping prospects* – Overview. Geneva.
- [18] Kalleberg, A.L., 2000. Nonstandard Employment Relations: Part-time, Temporary and Contract Work. *Annual Review of Sociology* 26, pp. 341–365. <https://doi.org/10.1146/annurev.soc.26.1.341>
- [19] Kalleberg, A.L., Reskin, B.F., Hudson, K., 2000. Bad Jobs in America: Standard and Nonstandard Employment Relations and Job Quality in the United States. *American Sociological Review* 65, pp. 256–278. <https://doi.org/10.2307/2657440>
- [20] Lancker, W.V., 2012. The European World of Temporary Employment. *European Societies* 14, pp. 83–111. <https://doi.org/10.1080/14616696.2011.638082>
- [21] McGinnity, F., Mertens, A., 2002. Fixed-term contracts in East and West Germany: Low wages, poor prospects? (Working Paper No. 2002,72). *Discussion Papers, Interdisciplinary Research Project 373: Quantification and Simulation of Economic Processes*.
- [22] McGovern, P., Smeaton, D., Hill, S., 2004. Bad Jobs in Britain: Nonstandard Employment and Job Quality. *Work and Occupations* 31, pp. 225–249. <https://doi.org/10.1177/0730888404263900>
- [23] Mortensen, D.T., 1986. Chapter 15 Job search and labor market analysis, in: *Handbook of Labor Economics*. Elsevier, pp. 849–919. [https://doi.org/10.1016/S1573-4463\(86\)02005-9](https://doi.org/10.1016/S1573-4463(86)02005-9)
- [24] Nätti, J., Happonen, M., Kinnunen, U., Mauno, S., 2005. Job Insecurity, temporary work and trade union membership in Finland 1977-2003, in: *Job Insecurity, Union Involvement and Union Activism*. Ashgate, Aldershot, pp. 11–48.
- [25] OECD, 2015. Non-standard work, job polarisation and inequality, in: *In It Together: Why Less Inequality Benefits All*.
- [26] Scherer, S., 2004. Stepping-Stones or Traps?: The Consequences of Labour Market Entry Positions on Future Careers in West Germany, Great Britain and Italy. *Work, Employment and Society* 18, pp. 369–394. <https://doi.org/10.1177/09500172004042774>
- [27] Smith, A., 1776. *The Wealth of Nations*, Reprint. ed. Modern Library, New York.
- [28] Toots, A., Bachmann, J., 2010. Contemporary Welfare Regimes in Baltic States: Adapting Post-communist Conditions to Post-modern Challenges. *Studies of Transition States and Societies II*, pp. 31–44.

# **The importance of transparency in online communication: Focus on higher education institutions**

**Judit Bilinovics-Sipos**

Óbuda university, Keleti Károly Faculty of Business and Management, ,  
sipos.judit@uni-obuda.hu

**Regina Zsuzsánna Reicher**

Keleti Károly Faculty of Business and Management, Óbuda University,  
reicher.regina@uni-obuda.hu

*Abstract Due to competition between higher education institutions, strategic marketing activities are becoming increasingly important. Today in Hungary, the primary online marketing communication tool is the website. The study shows how selected higher education institutions perform, communicate well in a well-structured and age-appropriate manner in the online space. In the face of intensifying market competition, higher education institutions could also benefit from this opportunity. The experience shows that the examined websites of the institutions lag far behind the customer-friendly level, so students have a hard time knowing to be informed through them..*

*Keywords: higher education institution, online marketing, website, online communication, transparency*

## **1 Introduction**

The importance of online marketing is growing more and more emphasis these days as the year 2020 has rearranged our lives. The main arena of services, communication and information acquisition is the world wide web with expanding importance.

Nowadays, the increase in internet penetration also justifies the availability of services online, however, now that pandemic and quarantine are forcing a large part of the population to use online services, online appearance is becoming even more important. Education is no exception to this trend. Higher education

institutions needed to respond most quickly to the changes brought about by the pandemic and make all their services available online. In addition to the introduction of e-Learning systems, and the possibility of accessing libraries online, the importance of online platforms has also increased in the past year.

## 1.1 Internet use

The evolution of Internet penetration, as shown in the first figure, between 2015 and 2019, even in the case of the 50-69 age group - which can be called fewer Internet users - started to grow as never seen before 2015. Based on the research of 2000-2019 [1], it can be stated that in the case of all age groups, by 2019, at least 70% of the Hungarian population will have Internet use in the case of the 15-69 age group.

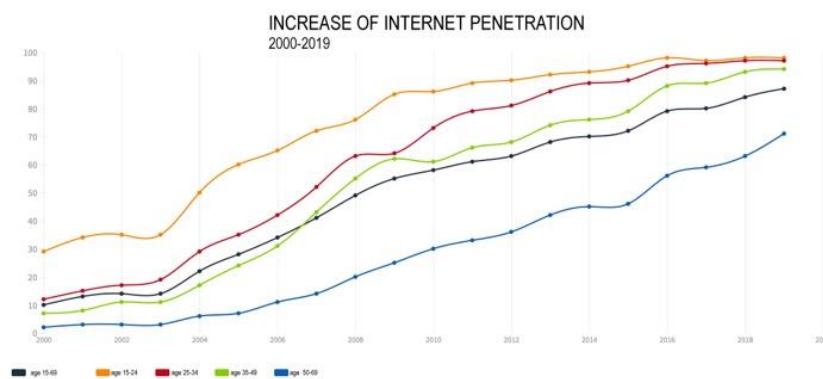


Figure 1.  
Internet penetration 2000-2019

As can be seen from the chart above, only 2% of the 15-24 age group, the main target group of higher education institutions, cannot be labelled as an Internet user.

With the spread of internet use, online services also converting more widespread. It is important to highlight the fact that this research was completed before the spread of COVID-19 and therefore, does not include the presumed large expansion in internet use in 2020. At the same time, as the target group of universities, the 15-24 age group is 98% of the Internet users, the increase caused by the epidemic is irrelevant for the present research.

It is an indisputable fact that the internet is gaining ground these days and has become an indispensable part of our everyday lives. The acceleration of information flow has reached education outside the competitive sphere, which we assume responds more slowly to change than required by the demands. The Internet, which has become the main arena of our changed habits and activities,



increases the demand for the online appearance of services. There is an expanding requirement for online university administration, digital education, online access to libraries and last but not least, access to information. An international study confirms that, among other things, student applications are linked to the website of higher education institutions [2].

The focus of the present research is the examination of websites, the main online marketing communication platform of higher education institutions. The websites due to the intensifying competition can be a market advantage for higher education institutions that design their communications and message format in line with 2020 expectations. In our research, we first highlight the importance of online availability of services, ignoring the changes caused by the COVID-19 pandemic, which is not referred to in our study through institutional regulations and current news for the websites examined.

## **2 Online Communications Platforms for Higher Educations**

### **2.1 Online communication**

Among online communication platforms, the importance of university websites and social media interfaces is of paramount importance, especially when examining the practice of higher education institutions. The international case study, which examined the relationship between website quality and the enrollment of new students in higher education institutions, identifies the quality of information on the website as an important aspect in assessing the usability of websites. [3]

It is clear that a dead website, or even a hectic website, can give any visitor a bad impression of a higher education institution with an internet connection. The present study aims to examine the website of higher education institutions in the light of the principle of transparency.

### **2.2 International outlook - criteria**

Based on the examination of the international practice, we set up the criteria for examining the effectiveness of the website, taking into account the principle of transparency (Fig. 2).

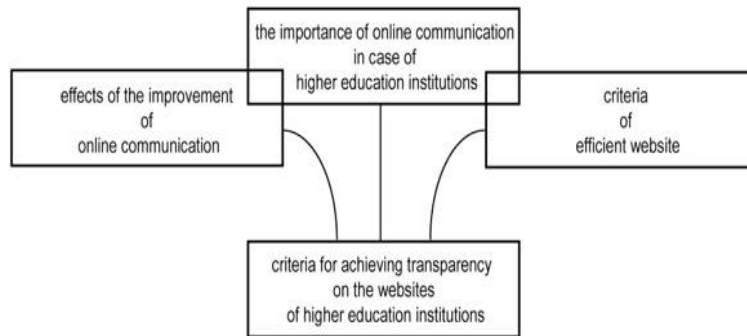


Figure 2.  
Criteria for examining websites

In the case of higher education institutions, we linked the effectiveness of websites to the use of the opportunities provided by the World Wide Web.

Opportunities offered by websites in higher education:

- promoting the image of the university (implementation of image elements in the website);
- systematic, structured transfer of information about the institution, training, procedures to recruiters, students, researchers and competitive market participants;
- prominently display current news and events;
- to communicate the social role on the website in order to have a positive perception of the brand of the institution and to increase the trust in the higher education institution;

Implementing the criteria for an effective website for higher education institutions, three main groups can be identified along which websites should be examined. In defining the three groups, we took into account the various international country studies that examined the criteria for an effective website, or the relationships between the information displayed and the usability of the website.

### 2.2.1 Technical elements

Examining the technical elements could be a separate research topic; however, the present research focuses on the following aspects:

- *Load speed* – Use the <https://developers.google.com/speed/pagespeed/insights/> speedometer tool to check the load speed of selected web pages.;

- *number of clicks required to pass (central page - selected faculty page)* – How easy it is to navigate from the central page of the higher education institution to the selected faculty page.
- *the portal engine of the examined website* – Custom development or developed for frameworks covered by the GNU General Public License (WordPress, Drupal, Joomla);
- *mobile optimization* – Internet usage patterns have undergone a significant transformation in the last few years, the use of the tools used for this has also changed. As a result of the development of devices capable of surfing the Internet, in addition to desktops and notebooks, a large number of users on the tablet as well as on the telephone have appeared on the Internet. According to market research by the National Media and Communications Authority at the end of 2019, Internet users make up three-quarters of the total population. In the case of the population over the age of 14, it can be stated that 44% of them have a continuous online presence. [5] Mobile optimization is essential for a website to display information through its website on mobile devices in a well-structured, transparent, clear manner. Responsive website (RWD) means that the design and development of the website have taken into account that its appearance, usability and [9] readability are perfectly adapted to all devices.

### 2.2.2 Visual elements

The issue of visual elements is complex. The use of colours is paramount to the usability and judgment of websites.

Studies of the psychological effects of main and complementary colours and their compositions clearly support that their use has a direct effect on the feelings generated in visitors. [6]

In the present research, we examine the following visual elements for the selected websites, examining the status of their existence, while overlooking the psychological effect:

- *Image of the institution* - Image of the institution - According to study based on eye movement research, the criteria for an effective website are that the logo must first be prominently displayed in order for the institution appearing on the website to be easily identified. [7];
- *design* - The choice of uniform elements that fit the image influences the overall image of the universities in the visitor. Uniform appearance in the case of online and offline marketing communication tools is an essential criterion not only for the actors of the private sector but also for higher education institutions, as it conveys unity and predictability to those interested;
- *navigation via visual elements* - Repetitive and consistently used graphic elements, highlights, fonts all contribute to easy navigation on the website. We examine the existence and consistent use of these elements in the present research.;

### 2.2.3 Content elements

In the case of the selection of content elements, our research examined the elements closely related to the principle of transparency in the case of websites, which are the following:

- *multilingual content* – In the case of higher education institutions, it is of pre-eminent concern to communicate internationality and standing in the international market. Displaying multilingual content on the World Wide Web can also be a tool for institutions to attract international students. However, for a higher education institution's website to be an effective recruiting tool, all relevant content must be available in several languages, or at least one world language.;
- *general information about the institution* - Visitors to the website must first be clear about which institution the website belongs to, what are the principal information about the institution (structure of the higher education institution, history, status of the given institution in higher education and position in the international market). We are also examining here the social engagement, which nowadays is increasing more and more emphasis, to what extent it is integrated into the online marketing strategy of the higher education institution, i.e. whether the examined institution publishes relevant information. [4];
- *menu structure* – The more submenus a main menu contains, the more difficult it is for visitors to navigate the pages because the multi-level menu system assumes a complex website structure. At the same time, the organizational structure of higher education institutions and the characteristics of the content to be displayed also require a complex structure.;
- *landing page content* - Here we examine the page of the selected faculty, what kind of information and how structured the landing page of the examined website is displayed.;
- *current news* - The subject of our study is how long it has taken compared to the date of the study for the latest published news to appear on the website. We also examined the time distribution of the last five news items, as the regularity of publication on the website is relevant for transparency.;
- *University life* - What information that reflects student life is displayed on the website. In this case, preset research do not examine the existence of information closely related to the studies, the system of requirements, the timetable, the study and exam regulations, the admission procedure, but we examine other information (changes in internships, library visits) related to student life.;
- *display of content to the target group* - Subject of our research is the quality and structure of the appearance of the messages to be delivered to the main target groups of higher education institutions. As we have already pointed out in the study, recruiters, students, researchers and private sector actors can be considered as a target group for higher education institutions. Since different target groups cannot be classified into a homogeneous group according to the criteria, the content to be displayed to them must

appear on the website with different messages, different tones and different purposes.;

- *blog* – One of the effective tools of online marketing communication is the blog, through which the formation of the message, the building of trust and the formed image can be easily implemented in a partially informal, direct and interesting way. We hypothesize that the examined universities do not use this effective means of communication, which is why this study does not address this.;
- *event calendar* – Nowadays, the digital calendar is an indispensable tool, through which users with an ever-increasing level of digital competence can easily organize our daily tasks, meetings and events. In the case of higher education institutions, the most important events, breaks, deadlines, scientific movements should be similarly traced, so that visitors can find the event of interest to them and be able to connect with university life simply, using the achievements and applications of the age.;
- *Library accessibility* - With the spread of the pandemic, in parallel with the introduction of quarantine, in-person visits to libraries were restricted along with visits to university buildings, so higher education institutions should pay special attention to online access to libraries. The present study examines the availability of a hyperlink to libraries, which is not a consequence of the COVID-19 epidemic, but can be defined as a basic requirement for a user-friendly university site.;
- *Access to social media* – As discussed earlier, one of the main tools of online marketing communication is the website, however, with the change in social media usage patterns, the extension of online communication channels to social media has become indispensable. In the present case, we examine whether social media interfaces in the form of links, icons, and logos are easily accessible from the faculty homepage. Social media use has been reformed. Students are already studying in groups on Facebook and preparing for exams together. Using social media, they can exchange information quickly and efficiently. [13] The possibilities offered by social media are limited only by the imagination on the student side (for example, solving individual online exams in groups). In November 2020, there were 6,405,000 Facebook users in Hungary, which is 66.7% of the population. Higher education institutions need to take into account that their students and applicants use Facebook on a daily basis, as the age distribution is shown in Figure 3. In the 18-24 age group, men and women had a total of 1,070,000 user accounts. As a reference, the population of Hungary by gender and age According to the data published by the CSO on 1 January 2020, 741,094 people belonged to the 18-24 age group in Hungary. [14] [15]

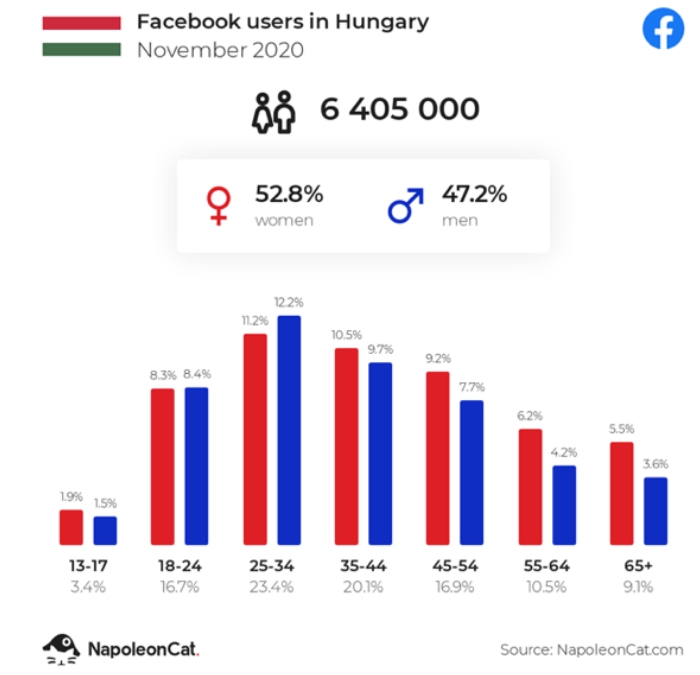


Figure 3.

Facebook users in Hungary(november 2020.)

Source: <https://napoleoncat.com/stats/facebook-users-in-hungary/2020/11>

From the statistics we can conclude that a person can have several user accounts, however, we do not deal with this in the present study, we have only noted it as interesting.;

- *Contact options* - A basic requirement for websites, in addition to providing structured, easily transparent information, is to provide visitors with an easy way to contact them. This can include telephone contact, a central email address, or a contact form. Further research may be on what forms of contact are primarily preferred by higher education institutions and how this meets student expectations.;
- *Possibility of personalization* - In the case of websites and web shops, the user accounts and personalization options appearing in e-commerce are already clearly integrated into the needs of visitors towards websites.;

The aim of the present research is to form a comprehensive picture of the website usage habits of higher education institutions through the examination of several websites, taking into account the principle of transparency, on which we based the above aspects as comparability in order to learn.

## **3 Research (Introduction of website usage)**

### **3.1 Method**

The nature of the research topic required the use of the structured observation method among the descriptive research methods [8] in order to objectively map the quality of the information appearing on the websites of higher education institutions, taking into account transparency. The system of criteria, which was established on the basis of the international and domestic literature, has been described previously.

### **3.2 Aim of the research**

Examination of the website of the selected universities on the basis of a set of criteria based on the principle of transparency.

### **3.3 Participants**

Among the examined websites, we chose the websites of the faculties of economics of five universities, which also provide outstanding professional training in this field. When selecting the five institutions, the condition is the existence of management and management training in the basic period. In the case of the Corvinus University of Budapest, the specialization of management and administration is under the care of the Institute of Management, therefore we examined the website of the institute.

The faculty and institute pages of the five selected universities, which are the subject of the present research, are presented below. Figures 4, 5, 6, 7, 8 show a screenshot of the institutions' website on a desktop (center item), tablet (left item) and mobile phone (right item). For a later study of mobile optimization and responsiveness, it is essential to be able to compare the appearance of the website under study on the different three tools.

### 3.3.1 Keleti Faculty of Business and Management at Óbuda University - Budapestt

The main direction of the University of Óbuda is the training of engineers, the Károly Keleti Faculty of Economics itself is known nationally for its administration and management.



Figure 4.

Website of Keleti Faculty of Business and Management at Óbuda University



### 3.3.2 Szent István University Faculty of Economics and Social Sciences – Gödöllő

The main direction of the former Gödöllő University of Agricultural Sciences, true to its old name, is the training of agricultural specialists, but also the training of management and administration available at the Faculty of Economics and Social Sciences nationwide.



Figure 5.

Website of Szent István University Faculty of Economics and Social Sciences



### 3.3.4 Eötvös Lóránd University Faculty of Social Sciences – Budapest/Szombathely

Despite the internationally recognized reputation of ELTE's humanities courses, the Faculty of Social Sciences, which started with a training place in Szombathely, occupies a prominent place in the training rankings.

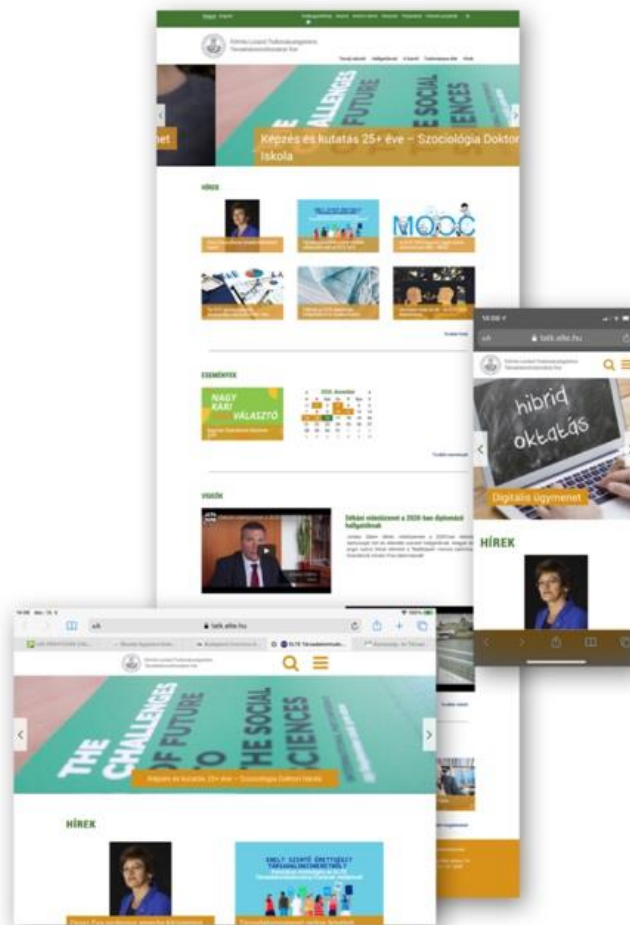


Figure 7.

Website of Eötvös Lóránd University Faculty of Social Sciences

### 3.3.5 University of Szeged - Faculty of Economics and Business Administration - Szeged

The University of Szeged has gained an international reputation for medicine, but the Faculty of Economics also has a prominent position in Management.

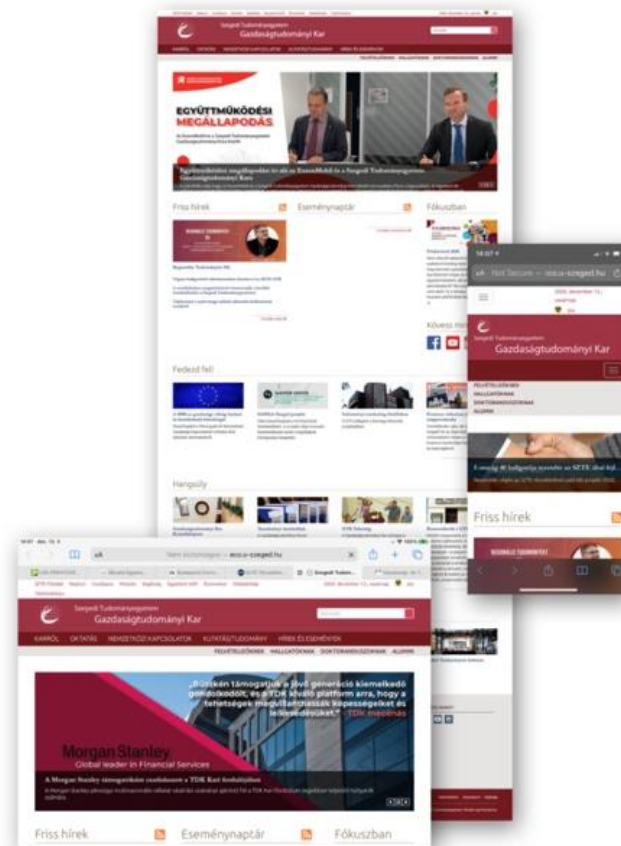


Figure 8.

Website of University of Szeged - Faculty of Economics and Business Administration

## 4 Results

The research is structured thematically observational study, the criteria of which have been introduced. In the following, the test results for the three groups examined are discussed in detail.

### 4.1 Examination of technical elements

In the observation, we started by examining the technical elements. Table 1. summarizes how university websites have performed in terms of meeting the criteria we have identified.

<i>Examined technical elements</i>	ÓE KGK <sup>a</sup>	SZIE GTK <sup>b</sup>	BCE VI <sup>c</sup>	ELTE TáTK <sup>d</sup>	SZTE GTK <sup>e</sup>
Load speed	1	1	2,5	3,2	5,0
Number of clicks <sup>g</sup>	3	3	2	4	1
Mobile optimization <sup>h</sup>	-	1	1	1,2	1
Portal engine <sup>i</sup>	1	2	2	2	2

Table 1  
Technical Elements Analysis Results

<sup>a</sup> <http://kgk.uni-obuda.hu>

<sup>b</sup> <http://gtk.szie.hu>

<sup>c</sup> <https://www.uni-corvinus.hu/fooldal/egyetemunkrol/intezetek/vezetestudomanyi-intezet/>

<sup>d</sup> <https://www.tatk.elte.hu>

<sup>e</sup> <http://eco.u-szeged.hu>

<sup>f</sup> The loading speed of the main page of the examined institution with the result of the already declared measuring device. Speed Index desktop unit: sec.

<sup>g</sup> The number of clicks required to move from the central website of the institution to the faculty site.

<sup>h</sup> The number of devices on which the content is optimized next to the desktop. 0. on desktop 1. Mobile phone, 2. Tablet

<sup>i</sup> The portal engine is based on 1. an opensource portal engine, 2. custom development.

When testing the load speed, we took into account the value shown for desktop computers on the predefined free tool available online (<https://developers.google.com/speed/pagespeed/insights/>). University pages were loaded at different times in 1-5 seconds, however, for each website examined, the tool used made a suggestion to increase the efficiency of the website and to correct other errors. Overall, the websites performed well in terms of loading speed.

We can state that in the case of the websites, apart from the website of the Faculty of Social Sciences of Eötvös Lóránd University, none of the examined pages appeared on the tablet differently than on the desktop computer. From this it can be concluded that none of the pages fully met the conditions of responsiveness - apart from the side of ELTE TáTK.

In the case of the website of the University of Szeged, the easiest way is to get to the website of the faculty you are looking for. It should be emphasized that in the case of the website just mentioned, a technical solution is used in the footer, during which the visitor can get to the page of the desired Faculty through a sitemap-like list without any special search. In terms of the number of clicks, the website of the faculty you were looking for was accessible in steps 1-4. Most clicks were required on the ELTE TáTK page, where once the desired Faculty was selected, an additional step was required to access the desired website.

With the exception of the Keleti Károly Faculty of Economics of the University of Óbuda, the examined websites are a unique development based on the source code available from the browser, which suggests that higher education institutions are paying more and more attention to building their online marketing strategy. It is not the subject of this research to discuss the pros and cons of a custom-developed or opensource website. From the source code available through the browser, as well as the method of web development, we draw a kind of conclusion that can be definitively established from the time required for the above two development methods. While in the case of a custom-developed website all functions and appearance modes must be pre-declared, precisely formulated and supported by documentation, when using an open source solution, the room for maneuver can be narrowed down and more time-efficient by incorporating already available modules.

## **4.2 Examination of visual elements**

The following pre-defined aspects of our structured observational research were classified into the group of visual elements. In the table below, we have highlighted three elements that are essential for higher education institutions to build a brand.

As can be seen from the table below (table 2.), as a result of our research, it can be clearly established that higher education institutions are characterized by the same approach as the private sector. The most important part of the image elements, the logo can be found on every website and is easily identifiable.

<i>Examined visual elements</i>	ÓE KGG <sup>a</sup>	SZIE GTK <sup>b</sup>	BCE VF <sup>c</sup>	ELTE TÁTK <sup>d</sup>	SZTE GTK <sup>e</sup>
University image <sup>f</sup>	1	1	1	1	1
Logo <sup>g</sup>	0	1	1	1	1
Use of colour <sup>h</sup>	1	1	1	1	1

Table 2.

Examination of visual elements

<sup>a</sup> <http://kgk.uni-obuda.hu>

<sup>b</sup> <http://gtk.szie.hu>

<sup>c</sup> <https://www.uni-corvinus.hu/fooldal/egyetemunkrol/intezetek/vezetestudomanyi-intezet/>

<sup>d</sup> <https://www.tatk.elte.hu>

<sup>e</sup> <http://eco.u-szeged.hu>

<sup>f</sup> 0 – unrecognizable, 1- recognizable

<sup>g</sup> 0 – assimilated, 1 – recognizable

<sup>h</sup> The image can also be clearly recognized through the use of color in the graphic elements that appear. 0 - color palette that does not fit the image, 1 - color world defined for the image

On the website of the Keleti Károly Faculty of Economics of the University of Óbuda, the logo has been incorporated into the graphic elements (menu, header) surrounding it as a result of the chosen web design. In the case of the other institutions, the logo of the higher education institution could be easily identified separately, highlighted.

The use of color and the use of graphic elements contained elements with a clear image for each of the websites examined. Congestion and airiness were not examined. In our research, we did not address the effect of different colors on the visitor's psyche and, based on that, the characterization of color choice. In our study, keeping in mind the principle of transparency, we focused on the identifiable and consistent nature of the logo and the color scheme, font and graphic elements used on the website.

### 4.3 Examination of content elements

Examining the existence of content elements is of paramount importance for transparency. The present research is a preliminary structured observation that

maps the communication of the faculties of the five selected higher education institutions through the website.

In terms of multilingual content, even internationally renowned higher education institutions do not display all content to visitors to the international website. In the case of one institution, even the number of secondary menu items decreased after the language of the website was changed to English. Visitors who do not speak Hungarian have clearly less content available on all five websites examined.

In the case of the monitored websites, except for the side of the Keleti Károly Faculty of Economics of the University of Óbuda (here further menu breakdown and structured content display were used on the right and left of the useful area).

The display of news was varied on the websites examined. From the magazine-like appearance on the home page to accessing only through the new menu item, we came across several solutions. We do not discuss the effectiveness of these solutions, however, we looked at the time elapsed since the news published on the last website at the time of our study for the selected universities. In the case of the Institute of Management Sciences of the Corvinus University of Budapest, we found the news published in the shortest possible time, despite the fact that the news was accessed only with the help of a separate menu item, unlike other institutions.

Looking for information about university life, we did not really find an institution that would pay much attention to the mood of student life. We found formal messages to students mainly related to their studies and measures due to the epidemic.

A Table 3. summary table does not include the display of general information, because in our research it is worthwhile to specify which institution shares what kind of information about itself in an accessible way, which we present in detail when examining the home page.

As in Table 3. As can be seen in the summary table, the institutions use the same scheme in the design of the website, but it can be stated which universities place more emphasis on reaching the target group, forming opinions and influencing through the website.

In the research, we also deal with the content of the landing pages separately, because during our study we found that combining some solutions could create a really user- or student-friendly interface.

The website of the Institute of Management Sciences of the Corvinus University of Budapest is a well-transparent static interface that provides essential information, where the functions concerning different students can be accessed by clicking on icons in accordance with the trend of 2020.



On the website of the University of Óbuda, even if not using the most up-to-date solutions, it addresses all its target groups effectively and concisely through the homepage. As a result of our study, it can be concluded that on the landing page and on the other sub-pages, despite the excessive use of the interfaces in a somewhat crowded and difficult-to-understand way, all relevant information is relatively easily accessible separately by graphic elements by topic and function..

The opening page of ELTE TáTK is dominated by picturesque elements, as well as a video message from both the institutional side (dean's greeting) and the student side, which better addresses the visitor, the students and those who are about to apply. On the home page, the news will also appear with pictorial elements and students can gain additional insight if they hover the mouse over the image. This solution does not make the current news completely transparent, as the pictorial element dominates much more than the information to be communicated itself. However, the different information needs of different target groups were taken into account when designing the menu structure (similarly to several universities). They will display separately the information "Learn from us!", Ie for the enrollers, and the "Important" for the "Students", ie those who are already in the student status. Additional menu items contain information about the Faculty, related to Scientific Life and current events.

The website of the Faculty of Economics of the University of Szeged decided on a novel website structure typical of the private sector. The most complex information about the university and its role in the international and competitive market can be found on the website of the University of Szeged, Faculty of Economics. Their relationship with the actors of the private sector appears in a prominent place on the home page in an eye-catching way, thus giving the visitors the feeling that the university trains the professionals in line with the outstanding actors of the private sector. The possibilities offered by the block containing moving pictorial elements have been fully exploited and not only pictorial but also attention-grabbing textual explanations are displayed on it.

Not a single university uses a form of partially informal information about blogging. Here, the reasons for further investigation may be explored, however, in the present study, focusing on transparency, we examine from the aspect of whether such an initiative exists on the websites examined.

In connection with the use of the event calendar, there is still room for improvement for higher education institutions, apparently their communication on the website has not been integrated into the daily operational tasks. A total of two faculties examined published the event calendar, however, none contained relevant information. In the case of the Corvinus University of Budapest, the news and events can be found in a separate menu item, which makes it easier for visitors to find their way around. It is not event calendar in the classical sense, despite,

listed here is the most information about upcoming events with different categories.

The contact details of the library can be found on all websites except the Faculty of Economics and Social Sciences of Szent István University. In this respect, the icon set of Corvinus University of Budapest is outstanding, as functions such as Neptune (students), Neptun (lecturers), Moodle, Library, Webmail are consistently marked with different infographics on all faculty and institutional sites. The icons are located in the same place on each page (university level), making it even easier for visitors to access the features listed above.

We have already addressed the importance of social media in the past, as their use is gaining ground these days. Facebook is the most popular social media interface, where in addition to keeping in touch, information gathering also plays a big role. In the case of content gathering, users do not look for officially available information, but primarily try to gather information that can help them find out what the image of the given university in the community is and how they would fit into the given higher education institution. Once the Facebook group has been created, students will have a number of creative, informal opportunities to take advantage of real-time communication opportunities for online exams as well. An important social communication channel for higher education institutions is the most popular social media in Hungary, therefore they should be given priority. Despite our finding above, we found that not all universities have a direct gateway between their website and community profile. Characterization of the community profile may be the subject of a separate study due to its complexity.

The next content element we examined is the opportunity to contact. The following contact options were relatively easily available on all websites: central e-mail address, telephone number, fax contact, address.

The existence of personalized content in higher education institutions is seldom, mostly not at all, a practical example at all. There were no clear signs of personalized content on the websites examined. There was an opportunity to enter the Corvinus University of Budapest, but we did not encounter such an opportunity in the case of the other universities. In the case of the above-mentioned university, it was not revealed during our investigation what additional information the entrant gets with the entry, whose circle is also not revealed from the examination of the opening page.

## 5 Summary

In the case of the examined websites, it can be stated that the central message of the communication of the universities through the website is the same, but different in terms of its presentation, emphasis and form. We have previously mentioned that by combining the functions and content elements of websites, the image of an effective website is created. In the case of all universities, there is an outstanding solution, but it can be considered lagging behind compared to the international market.

Several of the studied universities did not meet the condition of transparent information transfer through the website, which system of conditions was compiled on the basis of international case studies.

### Conclusion, Suggestion

Our study showed that the selected universities do not have the same degree of transparency in communicating through the website, nor do they communicate to the same extent to the target groups already identified.

The objective, transparent structure of the examined website of the Corvinus University of Budapest represented the clarity and easy-to-understand content.

However, the website of the University of Szeged no longer only informs the visitors about the structure of the institution or the available courses, a kind of communication about university life, about the opportunities in the post-university years, and about the cooperation with the private sector has already appeared here.

On the website of the faculty of Eötvös Lóránd University, the visual elements have been given a prominent role, as well as great emphasis is placed on communication with the applicant and their existing students. In the case of the ELTE website, great emphasis was placed on mobile optimization, so that mobile devices could also appear with easy-to-read content.

The main role on the website of Szent István University, Faculty of Economics and Social Sciences, is where we found messages for both applicants and students but navigating the website did not fully comply with the principle of transparency we defined.

The website of the University of Óbuda's Keleti Károly Faculty of Economics was the only opensource website - clearly visible from the source code - which, despite trying to reach all target groups on the home page,

Our study shed light on a proposal from which universities could derive additional benefits. As we pointed out in the detailed presentation of the results, the blog, as a marketing communication tool, was not integrated into the marketing communication strategy of any of the universities. This is a partly informal

opportunity where visitors could be better involved in university life, thereby also strengthening their desire to be a part of university life. The blog would provide an additional opportunity for either the Student Government to communicate with students, or it could be an effective tool for repositioning the university.

Based on the present study, further research directions have emerged that are worth examining in connection with the mapping of online communication in higher education institutions from the perspective of transparency.

The research presented above is not representative research and cannot be generalized to Hungarian higher education institutions.

Later, our goal is to conduct an extended research, where it can be extended to the websites of all higher education institutions after further clarification of the criteria system with the involvement of students.

The research result also highlights the shortcoming for the five universities examined, but cannot yet be considered as specific guidance for further website improvements.

Websites can clearly bring a market advantage to higher education institutions, where today's trend is increasing competition for students. University and faculty sites should also be included in the online marketing tools as the main platform for online communication once the long-term strategy has been defined.

Compared to the international trend, the good news is that there is room for improvement for Hungarian higher education institutions, but our research has shown that they need to place more and more emphasis on online marketing.

## References

- [1] János, K. (2020, May 8). *Legfrissebb internetpenetráció - internetezők száma 2019Q4 I NRC*. NRC Marketingkutató És Tanácsadó Kft. source: <https://nrc.hu/news/internetpenetracio-2/> date: 17.11.2020.
- [2] *Exploring the relationship between Australian university websites and international student enrolments* | Emerald Insight. (2020, July 24). <https://www.emerald.com>. source: <https://www.emerald.com/insight/content/doi/10.1108/IJEM-02-2019-0068/full/html> date: 15.11.2020.
- [3] M. Baroudi, M. Alia and A. W. Marashdih. "Evaluation of Accessibility and Usability of Higher Education Institutions' Websites of Jordan," *2020 11th International Conference on Information and Communication Systems (ICICS)*. Irbid, Jordan, 2020, pp. 125-130, doi: 10.1109/ICICS49469.2020.239565.
- [4] Ishak, Z., Alexander, O., Al-Sanjary, O. I., & Yusuf, E. (2020). *Potential students preferences towards university website interface design: The methodology*. Paper presented at the Proceedings - 2020 16th IEEE International Colloquium on Signal Processing and its Applications, CSPA

- 2020, pp. 115-119. doi:10.1109/CSPA48992.2020.9068724  
Retrieved from [www.scopus.com](http://www.scopus.com)
- [5] *NMHH-felmérés: a telefonon internetezők kétharmada már éjjel-nappal a neten lóg.* (n.d.). Nemzeti Média- Es Hírközlési Hatóság. Retrieved November 14, 2020, from [https://nmhh.hu/cikk/214700/NMHHfelmeres\\_a\\_telefonon\\_internetezok\\_k\\_eharmada\\_mar\\_ejjelnappal\\_a\\_neten\\_log](https://nmhh.hu/cikk/214700/NMHHfelmeres_a_telefonon_internetezok_k_eharmada_mar_ejjelnappal_a_neten_log)
- [6] Komáromi László, Gyenge Balázs, “A website, mint a felsőoktatási intézmények marketing kommunikációs eszköze” in *Marketing & Menedzsment* 2002/2., oldal 39-46
- [7] Színek pszichológiai hatása esettanulmány R. Nicole, “Title of Paper”, *J. Name Stand. Abbrev.*, in press
- [8] Malhotra, N. K. (2015). *Marketing Research*. Pearson Education Limited.
- [9] Cutrell, E.. & Guan, Z. (2007). What are you looking for?: An eye-tracking study of information usage in web search. Paper presented at the *Conference on Human Factors in Computing Svstems - Proceedings*, 407-416. doi:10.1145/1240624.1240690 Retrieved from [www.scopus.com](http://www.scopus.com)
- [10] Shenoy A. (2020) Web Design - Peek into the Upcoming Trends in 2020. In: *Jumpstart UIKit*. Apress, Berkeley, CA. [https://doi.org/10.1007/978-1-4842-6029-6\\_6](https://doi.org/10.1007/978-1-4842-6029-6_6)
- [11] Mochamad Malik Akbar Rohandi, Eka Tresna Gumelar, Lufthia Sevriana: “Website Quality 4.0 on Admission of New Students (PMB) at Higher Education” *Advances in Social Science, Education and Humanities Research*, volume 409 2nd Social and Humaniora Research Symposium (SoRes 2019)
- [12] M. Cavallone, M. V. Ciasullo, J. Douglas, R. Palumbo. (2019) *Framing higher education quality from a business perspective: setting the conditions for value co-creation*. *Studies in Higher Education* 0:0, pages 1-13. source: <https://www.tandfonline.com/doi/abs/10.1080/03075079.2019.1672644>  
date:
- [13] Chuoh, R. Ruhi, II. Social media in higher education: A literature review of Facebook. *Educ Inf Technol* **23**, 605–616 (2018). <https://doi.org/10.1007/s10639-017-9621-2>
- [14] *Exploring the relationship between Australian university websites and international student enrolments | Emerald Insight.* (2020, July 24). <https://www.emerald.com/insight/content/doi/10.1108/IJEM-02-2019-0068/full/html>
- [15] *Magyarország népességének száma nemek és életkor szerint, 1870-2060.* (2020, November 30). KSH. <https://www.ksh.hu/interaktiv/korfak/orszag.html>

# The security of the organization - the trust of the employees?

## Balázs Molnár

Óbuda University Doctoral School on Safety and Security Sciences,  
molnar.balazs@uni-obuda.hu;

## Csilla Ilona Mizser

Óbuda University Keleti Faculty of Business and Management,  
mizser.csilla@kgk.uni-obuda.hu

*Abstract:* Organizational security increases employee and customer trust in the organization. Security measures that strengthen compliance, legal compliance, privacy, physical security, cyber security and emergency planning help people trust the organization. *In our thesis, we are looking for an answer to the question of whether the employees of organizations with a high level of integrity have a higher level of trust. The actuality of the introduction of the new Complaints Act as background legislation also justifies us to deal with the reporting of abuses and its preventive function. By presenting and analyzing a wide range of legal background, as well as analyzing domestic and international literature, the thesis intends to serve as an added value to the research of the topic.*

*Keywords:* trust, security, organization, complaint law

## 1 Introduction

Trust is not a concrete thing, it comes from within. In organizations as well as in private life, it is an important factor that can affect in the everyday life of organizations. People's trust must be won and maintained, but it also has an important role between organizations. Organizational security can enhance trust or, in the absence of it, diminish it. Also the loss of trust can weaken an organization in many different ways. Trust is a complex emotional and cognitive concept that includes an individual's or organization's positive expectations of another person, team or institution and willingness to accept vulnerability or risk. This concept is based on mutual respect, commitment and compliance and appears in many contexts from personal relationships to organizational relationships. Trust

has two main components: emotional and cognitive (Sass J., 2005). Emotional trust involves an individual's feelings, emotions, and attitudes towards the other parties. In addition, cognitive trust is based on an individual's judgement, experience and rational thinking, taking into account the reliability and credibility of the other parties. Trust forms the basis of human relationships and is essential for effective cooperation and communication. In the corporate environment, trust plays a key role in employee-management relationships, customer relationships, and organizational performance. Building trust takes time, but it can be the foundation of long-term successful relationships and results. The duality of security and trust is a key factor for the successful operation and long-term sustainability and efficient operation of organizations. Corporate security does not only mean technological measures, but also the trust of employees and customers. Strengthening organizational security means not only increasing digital protection, but also measures increasing people's level of trust in the companies. Organizational security increases employee and customer trust in the organization. Security measures such as personal data protection, physical security, cyber security and emergency planning help people trust the organization. In this article, we detail how building trust contributes to organizational security and the important role it plays in a successful defense strategy of the company.

Primarily, the following topics are emphasized:

1. Trust among employees:

Organizational security also creates trust among employees. Employees feel comfortable at work if they know that the organization takes care of their physical and mental safety and security. Trust and satisfaction in the workplace increase employee loyalty and commitment.

2. Customer trust:

Customers also tend to do business with organizations that are safe and reliable. Security measures and risk management increase customer confidence in products and services and contribute to long-term customer relationships.

3. Crisis management and recovery:

The organizational security system helps to manage unexpected events and recover from crises. When an organization effectively manages unexpected challenges, it increases its chances of maintaining trust among employees, customers and the community.

4. Internal communication and transparency:

Transparency and effective communication are part of organizational security. Employees and customers trust the organization when they are well informed and detailed about possible security measures and events.

## **2 Literature Review**

The concept of organizational trust is complex and it is not easy to clearly state who first defined it. The topic of organizational trust appears in many disciplines, including sociology, psychology, business management and other fields. Due to the continuous development of thinking and research on organizational trust, it is difficult to trace it back to a single person or work.

In the field of organizational trust, according to some sources, the early works on the subject date back to the 20th century. One such early, influential thinker was the sociologist and philosopher Émile Durkheim, who lived at the turn of the 19th and 20th centuries. Durkheim emphasized the importance of social relations, institutions and relationships for social stability and individual well-being. ([https://hu.wikipedia.org/wiki/%C3%89mile\\_Durkheim](https://hu.wikipedia.org/wiki/%C3%89mile_Durkheim), available on internet 27.11.2023)

In the 1980s and 1990s, the concept of organizational trust gained more and more emphasis in the business and management literature. Several scholars and experts, such as Mayer, Davis, and Schoorman (1995), have written about the importance of organizational trust, particularly in the relationship between employees and organizations. Their work has given rise to many further researches and writings in this field.

Organizational trust as a concept clearly came to the attention in management and business literature in the second half of the 20th century and the beginning of the 21st century. Works that emphasize the importance of trust between employees and managers and examine the effects on corporate performance and innovation have contributed to a wider recognition of the importance of organizational trust among managers and experts.

The psychological aspects of trust were also written early. For example, experiments called "trust games" in the psychological literature studied the psychological mechanisms of trust and cooperation in the second half of the 20th century (Johnson-Mislin, 2011).

## **3 Organizational culture**

The competitiveness of modern companies depends not only on the quality of their products or services, but also on their organizational culture and the resulting level of trust.

Organizational culture is not just a nominal concept; it is the value system that determines how the employees of a company behave, work together and make decisions. Formulated by Schein (Schein, 2010), organizational culture is not only



the visible, but also the set of imperceptible, deeply embedded norms and beliefs that shape workplace behavior and decisions.

The development of trust is closely intertwined with organizational culture. A strong, positive organizational culture increases trust among employees. (Mindy Genetzky-Haugen, 2010). Mutual respect, support and transparency as part of the culture contribute to building trust between employees and management.

Strengthening organizational culture and trust is the task of management. Leaders who set an example of respectful, supportive and fair behavior contribute to the positive development of culture . The influence exerted by leaders has an impact on employees and thus on the culture of the entire organization (Sadri-Lees, 2001).

Trust plays a key role in improving corporate performance. According to research in companies with high trust, teamwork is more effective, employee engagement increases and turnover decreases. Employees of such companies are willing to put more effort into common goals (Chalutz et al, 2015).

Corporate culture and internal trust play a role not only in relations among employees, but also in relations with customers. According to PwC's report , reputations of companies and customer trust are closely related. Customers are more inclined to do business with a company that they trust and that has a positive organizational culture.

## **4 Methods**

The system of corporate hierarchy is a determining factor in organizational culture and relations among employees. This article examines how corporate hierarchy affects trust in organizations and how this dynamic can be effectively managed.

A company hierarchy system determines how relationships among employees develop and how much trust management enjoys. According to Cole and Bruch (2006) the hierarchy and leadership style established by top managers has a significant impact on how much employees can feel part of and valued in the organization.

Corporate hierarchy is closely related to communication and information flow. According to research about (Hardani, 2012), hierarchical communication, where information flows from the top down, can affect employee trust. If information is withheld or has limited access, it can increase mistrust.

Corporate hierarchy can have challenges in terms of trust. Kotter (2011) mentions that an excessively strict hierarchy, where decisions are made in a narrow circle, can weaken trust and commitment in employees. In hierarchical structures, it may

be more difficult for employees to express their opinions, which can also reduce trust.

In order for corporate hierarchy to positively influence trust, management must employ strategies. According to MIT Sloan Management Review, transparency, participation, and two-way communication are important elements of trust in a hierarchical organization. Leadership practices such as mentoring and leadership openness can help build trust.

(<https://sloanreview.mit.edu/article/buildingdigitalready-culture-in-traditional-organizations/>, 2018).

Empathetic leadership is another key factor in hierarchical organizations. Study by Rahman (2016) shows that empathetic leaders are better able to build and maintain trust in hierarchical structures because employees feel they are considered and cared for. Empathetic leadership and effective communication can help make corporate hierarchy a building block of trust, not an obstacle.

## **5 Results**

The success of organizations is often closely related to the level of internal trust. A lack of trust can have serious consequences and negatively affect the performance of employees, management and the entire organization. A lack of trust between employees has a direct impact on work performance and engagement. Harvard Business Review articles point out that when employees do not trust each other or management, the level of teamwork and commitment decreases, which can lead to lower performance in the long run. A lack of trust is often closely related to growing conflicts and can cause communication problems in organizations. According to Zak (2017), lack of trust increases tensions among employees and inhibits effective communication, which adversely affects organizational cohesion. A lack of trust can lead to an increase in the level of stress at work. Stress increases work efficiency to a certain level, but it can have harmful effects to a greater extent.



Figure 1.

Stress level diagramm (Yerkes-Dodson Law)

Source: Keith W. Godin, John H. L. Hansen (2015.) *Physical task stress and speaker variability in voice quality*, p2.

Research of Ornek and Esin (2020) found that when employees lack trust in their organization, the risk of stress and burnout increases. Additionally, a lack of trust can contribute to employee turnover, as employees may be more inclined to look for other jobs with higher levels of trust.

A lack of trust can also have negative effects in terms of innovation and creativity. According to research of Bidault-Castello (2010), employees in a distrustful environment are less inclined to share their ideas or initiate new projects, which can hold back innovation and development.

External relations of the organizations can also suffer from a lack of internal trust. Based on Forbes articles, a lack of internal trust can affect a company's reputation and reduce customer trust. Losing customer trust can cause long-term damage to a company (Smith, 2019).

In order to manage the lack of trust, organizations should take proactive steps. Trust-building strategies and improving communication are key. For example, a study (Ferreira, 2018), highlights the role of management in building trust, while Zak's (2017) article presents concrete steps to improve workplace trust.

## 6 Discussion

In addition to the advantages associated with the spread of digitalization and technological development, the number of cyber security challenges is increasing. It is crucial for organizations to understand cyber security and implement appropriate protection measures. People are generally sensitive to the security of

their data and respect for privacy (IBM, 2023). Proactive communication about security measures strengthens user confidence. It is important to provide end users with regular information about the data protection policy of the organization, updates and possible incidents, which are key to building and maintaining trust. Cyber security is not only a technological issue, but an integral part of organizational functioning. Adapting to challenges and being quick to react is essential to maintaining a secure digital environment. The combination of prevention, detection and response strategies is key to effective cyber security. The concept of cyber security is closely related to the protection of computer systems, networks and data against unauthorized access, data leakage and other cyber threats. According to the National Institute of Standards and Technology (NIST), the goal of cyber security is to protect computer systems, networks, and programs from unauthorized access, damage, and intact operation, as well as to preserve the usability of services. (<https://nvlpubs.nist.gov/nistpubs/cswp/nist.cswp.04162018.pdf>)

As a research of CISA shows (<https://www.cisa.gov/topics/physical-security/insider-threat-mitigation/defining-insider-threats>) internal threats often originate from the mistakes of employees. Organizations must therefore focus on training users and raising awareness of cyber security issues. The participation of employees in the safety processes and their knowledge contributes to the creation of a safe working environment.

IDC has conducted a research (IDC, 2022) stating, the reliability of IT infrastructure is directly related to corporate trust. The use of safe and reliable technological solutions on company networks and systems increases the trust of users and customers.

According to a survey conducted by Cyber Security Tribe (<https://www.cybersecuritytribe.com/articles/information-security-leads-to-customer-trust>), customers trust more companies that are open and transparent about their security practices. Organizations must disclose their security measures and actively participate in the dialogue regarding their security policies.

Organizations face many challenges in the field of cyber security. According to the IBM X-Force Threat Intelligence Index, "ransomware" attacks, constantly changing threats and data breaches are a growing danger. (IBM X-Force Threat Intelligence Index, 2021) Adaptive defense strategies to track and prevent rapidly evolving cyber threats are critical.

Integrated cyber security strategies and policies are essential for effective protection.

The Cybersecurity Framework (<https://www.nist.gov/cyberframework>) developed by the United States Government serves as a reference model for organizations to develop their cybersecurity measures. The GDPR (General Data Protection

Regulation) is a law created by the European Union that prescribes data protection and security measures.

Organizations must create a cyber security culture so that employees are also part of the protection. Fisher et al (2021) highlights that a proactive and resilient culture is essential for organizations to be prepared against new types of cyber threats.

Adequate employee education and training is key to cybersecurity defenses. Supported by the Cybersecurity and Infrastructure Security Agency (CISA), the National Initiative for Cybersecurity Careers and Studies (NICCS) offers a variety of cybersecurity education and training resources (<https://niccs.cisa.gov/>)

Companies that are well-known for secure data management and the use of strong cyber security measures will become more confident in the eyes of customers and business partners.

## **Conclusion**

Overall, organizational security and trust are mutually reinforcing factors that contribute to the long-term success and sustainability of the organization. Commitment to security and building trust with both internal and external stakeholders is key to maintaining an organization's reputation and effectiveness.

Building trust and organizational security are closely intertwined. For a company to be successful in the digital environment in the long term, it is necessary not only to have a strong technology defense strategy, but also to build trust among employees and customers. The references and studies presented here support that proactive communication, training, technological reliability, transparency and regular audits all contribute to the effective strengthening of organizational security.

At the same time, a lack of trust can have serious consequences for organizations. Decreased work performance, increased conflicts, and compromised customer relationships are just a few examples of the negative effects. Building and maintaining trust is key to organizational success, and efforts to do so can yield long-term results.

## References

- [1] Hila Chalutz Ben-Gala, Shay Tzafrirb, and Simon Dolanc (2015). Actionable trust in service organizations: A multi-dimensional perspective. *Journal of Work and Organizational Psychology* 31, pp. 34-36
- [3] Cyber Security Tribe <https://www.cybersecuritytribe.com/articles/information-security-leads-to-customer-trust>, available on internet 27.11.2023
- [4] Cybersecurity Framework. (2021). *Cybersecurity Framework - Overview*. <https://www.nist.gov/cyberframework>, available on internet 27.11.2023
- [5] Daniela Sandrini Bittencourt Ferreira (2018). *Building Trust from the Inside Out: Employees and Their Power of Influence*, In: Thornton, G., Mansi, V., Carramenha, B., Cappellano, T. (eds) Strategic Employee Communication. Palgrave Macmillan, Cham. [https://doi.org/10.1007/978-3-319-97894-9\\_11](https://doi.org/10.1007/978-3-319-97894-9_11), 138
- [6] Deloitte (2021). *Future of Cyber - Shaping the Human Side of Cyber*. <https://www.deloitte.com/gh/en/services/risk-advisory/analysis/future-of-cyber/not-one-size-fits-all.html>, available on internet 27.11.2023
- [7] Émile Durkheim, [https://hu.wikipedia.org/wiki/%C3%89mile\\_Durkheim](https://hu.wikipedia.org/wiki/%C3%89mile_Durkheim), available on internet 27.11.2023
- [8] Shelley Smith (2019). *Lack Of Trust Can Make Workplaces Sick And Dysfunctional*, <https://www.forbes.com/sites/forbescoachescouncil/2019/10/24/lack-of-trust-can-make-workplaces-sick-and-dysfunctional/>, available on internet 27.11.2023
- [9] Francis Bidault, Alessio Castello (2010). Why Too Much Trust Is Death to Innovation. *MIT Sloan Management Review* June 2010, 6-8
- [10] Hardani Widhiastuti (2012). The Effectiveness of Communications in Hierarchical Organizational Structure, *International Journal of Social Science and Humanity*, 2(3), pp. 2-4
- [11] Kotter, John P. (2011). Hierarchy and Network: Two Structures, One Organization. *Harvard Business Review* <https://hbr.org/2011/05/two-structures-one-organizatio.html>, available on internet 27.11.2023
- [12] IBM X-Force Threat Intelligence Index. (2021). *Threat Intelligence Index 2021*. <https://www.ibm.com/reports/threat-intelligence/uk-en/>, available on internet 27.11.2023
- [13]. IBM. (2023). *The Cost of Data Breach Report 2023*, <https://www.ibm.com/reports/data-breach>, available on internet 27.11.2023
- [14] Turner, Mary J. (2022). *The Business Value of Reliable IT Infrastructure*. <https://blogs.idc.com/2022/01/24/enterprise-digital-infrastructure-buyers->

- [transforming-strategic-vendor-relationships-in-2022/](#), available on internet 27.11.2023
- [15] Godin, K.W., Hansen, J.H.L. (2015). Physical task stress and speaker variability in voice quality. *J AUDIO SPEECH MUSIC PROC.* <https://doi.org/10.1186/s13636-015-0072-7>, available on internet 27.11.2023
- [16] Mayer, Davis and Schoorman (1995). An Integrative Model of Organizational Trust, *Academy of Management Review*, 20(3), pp. 729-730
- [17] Michael S. Cole and Heike Bruch (2006). Organizational Identity Strength, Identification, and Commitment and Their Relationships to Turnover Intention: Does Organizational Hierarchy Matter? *Journal of Organizational Behavior*, 27(5), pp. 589-590
- [18] Mindy Genetzky-Haugen (2010). *Detemining the relationship and influence organizational culture has on organizational trust*, Thesis, Faculty of The Graduate College at the University of Nebraska, 11-12
- [19] George Westerman, Deborah L. Soule, and Anand Eswaran (2019). Building Digital-Ready Culture in Traditional Organizations. *MIT Sloan Management Review*. <https://sloanreview.mit.edu/article/building-digital-ready-culture-in-traditional-organizations/>, available on internet 27.11.2023
- [20] National Institute of Standards and Technology (NIST) (2018). *CybersecurityFramework*. <https://nvlpubs.nist.gov/nistpubs/cswp/nist.cswp.04162018.pdf>, available on internet 27.11.2023
- [21] *National Initiative for Cybersecurity Careers and Studies (NICCS) (2021). Training and Certifications.* <https://niccs.cisa.gov/>, available on internet 27.11.2023
- [22] Noel D. Johnson, Alexandra A. Mislin (2011). Trust games: A meta-analysis. *Journal of Economic Psychology*, 32., pp. 867-871
- [23] Esin, M.N., Ornek, O.K. (2020). Effects of a work-related stress model based mental health promotion program on job stress, stress reactions and coping profiles of women workers: a control groups study, *BMC Public Health* 20:1658 <https://doi.org/10.1186/s12889-020-09769-0>, 3-4
- [24] Paul J. Zak (2017). The Neuroscience of Trust, <https://hbr.org/2017/01/the-neuroscience-of-trust>, available on internet 27.11.2023
- [25] PwC. (2022). *Global Consumer Insights Survey*. <https://www.pwc.com/gx/en/industries/consumer-markets/consumer-insights-survey-feb-2023/archive/consumer-insights-survey-june-2022.html>, available on internet 27.11.2023

- [27] Ron Fisher, Celia Porod, Sydney Peterson (2021). Motivating employees and organizations to adopt a cybersecurity-focused culture, in: *Journal of Organizational Psychology* 21(1) 2021, pp. 11-12
- [28] Sadri, G, Lees, B. (2001). Developing corporate culture as a competitive advantage, *Journal of Management Development*, 20(10), pp. 856-858. <https://doi.org/10.1108/02621710110410851>, available on internet 27.11.2023
- [29] Sass Judit (2005). Bizalomintázatok és bizalmi döntések a szervezetben, PhD Értekezés, 2005. PÉCSI TUDOMÁNY, EGYETEM PSZICHOLÓGIA DOKTORI ISKOLA, 4.
- [30] Schein, E. H. (2010). *Organizational Culture and Leadership*. San Francisco: Jossey-Bass., 15-17
- [31] Wan Afezah Wan Abdul Rahman (2016). Empathy and Trust: Into a Better Workplace Environment, *Journal of Business and Economics*, ISSN 2155-7950, USA, December 2016, 7(12), 116
- [32] <https://www.cisa.gov/topics/physical-security/insider-threat-mitigation/defining-insider-threats>, available on internet 27.11.2023



# **The transfer of HRM practices across countries: case of Albania**

## **Alba Berberi**

Faculty of Economy, University “Luigj Gurakuqi”, Shkoder, Albania  
alba.berberi@unishk.edu.al

## **Emirjeta Bejleri**

Faculty of Economy, University “Luigj Gurakuqi”, Shkoder, Albania  
emirjeta.bejleri@unishk.edu.al

## **Mario Çurçija**

Faculty of Economy, University “Luigj Gurakuqi”, Shkoder, Albania  
mario.curcija@unishk.edu.al

*Abstract: Nowadays, in the conditions of globalization, international companies (MNC) have an important role in the global economy. They spread their activity beyond national borders by exploiting different opportunities in local markets. A very important factor for their success is the effective management of human resources, which is also a challenge for MNCs. This is explained by the fact that the more MNCs are expanding their operations across borders, the more they are being exposed to the cultural diversity, customs, and practices of each country where their subsidiaries are located. The transfer of HRM practices from foreign companies to host countries, to be successful, must consider several factors (cultural, institutional, or related to the company itself). Thus, the dilemma faced by MNCs is whether they should globally standardize HR management practices or adapt these practices locally, according to the norms and rules of the host countries. The aim of this research intends to explore the impact of these factors in the process of transferring HRM practices from MNCs operating in Albania. The methodology consists of quantitative methods. The population of the study consisted of a final sample of 255 MNCs that operates in Albania and regression analysis is used to empirically evaluate the hypothesis. The results of the study, show that the internal factors (related to the MNC's own environment) have more impact on the process of transferring HRM practices. This is because in developing countries and in countries where the rules and legal norms are not consolidated, the main determinants of the transfer of HRM practices will be those related to the internal environment of MNCs.*

*Keywords: globalization, HRM practices, multinational companies (MNC), internal and external factors, Albania.*

## **1 Introduction**

According to Chambers (2013), many international firms (MNCs) are facing multiple challenges in adapting HR management practices across borders. Nowadays, in a dynamic and global environment, international firms face the need to effectively manage human resources across borders, as this will affect the growth and sustainable development of their businesses (Ananthram and Chan, 2013). The more international firms are expanding their operations across borders, the more they are being exposed to the cultural diversity, customs, and practices of each country where their subsidiaries are located.

A multinational company (MNC) is a company that is headquartered in one country (home or parent country) and has its operations and employees in other countries (host countries). These international companies face the dilemma of whether to globally standardize their HR management practices. or adapt these practices locally, according to the norms and rules of the host countries, so convergence versus divergence becomes a "concern" for international companies.

Globalization and international markets put pressure on international companies to standardize policies and practices. But, despite a "hospitable" environment in attracting foreign companies, the MNCs should be careful to identify different factors that facilitate or limit the process of transferring HR management practices.

The adaptation of HR management practices is the process of adapting them to values, traditions, local cultural rules, as well as to laws and regulatory institutions.

## **2 Theoretical framework**

### **2.1 Transfer of HR management practices and policies**

International companies are a powerful vehicle for transferring managerial and technical knowledge, capital, and other production functions between countries. This whole process is part of their overall strategy. In general, multinational firms have three strategic HR management options to choose from: ethnocentric,

polycentric, and global (Perlmutter, 1969). An ethnocentric strategy is one in which the company chooses to implement HRM policies and practices similar to those of the country of origin in its subsidiaries abroad. When a company mainly follows the practices and policies found in the host country; then this will be choosing a polycentric strategy. In the case when it chooses the geocentric strategy, the company will design and implement a global policy, which is "fed" by its organizational culture and philosophy, regardless of where it is located.

The freedom to choose between the above strategies depends not only on the company's philosophy and preferences, but also on local conditions. International companies, in practice, may be inclined to choose a hybrid strategy and adapt, for example, an ethnocentric strategy in some subsidiaries and a polycentric strategy in others. For example, it may be easier for a multinational company to impose its HR management policies and practices on a subsidiary where the local workforce does not enjoy much power, or is unskilled and uneducated, or where there are few opportunities for jobs. Conversely, in a country where there is a low unemployment rate, people are educated, skilled, and aware of their rights and local rules and regulations, the multinational firm may find it difficult to ignore local customs and impose the practices and policies of the country of origin.

## **2.2 Factors affecting the transfer of HR management practices**

From the existing literature on global HRM and its international and cross-cultural applicability, several key determinants are identified that influence the effectiveness of HR practices across national borders, as well as the differentiation of these practices in different localities. These determinants are national culture, institutional factors (for example: labor market and other regulations), labor force characteristics, and the presence of foreign managers in subsidiaries of multinational companies.

### **2.2.1 Cultural factor**

Since organizations are formed within a particular country, their ways of operating are strongly influenced by the culture of that country (Hofstede 1980, 1985; Laurent 1983; Schneider 1988; Trompenaars 1993; Tayeb 1998).

Kanungo and Jaeger (1990) further argue that developing and developed countries constitute two distinct socio-cultural environments. Whereas the culture spread in developing countries can be characterized by high levels of power distance, collectivism, and uncertainty avoidance; developed countries share the cultural characteristics of relatively low power distance, high individualism, low level of uncertainty avoidance (these features may be related to the high predictability of the political and economic environment), higher level of performance orientation

than people orientation. Differences in the external environment, as well as in the cultural context, also affect the internal culture of the organizations, which create well-known assumptions among the members of the organizations (i.e., in the employees) (Kanungo and Jaeger, 1990; Aycan et al, 2000, 2007).

A theory regarding the interaction of national culture and HR management practices confirms that a large cultural distance between two countries will negatively affect the transfer and acceptance of HR practices from a MNC to its subsidiary, while another theory suggests that, when faced with a large cultural distance, MNCs will aim to conform to local management customs (Gamble, 2003, Alamzeb, et.al., 2023).

### **2.2.2 Institutional factors**

These factors include labor legislation, the financial system, the education and training system, social welfare systems and the degree of organizational autonomy (Sparrow and Hiltrop, 1997).

Institutions are a set of rules that structure social interactions, for example: training, performance appraisal, communication, and others (Knight, 1992). According to Paauwe and Boselie (2003), institutional theory is concerned with the behavior of organizations and how they respond to institutional pressures. According to the model of Rupidara and McGraw, (2011), MNC subsidiaries in foreign countries must adapt to several types of pressures. The institutional theory of HRM has been used to reveal the influence of the “organizational phenomenon” on the transfer of HR strategy to MNC subsidiaries in other countries (Björkman et al., 2007).

### **2.2.3 Workforce characteristics**

Workforce characteristics, such as: training level; education level; demographic composition of the workforce; can have a significant effect on the convergence of international HRM practices. While workforce characteristics are not "pure" factors (in the sense that they are generally a product of national culture and institutional factors), the potential they have in influencing decision-making and the implementation of global HRM practices- at the national level is relevant.

### **2.2.4 Foreign managers presence**

A key factor in determining and implementing global HR management practices at the national level is the presence of foreign managers in MNC subsidiaries. The presence of foreign managers has the effect of increasing the similarity of HR management practices between the MNC subsidiary and the parent company (Rosenzweig and Nohria, 1994; Waxin and Brewster, 2016).

<b>Authors</b>	<b>Factors affecting the transfer of HRM practices.</b>
Jane (1983)	Economic, social, political and legal environment.
According to a theoretical treatment of Schuler et al., (1993).	Legal and cultural differences between home and host countries, the international orientation of the parent company, the MNC's organizational structure, the MNC's competitive strategy and the firm's experience in the international arena.
Rosenzweig & Singh (1991).	Legal and regulatory restrictions; industry; technology; host country culture; cultural distance; the characteristics of the workforce, the type of establishment of the subsidiary and the influence of the host country on the MNC.
Beechler & Yang (1994).	Firstly, the factors related to the country of origin; secondly, factors related to the host country; thirdly, factors related to the company itself (to what extent the MNC's subsidiaries are an integral part of the parent company's strategic plans).
Gamble, (2003), study in British companies and their subsidiaries in China.	Labor force characteristics.
Rosenzweig & Nohria: (study of 249 subsidiaries of American MNCs).  Alamzeb, et.al., (2023) a literature review.	- The time the subsidiary has in a host country.  - The size of the subsidiary.  -Dependence of the subsidiary from the home company.  -The role of the subsidiary in the

	MNC group. - The difference between cultures.
Myloni, Harzing & Mirza, (2004, 2007), subsidiaries of MNCs in Greece.  Cuiling, (2013), seven case studies in their China subsidiaries of French MNCs.	The presence of foreign managers.  Control by the home company.
Cocuľová, (2015), from a study in MNC subsidiaries in Slovakia.	The factors that affect the transfer of HRM practices, in particular the recruitment and selection of employees, can be divided into two categories: <b>external factors</b> (related to the culture and institutional environment) and <b>internal factors</b> (related to the internal environment of the MNC).

Source: Authors

### 3 Methodology

The target population for this article consists of MNCs operating in Albanian. To gather information about the factors that influence the transfer of HRM practices from these MNCs in their subsidiaries in Albania, a questionnaire was distributed to managers of these companies. Questionnaires were distributed by email, in-person interactions, and most of them online. 255 questionnaires were valid to be included in the analysis and to continue the statistical analysis. The quantitative method is used and a survey was distributed to MNCs operating in Albania. This form of research has also been used by various researchers, such as: Rosenzweigh and Nohria, (1994); Myloni, Harzing and Mirza, (2004, 2006). There are medium and large companies included in the study, used also in the study of Muller & Mayrhofer (1998). The questionnaire consists of three sections. The first section collects general data on the company; the second section, collects data on the characteristics of personnel and HRM practices at the subsidiary; in the third section, the collected data aim to measure the impact of the factors/independent variables in the transfer of HRM practices/dependent variables.

## **4 Results and discussion**

Based on descriptive analysis, in 43% of cases the home companies of the subsidiaries originate in Italy; 14% in Austria; 7% in Germany; 7% in the USA; 10% in Turkey and 5% in Greece and France. The rest, of 9%, originate in other countries, such as: UK, Bulgaria, Slovenia, Switzerland, Macedonia. In relation to the type of activity carried out by the home company, the service sector occupies the largest share (59%), followed by the production sector. Information about the strategy used by the company to compete in the international market, where it is noted that the use of the global strategy and the adaptation strategy (39%) is equally shown and 21% of the answers show the use of the regional strategy to compete in the international markets. The main form of entry into Albanian market is direct investment (47%), and licensing (22%). The main reasons for entering the Albanian market, are for market development (44%) and lower labor costs (25%). In 62% of cases the subsidiary was created as a greenfield (investment from the beginning) and in 38% of cases it results as a purchase.

Factorial analysis (principal component analysis with Varimax rotation) was carried out, as a necessary tool to investigate the relationship between variables, and reliability was further assessed by measuring the Cronbach alpha coefficient, which is a measure of internal consistency, which means how many units are connected in a group. The factor analysis values for the included data and the value of the Cronbach alpha coefficient resulted within the accepted ranges.

### **4.1 Regression analysis to measure the impact of external and internal factors to transfer of HRM practices**

Initially, a research question was raised: "Are external factors (cultural distance and law and local norms) less influential than internal factors (the role of the subsidiary; control by the home company; the presence of foreign managers; the flow of technical knowledge and manager's role; manager's age) in the transfer of HRM practices? According to Cocuľová, (2015), from a study done in MNC subsidiaries in Slovakia, the factors affecting the transfer of HRM practices can be divided into two categories: external factors (related to culture and institutional environment ) and internal factors (related to the MNC's internal environment). And it has been found that internal factors are more influential in making HRM practices similar to the HRM practices used by the parent company.

Thus, to answer the research question, we pose and test the following hypothesis: External factors (cultural distance and legality and local norms) are less influential than internal factors (the role of the subsidiary; control by the parent company; the presence of foreign managers; the flow of technical and managerial knowledge; the role of the manager; the age of the manager) in the transfer of HRM practices.

Before proceeding with the regression analysis to test the hypothesis, it is necessary to see the correlation between these independent variables, to see if we are in the conditions of multicollinearity or not. The accepted interval that allows us to continue the analysis is from (-0.7) to 0.7. In the present case, the correlation values result within this interval allowing us to continue the regression analysis.

Next, we perform the multiple regression analysis, from which it was found that the variables "law and local norms"; "cultural distance" and "manager's age" are not statistically significant. Therefore, we exclude them from the analysis and review once again the results of the regression analysis for the other variables "subsidiary role"; "control by the home company"; "the presence of foreign managers"; "flow of technical and managerial knowledge" and "manager's role". The model is statistically significant, where the value of  $F(2,252)=169,861$  and  $p=0,000$ . The analysis shows that the role of the subsidiary; control by the home company; the presence of foreign managers; the flow of technical knowledge and the role of the manager explain 89.4% of the variance of the dependent variable (adjusted  $R^2=0.894$ ) and we can say that this is not a result of  $R^2$ . From the statistical test t for the control of the individual regression coefficient, we have the same result, showing that these coefficients are different from zero  $t_1=26,991$  and  $p=0,000$ ;  $t_2=-2,661$  and  $p=0,009$ ;  $t_3=3,251$  and  $p=0,002$ ;  $t_4=3,337$  and  $p=0,001$  and  $t_5=2,301$  and  $p=0,024$ , which means that the variables have a significant contribution to the model.

The multiple regression equation is presented:

$$\text{"transfer of HRM practices"} = 0.788 + 0.938 \text{"subsidiary role"} + 0.109 \text{"control by the home company"} + 0.127 \text{"presence of foreign managers"} + 0.085 \text{"flow of technical knowledge and managerial"} + 0.109 \text{"manager's role"}$$

From this equation it can be seen that there is a positive relationship between the independent variables and the dependent variable "transfer of HRM practices", or, the greater their influence, the greater the possibility of the transfer of HRM practices. In conclusion, we say that the hypothesis is accepted.

## Conclusions

Internal factors (related to the MNC's own environment) have more impact in the transfer process of HRM practices. This is due to the fact that in developing countries and in countries where the rules and legal norms are not consolidated, the main determinants of the transfer of HRM practices will be the factors related to the internal environment of the international company.

Albania remains a country that follows patriarchal methods at work, such as: high managerial control; low responsibility by the employees; large "gap" between managers and employees; weak role of trade unions. These should also be a sign



to MNC subsidiaries in the country, to evaluate the transfer of HRM practices and support this transfer in local conditions.

Albania is a country with a long transition period, where institutions, norms and laws are not stable, cohesive and integrated, it means that MNCs must be careful, but at the same time they find it easier to transfer the HRM practices here.

MNCs must be culturally "sensitive", as employees often behave, and act based on culturally dictated norms and rules.

The existence of a skilled labor force in the country, combined with its low cost, helps MNCs to select not only employees, but also local managers. This should be considered as a limiting factor in the transfer of its HRM practices.

It is seen that internal factors, affect more the transfer of HRM practices in the country than the external ones. This can serve as a "signal" for MNCs that institutional factors are not yet consolidated and our culture, despite the cultural distance that may appear with home countries, "leads" us to adapt to foreign "things".

## References

- [1] Alamzeb, A. et.al., (2013): Transfer of HR practices across different cultures, *J. Basic. Appl. Sci. Res.*, 3(2) pp. 60-67, ISSN 2090-430, [https://www.researchgate.net/publication/286190478\\_Transfer\\_of\\_Hr\\_Practices\\_across\\_Different\\_Cultures](https://www.researchgate.net/publication/286190478_Transfer_of_Hr_Practices_across_Different_Cultures).
- [2] Ananthram, Sdhe Chan, C. (2013), Challenges and strategies for global human resource executives: Perspectives from Canada and the United States. *European Management Journal*, 110, 2-11.
- [3] Aycan, Z., Kanungo, R. N., Mendonca, M., Yu, K., Deller, J., Stahl, G., dhe Khursid, A., (2000), Impact of culture on human resource management practices: A ten country comparison. *Applied Psychology: An International Review*, 49(1), pp. 192-220
- [4] Aycan, Z., Al-Hamadi, A. B., Davis, A., dhe Budhwar, P., (2007), Cultural orientations and preferences for HRM policies and practices: the case of Oman. *The International Journal of Human Resource Management*, 18(1), pp. 11 -32.
- [5] Beechler, S. dhe Yang, J. Z. (1994), The transfer of Japanese-style management to American Subsidiaries: contingencies, constraints and competencies, *Journal of International Business Studies*, 25(3) pp: 467-491.

- [6] Björkman, I., Lervik, J. E., (2007), Transferring HR practices within multinational corporations. *Human Resource Management Journal*, 17(4), pp. 320-335
- [7] Chambers, M. S. (2013), An Exploration into the Challenges Facing Practitioners of International Human Resource Management: A Literature Review, *International Journal of Business and Social Science*, 4(6), 21-27.
- [8] Coculov J., (2015), Analysis of Determinants of Transfer of Recruitment & Selection Practices in Multinational Companies, *Polish Journal of Management Studies*, 12(2)2, 2015.
- [9] Cuiling, J. (2013), Transfer of HRM practices in French MNCs: The case of French subsidiaries in China, Université de Pau et des Pays de l'Adour École Doctorale 481 *Sciences Sociales et Humanités*.
- [10] Gamble, J (2003). Transferring human resource practices from the United Kingdom to China: the limits and potential for convergence. *International Journal of Human Resource Management*, 14(3), pp. 369-387.
- [11] Hofstede, G (1980), Motivation, Leadership and Organization: Do American Theories Apply Abroad?. In: *Organizational Dynamics*, 16 (4), pp. 4-21.
- [12] Jain, H. (1983), 'Cross-Cultural Management of Human Resources and the Multinational Corporations', *Indian Journal of Industrial Relations*, 19. pp. 101-14.
- [13] Kanungo, R. N., dhe Jaeger, A. M. (1990). Introduction: The need for indigenous management in developing countries. In A. M. Jaeger & R. N Kanungo (Eds.), *Management in Developing Countries*. London: Routledge.
- [14] Kogut, B dhe Singh, H. (1988), "The effect of national culture on the choice of entry mode", *Journal of International Business Studies*, 19(3) pp. 411-432.
- [15] Laurent, A. (1986), The cross-cultural puzzle of International Human Resource Management, *Human Resource Management*, 25(1), pp. 91-102.
- [16] Muller, M./Mayrhofer, W. (1998), Human Resource Management in Austria: The Importance of the Context. Arbeits papier Nr. 1 der *Interdisziplinären Abteilung für Verhaltenswissenschaftlich Orientiertes Management*. Wirtschaftsuniversität Wien
- [17] Myloni, B., Harzing, A.W.K. dhe Mirza, H. (2004) 'Host Country Specific Factors and the Transfer of Human Resource Management Practices in Multinational Companies', *International Journal of Manpower*, 25(6) pp.518-34.

- [18] Myloni, B., Harzing, A.W.K. dhe Mirza, H. (2007), The effect of corporate-level organizational factors on the transfer of human resource management practices: European and US MNCs and their Greek subsidiaries, *Int. J. of Human Resource Management* 18(12) December 2007 pp. 2057–2074.
- [19] Paauwe, J., Boselie, P., (2003), Challenging 'strategic HRM' and the relevance of the institutional setting. *Human Resource Management Journal*, 13(3), pp. 56-70.
- [20] Perlmutter, H.V. (1969) 'The Tortuous Evolution of the Multinational Corporation', *Columbia Journal of World Business*, 4, pp. 9–18.
- [21] Rosenzweig, P.M. dhe Singh, J.V. (1991) 'Organizational Environments and the Multinational Enterprise', *Academy of Management Review*, 16(2) pp.340–61.
- [22] Rosenzweig, P. M. dhe Nohria, N. (1994), Influences on HRM practices in multinational corporations, *Journal of International Business Studies*, 25(2), pp. 229-251
- [23] Rupidara, N. S., McGraw, P., (2011), The role of actors in configuring HR systems within multinational subsidiaries. *Human Resource Management Review* 21, pp. 174-185.
- [24] Schneider, S. (1988), National vs. corporate culture: Implications for human resource management. *Human Resource Management*, 27, pp. 231-246.
- [25] Schuler, R., Dowling, P. dhe De Cieri, H. (1993), 'An Integrated Framework of Strategic International Human Resource Management', *International Journal of Human Resource Management* 4 pp. 717-64.
- [26] Sparrow, P. R. dhe Hiltrop, J. (1997), Redefining the field of European Human Resource Management: a battle between national mindsets and forces of business transition? *Human Resource Management*, 36(2), pp: 201-219.
- [27] Tayeb, M. (1998), Transfer of HRM practices across cultures: an American company in Scotland, *International Journal of HRM*, Vol. 9, Issue 2, pp: 332-358
- [28] Trompenaars, F. (1993), *Riding the Waves of Culture: Understanding Cultural Diversity in Business*, Nicholas Braeley Publishing, London.
- [29] Waxin, M. F. and Brewster, C., (2016), Antecedents of expatriates' time to proficiency; does home country culture have an effect? *Journal of Developing Areas* . ISSN 1548-2278

# **Entrepreneurial skills as a development perspective in the tourism sector**

**Mónika Fosztó**

Babeş-Bolyai University, Faculty of Economics and Business Administration,  
monika.fosztó@econ.ubbcluj.ro

**Izabella Krájník**

Babeş-Bolyai University, Faculty of Economics and Business Administration,  
izabella.krajnik@econ.ubbcluj.ro

*Abstract: In this paper, we seek answers to the question of what opportunities exist for start-up entrepreneurs and business start-ups in Romania. We chose this topic because we have always been interested in starting and running a business, as well as entrepreneurship opportunities and areas worth investing in. The most important objective of the research is to identify individual motivations and background personal characteristics that can significantly influence the process of becoming an entrepreneur. In the literature review, we will examine what is meant by the concepts of entrepreneurship and enterprise and what types of entrepreneurship exist. We look at international experience in this field, as well as experience and innovation in the European Union, and then we look at entrepreneurship in Romania. The research is based on a personal questionnaire survey, which aims to assess young people's inclination towards entrepreneurship, including what are the motivational factors for starting their own business and what are the obstacles that prevent them from doing so. The research aims to investigate entrepreneurial attitudes in tourism, and what factors influence them most in making this decision.*

*Keywords: Tourism development, rural economy, management, sustainability*

## **1 Introduction**

In this paper, we seek answers to the question of what opportunities exist for start-up entrepreneurs and business start-ups in Romania. We chose this topic because we have always been interested in starting and running a business, as well as entrepreneurship opportunities and areas worth investing in tourism (Shah, S. K., & Tripsas, M. 2007). The most important objective of the research is to identify individual motivations and background personal characteristics that can

significantly influence the process of becoming an entrepreneur. In the literature review, we will examine what is meant by the concepts of entrepreneurship and enterprise and what types of entrepreneurship exist. We look at international experience in this field, as well as experience and innovation in the European Union, and then we look at entrepreneurship in Romania. The research is based on a personal questionnaire survey, which aims to assess young people's inclination towards entrepreneurship, including what are the motivational factors for starting their own business and what are the obstacles that prevent them from doing so. The research aims to investigate entrepreneurial attitudes in tourism, and what factors influence them most in making this decision. Absolutely, in the tourism domain, innovation stands as a critical instrument for growth and resilience amid the swift replication and uptake of successful new ideas by rivals. This phenomenon potentially explains the surge in varied products and tourist locales, arising to meet the evolving demand for fresh types of tourism (Gupta, V.K., Turban, D.B., Wasti, S.A., & Sikdar, S. 2009). Moreover, innovation consistently enhances visitors' experiences and, given its unique and exclusive attributes, emerges as a key catalyst for economic advancement. Importantly, it could represent a foundational competitive advantage for tourism entities.

The research aims to achieve the following specific objectives:

- Acknowledging the essential skills and aptitudes pivotal for entrepreneurs venturing into the tourism sector.
- Comprehending the fundamental drivers and reasons prompting individuals to establish businesses in the tourism field.
- Recognizing the essential resources required for initiating and expanding a business within the tourism industry.
- Identifying and specifying the hurdles and difficulties encountered by entrepreneurs entering the realm of tourism.

The article emphasizes the increasing importance of equipping upcoming graduates in the tourism field with diverse skills necessary for various roles across different settings. It delves into the concepts of entrepreneurial education and skills, stressing the importance of instilling these abilities in higher education students. Furthermore, it offers a case study illustrating entrepreneurship education integrated into the tourism curriculum, outlining its fundamental components, course organization, and intended aims. Ultimately, it wraps up by discussing the significance of entrepreneurship education specifically tailored for students studying tourism.

For tourism entrepreneurs to thrive, strategic positioning is crucial for competitive success. They need to embrace risk-taking and innovation, efficiently manage human resources to foster a conducive workplace for both employees and customers and anchor their endeavours on ethical values.

The tourism industry is marked by its continual evolution, supply saturation, and the prevalence of a globalized clientele, culminating in exceptional and fierce competition. Consequently, enterprises within this sphere must prioritize innovation to achieve reduced costs and offer new or enhanced products and services of superior quality that align with the discerning demands of potential customers.

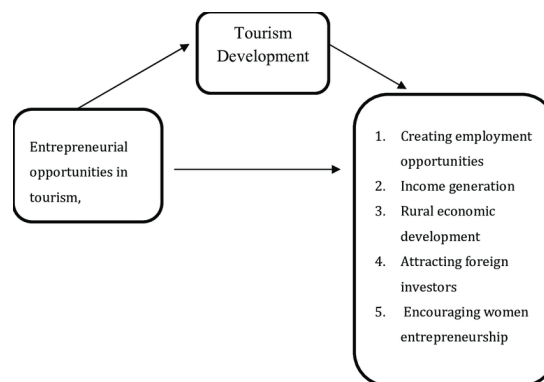


Figure 1

The correlation between entrepreneurship in the tourism industry, the advancement of tourism, and overall economic development.

Source: own editing

Tourism, as both an economic and social force, possesses the inherent capacity to catalyze regional development, with an increasing recognition of its innovation potential, notably through creative endeavours. This recognition is manifest in the emergence of novel services integrating technology and sustainability initiatives. Given its ability to propel socio-economic advancement, the tourism sector emerges as fertile ground for entrepreneurial ventures.

## 2 Literature Review

Presently, the undeniable reality is the substantial economic, social, and political impact of the tourism industry. Romania stands as no exception to this trend, having emerged as a prominent European destination in recent years. The country has experienced notable growth in visitor numbers and generated revenues, solidifying its position as a noteworthy tourist hotspot.

According to this theoretical model, the authors outline four crucial elements necessary to achieve a critical mass of successful and sustainable ventures that

contribute to economic development. These elements encompass entrepreneurs, the level of fairness and freedom, funding, and market mechanisms.

Firstly, entrepreneurs are essential, and three conditions must be fulfilled to foster their development. These conditions involve possessing entrepreneurial potential, having the necessary infrastructure, and access to opportunities and markets. The transmission of an entrepreneurial tradition from one generation to the next, along with entrepreneurial education available in schools and universities, provides suitable environments for cultivating entrepreneurial potential. Additionally, having infrastructure and access to market opportunities is crucial in shaping an entrepreneur.

Secondly, government cooperation is vital to provide a favourable economic environment for entrepreneurs to initiate new businesses. The emergence of a free market economy might increase investment risks, resulting in higher capital costs (Nikraftar, T., & Hosseini, E., 2016). Moreover, there might be a reluctance among banks to extend credit in such situations.

Entrepreneurship holds significant importance in the development of tourism, particularly in rural and ethnic communities. This is evident as numerous hotel chains and multinational corporations have chosen to establish themselves in rural areas through small or medium-sized enterprises, capitalizing on potential markets. Past research has extensively explored the competitive advantages inherent in small tourism businesses. These studies have underscored the pivotal role of high-quality entrepreneurship in ensuring the survival and growth of these smaller ventures. Consequently, these types of enterprises, characterized by relatively low capital investments, thrive based on the skills and attributes of the entrepreneurs driving them forward.

Once the research topic was chosen and relevant studies on ensuring quality in tourism were thoroughly reviewed, the research question was shaped to align with the study's goals. Over recent years, there has been a persistent academic focus on quality assurance, leading to an increase in research efforts dedicated to this area.

### **3 Research Method**

Over the past decade, rapid global changes have introduced significant challenges and uncertainties for businesses, particularly those investing in tourism real estate. Safeguarding investors' interests in this sector demands a comprehensive understanding and proactive management within a dynamic landscape marked by economic fluctuations, environmental shifts, political uncertainties, and societal concerns.

This paper aims to equip individuals with the necessary tools to make informed decisions guided by strategic foresight. Through an in-depth analysis of the literature, it identifies the primary risks and obstacles confronted by investors in managing real estate assets within the tourism industry (Daniel, A. D. 2016).

A substantial body of literature links entrepreneurship and innovation. However, to meet the specific goals of this study, it was necessary to establish a classification system that discerns varying levels of innovation among entrepreneurs. This classification facilitated the development of a variable termed "Innovative Tourism Entrepreneur" for this study, enabling the examination of how typical entrepreneurial factors influence it. In gauging the innovation level of new ventures, the guidelines recommended by Koellinger were employed. The term "entrepreneurship process" encompasses two primary elements, each representing distinct concepts. "Entrepreneur" refers to the individual or group engaged in executing entrepreneurship activities, while "process" denotes the procedural sequence associated with entrepreneurship's execution (Gartner, 1988; Blawatt, 1998). Despite their unique characteristics, these terms are interconnected and reliant on one another (Kang & Uhlenbruck, 2006).

Within the entrepreneurial process, entrepreneurship is defined as a context-dependent social process that commences with the creation and promotion of new businesses, typically driven by the aim of maximizing profit (Low & Abrahamson, 1997). Individuals engaged in the entrepreneurial process capitalize on market opportunities through innovative actions and distinctive approaches in production and management systems (Mazubane, 2009:8).

## **4 Results**

The tourism sector has felt the impact of disruptive innovations significantly. Technologies like blockchain are starting to revolutionize the way investments are made, particularly within the tourism sector. Grasping these advancements and their implications for real estate investment could be crucial.

In contrast to various industries, the tourism and hospitality sector has historically exhibited a relatively low engagement in entrepreneurial endeavors. Traditionally, instances of entrepreneurship were scarce, primarily observed within small or medium-sized family-owned tourism enterprises (Morrison, 2006:193). However, over the past decade, the practice of entrepreneurship has proliferated not only among global tourism conglomerates but also within small and medium-sized enterprises (SMEs). Particularly, entrepreneurship thrives within SMEs focusing on specialized ethnic niche tourism in rural areas where local cultural expertise is pivotal for tourism success. SME entrepreneurship emerges as crucial, especially



in the initial phases of urban tourism development in regions untouched by global hotel chains and international franchises.

Small enterprises play a crucial role in national economies by facilitating job creation, boosting overall production, and relatively increasing investments and products. They also aid in addressing development disparities between regions aspiring for technological advancements (Kwaramba, H.M., Lovett, J. C., Louw, L., & Chipumuro, J. 2012). Furthermore, they support individual capital growth and offer adaptability to changing economic landscapes and innovation. Beyond these overarching advantages, small businesses, especially in tourism, provide localized benefits. They generate employment opportunities for local inhabitants, foster economic diversity and stability, expedite regional development, and elevate social development levels within the community they serve.

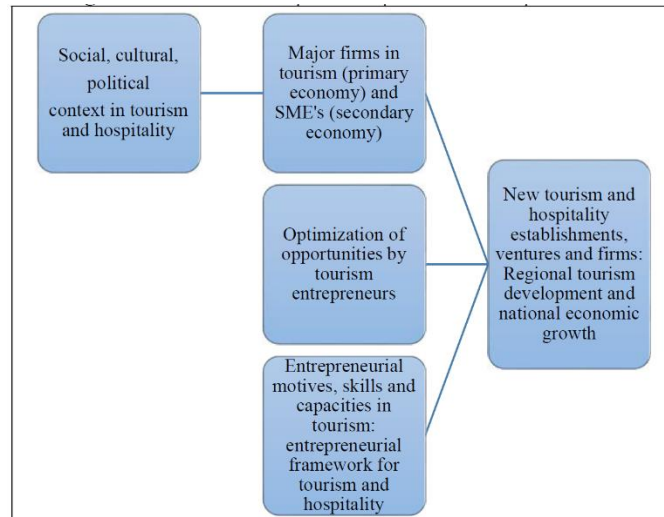


Figure 2

The conceptual model outlined by the Global Entrepreneurship

Source: Adapted from: Williams, Shaw

The intricate relationship between tourism entrepreneurship and the industry's unique characteristics leads some scholars to suggest considering this process as a type of consumption rather than strictly production (Garai-Fodor, M.; Szemere, T.P.; Csiszárík-Kocsir, Á.2022). This viewpoint emerges from research indicating that factors like previous work experience and access to capital offer a limited explanation of entrepreneurship in the tourism sector.

This review explores the intricacies of the tourism sector, delving into the complexities arising from the interplay of supply and demand, shifts in travel behaviour, and political risks that substantially affect these assets. It emphasizes how political instability can detrimentally affect travel demand, consequently

impacting investment returns. Underlining the importance of considering these factors in investment decisions, the paper also highlights sociological challenges stemming from evolving consumer preferences and demographic changes (Morrison, A. 2006).

The research underscores the substantial influence of macroeconomic factors on tourism, particularly in terms of economic risks. Various elements such as inflation, economic downturns, interest rates, and currency exchange rates significantly influence the profitability and sustainability of these investments. Moreover, alterations in travel patterns and the interplay between supply and demand markedly influence the economic feasibility of these assets.



Figure 3

Sustainable tourism

Source: Adapted from: Kato, K. (2019).

Sustainable tourism can take on varying strengths: weak or strong. The weak approach places humans (anthropocentrism) at its core, focusing on ‘development’ to cater primarily to human needs Ahmad, S. Z. (2015). This is commonly seen in large resort hotels or theme parks.

Conversely, strong sustainable tourism operates in relatively untouched natural or cultural environments, where even minimal increases in tourism can harm the environment or local sociocultural aspects.

This strong approach aligns more with the 'sustainable' aspect of sustainable development. It either explores alternatives like small-scale ecotourism or imposes restrictions on tourism activities in specific areas (Pritchard, A., & Morgan, N. 2017).

In practical terms, sustainable tourism serves to link the planning and management of tourism development with social objectives, establishing clear guidelines for fostering a more sustainable tourism industry.

The outcomes of this study hold substantial theoretical implications. Specifically, the success of cultural tourism exhibited a positive correlation with innovative management practices. While the study was limited in scope, it did explore the association between performance and key factors like innovative management on tourism.

Simultaneously, innovative tourism entrepreneurship endeavors significantly contribute to creating diverse new tourism models and inventive applications within the hospitality market. For instance, these efforts involve the introduction of local gastronomy tourism, tailored rural adventure tourism experiences, the development of sustainable regional ecotourism packages, initiatives in local dark tourism, utilization of specific local events and festivals, exploration of softer tourism experiences, adoption of the slow food movement, establishment of agri-tourism ventures, and the establishment of authentic ethnic family-owned restaurants.

## **5 Discussion**

The limited occurrence of notable innovation within the tourism sector stands as a potential opening for pioneering entrepreneurs in the domain. Nevertheless, it's important to note that this study carries inherent limitations (Varga J., 2021). Being a non-experimental research effort, it recognises the challenge of achieving exhaustive control over variables, thereby complicating the discernment of effects related to the numerous variables at play.

Additionally, the focus on tourism entrepreneurship can drive rural economic growth, lessening dependence on agriculture. There's a noticeable shift where the tourism industry is gradually overtaking agriculture in recent times. Consequently, tourism entrepreneurship initiatives open up employment avenues, particularly for women (Nemirschi & Craciun, 2010). This aspect of entrepreneurship within tourism also plays a role in addressing unemployment challenges. Moreover, it enhances the living standards of entrepreneurs by augmenting their income and resolving their unemployment issues.

### **Conclusions**

The outcomes of this study carry significant practical implications for public administrations in advancing innovative entrepreneurship within the tourism sector. Fostering entrepreneurial endeavours ought to specifically target

demographics. This objective should be pursued without undermining support for other groups. Recognizing the pivotal role of higher education in fostering innovative entrepreneurship in tourism, universities offering programs in tourism management should incorporate entrepreneurial training into their curricula. Emphasizing training modules that explore potential innovation strategies pertinent to establishing businesses within the tourism industry is crucial.

Assessing evolving patterns and the innovative potential within the tourism sector carries considerable managerial implications. Selecting innovative business models aligned with the sustainability of the tourism industry and environmental management practices is paramount. The escalating global competitiveness within tourism opens avenues for implementing eco-innovations as a differentiating factor among destinations and industry entities, amplifying the significance of quality management and sustainable development (Kato, K. 2019).

In summary, after a thorough theoretical and practical exploration of small tourism businesses, we've identified both challenges and promising avenues within this sector. Consequently, our findings point towards strategies to enhance business competitiveness: small businesses within the tourism industry encompass a spectrum of behaviours, activities, professional expertise, and training involving entrepreneurs, individuals, family enterprises, new ventures, and corporate entrepreneurship and small tourism enterprises significantly contribute to local tourism development by providing opportunities for entrepreneurs to initiate businesses despite technological and capital constraints. These businesses not only fulfil the employment needs of the owners but also serve as direct income sources for their families and local residents.

When side against industries such as manufacturing, medicine, or financial services, historical analysis reveals a notably subdued engagement with entrepreneurial methodologies within the tourism and hospitality sector. Despite a discernible uptick in entrepreneurial endeavors among both global tourism conglomerates and small to medium enterprises (SMEs) over the past decade, such initiatives remain relatively uncommon. This deficiency warrants enhancement considering the manifold economic and societal advantages entrepreneurial approaches bestow upon individuals, enterprises, and destinations.

To foster entrepreneurial advancement and broaden its adoption within the domain of tourism, a crucial step involves identifying the distinct and intrinsic traits that define this entrepreneurial process. Innovative processes within tourism entrepreneurship often yield the creation and introduction of diverse tourism types, a broadening array of tourism products, and the implementation of inventive practices. Examples such as local gastronomy tourism, specialized rural adventure tourism, sustainable ecotourism packages tailored to regional environments, localized dark tourism, utilization of specific local events and

festivals, slow tourism initiatives, adoption of the slow food movement, agri-tourism ventures.

However, ensuring the alignment of these new and pioneering tourism types with prevailing market trends is crucial for successful entrepreneurial endeavors. Yet, mere compliance is insufficient; continuous adaptation and updates are imperative. This perpetual need for evolution poses a challenge, demanding greater support from relevant project funding and managerial strategies such as partnerships and strategic alliances aimed at fostering synergy and reducing costs.

### **Acknowledgement**

A more comprehensive investigation could offer empirical evidence concerning three critical dimensions of economic development: employment opportunities, living standards, and rural development facilitated by tourism entrepreneurship ventures. Future studies should delve into understanding how these businesses in the tourism sector foster improvements in these areas.

### **References**

- [1] Ahmad, S. Z. (2015). Entrepreneurship education in tourism and hospitality programs. *Journal of Hospitality & Tourism Education*, 27(1), pp.20-29.
- [2] Akram, U., Fülöp, M. T., Tiron-Tudor, A., Topor, D. I., & Căpușneanu, S. (2021), *Impact of digitalization on customers' well-being in the pandemic period: Challenges and opportunities for the retail industry*, International Journal of Environmental Research and Public Health, 18(14), 7533.
- [3] Daniel, A. D. (2016). Fostering an entrepreneurial mind-set by using a design thinking approach in entrepreneurship education. *Journal of Industry & Higher Education*, 30(3), pp.215-223.
- [4] Garai-Fodor, M.; Szemere, T.P.; Csiszárík-Kocsir, Á.(2022). Investor Segments by Perceived Project Risk and Their Characteristics Based on Primary Research Results. *Risks*
- [5] Gartner, W. B. (1988). Who is an entrepreneur? is the wrong question. *American Journal Of Small Business*, 12(4), pp.11-32.
- [6] Goebel, A. (2003). Women and sustainability: What kind of theory do we need?. *Canadian Woman Studies*, 23(1), pp.77-84.
- [7] Greco, A. & de Jong, G. (2017) Sustainable entrepreneurship: definitions, themes and research gaps. Working paper series 1706-CSE, University of Groningen.
- [8] Gupta, V.K., Turban, D.B., Wasti, S.A., & Sikdar, S. (2009). The Role of Gender Stereotypes in Perceptions of Entrepreneurs and Intentions to

- Become an Entrepreneur. *Entrepreneurship Theory and Practice*, 33(2), pp.397-417.
- [9] Hallak, R., Assaker, G., & O'Connor, P. (2012). Are family and nonfamily tourism businesses different? An examination of the entrepreneurial self-efficacy–entrepreneurial performance relationship. *Journal of Hospitality & Tourism Research*
- [10] Kato, K. (2019). Gender and sustainability–exploring ways of knowing–an ecohumanities perspective. *Journal of Sustainable Tourism*, 27(7), pp.939-956
- [11] Kwaramba, H.M., Lovett, J. C., Louw, L., & Chipumuro, J. (2012). Emotional confidence levels and success of tourism development for poverty reduction. *Tourism Management*, 33, pp.885-894;
- [12] Morrison, A. (2006). A contextualisation of entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 12(4), pp.192-209.
- [13] Nikraftar, T., & Hosseini, E. (2016). Factors affecting entrepreneurial opportunities recognition in tourism small and medium sized enterprises. *Tourism Review*, 71(1), pp.6-17.
- [14] Nowiński, W., Haddoud, M.Y., Lančarič, D., Egerová, D., & Czeglédi, C. (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, 44(2), 361-379.
- [15] Pritchard, A., & Morgan, N. (2017). Tourism's lost leaders: Analysing gender and performance. *Annals of Tourism Research*, 63, pp.34-47.
- [16] Ruef M., (2005). *Origins of Organizations: The Entrepreneurial Process*, in Lisa A. Keister (ed.) *Entrepreneurship (Research in the Sociology of Work, Volume 15)* Emerald Group Publishing Limited: 63 – 100.
- [17] Shah, S. K., & Tripsas, M. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. *Strategic Entrepreneurship Journal*, 1(12), pp.123-140.
- [18] Varga J., (2021), *Defining the economic role and benefits of micro small and medium-sized enterprises in the 21st century with a systematic review of the literature*, Acta Polytechnica Hungarica.

# **Strategic management approaches used in the banking sector by adopting digital technologies**

**Izabella Krájnik**

Babeş-Bolyai University, Faculty of Economics and Business Administration,  
izabella.krajnik@econ.ubbcluj.ro

**Mónika Fosztó**

Babeş-Bolyai University, Faculty of Economics and Business Administration,  
monika.fosztó@econ.ubbcluj.ro

*Abstract: This paper presents a comprehensive examination of customer relationship management within the banking sector, focusing on assessing the impact and advantages of this approach. Through a systematic review of the literature, clarification of key concepts, and empirical research, the findings suggest that this approach offers numerous benefits to banks. These advantages include heightened customer satisfaction and loyalty, enhanced financial performance and profitability, reduced costs associated with customer acquisition and retention, increased operational efficiency and productivity, the identification of revenue growth opportunities, and the ability to adapt swiftly to evolving market conditions. The outcomes and recommendations of this study provide valuable tools for banking institutions to enhance their customer relationship management practices and attain success within a dynamic and competitive business environment.*

*Keywords: Management, banking industry sector, digital technologies, economic growth*

## **1 Introduction**

The banking sector is currently facing fierce competition and an increased need to adapt quickly to market changes and customer demands. In this context, customer relationship management analysis is becoming an essential component for the success of financial institutions. Thus, this paper focuses on exploring and understanding how customer relationship management analysis can bring significant benefits to the banking sector.

The main purpose of this paper is to examine different aspects of customer relationship management analysis in the banking sector and to highlight how it can





interpretation of customer data to support decision-making and develop effective strategies within financial organisations.

Throughout the paper, it will also explore how customer relationship management analytics can help identify and address specific customer needs in the banking industry. It will explore how data and information collected about customers can be used to develop customised products and services tailored to individual customer needs.

The paper will also identify and analyse the main challenges and barriers to the effective implementation and use of customer relationship management analytics in the banking industry. It will explore the factors that can influence the successful implementation of a data analytics approach and propose solutions to overcome these challenges.

Finally, the paper will investigate the long-term impact and benefits of an analytics-based approach to customer relationship management in the banking industry. It will examine how effective use of customer data and information can enhance the performance of financial organisations, leading to increased competitiveness, customer loyalty and long-term profitability.

Through a detailed analysis of these hypotheses and research questions, the paper aims to provide an in-depth understanding of the role and impact of customer relationship management analytics in the banking industry. The results will provide financial organisations with the necessary information to develop effective customer relationship management strategies and tactics to gain a competitive advantage in a changing business environment.

## **2 Literature Review**

Certainly, the literature review on strategic management approaches employed within the banking sector through the adoption of digital technologies revolves around several key themes and insights.

The banking sector's evolution in the digital era has prompted a strategic shift towards integrating technological advancements into various aspects of operations and management. Studies by (Buttle, F., 2018) and (Dehnert M, Schumann J., 2022) emphasize the significance of strategic planning in leveraging digital technologies for competitive advantage within the industry.

The adoption of digital technologies, such as AI, blockchain, and big data analytics, is highlighted in the works of (Kovari, A., & Katona, J., 2023) as transformative tools in enhancing operational efficiency, customer engagement, and risk management within banking institutions.

Moreover, the strategic implications of digital transformation on organizational structure, leadership, and culture are explored by (Türkmen E, Soyer A., 2020). They emphasize the need for adaptive leadership and a culture of innovation to successfully navigate the digital landscape.

Additionally, (Li, F., 2020) discuss the challenges and opportunities associated with cybersecurity and regulatory compliance in the context of digital banking strategies, stressing the crucial role of robust risk management frameworks.

Overall, the literature underscores the pivotal role of strategic management in orchestrating the seamless integration of digital technologies (Varga J., 2021) within the banking sector, shaping competitive positioning, operational efficiency, and customer-centricity.

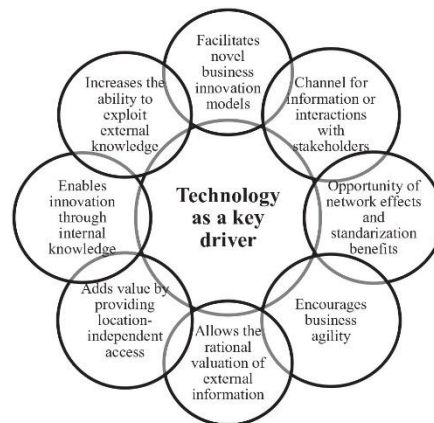


Figure 2

CRM conceptual model of software revenue estimates

Source: own editing

The benefits of integrating technology into business strategies are numerous and impactful:

- **Enhanced Efficiency and Productivity:** Technology streamlines processes, automates tasks, and reduces manual effort, leading to increased productivity and faster operations.
- **Improved Decision-Making:** Access to real-time data and analytics empowers businesses to make informed decisions, enabling them to adapt quickly to market changes and make strategic choices.
- **Expanded Reach and Market Penetration:** Technology facilitates global outreach, breaking geographical barriers and allowing businesses to reach wider audiences, fostering growth opportunities.

- Better Customer Engagement: Technology enables personalized interactions with customers, enhancing customer experiences, and building stronger relationships through various communication channels.
- Cost Savings: Efficient use of technology reduces operational costs, minimizes errors, and optimizes resource utilization, contributing to overall cost savings.
- Innovation and Competitive Edge: Embracing technology fosters innovation, enabling businesses to stay ahead of the curve, adapt to industry trends, and maintain a competitive edge.
- Flexibility and Adaptability: Technology offers flexibility in operations, allowing businesses to scale, pivot, and adapt to changing market demands more effectively, advanced technology provides robust security protocols, safeguarding sensitive business data and minimizing cybersecurity risks.
- Streamlined Communication and Collaboration: Tools and platforms facilitate seamless communication and collaboration among teams, fostering synergy and efficiency in operations.
- Sustainability and Environmental Impact: Technology enables the implementation of eco-friendly practices and solutions, contributing to sustainability efforts and reducing environmental footprints.

Integrating technology into business strategies presents multifaceted advantages that significantly contribute to a business's growth (Gunarathne N, KH Lee 2021), resilience, and competitive stance in the market.

Customer relationship management is essential to the success of any organisation, regardless of industry or size. Here are a few reasons why it's important to have a solid customer relationship management strategy:

- Increase revenue: Effective customer relationship management can help increase revenue by improving satisfaction and retention of existing customers, as well as identifying new business opportunities and converting prospects.
- Increase customer loyalty: Good customer relationship management can improve the customer experience, making customers feel better about your products or services and more likely to return to you for future purchases.
- Improve operational efficiency: Customer relationship management can help streamline internal processes by improving communication between departments and systems, which can save time and resources.
- Identifying problems and opportunities: Good customer relationship management can help identify problems in a timely manner and implement solutions to avoid problems in the future. It can also help identify

opportunities to improve your products or services and increase customer satisfaction and loyalty.

- Increasing reputation: Effective customer relationship management can help increase your reputation by improving the customer experience and promoting your products or services positively to the general public (Guerola-Navarro, et al., 2021).

The majority of past research has centred on the perspectives of bank employees regarding the shift towards digital transition. By categorizing their findings around the central theme and the factors influencing employees' acceptance of digital transformation, the core concepts identified include change, the Technology Acceptance Model (TAM), skills of e-banking employees, and strategic considerations. An essential element crucial to embracing digital transition, much like in any new and distinct scenario, revolves around effective change management strategies.

### **3 Research Method**

Research methods employed in investigating strategic management approaches in the banking sector, particularly concerning the adoption of digital technologies, encompass diverse approaches for comprehensive analysis and insights.

Quantitative methods, as observed in studies by (Bican, P.M.; Brem, A., 2020), often involve data-driven analyses leveraging large datasets. These studies employ surveys, statistical analyses, and quantitative models to quantify the impact of digital technology adoption on key performance indicators (KPIs) such as profitability, customer satisfaction, and market share.

Qualitative methods, as evidenced by (Kovari, A., & Katona, J., 2023), delve into the nuances of strategic decision-making processes and organizational dynamics. These studies often employ interviews, case studies, and content analysis to explore managerial perceptions, organizational culture shifts, and leadership strategies in response to digital transformations.

Mixed-method approaches, highlighted by (Csiszárík-Kocsir, Á., & Garai-Fodor, M., 2018), offer a comprehensive understanding by combining both quantitative and qualitative techniques. These studies integrate surveys or data analysis with in-depth interviews or focus groups, providing a holistic view of strategic management approaches and their outcomes in the digital banking landscape.

Additionally, action research methodologies, involve collaborative engagement with banking institutions to implement and evaluate strategic changes. These studies focus on iterative cycles of planning, implementation, reflection, and adaptation, fostering practical insights into effective strategic management in the

digital era. Overall, researchers in this field employ a range of research methods to comprehensively examine strategic management approaches in the banking sector concerning the adoption of digital technologies, aiming to offer nuanced insights into the complex dynamics of this evolving landscape.

## 4 Results

The article aims to pinpoint the primary reasons for non-compliance with strategic management approaches in the banking sector, specifically in the context of digital technology adoption. By analyzing these factors, we hope to determine their root causes using relevant management tools. The findings from this analysis will provide insight into the adoption of digital technologies in the banking sector and the main reasons for their occurrence.

The report conducted by Forrester Research discovered that businesses that have a high level of CRM maturity experience a 33% lower customer churn rate compared to those that have a low level of CRM maturity. This finding indicates that implementing an effective customer relationship management strategy can result in a significant reduction in customer churn.

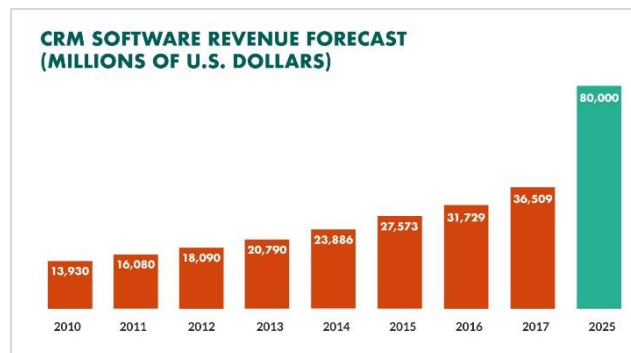


Figure 3  
CRM software revenue estimates  
Source: Gartner (2018)

Gartner's report on "Improving Customer Experience" emphasizes that a satisfying customer experience is crucial to CRM. Every interaction a customer has with an organization, regardless of the channel used, presents an opportunity to form an impression - positive, negative, or neutral. Over time, these experiences collectively shape the customer's perception of the brand and its values.

Organizations that take their CRM seriously prioritize the delivery of exceptional customer satisfaction. They understand that a negative experience can drive

customers away, while a positive one can foster loyalty. A comprehensive view of each customer is essential to achieving this goal. This includes information such as contact details, previous interactions with the organization, and the status of open issues - each of these factors contributes to ensuring compliance with GDPR regulation.

This data serves the purpose of overseeing, gauging, and monitoring marketing, sales, and customer service endeavours connected to with each customer - leading to greater customer loyalty and an improved customer experience. By centralizing all customer information, a CRM system eliminates silos and finger-pointing. Sales, Marketing, and Customer Service all have access to the same information, providing a complete 360-degree view of the customer. This, in turn, leads to better collaboration and communication across the organization.



Figure 4  
360-degree view of a customer  
Source: Superoffice.com (2022)

Investment in technology stands as a cornerstone for effective customer relationship management within the banking sector. Advancements in systems and platforms, such as intuitive mobile apps, chatbots, and automated customer support, facilitate seamless communication and interaction with customers. Accenture's survey underscores technology's positive impact, with 87% of consumers acknowledging its enhancement of brand experiences.

Implementing loyalty and rewards programs emerges as another pivotal strategy to boost customer satisfaction and loyalty. These programs, offering personalized perks like service discounts or exclusive access, significantly influence customer recommendations, as revealed by Bond Brand Loyalty's study.

Monitoring customer satisfaction and feedback remains essential. Regular surveys, social media monitoring, and analytics tools aid in assessing the customer experience. Qualtrics' survey emphasizes the critical role of customer feedback, with 80% of customers acknowledging its importance in enhancing brand experiences. Overall, these practices form the foundation of effective customer relationship management, fostering increased satisfaction and loyalty in the

banking sector. Personalization, effective communication, technology utilization, loyalty programs, and feedback analysis are instrumental in improving customer relationships, consequently bolstering revenue and loyalty.

The role of Customer Relationship Management (CRM) in boosting sales and profitability within the banking sector is significant. CRM systems empower banks to collect, manage, and analyze customer information, leading to a better understanding of customer needs and preferences. Gartner's findings illustrate how improved service and satisfaction result in heightened loyalty, attracting new customers and retaining existing ones.

Moreover, CRM systems aid in identifying cross-selling and up-selling opportunities by analyzing customer data, and aligning offered products with customer needs. This targeted approach results in increased sales and revenue streams. Efficient sales process management is another area where CRM systems shine. Tracking customer interactions allows banks to optimize sales flow, improving efficiency and employee productivity. Forrester Research highlights how CRM systems contribute to increased sales and profitability by 75% for adopting banks.

Customer retention receives a substantial boost through CRM's proactive identification of high-risk customers. By offering personalized services and anticipating needs, banks enhance customer relationships, reducing churn. Bain & Company's study reflects a 27% higher customer retention rate for banks employing CRM systems.

Data and trend analysis further enhance CRM's impact. By interpreting market trends, banks can develop innovative products and services, tapping into new business opportunities. This adaptability is vital in boosting sales and profitability within the banking sector. Harnessing customer relationship management analytics stands as a pivotal strategy for driving sales and profitability in banking. This approach, encompassing enhanced satisfaction, identifying opportunities, efficient sales management, retention strategies, and trend analysis, offers competitive advantages and improved business outcomes.

The transformative impact of CRM systems is evident, especially in mobile CRM usage, where Nucleus Research reports a significant 65% achievement of sales quotas, compared to only 22% for non-mobile CRM users.

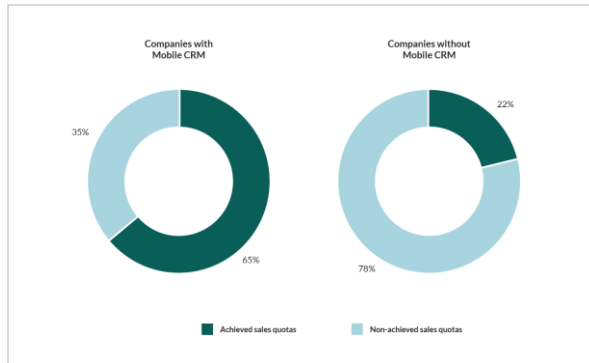


Figure 5  
The rise of mobile CRM  
Source: Superoffice.com (2022)

The worldwide mobile CRM market is expected to expand by 11%, reaching a \$15 billion valuation this year as businesses aim to engage with customers via mobile platforms. While the utilization of CRM on mobile devices currently lags behind that on laptops or desktops, the escalating adoption on mobile devices and tablets signifies that 81% of users now access their CRM software across multiple devices.

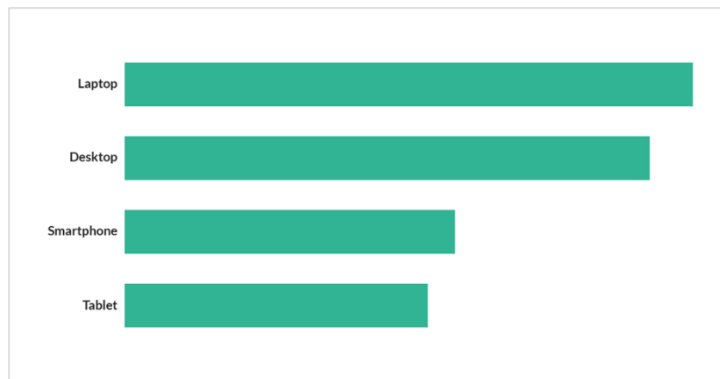


Figure 6  
Multi-device access  
Source: Superoffice.com (2022)

Social CRM facilitates detailed analysis derived from conversations across social media platforms, enabling businesses to craft more precise programs or initiatives aligned with customer interests and preferences. This approach allows for a better understanding of customer sentiments and behaviours, aiding in the creation of targeted activities that resonate effectively with the audience.



The escalating demand for accessing software across diverse devices and locations has significantly fueled the surge in cloud-based CRM adoption. Initially, back in 2008, only 12% of companies had embraced cloud-based CRM solutions. However, this figure has substantially surged over time, reaching an impressive 87% adoption rate presently.

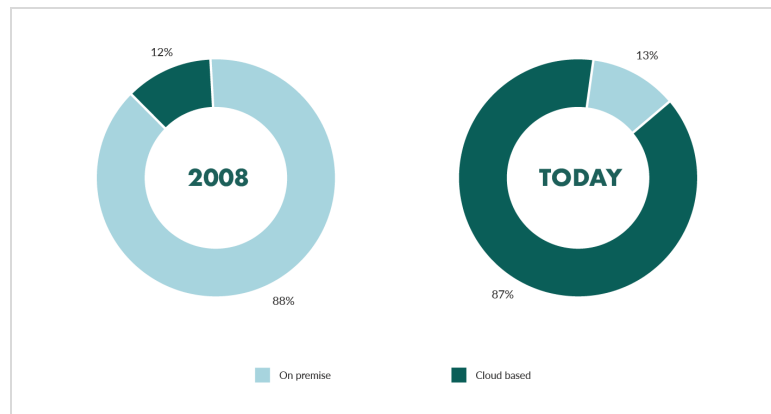


Figure 7  
The growth of cloud-based CRM solutions  
Source: Superoffice.com (2022)

Effective Customer Relationship Management (CRM) is a vital tool in the banking sector as it allows for the identification of high-risk customers and enables appropriate risk management (Buttle, F., 2018). The power of data collection and analysis is harnessed through a well-designed CRM system, which allows banks to gather and store customer information such as credit history, transaction details, and payment habits.

By carefully analyzing this data, banks can detect suspicious patterns and behaviours that may indicate high risk associated with certain customers or accounts.

FICO credit scores or FICO credit ranks are numerical representations that assess an individual's creditworthiness based on various financial factors. These scores, typically ranging from 300 to 850, help lenders evaluate the risk associated with extending credit to a person, with higher scores indicating better creditworthiness and lower risk for lenders.

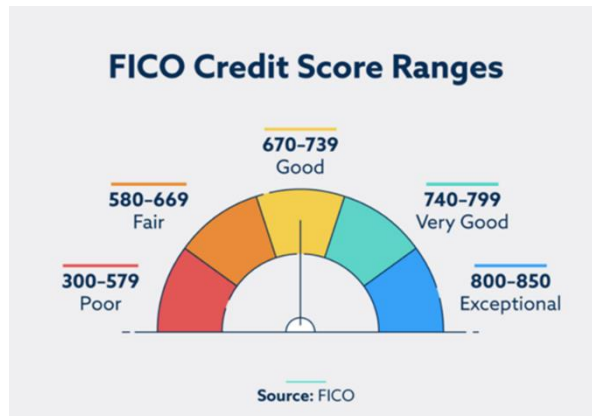


Figure 8  
Credit score intervals  
Source: Fico (2022)

Credit score assessment: CRM systems can integrate credit score assessment tools to analyse and assess the risk associated with customers. This involves analysing financial information and other relevant data to determine whether a customer is eligible for loans or other banking products. A low credit score may indicate a higher risk associated with that customer. According to a survey by Experian, 96% of financial institutions use credit scores to assess customers' risk and repayment capacity. According to the same survey, 90% of financial institutions consider credit score to be a critical factor in making lending decisions. Another survey by the Federal Reserve shows that credit scores have a significant impact on the cost and availability of loans, affecting interest rates and credit limits. According to the same study, 82% of consumers say their credit score has influenced their borrowing decisions and access to credit.

## 5 Discussion

The threat of cyber attacks presents a significant obstacle for both employees and executives to consider when adopting digital technologies. Unfortunately, many employees fail to recognize the potential consequences of such attacks. Bank executives are particularly concerned with how well the banking sector can comprehend and address cyber risks, as well as the ability of regulators to act as a safeguard against systemic threats (Neacșu N.A., Anton C.E., Baba C.M., Popescu A., 2023). Additionally, the shortage of qualified and specialized staff presents a severe challenge to addressing these risks. Finally, inadequate control procedures

for new and existing staff represent critical operational and systemic risk factors that must be addressed.

Based on the analysis of customer relationship management in the banking sector (Peelen, E., 2018), the following recommendations can be considered to enhance customer experience and improve overall performance:

- Improve data collection and management: Banking institutions should invest in technology infrastructure and data management systems to ensure efficient collection and integration of information from various sources. This will enable a better understanding of customers and support personalised services and offers.

- Ensuring data privacy and security: Banks need to adhere to stringent data protection regulations and employ advanced security protocols to safeguard customer information. Providing adequate training to employees in data protection and adopting appropriate policies and procedures will help increase customer trust in the institution.

- Integrate systems and platforms: Banks should consolidate and integrate their existing systems and platforms to have a complete and unified customer view. This will enable efficient management of customer relationships and better use of available data, fostering a customer-focused culture: Banks should develop a customer-focused mindset at all levels of the organisation. This can be achieved by training employees in analytics using the right tools and technologies to harness the benefits of customer relationship management analytics, and use effective communication channels: Banks should identify customer-preferred communication channels and use them effectively to provide relevant and personalised information. Appropriate communication tailored to customer needs and preferences will increase customer engagement and satisfaction.

- Monitor and measure results: Banks need to implement robust systems to monitor and measure the results achieved through customer relationship management analysis. This will allow them to assess the effectiveness of strategies and adjust marketing and sales activities according to the results achieved.

By implementing these recommendations, banking institutions can improve customer relationships, increase customer satisfaction and optimise overall performance in the banking sector.

## **Conclusions**

In this paper, we have addressed the analysis of customer relationship management in the banking sector and investigated the impact of this approach on the efficiency and effectiveness of customer relationship activities. By assessing the benefits and challenges associated with the implementation and use of customer relationship management analytics, we have reached relevant

conclusions that can be applied in practice to enhance the performance of banking organisations.

The results of this study have highlighted the multiple benefits of customer relationship management analytics in the banking sector. One of the most important findings is related to the personalisation of banking services and offers. By using data-driven analytics, banks can gain a deeper understanding of customer needs, preferences and behaviour, enabling them to offer individually tailored services and products, leading to increased customer satisfaction and loyalty.

Effective risk management is another key issue. By applying advanced data analytics technologies and algorithms, banks can monitor customer behaviour and transactions, identify risk patterns and indicators, develop predictive and risk assessment models, and make informed and timely decisions on lending, portfolio management and the implementation of risk mitigation measures. This enables banking institutions to identify high-risk customers (Sund K J, Bogers M L, Sahramaa M., 2021) and implement effective risk management strategies.

Customer relationship management analysis also contributes significantly to increasing the efficiency and effectiveness of marketing and sales efforts in the banking sector. Using data-driven analytics, banks can identify high-potential customer segments, develop tailored marketing strategies, improve lead generation and qualification, and use effective communication channels tailored to customer preferences. Monitoring and measuring results enables continuous adjustment and optimisation of marketing and sales activities.

Based on these conclusions, we can state that customer relationship management analytics is a key approach for the banking sector, with multiple long-term benefits. By personalising services, effectively managing risk and improving marketing and sales activities, banking institutions can achieve significant increases in customer satisfaction and loyalty, financial performance and profitability, operational efficiency and productivity, identify and capitalise on revenue growth opportunities, and improve data-driven decision-making. By continually adapting to market changes and customer needs, banking institutions can ensure a sustainable competitive advantage and a strong market position.

### **Acknowledgement**

Expressing profound gratitude to the teacher for her unwavering patience and insightful feedback presents a heartfelt challenge. Her guidance has been invaluable in my learning journey. Equally, my heartfelt thanks extend to the participants whose contributions enriched this study, offering invaluable results for thorough analysis. Their involvement has been instrumental, in shaping the depth and quality of this research endeavour. These expressions of gratitude

underscore the significance of collective support and collaboration in academic pursuits.

## References

- [1] Akram, U., Fülöp, M. T., Tiron-Tudor, A., Topor, D. I., & Căpușneanu, S. (2021), Impact of digitalization on customers' well-being in the pandemic period: Challenges and opportunities for the retail industry, *International Journal of Environmental Research and Public Health*, 18(14), pp.7533.
- [2] Al-Faihani M., Al-Alawi A. I., (2020), A Literature Review of Organizational Cultural Drivers Affecting the Digital Transformation of the Banking Sector, In 2020 International Conference on Data Analytics for Business and Industry: Way Towards a Sustainable Economy (ICDABI) pp. 1-6. IEEE.
- [3] Bellardini L., Del Gaudio B. L., Previtali D., Verdoliva V. (2022), How do banks invest in fintechs? Evidence from advanced economies, *Journal of International Financial Markets, Institutions and Money*, 77, 101498.
- [4] Bican, P.M.; Brem, A., (2020), Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable “Digital”, Sustainability.
- [5] Bouncken, R. B., Kraus, S., & Roig-Tierno, N. (2021), Knowledgeand innovation-based business models for future growth: Digitalized business models and portfolio considerations, *Review of Managerial Science*, 15(1), pp.1–14.
- [6] Buttle F., (2018), *Customer Relationship Management: Concepts and Technologies*, Routledge.
- [7] Buttle F., (2008), *Customer Relationship Management (Second Edition)*, London: Taylor & Francis Group.
- [8] Choudhury, M. M., & Harrigan, P., (2014), CRM to social CRM: The integration of new technologies into customer relationship management, *Journal of Strategic Marketing*, 22(2), pp.149-176.
- [9] Csiszárík-Kocsír, Á., & Garai-Fodor, M. (2018), Miért fontos a pénzügyi ismeretek oktatása a Z generáció véleménye alapján?, *Polgári Szemle: Gazdasági és Társadalmi folyóirat*, 14(1-3), pp.107-119.
- [10] Dapp T. F., (2017), Fintech: the digital transformation in the financial sector. In *Sustainability in a digital world* pp. 189-199, Springer, Cham.
- [11] Dehnert M, Schumann J., (2022), Uncovering the digitalization impact on consumer decision-making for checking accounts in banking, *Electronic Markets*, 1-26.

- [12] Deloitte (2020), Digital Banking Maturity 2020. Available at: <https://www2.deloitte.com/ce/en/pages/financial-services/articles/digital-banking-maturity-2020.html>.
- [13] Gunarathne N., Lee K.H. (2021), The link between corporate energy management and environmental strategy implementation: Efficiency, sufficiency and consistency strategy perspectives, *Journal of Cleaner Production*.
- [14] Kotler, P. (2009), *Marketing Management*, Pearson Education.
- [15] Kovari, A., & Katona, J. (2023), Effect of software development course on programming self-efficacy, *Education and Information Technologies*, 1-27.
- [16] Lanzolla, G., & Anderson, J. (2008), Digital transformation, *Business Strategy Review*, 19(2), pp. 72–76.
- [17] Li, F. (2020), The digital transformation of business models in the creative industries: A holistic framework and emerging trends, *Technovation*, 92, 102012. <https://doi.org/10.1016/j.technovation.2017.12.004>.
- [18] Neacșu N.A., Anton C.E., Baba C.M., Popescu A. (2023), Financial and Banking Education of Consumers in the Context of Sustainable Development Society, Sustainability.
- [19] Peelen, E. (2018), *Customer Relationship Management*, Pearson Education Limited.
- [20] Peelen, E., & Beltman, R. (2013), *Customer Relationship Management*, Pearson Education Limited.
- [21] Sund K, J., Bogers M L, Sahramaa M (2021), Managing business model exploration in incumbent firms: A case study of innovation labs in European banks, *Journal of Business Research*, 128, pp.11-19.
- [22] Türkmen E., Soyer A., (2020), The Effects of Digital Transformation on Organizations, In *Handbook of Research on Strategic Fit and Design in Business Ecosystems*, pp. 259-288.
- [23] Varga J., (2021), Defining the economic role and benefits of micro small and medium-sized enterprises in the 21st century with a systematic review of the literature, *Acta Polytechnica Hungarica*.

# Thematic Analysis on Immersive Technologies and Metaverse in Tourism

**Pipih Nurjamilah**

Corvinus University of Budapest, pipih.nurjamilah@stud.uni-corvinus.hu

*Abstract: Even though immersive technologies have been studied for decades across many disciplines, research on metaverse attracted increased attention in recent years, including tourism research. This raised the question how interest in immersive technologies, namely Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), and Extended Reality (XR) evolved into metaverse research. This study used bibliometrics analysis to explore the evolution of these technologies by identifying conceptual structures and analysing trending topics and thematic evolution, as well as assembling a thematic map in relation to the tourism field. The study has resulted in three main findings: a) the term metaverse emerged as a prominent and trending topic by the year 2023, while three years prior publications were dominated by augmented reality, virtual reality, mixed reality, and virtual tourism; b) the thematic evolution of metaverse can be traced back to immersive technology terms in two time intervals: 'augmented reality' and '3D virtual world' in the period of 1995-2010 and 'augmented reality' along with 'mixed reality' during 2011-2021; c) the thematic map has pointed out that metaverse research is considered to be a basic theme although it is still underdeveloped in certain research areas of tourism.*

*Keywords: metaverse; immersive technology; augmented reality; mixed reality; tourism; bibliometrics.*

## 1 Introduction

The constant evolution of information and communication technology (ICT) goes hand in hand with its growing role in the tourism industry, driven by the need to adapt to the fluctuating landscape of market changes and business innovation (Gössling, 2021). Tourism has been utilizing the opportunities offered by ICT starting from the early days of Personal Computers through the invention of the Internet and then social media (Anand, 2013). Recently, the concept and application of metaverse appeared in tourism (Go & Kang, 2023) Metaverse is defined as a reality beyond our current universe where the difference between physical and virtual worlds are blurred (Mystakidis, 2022). Metaverse in tourism acts as a visualized imagination before the trip as an anticipation of will-be-visited destination and during the trip when visiting historical sites in curiosity of what

happened between the ancient monuments and ruins (Dwivedi et al., 2022a). Metaverse has a potential to fulfill tourists' demand on complementary aspects in the trip or even acts as an alternative virtual trip (Volchek & Brysch, 2023).

Metaverse tourism research is gaining momentum especially after the pandemic where virtual tourism grew in demand due to physical distancing (Bilińska et al., 2023), travel anxiety, and fear of missing out (FOMO) (Zaman et al., 2022). However, research on metaverse tourism is still considered to be in its infancy as highlighted by Buhalis et al. (2023). Formerly, literature review on immersive technology in tourism have been conducted in relation to several issues such as AR/VR features of digital presence, immersion, interactivity and vividness (X. Fan et al., 2022), marketing tool, heritage preservation, education, tour guidance, and navigation (Pratisto et al., 2022). Therefore, it is important to understand how research in ICT tourism especially immersive technology leads to metaverse tourism. This study aims to fill this gap by mapping the evolution of immersive technologies that lead to the existence of metaverse by identifying the correlation of conceptual structures between current immersive technology and metaverse.

In order to have a comprehensive understanding of the emergence and progression of research on the question of metaverse in the area of tourism, this research has utilized the bibliometrics analysis method. Bibliometrics is typically used for the purpose of creating a better view and predictions of the information and evolution of research in a subject area (Burton, 1988). The results show that immersive technology in tourism already became a trend during the last few years eventually leading to metaverse in 2023. Regarding its historical roots, thematic evolution for the last two decades shows that metaverse comes from the term augmented reality. Furthermore, Metaverse is supported by two main immersive technologies, namely AR and VR and currently has a key role in cultural heritage and tourism marketing.

The paper is divided into six sections, where section 2 reveals the history of ICT in tourism, literature of the metaverse and bibliometrics. Section 3 highlights the methodology followed by the findings of trending topics, thematic map, and thematic evolution in section 4. Finally, discussion and conclusion are presented in section 5 and 6 respectively.

## **2 Literature Review**

### **2.1 ICT and Tourism**

The history of ICT in tourism began in the 1980s when technology pioneers such as Apple and Microsoft initiated the mass production of personal computers. This started ICT adoption by the tourism industry in several areas including sharing travel information, providing consultations, management, marketing, and



suppliers-customers relationships (Poon, 1988). Subsequently, in the mid-1990s, with the advent of the internet and search engines, ICT has changed tourism drastically through the increase of tool choices for development, management and marketing of products and destinations, as well as further strengthening suppliers-customers interactions (Buhalis & Law, 2008). Approximately a decade later, social media was introduced with elaborated functions of user engagement (Pencarelli, 2020). The year 2007 marked a significant milestone with the emergence of smartphones accompanied by the widespread collection of user data on a global scale that led to the foundation of personalized services (Gössling, 2021). During this era, tourism suppliers took advantage of innovative tools such as location-based recommender system and mobile payment to facilitate tourists to easily plan their trip with the possibility of spontaneous change on the go (Law et al., 2018). The next phase was the concept of 'Tourism 4.0' that emerged in response to the advancements of Industry 4.0 technology (Stankov & Gretzel, 2020) that include big data, Artificial Intelligence (AI), Internet of Things (IoT), cloud computing, Virtual Reality (VR), and Augmented Reality (AR) (Bilotta et al., 2020).

## **2.2 The metaverse**

Metaverse is defined as three-dimensional (3D) virtual spaces that enhance social interactions among users (Gursoy et al., 2022) in an immersive environment using AR or VR devices where users are represented as avatars that have the ability to move seamlessly between physical and virtual worlds (Dwivedi et al., 2022b). It is argued that metaverse may change the entire definition of tourism by offering advanced tools and enhanced experience (Volchek & Brysch, 2023). The reason is due to the ability of metaverse to imitate, intensify, interact, and integrate physical and virtual tourism surroundings (Yang & Wang, 2023). For instance, a unique capability of such solutions is the so called 'time machine tour' where it is possible for tourists to visit historical periods in the past (Monaco & Sacchi, 2023) in a 4D (3D space + time) setting.

Furthermore, several studies on tourism metaverse frameworks and developments have been carried out. Suanpang et al. (2022) developed Extensible Metaverse as an open source system that enables developers to create, modify and express their ideas across metaverse platforms. Wei (2022) proposed Gemiverse that functions as an education and training space for tourism professionals and soon to be the first tourism university in the Metaverse. An immersive cultural heritage framework is developed to deliver historical figures in the metaverse (Z. Fan et al., 2022). Lastly, marine tourism specifically surfing can be experienced virtually in the metaverse (Yoon et al., 2022).

Prodingler & Neuhofer (2023) mention that by 2030, the potential integration of physical and virtual worlds in the metaverse could lead to three scenarios: interconnected living, working, and traveling activities; conventional tourism as

an escape from the high digital use of daily life and work; and/or virtual tourism spaces becoming the first option while natural destinations act as extensions:

1. The first scenario is the integration of the physical and virtual realms that allow individuals to seamlessly participate in various activities in both worlds, offering flexibility in how and where they live, work, and travel. For instance, when an individual decides to visit a place, before the trip s/he can visit the destination in metaverse beforehand to “feel” the atmosphere and find information on what to bring and wear. During the trip, the AR devices can enhance the experience with historical tour throughout the place, or holographic entertainment such as art exhibitions or concerts. After the trip, those experiences are available to be revisited at home.
2. The second scenario indicates that some individuals may seek conventional tourism experiences as a means of disconnecting from the digital world and reconnecting with the physical environment. When the internet becomes immersive where individuals spend most of their activities in the metaverse, it is important to maintain physical and mental health by staying away for a while. A Digital-Free trip can be an escape and refreshing way to disconnect from virtual life and reconnect with people and nature in real life.
3. Lastly, advanced virtual reality technologies could make virtual tourism the preferred option, providing realistic and immersive experiences that rival natural destinations. A trip in metaverse can be more sustainable since, for instance, it has less environmental footprints and the experiences can be beyond imagination. Spending time on planet Mars, swimming with sharks and piranhas, or going back to the Roman era is possible.

However, it is important to recognize that these scenarios and the actual outcome may involve a combination of these possibilities or even something entirely different.

Similar to prior technologies, metaverse has advantages and disadvantages that influence tourists’ preferences about engaging in activities either within the metaverse or in-person (Cheng et al., 2023). While metaverse has the potential to provide sustainable tourism related to preserving nature, environment, and cultural heritage (Go & Kang, 2022), a few threats also need to be mentioned including privacy and security concerns. These resulted in an increased necessity for governance, policy, and regulation (Koohang et al., 2023).

As augmented and virtual tourism may grow into metaverse tourism, a few questions arise:

1. What were the trending topics of immersive technology in tourism over the years?
2. Which immersive technologies has lead into metaverse tourism research?

3. What are the key concepts in relation to metaverse in Tourism?
4. How are the key concepts related to each other?

This study will address these questions using bibliometrics analysis as described in the next section.

### **3 Methodology**

The methodology used in this study is bibliometrics which defined as an analysis using available digital information along with certain tools and techniques to create information of publication volume, authors, subject areas, and many more (Burton, 1988). The procedure of bibliometrics analysis include defining the aims and scope of the study, choosing the technique, collecting data, analyzing, and reporting the finding (Donthu et al., 2021).

The goal of this research was to address the questions raised above and the techniques chosen were identification of trending topics (based on keyword analysis), thematic evolution, and thematic map analysis.

#### **3.1. Data Collection**

The data for this study was retrieved on 7 October 2023, from Scopus database including all available documents from all years since 1995. The data collection was conducted using keywords that are related to immersive technology and metaverse tourism. The search query used as follows: ("*augmented reality*" OR "*virtual reality*" OR "*mixed reality*" OR "*extended reality*" OR *metaverse*) AND *tourism*". The data consist of number of publication and citation, country origins, subject areas, and many other necessary information limited to English only documents.

The total documents retrieved was 838 and exported into CSV Excel along with detailed information of: (1) citation information (authors, authors ID, document title, year, EID, source title, volume, issue, pages, citation count, source and document type, publication stage, DOI, open access), (2) bibliographical information (affiliation, serial identifiers, PubMed ID, editors, language of original document, correspondence address, abbreviated source title), (3) abstract and keywords (abstract, author keywords, index keywords), (4) include references.

Description	Results
Timespan	1995-2024
Documents	838
Annual Growth Rate %	1
Average citations per doc	17.05
Authors	2370
Author's Keywords (DE)	2161
Single-authored documents	96
Co-Authors per Doc	3.38
International co-authorships %	21.39

Table 1.  
Main sample information

The detailed information of data collection is shown in Table 1 including the time span, annual growth, document specifics, author information, and citations. The results of basic statistical analysis are visualized and interpreted in Figure 1.

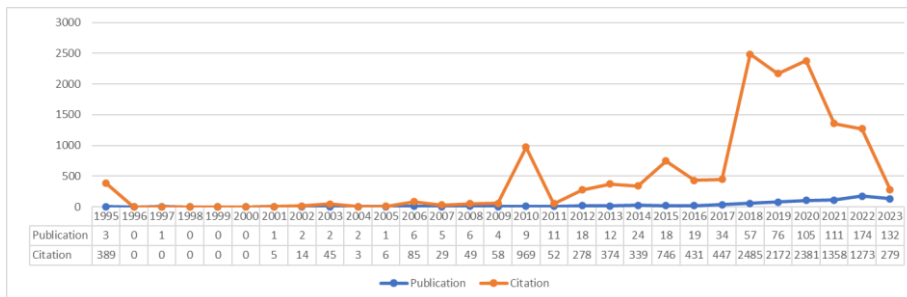


Figure 1.  
Annual volume of publications and citations of AR, VR, MR, XR, and Metaverse in Tourism 1995-2023.

In Figure 1, the publications on AR, VR, MR, XR, and Metaverse Tourism before 2010 were scarce. In the period following that, the number of publications experienced a fluctuating growth until 2016 then substantially increased until reaching its peak in 2022 with 174 papers. The publications in 2023 do not represent the whole year, since the data used is up until October that year. The number of citations is more fluctuating throughout the period, spanning from zero to 2,485. This high number shows the popularity of the topics.

### **3.2. Data cleaning and techniques of analysis**

Data analysis begins with data cleaning as an essential step in the data preprocessing phase, aiming to eliminate irrelevant information from a dataset. In the context of this study, data cleaning was performed to remove incomplete document details, such as entries lacking author names, as well as unrelated keywords. The next step is the process of combining synonymous terms and abbreviations to enhance consistency and improve the quality of the dataset. By executing thorough data cleaning procedures, researchers can ensure the integrity and usability of the dataset, enabling more accurate and effective analysis and interpretation.

The next step is scientific mapping which is conducted through co-word analysis. This technique is used to find research themes and their relation in the structure and centrality (Qin, 1999), using keyword co-occurrence that relies on the frequency of keyword appearances to measure which topics or areas of publication activity are more prevalent than others. Keyword analysis is useful to grasp the trending topic of research (Cobo et al., 2011) Here it is based on 2 criteria: word minimum frequency and number of words per year. Thematic evolution is the analysis of conceptual structures across diverse time intervals to see how different terms change over time. Thematic maps are used to visualize the characteristics of selected properties and their relationships as patterns. The characteristics illustrated within the map may consist of a wide variety of properties of interest to the researcher – in this case density and centrality were selected. Density measures the links strength between clusters, while centrality measures the links intensity between clusters (Callon et al., 1991). Density and centrality represent the cluster topic development and significance respectively (Hanaa & Abdul, 2023).

Data analysis and visualization was conducted using Biblioshiny, bibliometrix R package. Biblioshiny is a user-friendly web interface that facilitates the utilization of the bibliometrics package within the R analysis software. This innovative tool allows researchers to easily conduct bibliometric analysis and gain valuable insights from scholarly literature data, enhancing the understanding of research trends and patterns (bibliometrix.org).

## **4 Results**

### **4.1. Trending topics on immersive technology and metaverse tourism research**

Keyword analysis is a valuable tool for understanding the current trends within a research topic (Cobo et al., 2011). In Figure 2, the shifting patterns of trending keywords are presented, determined by two parameters: the minimum word

frequency and the number of words per year, both set at 20. This configuration reveals trends spanning from 2016 to 2023. Immersive technology has received significant attention in recent years. In 2020 the term “augmented reality” took the spotlight, while the following year was dominated by “virtual reality” and “mixed reality”, followed by “virtual tourism” in 2022. The term evolved into metaverse in 2023 and remains the only trending topic for the entire year.

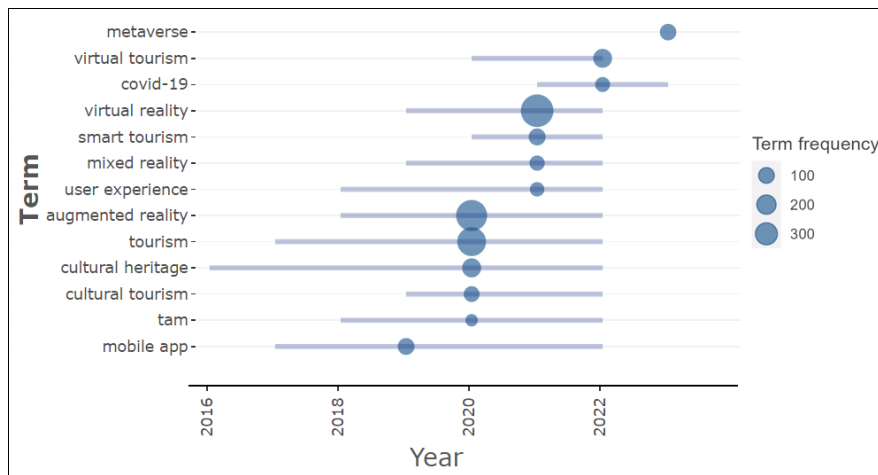


Figure 2.

Trending topics of immersive technology and metaverse tourism.

Even though the research on metaverse in tourism is still limited in numbers, a few issues have been appointed including metaverse concept (Gursoy et al., 2022) (Buhalis et al., 2023b) (Koo et al., 2022), opportunities and challenges (Koohang et al., 2023), metaverse and sustainable tourism (Go & Kang, 2022), and cultural heritage (Z. Fan et al., 2022).

#### 4.2. Thematic evolution analysis and conceptual structure on immersive technology and metaverse tourism research

Thematic evolution is the analysis of conceptual structure across diverse time intervals to see how different terms change over time. The parameters assigned were minimum cluster frequency which was set at 10 and number of words per year was set at 100. Aiming to understand the evolution, the period is sliced into two sub-periods. As apparent from figure 3, the word ‘metaverse’ can be traced back to ‘augmented reality’ and ‘mixed reality’ in the period of 2012-2021, and ‘augmented reality’ and ‘3d virtual world’ in the period of 1995-2011.

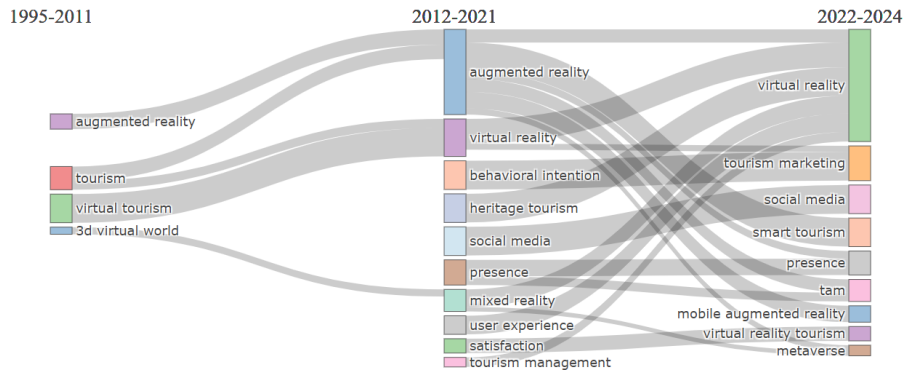


Figure 3.

Thematic evolution of immersive technology and metaverse tourism

In the first period, there are nine studies assigned to augmented reality which all of them focused on application development. Park et al. initiated a software and hardware design of an immersive tour for cultural tourism that can be accessed in the sites (2006), followed by a walking tour application development with audio and video narratives to promote cultural sites and reduce over tourism in certain areas of Venice (Epstein & Vergani, 2006). In 2009, the research started to turn into mobile AR application (Haveri & Mattila). The next year, the development was improved by additional 3D arrows visualization that enables estimation of nearby objects positions (Schinke et al., 2010) and AR catalogue to navigate tourists and allow the experience to be revisited in the post-trip (Lashkari et al., 2010). In 2011, AR applications were explored wider on mobile AR for hotel (Bernardos et al., 2011), AR website for destination promotion (Hsu, 2011), mobile application for island tourism (Lim et al., 2011), and edutainment application for city tour (Dingli & Seychell, 2011).

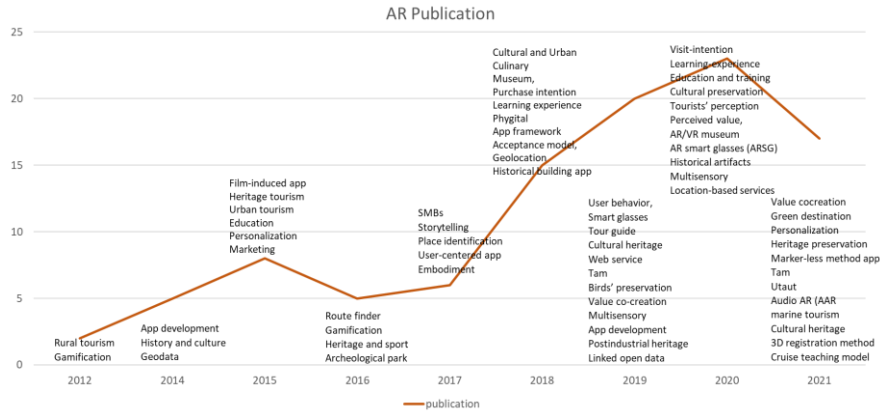


Figure 4. Main topic studies on AR period 2012-2021

In the second period, AR studies continuously aimed on application development and adoption behaviors. Figure 4 shows the main themes of AR research from 2012 until 2021 which were dominated by application development in the beginning and gradually increased in theory.

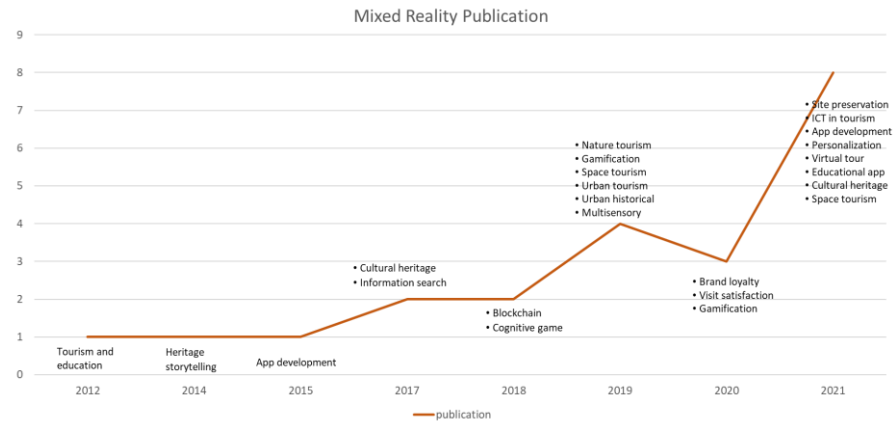


Figure 5. Main topic studies on mixed reality period 2012-2021

Mixed reality in the second period has 24 studies with diverse themes as represented in figure 5. The study range is wide including: a) empirical studies such as relation of MR and cognitive processing on users' behavior (Raptis et al., 2018) and MR and brand loyalty of cultural heritage (Bae et al., 2020), b) theoretical contribution mentioned immersive technologies for tourism (Karadimitriou, 2019), MR for urban historical places (Dai & Li, 2019), and



concept of how historical site virtually reconstructed (Bec et al., 2021), and c) artefactual papers focus on gamification in educational tourism (Perez-Valle & Sagasti, 2012), a framework to design MR heritage tourism based on co-design method (O’Keefe et al., 2014), reconstructing lost historical building into virtual 3D objects in a physical UNESCO World Heritage site (Okura et al., 2015), storytelling framework of cultural heritage (Elrawi, 2017), application development of location-based tourism information (Kasinathan et al., 2017) proposed a system design for space tourism (Basu et al., 2019) (Basu et al., 2021), and immersive museum visit (Trunfio et al., 2020).

MR studies are rooted from ‘3D virtual world’ in the first period with four papers available. The first study in 2007 was reusable virtual reality framework to build tour guide desktop application with storytelling (Fuertes et al., 2007). Gärtner et al., proposed 3D e-tourism application prototype as an e-marketplace of tourism (2008) (2010). Lastly, a model of virtual UNESCO historical and artistic heritage was proposed Menghi et al. (2011).

### 4.3. Thematic map analysis and conceptual structure on immersive technology and metaverse tourism research

Thematic Map is based on keyword clusters resulted from co-word analysis (bibliometrix).

Cluster Number	Cluster	Rank Centrality	Rank Density	Frequency
1	augmented reality	8	1	773
2	virtual reality	7	6	541
3	metaverse	6	4	51
4	presence	5	7	50
5	user experience	4	5	32
6	mobile augmented reality	2	2,5	12
7	virtual reality technology	3	2,5	12
8	social media	1	8	8

Table 2.  
Thematic Map Clusters

Figure 6 represents clusters segmented by the selected density measures vs. centrality measures.

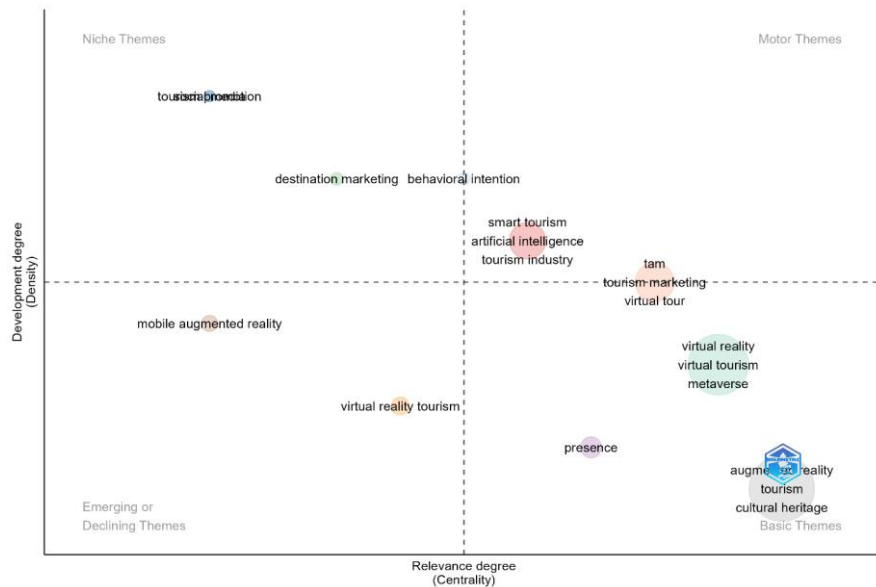


Figure 6.

### Thematic Map of immersive technology and metaverse tourism

The thematic map visualizes ten clusters of the keywords co-occurrence. The cluster's size represents words' quantity. Referring to the research conducted by Aria et al., (2022), the four quadrants can be described as follows:

- Motor themes (quadrant 1) high density and high centrality: the keywords are defined as well developed and strongly relevant in the field. Within this context, the analysis revealed three prominent motor themes which are *smart tourism*, *artificial intelligence*, and *tourism industry*.
- Basic themes (quadrant 2) low density and high centrality: the keywords are defined as underdeveloped and significant in different areas in the tourism field. The first keywords cluster contains *virtual reality*, *virtual tourism*, and *metaverse*. The second cluster contains *presence* while the third consists of *augmented reality*, *tourism*, and *cultural heritage*.
- Emerging or declining themes (quadrant 3) low density and low centrality: the keywords are defined as underdeveloped and somewhat significant, including: *mobile augmented reality* and *virtual reality tourism*.
- Niche themes (quadrant 4) high density and low centrality: the keywords are defined as highly developed but still insignificant, such as: *social media*, *tourism prediction* and *destination marketing*.

Several themes located in between quadrants such as *behavioral intention* that is considered as motor and niche themes, and *tam*, *tourism marketing*, and *virtual tour* are motor and basic themes.

## 5 Discussion

The evolution of metaverse as a term can be traced back to the research of three main themes, namely augmented reality, mixed reality, and 3D virtual worlds. Initially, the term “metaverse” appeared in a paper abstract in 2015, but then it did not become part of the mainstream as various forms of virtual reality were dominant for years.

Regarding trending topics, immersive technologies pushed forward significantly in 2020 until 2022. During those years, immersive technologies gradually led the way into the metaverse. Immersive technologies represent a group of interactivity tools that is one of six underlying technologies of metaverse components (Wang et al., 2023). This eventually led to the sudden resurface of the term ‘metaverse’ in 2022 – which then has become the only trending term throughout the year of 2023. By the end of 2023, metaverse studies in tourism turned their focus on concepts, opportunities, challenges, and recommendations for future research.

Consequently, it can be concluded that the metaverse in the tourism industry is just in its infancy, yet it is safe to say that it will continue to grow in the coming years. This is likely to be fueled by the integration of various streams of advanced ICT solutions.

### Conclusion and Future Work

This study explored the evolution of immersive technologies into metaverse and the relation of relevant key concepts to tourism research. The trending topics of the last ten years included various forms of virtual realities and immersive technologies which lead to the conclusion of metaverse becoming the key trending term throughout the year of 2023. Yet the research on the metaverse theme in tourism is still considered underdeveloped since it is still in the initial stage. However, it is already significant in certain areas of tourism research. There are many technological themes that remain to be explored in future studies including AI, blockchain, networking, digital twin, cloud, and edge computing. Further research also could enrich data collection from other databases such as the Web of Science.

## References

- [1] Anand, B. (2013). The role of ict in tourism industry. *Journal of Applied Economics . Library Journal*, 20(6), pp. 67–69.
- [2] Aria, M., Cuccurullo, C., D’aniello, L., Misuraca, M., & Spano, M. (2022). Thematic Analysis as a New Culturomic Tool: The Social Media Coverage on COVID-19 Pandemic in Italy. *Sustainability (Switzerland)*, 14(6), pp. 1–22. <https://doi.org/10.3390/su14063643>
- [3] Bae, S., Jung, T. H., Moorhouse, N., Suh, M., & Kwon, O. (2020). The influence of mixed reality on satisfaction and brand loyalty in cultural heritage attractions: A brand equity perspective. *Sustainability (Switzerland)*, 12(7). <https://doi.org/10.3390/su12072956>
- [4] Basu, T., Bannova, O., & Camba, J. D. (2019). Mixed reality architecture in space habitats. 70th International Astronautical Congress, IAC 2019, 2019-October. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85079168043&partnerID=40&md5=75d008b320c47b07ed54daa5579797e7>
- [5] Basu, T., Bannova, O., & Camba, J. D. (2021). Mixed reality architecture in space habitats. *Acta Astronautica*, 178, pp.548–555. <https://doi.org/10.1016/j.actaastro.2020.09.036>
- [6] Bec, A., Moyle, B., Schaffer, V., & Timms, K. (2021). Virtual reality and mixed reality for second chance tourism. *Tourism Management*, 83. <https://doi.org/10.1016/j.tourman.2020.104256>
- [7] Bernardos, A. M., Cano, J., Iglesias, J., & Casar, J. R. (2011). Mobile indoor augmented reality - Exploring applications in hospitality environments. 1st International Conference on Pervasive and Embedded Computing and Communication Systems, PECCS 2011, pp.232–236. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-80052508899&partnerID=40&md5=295df6bea3185527136acc2c914d2ddf>
- [8] Bilińska, K., Pabian, B., Pabian, A., & Reformat, B. (2023). Development Trends and Potential in the Field of Virtual Tourism after the COVID-19 Pandemic: Generation Z Example. *Sustainability (Switzerland)*, 15(3), pp.1–13. <https://doi.org/10.3390/su15031889>
- [9] Bilotta, E., Bertacchini, F., Gabriele, L., Giglio, S., Pantano, P. S., & Romita, T. (2020). Industry 4.0 technologies in tourism education: Nurturing students to think with technology. *Journal of Hospitality, Leisure, Sport and Tourism Education*, xxxx, 100275. <https://doi.org/10.1016/j.jhlste.2020.100275>
- [10] Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet-The state

- of eTourism research. *Tourism Management*, 29(4), pp.609–623. <https://doi.org/10.1016/j.tourman.2008.01.005>
- [11] Buhalis, D., Leung, D., & Lin, M. (2023a). Metaverse as a disruptive technology revolutionising tourism management and marketing. *Tourism Management*, 97. <https://doi.org/10.1016/j.tourman.2023.104724>
- [12] Buhalis, D., Leung, D., & Lin, M. (2023b). Metaverse as a disruptive technology revolutionising tourism management and marketing. *Tourism Management*, 97(June 2022), 104724. <https://doi.org/10.1016/j.tourman.2023.104724>
- [13] Burton, H. D. (1988). Use of a virtual information system for bibliometric analysis. *Information Processing and Management*, 24(1), pp.39–44. [https://doi.org/10.1016/0306-4573\(88\)90076-3](https://doi.org/10.1016/0306-4573(88)90076-3)
- [14] Callon, M., Courtial, J. P., & Laville, F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry. *Scientometrics*, 22(1), pp.155–205. <https://doi.org/10.1007/BF02019280>
- [15] Cheng, X., Zhang, S., Liu, W., & Mou, J. (2023). Understanding visitors' metaverse and in-person tour intentions during the COVID-19 pandemic: A coping perspective. In B. T.X. (Ed.), 56th Annual Hawaii International Conference on System Sciences, HICSS 2023 (Vols. 2023-Janua, pp. 554–562). IEEE Computer Society. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85149982526&partnerID=40&md5=39ef5445a6ecab7fed77c1cee38a6e3b>
- [16] Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, 62(7), pp.1382–1402. <https://doi.org/10.1002/asi.21525>
- [17] Dai, Y., & Li, J. (2019). Application research of mixed reality (MR) technology in urban historical features display. 3rd IEEE International Conference on Electronic Information Technology and Computer Engineering, EITCE 2019, pp.750–753. <https://doi.org/10.1109/EITCE47263.2019.9095081>
- [18] Dingli, A., & Seychell, D. (2011). Mobile edutainment in the city. In R. L., I. P., & S. I.A. (Eds.), IADIS International Conference on Mobile Learning 2011, ML 2011 (pp. 183–187). IADIS. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84944041369&partnerID=40&md5=88865c1f0b6cfef5396ee260f26f0a8f>
- [19] Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines.

*Journal of Business Research*, 133(April), pp.285–296.  
<https://doi.org/10.1016/j.jbusres.2021.04.070>

- [20] Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebabli, I., ... Wamba, S. F. (2022a). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 66(July), 102542. <https://doi.org/10.1016/j.ijinfomgt.2022.102542>
- [21] Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebabli, I., ... Wamba, S. F. (2022b). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 66(July). <https://doi.org/10.1016/j.ijinfomgt.2022.102542>
- [22] Elrawi, O. M. (2017). The use of mixed-realities techniques for the representation of islamic cultural heritage. 2017 International Conference on Machine Vision and Information Technology, CMVIT 2017, pp.58–63. <https://doi.org/10.1109/CMVIT.2017.16>
- [23] Epstein, M., & Vergani, S. (2006). Mobile technologies and creative Tourism: The history unwired pilot project in Venice, Italy. 12th Americas Conference on Information Systems, AMCIS 2006, 3, pp.1361–1369. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84870211156&partnerID=40&md5=25cdc2a94cba1120f12f4077c150f556>
- [24] Fan, X., Jiang, X., & Deng, N. (2022). Immersive technology: A meta-analysis of augmented/virtual reality applications and their impact on tourism experience. *Tourism Management*, 91. <https://doi.org/10.1016/j.tourman.2022.104534>
- [25] Fan, Z., Chen, C., & Huang, H. (2022). Immersive cultural heritage digital documentation and information service for historical figure metaverse: a case of Zhu Xi, Song Dynasty, China. *Heritage Science*, 10(1). <https://doi.org/10.1186/s40494-022-00749-8>
- [26] Fuertes, J. L., González, Á. L., Mariscal, G., & Ruiz, C. (2007). Developing virtual storytellers for the virtual alhambra. In 4th International Conference on Virtual Storytelling, ICVS 2007: Vol. 4871 LNCS (pp. 63–74). Springer Verlag. [https://doi.org/10.1007/978-3-540-77039-8\\_6](https://doi.org/10.1007/978-3-540-77039-8_6)

- [27] Gärtner, M., Seidel, I., & Berger, H. (2008). Agent mediated trading in a 3D e-tourism environment. 10th International Conference on Electronic Commerce 2008, ICEC'08. <https://doi.org/10.1145/1409540.1409559>
- [28] Gärtner, M., Seidel, I., Froschauer, J., & Berger, H. (2010). The formation of virtual organizations by means of electronic institutions in a 3D e-Tourism environment. *Information Sciences*, 180(17), pp.3157–3169. <https://doi.org/10.1016/j.ins.2010.03.010>
- [29] Go, H., & Kang, M. (2022). Metaverse tourism for sustainable tourism development: tourism agenda 2030. *Tourism Review*, 78(2), pp.381–394. <https://doi.org/10.1108/TR-02-2022-0102>
- [30] Go, H., & Kang, M. (2023). Metaverse tourism for sustainable tourism development: Tourism Agenda 2030. *Tourism Review*, 78(2), pp.381–394. <https://doi.org/10.1108/TR-02-2022-0102>
- [31] Gössling, S. (2021). Tourism, technology and ICT: a critical review of affordances and concessions. *Journal of Sustainable Tourism*, 29(5), pp.733–750. <https://doi.org/10.1080/09669582.2021.1873353>
- [32] Gursoy, D., Malodia, S., & Dhir, A. (2022). The metaverse in the hospitality and tourism industry: An overview of current trends and future research directions. *Journal of Hospitality Marketing and Management*, 31(5), 527–534. <https://doi.org/10.1080/19368623.2022.2072504>
- [33] Hanaa, S. M., & Abdul, A. P. (2023). A holistic approach to augmented reality-related research in tourism: through bibliometric analysis. *Journal of Hospitality and Tourism Insights*. <https://doi.org/10.1108/JHTI-08-2022-0369>
- [34] Haveri, M., & Mattila, J. (2009). Enhancing traveling experiences with augmented reality. 13th International Academic MindTrek Conference: Everyday Life in the Ubiquitous Era, MindTrek 2009, 215. <https://doi.org/10.1145/1621841.1621883>
- [35] Hsu, C. (2011). The feasibility of Augmented Reality on virtual tourism website. Proceedings - 4th International Conference on Ubi-Media Computing, U-Media 2011, pp.253–256. <https://doi.org/10.1109/U-MEDIA.2011.66>
- [36] K-Synth Srl. (2023). Bibliometrix. bibliometrix.org
- [37] Karadimitriou, C. (2019). From real to virtual: nature tourism insights. *International Journal of Spa and Wellness*, 2(2), pp.65–77. <https://doi.org/10.1080/24721735.2020.1770982>
- [38] Kasinathan, V., Mustapha, A., Seong, Y. C., & Abidin, A. Z. Z. (2017). Footprint: Tourism information search based on mixed reality. *International Journal on Advanced Science, Engineering and Information*

- Technology*, 7(4-2 Special Issue), pp.1504–1509.  
<https://doi.org/10.18517/ijaseit.7.4-2.3400>
- [39] Koo, C., Kwon, J., Chung, N., & Kim, J. (2022). Metaverse tourism: conceptual framework and research propositions. *Current Issues in Tourism*. <https://doi.org/10.1080/13683500.2022.2122781>
- [40] Koohang, A., Nord, J. H., Ooi, K.-B., Tan, G. W.-H., Al-Emran, M., Aw, E. C.-X., Baabdullah, A. M., Buhalis, D., Cham, T.-H., Dennis, C., Dutot, V., Dwivedi, Y. K., Hughes, L., Mogaji, E., Pandey, N., Phau, I., Raman, R., Sharma, A., Sigala, M., ... Wong, L.-W. (2023). Shaping the Metaverse into Reality: A Holistic Multidisciplinary Understanding of Opportunities, Challenges, and Avenues for Future Investigation. *Journal of Computer Information Systems*. <https://doi.org/10.1080/08874417.2023.2165197>
- [41] Lashkari, A. H., Parhizkar, B., & Mohamedali, M. A. (2010). Augmented reality tourist catalogue using mobile technology. 2nd International Conference on Computer Research and Development, ICCRD 2010, pp.121–125. <https://doi.org/10.1109/ICCRD.2010.57>
- [42] Law, R., Cheng, I., Chan, C., Wang, L., Law, R., Cheng, I., Chan, C., & A, L. W. (2018). A comprehensive review of mobile technology use in hospitality and tourism. *Journal of Hospitality Marketing & Management*, 27(6), pp.626–648. <https://doi.org/10.1080/19368623.2018.1423251>
- [43] Lim, Y., Park, Y., Heo, J., Yang, J., Kang, M., & Byun, Y.-C. (2011). A smart phone application based on AR for Jeju tourism. 1st ACIS/JNU International Conference on Computers, Networks, Systems, and Industrial Engineering, CNSI 2011, pp.271–272. <https://doi.org/10.1109/CNSI.2011.101>
- [44] Menghi, R., Maino, G., & Panebarco, M. (2011). Virtual reality models for the preservation of the UNESCO historical and artistic heritage. In 16th International Conference on Image Analysis and Processing, ICIAP 2011: Vol. 6979 LNCS Issue PART 2, pp. 475–485. [https://doi.org/10.1007/978-3-642-24088-1\\_49](https://doi.org/10.1007/978-3-642-24088-1_49)
- [45] Monaco, S., & Sacchi, G. (2023). Travelling the Metaverse: Potential Benefits and Main Challenges for Tourism Sectors and Research Applications. *Sustainability* (Switzerland), 15(4). <https://doi.org/10.3390/su15043348>
- [46] Mystakidis, S. (2022). Metaverse. *Encyclopedia*, 2(1), 486–497.
- [47] O’Keefe, B., Benyon, D., Chandwani, G., Menon, M., & Duke, R. (2014). A blended space for heritage storytelling. 28th International BCS Human Computer Interaction Conference: Sand, Sea and Sky - Holiday HCI, HCI 2014, 90–99. <https://doi.org/10.14236/ewic/hci2014.10>



- [48] Okura, F., Kanbara, M., & Yokoya, N. (2015). Mixed-reality world exploration using image-based rendering. *Journal on Computing and Cultural Heritage*, 8(2). <https://doi.org/10.1145/2700428>
- [49] Park, D., Nam, T.-J., & Shi, C.-K. (2006). Designing an immersive tour experience system for cultural tour sites. Conference on Human Factors in Computing Systems, CHI EA 2006, p.1193–1198. <https://doi.org/10.1145/1125451.1125675>
- [50] Pencarelli, T. (2020). The digital revolution in the travel and tourism industry. *Information Technology and Tourism*, 22(3), pp.455–476. <https://doi.org/10.1007/s40558-019-00160-3>
- [51] Perez-Valle, A., & Sagasti, D. (2012). A novel approach for tourism and education through virtual Vitoria-Gasteiz in the 16th century. 2012 18th International Conference on Virtual Systems and Multimedia: Virtual Systems in the Information Society, VSMM 2012, pp.615–618. <https://doi.org/10.1109/VSMM.2012.6365991>
- [52] Poon, A. (1988). Tourism and information technologies. *Annals of Tourism Research*, 15(4), pp.531–549. [https://doi.org/10.1016/0160-7383\(88\)90048-5](https://doi.org/10.1016/0160-7383(88)90048-5)
- [53] Pratisto, E. H., Thompson, N., & Potdar, V. (2022). Immersive technologies for tourism: a systematic review. *Information Technology and Tourism*, 24(2), pp.181–219. <https://doi.org/10.1007/s40558-022-00228-7>
- [54] Prodinge, B., & Neuhofer, B. (2023). Never-Ending Tourism: Tourism Experience Scenarios for 2030. In F.-R. B., M. D., & B. K. (Eds.), 30th Annual International eTourism Conference, ENTER 2023 pp. 288–299. Springer Nature. [https://doi.org/10.1007/978-3-031-25752-0\\_31](https://doi.org/10.1007/978-3-031-25752-0_31)
- [55] Qin, H. (1999). Knowledge Discovery Through Co-Word Analysis. *Library Trends*, 48(1), pp.133–159.
- [56] Raptis, G. E., Fidas, C., & Avouris, N. (2018). Effects of mixed-reality on players' behaviour and immersion in a cultural tourism game: A cognitive processing perspective. *International Journal of Human Computer Studies*, 114, pp.69–79. <https://doi.org/10.1016/j.ijhcs.2018.02.003>
- [57] Schinke, T., Henze, N., & Boll, S. (2010). Visualization of off-screen objects in mobile augmented reality. 12th International Conference on Human-Computer Interaction with Mobile Devices and Services, Mobile HCI2010, pp.313–316. <https://doi.org/10.1145/1851600.1851655>
- [58] Stankov, U., & Gretzel, U. (2020). Tourism 4.0 technologies and tourist experiences: a human-centered design perspective. *Information Technology and Tourism*, 22(3), pp.477–488. <https://doi.org/10.1007/s40558-020-00186-y>

- [59] Suanpang, P., Niamsorn, C., Pothipassa, P., Chunhapatragul, T., Netwong, T., & Jermsittiparsert, K. (2022). Extensible Metaverse Implication for a Smart Tourism City. *Sustainability (Switzerland)*, 14(21). <https://doi.org/10.3390/su142114027>
- [60] Trunfio, M., Campana, S., & Magnelli, A. (2020). Measuring the impact of functional and experiential mixed reality elements on a museum visit. *Current Issues in Tourism*, 23(16), pp.1990–2008. <https://doi.org/10.1080/13683500.2019.1703914>
- [61] Volchek, K., & Brysch, A. (2023). Metaverse and Tourism: From a New Niche to a Transformation. In F.-R. B., M. D., & B. K. (Eds.), 30th Annual International eTourism Conference, ENTER 2023 pp. 300–311. *Springer Nature*. [https://doi.org/10.1007/978-3-031-25752-0\\_32](https://doi.org/10.1007/978-3-031-25752-0_32)
- [62] Wang, Y., Su, Z., Zhang, N., Xing, R., Liu, D., Luan, T. H., & Shen, X. (2023). A Survey on Metaverse: Fundamentals, Security, and Privacy. *IEEE Communications Surveys and Tutorials*, 25(1), pp.319–352. <https://doi.org/10.1109/COMST.2022.3202047>
- [63] Wei, D. (2022). Gemiverse: The blockchain-based professional certification and tourism platform with its own ecosystem in the metaverse. *International Journal of Geoheritage and Parks*, 10(2), pp.322–336. <https://doi.org/10.1016/j.ijgeop.2022.05.004>
- [64] Yang, F. X., & Wang, Y. (2023). Rethinking Metaverse Tourism: A Taxonomy and an Agenda for Future Research. *Journal of Hospitality and Tourism Research*. <https://doi.org/10.1177/10963480231163509>
- [65] Yoon, T. H., Do, J. K., & Jeong, S. C. (2022). Developing Songjeong Metaverse Surfing Village: Development of Metaverse-based Platform Specialized for Marine Tourism. In T. V.H., P. J., T. V.T.T., & K. J. (Eds.), 7th IEEE/ACIS International Conference on Big Data, Cloud Computing, and Data Science, BCD 2022 (pp. 276–278). Institute of Electrical and Electronics Engineers Inc. <https://doi.org/10.1109/BCD54882.2022.9900793>
- [66] Zaman, U., Koo, I., Abbasi, S., Raza, S. H., & Qureshi, M. G. (2022). Meet Your Digital Twin in Space? Profiling International Expat’s Readiness for Metaverse Space Travel, Tech-Savviness, COVID-19 Travel Anxiety, and Travel Fear of Missing Out. *Sustainability (Switzerland)*, 14(11). <https://doi.org/10.3390/su14116441>

# Research on Chinese Municipal Solid Waste Management Based on Greenhouse Gas Emissions

**Wang Chao**

Budapest University of Technology and Economics, wangyichao52@gmail.com

**Wu Yue**

Doctoral School of Security Studies, Óbuda University, Bánki Donát Faculty of Mechanical and Safety Engineering, Budapest, Hungary,  
wuyue.budapest@gmail.com

*Abstract: China promises international community to striving to achieve “Carbon Neutralization” before 2060. The problem of “waste besieging the city” is getting worse as a result of the rising waste production, and the environmental effects of municipal solid waste management (MSWM) have sparked global concern. Designing a fair and workable MSW classification management system is crucial in response to national policies. According to the 17 Sustainable Development Goals of United Nations, waste incineration, as one of the main waste disposal methods, convert electricity helps to achieve the 17th goal, provide affordable and clean energy. Separating waste reduces greenhouse gas emissions, which complies with the 13th goal, climate action. The paper assessed GHG emissions from landfill, incineration, and composting as well as the other three defined MSWM scenarios based on greenhouse gas inventory guidelines and a life cycle framework. Also measures were taken to reduce greenhouse gas emissions were taken into account, such as the generation of electricity from waste incineration and the recycling of recyclable materials. The results will show that the highest emission reduction can be achieved by one scenario. The optimal strategy is still chosen regardless of the separation rate. Second, the volume of MSW for 2025 was calculated based on the gray prediction model GM (1,1) in Beijing. The findings of this paper offer useful data for government decision-making on MSWM when taking GHG emission reduction targets into account.*

*Keywords: Greenhouse Gas Emission; Municipal Waste Management*

# **1 Introduction**

## **1.1 The generation and characteristics of MSW in China**

One of the most urgent environmental challenges now affecting society as a whole is climate change. According to the World Bank and International Energy Agency (2022), China's annual greenhouse emissions increased from 7.1 tons in 2017 to 10 tons in 2022, which is much faster than the global per capita level, and China's total CO<sub>2</sub> emissions increased from 9462.7 million tonnes in 2017 to 11480 million tons in 2022. In terms of greenhouse gas emissions, China has surpassed all other countries in the globe. China formally requested to peak its carbon emissions by 2030 and set a carbon intensity reduction target of more than 60% compared to 2005 at the 2015 Climate Conference. The government and many academics have focused on waste management practises recently as a significant source of greenhouse gas emissions. The waste sector, which is an important area of emission reduction after the energy sector, is based on the experience of several industrialised nations in lowering emissions. Therefore, lowering greenhouse gas emissions from municipal garbage disposal is one of the efficient approaches to accomplish national emission reduction objectives since China is the greatest producer of greenhouse gases. In this paper, Beijing is the example to be researched.

## **2 Literature review**

The terminal disposal process is the main source of greenhouse gas emissions from waste. Many scholars have studied the different GHG emissions of waste disposal strategies to help governments make decisions that are most beneficial to the environment. Some scholars have shown that, compared with composting and incineration, landfills are more efficient in terms of GHG emissions. It is suggested that landfill disposal should be reduced or a combination of composting and incineration should be used. Some scholars have suggested that landfill should be reduced or combined with composting and incineration, but others have come to the opposite conclusion. Municipal domestic waste landfills are one of the largest sources of anthropogenic methane emissions, so many scholars have specifically studied.

Therefore, many scholars have studied the greenhouse gas emissions from landfills. Among the many studies, scholars have mostly based on first-order decay models (FOD). Chen C.C. et al. (2012) combined the FOD model and Monte Carlo method and carried out the uncertainty identification and sensitivity analysis to quantify the influence of each parameter on the model output, relying on local and national data and expert experience. This improved the accuracy of

CH<sub>4</sub> assessment at Beijing's domestic landfills. The findings revealed that the mean value of CH<sub>4</sub> generation from landfill in Beijing in 2008 was 15.58 10<sup>4</sup>t.a<sup>-1</sup>, with a 95% probability distribution of emissions ranging from (11.80 to 19.76) 10<sup>4</sup>t.a<sup>-1</sup> and an uncertainty range of -24.26% to 26.83%. The study provides a scientific foundation for guiding landfill GHG inventory improvement and data collecting, as well as an improvement in the accuracy and quality of CH<sub>4</sub> emission assessment of Beijing's domestic waste dumps.

Incineration is a waste treatment technology that turns the energy in waste into electricity and can successfully achieve carbon emission decreasing and is currently the main waste treatment method in developed countries such as the South Korea. However, due to both financial and technical reasons, it is still a supplementary choice and is gradually gaining popularity in countries such as China and other developing countries. Zhang X. et al. (2022) introduced the development status of landfill biogas, analysis the development opportunities under the goal of 'carbon neutrality', and proposes countermeasures to provide reference for the further development of landfill biogas.

Using composting for disposing of organic solid waste (OSW) is a successful strategy. In light of climate change and the depletion of fossil fuels, there is rising interest in collecting and recycling heat from composting. The goal of Hermann B.G. et al. (2011) is to simulate residential and commercial composting, anaerobic digestion, and incineration in order to determine the estimated carbon and energy footprints of the waste treatment phase and the best waste treatment option for biodegradable materials.

Open burning is a fairly typical practise in China since it is straightforward, convenient, and has cheap transportation costs. In contrast to incinerator treatment, open fire treatment results in a significant amount of pollutants being emitted because of incomplete combustion brought on by low temperature and a lack of oxygen. MSW samples were gathered from several municipal functional regions. The two most typical open burning techniques were then used to manage these MSW samples: pile-up burning and barrel burning (Hao W.W., 2019).

Separate recycling of waste is considered an important activity that affects its greenhouse gas emission profile. In order to study the carbon emissions of domestic waste disposal in Suzhou following waste separation, Fu F.Y. et al. (2023) uses five of the city's major urban areas as the research subject and implements the national greenhouse gas inventory guidelines (IPCC inventory guidelines) (IPCC) along with the carbon emission factor method. The findings demonstrate that Suzhou has completed the waste separation procedure. According to the findings, Suzhou's domestic waste treatment produces roughly 1.55 million tonnes of carbon emissions annually, with relatively little variation after waste separation. This can contribute to an earlier peaking of greenhouse gas emissions from domestic waste disposal processes (Chen L.J., & Wu J.Z., 2021).

## **3 Method**

### **3.1 Transverse estimation techniques**

Model estimation is a technique for calculating emissions from input data using proven mathematical models or procedures. Depending on the values of the pertinent parameters and the model's calculation approach, there can be some differences between the results of the various estimating methods and the real scenario, but this method is straightforward to use, makes data easy to collect, and has a broad range of applications.

#### **3.1.1 IPCC's system of accounting**

Assessment reports from the IPCC have influenced choices like the Kyoto Protocol. The IPCC Guidelines for country Greenhouse Gas Inventories is one of the products of its work, which also produced methodological papers that provided methodology for accounting for greenhouse gases at the country level. The recommendations are designed to offer methods for calculating GHG emissions in pertinent industries, such as energy, waste management, forestry, and industry.

The waste section includes default values for the characteristics of domestic waste in several international locations as well as techniques for calculating GHG emissions from landfills, incineration, and biological treatment of domestic waste. The most accurate estimates for the city context are those from the IPCC.

#### **3.1.2 Models for life cycle assessments**

Life cycle assessment (LCA), which quantifies the environmental impact of an activity, product, or process's material and energy consumption and waste emissions, is an evaluation of the environmental impact of a given activity, product, or process over the course of its entire life cycle. The International Organization for Standardization (ISO), which claimed that it consisted of defining the scope of the objectives, assessing the inventory, evaluating the impacts, and debating the results, went on to comprehensively standardize the idea and theoretical underpinnings of LCA.

Process models, decision theory models, input-output models, are examples of common LCA models. Additionally, some researchers have reduced the conventional LCA model and utilized it as a conceptual model and research framework for qualitative research in order to decrease the amount of data needed, the amount of time needed, and the associated expenses. Christensen T.H. et. al., (2020) describe six areas where LCA is expected to play a role in waste management in the future: 1) understanding an existing waste management system; 2) improving existing waste management systems; 3) comparing alternative technologies/ technology performance; 4) technology

development/prospective technologies; 5) policy development/strategic development; and 6) reporting.

In this study, a life-cycle framework is created to evaluate the GHG emissions of Beijing's municipal waste collection and disposal systems under various strategies. This framework takes into account the current state of China, the GHG accounting techniques advised by the IPCC guidelines, and the methodologies advised by the pertinent Chinese standards.

### **3.2 Grey forecast**

Grey model (GM) has shown to be a valuable application of the forest. (Pudcha T. et al., 2022). Systems can be categorized as white, grey, or black depending on the amount of information that is contained within them; white systems contain all of the knowledge that is currently known, black systems do the opposite, and grey systems fall somewhere in the between. In a particular category, a grey predictive model predicts a process that evolves over time and contains unknown information while offering a short- and long-term description of the underlying pattern with little to no prior knowledge. In order to weaken the unpredictability of the original series and enable it to reveal a distinct pattern, the original, somewhat random data can be added sequentially to create a new series. The GM (1, 1) model is a model with a single variable that has been added up once. Grey forecasting is popular because it doesn't need a lot of data, doesn't need a very regular distribution, is computationally efficient, and has excellent prediction accuracy.

## **4 Design of MSW management strategy**

Five MSW disposal plans were created using the aforementioned justification, as illustrated in following figures:

Scenario 1: mixed waste, a landfill, open piling and incineration. According to Beijing's current landfill and incineration ratio, 10341 t/d of garbage was landfilled and 10341 t/d of waste was burned in the baseline scenario. According to Beijing's present disposal strategy, electricity was produced using the heat from incineration and landfill. The residuals from the incineration process were landfilled.

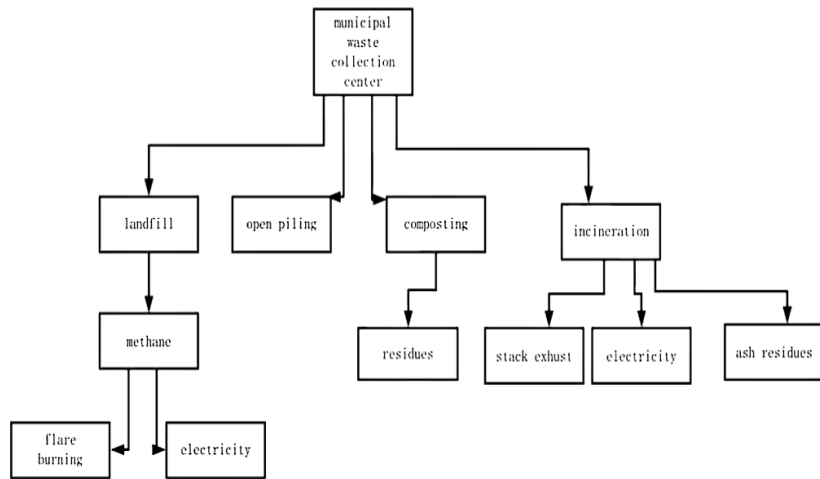


Figure 1.

Scenario 1

Source: Designed by author.

Scenario 2: composting, landfilling, open piling, burning, and classifying waste. For source-separated collection, MSW was split into kitchen waste and residual garbage based on a 50% separation rate. Kitchen garbage that had been separated was composted, while the remaining waste was landfilled and burned in the same proportions as in Scenario 1. Electricity was produced using the heat from incineration and landfill. The leftovers from composting and incineration were taken to a landfill.



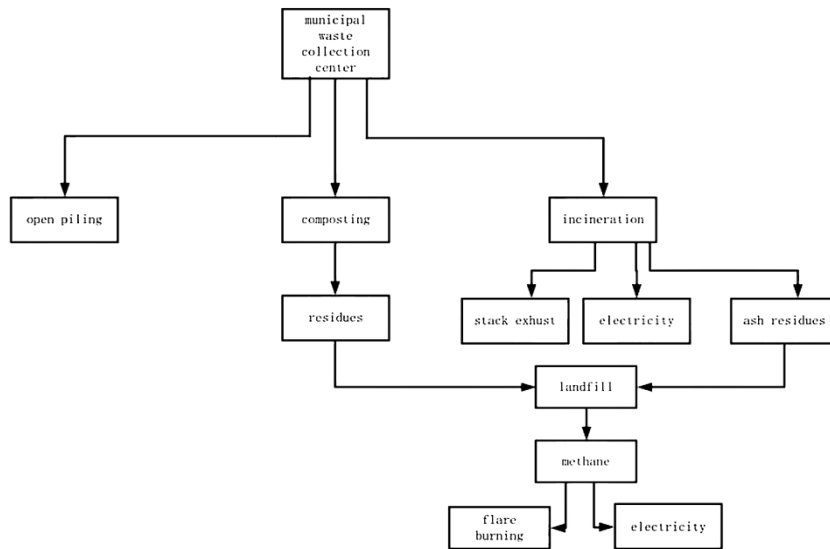


Figure 2.

Scenario 2

Source: Designed by author.

Scenario 3: composting, incineration, open piling, and classified waste. The classification of this scenario was the same as that of Scenario 2, with the exception that the incineration residue from all residual garbage was incinerated rather than landfilled.

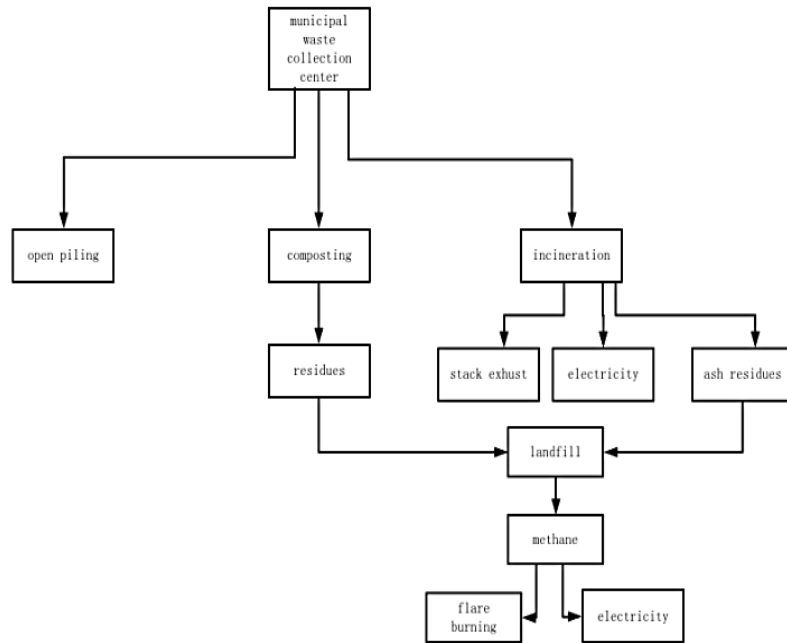


Figure 3.  
 Scenario 3Source  
 Designed by author.

Scenario 4. MSW was classified into kitchen waste, recyclable materials, and residual waste based on a 50% separation rate. The segregated kitchen waste was composted, the recyclable materials were delivered to the recycling facility as renewable resources, the remaining waste was disposed of in the same proportions as Scenario 1 and burned, and the composting and burning waste was disposed of in the same.

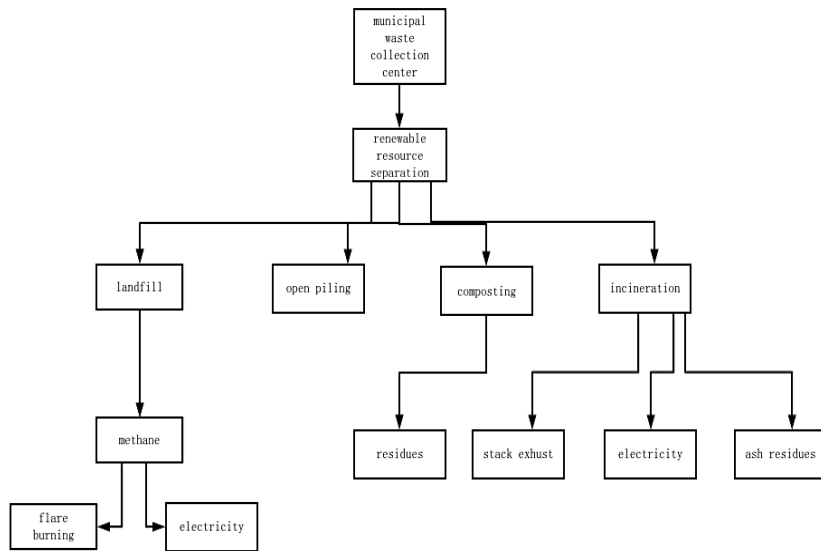


Figure 4.

Scenario 4

Source: Designed by author

Scenario 5: recycling, composting, incineration, and classified waste. The classification of this situation was the same as situation 4, with the exception that all residual waste was incinerated.

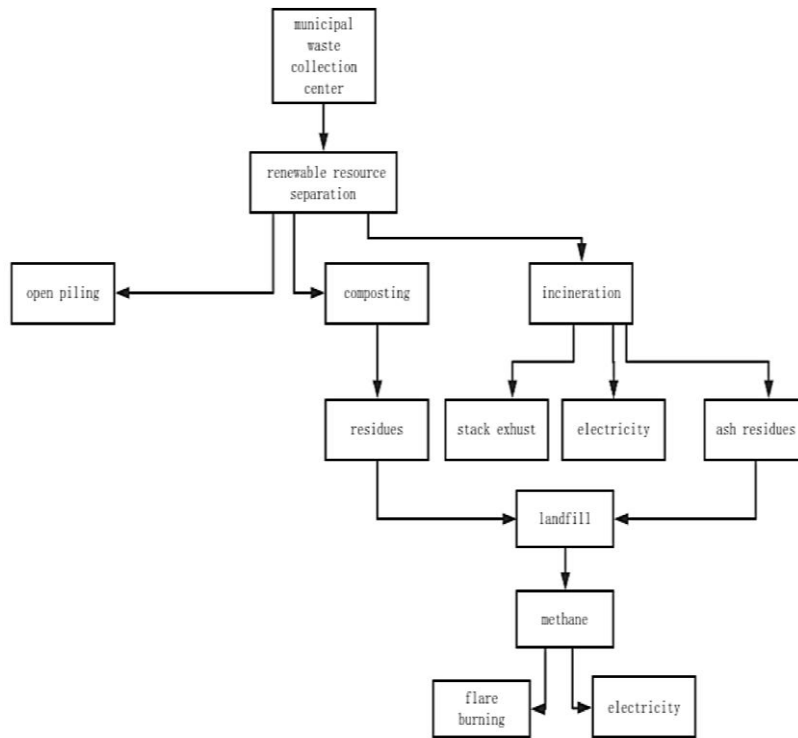


Figure 5.  
Scenario 5  
Source: Designed by author

## 4 Forecast of domestic waste disposal capacity in Beijing in 2025

### 4.1 Model building

The data of municipal domestic waste removal in Beijing from 2017 to 2022 were substituted into the GM ( 1, 1) model to forecast the waste removal volume in 2025, where a is 0.0096; b is 875.2346; as shown in Table 1, which shows the relevant data of the series X(0), X(1) and Z(1) from 2017 to 2022.

year	$x^{(0)}(k)$	$x^{(1)}(k)$	$z^{(1)}$
2017	901.75	901.75	—
2018	929.42	1831.17	1366.46
2019	1011.16	2842.33	2336.75
2020	797.52	2587.4	2714.865
2021	784.22	3321.2	2954.3
2022	740.57	4111.5	3716.35

Table 1.

Data in GM (1,1) for MSW quantity (unit: wt)

Source : The original data from China Statistical Yearbook-2022, and calculated by author

## 4.2 Model testing-residual test

By substituting historical data into the prediction model, the estimated value of the cumulative series  $X^{(1)}$  can be obtained, followed by data reduction by cumulative subtraction operations to obtain the estimated value of Beijing's municipal waste removal data for all years, and the residuals and relative residuals of the data for all years, as shown in Table 2. According to the data in the table, the average relative residual  $E=1.69\%$ , each relative residual and the average relative residual are less than 5%, the model is qualified and the accuracy is high.

years	$x^{(0)}(k)$	$\hat{x}^{(1)}(k)$	$\hat{x}^{(0)}(k)$
2017	901.7500	901.75	901.75
2018	929.42	1764.1	862.3994
2019	1011.2	2618.3	854.1392
2020	797.52	3464.2	845.9582
2021	784.22	4302.1	837.8556
2022	740.5700	5131.9	829.8305

Table 2.

Data for residual between estimated and actual values of MSW quantity (unit: wt)

Source : The original data is from China Statistical Yearbook-2022, and calculated by author.

## 4.3 Forecast of domestic waste removal volume

On the basis of the verification of the procedure described above, it is evident that the prediction model that was constructed in this article is qualified. As a result,

this model is utilized to forecast the volume of municipal solid waste removal,  $x^{(1)}$ , in Beijing in the years 2023, 2024, and 2025. There is a display of the findings in Table 3.

years	$x^{(0)}(k)$	$x^{(1)} (k)$
2023	/	863.971
2024	/	976.772
2025	/	955.983

Table 3.

Prediction of domestic waste removal volume quantity (unit: wt)

Source : The original data is from China Statistical Yearbook-2022, and calculated by author.

## Conclusion

China has a large population, and garbage classification is only promoted and implemented in first-tier cities. The city generates huge amounts of garbage every year and emits a lot of greenhouse gases. Therefore, this paper designs different urban domestic waste management strategies and uses Beijing as a case study to study urban life. A complete review of domestic and international studies on greenhouse gas emissions from municipal solid waste and related theoretical foundations led to the development of five municipal solid waste management strategies. These strategies were established based on the various classifications and processing techniques of domestic waste.

The Beijing Municipal Government can set emission reduction targets earlier based on the forecast results of municipal solid waste in the next few years and formulate different waste treatment combinations to achieve the lowest target of greenhouse gas emissions. In addition to Beijing, various provincial and municipal governments in China can use this Gray Model (1, 1) to calculate local waste generation. Waste treatment companies can judge Beijing's main future treatment methods and business trends based on the forecast results, and determine which type of waste treatment equipment to purchase.

Among the above five scenarios in table 4, scenario 1 has the highest emissions, and scenario 5 has the lowest emissions. After adding the composting link in Scenario 2, greenhouse gas emissions are reduced 31.764 million tons compared to Scenario 1. Scenario 3 removes the landfill treatment part, and the emission reduction amount increases significantly, with a reduction of 45.441 million tons. Scenario 4 adds recycling of renewable resources and reduces emissions by 4.0733 million tons, which fully reflects the advantages of waste incineration. Scenario 5 is the optimal model. When food waste and recyclable resources are separated, all remaining waste is incinerated, and the emission reduction is

142.642 million tons. Compared with Scenario 3, Scenario 5 reduces emissions by 19.308 million tons, which is caused by the recycling of recyclable resources. When the emission reduction benefits brought by waste-to-energy and renewable resource recycling are taken into account, the net emissions of scenarios 1 to 5 decrease in sequence.

	scenario 1	scenario 2	scenario 3	scenario 4	scenario 5
landfill	80.323	60.157	0	27.739	0
incineration	117.815	89.596	106.032	40.639	48.093
recycling	0	0	0	-123.40	-123.40
composting	0	31.361	32.361	33.361	34.361
electricity	-0.08	-14.82	-17.54	-0.127	-0.15

Table 4.

Greenhouse gas emissions under 5 scenarios in 2022(unit: wt)

Source : The original data is from China Statistical Yearbook-2022, and calculated by author.

### Acknowledgement

I would like to express my sincere gratitude to all those who contributed to the completion of this research on Chinese Municipal Solid Waste Management and its correlation with Greenhouse Gas Emissions. Special thanks to my co-author, Wu Yue for invaluable guidance and support throughout the project. I extend my appreciation to the research participants and data contributors, whose cooperation made this study possible.

I am also thankful for the resources provided by academic institutions and organizations that facilitated the data collection and analysis processes. Additionally, I acknowledge the Budapest University of Technology and Economics, which played a crucial role in conducting this research effectively.

Furthermore, I appreciate the insightful feedback and discussions with colleagues and peers that enriched the quality of this work. This research stands as a collaborative effort, and I am grateful to everyone involved for their dedication

and commitment to advancing our understanding of sustainable waste management practices and their environmental implications in China.

## References

- [1] Chen C. C., Liu C.L., Li Z., Wang H.H., Zhang Y., Wang L.(2012) Uncertainty Analysis for Evaluating Methane Emissions from Municipal Solid Waste Landfill in Beijing. *Environment Science*, 33, pp.208-214. <https://doi:10.13227/j.hjcx.2012.01.039>
- [2] Chen L.J., & Wu J.Z. (2021) Research on the impact of domestic waste classification on synergistic emission reduction of solid waste and greenhouse gases: a case study of Zhejiang Province. *Environmental and Sustainable Development*, 01,90-94. <https://doi: 10. 19758/j. cnki. issn1673-288x. 202101090>
- [3] Christensen, T. H., Damgaard, A., Levis, J., Zhao, Y., Björklund, A., Arena, U., Barlaz, M. A., Starostina, V., Boldrin, A., Astrup, T. F., & Bisinella, V. (2020). Application of LCA modelling in integrated waste management. *Waste Management*, 118, pp.313–322. <https://doi.org/10.1016/j.wasman.2020.08.034>
- [4] Hao W.W. (2019). Study on Emission Characteristics of Pollutants from Burning of Municipal Solid Waste. Unpublished Master dissertation, Henan Normal University, Henan
- [5] Hermann, B. G., Debeer, L., De Wilde, B., Blok, K., & Patel, M. K. (2011). To compost or not to compost: Carbon and energy footprints of biodegradable materials' waste treatment. *Polymer Degradation and Stability*, 96(6), pp.1159–1171. <https://doi.org/10.1016/j.polymdegradstab.2010.12.026>
- [6] National Bureau of Statistics of China (2023). China Statistical Yearbook-2022. China Statistics Press, Beijing.
- [7] World Bank. CO2 emissions (metric tons per capita)-China[EB/OL]. (2015-4-20)[2019-06-16]. <https://data.worldbank.org.cn/>
- [8] Zhang X., Chen X., Ma C., Chu L., Nie B.(2022)Development opportunities and countermeasures of landfill gas industry under the targets of carbon neutrality'. *Intelligent City*, 05, pp.8-10 DOI : 10.19301/j.cnki.zncs.2022.05.003
- [9] Pudcha, T., Phongphiphat, A., Wangyao, K., & Towprayoon, S. (2022). Forecasting Municipal Solid Waste Generation in Thailand with Grey Modelling. *Environment and Natural Resources Journal*, 21(1), pp.1–12. <https://doi.org/10.32526/enrj/21/202200104Author>, X. (2021): Title, in Proceedings of ..., place and date of edition, pp.



# Challenges and opportunities for the digital transformation of Hungarian companies

**Anita Plötz**

PhD student, Óbuda University, Doctoral School of Security Sciences,  
aniplo@stud.uni-obuda.hu

*Abstract: As the importance of digital transformation is growing, it is becoming increasingly urgent for companies to keep pace with technological innovation. The effective integration of digital tools and technologies has become key to competitiveness and sustainability in this new era. Through the results of a questionnaire survey of 108 Hungarian companies, this study focuses on the key aspects of the digital transformation in companies. This includes used digital tools, developed strategies, challenges and opportunities for change. The review provides further analysis on the transformation of corporate culture and work processes, highlighting steps to improve employee skills, customer experience and market positioning. However, digital transformation does not only bring technological change, it also requires creative and effective solutions to successfully manage the challenges companies face. Beyond the findings of this research, the study also defines further orientations for research in the field of digital transformation, contributing to the development of current and future corporate strategies.*

*Keywords: digitalisation, digital transformation, organisational development*

## 1 Introduction

Industry 4.0 and the new era of digitalisation are changing the way companies traditionally operate and creating new technologies and innovations to meet current and future needs. The rapid digital transformation and smart networking behind Industry 4.0 is fundamentally reforming existing business models and processes, affecting our economy, society and mindset (Mayer & Cukier 2014). New technologies offer a wide range of opportunities, but companies face significant risks and substantial investments. For companies, digital transformation is not just the introduction of a few digital technologies, but a complete paradigm shift in how they operate and are competitive (Oláh 2019). To operate effectively in a given business environment, they need to monitor trends, adapt to change with anticipation and develop strategies that enable sustainable growth and development. Industry 4.0 is creating networks of values

that guarantee full transparency of the system to enable companies to cope with increasing volatility and growing demand for tailor-made products (Kagermann et al, 2013). Consequently, the complexity of tasks is gradually increasing. The consequences of digitalisation are radical changes that are generating changes both in companies and in their operating environment (Christensen, 2016, Wirtz & Langer, 2021). These changes can transform the dynamics of industries and even lead to the decline of certain business areas (Neligan et al, 2022). Innovative, agile companies are integrating the requirements of digital transformation into their strategies to maintain their competitiveness in the market. This enables them to take advantage of new opportunities in time and become more resilient to risks.

My research focuses on key aspects of the digital transformation of Hungarian companies. The aim of the study is to explore the challenges of digital transformation and to emphasise its strategic importance for business leaders.

The paper consists of four main parts. The first part examines the literature background of the challenges of digital transformation, the next one presents the research methodology, the results of the quantitative research are described in the third part. The study concludes with a summary of the main conclusions and findings of the research.

## **2 The digital transformation**

Although considerable efforts are being made worldwide to promote research and a deeper understanding of digital transformation, no commonly accepted definition of digital transformation has yet emerged (Schallmo et al., 2018). The dynamic and rapidly changing nature of digital transformation continues to challenge both companies and academic researchers. Digital transformation is a complex and multifaceted phenomenon that can be approached from a number of perspectives. To clarify the definition of digital transformation, which is the focus of this study, it is first necessary to understand the key concepts of digitalisation and Industry 4.0, which together shape the modernisation of business activities and processes. Schallmo et al. (2018) define digitalisation as the process of transforming analogue information into digital data and highlight that several aspects of social life are radically changing as a result. Schuh et al. (2017), on the other hand, see digitisation as a forerunner of Industry 4.0, in which the use of technological tools and the networking of individual components create the basics of Industry 4.0. Industry 4.0 involves networks of devices and machines, intelligent analysis of data and automation of processes. It is designed to increase process efficiency, reduce costs, improve business agility and exploit new opportunities through digital technologies.

Companies are thus characterised by real-time transparency, where up-to-date information, according to Pfohl et al. (2017), promotes data-driven decision making, thereby ensuring efficient creation of value.

It follows from the above that digital transformation is a consciously organised, cross-company process of the activities mentioned above that induces a complete change in leadership, organisational culture, mindset, corporate structure, product and service innovation (Schallmo, 2019). During digital transformation, digital technologies become an integral part of business processes, triggering profound changes in business operations and dynamics of value creation (Vial, 2019). This process ranges from transforming corporate structures to paradigm shifts in management, all by exploiting new opportunities offered by digital tools and making work processes more efficient (Hess et al., 2016, Oláh, 2019). Digital transformation is in fact a never-ending process in which companies need to constantly adapt to technological changes and actively engage in innovation to maintain competitiveness (Hanschke, 2018).

### **3 The challenges of digital transformation**

The question for companies today is no longer whether to engage in digital transformation, but when and especially how to implement their digital strategy. The constant and rapid pace of change in the digital world has made timing and implementation a key issue for companies (Christensen, 2016). It is important that digital transformation is not just a reaction to current trends, but a thoughtfully planned and organised process that leads to long-term business success. Companies that recognise and effectively implement their digital strategy timely can gain a competitive edge in a rapidly changing market. Given the opportunities and challenges of a dynamically changing business environment, digital transformation is an inevitable process that all companies must face. According to Varga (2014), adaptability to change is basically sufficient for survival, but really successful companies strive for more. Not only do they adapt to change, but they are also able to bring about change in markets themselves through their own activity and creativity. While digital transformation offers many opportunities, it also challenges companies strategically, and it is therefore crucial that they are prepared and focused to face these dynamic changes.

The failure and success of change processes in companies can be attributed to several reasons. According to a study by Hirschhorn (2002), a large proportion of profound organisational change fails because companies collapse due to their own complexity. He suggests that successful organisational transformation requires three coordinated and parallel campaigns.

First, he mentions a political campaign that effectively promotes and manages change processes to gain acceptance and support for change within the organisation. Secondly, the marketing campaign, which penetrates into the minds and feelings of employees and thus effectively communicates the message and benefits of the planned programme. Finally, the military campaign is the third, which identifies shortcomings in employee attention and helps address any resistance (Hirschhorn, 2002).

This resistance can be due to a variety of reasons, and these emphasise the key role of organisational culture and stakeholder engagement in the digital transformation process. Disselkamp and Heinemann (2018), for example, categorise the challenges emerging during digital transformation into three main groups: emotional, technological and economic barriers. In addition to them, other researchers argue that transformation projects often fail due to the emotional barriers of the participants in the change process, as negative emotions against changing traditional work processes and organisational hierarchies can be an obstacle to the success of implementation (Disselkamp and Heinemann, 2018, Cortellazzo et al., 2019, Hirsch-Kreinsen, 2014). In order to understand and accept change, persuasive and inspiring communication is essential for employees in the company. It is important to note, however, that if mutual trust and willingness to change were not present in the corporate culture before the digital transformation, this may lead to the potential failure of implementing the digital transformation. Therefore, companies must first create the conditions to ensure open communication and trust among employees to help them overcome the challenges of digital transformation. In this way, digital transformation not only leads to technological improvements, but also contributes to the long-term sustainability of corporate culture. If both internal and external stakeholders in the company can work together, digital transformation is likely to be successful (Fischer et al., 2020)

A lot depends on the behaviour and leadership style of managers (Dióssy et al., 2023), therefore "a high level and development of the emotional intelligence of the decision maker is the first important step" in the change process (Farkas, 2013, pp. 177). Managers need to understand what employees are concerned about when they reject change and encourage employees to put their ideas forward to management with confidence. This can be achieved by giving employees more power. Good communication is also essential in this case, as it will make employees aware of the need for change and encourage them to experiment and implement new ideas.

A good leader is also aware that trying new ideas takes time and can often lead to dead ends, but this should not be considered a failure, but a way of finding the path to progress. A supportive attitude from managers can boost employees' motivation and make them more willing to try new ideas, which can lead to quick

successes. Although people are usually emotionally affected by change, they need to step out of their comfort zone, learn new things and acquire new skills.

If employees misunderstand the purpose of change, are afraid of its consequences, or simply do not want to part with technology that is valuable to them and has already worked well, this can lead to resistance (Farkas, 2013, pp. 179). A good leader can prevent these problems through targeted communication, remove potential fears and build trust in change and management.

Some employees consider digital technologies to be job-destructive, which increases their resistance to change. These fears will be confirmed if some of the workforce is replaced by artificial intelligence, robotisation or other smart technologies in the digital transformation. Workers' sceptical attitudes towards promises of efficiency or automation and fear of the supervisory potential of digital technologies lead to a loss of competence and autonomy, and more generalised anxiety. In the process of change, workers may find it difficult to work with new automated machines and programmes due to a lack of skills and competences. Not everyone is open to modernisation, for a number of reasons. It could be just a lack of self-confidence, but it could also be caused by cultural or generational differences. The younger generation is socialised with modern digital technologies and is more familiar with more modern programmes and sees their potential, while the older generation is more attached to the traditional workflow. In addition, if the corporate strategy is structured in such a way that new technology will indeed replace human labour, workers' fears are not ungrounded. Often middle managers within the company are also resistant to change. They "seek to avoid the loss of their own power by sabotaging digital transformation initiatives rather than increasing their own value creation by recognising their positive impact. This would require considerable self-development and training, but in most cases the willingness and in some cases the ability is missing" (Hortoványi et al., 2020).

It is also the case, in my own experience, that older people are the ones who are more fearful of their jobs and therefore reluctant to innovate: they fear that they will be displaced by new technology or will not be able to master its use. Younger generations, on the other hand, are often not even committed to a workplace that is not innovative enough, has not yet introduced technological innovations or does not offer the possibility of working from home. It is very difficult to find a management style that is beneficial to both generations. A moral and economic balance must be found, so that not everything is about profit, but about achieving human well-being.

In addition to human resources, the optimal use of raw materials for production can also be achievable through digitalisation. However, this can involve huge risks. Digitalisation is costly and the capital invested may not be rewarded. Market-leading products can quickly become obsolete, and leading companies can

fall behind. It is also likely that revenues will fall during the transformation period as all stakeholders have to get used to using the new technology. It is also possible that the changes will not be well accepted by the entire customer base, which may also decrease.

Digital transformation therefore requires adequate financial capital, which needs to be used both to introduce new products and to compensate for potential losses and revenue shortfalls. However, not all companies have access to the right amount of money, there are countries where local companies cannot compete with those in richer countries, and there are regional differences within countries.

A poorer firm cannot provide the same technology as its richer counterpart and can easily be at a disadvantage in the market. But this disadvantage can be overcome through creativity and innovation.

Further questions arise as to whether the new technology to be introduced is compatible with the tools already in use, or whether all the old software and machines will have to be replaced. In addition, the new technology must be compatible not only with in-house programmes and tools, but also with the technology used by partners. Cooperation between the parties involved is therefore essential in this regard too.

The company's management also needs to consider the complexity of the software and equipment the company needs, the depth and amount of data it wants to extract, store and process, and what is essential, useful or negligible for the work. The purity and reliability of the data extracted is also an important consideration when choosing new technology, and the automated processing and storage of partner companies' data can raise data protection issues.

Based on the results of this research, I will examine the extent to which the managers of the companies I interviewed have built these challenges into their digital strategy, how consciously they try to avoid pitfalls and how they strive for positive, fruitful change.

## **4 Material and method**

I conducted my research using an online questionnaire, which allows for quantitative analysis. After standardisation and pre-testing, I created the questionnaire on the SurveyMonkey platform. I distributed the questionnaire to several companies through email enquiries and contacted others through social media. The questionnaires were completed by the respondents in May and June 2023.

The 27 questions were divided into two broad categories: a choice between pre-defined options (some questions allowed respondents to select more than one

answer) and a 4-point Likert scale. At the end of the questionnaire, there was an open-ended question, to which respondents could give their own opinion on the subject.

A total of 134 respondents completed the questionnaire, of which 26 had to be excluded for formal and other reasons, leaving 108 questionnaires to be evaluated. I aggregated the already cleaned data received using Microsoft Excel and applied a descriptive statistical analysis in order to get a general picture of the digital transformation of Hungarian companies. The responses were analysed using Cramer's association coefficient and a Chi-square test was carried out in order to get a more accurate picture of the relationship between an adequate technological infrastructure and the regular review, assessment and development of employees' digital competences.

Although the sample is not representative, the responses received may provide valuable insights to better understand the issues under investigation and may also serve as a basis for further research.

Based on the 108 questionnaires received, slightly more than half of the respondents (52.8%) are professionals working in SMEs, while 47.2% are employees of large companies.

The data show that a significant proportion of the SMEs surveyed are Hungarian private companies, while the vast majority of large companies, with 250-499 or more than 1,000 employees, are foreign-owned. In terms of industry, more than half of the responding enterprises are active in trade, motor vehicles (21.30%), manufacturing (20.37%) and other sectors (public administration, education, healthcare, social work, arts, other services) (15.74%).

## **5 Results**

Digitalisation creates new opportunities for both market players and new competitors. The key to successful digital transformation is a well developed strategy with defined business objectives and sustainable business models. Kofler (2018) emphasises that digital strategy should not be seen as a secondary element of corporate strategy, but as a closely interrelated component that aligns IT and business strategy and is enterprise-wide. As the development of a digital strategy is a complex task, management should be responsible for developing it, aligning it with business objectives and implementing it: a process that is essential for the success of the company (Kienbaum 2017).

The questionnaire survey revealed that almost half of the respondents, 50.93%, believe that their company has a digital strategy in place that is aligned with the company's long-term goals and business plan (16.67% strongly agree and 34.26%

tend to agree). A closer look at exactly which company employees disagreed or disagreed with the above statement shows that it is more likely that smaller companies and SMEs do not have a digital strategy implemented.

This is illustrated in the following chart:

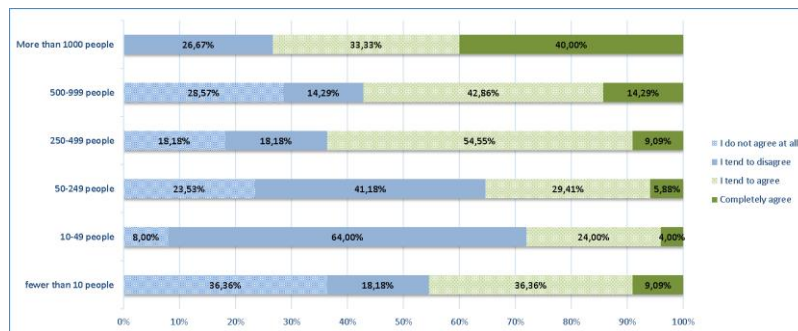


Figure 1.

Does your company have clear digital goals and a strategy that is in accordance with the long-term goals and business plan of the company (in proportion of company size (in headcount))?

Source: research by the author

My hypothesis was based on the fact that Hungarian companies are not sufficiently prepared for digital transformation. The following questions focused on this; the figure below shows the level of readiness of different companies and how they are implementing each step of the digital transformation.

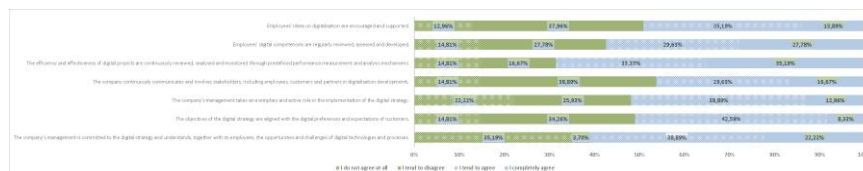


Figure 2.

Priority aspects of digital readiness.

Source: research by the author

The diagram shows that my assumption was correct. Only nearly a quarter of respondents (22.22%) strongly agreed and 38.89% somewhat agreed with the statement that the company's management is committed to a digital strategy and understands the opportunities and challenges of digital technology and processes together with its employees. A significant figure is that 35.19% of respondents said they strongly disagreed, which, as the results of the literature review showed, could be the biggest barrier to digital transformation, as the process should start from the top of the company.



This was echoed by another statement that "the company's management is leading by example and taking an active role in implementing the digital strategy." It was also mentioned in the literature review that it is often middle managers who sabotage digital transformation because they fear for their position.

Responding to this statement, while most (38.89%) tended to agree, only 12.96% fully believed that management is committed to digital transformation and exemplifies this through their behaviour. Again, although the balance is tilted in the positive direction, almost half of respondents (48.15%) still considered that management is not behind digital transformation and does not take an active role in it. This is reflected in the fact that a large proportion of responses show that companies are not communicating with stakeholders - customers, partners and employees - to jointly develop new developments. Only 46.30% of respondents were positive on this issue, and of these only 16.67% fully agreed with the statement. 14.81% thought that the company does not communicate at all with its stakeholders and 38.89% did not find the communication of the company satisfactory.

Due to a lack of or insufficient communication, only 8.33% of respondents fully agreed that the objectives of the digital strategy are in accordance with the expectations of customers and partners. This answer is disappointing because digital transformation must be in the company's interest and if the needs are not assessed due to lack of communication, the company could lose both partners and customers. Although about half of the respondents did not rate communication as adequate, 42.59% said that the company is somewhat able to follow the needs of partners and customers. 49.07% said that the company's digital strategy is not or rather not in line with the expectations of other stakeholders (14.81% disagree and 34.26% tend to disagree).

In addition to assessing the needs of customers and business partners, employees should also be involved in the digitalisation process. One of the most important is that managers also include their ideas when defining a digital strategy. Despite this, the survey found that only 13.89% of respondents said that management encourages and supports employees' innovative ideas. 35.19% said that managers are more open to new ideas, while 50.92% said that managers do not ask employees for their opinion (37.96% tend not to, 12.96% not at all).

Digital transformation cannot be imagined without developing workers' competences. However, in order to develop them, it is essential to regularly review skills and organise training to ensure that employees' skills are improved and that they are able to keep up with the demands of innovation. The responses show that rates are improving, but I think the results are by far not satisfactory. A little more than half of the respondents (57.41%) think that their company pays attention to this (27.78% completely, 29.63% rather so). However, there is concern on the other side, especially 14.81% who think that their company does not pay attention at all to developing the digital competences of its employees.

Also, 14.81% of respondents said that their company does not even assess employees' performance or monitor the effectiveness of digital projects. Without this, it is difficult to develop employees' skills in a targeted way, but 68.52% said that the company has a predefined way of measuring performance and analysing results. This figure gives hope that perhaps in the future, not only will performance measurement and project effectiveness be analysed, but employees' ideas will also be taken into account and training will be provided to help and support their work.

In the light of the above, I felt it important to examine whether there is a significant correlation between the availability of appropriate technological infrastructure and necessary resources and predefined performance measurement and analysis mechanisms.

The significance level should be 5%.  $\alpha = 0.05$

The analysis is performed by testing the independence of two criteria within the sample. The test uses a trial with a right-hand-side critical value.

H0: the two criteria are independent.

H1: the relationship between the two criteria is stochastic or functional.

$$\nu = (r - 1)(c - 1) = (4 - 1)(4 - 1) = 9$$

r: number of rows in the table; c: number of columns in the table

$$\chi^2_{1-\alpha}(\nu) = \chi^2_{1-0,05}(9) = \chi^2_{0,95}(9) = 16,9 \text{ critical value}$$

$$\chi^2 = 13,789 + 0,067 + 0,531 + 3,518 + 0,51 + 1,285 + 2,57 + 7,85 + 2,34 + 0,017 + 1,721 + 5,57 + 2,674 + 3 + 0 + 5,079 = 50,521$$

$$\chi^2_{1-\alpha}(\nu) = \chi^2_{1-0,05}(9) = \chi^2_{0,95}(9) = 16,9$$

The obtained value is much higher than the critical value, so the null hypothesis is discarded.

Thus, at the 5% significance level, we cannot say that the relationship between the availability of an appropriate technological infrastructure and the continuous monitoring and analysis by predefined performance measurement and analysis mechanisms is independent.

**This shows that if a company provides the right technological infrastructure and the necessary resources, the consequence will be continuous monitoring and analysis through predefined performance measurement and analysis mechanisms.**

The strength of the relationship between the two qualitative criteria can be indicated by the Cramer association coefficient.

$$C = \sqrt{\frac{\chi^2}{N \cdot \min\{(r-1); (c-1)\}}}$$

$$C = \sqrt{\frac{50,21}{108 \cdot 3}} = 0,394$$

The Cramer coefficient is 1 in the case of a functional relationship and 0 in the case of independence.

The relationship is neither functional nor independent, but stochastic, with a value of 0.394, thus a medium relationship.

My next question was whether there is a significant correlation between the availability of adequate technological infrastructure and necessary resources and the regular review, assessment and development of employees' digital competences.

The significance level should be 5% as before.  $\alpha = 0.05$

We now also use a test with a right critical coefficient.

H0: the two criteria are independent.

H1: the relationship between the two criteria is stochastic or functional.

$$\chi^2 = 13,789 + 0,535 + 2,963 + 2,78 + 0,51 + 4,62 + 2,38 + 1,15 + 2,34 + 1,962 + 4,03 + 0,199 + 2,66 + 3,2 + 0,52 + 5 = 48,638$$

$$\chi_{1-\alpha}^2(\nu) = \chi_{1-0,05}^2(9) = \chi_{0,95}^2(9) = 16,9$$

The value obtained is much higher than the critical value, so the null hypothesis is rejected.

Thus, at a 5% significance level, we cannot say that the relationship between the availability of adequate digital technology infrastructure and necessary resources and the regular review, assessment and development of employees' digital competences is independent.

**All this shows that if a company provides adequate technological resources, it will result in employees' digital competences being regularly reviewed, assessed and developed.**

I calculated the Cramer association coefficient.

The relationship is stochastic, with a value of 0.387, so this relationship is slightly weaker than the medium.

Returning to the questionnaire, the next question asked to what extent the company supports digital culture and agile operations. Based on the answers, it seems rather that Hungarian companies are less open to full digital transformation for the time being. According to respondents, there are two areas that are important for management: knowledge sharing and digital workflows and virtual teams. These results are presented in the following figure.

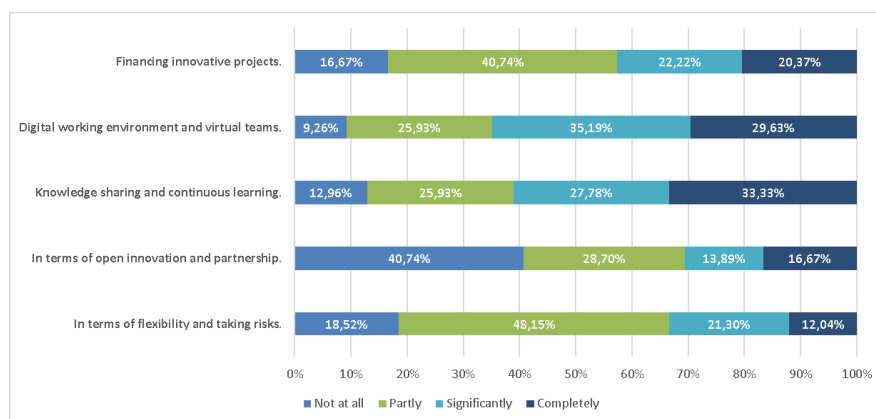


Figure 3.

To what extent does your company support digital culture and agile operations?

Source: research by the author

The responses show that the digital work environment and the creation of virtual teams are the most important aspects of digitalisation for Hungarian companies. A total of 64.82% stated that their company supports this area significantly or fully (significantly 35.19%; fully 29.63%). The picture is complete when the other side is presented: 25.93% of respondents perceive that the development of a digital working environment is not important for their company, and fortunately only a few (9.26%) rate it as not being given any attention at all. It seems that digital transformation in Hungary starts with the digitisation of the working environment, which can be found at all levels; in offices as well as in assembly plants.

Another thing that companies consider important is continuous learning and knowledge sharing. Basically, you could say that this is a result of the previous one, because the digital workplace - advanced technical tools, networking within the company, data stored in the cloud and accessible to all, platforms that can be shared and allow collaborative working - facilitates the creation of virtual teams that can communicate and work together without being physically together. This connectivity, the rapid flow of information, allows knowledge to be shared and continuous learning to take place.

Of course, this is not the only thing that can be included here, as the evaluation of the previous question showed that there are companies that pay particular attention to developing the skills of their employees. As in the previous question, there was a majority of respondents who considered both knowledge sharing and continuous learning to be important for the company. 33.33% of the respondents said that their company supports its employees in this to a full extent, while 27.78% said that it supports them to a considerable extent.

In fact, this is a good start for digital transformation, but it is a concern that companies are less cooperative on the other three aspects. Although innovation projects would be of paramount importance for digital transformation, companies do not seem to put enough emphasis on this. Only 42.59% of the respondents considered that their company was willing to support these efforts: a minority, although not by much, of those who considered that their company fully supported innovation projects (20.37%). 40.74% of the respondents answered that their company only partially or to a lesser extent financed innovative projects, and 16.67% considered that their company did not deal with innovation at all.

It is also striking that companies are very closed to open innovation and partnership, with 40.74% of respondents considering that their company does not support or exploit the potential of open innovation. Only around 30% thought that their company supported open innovation (13.89% significantly; 16.67% fully).

It is also a problem that companies do not dare to take risks and are not flexible enough, according to the respondents. While 12.04% think their company is fully flexible and 13.89% think it is significantly flexible and risk-taking, 40.74% think it is not at all flexible and 28.70% think it is only partially flexible. This is a negative because all change involves risk-taking, if you don't dare to take risks you won't get ahead. The search for a way forward is always dangerous, but it is the only way to find a solution. To be able to correct mistakes - inevitably mistakes in pathfinding - with as little loss as possible, flexibility is needed. The lack of risk-taking and flexibility of companies makes digital transformation much more difficult.

This may be one of the reasons why digital transformation in Hungarian companies is still in its infancy, but the next question further clarifies this picture, and the slow pace of digital transformation can be attributed to a number of factors, according to the responses. High investment costs (60.34%) were perceived as the biggest barrier, but a lack of IT professionals (48.28%) was also a hindrance. More respondents cited employee resistance or lack of time (43.10% - 43.10%) as a barrier, but also a lack of digital skills, the complexity of transforming existing systems, high security risks or the need to develop a digital strategy for the company.

These reasons are summarised in the following graph:

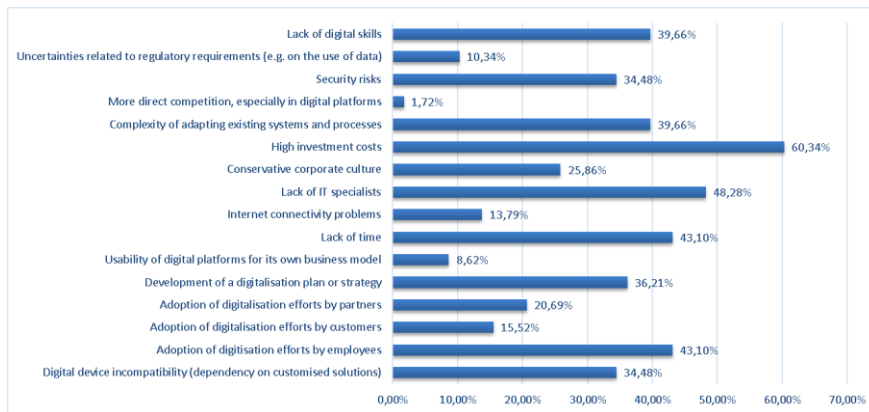


Figure 4.

What do you consider to be the biggest challenges for the successful digitalisation of a company?

Source: research by the author

Developing the digital strategy of the company is likely to be a barrier because it requires complex knowledge: besides being able to define the precise purpose of the business, it is also necessary to know the processes within the company, the tools available, the market opportunities, innovations and how compatible they are with the company's existing tools. In addition, it is not enough to consider the needs of your own business, but also those of your partners, as change must be driven by common interests in order to ensure that digital transformation brings positive benefits for all parties. I believe that the complexity of this task influences the high price, which was indicated by most of the respondents as a barrier. Often a cheaper tool or software would be sufficient for a business, but as the decision-maker is not always well informed, he or she will opt for a more expensive tool, which may generate additional costs (e.g. incompatible with existing tools, so they have to be replaced).

Although the lack of digital competences is only the fourth most important barrier in the responses, I believe that this is the reason why digital transformation is too expensive in the end. If the management is willing to change, the high costs can be compensated by creativity and there are also grants and tenders that provide financial support for the purchase of tools for digital transformation.

It is interesting to note that the responses received showed that only half of the companies (50.92%: 42.59% / 8.33%) thought that the objectives of the company were compatible with the digital expectations of customers. This is a shocking result, as serving customers' needs should be a top priority for any company.

Mapping customer expectations should be a key element of a digital transformation strategy, without which it would be risky to make any changes: it may not pay off.

I wanted to know how companies see the future and which key competences they consider important for successful digitalisation efforts. Respondents were given the option of indicating several options. The responses to this question are summarised in the following figure.

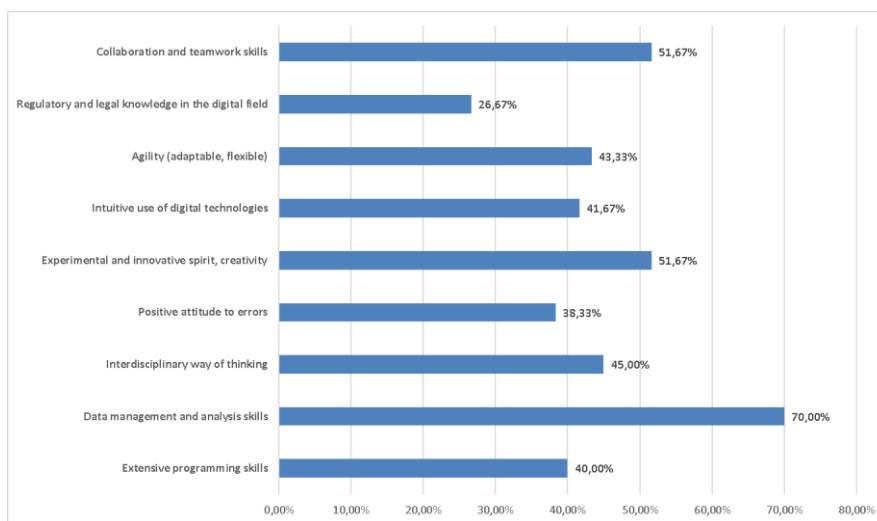


Figure 5.

Which key competences do you think your company needs to improve in order to succeed in its digitalisation efforts?

Source: research by the author

The highest number of votes was given to knowledge of data management and analysis (70%), which shows that a large proportion of companies are concerned about what data to collect, where and how to store it (a key issue, especially for security reasons) and what information can be extracted from the data collected.

A spirit of experimentation and innovation, creativity and the ability to work collaboratively and in teams all scored 51.67%. Interdisciplinary mindset (45%) followed by agility (43.33%). It seems that managers and employees have realised that without collaboration, positive change cannot be brought about, everyone in the company needs to be involved, as well as all partners need to be consulted to develop a coherent strategy for digital transformation.

And the implementation of processes is unthinkable without experimentation and agility, while an interdisciplinary approach helps professionals to have a complex vision.

What is of concern, however, is that a positive attitude to failure is only 38.33% of the responses. While we could interpret this response as companies being permissive and accepting that change means making mistakes, I fear that because people are afraid to make mistakes, this is seen as a weakness, the low percentage of responses could be explained by the fact that tolerance is not seen as important by respondents.

Improving regulatory and legal knowledge also did not receive many marks, with only 26.67% of responses. This could also be interpreted as respondents being satisfied with their legal and regulatory knowledge, but innovations follow each other so quickly that there is always a need for new legislation to regulate new technology.

More respondents identified programming skills as an area for improvement (40%), as well as the intuitive use of digital technology (41.67%). IT skills will become increasingly important in the workplace of the future, respondents are well aware of this, without which digital transformation is unthinkable.

The responses show that the majority of companies are aware of their shortcomings and want to change them. This is certainly positive and if these problems can be eliminated, the process of digitalisation will be completed more quickly.

## **Summary**

The study deals with the digital transformation of Hungarian companies, and investigates where companies stand in this process.

Based on the literature, it can be said that digital transformation must be preceded by a digital strategy, which includes several components. It is the responsibility of the management team to set up the strategy, as they have the most comprehensive knowledge of the goals, prospects, capabilities, workflows and partners of the company, as well as the needs of its customers.

However, there are a number of barriers and obstacles to digital transformation. Resistance from employees, middle managers, financial difficulties, understanding and identifying customers' needs are all setbacks to digital transformation. Most importantly, most companies in Hungary do not have a digital strategy to drive digital transformation.



The study also points out that communication would be important for digital transformation, helping to understand the importance of digitalisation and increasing the engagement and motivation for digital transformation. Company management does not encourage employees to come up with innovative ideas, nor are they generally tolerant of mistakes. Digital transformation would require upgrading the competences and knowledge of employees, which is not always fully achieved. On the other hand, companies are reluctant to take risks, and taking risks is an inevitable part of any change. The responses to the questionnaire suggest that these are the main reasons why digital transformation is not yet widespread in Hungary, where we see initial attempts, but where digitalisation is still a long way away in all segments of companies.

Although I have tried to get a complete picture of the digital transformation of Hungarian companies, while writing this study, several questions have arisen. The first is that companies themselves are not always aware of the concept of digital transformation and in many places they believe that only the acquisition of equipment (scanners, modern printers) is sufficient for digital transformation. Another question I wondered about is whether all companies need digitalisation. Smaller businesses can probably survive without radical innovation if they can offer good products or services. However, it is important for them to be present in the virtual world, if not elsewhere, at least to create a social media presence, because most of today's customers, when they are looking for a product, start online. Even the best professionals need attention-grabbing advertising to reach customers and clients - although often the best advertising is when people you know recommend professionals and products.

Another difficulty was that most of the questions about digitisation are subjective, there can be multiple opinions within a company about what is good and what is bad about digitisation. There is a need for a method to provide measurable data on the impact of a company's digitisation efforts on revenue, employee activity and performance, and most importantly customer satisfaction. In addition, in order to understand the responses to the questionnaire more clearly, it would be important to conduct some in-depth interviews to better outline the aspirations and challenges of companies in terms of digitisation.

Overall, digital transformation will improve the competitiveness of companies and their ability to survive in a rapidly changing world, but it needs to be done very carefully, looking at every detail to ensure that all stakeholders are satisfied and that people are not lost in the process.

## References

- [1] Alshehab A., Alfozan T., Gaderrab H. F., Alahmad M. A. & Alkandari A. (2022). Identifying significant elements of the digital transformation of organizations in Kuwait. *Indonesian Journal of Electrical Engineering and Computer Science*. 26(1).
- [2] Christensen C. M. (2016). *The innovator's dilemma. When new technologies cause great firms to fail*, Boston, Mass.
- [3] Cortellazzo L., Bruni E., Zampieri R. (2019). The role of leadership in a digitalized world: a review. *Frontiers in Psychology*, 10. <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01938/full>. (utolsó letöltés, megtekintés dátuma: 2023. október 21.)
- [4] Dióssy K., Losonci D. I., Demeter K. (2023). Vezetési stílusok hatása a digitális transzformációra. In: *Vezetéstudomány*. LIV. évf. 2023. 10. szám. <https://unipub.lib.uni-corvinus.hu/9379/1/1014267VEZTUD20231001.pdf>. (utolsó letöltés, megtekintés dátuma: 2023. október 28.)
- [5] Disselkamp M., Heinemann S. (2018). Digital-Transformation-Management. Den digitalen Wandel erfolgreich umsetzen. Schäffer-Poeschel Verlag. Stuttgart
- [6] Farkas F. (2013). *A változásmenedzsment elmélete és gyakorlata*. Akadémia Kiadó. Budapest
- [7] Fichter A. (2019). Change management towards digitalization and innovation. In ICETA 2019 17th International Conference on Emerging eLearning Technologies and Applications (ICETA). IEEE.
- [8] Hanschke I. (2018). Digitalisierung und Industrie 4.0. Systematisch & lean die digitale Transformation meistern. Carl Hanser. München
- [9] Hess T., Benlian A., Mat C., Wiesböck F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*
- [10] Hirschhorn L. (2002). Campaigning for change. *Harvard Business Review*. 80 (7). pp.98-104
- [11] Hirsch-Kreinsen, H. (2014). Wandel von Produktionsarbeit – “Industrie 4.0”. WSI-Mitteilungen 6/2014. pp. 421–429. <https://www.nomos-elibrary.de/10.5771/0342-300X-2014-6-421/wandel-von-produktionsarbeit-industrie-4-0-jahrgang-67-2014-heft-6?page=1>. (utolsó letöltés, megtekintés dátuma: 2023. október 22.)
- [12] Hortoványi L., Szabó Zs. R., Nagy S. Gy., Stukovszky T. (2020). A digitális transzformáció munkahelyekre gyakorolt hatásai – Felkészültek-e a hazai vállalatok a benne rejlő nagy lehetőségekre (vagy a veszélyekre)? *Külgazdaság*. LXIV. évf.. 2020. március-április. pp. 73-96

- [13] Kagermann H., Wahlster W., Helbig J. (2013). Umsetzungsempfehlungen für das Zukunftsprojekt Industrie 4.0 – Abschlussbericht des Arbeitskreises Industrie 4.0. Bundesministerium für Bildung und Forschung. Berlin. Forschungsunion
- [14] Kienbaum (2017). Die richtige Organisation zur digitalen Transformation. <https://www.baymevbm.de/Redaktion/Frei-zugaengliche-Medien/Abteilungen-GS/Regionen-und-Marketing/2017/Downloads/17-05-10-Studie-Organisationsformen-final-%C3%B6ffentlich.pdf> (utolsó letöltés, megtekintés dátuma: 2023. október 22.)
- [15] Kofler T. (2018). Das digitale Unternehmen. Systematische Vorgehensweise zur zielgerichteten Digitalisierung. Springer Vieweg.
- [16] Kohli R., Johnson S. (2011). Digital Transformation in Latecomer Industries: CIO and CEO Leadership Lessons from Encana Oil & Gas (USA) Inc.. *MIS Quarterly Executive*, 10(4), Article 3. <https://aisel.aisnet.org/misqe/vol10/iss4/3>. (utolsó letöltés, megtekintés dátuma: 2023. október 22.)
- [17] Matt C., Hess T., & Benlian A. (2015). Digital transformation strategies. *Business and Information Systems Engineering*, 57. pp.339-343.
- [18] Mayer-Schönberger V., Cukier K. (2014). *Big Data. Forradalmi módszerek, amely megváltoztatja munkánkat, gondolkodásunkat és egész életünket*. HVG Kiadó Zrt. Budapest
- [19] Neligan A., Baumgartner R. J., Geissdoerfer M., Schögl J-P. (2022). Circular disruption: Digitalisation as a driver of circular economy business models. <https://onlinelibrary.wiley.com/doi/full/10.1002/bse.3100>. (utolsó letöltés, megtekintés dátuma: 2023. október 12.)
- [20] Oláh J. (2019). Az Ipar 4.0 keretrendszere, valamint a kapcsolódó technológiák. *International Journal of Engineering and Management Sciences*, 4(4). pp. 213-223. [https://www.researchgate.net/publication/337333691\\_Az\\_Ipar\\_40\\_keretrendszere\\_valamint\\_a\\_kapcsolodo\\_tehnologiaik](https://www.researchgate.net/publication/337333691_Az_Ipar_40_keretrendszere_valamint_a_kapcsolodo_tehnologiaik). (utolsó letöltés, megtekintés dátuma: 2023. október 25.)
- [21] Pater K., McCarthy M. P. (2000). *Digital Transformation: The Essentials of e-Business Leadership*. McGraw-Hill Professional. New York
- [22] Pfohl, H.-C., Yahsi, B. & Kurnaz, T. (2017). Concept and Diffusion-Factors of Industry 4.0 in the Supply Chain. Dynamics in logistics. Proceedings of the 5th International Conference LDIC. Springer Gabler. Wiesbaden
- [23] Schallmo D. R. A. (2019). Jetzt digital transformieren. So gelingt die erfolgreiche digitale Transformation ihres Geschäftsmodells. Springer Gabler. Wiesbaden. 2. Auflage

- [24] Schallmo D. R. A., Reinhart J., Kuntz D. (2018). Digitale Transformation von Geschäftsmodellen erfolgreich gestalten. Trends, Auswirkungen, und Roadmap. Springer Gabler. Wiesbaden
- [25] Schuh, G., Anderl R., Gausemeier J., Hompel M., Wahlster W. (2017). Industrie 4.0 Maturity Index – Die digitale Transformation von Unternehmen gestalten. acatech- Deutsche Akademie der Technikwissenschaften. München.  
<https://www.acatech.de/publikation/industrie-4-0-maturity-index-die-digitale-transformation-von-unternehmen-gestalten/>. (utolsó letöltés, megtekintés dátuma: 2023. október 19.)
- [26] Teece D. J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning* 43(2-3)
- [27] Varga J. (2014). Üzleti agilitás és versenyképesség a XXI. század vállalkozásainál. In.: *Vállalkozásfejlesztés a XXI. században*.  
[https://old2.kgk.uni-obuda.hu/sites/default/files/07\\_VargaJanos.pdf](https://old2.kgk.uni-obuda.hu/sites/default/files/07_VargaJanos.pdf). (utolsó letöltés, megtekintés dátuma: 2023. október 23.)
- [28] Vial G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, Vol. 28.  
<https://www.sciencedirect.com/science/article/abs/pii/S0963868717302196>  
 (utolsó letöltés, megtekintés dátuma: 2023. október 25.)
- [29] Wirtz B. W., Langer P. F. (2021). Digitale Disruption. Bedeutung, Auswirkung und Strategien.  
[https://rsw.beck.de/docs/librariesprovider75/default-document-library/beitrag-wirtz-langer-wist-06-2021.pdf?sfvrsn=a8131bc9\\_0](https://rsw.beck.de/docs/librariesprovider75/default-document-library/beitrag-wirtz-langer-wist-06-2021.pdf?sfvrsn=a8131bc9_0). (utolsó letöltés, megtekintés dátuma: 2023. október 14.)

# **Entrepreneurial solutions for social good: Examining the fusion of Corporate Entrepreneurship and Corporate Social Responsibility**

**Daniela Tzvetkova**

University of National and World Economy, Sofia, Bulgaria,  
daniela.tzvetkova@unwe.bg

*Abstract: This research paper, explores the intricate relationship between two critical concepts in contemporary business practices: corporate entrepreneurship (CE) and corporate social responsibility (CSR). While corporate entrepreneurship involves innovation, risk-taking, and growth strategies, corporate social responsibility is rooted in ethical, social, and environmental responsibilities. This paper delves into the convergence of these domains, aiming to decipher how businesses can simultaneously generate profits and contribute to societal and environmental well-being. The study examines the perspectives of various stakeholders and the broader community, to gain insight into how their views and demands influence the efforts of companies seeking to combine entrepreneurial and socially responsible activities. Integrating intrapreneurship with Corporate Social Responsibility (CSR) can offer numerous benefits for companies and their employees. This integration aligns innovation and entrepreneurial initiatives with a commitment to social and environmental responsibility, fostering a holistic approach to business.. Looking toward the future, the paper identifies emerging trends in corporate entrepreneurship and CSR integration, including the growing significance of impact investing, circular economy practices, and sustainable innovation. This forward-looking perspective provides valuable insights into the evolving landscape of responsible and innovative business practices.*

*Keywords: corporate entrepreneurship (CE), corporate social responsibility (CSR)*

## **1 Introduction**

In recent years, the discourse on sustainable business development and corporate social responsibility (CSR) has gained unprecedented relevance. As our global community grapples with the consequences of environmental degradation and social inequality, the imperative to reshape our development models and leave a positive legacy for future generations has become more apparent than ever.

Sustainable development is not merely a call to action; it is an opportunity for innovation and new ways of thinking. By challenging conventional norms, it paves the way for creative solutions that address both environmental and societal needs. Companies, as drivers of economic growth, play a pivotal role in this transformative journey. In integrating sustainability into their core values, businesses have the chance to not only thrive in the long run but also contribute meaningfully to the well-being of society.

Corporate Social Responsibility (CSR) plays a crucial role in engaging and resonating with younger generations, such as Millennials and Generation Z. These generations are characterized by a heightened awareness of social and environmental issues, and they actively seek out companies that align with their values. Younger generations often prioritize social and environmental values. Companies integrating CSR with a focus on innovation and entrepreneurship can attract the attention and admiration of young consumers who appreciate forward-thinking and socially responsible business practices.

In the 21st century, entrepreneurship has become a way of life for much of the workforce. Not only the creation of one's own business is meant, but also the development of entrepreneurship in an organizational environment. Intrapreneurship provides such opportunities for work and development of people in the organization.

## **2 Literature Review**

In the scientific literature, the concept of entrepreneurship within organizations is known under different names. Examples of such names are: corporate entrepreneurship, intrapreneurship, entrepreneurial management, strategic entrepreneurship, strategic renewal, etc. Most often intrapreneurship is used as a synonym for corporate entrepreneurship or an alternative substitute for it. Some authors distinguish between the concepts of intrapreneurship and corporate entrepreneurship. According to Antonic (Antonic -Hisrich,2003), intrapreneurship takes place among employees within an organization, while corporate entrepreneurship tends to be primarily externally focused. Jong (Jong – Weneckers, 2008), further narrow the focus of the two concepts, placing corporate entrepreneurship at the level of the organization, and intrapreneurship at the level of the individual in the organization. Gifford Pinchot (Pinchot, 1985) introduced the concepts of "intrapreneurship" and "intrapreneur". He calls intrapreneurs "dreamers who create." The author refines his definition by the responsibility these people have for creating innovations of any kind within the organization. "They may be creators or inventors, but they are always dreamers who figure out how to turn an idea into a profitable reality."

According to Antonic (Antonic - Zorn, 2004), intrapreneurship refers to "the process that takes place inside the organization and leads not only to new business ventures, but also to the achievement of innovative activities and directions, such as the development of new products, services, technologies, administrative techniques, strategies and competitive positions". The authors emphasize that entrepreneurship does not only lead to the creation of new businesses, but is largely used to modify existing company concepts. A similar idea is advocated by (Guth - Ginsberg, 1990), according to which intrapreneurship covers two types of phenomena and processes: the birth of new enterprises within existing organizations - for example, internal innovation and change in organizations by renewing key ideas, on which are built – eg strategic renewal. Internal innovation and strategic renewal are the only possible outcomes of the application of corporate entrepreneurship in the organization according to Guth and Ginsberg's definition and model of entrepreneurship.

The most important factor in the success of intrapreneurship is the recruitment and retention of the right people, and the development of a results-oriented reward system that encourages individual initiative, the generation of ideas and their implementation. Organizations need "intrapreneurs" and an intrapreneurial culture if they are to grow and prosper. In an intrapreneurial organization, there must be evidence that innovative people are set as an example and given the appropriate recognition, or in other words, the need to be innovative and the need to explore new future approaches are an integral part of the company culture. It means that workers and employees at all levels of the organization welcome new ideas and are extremely active in generating new approaches and new ways of doing things, willing to take risks and ready to conquer new territories. There are usually many ideas gravitating around any organization, but ideas are worthless until they are put to use. It is the intrapreneur who does this by innovating and perceiving products, services and markets in a new "fresh" way. Intrapreneurs reject bureaucracy and take full responsibility for maneuvering their projects within the organization and in the marketplace. The intrapreneur acts as an agent of change in the organizational environment.

The concept of Corporate Social Responsibility (CSR) is crucial for understanding the relationship between businesses and society. CSR is a term that encompasses several aspects – social, economic, and environmental – and applies to all enterprises, whether large or small, that are capable of improving their economic, environmental, and social success in the short and long term. It affects each of us as it reflects the fundamental values of the society we live in.

CSR is approached from various perspectives, such as social performance, business ethics, corporate governance, stakeholder management, corporate citizenship, and the social contract. One of the most common definitions of CSR comes from the European Commission. CSR is defined as "the responsibility of enterprises for their impact on society" (EC, 2011). The impact extends not only to society and the environment but also to ethical and consumer issues, as well as human rights. The Commission's Communication states that "to fully meet their

corporate social responsibility, companies should have a mechanism for integrating social and environmental issues, ethics, human rights, and consumer concerns into their business operations and core strategy, in close collaboration with stakeholders, with the aim of optimizing the creation of shared value for their owners/shareholders and other stakeholders, as well as society as a whole, and identifying, preventing, and mitigating any potential adverse impacts" (EC,2011).

Companies develop their CSR in various areas related to diverse activities that support different causes, namely:

For the Benefit of Society:

- Beautification of urban environments
- PR activities with a social impact
- Voluntary work
- Support and social integration of orphans, children, and elderly people in homes
- Preservation of cultural-historical heritage
- Quality and safety of products
- Donations
- Sponsorships

Environmental Conservation:

- Pollution control
- Restoration or preservation of the environment
- Conservation of natural resources
- Recycling
- Investments in energy efficiency and reducing environmental pollution
- Management of environmental impact and natural resources

Human Capital and Working Conditions:

- Development of healthy and safe working conditions
- Training and development of personnel
- Support for career development
- Voluntary programs for employees
- Programs for objective and fair compensation
- Employee satisfaction and engagement



Knowledge and Education:

- Scholarships to support people in disadvantaged positions
- Provision of tools and materials for practical lessons in schools
- Providing paid internships
- Encouraging young, intelligent individuals

Cause Marketing:

- Product donations

We can distinguish CSR activities based on the direction of action. In this sense, companies categorize initiatives towards stakeholders as external or internal. External CSR practices are oriented towards society as a whole, the local community in which companies operate, the environment, and their customers. Internal initiatives are actions focused on employees, including the areas of human capital and working conditions.

The development of CSR within the company and its integration with corporate entrepreneurship can lead to significant benefits for both the company and its employees.

### **3 Integration of Corporate Social Responsibility with corporate entrepreneurship (intrapreneurship)**

The integration of Corporate Social Responsibility (CSR) and intrapreneurship can have several positive impacts on companies. Here are some key benefits:

#### **Enhanced Innovation and Agility:**

- Combining intrapreneurship with CSR encourages a culture of innovation and agility within the organization. Employees are empowered to explore creative solutions to societal challenges, fostering a dynamic and adaptive business environment.

#### **Talent Attraction and Retention:**

- Companies that integrate CSR and intrapreneurship are often more attractive to top talent. Employees, especially the younger generation, are increasingly seeking employers who are socially responsible and provide opportunities for innovation and entrepreneurial thinking.

#### **Positive Corporate Image and Reputation:**

- Demonstrating a commitment to CSR through intrapreneurial initiatives contributes to a positive corporate image. Companies that actively engage in social responsibility are often viewed favorably by consumers, investors, and other stakeholders, leading to a strengthened reputation.

**Stakeholder Trust and Loyalty:**

- Integrating CSR and intrapreneurship builds trust and loyalty among stakeholders. Customers and partners are more likely to support and engage with companies that demonstrate a commitment to social and environmental responsibility while fostering a culture of innovation.

**Risk Mitigation:**

- CSR practices, when integrated with intrapreneurship, can help mitigate certain risks. For example, companies that actively address environmental concerns or engage in ethical business practices may be better positioned to navigate regulatory changes and market fluctuations.

**Competitive Advantage:**

- Companies that successfully integrate CSR and intrapreneurship gain a competitive advantage. They can differentiate themselves in the market by offering innovative products or services that address societal needs while aligning with ethical and sustainable business practices.

**Cost Savings and Efficiency:**

- Intrapreneurial projects focused on CSR can lead to cost savings and increased operational efficiency. For example, initiatives that reduce environmental impact or promote resource efficiency may result in long-term financial benefits for the company.

**Long-Term Sustainability:**

- The integration of CSR and intrapreneurship contributes to the long-term sustainability of the business. By addressing social and environmental issues, companies can create a positive impact on society while ensuring their own viability in the face of evolving market dynamics.

**Innovation in Product and Service Development:**

- CSR-driven intrapreneurship often leads to the development of innovative products and services that meet both market demands

and societal needs. This can open up new revenue streams and business opportunities for the company.

Integrating Corporate Social Responsibility (CSR) and intrapreneurship can have several positive impacts on employees. Here are some potential effects:

**Increased Employee Engagement:**

- Connecting employees to a higher purpose through CSR initiatives and allowing them to be part of intrapreneurial projects can increase their sense of engagement and commitment to the organization.

**Boosted Morale and Motivation:**

- Working on projects that have a positive impact on society or the environment can boost employee morale and motivation. Intrapreneurship provides employees with opportunities to pursue creative ideas and make a meaningful difference.

**Skill Development:**

- Intrapreneurship often involves taking risks and learning from failures. Employees engaged in intrapreneurial activities can develop new skills, including problem-solving, adaptability, and resilience. Additionally, involvement in CSR initiatives may provide employees with opportunities to develop skills related to social responsibility and sustainability.

**Sense of Ownership:**

- Intrapreneurship often involves giving employees more autonomy and a sense of ownership over their projects. This empowerment can lead to increased job satisfaction and a stronger commitment to project success.

**Alignment with Personal Values:**

- Employees who feel that their personal values align with the organization's commitment to CSR are more likely to be satisfied with their work. This alignment can create a positive and values-driven work environment.

**Collaboration and Team Building:**

- Both CSR and intrapreneurship require collaboration and teamwork. Employees working on these initiatives often have

the opportunity to collaborate across different departments, fostering a sense of unity and teamwork.

**Professional Development Opportunities:**

- Employees involved in CSR initiatives and intrapreneurial projects may have access to professional development opportunities. This can include training programs, mentorship, and exposure to diverse experiences that contribute to their career growth.

**Positive Corporate Culture:**

- Integrating CSR and intrapreneurship contributes to building a positive corporate culture. Employees are more likely to be proud of working for an organization that values social responsibility and encourages innovation.

It's important to note that the impact of integrating CSR and intrapreneurship can vary depending on the specific initiatives, industry, and the commitment of the organization. Successful integration requires a strategic approach, a supportive organizational culture, and effective communication of the company's values and objectives. While there are numerous positive impacts, it's essential for organizations to effectively communicate the purpose and impact of CSR initiatives and intrapreneurship to ensure that employees understand and align with these values. Additionally, providing the necessary resources and support is crucial for the success of such initiatives and the well-being of employees.

An example of such initiatives is the software company EPAM Bulgaria. EPAM Bulgaria (EPAM, 2023) embraces the employee voice and builds a culture of collaboration, thanks to the „One Team“ Program. Everything in EPAM starts from the idea of an employee who takes the initiative and develops it into a complete project, engaging others along the way. „One Team“ breaks the familiar work model and makes the employees, an active part of the organizational process and the decisions that are made. The project is constantly changing, and adapting to the needs of people, as it involves teams with diverse experiences and colleagues from different positions. From engineers to data specialists, „One Team“ has something for everyone, inviting employees to be active in the organization. „One Team“ groups make sure everyone feels understood and heard—like they're part of a larger community. They have groups responsible for: internal communications, additional well-being activities, fun after-work-hours initiatives, corporate social responsibility events, development and innovation projects, and more.

Some of „One Team“ working groups:

- Corporate Social Responsibility (CSR) Group

CSR group actively monitors global Environmental, Social and Governance (ESG) trends. They organize activities to support and develop EPAM communities. The company has a strong focus on educational activities, in this way, EPAM implements innovative training practices directly related to the real IT field.

- Well-being Team

Well-being organizes various events, such as mountain hikes, volleyball training, running marathons, sports camps, summer office, and free sessions with a psychologist to all employees, which provide a much-needed mental and physical break from the busy work schedule.

By giving employees the freedom to work on their own social projects, the company develops and expands its competencies. Very often, employees possess information and knowledge that the company may not be aware of. On the other hand, employees feel valued and beneficial, both for the company and for society as a whole.

## **Conclusion**

The integration of Corporate Social Responsibility (CSR) and Corporate Entrepreneurship (CE) is crucial for sustainable development for several reasons. Corporate entrepreneurship emphasizes innovation and the ability to adapt to changing environments. By integrating CSR into entrepreneurial activities, companies can foster innovative solutions that address social and environmental challenges. This can lead to the development of sustainable products, services, and business models. CSR emphasizes the importance of engaging with various stakeholders, including communities, customers, and employees. Corporate entrepreneurship that takes into account the interests and concerns of these stakeholders is more likely to be accepted and supported. Engaging stakeholders in the entrepreneurial process can lead to more sustainable and socially responsible outcomes. Governments and regulatory bodies are increasingly imposing stricter standards on environmental and social issues. By considering CSR, companies can proactively address these standards and avoid potential legal and regulatory challenges. Employees are increasingly seeking purposeful work and are attracted to companies that are socially and environmentally responsible. Integrating CSR into corporate entrepreneurship can enhance employee motivation and satisfaction, leading to improved productivity and talent retention.

## References

- [1] Antoncic, B., R. D. Hisrich, (2003): Clarifying the intrapreneurship concept, *Journal of Small Business and Enterprise Development*
- [2] Antoncic, B., O. Zorn, (2004): *The Mediating Role of Corporate Entrepreneurship in the Organizational Support-Performance Relationship: An Empirical Examination*
- [3] European Commission, 2011  
[https://www.europarl.europa.eu/meetdocs/2009\\_2014/documents/com/com\\_com\(2011\)0681/com\\_com\(2011\)0681\\_en.pdf](https://www.europarl.europa.eu/meetdocs/2009_2014/documents/com/com_com(2011)0681/com_com(2011)0681_en.pdf)
- [4] EPAM, Bulgaria <https://www.epam.com/>
- [5] Guth, W, A. Ginsberg, (1990): Guest Editors Introduction: Corporate Entrepreneurship, *Strategic Management Journal*
- [6] Jong, J.-S. Wennekers, (2008): *Intrapreneurship – Conceptualizing entrepreneurial employee behavior*
- [7] Pinchot, G., (1985): *Intrapreneuring: Why You Don't Have to Leave the Corporation to Become an Entrepreneur*

# Fuel consumption as an indicator of economic changes in Hungary

**Zoltán Váradi**

Óbuda University, Doctoral School on Safety and Security Sciences,  
varadi.zoltan@kgk.uni-obuda.hu

*Abstract: Fuel consumption, both diesel and petrol play a vital role in economic and social well-being, and contributes to customary livelihood in many ways: fuel is necessary to maintain personal mobility; diesel is to a greater extent necessary for transporting goods and creates the possibility of access to food and other goods; and through interdependencies it influences other sectors' prosperity. As citizens and enterprises feel economic changes, crises and other trends, their fuel usage changes over time. This paper examines the changes of fuel sales at petrol stations in Hungary since 2008 to today, based on a publicly available database, and questions how the total fuel sales volume was affected by events and trends, and what other patterns occurred. The analysis showed a 4-year decline after 2008 crisis on both diesel and petrol, however petrol suffered nearly three times as much relative decline. Patterns on seasonal effects and residuals also help identifying the traces of economic and political effects, though the long-term repeating pattern is entirely restructured during and after the pandemic period. 150-200 words are required. Include the aim, method, and the main outcome of the paper.*

*Keywords: time series; decomposition; fuel sales; petrol stations; economic changes; critical infrastructures*

## 1 Introduction

The European Union directive on the identification and designation of European Critical Infrastructures identifies both oil refining in energy sector, and transportation (Annex I of Directive 2008/114/EC). The fuel utilization, diesel and petrol, is in common to both. Fuel is also critical in contribution to economic and social well-being; its availability provides a sense of security through personal mobility. Fuel is a necessary condition for the transport of goods, it provides access to food and other goods for a large part of the population and other economic stakeholders. Fuel availability has a close influence on other sectors through interdependencies. In addition to economical welfare, energy sector and transportation have national security concerns.

The daily life of the population is influenced by many factors including economic and political circumstances, of which some are global, e.g. the pandemic waves, and some are local, such as the evolution of traffic around a newly developed industrial area. Given the critical role of fuel sources on social and economic welfare, it is of interest to monitor the extent to which fuel sales change over time, as conditions change.

This paper explores the question of how the quantity of fuel sales is related to economic changes, and identifies ways to identify smaller scale, i.e. local or short-term changes. The study is not trying to find cause and effect relationships between the sales volume changes and social, political, or economic effects apart from some explanatory bits; it provides a descriptive analysis of the time series.

## **2 Literature review**

The petroleum-based energy accounts for 10% of the total primer energy production of Hungary in 2021 (Energiatermelés, 2022), though the same sources account for 29,3% of the total primer energy consumption (Primer energy, 2023). The difference is covered by imported energy sources. According to MOL's description, approximately one third of the total petroleum is converted into petrol, another one third is converted into diesel or heating oil, depending on the configurations of the process. (Csernik, 2016).

Petroleum-based energy producers shall be considered as essential service providers according to the definition of National Directorate General for Disaster Management (Katasztrófavédelem, 2023), as they provide an essential service the provision of vital social and economic processes and functions. Any incidents affecting their operations would result in significant disruption of the service. Among the seven sectors, energy and transport may be directly affected by the producers of petroleum-based energy products.

It is important to notice that the Government Decree on critical transport systems (Gov.Dec. 161/2019 (VII.4.)) does not mention fuel availability, though fuel is an essential contributor to traffic and transportation. In terms of road transport, it only deals with the definition of essential roads of Europe and Hungary. In terms of incidents, it mentions breakdowns of data collection and observation devices, and shutdown of traffic management systems. Without fuel, traffic would shut down immediately, therefore fuel availability turns vital, though it is not affecting the infrastructural elements.

The importance of fuel availability is declared in the Government Decree about critical energy systems (Gov.Dec. 374/2020 (VII. 30.)). It states that a petroleum industry unit that supplies diesel, petrol, or kerosene products shall be considered a national essential system element if in case of its loss, the domestic demand can



not be satisfied by at least 70% for a period of 55 days. Having this legal definition, none of the individual petrol stations, nor petrol station chains shall be considered a critical infrastructure system element.

Despite the above, sales at petrol stations as system elements shall be investigated, as fuel sales has cross-border and cross-sectoral impact that results from interdependencies. Fuel availability touches two of the horizontal criteria: the economic impact through the deterioration of services, and the social impact through the disruption of daily life. This study seeks to analyse the interdependencies backwards: having a detailed time series of petrol stations sales volumes in liters of petrol and diesel oil, it seeks signs of economic changes.

### 3 Method

Time series of sold litres of fuels show seasonal patterns in addition to trend data. Decomposition of components are based on a moving average smoothing for the 12 months length of the repeating pattern (Koltai, 2006). Such smoothing makes long-term patterns highlighted. In detail, the smoothed series' data point  $i$  are the averages of the 12 sales data of the half year before and half year after, i.e., averages of the interval  $[i-5; i+6]$ , meaning that the smoothed data is a shorter time series at both ends.

$$\bar{D}_i = \frac{\sum_{n=i-5}^{i+6} D_n}{12} \quad (2)$$

Detrended data are generated by subtracting the calculated smoothed trendline data from the actuals, assuming an additive seasonal pattern. Individual seasonal deviations are monitored. The average of seasonal additives over years for each month is taken as a baseline to calculate residuals. Residuals are the unexplained variation of sales after subtracting the 12-month MA trendline values and the averaged monthly seasonal additives,  $a_i$ .

$$r_i = D_i - \bar{D}_i - a_i \quad (2)$$

Residuals are then further analyzed to find additional signs of factors affecting the sales of fuel in Hungary. If the above additive seasonal and trend model would fit ideally, a normal distribution could be a good estimate. Minitab Statistical Software's Probability Plots and Anderson-Darling test for normality are applied (Minitab, 2023). Time series of residuals are also tested for signs of nonrandom patterns through statistical process control charts. Individual values and moving range charts of Minitab Statistical Software enhanced with the Western Electric rules are plotted and used to substantiate nonrandom variation.

### 3.1 Data sources

Fuel consumption data are available from a number of different data sources in Hungary. One very detailed set of data is the National Tax and Customs Administration excise statistics, which has provided monthly and county-by-county quantitative data on petrol and diesel since 2008 (HTCA Excise statistics downloadable database, 2023). The data source is based on the tax declarations provided by petrol stations, which, by its nature, may contain errors and discrepancies, and late declarations and corrections may retroactively change the data to a minor extent (HTCA Excise statistics, 2023). In addition to the volume of sales of filling stations located in Hungary, other sources may also supply the Hungarian market, such as cross-border sales and private imports. The fuel sold elsewhere, not through public filling stations, is not included. Despite this, the data set is suitable for examining trends and patterns and for drawing conclusions.

Although data on the volume of E85 fuel is available in the data source table (HTCA Excise statistics downloadable database, 2023), it is very low in volume, compared to petrol and diesel, and has therefore been excluded from the study.

The comparatory data of the number of road vehicles, including passenger cars, trucks and lorries, and other forms are from the Hungarian Central Statistical Office (Number of road vehicles, 2023).

Fuel prices have great variety from petrol station to petrol station, and by time also, but trend patterns can be captured from the fuel prices to be used in fuel cost accounting, released monthly by the Hungarian Tax and Customs Agency (Fuel costs, 2023). These official prices are always released for the next month, so their values represent market prices with approximately a month delay. However, on HTCA website, only fuel cost accounting prices from 2014 are available. From November 15, 2021, the Hungarian government has frozen the fuel prices at 480HUF/liter for 13 months, both diesel and petrol. That has later been split: Hungarian private car owners could continue to purchase at the lower fixed price, foreigners and trucks have paid the regular market price. Petrol prices before 2014 are available from (Kiküldetési rendelő, 2023). There is only one discrepancy between the two data sources: in July 2022, HTCA lists 725HUF/liter for diesel, whereas Kiküldetési rendelő lists 751HUF/Liter for the same, while private car owners had to pay only 480HUF/Liter. In this study, the HTCA official 725HUF/liter was used.

## 4 Results

The raw monthly data of fuel sales show both long term trends and yearly seasonal patterns, as indicated on Figure 1. For better comparison of volume and prices,

both are plotted on the same chart. It is not obvious if the price would have influenced the sales volume on long term, and price changes neither move together with seasonal patterns of sales.



Figure 1

Fuel sales at petrol stations of Hungary, and fuel prices on the secondary axes.

Left: petrol; Right: diesel

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

#### 4.1 Petrol sales

Time series charts by counties show the weight of each county in the total sales, Pest county and Budapest being the most important in terms of liters sold, giving 35% of Hungary's petrol sales. The absolute lowest volume is sold in Nógrád with 1.5% of the total, followed by Tolna with 2.2%. All other counties ranged 2.8-5.5% of the total country sales. By Aug 2016, Pest county sales reached that of Budapest, and slightly exceeded it during the pandemic. Between 2012 and Feb. 2023, Győr-Moson-Sopron county and Borsod-Abaúj-Zemplén county sales moved close to each other, and then Győr-Moson-Sopron county sales have increased suddenly by 10%. Though this study is not seeking causes and effects, we may note that this increase may come from the refugees from Ukraine travelling to the rest of Europe, and finally filling their cars with the comparably cheaper petrol yet in Hungary. Győr-Moson-Sopron county location is just in the range of 400-500kms away from the Ukrainian border, and this distance covers the typical fuel range of a petrol engine passenger car.

The effect of 2008 financial crisis is also visible on petrol sales in the form of a decline in every region in Hungary. This decline however was not evenly observable. The steepest and fastest decline was observable in Szabolcs-Szatmár-Bereg county with 30% drop by Aug. 2011. The country total drop was 24% compared to the 2008 starting values, and the smallest drop turned 20% in Pest county. Counties started turning the trend upwards again after Sep. 2009, Budapest being the slowest in recovery, where the trend started growing in July 2013. Budapest's recovery was not complete, its drop in petrol sales during the pandemic arrived below the 2013 minimum. In Győr-Moson-Sopron county, the

decline was as steep as in Szabolcs-Szatmár-Bereg until June 2010, then turned stable, until another short wave of decline in the first half of 2012. This short-term backflip may be related to the expansion of Audi Hungaria Zrt and its suppliers, which has attracted thousands of families to the vicinity of Győr.



Figure 2

Regional sales of petrol (left), and the 12-month MA smoothed (right)

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Pandemic waves also observably alter the seasonal pattern and the overall trend. The seasonal pattern is best observable on the detrended data of Figure 3.

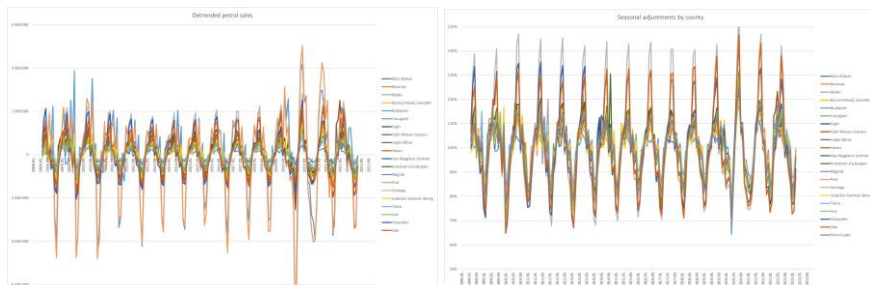


Figure 3

Detrended sales values of petrol (left), and their relative magnitude (%), right)

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Both views of data highlight some sporadic events, and long-term effects, too. Sporadic events are, for example, the +20% sales in Békés county in Dec. 2012, the +30% sales in Komárom-Esztergom county in Oct. 2014, or the +16% sales in Tolna county in Dec. 2008. Some of those may be reporting issues, e.g., if Békés county had a low sale in Nov. 2012 and a high sales in Dec.2012, they may compensate.

On long term, as the relative importance changes, we can identify that the summer sales in counties near Balaton region has shifted. During summers until 2013, Veszprém had higher seasonal effect than Zala, later, in 2014 and after, Zala's relative seasonal change has exceeded the same of Veszprém, and approached Somogy's relative seasonal variance, which is the biggest in the country with its 50% peak. In absolute values, however, Zala's fuel sales are yet lower. This relative importance increase in Zala might indicate the higher exposure to tourism in that region.

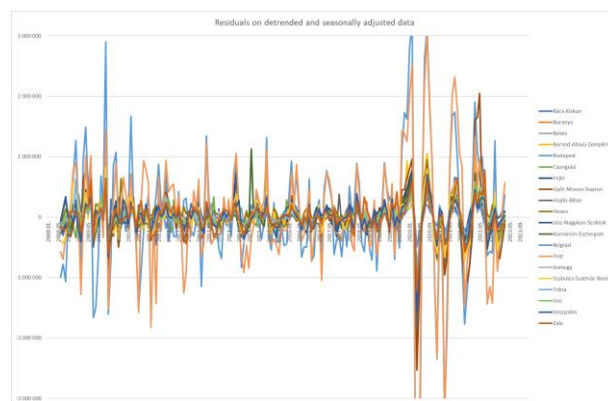


Figure 4

Residuals time series by county

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Residuals as calculated according to (2) are plotted on Figure 4. Positive residuals are topping at +15%, and negative residuals average out at -27%, that is due to the extreme negative residuals during the pandemic waves. Peaks on residual plots also indicate sporadic nonrandom changes, e.g. a +1.13M liters sold in Oct. 2014 in Komárom-Esztergom, or a +1.6-2M liters sold each month between Feb. and May 2022 in Győr-Moson-Sopron county.

Residuals do not align with normal distribution model, suggesting that other factors or constraints might be identified with a deeper analysis.

A simple but powerful tool to analyse nonrandom variation or patterns on a time series are statistical process control charts. Residuals as individual data points are plotted on an individual and moving ranges chart, as illustrated on Figure 5. Western Electric rules are added to highlight possibilities of any nonrandom changes. In case of Budapest, a lower variation state can be identified between Feb. 2010 and Feb. 2020, the WE rules only indicate unusually small variation.

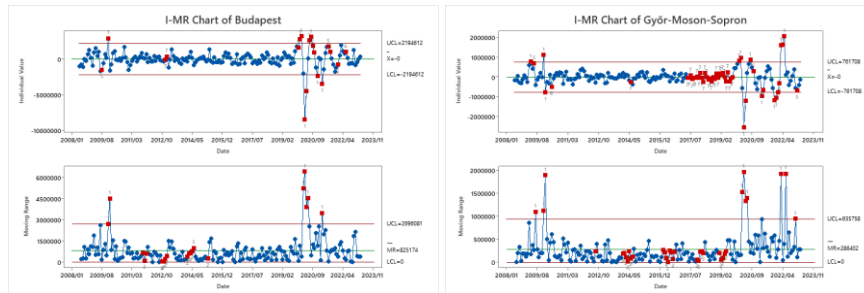


Figure 5

I-mR chart examples of residuals for two regions

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

## 4.2 Diesel sales

Compared to the petrol sales, county weights of the total Hungary diesel sales are not so different. Nógrád is again the lowest with 1% contribution to total, and the top 3 are Pest, Budapest, and Győr-Moson-Sopron county with 36.6% contribution to total sales. Since 2008, it was always Pest county with highest monthly liter volume, and Győr-Moson-Sopron exceeded Budapest since Apr. 2020. The same phenomena can be observed on the diesel charts as on the petrol charts, though at a lower relative amplitude: during the pandemic waves, there was a slight drop, and in March 2022 Győr-Moson-Sopron county's sales raised.

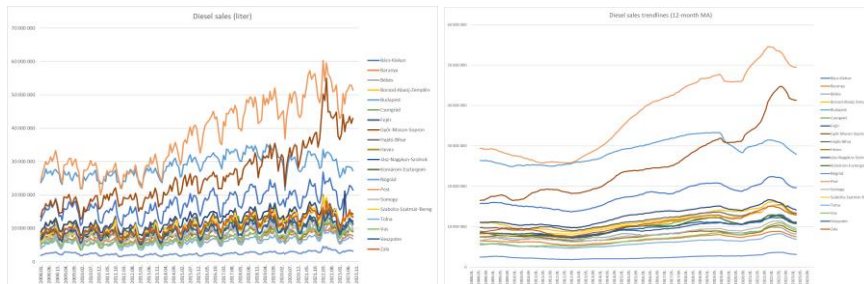


Figure 6

Diesel oil volume sold by county (left), and 12-month MA smoothing (right)

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Diesel sales is not so sensitive to crises as petrol. A possible source of the difference can be that diesel is mostly used in transportation, and only a smaller portion of passenger cars contribute to the diesel volume. The recovery after the 2008 financial crisis went way faster in four counties, they recovered by Nov. 2009, and the latest increase started in Heves in Nov. 2012. Hungary total drop compared to 2008 was 10%. Győr-Moson-Sopron county sales shows a wavy pattern with no drop below the starting level.

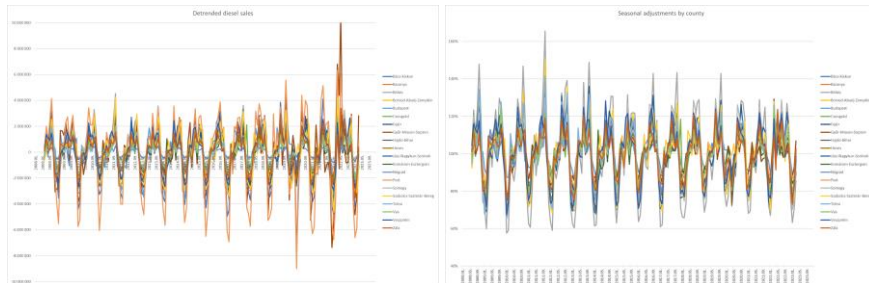


Figure 7

Detrended sales volumes of diesel oil (left), and its relative magnitude (right)

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Unusual seasonal pattern is observable in Békés, there is a much larger relative difference between summer and winter seasons, than in other places in Hungary. Similarly to the petrol sales, there are other sporadic changes observable, e.g. the seasonal pattern gets broken in spring 2022.

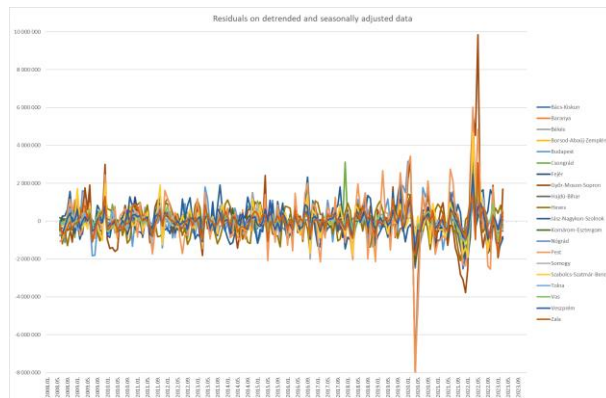


Figure 8

Residuals time series of diesel sales volumes

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Residuals are plotted in Figure 8. Apart from the extreme changes during pandemic and the war at Ukraine, diesel residuals tend to fit to a normal distribution, meaning that diesel sales are more robust and less sensitive to economical cycles.

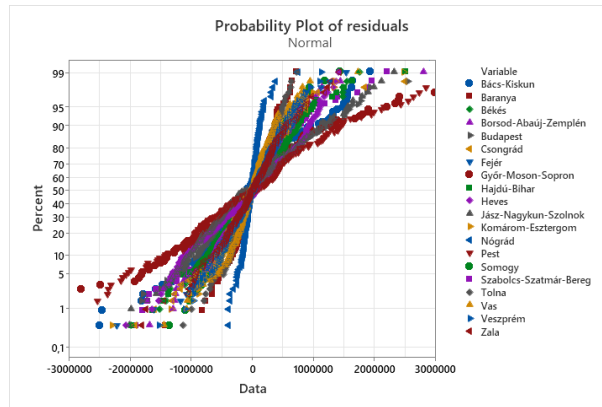


Figure 9

Normal probability plots of residuals of diesel by county

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

Time series of residuals are plotted on I-mR charts, which are enhanced with Western Electric rules of nonrandom patterns. It is easily seen that, compared to the petrol charts of the same type, there is not so much off-control variation.

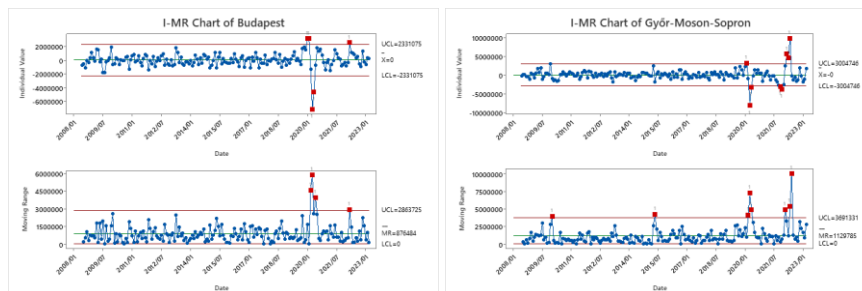


Figure 10

I-mR chart examples of the residuals

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

## 5 Discussion

Fuel sales comes as a result of need to travel or transport goods. That need also influences the number of road vehicles. According to data source of year-end number of vehicles (KSH number of road vehicles, 2023), the number of passenger cars has grown 73% between 2000 and 2022, and the number of trucks and lorries has grown 66% in the same period. The number of motorbikes has grown 131%, in all cases the number of vehicles in year 2000 is taken as basis.



The growth is not linear, it has a slight decline after 2008. Main users of diesel are trucks, so they are more tied to business related transportation, whereas passenger cars are mostly driven by petrol engine (Which type of fuel for your car? 2019). In Hungary, one out of 5 cars were diesel operated in 2008, and it increased to 28% by 2016. Other forms of vehicles are in so low numbers that their effect in the diesel-petrol ratios are negligible in this study.

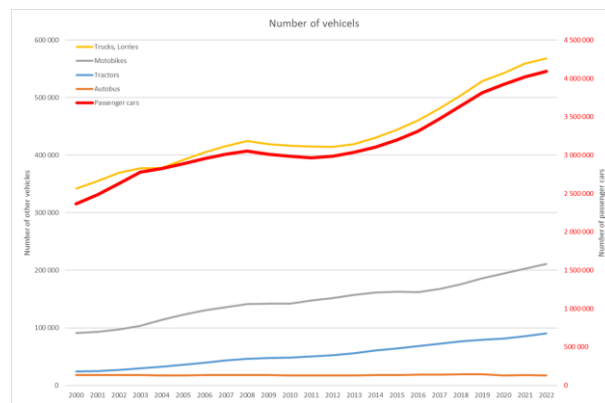


Figure 11

Number of road vehicles in Hungary. The vertical scale for passenger cars is on the secondary axis.

Source: Own chart based on (KSH number of road vehicles, 2023)

The growing number of vehicles would suggest a similar growth in fuel consumption, too, however, it does not turn true. Figure 12 shows diesel and petrol sales over the same time scale: The diesel sales has doubled in 2006, that can not be explained by the increase of number of cars in this year. A realistic explanation may be related to other macro-political circumstances like the increase of traffic and trade after Hungary joined the European Union in 2004.

A similar but much smaller increase was observable on the petrol sales volumes in that time. Petrol sales growth until 2008 was followed by a 5-year decline, and it took nearly another decade to grow back to the level of 2008. As the number of cars continued to grow, it can only happen if the average petrol consumption by passenger car per year drops.

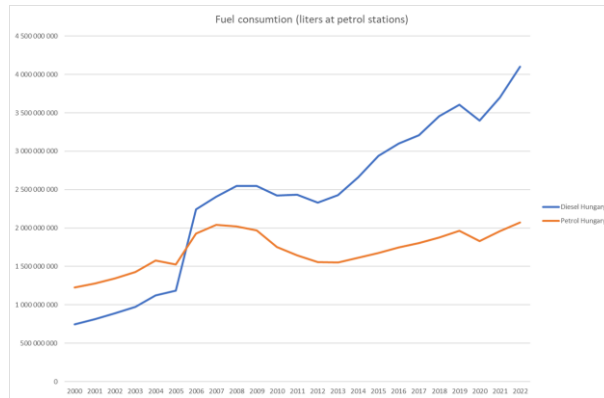


Figure 12

Fuel sales at petrol stations of Hungary.

Source: Own chart based on (HTCA Excise statistics downloadable database, 2023)

## Conclusions

Simple time series analyses like time statistical process control charts can not be used on data series where consecutive data points are not independent of each other. Fuel sales volume data are not independent as both trends and seasonal patterns are observable. Analysis shall in that case start with decomposition. Moving average smoothing has valuable highlights of the overall trends, however in case of sudden changes it is late in following it, resulting in larger residual errors. On detrended data, seasonal adjustments are to be calculated. In case there is a long series of data, seasonal adjustments of every season can be plotted on a similar SPC chart checking if there is any change in the seasonal pattern. Analysis of residuals, i.e. detrended and seasonally adjusted data points shows every additional pattern like one-time deviations or short- or long-term patterns. The main conclusion of the study is that residual plots contain sources of signals of factors affecting variation in sales volume. The analysis pointed out some regional and timely limited factor that altered fuel sales. “The rest is just history”, similarly to a regular use of statistical process control: if a symptom is discovered, a thorough analysis of potential causes shall follow.

## References

- [1] Csernik, K. (2016): A kőolaj-finomítás alapjai, retrieved from [https://mol.hu/images/content/A\\_MOL\\_rol/a\\_tvk-rol/egyetemi\\_kapcsolatok/debreceni\\_egyetem/Oktatasi\\_anyagok/Bemutatok/DE\\_Koeolajfeldolgozas\\_2016\\_10\\_28.pdf](https://mol.hu/images/content/A_MOL_rol/a_tvk-rol/egyetemi_kapcsolatok/debreceni_egyetem/Oktatasi_anyagok/Bemutatok/DE_Koeolajfeldolgozas_2016_10_28.pdf) on June 10, 2023.
- [2] Directive 2008/114/EC. *Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection*, retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0114> on June 13, 2023.
- [3] Energiatermelés Magyarországon (2022), retrieved from <https://energiaoldal.hu/energiatermeles-magyarorszag/> on May 4, 2023.
- [4] Fuel costs, *Korábbi években alkalmazott üzemanyagárak*, retrieved from [https://nav.gov.hu/ugyfeliranytu/uzemanyag/Korabbi\\_evben\\_alkalma20150212](https://nav.gov.hu/ugyfeliranytu/uzemanyag/Korabbi_evben_alkalma20150212) on Nov. 12, 2023.
- [5] Government Decree 161/2019 (VII. 4.). *Government Decree 161/2019 (VII. 4.) on the identification, designation and protection of critical transport systems and facilities*, retrieved from <https://net.jogtar.hu/jogszabaly?docid=a1900161.kor> on Nov. 08, 2023
- [6] Government Decree 374/2020 (30.VII.). *Government Decree 374/2020 (30.VII.) on the identification, designation and protection of critical energy systems and installations*, retrieved from <https://net.jogtar.hu/jogszabaly?docid=A2000374.KOR> on Nov. 08, 2023
- [7] HTCA Excise statistics (NAV Jövedéki statisztikák), retrieved from [https://nav.gov.hu/adatbazisok/adostatisztikak/jovedeki\\_statisztikak/uzemanyagtolto\\_allomasok\\_forgalmi\\_adatai\\_havi\\_bontasban](https://nav.gov.hu/adatbazisok/adostatisztikak/jovedeki_statisztikak/uzemanyagtolto_allomasok_forgalmi_adatai_havi_bontasban) on May 4, 2023.
- [8] HTCA Excise statistics downloadable database (*NAV Jövedéki statisztikák – Adatbázisok*), retrieved from [https://nav.gov.hu/pfile/file?path=/adatbazisok/adostatisztikak/jovedeki\\_statisztikak/Uzemanyagtolto\\_allomasok\\_altal\\_forgalmazott\\_uzemanyagok\\_mennyisege\\_havi\\_bontasban](https://nav.gov.hu/pfile/file?path=/adatbazisok/adostatisztikak/jovedeki_statisztikak/Uzemanyagtolto_allomasok_altal_forgalmazott_uzemanyagok_mennyisege_havi_bontasban) on Nov. 8, 2023.
- [9] Katasztrófavédelem (2023), *Kritikus infrastruktúrák védelmével összefüggő hatósági feladatok, jogszabályok*, retrieved from <https://www.katasztrofavedelem.hu/109/kritikus-infrastrukturak-vedelmevel-osszefuggo-hatosagi-feladatok-jogszabalyok> on May 4, 2023.
- [10] KK fuel costs (2023), *APEH üzemanyagárak 2023*, retrieved from [http://kikuldetesi-rendelveny.hu/apeh\\_uzemanyagarak/](http://kikuldetesi-rendelveny.hu/apeh_uzemanyagarak/) on Nov. 12, 2023.
- [11] Koltai, T. (2006): *Termelésmenedzsment*, 1<sup>st</sup> edition, Typotex Budapest

- [12] Minitab Methods and formulas for Normality Test, retrieved from <https://support.minitab.com/en-us/minitab/21/help-and-how-to/statistics/basic-statistics/how-to/normality-test/methods-and-formulas/methods-and-formulas/#anderson-darling-statistic-a2>, on Nov. 12, 2023
- [13] Number of road vehicles, *A közúti gépjárművek száma vármegye és régió szerint, december 31., KSH Stadat*, retrieved from [https://www.ksh.hu/stadat\\_files/sza/hu/sza0040.html](https://www.ksh.hu/stadat_files/sza/hu/sza0040.html) on Nov. 21, 2023.
- [14] Primer energy, 6.1.1.5. A primer energiafelhasználás szerkezete, retrieved from [https://www.ksh.hu/stadat\\_files/ene/hu/ene0005.html](https://www.ksh.hu/stadat_files/ene/hu/ene0005.html) on Nov. 08, 2023.
- [15] Which type of fuel for your car?, Eurostat, 2019, retrieved from <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190109-1?inheritRedirect=true&redirect=%2Feurostat%2F> on Nov. 28, 2023

# Meat, protein and food supplement consumption in Hungary

Gréta Újvári

Mars tér 7., Szeged, 6724, ujvari.greta@phd.gtk.uni-pannon.hu

*Abstract: There have been huge changes in the field of nutritional science. Nowadays, gyms are being developed or expanded and the market for nutritional supplements is growing. In my former research, I have aimed to map the consumption of meat and protein in Hungary. We have tried to design our questionnaire in line with international trends. We have taken into account the increasing vegetarian diet, the characteristics of meat consumption, and the sporting habits of the respondents. As a continuation of my research, one of my objectives is to understand the sport and dietary supplement consumption habits of the domestic population, using a variety of marketing research tools. Another objective is to map and analyse the marketing strategies and tools used by sports supplement companies. The results of my research can contribute to the mapping of the domestic population's attitude towards sport and their motivation. Thanks to these results, we can move the health of the Hungarian population in positive direction, and the relationship between sport, nutrition and physical activity. In addition to its health and economic utility, it will also provide food and pharmaceutical industry players information on current trends and a database to base product development.*

*Keywords: vegetarianism; Hungarian food consumption; purchasing of food; sport nutrition; fitness diet; protein consumption; marketing*

## 1 Introduction

In Hungary, thanks to Hungarian gastronomy, omnivorous diets have become predominant, but we have to take into account the growing vegetarian and vegan diets, especially among the younger age group.

Dieticians, doctors and food industry professionals are trying to raise awareness of the dangers of meat-free eating. While this type of diet can have many benefits, it requires a well-planned diet and adequate intake of minerals and vitamins, as there are essential amino acids and fatty acids that our body cannot produce on its own, and therefore need to be ingested through food.

This article presents the results of our research on meat and protein consumption in Hungary, as well as preliminary indications for my next research topic on the

use of dietary supplements. In these topics, it is worth paying attention to the marketing tools of the manufacturing companies and consumer preferences, which can give us a complete picture by combining the disciplines of psychology, sociology and marketing.

## **2 Literature Review**

### **2.1 The emergence of food marketing**

The emergence of the marketing discipline dates back to the 1910s and 1920s, along with social sciences such as sociology and psychology. It was during this early period that those interested in marketing first encountered it as agricultural marketing, as the first textbook was published, *The Marketing of Farm Products*, written in 1916 by Louis Dwight Harvell Weld. This may be due to the fact that the food market was the first to be saturated (Szakály et al., 2017)

Later the concept of food marketing became broader and broader, including the marketing of raw and processed foods. This was called agri-marketing, which focuses on raw and processed foods, and food marketing, which focuses on processed foods. There was also the concept of food marketing, which covered the whole production chain in the farm-to-table concept. For a long time, general marketing science and food marketing developed together, but the latter has lagged behind over the years. What they have in common today is the creation of value, which is important for both buyers and consumers (Szakály et al., 2017).

### **2.2 Multidisciplinarity of the topic**

As in the current research topic; meat and protein consumption, as well as the topic of food supplementation, i.e. consumer habits and preferences, we should not overlook the multidisciplinarity of the topic. It is well known that manufacturers and distributors use various marketing tools to attract consumers to their shopping baskets, and that they use various market research tools and surveys to understand their current and future needs. In this way, we should not ignore the sociological and psychological aspects of marketing, since understanding consumer behaviour, preferences and target groups requires the involvement of several disciplines.

As our research concerns food, it is important to emphasise food safety, as the production of quality and safe food is an essential requirement for market competitiveness. In addition, all food producers and distributors in Hungary are required to comply with and implement HACCP, i.e. Hazard Analysis and Critical Control Points. In addition, thanks to higher standards and management

commitment, it is worth mentioning various food industry quality management standards, which can help companies to produce food with even higher quality and responsibility. In addition, some chains have their own set of requirements through supply chains.

The consumption of food and food supplements should not make us forget about health aspects, such as the recommended daily intake, or the issue of nutrition and supplementation for different diseases and different ages. In addition to the expertise of doctors and dieticians, when we talk about sports-specific nutrition and supplementation, we must also look at research in conjunction with sports science, as we must not forget the objectives of athletes, performance enhancement and the associated supplementation and sports-specific nutrition.

Regular exercise has many known benefits. It can be used as a complementary treatment or prevention for many diseases. It can also reduce the effects of stress. In our everyday lives, it improves our mental and physical capacity, our decision-making skills and our concentration, among other things. For those who take exercise seriously, it is also necessary to adapt dietary habits to diet. Healthy, high-quality food intake, pre- and post-exercise fluids and supplements are necessary for a successful exercise programme (Alexis, 2016) It is also worth looking at the importance of sustainability for individuals in sport and how this is incorporated into the marketing strategies of individual companies, as a large proportion of athletes rely on animal protein for a significant part of their diet (Fritz et al., 2020)

### **2.3 Characteristics and trends in Hungarian nutrition**

From the 1980s until 2010, the health of the Hungarian population has been steadily deteriorating, writes János Rigó in his book "Dietetics". The reasons for this may include the unbalanced diet of the Hungarian population, excessive consumption of stimulants and an unhealthy, sedentary lifestyle. The author also points out that unbalanced, inappropriate nutrition plays a significant role in the 145,000 deaths per year in Hungary and the reduction in life expectancy. There is a correlation between the annual mortality rate of 80,000 cardiovascular and 32,000 cancer deaths and unhealthy diet (Rigó, 2013, Újvári et al. 2020)

János Rigó has also compiled a list of the main bad dietary habits in Hungary.

- the energy and fat intake of the domestic population is too high; instead of the recommended 300 mg, we consume on average 500 mg
- carbohydrates; our sugar consumption is too high
- on average, we put three times more salt into our bodies per day than the recommended daily intake, instead of the recommended 5 g

- we consume 20-25 g of fibre per day instead of the recommended 30-35 g, so the domestic population's fibre consumption is too low
- we are not getting enough vitamins and minerals
- on the other hand, our alcohol consumption is too high, with nearly one in ten of the population regularly consuming more than 10-20 g of alcohol per day (Rigó, 2013, Újvári et al. 2020)

## 2.4 Vegetarian eating habits

If we want to know the history of the meat-free diet, it is worth knowing that no indigenous community or natural people has ever been found where this diet was followed by all members in all its elements. It was first encountered in India through religious-philosophical endeavours, and vegetarianism was also encountered in the ancient Greek world. The emergence of modern vegetarianism dates back to the 1800s. Nowadays, there is a holistic world view, i.e. ethical-moral, environmental, agrotechnological, closed philosophical views of the meat-free diets of our time (Balogh, 2017).

Vegetarianism has also become a fashionable trend; the so-called semivegetarianism, which is based on a mixed diet. In the latter case, the consumer consumes a plant-based diet supplemented with fish and poultry meat. In the case of ovo-lacto vegetarianism, the consumption of eggs and milk and milk products is not prohibited. In the case of ovo-vegetarianism, only eggs are allowed in combination with plant foods. In lactovegetarianism, the consumption of milk and dairy products is not prohibited. In pescovegetarianism, the consumption of fish is allowed. Vegans are those who omit all raw materials of animal origin from their diet. Raw vegetarians eat at least three quarters of their vegetarian food raw. Sándor Balogh writes about these in his book "Alternative nutrition - our food choices" (2017).

## 2.5 Use of nutritional supplements

According to European Union legislation, foodstuffs containing various nutrients or other substances with a physiological effect on nutrition in concentrated form are considered food supplements. These supplements can be found on the shelves in powder, liquid or capsule form (europa.eu, 2023)

It is important to note that dietary supplements are not medicines, which are used to prevent and treat various diseases, whereas food supplements, as their name implies, are used to supplement the diet. While medicinal products can only be marketed through a specific authorisation by a specific authority, for food supplements only the manufacturer or distributor is responsible; it is the



manufacturer or distributor who has to control the quality and safety of the food in-house (portal.nebih.gov.hu, 2023).

According to the NÉBIH's Dietary Supplement Guide, people should take a food supplement if they are following a special diet, if they are heavily using their body, if they are exposed to various diseases, stressful lifestyles or unbalanced diets. There are two thresholds to be aware of, because just as a lack of minerals and vitamins can cause problems for the body, excessive intake has no positive physiological effects. The Upper Level value, or UL for short, is the upper limit of safety for intakes. The well known NRV, Nutrient Reference Values, is the recommended daily intake of minerals and vitamins (portal.nebih.gov.hu, 2023)

We are increasingly confronted with advertisements and recommendations for various nutritional supplements; just think of the social media, pharmacies, billboards. One may wonder whether this is necessary. Research carried out in the second half of the 1980s showed that, in addition to an inadequate intake of macronutrients, vitamin and mineral intakes are not very beneficial. A decade later, research came to the same conclusion. If we eat a healthy diet, it can contain the levels of vitamins and minerals our body needs. However, this can be influenced by the foods we like or dislike to eating, so it is worth checking that we are providing our body with the daily requirements (Rigó, Gyurcsáné, 2006)

Gabriella Silye also raised the question of whether supplementation is necessary in her book. She pointed out that the increased demand from the food industry, the use of chemicals in agriculture, has led to soil depletion, which means that the soil itself binds many minerals, which are then absorbed by the plants in smaller quantities. This may support studies that have indicated a decline in nutrients in food (Silye, 2019).

There is a large body of research supporting the anti-cancer effects of antioxidants. They are substances, as the name suggests, that can protect various substances from increased oxidation. They increase the body's defences, as the free radicals produced in our bodies do work like the corrosion processes on the fence that we can see with our eyes. Antioxidants are intended to improve the situation by weakening the defensive effects of various stresses and harmful addictions (Rigó, Gyurcsáné, 2006)

Nowadays, gyms are opening and expanding, personal trainers are becoming more and more common, and the market for nutritional supplements is growing. Gyms have become quite popular due to their visibility in urban environments and commercial images, with increasing gym attendance (Honfi et al., 2009). More and more people are paying attention to exercise, healthy lifestyle and nutrition. The number of people changing their lifestyle and exercising recreationally has increased, which has led to a growing and evolving market for sports supplements. The consumption of the latter is also becoming increasingly common among younger generations. In addition to recreational and competitive athletes, even

young children are increasingly taking dietary supplements containing mainly vitamins and minerals (Liska et al., 2021). According to Gabriella Silye, it can be said that athletes often do not use supplements properly and often supplement according to fashion. Too high intakes can also impair the performance of athletes (Silye, 2019).

It is worth mentioning that supplementation is necessary in all sports where it is necessary to keep the athlete's body weight low. However, there are sports where we want to achieve the opposite, such as bodybuilding and powerlifting. There is a special group of athletes in weightlifting sports. For them, after fasting and dehydration, they need to get nutrients and electrolyte solutions into their system that will give them the performance they need. And for those in the long-distance endurance sports group, they need to replenish energy and fluid losses during exercise (Silye, 2019).

### **3 Methods**

The aim of my baseline study was to assess meat and protein consumption habits in Hungary and to investigate the extent to which the protein consumption and exercise habits of meat-eaters and meat-free dieters differ.

The quantitative research was preceded by a literature search. Quantitative research was conducted through an online questionnaire, which was shared on social media platforms. When compiling the questionnaires, we tried to put as much emphasis as possible on demographic data, in line with the discipline of sociology, and also to investigate consumer preferences and certain elements of behaviour. We have also included some sport-related questions in relation to sport science, and we have also tried to take into account health aspects in the response options.

We looked for links between vegetarian, carnivorous diets and sport and protein consumption. The first questionnaire survey was carried out in October 2020 on "Mapping meat and protein consumption in our country" with 200 participants. Since less than 5% of the respondents were vegetarians or vegans, a separate questionnaire survey was dedicated to them. This survey was carried out in March 2021 under the title "Vegetarian and vegan dietary habits survey", with 284 participants.

Overall, the aim of my research is to continue my previous research results, which are mainly related to meat and protein consumption in Hungary, as well as vegetarian diets and sports; to be as specific as possible through the co-disciplines; in the field of food supplementation.

## 4 Results

Our October 2020 survey, "Mapping meat and protein consumption in Hungary", was conducted with 200 participants. The gender ratio was nearly 70:30 in favour of female respondents. 80.6% of the respondents belong to the urban population. More than half of the participants have a university degree.

The evaluation showed that the consumption of poultry and pork meat remains the highest in the country, followed by fish and then beef. Most people eat them for their balanced nutrition, good taste and high protein content. Consumer preferences were also examined in terms of purchasing preferences, where participants were given a choice of pre-set answer options to select which aspects they take into account when they put products from the shelves of the shops into their shopping basket. Almost two thirds of respondents considered appearance to be important. 57.5% said that price was also very important, which shows the price sensitivity of the Hungarian population, and the third place was taken by origin with 50.5%.

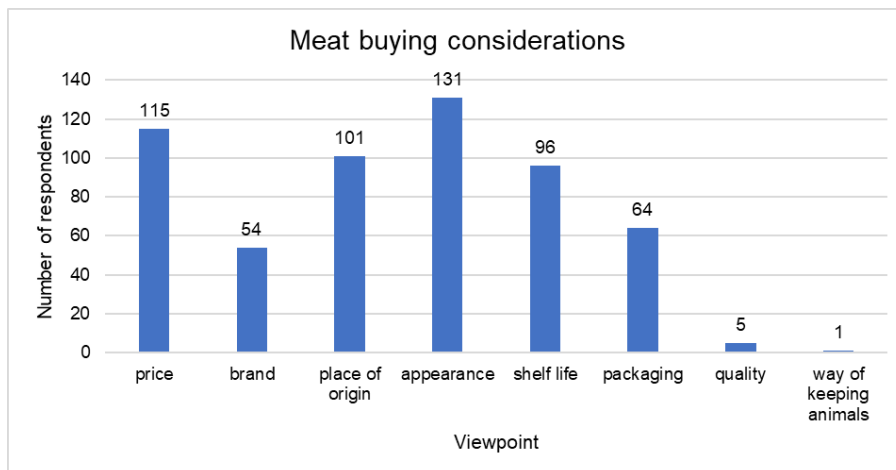


Figure 1  
Meat and meat product purchasing criteria in Hungary

Nearly 40% of participants consume products with increased protein content. Most of them put it into their bodies in the form of protein powder or desserts. The main reason for using these are to maintain or increase muscle mass, and 15% believe they eat so little protein that they need to replace it.

In this study, 4% of the population were vegetarians, so we have already seen that this segment needs to be looked at more closely. 60% of those on a meat-free diet had a university degree. The responses suggest that they stop eating meat mainly because of a healthy lifestyle. No significant differences were found between

meat-eating and vegetarian individuals in terms of exercise habits and use of protein supplements.

In March 2021, we conducted a survey entitled "Vegetarian and vegan eating habits" with 284 participants to further understand the behaviour and preferences of non-meat consumers. Nearly 25% of the respondents were residents of the capital, and 85.9% of the total respondents were urban residents. This means that we were able to disprove the common belief that there are no vegetarians or vegans among the rural or farm population. The majority of respondents; 63.5% of them are in the 22-45 age group. The sex ratio is quite skewed as 91.7% of the respondents are female. The majority of respondents are higher educated, with 50.5% of completers having a university degree and nearly 25% having a high school education.

More than 25% of respondents gave up meat consumption for animal welfare reasons, 19% for health reasons, nearly 18% for ethical reasons and nearly 16% for environmental reasons. More than two thirds of respondents have no health problems related to food consumption. The price sensitivity of Hungarian consumers is also confirmed in this survey, where 85% of respondents take price into account.

In terms of protein consumption habits, almost 70% of respondents do not use protein supplements. However, confirming our previous research, it was confirmed here that most people prefer to consume flavoured protein powder or protein bars when taking extra protein. Among the consumers of food supplements, 99 responses were received for vegetable supplements and 27 for animal supplements. Soya, tofu, seitan and legumes are the main meat substitutes on the table.

According to the survey, 56% of respondents also consume eggs and 50% dairy products. Veganism, i.e. not eating meat and animal products at all, was chosen by approximately a third of respondents; 33.6%. More than a third of respondents, nearly 36%, have been vegetarian or vegan for more than 3 years. Nearly 17% have been following this diet for 1-2 years, 16% for 2-3 years and 20% for less than 1 year. So we can clearly see that more and more people are choosing this type of diet, so it is a topical issue and worth addressing.

## **5 Discussion**

In Hungary, the consumption of poultry and pork remains the highest, followed by fish and then cattle. Most people consume them for their balanced nutrition, good taste and high protein content. Looking at consumer preferences, we also looked at purchasing criteria, with two thirds of consumers considering appearance to be

important. Our first survey showed that the Hungarian population is price-sensitive, with almost 60% and 85% respectively.

With an urban completion rate of almost 86%, it is clear that meat-free lifestyles are mainly concentrated in urban areas, which also dispels the misconception that vegetarian or vegan individuals are not numerous in rural or farm communities. Most people switch to a meat-free diet to protect animals and their own health. The meat-free diets are mainly for the more educated. The surveys show that there is no significant difference between vegetarians, vegans and meat-eaters in their exercise habits and protein supplementation. As the number of people switching to a meat-free diet is steadily increasing in the domestic population, this could be a worthwhile area of future research.

Nowadays, gyms are opening and expanding, personal trainers are becoming more and more common and the market for nutritional supplements is growing. Manufacturers are trying to attract customers with various marketing tools, while consumers are also trying to inform themselves. It is worth looking at consumer behaviour and preferences to get a more complete picture of this growing industry.

### **Conclusions**

In Hungary, the consumption of poultry and pork remains the highest, followed by fish and then cattle. Most people consume them for their balanced nutrition, good taste and high protein content. Besides appearance, the price sensitivity of the Hungarian population dominates the analysis of consumer preferences.

The meat-free population is mainly made up of the more educated, urban population. As the number of people switching to a meat-free diet is steadily increasing among the Hungarian population, this could be a worthwhile area of research in the future.

Food supplement manufacturers are trying to attract customers through various marketing tools, and consumers are also trying to inform themselves. Consumers are confronted with an increasing amount of information and manufacturers and distributors. It is worth looking at consumer behaviour and preferences.

### **Acknowledgement**

I would also like to thank Prof. Dr. Zoltán Veres and Dr. Brigitta Zsótér for agreeing to be my supervisors. I thank them for their efforts to further my scientific career in the best direction. Thank you very much to the Doctoral School in Management Sciences and Business Administration University of Pannonia for providing me with the right foundation for my academic career.

## References

- [1] Alexis S. R. (2016): I'm super-setting my life! An ethnographic comparative analysis of the growth of the gym market, *Sport Science Review*, XXV(5-6), pp. 321-344
- [2] Balogh S. (2017): *Alternatív táplálkozás – választható táplálékaink*, Oriold és Társai Kft., Budapest, pp. 38-39., 183-208.
- [3] Fritz P., Kiss A. Pfeiffer L. (2020): Fenntarthatóság és sporttáplálkozás = Sustainability and sport nutrition. *Recreation*, 10 (1). pp.10-13. ISSN 2064-4981
- [4] Honfi L., Szalay G., Vácz P. (2009): Eszterházy Károly Főiskola, Testnevelési és Sporttudományi Intézet, Eger, Acta Academiae Agriensis, Sectio Sport, 2009. Nova series tom. XXXVI. pp. 51–63.
- [5] Liska F., Kovács I., Veres Z. (2021): Sportaktivitás és étrend-kiegészítők fogyasztásának összefüggései. *Táplálkozásmarketing*, VIII( 2), pp. 35-48.
- [6] Rigó J. (2013): *Dietetika*, Medicina Könyvkiadó, Budapest, pp. 113-114
- [7] Rigó J., Gyurcsáné K. I. (2006): *A daganatos betegek étrendje*, Medicina Könyvkiadó, Budapest, pp. 27, 55
- [8] Silye G. (2019): *Sporttáplálkozás a maximális teljesítményhez*, ExSol Group Kft., Budapest, pp. 74-75, 76
- [9] Szakály Z. et al. (2017): *Élelmiszer-marketing*, Akadémiai Kiadó, Budapest pp. 21-24
- [10] Újvári G., Zsótér B., Bencsik, D. (2020): *A hazai hús- és fehérjefogyasztás feltérképezése, Mezőgazdasági és vidékfejlesztési kutatások a jövő szolgálatában*. Magyar Tudományos Akadémia Szegedi Akadémiai Bizottság Mezőgazdasági Szakbizottság, Szeged, pp. 63-73. ISBN 9789635089543
- [11] [https://europa.eu/youreurope/business/product-requirements/food-labelling/supplements/index\\_hu.htm](https://europa.eu/youreurope/business/product-requirements/food-labelling/supplements/index_hu.htm) (2023.12.08.)
- [12] [https://portal.nebih.gov.hu/documents/10182/1166172/Nebih\\_etrend-kiegészito\\_utmutato.pdf/](https://portal.nebih.gov.hu/documents/10182/1166172/Nebih_etrend-kiegészito_utmutato.pdf/) (2023.12.08.)

# Key success factors for youth entrepreneurs

**Maria Vasilska**

University of National and World Economy, Sofia, Bulgaria  
maria@unwe.bg

*Abstract: In today's fast-changing world, the intensification of youth entrepreneurship is crucial for driving economic growth and fostering innovation. Encouraging and helping young, motivated individuals to initiate and develop their own businesses is an important tool for tackling key socioeconomic challenges. Gaining a deeper understanding of the needs and prerequisites for the success of young entrepreneurs could enable them to be better prepared and the supporting institutions would channel their efforts more effectively, unlocking the full potential of this form of entrepreneurship. The aim of the paper is to present and analyse the key success factors for youth entrepreneurs. The study is based on available research findings and official publications, as well as author's expert observations and results from empirical investigations done among university students. It reveals the main factors making young people successful in their entrepreneurial endeavours, such as education, possession of certain competences, innovative and viable business idea, good team, etc.*

*Keywords: youth entrepreneurship; startups; entrepreneurial success; education*

## 1 Introduction

The launch, survival and development of new entrepreneurial businesses helps the national and regional economies to be more dynamic, diversified, innovative and adaptive to the rapidly evolving global landscape, marked by digitalisation, severe competition and the consequent drastic transformations. The driving force behind these processes are the entrepreneurs who take risks to apply their ideas by establishing and managing own companies pursuing profit, growth, or other personal or business aims. At the same time, through doing this, they address major socioeconomic challenges because they create jobs, implement novelties needed by the customers, serve small niche markets, solve some regional problems, etc. In this regard, even much reliance is placed on young entrepreneurs, who, through establishing startups, not only create new business tendencies offering innovative products and services but also reduce the unemployment within this significant group of the population.

Nowadays, due to many reasons, such as education, mindset changes, available inspiring success stories, and others, more and more young people dream of an entrepreneurial career and take the steps towards it. Nevertheless, not many of them are lucky in their first entrepreneurial endeavours. That is why it is useful to examine the key factors that would help young people succeed in their businesses. This information can serve not only the youth to purposefully prepare themselves for initiating and scaling their businesses, but also the interested institutions while developing policies and mechanisms to provide young entrepreneurs with specific support and incentives untapping their potential.

## **2 Literature review**

Youth entrepreneurs are usually considered those under the age of 30. These are people who grew up in an environment of rapidly evolving ICT, in a world where borders are concepts from the past, creativity and innovative thinking displace traditional competences (Hristova – Wolejsza, 2020). Additionally, because of their age, young people who devoted themselves to entrepreneurial initiatives, have particular strengths in comparison to the mature and senior entrepreneurs. Usually they are more innovative and energetic, easily taking risks, open to changes and quickly taking up novelties, easily accessing information and establishing contacts and networks, having time to correct the mistakes they have made (Todorov, 2015), more eco-minded and socially-oriented. Nevertheless, youth entrepreneurs are still quite a small percentage of the total number of entrepreneurs and they need encouragement in order to give their valuable contribution to building robust and innovative economies for the times ahead.

Entrepreneurial success has been defined in various ways. The easiest definition is through tangible elements such as revenue or a firm's growth, personal wealth creation, profitability, sustainability, turnover (Makhbul – Hasun, 2011). Orser (2003) pointed the important personal and social outcomes of the business as a mark of success. Other authors focus on the firm's competitive performance – the efficiency and effectiveness with which it carries out its tasks in the process of providing products and services to customers. The most frequently used indicators for measuring it are the customers' satisfaction and some financial outcomes compared to the competitors' ones (Vasilska, 2020). In this study, entrepreneurial success is defined based on the understanding of definition given by several researchers, who support the notion that a successful business is a venture that has been operating for at least three years.



### **3 Methods**

The research methods within this study include investigation of available research findings and official publications; exposure of author's expert observations grounded in working with young entrepreneurs and in teaching university students who have entrepreneurial intentions; discussion of results from empirical research done among students, already having entrepreneurial experience.

### **4 Results and discussion**

Using the methods described, the key success factors for youth entrepreneurs can be classified into two main groups. The author does not claim exhaustiveness in presenting the factors but rather provides own perspective on which ones have the greatest influence on the entrepreneurial success.

#### **4.1 Personal characteristics, knowledge, competences**

##### **4.1.1 Overall education and training**

Acquiring a robust combination of theoretical and practical training is widely acknowledged as the primary requirement for progress of today's entrepreneurs, especially of younger ones. The accredited education and training in different areas could prepare young people for starting and developing their businesses. Many studies show that the level and the quality of the entrepreneurs' educational background and qualifications have an impact on the abilities to manage their businesses. Higher educational level is connected with acquiring knowledge and skills that are important for organising and performing entrepreneurial activities, such as detecting and utilising opportunities; taking calculated risks; ability to get funding; business development planning; establishing beneficial relations with business partners, subordinates, equals and superiors; conceptual thinking; proper decision-making (Davidkov, 2010, Bridge – O'Neill, 2018, and others). According to Davidkov (2010), entrepreneurs with better education tend to manage bigger and more stable companies. Such entrepreneurs often have fruitful business partnerships. They are also more proactive in making plans to expand the existing business and to start a new one (entrepreneurs with lower education are more oriented towards preserving the existing situation, the status-quo).

##### **4.1.2 Continuous development of key competences for lifelong learning**

In recent years, the competences necessary for success not only in business but also in life have been changing. That is why educational systems are also adapting to these changes aiming to prepare young people for the life ahead of them. In

2018 the Council of the European Union highlighted the eight key competences for lifelong learning, essential to citizens for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship and social inclusion (EC, 2019) – see fig.1.



Figure 1  
Key competences for lifelong learning  
Source: EC, 2019, <https://op.europa.eu/>

The constant development of these competencies is particularly important for young entrepreneurs because it helps them overcome their weaknesses and provides them with strong competitive advantages. By possessing some of them (such as the digital one), young people seem privileged as they are somehow ‘born learned’, but for developing others, they need to make systematic efforts not only while growing up and studying but also throughout their professional journeys, regardless of what they do. Of course, the entrepreneurship competence is particularly crucial for young entrepreneurs, as it refers to “the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value” (EC, 2019).

#### **4.1.3 Awareness of the specifics of particular industry/sector**

To have knowledge about the sector which the young person will work and compete in is extremely important. Every industry has certain characteristics, attractiveness and profitability that depend on competition intensity, threat of new entrants, power of suppliers and customers, and threat of substitute products. In case, the youth entrepreneur is not aware of these competitive forces, *specialised education and training* could help. However, this takes time and efforts but they will be worth it. In addition, he/she could look for and get *advice and consultancy*.

#### **4.1.4 Use of support and funding programmes/services**

Young people, incl. youth entrepreneurs, enjoy the attention of various support and funding programmes and initiatives. A number of global, European and national institutions and organizations provide young people with various types of assistance - financial, consulting, mentoring, and others, oriented towards entrepreneurial initiatives. Youth entrepreneurs should search for such opportunities and exploit them because these programmes/services exist with the aim to motivate them to take the step towards exciting entrepreneurial journeys and to help them to succeed in their endeavours. In macro aspects, promotion of youth entrepreneurship is proved to have substantial tangible and intangible effects in long term. Tangible one are the new rapidly growing companies, while intangible – changes in attitude and confidence of young people towards self-employment. Evidence for this targeted support are initiatives and programmes such as OECD's youth entrepreneurship policy academy, Erasmus for young entrepreneurs programme, EU youth strategy promoting youth employment and entrepreneurship, etc.

#### **4.1.5 Managerial competence**

Managing a small company is a very complex activity consisting of multiple tasks, sometimes competing for the time and attention of the entrepreneur. The literature attributes the failure of a significant part of the newly started enterprises (during the first three years of their existence) to the scarce managerial competences of their executives (Kolarov – Vasilska, 2018). Undoubtedly, the managerial competence is a key factor for the survival and the development of almost every small business. There are many young people that are very good at identifying opportunities, generating ideas, taking risks and behaving proactively towards starting new enterprises, but are not so good at managing finance, people, tasks, complexities and difficulties connected with running the company. Managerial competences can hardly be developed without proper education, trainings and efforts in this direction. However, sometimes those efforts are fruitless (there are people unable to develop such skills) and the company may not survive unless the entrepreneur hires managers, sells the business or undertakes other actions to save what he/she has created.

## **4.2 Business-related factors**

### **4.2.1 Innovative business idea, based on existing entrepreneurial opportunity**

The idea of the youth potential entrepreneur should not only be good and appealing (on his/her opinion), but also innovative (related to new product/service, technology or market), based on entrepreneurial opportunity (favourable conditions that create the need for a good or service or business), with an open “window” (time period available for creating the new venture). Therefore, all three should be evaluated – the idea, the opportunity and its window, before starting a business grounded on them. For example: in recent years, there are many niches/opportunities for green, social and digital entrepreneurship. The success of entrepreneurs depends on their ability to take advantage of opportunities and quickly transform creative ideas into practical actions.

### **4.2.2 Business with a mission and proper goal-setting**

Empirical research among university students reveals their major motives for starting a business, which are connected not only with pursuing personal goals such as work satisfaction, self-realization, higher income, flexibility, and freedom, but also with the opportunity to do something useful for the society. Running a business with a mission strongly motivates the entrepreneur, the people working with him/her and it is often highly assessed by the customers. The young entrepreneur should be able to properly formulate the reason for the existence of the company from the society’s point of view, to follow it and to make all the business’ stakeholders acquainted with it.

Propper goal-setting is crucial for the business success. Many young people are inconsistent in their ideas and objectives, dreaming of things that are not achievable, easily frustrating or giving up on failure, etc., that may affect their motivation and entrepreneurial initiatives negatively. That is why it is very important for them to set goals that are ambitious but also attainable. Business objectives should be also specific, measurable, relevant, time-bound and known by all the company’s employees.

### **4.2.3 Viable business model**

Youth entrepreneurs may start a business with a lot of enthusiasm and not a lot of viability. A viable business model is one that enables the company to set a price for the value it creates, ensuring that the business generates sufficient revenue to be sustainable and continue operating over time. Additionally, the products or services offered by the business must meet customer needs and quality expectations.

Having a written scheme of the company's business model helps the entrepreneur to be confident that the endeavour is worthwhile and to make consistent and coherent managerial decisions.

#### **4.2.4 Localisation**

Choosing the right location of the new business (country, settlement, area in/out of a city, etc.) is one of its basic success factors. If the young entrepreneur has the opportunity to choose between several locations, he/she should benefit by locating the enterprise close to raw materials, or work force, or available capital (investors), or major markets/distribution network, etc. Important factors for choosing a location could also be the available competition, taxation rules and subsidies, comparative international advantages of particular regions, and others.

#### **4.2.5 Good team**

The young person may start his / her business alone or with partners. Both options have their pros and cons, although the more experienced entrepreneurs usually advise the younger ones to start their businesses in partnership. In both cases, the young entrepreneur needs a good team – people that he/she can rely on. The small company's employees are usually multifunctional, motivated and devoted to achieving the firm's goals and that is why each person is important and hardly replaceable. Maybe one of the most important tasks for the starting entrepreneur is to find, hire and keep the "right" people.

#### **4.2.6 Networking: benefits from forming partnerships and working in personal, entrepreneurial and other types of networks**

Establishing connections is one of the most crucial factors for entrepreneurial success. The practice shows that SMEs can not survive and realise significant strategic initiatives alone, but primarily in partnerships with other companies. Therefore, the nowadays entrepreneurs, especially younger ones, are usually "networked" – working in a variety of networks (formal and informal, domestic and international, social and business, etc.).

Positive effects for the youth entrepreneurs and their companies are indisputable and the question that usually stands before them is not whether to find a strategic partner or join a network, but how to do it. The basic benefits and advantages of operating in networks are: increasing specialisation and cost reduction; knowledge sharing and creating innovations; achieving prospective development and growth; overcoming in sustainable matter the main weaknesses of SMEs, particularly of the starting ones – isolation and resource scarcity.

## Conclusions

Based on the research conducted for this paper, two main conclusions emerge:

Youth entrepreneurs have the potential to drive innovation and economic growth, given their underrepresentation in the entrepreneurial landscape. At the same time, they possess many strengths that could help them in business.

However, young people's intrinsic strengths are not enough to achieve entrepreneurial success. They need to constantly develop their personal characteristics, knowledge, and competences in order to cope with the competitive struggle. Besides, there are some business-related factors such as idea, team, partnerships, etc. that are important but somehow take a secondary role. This is because if the young individual has "the right" entrepreneurial personality, he/she most probably will be able to initiate and manage all aspects of the business effectively.

## Acknowledgement

Many thanks go to my clever and enterprising students from "Entrepreneurship" speciality at UNWE with whom I have discussed these and related issues numerous times.

## References

- [1] Bridge S. – O'Neill K. (2018): *Understanding Enterprise, Entrepreneurship and Small Business*. Fifth Edition, Macmillan Education, London, UK.
- [2] Davidkov, T. (2010), *Values for enrichment. The entrepreneurs in Bulgaria in the period 1991-2004*. University publishing house "St. Kliment Ohridski", Sofia. (in Bulgarian)
- [3] European Commission (2019): Key competences for lifelong learning, Retrieved from <https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en>
- [4] Kolarov K. – Vasilka M. (2018): International Experience of Entrepreneurs as a Factor in Their Managerial Development: Theoretical Aspects and Results of an Empirical Study, in Proceedings of the VIII international conference „The International Entrepreneurship: Trends, Challenges, Achievements”, June 2017, Bulgaria, pp. 210-227.
- [5] Makhbul Z.M. – Hasun F.M. (2011): Entrepreneurial Success: An Exploratory Study among Entrepreneurs. *International Journal of Business and Management*, 6(1), pp. 116-125.

- [6] Orser, B. (2003): *Management Competencies and SME Performance Criteria: A Pilot Study*. Small Business Policy Branch, Industry Canada, Ottawa.
- [7] Todorov, K. (2015): *Business Entrepreneurship*. BAMDE, Sofia, Bulgaria. (in Bulgarian)
- [8] Vasilka, M. (2020): Impact of entrepreneurs' management qualification on the competitive performance of their businesses, in Proceedings of the 10th International Conference "The Future of Education", June 2020, Florence, Italy, pp. 222-225.

# Usage of self-assessment questionnaires in safety and security sciences - a literature review

**Pál Fehér-Polgár**

Óbuda University, Keleti Károly Faculty of Business and Management,  
feherpolgar.pal@kgk.uni-obuda.hu

*Abstract: In the last three decades usage of infocommunication technologies has risen in our private and professional lives. This habit raises ICT security questions more and more in our lives. Are we prepared for this? Are we capable of handling the problems that these security aspects can cause when we are living in a fast-moving and fast-changing world? How can we measure the safety consciousness of the user? For this paper I have conducted literature review and will concentrate on how we can use self-assessment questionnaires as a tool for measuring the safety consciousness of the user.*

*Keywords: Safety consciousness, ICT security, security of the user*

## 1 Definition of self-assessment questionnaires

A self-assessment questionnaire (SAQ) is a tool that can be used to help individuals, teams, or organizations evaluate their strengths, weaknesses, and areas for improvement. (Andrade 2019)(Brockbank and McGill 2007 )

SAQs are often used in a variety of topics, including: employee development,: SAQs can be used to help employees identify their strengths and weaknesses so that they can develop training plans to improve their skills and knowledge. Team performance: SAQs can be used to help teams assess their collective strengths and weaknesses so that they can improve their collaboration and productivity. Organizational culture: SAQs can be used to assess the overall health of an organization's culture, identifying areas where improvements are needed. (Coronado-Aliegro 2000)

SAQs can be either standardized or customized, and they can be used in a variety of ways. Some SAQs are designed to be completed individually, while others can be completed by teams or groups of individuals. SAQs can be administered online, in person, or through a combination of both methods.



## **2 Common uses of self-assessment questionnaires:**

Identifying strengths and weaknesses: SAQs can be used to help individuals, teams, or organizations identify areas where they are doing well and areas where they can improve. This information can then be used to develop training plans, improve processes, or create new initiatives

Measuring progress: SAQs can be used to measure progress over time. This can be helpful for evaluating the effectiveness of training programs or initiatives.

Communicating progress: SAQ results can be used to communicate progress to stakeholders. This can help to build trust and accountability.

SAQs find extensive applications across various research areas.

- **Personality Assessment:** SAQs like the Myers-Briggs Type Indicator (MBTI)(Myers – Myers 1995) and the NEO Personality Inventory (NEO-PI) (McCrae et al 2005). measure individual traits like extroversion, agreeableness, and openness to experience.
- **Emotional Well-being:** SAQs like the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI) assess mood, stress, and anxiety levels.
- **Academic Performance:** SAQs can gauge self-efficacy, motivation, and learning strategies to understand factors influencing academic success. (Zi et al 2021)
- **Occupational Behavior:** SAQs can assess job satisfaction, work-related stress, and leadership styles to evaluate workplace factors. (Boud – Falchikov 2007).
- **Physical Health:** SAQs can measure health-related behaviors like exercise habits, dietary intake, and sleep patterns. (Prosser – Trigwell 1999)

**The Belbin Test for assessing team roles**

*This version of the Belbin test has been taken from Teambuilding by Alistair Fraser and Suzanne Neville: The Industrial Society 1993.*

**Self Perception Inventory**

To complete each section of this inventory, select the one, two or three sentences **most applicable** to yourself.

Then in the column on the right, apportion **10 points** between those sentences that apply to you: one of which you feel sums you up well while the other only applies some of the time. In this instance you could give your **first choice 7 points** and the remaining points to your **second choice**. In some instances you might decide that there are two sentences which apply to you **equally** - if this is the case, award **5 points** to each.

After assigning **all points**, please check the results in the tab "Scoring Key for Self-Perception" and then refer to "Explanation of the roles" tab

**SECTION A**

When involved in a project with other people:

No.	Statement	Points
1	I can be relied upon to see that work that needs to be done is organised.	
2	I pick up slips and omissions that others fail to notice.	
3	I react strongly when meetings look like losing track of the main objective.	
4	I produce original suggestions.	
5	I analyse other people's ideas objectively, for both merits and failings.	
6	I am keen to find out the latest ideas and developments.	
7	I have an aptitude for organising people.	
8	I am always ready to support good suggestions that help to resolve a problem.	
		0

The sum must equal 10

Figure 1

Example for self-assessment questionnaire:

Belbin Team Roles Self Perception Inventory test introduction (part A)

Source: <https://www.kuleuven.be/english/campuses/de-nayer-campus/events/euclides/belbin-team-roles-test>

### 3 Types of self-assessment questionnaires:

Self-rating: This type of SAQ asks individuals to rate themselves on a scale of 1 to 5, 1 to 7, or 1 to 10. This is a simple and easy-to-use method, but it can be subjective.

- Choice-based: This type of SAQ presents individuals with a series of statements and asks them to choose the answer that best describes them. This is a more objective method than self-rating, but it can be more time-consuming.
- Behavioral: This type of SAQ asks individuals to describe specific examples of their behavior. This is a more detailed method than the other two types, but it can be more difficult to complete.

SAQs encompass a diverse range of formats tailored to different research aims. Common types include:

- Likert Scales: Participants rate statements or questions on a graded scale, typically ranging from strongly agree to strongly disagree.
- Checklists: Participants indicate their presence or absence of specific characteristics or behaviors.
- Open-ended Questions: Participants provide detailed responses to specific prompts, fostering in-depth exploration of their experiences.

## **4 Benefits and Limitations of Self-Assessment Questionnaires**

SAQs are widely used in research and in corporate situations, they offer several advantages:

- **Efficient Data Collection:** SAQs can be administered to a large number of participants simultaneously, facilitating data collection at scale.
- **Relatively Cost-Effective:** SAQ development and administration costs are often lower than traditional methods.
- **Flexibility and Customization:** SAQs can be tailored to specific organizations, industries, or security domains.

However, they also have limitations, like human error and misinterpretation errors in questionnaire completion or misunderstanding of questions can impact the accuracy of results. Self-report bias, when participants may not always provide accurate or complete information due to social desirability bias or lack of awareness. Limited external validity, SAQs may not always generalize to broader populations or different organizational contexts.

## **5 Recommendations for Effective SAQ Use in ICT Security**

To maximize the effectiveness of SAQs in ICT security, consider the following guidelines, clear objectives and alignment, clearly define the research objectives and ensure the SAQ aligns with the specific questions being addressed. Tailoring and customization, tailor the SAQ to the specific organization, industry, or security domain to ensure relevance and accuracy. Pilot testing, pre-test the SAQ with a representative sample to identify any issues with clarity, comprehension, or response options. Data validation, implement data validation checks to ensure consistency and accuracy of responses. Complementary data sources, Combine SAQ results with other data sources, such as audit logs or incident reports, for a more comprehensive assessment. Actionable insights, translate SAQ results into actionable insights and recommendations for improving cybersecurity practices.

### **Conclusions**

In conclusion, self-assessment questionnaires have become valuable tools in evaluating in scientific research and in ICT security practices; identifying potential vulnerabilities, and guiding organizations towards improved cybersecurity posture. By carefully selecting appropriate SAQs, employing data validation

techniques, and integrating findings with other data sources, organizations can effectively utilize SAQs to enhance their cybersecurity posture.

## References

- [1] Andrade, H. L. (2019). A critical review of research on student self-assessment. *Frontiers in Education*, 4(87). <https://doi.org/10.3389/educ.2019.00087>
- [2] Brockbank, A., and McGill, I. (2007). *Facilitating Reflective Learning in Higher Education* (2nd ed.). Maidenhead: Open University Press McGraw-Hill. ISBN: 9780335229550
- [3] Boud, D. and Falchikov, N. (2007). Introduction: assessment for the longer term. In Boud, D. & Falchikov, N. (Eds.) *Rethinking Assessment for Higher Education: Learning for the Longer Term*. London: Routledge, 3-13. ISBN: 9780203964307
- [4] Coronado-Aliegro, J. D. (2000) "Students' perception of performance through self-assessment" (2000). Graduate Theses, Dissertations, and Problem Reports. 735. <https://researchrepository.wvu.edu/etd/735>
- [5] McCrae, Robert R.; Costa, Jr., Paul T.; Martin, Thomas A. (June 2005). "The NEO-PI-3: A More Readable Revised NEO Personality Inventory". *Journal of Personality Assessment*. 84 (3), pp. 261–270. doi:10.1207/s15327752jpa8403\_05.
- [6] Myers, I. B.; Myers, P. B. (1995). *Gifts Differing: Understanding Personality Type*. Mountain View, CA: Davies-Black Publishing. ISBN 978-0-89106-074-1.
- [7] Prosser, M. and Trigwell, K. (1999) *Understanding Learning and Teaching: The Experience in Higher Education*. McGraw-Hill Education (UK), ISBN: 9780335198313
- [8] Yan, Zi & Xiang, W., Boud, D. & Lao, H. (2021). The effect of self-assessment on academic performance and the role of explicitness: A meta-analysis. *Assessment & Evaluation in Higher Education*. 48. 10.1080/02602938.2021.2012644.

# **Young people's knowledge of the second industrial revolution - evaluation of a questionnaire survey**

**Anna Krisztina Fekete**

Kossuth Zsuzsanna Vocational School and College,  
feketeannakrisztina18@gmail.com

**Gábor Gyarmati**

Óbuda University, Keleti Károly Faculty of Business and Management,  
gyarmati.gabor@uni-obuda.hu

*Abstract: A questionnaire on the impact of the Second Industrial Revolution was completed by 172 young people. The survey aimed to assess young people's awareness of the achievements of this era and their understanding of the origins of some of today's technological tools. The results showed that most respondents were aware of the link between the achievements of the Industrial Revolution and today's technologies.*

*Keywords: second industrial revolution, knowledge*

## **1 Introduction**

The second industrial revolution in the 19th century also changes the society a bit. Surpassing the steam engine as an achievement of the first industrial revolution, the second industrial revolution, with the development of electronics and electricity, laid the foundations for the new inventions. I would like to present in this thesis. The perfection and broader diffusion of the steam engine enabled mining and manufacturing to continue to develop. The industrial revolution relied on different industries in different countries. In England, the textile industry was the driving force; in the United States, it was the railway industry.

It is the natural environment that best survives industrial revolutions. People are rarely able or willing to reckon with the consequences because they are constantly exposed to innovation. The environmental protection apparatus can now show some results. Nature still has to adapt to environmental pollution because even in

the first industrial revolution, there were already installations that were harmful to the environment (e.g. the case of the birch-bark moth: before the first industrial revolution, this moth was white and lived on white birch trunks. With the advent of smoke, the trunks became blackened, making the moths easy prey.)"

Through a questionnaire survey, this research aims to explore the level of knowledge young people in secondary schools have about the Second Industrial Revolution and its events. The research is based on the assumption that the respondents have knowledge of the era in terms of technology but have a more limited knowledge of the changes in society.

Technical and economic changes affect people's lifestyles and societies. Just think how a single invention can change our daily lives. These changes were the same more than one century ago. The technological innovations that spread in 19th-century Europe and the United States of America transformed the society of the time. The most important social impact of the Second Industrial Revolution was population growth. One of the reasons for this was that technological change led to changes in how agriculture worked and the mechanisation of its processes. Society became richer because tractors and threshing machines were used in the fields to help production, which also helped increase the quantity of food (Roberts, 2002).

Capital investment was needed to buy modern machinery and build new factories and production plants. This also required the cooperation of banks and large companies. These companies, which merged, gradually squeezed out their competitors because they could produce higher-tech goods in large quantities. Monopolistic large companies are those that have a prominent position within an industry. Monopolies dictate prices and limit free-market competition because of their economic power. New industries such as electricity or chemicals have become leading sectors (nkp. hu 2012).

The invention of the internal combustion engine (1876 Nikolaus Otto - the four-stroke Otto engine) revolutionised transport and created an entirely new industry: the car.

- Benz, Daimler (Mercedes, after his daughter), Peugeot, Michelin (he exceeds 100 km/h in tests as late as 1899), Ford (Henry Ford's famous Model T is the first car produced on a conveyor belt), FIAT, BMW

- the car was a luxury item until around the 1920s

The conquest of the air started in two ways: by Airship (1900, Ferdinand Zeppelin) and by aeroplane (1903, Wright brothers) - in 1909, Louis Blériot flew across the La Mache Canal.

Several innovations were introduced in the military industry, such as the back-loading rifle (with a mass-produced magazine) and the rapid-firing gun (Maxim

machine gun), and in the navy, the dreadnought and the submarine (zanza. tv 2023)

Transport and infrastructure are also changing thanks to the industrial revolutions. Steam locomotion is first exploited on water; then, the steam locomotive is created on land and gains ground. The development of the railways then led to networks that allowed smaller towns to join the trade, helped with passenger transport and shortened distances. Iron and coal were needed to build the railways, so opening new mines was essential. Later, artificial conquests could travel through the air, on land or underwater, reaching outer space. The infrastructure is still evolving today. The 20th century saw the advent of cars. Rubber, oil, concrete and natural gas were important. Smog damaged people's health because new roads caused much environmental damage, and the spread of pollutants associated with cars did not help much either, polluting the air to unknown levels (Digitori.blog.hu, 2021).

#### **Features:**

- 1860s: The industrial revolution in the centre countries was complete
- the beginning of the new world economic order
- 1860's - the end of the new industrial revolution - the beginning of the 1860's - the end of the new world economic order (USA, Germany)
- slowing down of the industrial countries
- the flow of capital
- modernisation, changes in the industry, the emergence of new sectors

#### **Phenomena in the economy**

- Second half of the 19th century - Europe (Germany) and North America
- Economic development, population growth, change in lifestyle
- heavy industry: driving force of development
- new industries: chemicals, electricity
- Start of industrial development: technical sciences and new scientific advances

#### **New raw materials**

- New industries and developments - required more investment
- Large capital accumulation - investor groups
- Iron and steel industry - "The Age of Steel"
- Energy sources from coal and raw materials from iron to steel

- Development of the steel industry - reduction of carbon content

### **The electricity**

- After the first Industrial Revolution, power machines and the steam engine continued to develop
- Accelerating transport - Steam car 1859
- Electricity has started to be used
- Lighting - Thomas Edison - light bulb (1879), phonograph
- Károly Zipernovszky, Miksa Déry, Ottó Bláthy – Transformer meant the transmission current, the transmission of current through wires
- Jedlik Ányos: dynamo - power generation with a rotating motor
- Advantages of electricity: cheap and transportable
- Advantages of an electric motor: operation, built-in machines, replacement of human power
- The spread of hydropower plants boosted the use of electricity.
- Electric lighting: transforms people's lives
- Lighting makes the days longer, continuous production, three shifts
- Consequences of the spread of electricity: the development of communications
- Bell - telephone (1876)
- Puskás Tivadar: telephone exchange
- Marconi - wireless telegraph
- Explosive engine – internal combustion engine
- Initial developments - Otto, Daimler, Benz;
- Perfection: Donát Bánki and János Csonka carburetor head
- Explosive engine: easy to start, energy-saving
- The car appeared in traffic
- Ford company - belt system - series production (T-model) - chief designer: József Galamb
- First passenger airship (1900) - with hydrogen - Ferdinand Zeppelin
- 1903 motor machine - Wright brothers
- 1909 - Louis Blériot's plane flies across the English Channel



- The development of the chemical industry was also essential (for steel production and the textile industry), but the USA is still at the forefront of development
- Developments in the field of chemistry (paints, additives.)
- Fuel, petroleum mining
- New industry: petrochemicals, petroleum chemistry (gasoline, diesel)
- Production of plastic in small quantities (onlineteszek.eu 2023)

According to Dárdai and Kaposi (2021), studying history means, first and foremost, historical thinking, the ability to think in the three dimensions of past, present and future. About critical thinking, Szebenyi and Vass (2002) add an understanding of cause and effect to historical thinking. Kojanitz (2015) distinguishes four possible directions for the development of historical thinking in schools:

- developing reflection on the nature of historical knowledge;
- learning about the specific problems of writing history;
- learning adaptive historical literacy;
- developing historical awareness of our present relations.

Kojanitz identifies the development of skills, adaptable interpretative frameworks (interpreting and comparing events and data), historical awareness (the relationship between past and present) and a reflective approach to history (thinking about historical research and historical knowledge) as the pillars of historical knowledge.

## 2 Data and methodology

We prepared a questionnaire about the effects of the Second Industrial Revolution. We sent it to Facebook groups and friends via the Internet. One hundred seventy-two people from several counties filled out the questionnaire. The questionnaire aimed to determine how much today's young people are aware of and how well they know about the subject.

We performed a mixed relationship analysis using H-square calculation to examine the statistical correlations.

Hypothesis. There is a minimum middle connection between education and the level of correct answers/knowledge about the Industrial Revolution.

### 3 Results

Figure 1 clearly shows that regarding the education degree, answers came from all levels in almost the same proportion. 15-18-year-olds are the group of primary school graduates with more advanced knowledge than other age groups. Forty-seven people with a primary school education completed it. However, some people graduated from high school or vocational high school. The 19-25 age group: 76 applicants, most of whom graduated from high school: 31 people. In the 25+ age group, the highest completed level is university or college: 18 people.

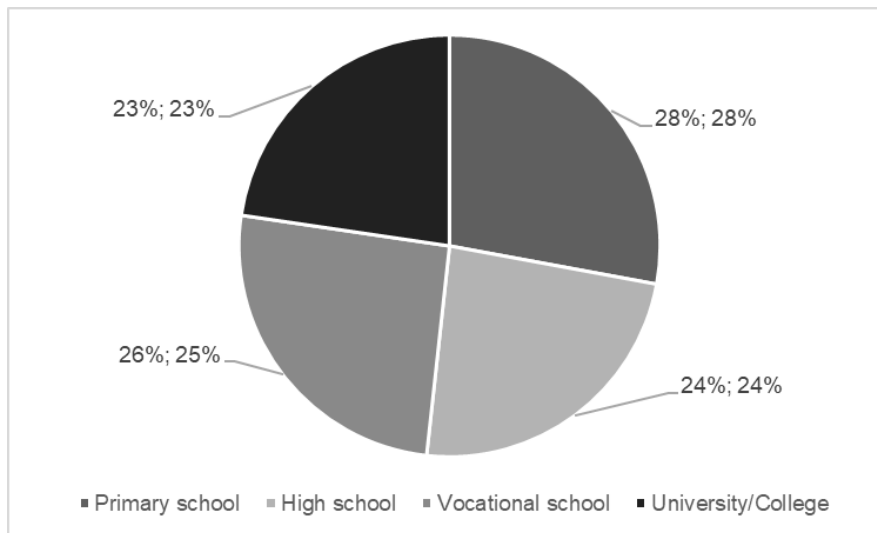


Figure 1  
Education result of questionnaire fillers

Most of those who filled out the questionnaire were from the county of Pest (147 people), but they also filled out the questionnaire from several surrounding areas. It was filled out by one person each from the counties of Zala, Veszprém, Baranya, Borsod-Abaúj-Zemplén, and Békés. 2 people from Nógrád County. Three people from Jász-Nagykun-Szolnok, Hajdú-Bihar county and five from Szabolcs-Szatmár Bereg county. Seven people from Bács-Kiskun county filled out the questionnaire.

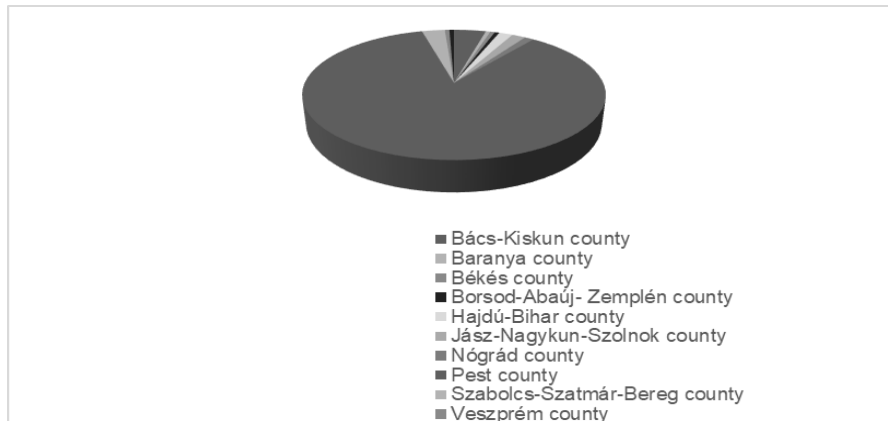


Figure 2  
Residence of questionnaire fillers

Most of the respondents knew about the inventions. Ford T-model 68% (117 people), Spinning machine 16.9% (29 people), Telephone 77.3% (133 people), Steam locomotive 47.7% (82 people), Light bulb 46.5% (80 people), Radio News 52.3% (90 people), Airship 34.4% (59 people) and Airplane 61% (105 people) cast their votes. Most people are aware of the inventions of the Second Industrial Revolution. As we know, the inventions of the Second Industrial Revolution are the Model T Ford, the Airship, the Telephone, the Radio Herald and the Airplane.

For the tools in use, most people knew all 4. 19 people (11%) also put the bicycle in it. Everyone else cast their vote by Telephone, 83.7% (144 people); by car, 83.1% (143 people); by train, 62.8% (108 people); and by the underground, 40.7% (70 people).

The second industrial revolution occurred in 1870-1914. A total of 128 people knew when we did this period. Twenty-three people placed it between 1780 and 1859, while 21 placed it between 1950 and 1990. Forty people from the 15-18-year-old age group, 63 people from the 19-25-year-old group and only 25 from the 25-year-old group knew. The younger generation knew better than the over-25 generation. One can conclude that those who recently learned it or learned it knew better than those who learned it a long time ago and no longer remember it.

The USA and Germany took the votes high. One hundred fifty-five people voted for the USA and Germany, but 12 votes also went to Russia and France. Fifty-six people accommodated the 15-18-year-olds, 72 in the 19-25-year-old age group, and 27 in the 25+ age group.

At the car manufacturers, the majority voted for Ford because the Ford Model T was also asked in 144 (83.7%) questions, so it can be concluded that they thought it was included twice, so there will be a fixed answer for those who guessed, but

there are those who knew. For example, 77 (44.8%) votes came for Opel, 102 people (59.3) voted for Mercedes, and fewer people voted for Bugatti because it is considered a luxury car in today's world. Few people can afford it, so only 38 (22.1%) ) voted. 22 (12.8%) and 33 (19.2%) people voted for Suzuki and Toyota.

We discovered that 93% of people (159) know that the Second Industrial Revolution also impacted today's world. It brought changes in many areas. The development of technology, the creation of economic machines, and car factories. 7% (12 people) voted no; according to them, the world has not changed anything since the Industrial Revolution.

The Industrial Revolution changed transportation. 97.7% (168 people) voted that transport and infrastructure have already changed in today's world. Moreover, four people for the fact that the transport has not changed.

Germany was rich in coal and iron due to the Ruhr regions, but as the diagram shows, Russia was ahead in the voting. Russia also had coal and iron mines, but between 1870 and 1914, Germany was the leader in this field. Seventy-two people voted for Germany, 74 for Russia, and 26 for the USA. 30 people aged 15-18 voted for Russia, 25 people aged 19-25, and 74 people aged 25+ voted for Russia. Twenty-three people between 15 and 18 voted for Germany, 37 people between 19 and 25, and 12 people voted for 25+. Only 26 people voted for the USA.

We have some correlation questions—correlations of education level and results (knowledge).

	Number	Sum	Average	Standard deviation			
Primary school	48	187	3,895833	1,18930667	67,89362	0,92808	
High school	41	177	4,317073	1,035350771	43,95	3,264866	
Technical college	44	173	3,931818	1,757346404	135,8837	0,46739	
University/College	39	157	4,025641	1,245775588	60,52632	0,003332	
Internal SD square	172	694	4,034884	1,337254536	<b>1,792172</b>		
External SD square						<b>0,027114</b>	
Total SD square							<b>1,819287</b>
H2						<b>0,122081</b>	0,014904
Weak connection							

Table 1  
Correlation of education and knowledge in the question of inventions.

	Number	Sum	Average	Standard deviation		
Primary school	48	28	0,583333	0,498223795	11,91489	1,241933
High school	41	35	0,853659	0,357839043	5,25	0,491353
Technical college	44	28	0,636364	0,41461686	7,563914	0,51153
University/College	39	37	0,948718	0,223455865	1,947368	1,631499
Internal SD square	172	128	0,744186	0,437591668	<b>0,155094</b>	
External SD square						<b>0,022537</b>
Total SD square						<b>0,177631</b>
H2						<b>0,356194</b>
Middle connection						0,126874

Table 2

Correlation of education and knowledge in the question of the era.

The results show a low correlation between achievement, knowledge of the Second Industrial Revolution and educational attainment. One exception was related to when the second revolution took place, where it made a difference in the educational attainment of the individual.

### Conclusions

The questionnaire asks how aware people today are of the Second Industrial Revolution and whether they know the changes, inventions and the rise of the great powers. The results also show that the population of Pest County - although the survey is not representative - is much better informed about the Industrial Revolution. The proportion of the Pest County surveyed population showed that those who had recently studied or learned about the Industrial Revolution were much more aware of the changes and circumstances. There is no correlation between educational attainment and results, i.e. it does not matter whether one is currently studying or has just entered higher education; one should know the results. Motivation and interest may have a more significant role in knowledge than education.

### Acknowledgement

Thanks to the teachers and students of Kossuth Zsuzsanna Vocational School and College and Óbuda University.

### References

- [1] Dárdai, Á. F., & Kaposi, J. (2021). A történelemtanítás elmúlt 30 éve (1990–2020): Helyzetkép és perspektíva. *Magyar Pedagógia*, 121(2), pp.137-167.
- [2] Digitóri.blog.hu (2021) [https://digitori.blog.hu/2021/03/13/11\\_1\\_4\\_a\\_masodik\\_ipari\\_forradalom](https://digitori.blog.hu/2021/03/13/11_1_4_a_masodik_ipari_forradalom) download on 2023.October.29

- [3] Kojanitz, L. (2015). A diákok gondolkodásának fejlődése a történelemtanulás eredményeként. *Iskolakultúra*, 25(11), pp. 44-52
- [4] Martin Roberts (2002): *Európa története 1789-1914 - Az ipari forradalom és a liberalizmus kora* Budapest, Akadémiai Kiadó, Budapest pp. 70–75.
- [5] Nkp.hu (2012) [https://nat2012.nkp.hu/tankonyv/tortenelem\\_7/lecke\\_01\\_004](https://nat2012.nkp.hu/tankonyv/tortenelem_7/lecke_01_004) download on 2023.October .29
- [6] Onlinesztek.eu (2023) [http://onlinesztek.eu/tori/boldog\\_bekeidok/masodik\\_ipari\\_forradalom.pdf](http://onlinesztek.eu/tori/boldog_bekeidok/masodik_ipari_forradalom.pdf) download on 2023.November.06
- [7] Szebenyi, P., & Vass, V. (2002). Történelemtudás és nemzeti azonosságtudat. *Iskolakultúra*, 12(2), pp. 30-51.
- [8] Zanza.tv (2023) <https://zanza.tv/tortenelem/ujkor-nemzetallamok-es-birodalmi-politika-kora/ii-ipari-forradalom-tarsadalmi-hatasai> download on 2023.October.30

# **Consumer behaviour related to products with environmental friendly packaging materials**

**Kornélia Sára Szatmáry**

Óbuda University, szatmary.sara@gmail.com

*Abstract: In the 21st century, owing to the significant change in the legislative environment, the markets are experiencing a drastic change in regards to push towards more sustainable practices and material use. Which is heavily affecting the use of packaging materials too. The focus of the research is revolving around the question, whether endusers are also appreciating the use of environmental friendly packaging materials, and even more so, if consumers are consciously making purchasing decisions taking packaging materials into consideration. The paper presents a quantitative research and its results, identifying the most probable customers for products with environmental friendly packaging materials.*

*Keywords: packaging, customer decisions, sustainability*

## **1 Introduction**

The European Union (EU) actively encourages the use of environmentally friendly packaging materials among its member states. In 2020, the EU adopted the Circular Economy Action Plan (EC, 2020) in order to reduce waste by 2030 and promote the transition to a circular economy. This plan includes measures such as the definition of minimum recyclability requirements for packaging sustainability and the promotion of packaging materials containing used material. In addition, the EU adopted and later tightened the Single-Use Plastics Directive, which bans single-use plastic products and sets specific targets to reduce plastic waste (EP, 2019; EC, 2022).

## **2 Laws and regulations affecting the operation of the packaging industry in Hungary**

In Hungary, strict regulations and regulations regarding waste management apply. The Waste Management Act defines the rules for the collection, utilization and

disposal of waste and requires companies to responsibly manage the waste generated during production. This affects the practices and costs of packaging companies.

The Waste Management Act (Parliament of Hungary, 2012) defines the legal framework for waste management in Hungary, including waste prevention, reuse and recycling. The law regulates the collection, sorting and treatment of packaging waste and requires producers to be responsible for the final disposal of their products.

According to the law, the prevention of waste generation is a priority task, and producers must take measures to prevent waste generation and promote the reuse of products and materials. The law also requires the separate collection of recyclable materials, such as packaging waste, and sets recycling and recovery targets for different types of waste. The Waste Management Act also contains provisions for the management of hazardous waste, including packaging materials containing hazardous substances. Manufacturers of such materials must take special precautions to ensure proper handling and disposal.

The Waste Management Fee Act (Parliament of Hungary, 2016) is an important tool for the development of Hungary's waste management and the promotion of sustainability. The law defines the fees and charges that producers, distributors and retailers must pay for the management of packaging waste. In addition, the law encourages waste prevention and recycling. Pursuant to the law, waste management fees are paid by waste producers, which may include households, businesses and other organizations. The fees depend on the amount and type of waste generated and are used to finance the collection, sorting and treatment of waste, with the aim of encouraging the use of environmentally friendly packaging and reducing packaging waste.

The Waste Management Fee Act also contains provisions encouraging waste reduction and recycling. For example, it sets a lower fee for waste separated at source and sent for recycling than for waste sent for disposal. This provides an economic incentive for waste producers to separate waste and promote recycling. The law also defines the system of fines for violations, which can range from HUF 5,000 to HUF 5,000,000 depending on the severity of the act. This provides a strong incentive for waste generators to comply and take measures to reduce their environmental impact. In addition to fees and charges, the Waste Management Fee Act also requires waste producers to report on their waste generation and management activities. This helps waste generators take responsibility for their environmental impact and provides valuable data to inform waste management policies and practices.

In addition, the regulations regarding packaging materials are also significant in the packaging industry. The Packaging Waste Management Act stipulates the requirements that packaging materials must meet. The regulations include



requirements for the collection, recycling and disposal of packaging waste, as well as restrictions on individual packaging materials.

In 2020, Hungary adopted the Packaging and Packaging Waste Management Act (Parliament of Hungary, 2020), which integrates the requirements of the European Union's Packaging and Packaging Waste Directive into the Hungarian legal system. The purpose of this law is to reduce the environmental impact of packaging waste by defining the obligations of manufacturers, distributors and retailers in the field of packaging waste management. The law requires measures to prevent and reduce packaging waste, including the use of reusable packaging. Pursuant to the law, producers must register with the National Organization for Packaging Waste Management Nonprofit Kft. (Öko-Pack) and provide information on the types and quantities of packaging they put on the market. Their task is also to finance the collection, sorting and treatment of packaging waste from their products. Distributors and retailers are obliged to take back packaging waste from their customers free of charge, and to ensure proper sorting and treatment. They must also report the amount of packaging waste they collect to Öko-Pack. The Packaging Waste Management Act also sets minimum recycling and utilization targets for different types of packaging materials. For example, by 2025 the recycling and recovery rate for glass packaging must be at least 60%, while paper and cardboard packaging must be at least 70%.

Overall, the legal and regulatory environment has a significant impact on the Hungarian packaging industry. The presented laws are coordinated measures aimed at reducing the amount of packaging waste and promoting sustainable practices in Hungary. By implementing laws and increasing environmental awareness, the Hungarian government has set itself the goal of strengthening environmental sustainability and reducing environmental damage. Companies must closely monitor changes and comply with regulations in order to ensure a sustainable and successful operation in the market.

### **3 Consumer behavior**

Customers of the packaging industry can come from a wide range, as packaging is present in almost every sector. Potential customers include manufacturing companies, food industry, pharmaceutical industry, retail companies, online retailers, manufacturers, logistics companies and many other sectors. Consumers evaluate packaging, packaging alternatives and the companies that offer them based on a variety of criteria, including price, quality, sustainability and services.

The bargaining position of buyers in the packaging industry can vary depending on the specific market or sector within which the packaging company operates. Price-sensitive buyers, such as retailers, usually enjoy a strong bargaining position

because they can choose from multiple suppliers and negotiate prices. However, in areas where quality and sustainability are key, customers may be willing to pay higher prices for quality packaging.(Rajkumar, Jain 2021)

Buyers' purchasing decisions can be influenced by many factors(Anisha, Kalaivani 2016) in the packaging industry. Price is one of the most important factors influencing customer decisions. Price competition is intensifying in some segments of the examined industry, especially in areas where prices are the main considerations when making purchasing decisions. In addition, the quality of the packaging is important to buyers, as it can affect the protection and prestige of the product. A quality packaging can increase customer trust and satisfaction. In accordance with the legal regulations, but hopefully not solely as a result of them, sustainability is becoming an increasingly important factor for customers. Environmentally friendly packaging solutions such as biodegradable or recycled materials can be attractive to customers. (Berg, Lingqvist 2019) In addition, it is mostly important for customers that the packaging company is easily accessible and that the delivery is reliable. However, it is very difficult to form an adequate picture of customer needs, as the market is highly inhomogeneous.

Sustainability and environmental protection are increasingly important topics in society. Consumers want to be more environmentally conscious and responsible in their purchases. This is reflected in the trend of more and more shopping malls shifting the sourcing of packaging materials to customers to encourage environmentally friendly choices. The packaging industry must adapt to such preferences and offer environmentally friendly packaging solutions. The increase in environmental awareness therefore brings both opportunities and challenges for the packaging industry. Companies that develop environmentally friendly packaging materials and use sustainable packaging practices may be more attractive to environmentally conscious customers.(Huang et al., 2014)

In the Hungarian market environment, consumer trust is an extremely important factor for the packaging industry. For Hungarian consumers, trust in products and companies significantly influences their purchasing decisions. As a result, packaging industry companies must pay special attention to strengthening and maintaining consumer trust. The way to do this is to ensure transparency in addition to quality packaging, as well as keeping sustainability in mind. (Wandosell et al., 2021)

Companies must ensure that products are properly packaged to protect their integrity and quality. Incorrect packaging or the use of low-quality packaging materials can lead to a loss of consumer confidence. They must also make publicly available information that helps consumers understand their choices about products and packaging materials. Transparency can help increase consumer confidence and build customer loyalty. (Tóth, 2015) As I mentioned earlier, it is also an important factor for Hungarian consumers that companies and their

products are environmentally conscious. The use of sustainable packaging solutions and environmentally friendly materials can get positive feedback from customers and strengthen trust in companies. Unfortunately, consumer confidence in Hungary is traditionally low.

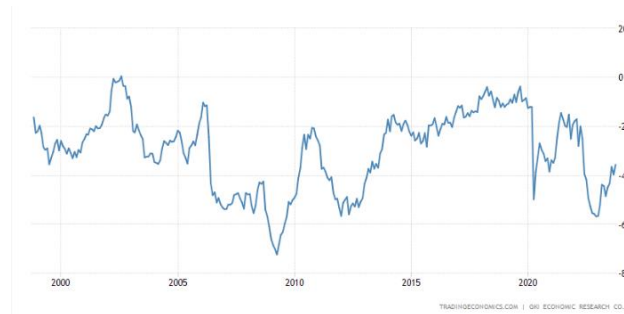


Figure 1  
Consumer confidence in Hungary (tradingeconomics, 2022)

Adapted to the specifics of the Hungarian market, the strengthening of consumer confidence therefore plays a critical role in the success of the packaging industry. Companies that consciously and consistently build consumer trust with quality packaging and sustainability practices can gain a competitive advantage on the Hungarian market.

Based on the comprehensive social analysis, it can be said that the packaging industry must strive to be sensitive to social changes and adapt to them. In addition to addressing the aging population and inequality, a focus on sustainability is also of paramount importance in market competition. Depending on this, it can be said that companies that are able to monitor demand trends and changes, and are able to respond flexibly to customer needs, and are able to offer high-quality and sustainable packaging solutions, can gain a competitive advantage in the market.(Rundh, 2009)

## 4 Research

The purpose of the research was to examine the factors on the basis of which consumers choose packaging material, and to reveal that these specific patterns are behind their choice decisions. Accordingly, my research question is: Is it possible to identify a group of customers for whom an environmentally conscious corporate decision regarding packaging materials is important.

Hypothesis 1, An environmentally conscious group of respondents can be identified.

Hypothesis 2, The purchasing decisions of the environmentally conscious group are also more conscious at the level of the chosen packaging materials.

#### **4.1 Research method and tool**

To examine this question, I chose an anonymized quantitative questionnaire as a tool. I chose this because anonymity allows respondents to answer the questions honestly, as they do not have to worry about possible negative consequences. This advantage is particularly important in cases like mine, when the requirements of the regulatory environment and social pressure both try to influence consumer decisions in the direction of packaging materials made from sustainable recyclables or recycled materials, so the "correct" answer is clear, which however may differ significantly from real consumer behavior. Anonymized questionnaires are thus particularly useful for examining topics that are sensitive or personal and that respondents do not wish to share publicly.

Anonymized questionnaires also allow for large sampling since there is no need for personal interaction between the researcher and the respondent. This large sample size can increase the statistical reliability and generalizability of the research. In addition, the anonymized questionnaire method enables quick data collection and faster analysis of the results. Answers are easy to code and manage. In addition, the online questionnaire I chose (Google Forms) is a cost-effective tool for research. It is not necessary to use expensive interviews or personal observation methods. In addition, the online questionnaire allows respondents to participate in the research at their own convenience, without having to be physically present at a specific place at a specific time.

Of course, I am aware that although the anonymized questionnaire survey method has many advantages, it also comes with limitations and disadvantages, which are important to take into account when planning the research. These disadvantages carry challenges affecting the reliability and efficiency of research.

One of the most important such disadvantages can be a low response rate. Since there is no personal obligation on the part of the respondents, the response rate may be low. As a result, the research sample may not adequately represent the population, which may bias the results. A low response rate may also mean that the sample will be self-selecting, i.e. those who are more active and willing to participate will respond, which distorts the representativeness of the research sample.

Another potential disadvantage is that anonymized questionnaires do not allow a deeper understanding and the exploration of cause-and-effect relationships. In addition, during the anonymized questionnaire survey, response bias can easily occur, i.e. the respondents may tend to distort or provide false information in the

questionnaires. Anonymity makes it difficult to verify or confirm the reliability of responses, which can cause problems with the accuracy of research findings.

Anonymized questionnaire surveys also do not allow immediate feedback of answers or clarification of questions. This can cause problems if the questions or instructions are unclear or confusing. Possible misunderstandings or confusion may affect the accuracy of the answers.

In summary, although anonymized questionnaire surveys provide a cost- and resource-efficient method for research, they also have certain limitations and disadvantages.

During the research, I used a convenience sampling procedure, because my goal was to get to know the opinions of as many respondents as possible. I distributed the questionnaire through various social media, asking the respondents to share the questionnaire. The sampling procedure thus followed a snowball methodology.

I understand that in the case of convenience sampling, the selection of respondents is not random and the research results may be biased as a result. The research focuses on people or groups who are easily accessible, but this does not necessarily represent the entire population. As a result, research findings may not be generalizable to other groups or situations. Snowball sampling can also suffer from a lack of representativeness. Even during snowball sampling, it is difficult to ensure randomness and objectivity, which can lead to distortions in the design of the research sample.

## **4.2 Research tool**

The instrument of the research was a simple questionnaire with 21 questions. The starting point of the questionnaire was the interview outline of my TDK presented in the spring of 2023. In addition to revealing the demographic characteristics, the respondents had to answer to what proportion they use different packaging materials in their everyday life, and to what extent they take into account certain packaging material factors when buying products. In the latter case, the respondents indicated their answer using a 5-point Likert scale, while in relation to the use of packaging materials, they could only indicate percentage values out of 10 in the questionnaire. “?”, “How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards?” ended with questions about factors influencing behavior, which the respondents also had to rate on a 5-point Likert scale. The questionnaire is included in Annex 1.

### 4.3 Presentation of the sample

During October 2023, 331 evaluable responses were received to the questionnaire. I determined the seriousness of the answers based on the free-word fields of the education and study data. If the respondent gave highly irrelevant answers, such as "I learned everything I needed", then the respondent's answers were excluded from the evaluated population. So I finally evaluated the results of 325 questionnaires.

The average age of the respondents is 23.75 years (Std Dev: 7.63). As can be seen in the following figure, the great majority of respondents were between the ages of 18 and 23, which can be considered a biasing effect from the research's sampling method. Therefore, the research results cannot be considered representative of the entire population. The mode was 19/20, 64-64 respondents from these two ages. And the median age was 21 years.

According to the age distribution, 77.5% of the respondents had a high school education, but there were also those in the sample who had graduated from a technical school, as well as those who already had a BSc degree. The exact figures are shown in the graph below.

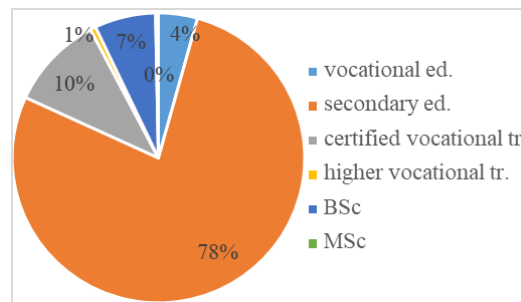


Figure 2  
Highest level of education of the respondents

91.1% of respondents are currently studying in higher education. Only 29 respondents are not currently studying. One part of this group is the older respondents, and the other part includes those with a technical school degree who did not study further after their secondary education. The distribution by training area is shown in the diagram below. The interesting thing about the distribution of the respondents is that although my circle of acquaintances consists primarily of IT people, 72% of the respondents are studying economics. This draws attention to the distorting factor, according to which, in the case of anonymous online questionnaire research, it is important who is interested in the topic and is therefore willing to fill out the questionnaire.

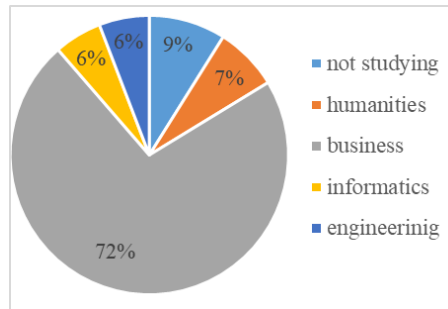


Figure 3  
Distribution of respondents by field of higher education

Among the respondents, there were a total of 7 people who are studying in a field closely related to packaging design.

86.5% of the respondents have work experience, which also shows that although I reached a relatively young age group with my questionnaire, the majority of them still have/had their own income, and thus it is more likely that they make their purchase decisions in a more autonomous way.

#### 4.4 Research results

With the help of the questionnaire, I revealed the proportion of the respondents who use different packaging materials in their daily life. With this, I obviously had the opportunity to explore not their purchasing decisions, but rather their consequences. The distribution of the packaging materials used by the respondents according to the ratio is shown in the graph below.

As can be seen in the table below, the number of respondents (2.9% on average) who only use products with one type of packaging material is relatively small. Within this population, 8 people answered that they only buy products with paper-based packaging. Another interesting fact is that 4.4% of the respondents answered that they buy products with 90% of the same packaging material, and 14 of them were the ones for whom this packaging material was plastic. Products with plastic packaging occupy a prominent place in the product baskets of more and more respondents if the data is examined further. For a more precise understanding, I present the data in tabular form below.

	<b>paper</b>	<b>textile</b>	<b>glass</b>	<b>plastic</b>	<b>metal</b>	<b>other</b>	<b>average</b>
0%	2%	34%	15%	2%	29%	42%	18%
10%	11%	27%	35%	6%	30%	26%	19%
20%	16%	16%	18%	14%	14%	11%	13%
30%	21%	8%	8%	14%	7%	8%	10%
40%	10%	5%	7%	9%	7%	4%	6%
50%	14%	2%	4%	12%	6%	5%	6%
60%	8%	3%	3%	13%	1%	1%	4%
70%	8%	2%	3%	11%	2%	1%	4%
80%	6%	2%	4%	12%	3%	1%	4%
90%	2%	1%	1%	4%	1%	0%	1%
100%	2%	1%	1%	1%	0%	0%	1%

Table 1.

Purchase percentages of products with different packaging materials

In the framework of the questionnaire, we also asked what they base their purchase decisions on. As you can see in the graph below, regulatory requirements were the least important when making purchase decisions. The respondents gave an average value of 2.606 to this characteristic (Std Dev: 1.065). This is a result that did not cause any particular surprise, since the young age group that I reached are not necessarily aware of the relevant rules, and as I explained the usage rate of packaging materials earlier, they are not necessarily concerned with environmental or even relevant regulatory matters. The second lowest value was given to design (average: 2.628; Std. Dev: 1.197), which does not meet my previous expectations. Since the majority of customers are young, and therefore less often have to buy products that are needed for everyday life, I assumed that impulse buying is more characteristic of them, and the appearance of a product's packaging is more important to them. Based on the opinion of the respondents, the two most important aspects are the cost (average: 3.874, Std Dev: 1.116) and the shelf life of the product (average: 3.695; Std Dev: 1.153). The latter somewhat explains the relatively large proportion of products with plastic packaging in relation to the products included in the product basket.



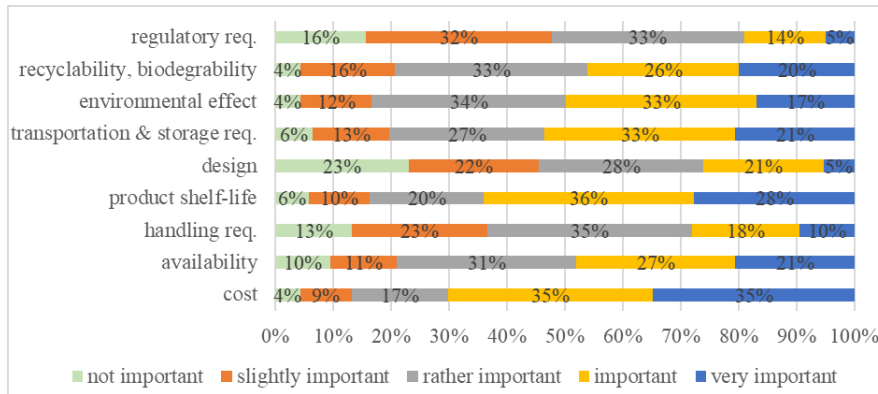


Figure 4

Distribution of answers to the question: To what extent do you consider the following packaging material factors when purchasing products?

Based on the answers of the respondents, all of the characteristics revealed by the last 3 questions are moderately important to the respondents. The highest mean (3.862, Std Dev: 0.787) was obtained for How important is sustainability to you? received in the case of answers to questions. In this case, both the mode and the median were the value 4 (important). For the other two questions, the mode and median were value 3 (moderately important). To what extent does sustainability influence your purchasing decisions? in the case of the question, the average is 3.243 (Std Dev: 0.916), while the How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards? question was 3.366 (Std Dev: 1.108).

To examine the relationships between the variables, I performed a Spearman correlation test, and since I do not have strong hypotheses about the direction of the relationship between the variables, I examined 2-Tailed significance. The Spearman correlation, as a non-parametric statistical indicator, is especially suitable for the analysis of ordinal data. (Ordinal data consists of categories that have a clear rank or order, but no precise interval information.) The values of the variables I used (Likert scale values) have a built-in order, but do not have equal intervals, making them unsuitable for Pearson for parametric methods similar to correlation. The Spearman correlation, on the other hand, evaluates the strength and direction of the monotonic relationship between variables. And the monotonic relationship does not assume linearity, but rather focuses on the consistent increase or decrease of the variables.

Interestingly, the age of the respondents was only correlated with the amount of use of plastic packaging materials (Spearman: 0.188; Sig 2-tailed: 0.001). Although the relationship is significant, it is particularly weak. The explanation behind this phenomenon may be that the older a person is, the wider the range of

products in their consumer basket, and indeed, in the case of many consumer goods, there is still no sufficiently widespread alternative to plastic packaging materials.

Another surprising factor is that education was negatively correlated with the importance of cost as a factor influencing purchase (Spearman: -0.116; Sig 2-tailed: 0.037). The connection was weak here as well. A possible explanation for this phenomenon can be found in the fact that the income increases with the increase in education, so the prices of the products are not necessarily a strong decision-influencing factor, as they are mostly only occasional or for the younger age group with a low level of own income. The table below shows the relationship between the answers to the last 3 questions and purchasing habits and decision-influencing factors. The table only contains the significant correlations.

		paper	glass	transport and storage	regulatory requirements	product shelf life	compliance with treatment requirements	environmental effect	cost	availability	recyclability or biodegradability
How important is sustainability to you?	corr.	,116	,531	,123	,335	,207	,292	,476	,112	,145	,531
	Sig.	,037	,000	,026	,000	,000	,000	,000	,044	,009	,000
To what extent does sustainability influence your purchasing decisions?	corr.	,174	,531		,384	,270	,290	,502	,143	,155	,531
	Sig.	,002	,000		,000	,000	,000	,000	,010	,005	,000
How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards?	corr.	,123	,380	,194	,442	,254	,324	,304	,167	,193	,380
	Sig.	,026	,000	,000	,000	,000	,000	,000	,002	,000	,000

Table 2.

The relationship between shopping habits and decision-influencing factors

As can be seen from the table, the strength of the correlations is typically weak, but there are also some stronger relationships. Examples include the importance of sustainability and compliance with regulatory requirements, the importance of environmental impact, recyclability or biodegradability, and the more frequent use of glass packaging. With the question, To what extent does sustainability

influence your purchasing decisions? these same variables were most strongly correlated. A How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards? question, we also see a similar pattern, with the difference that in this case compliance with the treatment requirements was also moderately strongly related to the variable.

In order to answer the research question, I formed clusters by using the answers to the last 3 questions, as well as environmental impact and recyclability as factors influencing customer decision. I used a 3-means K-means clustering procedure, which resulted in clusters with a clearly identifiable pattern. As can be clearly seen in the table below, the first cluster includes environmentally conscious consumers (134 people), the second cluster includes moderately aware consumers (134 people), and the third cluster includes those who are not environmentally conscious (57 people).

	1	2	3
How important is sustainability to you?	4.39	3.69	3.04
To what extent does sustainability influence your purchasing decisions?	3.86	3.07	2.21
How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards?	3.84	3.54	1.86
How much do you consider when buying products? environmental effect	4.31	3.10	2.30
How much do you consider when buying products? recyclability	4.44	2.94	2.11

Table 3.  
The values of the formed cluster centers

Although the distribution of the clusters according to the number of elements is not uniform, all of the cluster-forming criteria contributed significantly to the formation of the clusters based on the ANOVA table, so I consider the result of the clustering procedure to be adequate.

**ANOVA**

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
How important is sustainability to you?	40,091	2	,374	322	107,055	,000
To what extent does sustainability influence your purchasing decisions?	57,811	2	,485	322	119,194	,000
How important do you think it is that the packaging materials of the products you buy comply with the relevant regulations and standards?	81,425	2	,729	322	111,769	,000
How much do you consider when buying products? environmental effect	94,883	2	,512	322	185,254	,000
How much do you consider when buying products? recyclability	134,419	2	,403	322	333,167	,000

Table 4.

ANOVA table - On the results of the reliability of the clustering procedure

The variables describing the factors influencing the shopping habits and decisions of the respondents belonging to the clusters created in this way give the picture shown in the following table. The group we prefer, whose behavior we are most interested in, is the first cluster, since we can assume that they will turn their attention to more environmentally friendly paper or reusable packaging alternatives instead of plastic. As can be seen from the table below, the hypothesis according to which the purchasing decisions of the environmentally conscious group are more conscious also at the level of the chosen packaging materials was confirmed.

Members of the first cluster have the highest rates of use of paper as degradable waste and recyclable packaging materials (textile, metal, glass). The members of the cluster have, on average, the highest education, and they are also the oldest. (It is worth noting here that the least aware group – cluster 3 – is not made up of members of the youngest age group.)

In order for companies to be able to serve the environmentally conscious customers more effectively, it is also important to state that the respondents belonging to the first cluster not only rate the importance of the environmental impact and recyclability factors higher than the members of the other two clusters, but also the other customer decisions also an influencing factor. Based on this, it can be concluded that the members of the first cluster are not only more environmentally conscious, but also more conscious as a whole, i.e. they make their purchasing decisions by considering and considering several factors.

	Conscious		Moderately conscious		Not conscious	
	Avg.	Std.Dev	Avg.	Std.Dev.	Avg	Std.Dev
Age	25,127	8,706	22,649	6,679	23,105	6,559
Highest qualification	2,088	0.300	2,081	0.244	2,105	0.319
paper	0.464	0.248	0.387	0.226	0.346	0.230
plastic	0.435	0.249	0.534	0.229	0.479	0.255
textile	0.213	0.243	0.156	0.191	0.123	0.155
metal	0.200	0.226	0.195	0.218	0.167	0.183
glass	0.444	0.582	0.294	0.622	0.210	0.772
transport and storage	3,649	1,119	3,470	1,074	3,105	1,305
regulatory requirements	3,149	1,080	2,440	0.836	1,719	0.750
product shelf life	4,134	0.865	3,545	1,141	3,018	1,356
compliance with treatment requirements	3,336	1.103	2,761	0.998	2,070	1,083
environmental effect	4,306	0.640	3,104	0.652	2,298	0.981
cost	4,030	1,083	3,948	0.991	3,333	1,314
availability	3,701	1,097	3,366	1.128	2,667	1,327
design	2,664	1,207	2,642	1.172	2,509	1,241
recyclability or biodegradability	4,440	0.582	2,940	0.622	2,105	0.772

Table 5.  
The characteristics of the clusters

## 5 Summary of research results, suggestions

The research presented in the thesis helps to understand what factors influence customers' decisions regarding packaging materials, and especially highlights the behavior and preferences of environmentally conscious customers. In the course of my research, I used an anonymized online questionnaire to examine the proportion of respondents who use different packaging materials in their daily lives. The purpose of the study was not to map their purchase decisions themselves, but their consequences. It is clear from the results that there are relatively few respondents (2.9% on average) who only use products with one type of packaging material. Within this, 8 respondents only buy products with paper-based packaging. It is interesting that 4.4% of respondents buy products with 90% or more of the same packaging material, and in 14 of these cases plastic was the packaging material. Unfortunately, products with plastic packaging are often included in a large percentage of respondents' product baskets. Based on my research results, on average 41.17% of the respondents buy products with paper packaging. The most common value was 30%, and the median was 40%.

As part of my research, I also examined the factors influencing the respondents' decisions. The least important were regulatory requirements, with an average

value of 2.606 (on a 5-point Likert scale). The second least important factor was product design, which had a mean of 2.628. Based on the opinion of the respondents, the two most important aspects are the cost (average: 3.874, Std Dev: 1.116) and the shelf life of the product (average: 3.695; Std Dev: 1.153).

In addition to presenting the basic descriptive statistical characteristics of the variables, I also examined their relationship using Spearman correlation. There was a particularly weak but significant relationship between age and the use of plastic packaging materials (Spearman: 0.188; Sig 2-tailed: 0.001). There is also a weak and negative correlation between education and cost (Spearman: -0.116; Sig 2-tailed: 0.037). The correlations between the other factors are also weak, but some stronger relationships were also shown. For example, the relationship between the importance of sustainability and compliance with regulatory requirements, and the relationship between the importance of environmental impact and the increased use of glass packaging materials. There is also a moderately strong relationship between influencing sustainability and the suitability of the product's packaging. The age and education of the respondents also showed some interesting correlations with their purchasing decisions and their preferred packaging materials. For example, older respondents were more likely to buy products with plastic packaging, while those with a higher education level found cost to be less of a deciding factor.

The fundamental question of the research was whether it is possible to identify a group of customers for whom an environmentally conscious corporate decision regarding packaging materials is very important. To investigate this question, I used a clustering procedure to identify different customer groups based on different behavioral patterns. With the help of K-means clustering, I managed to form three medium-sized clusters, where the first cluster contains the environmentally conscious customers (134 people), the second cluster contains the moderately aware ones (134 people), while the third cluster contains those less concerned with environmental awareness (57 people).

The final focus of my research was the first cluster, i.e. environmentally conscious customers. It can be said that the members of the first cluster have, on average, a higher education and are older than the members of the other clusters. Their results show that this group prefers paper packaging and reusable packaging options over plastic. Based on this, it can be concluded that the members of the first cluster are not only more environmentally conscious, but also more conscious as a whole, i.e. they make their purchasing decisions by considering and considering several factors.

My research results enable companies to serve the environmentally conscious customers more efficiently and to recognize that the members of the first cluster consider not only environmental factors, but also other purchase aspects to be important. The members of the first cluster are generally more aware of their

purchasing decisions and consider several factors when choosing their chosen packaging materials.

In light of global and local trends, it is important to understand that although only 134 of the respondents belonged to the first cluster, the layer of conscious and environmentally conscious customers is becoming increasingly important for companies. These customers not only consider the quality and price of the products in their purchase decisions, but also consider environmental and sustainability aspects. Therefore, companies must actively respond to this trend and take advantage of the opportunities inherent in their products and services for conscious and environmentally conscious customers.

The first and most important step is to prioritize sustainability in the life of your company. Sustainability cannot be just a buzzword in company communication, but must be a real value that actually influences business practice. This includes the avoidance of single-use plastics, energy-saving production processes and the offer of recyclable products, as well as the conscious choice of packaging materials. Although in many cases these decisions may involve additional costs, it is important to keep in mind that sustainability is not only part of corporate responsibility towards the environment and society, but can also be a source of competitive advantage in the market. And in order for these values to become obvious to customers, in addition to responsibility, transparency is essential for business success.

Communication and education are also key to acquiring and retaining conscious customers. The level of awareness of environmentally conscious customers is different and higher than average in relation to factors not related to environmental protection. Companies must draw the attention of their customers to their sustainable products and explain why they should be chosen. In addition, they can also contribute to increasing the environmental awareness of customers with educational programs. In the service/interest of this, companies can launch campaigns about the importance of selective waste collection or the recycling process, or the importance of choosing packaging materials.

In addition, innovation can play an important role in attracting conscious customers. Companies must constantly improve their products and services to meet the needs of conscious customers. They must offer products and, of course, packaging that are, for example, easily recyclable or have a longer lifespan. Innovation contributes to increasing the competitive advantage of companies in the sustainable market.

## References

- [1] Tradingeconomics (2023). Downloaded from: <https://hu.tradingeconomics.com/hungary/consumer-confidence>
- [2] European Commission (2020). Circular economy action plan - The EU's new circular action plan paves the way for a cleaner and more competitive Europe. Downloaded from: [https://environment.ec.europa.eu/strategy/circular-economy-action-plan\\_en](https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en)
- [3] Európai Parlament (2019). AZ Európai Parlament és a Tanács (EU) 2019/904 irányelve egyes műanyagtermékek környezetre gyakorolt hatásának csökkentéséről. Downloaded from: L\_2019155HU.01000101.xml (europa.eu)
- [4] Draft European Parliament Legislative Resolution on the proposal for a regulation of the European Parliament and of the Council on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC (COM(2022)0677 – C9-0400/2022 – 2022/0396(COD)) ([https://www.europarl.europa.eu/doceo/document/A-9-2023-0319\\_EN.html](https://www.europarl.europa.eu/doceo/document/A-9-2023-0319_EN.html))
- [5] Magyarország Országgyűlése (2012). 2012. évi CLXXXV. törvény a hulladékról. Downloaded from: Hulladéktv. - 2012. évi CLXXXV. törvény a hulladékról - Hatályos Jogszabályok Gyűjteménye (jogtar.hu)
- [6] Magyarország Országgyűlése. (2016). Hulladékgazdálkodási díjról szóló törvény. Magyar Közlöny, 2016(168).
- [7] Magyarország Országgyűlése. (2020). Csomagolási hulladékgazdálkodási törvény. Magyar Közlöny, 2020(135).
- [8] Rajkumar, A., & Jain, V. (2021). A Literature Study on the Product Packaging Influences on the Customers Behavior. *Journal of Contemporary Issues in Business and Government*, 27(3), pp.779-785.
- [9] Anisha, S., & Kalaivani, A. (2016). Factors influencing buyers' behavior while purchasing. *Shanlax International Journal of Commerce*, 4(3), pp.153-158.
- [10] Berg, P., & Lingqvist, O. (2019). *Pulp, paper, and packaging in the next decade: Transformational change*. McKinsey & Company, 8(7), 2019.
- [11] Huang, H. C., Lin, T. H., Lai, M. C., & Lin, T. L. (2014). Environmental consciousness and green customer behavior: An examination of motivation crowding effect. *International Journal of Hospitality Management*, 40, pp. 139-149.



- [12] Wandosell, G., Parra-Meroño, M. C., Alcayde, A., & Baños, R. (2021). Green packaging from consumer and business perspectives. *Sustainability*, 13(3), 1356.
- [13] Tóth, O. (2015). Sustainable Consumption And Consumer Attitude In Hungary In The Light Of An International Research. *Challenges in economic and technological development*, 197.
- [14] Rundh, B. (2009). Packaging design: creating competitive advantage with product packaging. *British food journal*, 111(9), pp. 988-1002.

# Changes in project success factors and success criteria in a given company during COVID-19

**János Balogh**

engineer, economist, 2021, johannesz85@gmail.com

*Abstract: The COVID-19 pandemic has had a profound impact on every moment of our lives and work, and we have had to pay increased attention to counteract the negative effects of the pandemic and adapt in an effective way. The aim of the research was to identify and evaluate the project success factors and project success criteria of a hungarian pharmaceutical development and manufacturing company in the small and medium enterprise sector before and during the COVID. The research sought to explore and evaluate the project management literature, the results of project success research and the opinions of project leaders working in the company in a comprehensive manner. A questionnaire survey was used as a quantitative research method to assess project leaders' perceptions of success factors and success criteria, followed by an in-depth interview with a project leader as a qualitative research method to explore the personal reasons behind personal perceptions of success factors and success criteria. During the research, success factors (which are contribute to some extent to the success of the project) and success criteria (for evaluating projects) published in the literature were identified, then evaluated by project leaders in the given company. In addition to the identification and evaluation of success factors and success criteria, a company-specific (non-sector, - and non-industry-specific) success prediction factor set of success factors was identified. The application of its elements could have contributed to some extent to the more successful execution and implementation of the projects of the company during the COVID period.*

*Keywords: industry; pharmaceutical industry; project management; project success; COVID; success factor; set of factors, success criteria*

## 1 Introduction

The research included the identification of project success factors and project success criteria found in the domestic and international literature, defined before and during the virus situation, and then the determination of their importance in a given company, and then the exploration of how their importance changes depending on the virus situation. Understanding and adapting to the change caused by the pandemic could contribute to the success of the projects in a more conscious way in the changed work environment by pandemic, as adapted to the

changed environment. The assumption was that, while adapting to the change, instead of the previous success factors and success criteria, new or not previously considered or previously less important success factors and success criteria could have helped in the planning, implementation and evaluation of projects.

## **2 Literature review**

The main objective of the literature review was to identify and collect project success factors and project success criteria published in the domestic and international literature, defined before and during the pandemic.

### **2.1 The project and the project management**

Dancsecz pointed out that the definitions of the project found in the literature were not unified, but Dancsecz listed some common characteristics that are mainly found in the project definitions. These characteristics are the following (Dancsecz, 2008):

- one-time, complex task
- defined goal (product/service/outcome)
- defined start and end period
- unique, complex and significant problem
- specialized knowledge and multiple resource requirements
- short to medium term, strategically important process
- change, creating something new or special
- multifunctional nature.

Blaskovics stated that the diversity in the definition of the project showed that its interpretation went beyond the essential project triangle [according to Olsen (1971): time, cost, quality]. (Blaskovics, 2014; Olsen, 1971 in Blaskovics, 2014)

According to professional standards the project management:

- is the process by which a project is scoped, planned, monitored, controlled, executed and implemented to achieve pre-defined outcomes (APM, 2008)
- is the application of knowledge, skills, tools and methods during project activities in order to meet project requirements. (PMI, 2012); (AIPM, 2008)

According to Görög, project management is „... a management function that focuses information, resources - especially the project team staff as the temporary project organization implementing the project - and project management tools to achieve a specific project outcome within a given timeframe and budget.” (Görög, 2013)

The development of project management also provided an interesting insight. In her doctoral thesis, Horváth provides a visual summary of the overview of the different project management trends, schools and their development over time, as previously presented by Turner et al., 2013. (Horváth, 2018)

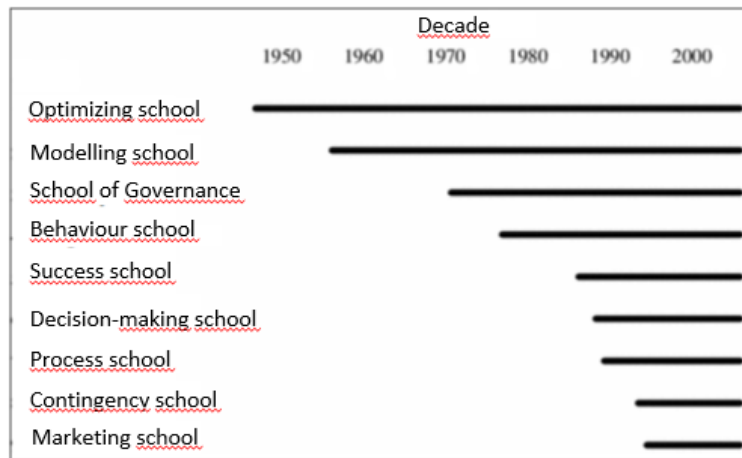


Figure 1

The nine schools of project management (Horváth, 2018; translated)

In the point of view of the research, the success school, which examines the relationship between project goals and business, strategic objectives, is highlighted. The two main areas of research of this school are project success factors (which may contribute to some extent to the achievement of success) and project success criteria (which allow the measurement of project success). (Turner et al., 2013)

## 2.2 Project success

The topic of the research was the study of project success, so the literature review naturally included the concept of project success in the following.

The most cited researchers in defining project success are Baker, Murphy and Fischer, who stated that project success cannot be defined in its entirety/exhaustively as achieving quality/specification within a timeframe and budget. The perceived success of project was defined as the achievement of the

defined quality/specification with a high level of satisfaction of the parent organization, client, user and project team. It can be observed that the authors were the first in the literature to mention the importance of customer satisfaction. (Baker et al., 1983)

Görög formulated the following definition of project success: „a project is considered successful if the project outcome contributes to the achievement of the underlying strategic objective in the initiating organization and both the project delivery process and the project outcome are acceptable for the stakeholders involved.” (Görög, 2013)

According to Horváth, like the project, clearly defining project success is a challenging task. „Defining the success of a project is difficult in itself, and understanding it is greatly aided by defining two related concepts, the success factor and the success criterion, and distinguishing between the two.” (Horváth, 2018)

According to Blaskovics, while success factors basically focus on the parameters that contribute to success, thus dealing with the input factors of success, success criteria allow the measurement of the achieved project success, i.e. they concern the output of success. (Blaskovics, 2014)

In the following, based on the literature, the possible success factors and success criteria for projects are presented.

### **2.2.1 Success factors**

As a result of their aggregation work, Pinto-Slevin has identified 10 success factors that depend on the internal organization:

- project goal
- support of top management
- project schedule
- consultation with the stakeholders, identification of needs/requirements
- team members
- technical performance
- acceptance of project deliverables by client
- information flow (monitoring, feedback, control)
- communication
- troubleshooting, problem solving (Pinto-Slevin, 1988)

According to Verzuh, regardless of the industry, all successful projects can have certain characteristics that are constant, so he summarized five success factors for projects:

- clearly defined goals/objectives agreed by all participants,
- an appropriate project plan (task plan, schedule plan, budget plan),
- constant and effective communication between stakeholders,
- well defined and controlled scope,
- support from senior management/management. (Verzuh, 2006)

Carden and Egan reviewed the literature from the 1970s, 1980s and 1990s and found that the following success factors were highlighted: project management competencies of management, communication and negotiation skills, project organization structure, and cooperation/collaboration between business units and senior management. (Carden and Egan, 2008)

The literature has also defined critical success factors within the success factors, which have significant importance.

According to Earl, the critical success factors method is about identifying a small number of factors (preferably 3-7) during the project planning process that in themselves can ensure the success of the project. (Earl, 1989; Blaskovics et al, 2023; Khan et al, 2023)

Rockart also stated that while success factors can contribute to some extent to success, critical success factors contribute to a large extent (or the greatest extent for the project, in extreme cases up to 100%) to project success. (Rockart, 2002)

Similar observations are made by Fortune and White, who define critical success factors (key success factors) as those that make a major, outstanding contribution to the development of project success as defined by one of the criteria. (Fortune and White, 2006)

### **2.2.2 Success criteria**

In her doctoral thesis, Dancsecz summarized the results of research on the criteria of project success and concluded that, in addition to the elements of the magic triangle, the contribution to the strategy and the satisfaction of different stakeholders/interested parties are the main elements that are repeatedly mentioned in the different works studied. (Dancsecz, 2008)

The 6th edition of the Project Management Body of Knowledge (PMBOK), published by the Project Management Institute, has defined the following success criteria:

- the project's compliance with revenue/benefit plans,
- compliance with the financial indicators of the decision-preparation study that defined the business case for the project [net present value (NPV), return on investment (ROI), internal rate of return (IRR), payback period (PBP), and cost benefit ratio (BCR)],
- the fulfilment of the nonfinancial objectives of the decision-preparation study to determine the business case for the project,
- meeting the quality expectations of the project outcome,
- integration of project results into the operational environment of the organization,
- meeting contractual conditions,
- meeting organizational strategy and objectives,
- meeting organizational governance objectives,
- achieving desired positive changes in the organization,
- stakeholder satisfaction,
- customer/end-user satisfaction
- other criteria (PMI, 2017)

Horváth categorized these criteria - in terms of their content - into the following four basic competence categories:

- business value-based criteria
- criteria for meeting primary project objectives (schedule, resources, budget and quality expectations)
- satisfaction of the project owner organization and compliance with organizational objectives
- criteria addressing the satisfaction of relevant stakeholders. (Horváth, 2018)

### **2.2.3 Project success in the pharmaceutical industry**

As the project success research was conducted in a given pharmaceutical development and manufacturing company, it was important to include the relatively small amount of published success literature that reported on previous pharmaceutical success research results.

According to Sara, the key to success is to involve management/leadership in the project from the very beginning, providing moral, financial and business support. (Sara, 2012)

According to Pattanaik, critical success factors for a pharmaceutical project include: the role of the project manager and stakeholders, team communication, and business processes. (Pattanaik, 2014)

According to Koka et al., project management itself, as a success factor, is one of the most effective management tools for influencing the entire process (from clinical research through production to market logistics) across the entire spectrum of drug development and manufacturing. (Koka et al., 2015)

#### **2.2.4 Project success during the COVID-19 pandemic**

According to Cooper's complex, comprehensive, cross-industry study, the most important lesson of the pandemic was the need to accelerate development and innovation processes to ensure the survival of companies (Csiszárík-Kocsir – Dobos, 2023a; 2023b; Varga – Csiszárík-Kocsir, 2023; Csiszárík-Kocsir – Varga, 2023).

Cooper pointed out which project success factors, which have been previously identified in the literature, may have been more important during the pandemic:

- an appropriate and realistic schedule plan
- an adequate resource plan
- known and appropriate processes
- satisfaction of partner
- satisfaction of client
- satisfaction of colleagues
- satisfaction of stakeholder
- satisfaction of management
- owner satisfaction
- satisfaction of project manager
- size of the project team
- composition of the project team
- commitment and satisfaction of the project team
- communication within the project team



- change management competence of the project manager and the project team
- problem-solving ability of the project manager and project team
- commitment of management, the project manager and the project team
- continuous monitoring, evaluation and feedback on the status and scope of the project. (Cooper, 2021)

Summarized, it can be concluded that the literature on success during the pandemic tended to focus on research on success factors, the authors looked for solutions to increase the probability of success of projects. Not completely new success factors were defined, rather the importance of success factors that had already been previously defined changed.

### **3 Research methods**

After the literature review, I conducted a questionnaire-based primary research to investigate which success factors and success criteria were considered important or more important by the project leaders of the given company (study population) before the pandemic and how this changed during the pandemic according to their experience.

The research methodology (questionnaire, in-depth interviews) is based on the books by Malhotra (2017) and Gyulavári et al. (2017).

The success factors and success criteria listed in the questionnaire are external data from secondary research, publications, articles, studies, validated questionnaires, no pilot surveys were needed. There were no or a relatively small number of pharmaceutical industry-specific studies and literature were published compared to the total literature, so the success factors and success criteria defined in general, multi-industry literature and the small number of pharmaceutical industry-specific literature were used as a basis for the definition of the success factors and success criteria to be included in the questionnaire.

The success factors of the project to be studied were grouped into logically and content-related groups based on research by Tsigas et al. (2017). The success criteria of the project to be studied were grouped into logically and content-related groups based on the research of Horváth (2018).

The questionnaire was designed to enable project leaders to anonymously rate the success factors and success criteria listed in the questionnaire on a Likert scale of 1 to 10, with 1 indicated least important and 10 indicated critical. The scale categories are based on research by the Bostock Marketing Group (2014). The

questionnaire respondents were asked to decide the importance of success factors and success criteria before and during COVID.

The questionnaire contained one-answer, closed questions. The questionnaire also included free spaces/blank lines to allow the respondents to define some additional important factors/criteria if they did not find them among those listed.

In addition to the quantitative survey, I also used a qualitative, explorative methodological technique, an interview. I conducted an in-depth interview with a project leader and examined, through the experiences of the project leader's execution-implementation of projects, the changes of the importance of success factors and success criteria at the individual level of the project leader.

The research aimed to answer the following questions:

- what are the success factors that can determine the success of projects in a given company before and during a pandemic?
- what are the success criteria that can be used to assess the success of projects in a given company before and during a pandemic?
- is there any difference between the importance of success factors and success criteria before and during the pandemic in a given company?

## **4 Results**

All project leaders were willing to fill the questionnaire and a full survey was carried out. The evaluation was carried out according to Malhotra's (2017) recommendations and with Microsoft Excel program, success factors and success criteria for each group were separately examined.

### **4.1 Success factors**

Before COVID, the following success factors were important to project leaders: realistic plans; commitment and satisfaction of the owner; support and commitment of management; defined quality; commitment of the project leader, project team and colleagues.

During COVID, the following success factors remained significantly important for project leaders: realistic plans; commitment of owner; support and commitment of management; defined quality; and commitment of colleagues. During COVID, the following success factors became more prominent, were more highly rated compared to the pre-COVID period: technological environment; working environment; defined and known processes; competencies of project leader;

communication; commitment of partner, client and project leader; risk management; project goal.

Before COVID	During COVID
<u>Realistic plans</u>	<u>Realistic plans</u>
<u>Commitment of the owner</u>	<u>Commitment of the owner</u>
<u>Owner satisfaction</u>	-
<u>Support of Management</u>	<u>Support of Management</u>
<u>Commitment of Management</u>	<u>Commitment of Management</u>
<u>Defined quality</u>	<u>Defined quality</u>
<u>Commitment of the project leader</u>	<u>Commitment of the project leader</u>
<u>Commitment of the project team</u>	-
<u>Commitment of colleagues</u>	<u>Commitment of colleagues</u>
	<u>Technological environment</u>
	<u>Working environment</u>
	<u>Defined and known processes</u>
	<u>Competences of project leader</u>
	<u>Communication</u>
	<u>Commitment of partner</u>
	<u>Commitment of customer</u>
	<u>Risk management</u>
	<u>Project goal</u>

Figure 2  
Success factors - result (own editing)

Based on this result, a company-specific success prediction factor set was defined, its elements, the given success factors, could be considered, could be implemented into the projects and could be continuously applied them during all phases of the project, thus the company-specific projects more likely to be successfully executed-implemented. These success factors are the followings: appropriate, detailed and accurate project plan and product design; commitment of the stakeholders to the project; support of management; technical-technological-informatics improvements; known processes; appropriate and known project goals; a competent project leader; continuous communication and continuous and flexible risk management.

## 4.2 Success criteria

Although it is not mentioned by definition in the relevant literature, in the context of this research I took the opportunity to consider that the criterion that would have received the maximum evaluation value would have been a critical success criterion, similar to the critical success factor, and the achievement, fulfillment of these criteria could entail a positive assessment, or in other words, the non-fulfilment of these criteria could lead failure of evaluability of the project.

Before COVID, the following success criteria were important for project leaders when evaluating projects: value creation; quality, specification performance; goal performance; satisfaction of management and owner.

During COVID, the following criteria remained significantly important for project leaders: value creation; quality, specification performance; satisfaction of management and owner. During COVID, the following success criteria became more prominent, were more important compared to the pre-COVID period: business, economic benefits; profit growth; schedule performance.

Before COVID	During COVID
Value creation	Value creation
Quality, specification performance	Quality, specification performance
Goal performance	Goal performance
Satisfaction of Management	Satisfaction of Management
The owner's satisfaction	The owner's satisfaction
	Business, economic benefits
	Profit growth
	Schedule performance
	Reliability of the product/process
	Sustainability of the product/process

Figure 3  
Success criteria - result (own editing)

### 4.3 In-depth interview

The in-depth interview was conducted with 1 project leader and me as the interviewer, and I adapted to the project leader in case of time and the interview process. The location was the corporate office of the project leader interviewed. The interview and the details and data of the projects mentioned as examples were not recorded. The supplementary and clarifying questions asked during the interview were intended to examine the questionnaire answers and responses of the leader in more depth. During the individual completion of the questionnaire, did the project leader rate certain success factors and success criteria as high enough (10) or low enough (2, 3)? Could the project leader explain the personal reasons behind the high and low scores?

The project leader interviewed focused on the changes during the pandemic period when answering questions on both success factors and success criteria. No low (2, 3) scores were given for success factor and success criterion to be evaluated.

When the project leader was asked about the success of a project, the project leader said that time/cost/quality-goal factors could not be sufficient to ensure the

success of a project and as criteria they could not be sufficient to assess the success of a project, it is more complex than that. Some of the factors and criteria (communication, risk management, regulations/laws, project team composition, project manager skills) were used by the project leader during previous work but the success literature was not familiar to the project leader, so the success factors and success criteria listed and assessed in the questionnaire sufficiently filled the perceived gap. The project leader also mentioned that some of the listed factors and criteria were planned to use during work.

According to the project leader, the implementation of the success factors that he considers critical, and their continuous maintenance throughout the project, could contribute great extent to the successful execution-implementation of the project. On the other hand, the success criteria considered by the project leader to be the most important - one could say critical - were prioritized by the project leader during the evaluation of the projects during the pandemic.

Identification with the project, the attitude towards the project, the determination and commitment to the project, joint problem solving, joint effort, the importance of perseverance in carrying out the projects became paramount in those times. Projects are implemented by colleagues, by staff, by the project team, and a proper communication plan and continuous communication and information sharing at a defined frequency at all stages of the project were essential. It was necessary to take as many communication opportunities as possible, including the possibilities offered by different IT solutions, as colleagues could do their work from home and face-to-face and boardroom meetings were not allowed or were very limited to reduce contacts within the company. It was therefore also important that the project leader, either in personally or virtually, but also most of the time, be presented, and represented the project and provided guidance to the project team.

The ability of the staff and the project team to adapt to difficult and often unpredictable situations and circumstances, to be flexible in the face of constant change, to remain enthusiastic throughout the project, to maintain the commitment to the project at all stages and to maintain constant communication have been identified as key evaluation criteria. Colleagues, the project team and managers/project leaders together, as one person, must be able to respond and react to the changing environment.

During the pandemic, the company tried to pay special attention to the support and development of its employees and project team members. The project leader believed that trainings and courses for the development of colleagues and the team were investments and the additional knowledge and skills acquired will pay off in the daily work and thus in the operation of the company. During evaluation of projects the project leader tried to provide feedback, information and planning inputs to colleagues and the project team as often and as thoroughly as possible.

## 5 Summary

In case of success factors, taking all the evaluations of the project leaders into account, no success factor was rated by project leaders as a critical success factor before or during the pandemic. No new success factors were identified by the project leaders responded. The pandemic triggered a change in the importance of success factors that had already previously defined. In the changed environment, the same or even greater project success could be achieved by focusing on and applying other success factors.

In case of success criteria, taking all the evaluations of the project leaders into account, no success criterion was evaluated as critical success criteria, neither before nor during the pandemic. No new success criteria were defined by the project leaders responded. The pandemic triggered a change in the importance of the success criteria already defined. The changed environment required the application of different and previously defined criteria for project evaluation.

In the in-depth interview, the project leader interviewed did not give a high score (10) to either success factor or success criterion in the pre-pandemic period, but during the pandemic, two success factors (commitment and communication) and two success criteria (performance and individual learning-development of staff, project team members during the project) were evaluated with high score (10), expressed the need to respond to the changes caused by the pandemic and the changed environment.

This situation was probably arisen due to the fact that the pandemic developed very quickly, a rapid reaction and rapid adaptation process were needed and as in most cases we relied on our existed knowledge and resources for short-term survival and there was not enough time to innovate, the create/define new factors and new criteria.

### References

- [1] Australian Institute of Project Management (2008): AIPM Professional Competency Standards For Project Management - Part A – Introduction (Version 1.0), Australia, Sydney
- [2] Association for Project Management (2008). APM Competence Framework, England, Buckinghamshire
- [3] Baker, B. N. – Murphy, D. C. – Fisher, D. (1983): *Factors affecting project success. Project Management Handbook*, New York, pp. 669-685
- [4] Blaskovics, B. (2014): The impact of the personal characteristics of project managers in the ICT sector on project success, Corvinus University of Budapest, PhD thesis, Budapest

- [5] Blaskovics, B. – Maró, Z.M. – Klimkó, G. – Papp-Horváth, V. – Csiszárík-Kocsir, Á. (2023): Differences between Public-Sector and Private-Sector Project Management Practices in Hungary from a Competency Point of View. *Sustainability*, 15 : 14 Paper: 11236
- [6] Bostock Marketing Group Research Ltd (2014): Factors in project success, Research Report for The Association for Project Management (APM), UK
- [7] Carden, L. – Egan, T. (2008). Does Our Literature Support Sectors Newer to Project Management? The Search for Quality Publications Relevant to Nontraditional Industries. *Project Management Journal*, 39 (3), pp. 6-27.
- [8] Cooper, B. R. (2021): Accelerating Innovation: Some Lessons from The Pandemic, *Journal of Product Innovation Management* (doi:10.1111/jpim.12565)
- [9] Csiszárík-Kocsir, Á. – Varga, J. (2023): The advancing role of digitalisation through the example of the Perlmutter project from the user side. In: Szakál, Anikó (ed.) IEEE 17th International Symposium on Applied Computational Intelligence and Informatics SACI 2023 : Proceedings IEEE Hungary Section, pp. 327-332.
- [10] Csiszárík-Kocsir, Á. – Dobos, O. (2023a): The place and role of research, development and innovation projects in the life of Hungarian and Polish micro, small and medium-sized enterprises after the pandemic. In: Szakál, Anikó (ed.) SISY 2023 IEEE 21st International Symposium on Intelligent Systems and Informatics IEEE Hungary Section, pp. 185-189.
- [11] Csiszárík-Kocsir, Á. – Dobos, O. (2023b): The aspects of RDI project management in Hungary and Romania in the light of the pandemic. In: Szakál, Anikó (ed.) SISY 2023 IEEE 21st International Symposium on Intelligent Systems and Informatics IEEE Hungary Section, pp. 179-184.
- [12] Dancsecz, G. (2008): Success factors and success criteria of international sport event organization projects, University of Pannonia, PhD thesis, Veszprém
- [13] Earl, M. J. (1989): *Management Strategies for Information Technology*. Prentice Hall
- [14] Fortune, J. – White, D. (2006): Framing of project critical success factors by a systems model. *International Journal of Project Management*, 24 (1), 53-65.
- [15] Görög, M. (2013). *Project management in organizations*. Panem Kiadó, Budapest.
- [16] Gyulavári T. – Mitev A.Z. – Neulinger Á. – Neumann-Bódi E. – Simon J. – Szűcs K. (2017): Basics of marketing research, Hungarian Electronic Reference Service, online smart library of Akadémiai Kiadó.

- [17] Horváth, V. (2018): The relationship between project management competence and project success in the project-intensive upstream business of the oil industry, Corvinus University of Budapest, PhD thesis, Budapest
- [18] Khan, U.U. – Yousaf, A. – Garai-Fodor, M. – Csiszárík-Kocsir, Á. (2023): Application of Project Management Techniques for Timeline and Budgeting Estimates of Startups. *Sustainability*, 15 : 21 pp. 1-18.
- [19] Koka, A. – Rao G. U. (2015): Project management and its advantages in pharma industry - Short communication. *Journal of Applied Pharmacy*, 7 (1) 9-12
- [20] Malhotra, N.K. – with the collaboration of Judit Simon (2017): Marketing research, Hungarian Electronic Reference Service, online smart library of Akadémiai Kiadó
- [21] Pattanaik, A. (2014): Complexity of project management in the pharmaceutical industry. Paper presented at PMI® Global Congress 2014-EMEA, Dubai, United Arab Emirates. Newtown Square, PA: Project Management Institute
- [22] Pinto, J. K. - Slevin, D. P. (1988): Project Success: Definitions and Measurement Techniques. *Project Management Journal*, 19 (1), pp. 67–72
- [23] Project Management Institute (2012). PMI Lexikon of Project Management Terms (Version 2.0), USA, Pennsylvania
- [24] Project Management Institute (2017). A Guide to the project management, Body of Knowledge, PMBOK Guide 6th Edition
- [25] Rockart, J. F. (2002): Critical Success Factors: A 2002 Retrospective, MIT Sloan School of Management, CISR Research Briefings 2002, Volume II, Number 1D
- [26] Sara, T. (2012): Project Management in Pharmaceuticals. *International Journal of Pharmaceutical and Life Sciences*, 1(1), Serial 4, pp. 1-13
- [27] Tsiga, Z. - Emes, E. – Smith, A. (2017): Critical success factors for projects in the petroleum industry, *Procedia Computer Science* 121, pp. 224–231
- [28] Turner, J. R. – Anbari, F. – Bredillet, C. (2013). Perspectives on research in project management: the nine schools. *Global Business Perspectives*, 1 (1), 3-28.
- [29] Varga, J. – Csiszárík-Kocsir, Á. (2023): Perception of innovation and innovative projects at user level through the example of the Atala Prism project. In: Szakál, Anikó (ed.) IEEE 17th International Symposium on Applied Computational Intelligence and Informatics SACI 2023 : Proceedings IEEE Hungary Section, pp. 321-326.
- [30] Verzuh, E. (2006): *Project management*, HVG Kiadó Zrt, Budapest



# **The power of theory in a practical research – Workplace selection preferences, career decision making styles, social network connections, and migration plans of early career electrical engineering students in Hungary**

**Szabolcs Kiss**

szabolcs.kiss.hu@gmail.com

*The research explored the workplace selection preferences of electrical engineering (EE) students in Hungary in the context of severe EE talent shortage, increased highly skilled labour migration, and growing number of new workplaces created by foreign direct investments especially around the city of Debrecen.*

*The interdisciplinary research created a 'diamond model' linking the topics of employer attractiveness, career decision making, social networks, and migration through numerous theories published in marketing, economics, management science, sociology, psychology, and vocational psychology literatures.*

*The multi-phased, mixed-methods research collected qualitative data through semi-structured, face-to-face interviews from 60 key informants and 57 EE students, and quantitative data through online survey from 587 EE students.*

*Based on Lyons' Work Value Survey the research found that competitive salary and monetary benefits are the most important and positive employer image is the least important employer attractiveness factor for EE students. According to Krumboltz's planned happenstance theory the study found that only 27% of its research population acknowledged the importance of chance events in career decision making compared to 57-69% of research populations in other studies. The research could neither confirm nor negate Granovetter's strength of weak ties theory due to the 'messy' and everchanging social network connections of EE students. The study confirmed the validity of Massey's migration network theory by uncovering that EE student's migration potentials are consistently higher if they do have family/friends planning to move abroad or already living abroad compared to those who do not have family/friends planning to move abroad or already living abroad. Finally, the research confirmed the validity of Lewis' neoclassical migration theory by finding that higher salary is the primary reason to leave, and maintaining strong relationship with family and friends are the primary reasons to stay in Hungary.*

*The researcher acknowledges and appreciates the support received from the supervisory team, examiners, university staff, fellow researchers, key informants, EE students, employer, and beloved family members.*

*Keywords: workplace selection; employer attractiveness; career decision making; social networks; migration; electrical engineering; Hungary*

# Factors can influence the roles of fuels used in some Central European countries

**Gábor Gyarmati**

Óbuda University, Keleti Károly Faculty of Business and Management,  
gyarmati.gabor@uni-obuda.hu

*Abstract: Oil is one of the most critical energy carriers, responsible for almost 50% of energy supply. Transport accounts for 48% of its use. States with oil are naturally favoured, but only sometimes in all cases. Central European countries, like the rest of the world, use oil. Using the Balassa index calculation, the research will examine whether this is a comparative disadvantage or advantage for Poland, Slovakia, the Czech Republic and Hungary. The analysis in this article clearly shows that these countries are at a comparative disadvantage but still need to import because they need to have significant natural resources.*

*Keywords: crude oil, transportation, fuel retail price, Balassa index*

## 1 Introduction

One of the most exploited fossil energy sources is oil. "Petroleum (also known as mineral oil) is a mineral of organic origin: dead marine single-celled or dead marine organisms (plants and animals) and plankton. Its main constituents are liquid hydrocarbons, but in the place of the deposit, it is geographically gaseous under pressure and solids, depending on its geographical location—hydrocarbons in varying quantities. Since crude oil is a complex mixture of these compounds, we must include hydrocarbons (found in smaller quantities in crude oil) with several sulphur, nitrogen, oxygen (and other chemical elements). In addition to water and solid minerals, Petroleum has become one of our most important and widely used mineral resources because of its relatively high specific energy content, ease of extraction, transport, storage and use" (Holló et al., 2014).

The world's largest commodity by value and volume is oil. The annual turnover of this market is close to USD 1700 billion. To put this value in perspective, the world gold market has an annual turnover of USD 170 billion and the world markets for iron, copper and aluminium have an annual turnover of around USD 115-115 billion (Syed, 2017).

The evolution of fuel and oil prices strongly impacts the economy, influencing its functioning and raising or lowering its performance. For example, fuel and tax changes explain around half of inflation in the second quarter of 2021. In the short term, fuel price developments are the primary driver of inflation, as world oil prices have recently significantly increased. This effect is amplified by the fact that a year ago, global oil prices and, as a consequence, domestic fuel prices were at a low point. In addition, in line with EU harmonisation, a series of excise duty increases on tobacco products will be introduced in January (Kis, 2021).

Oil is a strategic mineral fundamental to life, as it is crucial to a country's self-sufficiency, and oil supply can also contribute to a country's economic development (Kis, 2013).

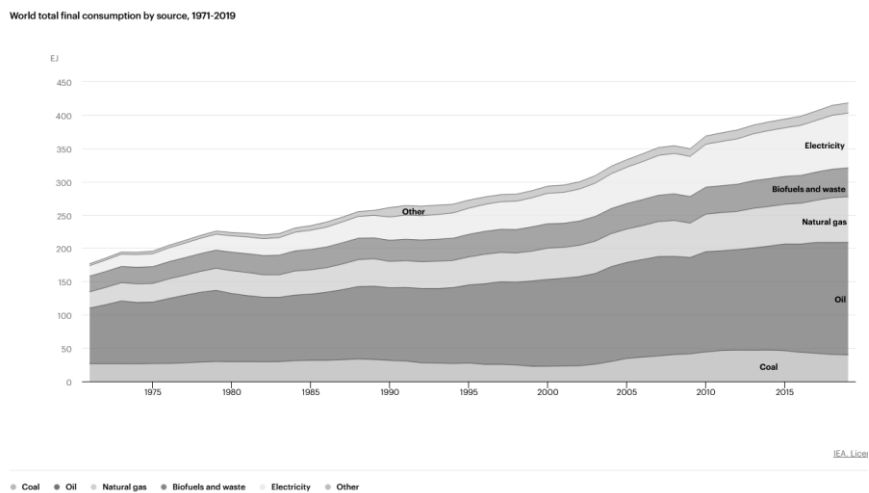


Figure 1.

World total final consumption by source Source: IEA (2023)

Consumption of oil is growing year on year and is dominant in the world, as we can see in Figure 1. Oil prices depend on factors like supply and demand, international market situations, and conflicts. As Figure 2. shows

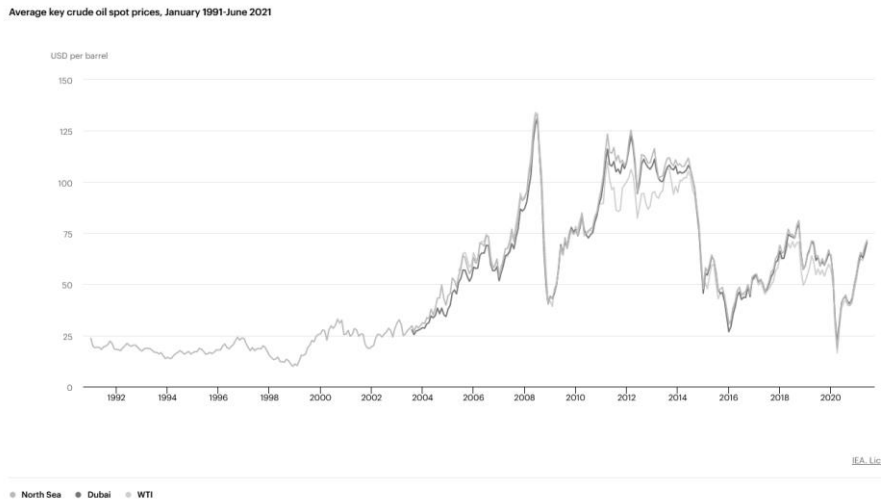


Figure 2

Average key crude oil spot prices, January 1991-June 2021 Source: IEA (2023)

Demand is one of the main factors affecting the price of oil. The world demand for crude oil is around 90 million barrels per day. Supply is generally held back because there is no interest in over-producing. Producers produce about a million barrels daily, less than the demand rate. The quality of oil affects prices. Better quality crude is more easily refined and straightforward to meet environmental requirements. The last factor to be listed is speculation, as players in the trading exchanges want to make a profit. Trading oil futures will likely impact prices (Inside Global, 2023).

According to OPEC statistics, 48% of the world's total energy is consumed on the roads, where we use energy for transport, travel and traffic. The fuel used for these purposes contains different proportions of different cost items. Crude oil accounts for about 51% of the total price, and the tax items vary from country to country but are around 17-20%. This is shown in Figure 3. Hungary, Poland, the Czech Republic and Slovakia have 1.5-1.8 USD per gallon fuel taxes. It means 20-23% tax ratios (EIA, 2023). These countries depend on Russia's energy supply (Weiner, 2012).

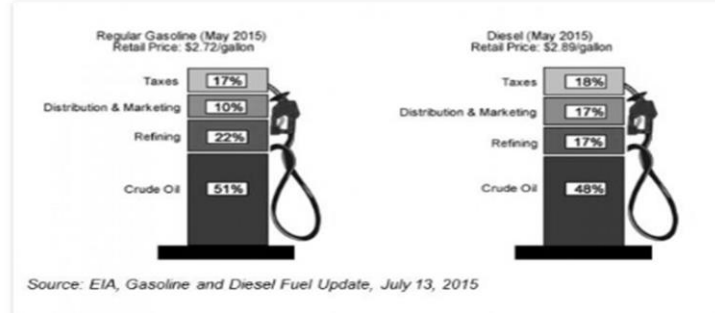


Figure 3  
Fuel price components Source: EIA (2023)

## 2 Data and methodology

The source of the trade data to calculate the Balassa Index was the World Bank's WITS (World et al.) database (World Bank (2023)). The data were downloaded at the HS-2 (Harmonized Commodity Description and Coding System) level for petrol products (Chapter 33) from 2007 to 2022. We use export and import data in USD. The Balassa index is calculated worldwide, including all countries' totals, including Czech, Slovakia, Poland, and Hungary. Focused on petrol import (relative import advantage: RMA) and export (RCA = relative comparative advantage)

The supply of oil - a resource in the broader sense - can significantly impact a country's foreign trade and, through it, its overall economic situation. This impact can be optimistic at best but has several adverse effects. It is, therefore, essential to assess the pros and cons to decide whether the extraction of a resource is worthwhile, whether it is sufficient to rely on it, and whether its existence is a blessing or a curse for countries (Kis, 2013).

The methodological basis of the study is the index of manifest comparative advantage defined by Balassa [1]. The index is based on the theory of trade based on Ricardo's theory of comparative advantage. The original index is calculated using the following formula:

$$B_{ij} = RCA_{ij} = \left( \frac{X_{ij}}{X_{it}} \right) \Bigg/ \left( \frac{X_{nj}}{X_{nt}} \right), \quad (1)$$

Where  $X$  is the export,  $i$  is the country,  $j$  is the product,  $t$  is the group of products, and  $n$  is the reference country, i.e. the index compares the share of the product under consideration in the exports of a country with the share of the same product in the exports of the reference country. In the present analysis, product ( $j$ ) is selected from the agricultural product groups, and the product group ( $t$ ) is all products for both the country and the reference country. A partial solution to the latter problem is the possibility of classifying the B index, which was developed by Hinloopen-van Marrewijk [8].

Category A:  $0 < B \leq 1$ ,

Category B:  $1 < B \leq 2$ ,

Category C:  $2 < B \leq 4$ ,

Category D:  $4 < B$ .

Category A includes product groups with no comparative advantage, category B with a weak comparative advantage, category C with a medium comparative advantage and category D with a strong comparative advantage.

### **3 Results**

Table 1 calculates the Balasa indices from the oil and product export data of the Central European countries under study. These clearly show that these countries are at a comparative disadvantage for this product. It is, therefore, not worth exporting these products. These countries do not even have large stocks of this commodity.

Petrol	Czech	Hungary	Poland	Slovakia
RCA				
2007	0,07	0,23	0,19	0,54
2008	0,08	0,19	0,14	0,43
2009	0,06	0,14	0,12	0,44
2010	0,08	0,17	0,14	0,36
2011	0,08	0,17	0,18	0,38
2012	0,08	0,18	0,21	0,35
2013	0,07	0,16	0,20	0,34
2014	0,08	0,18	0,20	0,29
2015	0,10	0,16	0,23	0,34
2016	0,08	0,14	0,18	0,29
2017	0,10	0,18	0,14	0,34
2018	0,09	0,20	0,14	0,26
2019	0,08	0,16	0,11	0,24
2020	0,08	0,17	0,11	0,27
2021	0,09	0,14	0,10	0,24
2022	0,09	0,14	0,14	0,30

Table 1

Export Balassa indexes 2007-2022. Source: own calculation.

These are also supported by the Balassa table calculated from the oil import data, which shows the data found in Table 2. It can be seen that these countries are worth importing oil.

Petrol	Czech	Hungary	Poland	Slovakia
RMA				
2007	0,45	0,44	0,76	0,60
2008	0,45	0,15	0,68	0,54
2009	0,43	0,15	0,70	0,54
2010	0,40	0,44	0,72	0,54
2011	0,39	0,48	0,75	0,58
2012	0,40	0,47	0,79	0,52
2013	0,40	0,49	0,71	0,56
2014	0,42	0,48	0,71	0,49
2015	0,41	0,46	0,73	0,51
2016	0,36	0,46	0,70	0,49
2017	0,37	0,45	0,69	0,45
2018	0,36	0,44	0,70	0,45
2019	0,36	0,44	0,68	0,41
2020	0,34	0,41	0,61	0,46
2021	0,37	0,44	0,60	0,45
2022	0,35	0,35	0,67	0,40

Table 2

Import Balassa indexes 2007-2022. Source: own calculation.

The GL index is the difference between export and import, and we can calculate a ratio with their help. GL shows the same result as export and import ones.



Petrol	Czech	Hungary	Poland	Slovakia
GL				
2007	-0,50	-0,46	- 0,74	-0,23
2008	-0,27	0,01	- 0,77	-0,24
2009	-0,40	-0,08	- 0,78	-0,19
2010	-0,13	-0,47	- 0,73	-0,27
2011	-0,20	-0,47	- 0,68	-0,24
2012	-0,16	-0,44	- 0,63	-0,22
2013	-0,23	-0,47	- 0,57	-0,23
2014	-0,19	-0,44	- 0,56	-0,24
2015	-0,17	-0,46	- 0,52	-0,20
2016	-0,36	-0,49	- 0,58	-0,22
2017	-0,17	-0,46	- 0,70	-0,20
2018	-0,28	-0,43	- 0,71	-0,33
2019	-0,24	-0,51	- 0,74	-0,33
2020	-0,29	-0,44	- 0,74	-0,31
2021	-0,25	-0,52	- 0,75	-0,32
2022	-0,33	-0,52	- 0,70	-0,25

Table 3

GL indexes (2007-2022). Source: own calculation.

## Conclusions

As expected at the beginning of the study, since these Central European countries do not have significant resources (Tóth, 2010), they rely on imports to meet their needs, leaving them exposed to oil producers, international markets, and price fluctuations. These countries have a demonstrable comparative disadvantage on the export side and advantages on the import side.

We can summarise the conclusions from the calculations.

- These countries are deplorable states in terms of energy resources;
- There is a comparative disadvantage in petrol and petrol products,
- The Russian energy import dependence on Hungary and a large part of Central Europe remained till the present day.
- The fuel tax of these countries is a little, but the energy consumption is also based on the fuel price.

## References

- [1] EIA US Energy Information Administration( 2023). download from [https://www.eia.gov/petroleum/gasdiesel/gaspump\\_hist.php](https://www.eia.gov/petroleum/gasdiesel/gaspump_hist.php) on 05 December 2023.
- [2] Hinloopen, J., & Van Marrewijk, C. (2001). On the empirical distribution of the Balassa index. *Weltwirtschaftliches archiv*, 137(1), pp. 1-35.
- [3] Holló, A. & Krár M. (2014) Szénhidrogénipari technológiák. Download from <http://kemia.apaczai.elte.hu/diakjainknak/10/csoportmunka/3-csoport/Forrasok/technologiak.pdf> on December 11, 2023.
- [4] IEA Key World Energy Statistics (KWES) (2023) download from <https://www.iea.org/reports/key-world-energy-statistics-2021> on 10 December 2023
- [5] Inside Global (2023). Factors That Influence Pricing Of Oil And Gas. download from <https://www.insights-global.com/factors-that-influence-pricing-of-oil-and-gas/> on 05 December 2023.
- [6] Kis, K. (2013). A kőolaj szerepe az OPEC Öböl-menti kisállamaiban: mi lesz az olaj után?. *KÜL-VILÁG (ONLINE)*, 10(3-4), pp. 1-19.
- [7] Kis, K. (2021). Magyar Nemzeti Bank: Rövid távú inflációs kiugrások és a gazdaság újraindítását követő élénk növekedés. *KÜLGAZDASÁG*, 65(3-4), pp. 32-36.
- [8] OPEC statistics (2023) can be downloaded from [https://www.opec.org/opec\\_web/en/202.htm](https://www.opec.org/opec_web/en/202.htm) on 05. December 2023.
- [9] Syed, R. H. (2017). The Petrodollar System and Its Importance to US Financial and Political Dominance, *Geopolitics of Energy* 39(1-12) pp. 2–6, <https://ceri.ca/publications/geopolitics-of-energy/issue/10>
- [10] Tóth, J. (Ed.). (2010). *Világföldrajz*. Akadémiai.
- [11] Weiner, C. (2012). A közép-és kelet-európai államok és az orosz gáz. Import és tranzit, függés és függetlenedés.

# The Spread of the Concept of Wellbeing Economy

**Valéria Szekeres**

Óbuda University, Keleti Károly Faculty of Business and Management,  
szekeres.valeria@kgk.uni-obuda.hu

*Abstract: Several indicators and methods have been developed as to the measurement of the wellbeing economy. The driving force behind was to exceed the monetary-based economic performance indicators to get a more complex description of the state of development of a country. As a result of the first alternative approach in Bhutan the Gross National Happiness index was formed, which measured the satisfaction of people regarding good governance, education, health, and environmental issues, among others. Although the new approaches have long been widely accepted by mainstream economists, and numerous organizations and scientists have expressed the need for such concepts to reach sustainability, the number of implementations is very limited. Only six governments have joined so far the Wellbeing Economy Alliance which have been formed to support the transformation. The paper examines some important indices and shows how wellbeing approach is emphasized in different levels.*

*Keywords: GNH; World Happiness Report; Better Life Index; Human Development Index; Genuine Progress Indicator; Wellbeing Economy Alliance*

## 1 Introduction

The number of countries applying the Gross Domestic Product (GDP) as macroeconomic performance indicator has constantly increased since the Great Depression in 1929-33. After WWII, OECD and other international organizations encouraged member states to publish GDP regularly, which has become an approved practice all over the world. GDP measures the value added created through the production of goods and services in a country in a certain period. Despite its limitations, no other index is issued and referred to as often as GDP. The growth of GDP is considered very positive and supposed to be a target for a country. The term economic growth has become frequently used and it has profound impact on public discourse. It is used so widely that even without the

adjective „economic”, it can be easily understood. The success of a country is not measured by the happiness of the population, but usually by the GDP, because it has become a symbol of performance.

However, the welfare or wellbeing of a nation cannot be measured by national income and world's prestigious experts have stated that it is not appropriate for its measurement (Stiglitz et al, 2009). The basic goal of the welfare economy is to achieve sustainable wellbeing with dignity and fairness for people and nature. This contrasts with current economies, which adhere to a very narrow vision of development that is the growth of GDP. The welfare economy recognizes that the economy is embedded in society and nature.

The global community has faced several crises, among which the COVID-19 pandemic has created new problems and exacerbated some old ones, for instance, income inequalities have risen significantly. As the GDP is not suitable for measuring well-being, because it does not express the irreversible destruction of natural resources, the global crisis characterized by increasing social polarization and the growing impoverishment, it was necessary to produce new development metrics. In our article, we present the most comprehensive welfare indicators developed as alternatives to GDP and show how wellbeing approach is emphasized in various levels.

## **2 Gross National Happiness**

The term Gross National Happiness (GNH) was first coined by King IV of Bhutan in 1972: As he mentioned: “Gross national happiness is more important than gross domestic product”. The concept of GNH reflects that sustainable development must have a universal approach towards progress and consider the non-economic aspects of well-being equally important. The GNH index includes traditional areas of socioeconomic aspects such as standard of living, health, and education, as well as less traditional aspects of culture and psychological well-being. The index is a holistic reflection of the general well-being of the Bhutanese people, rather than merely a subjective psychological ranking of 'happiness'. The GNH index is a value created from 33 indicators categorized into nine areas. The GNH concept is often explained in terms of its four pillars: good governance, sustainable socio-economic development, cultural preservation, and environmental protection. The nine areas are equally weighted, as each area is considered equally important as a component of GNH. Within each area two to four indicators were selected, and the objective indicators are listed with a higher weight, while the subjective and self-declared indicators were given a much lower weight (Ura et al, 2023). The GNH index supports Bhutan's policy making. Policy selection tools are used to examine the potential impacts of proposed policies on GNH, and GNH index results are tracked to evaluate interventions.

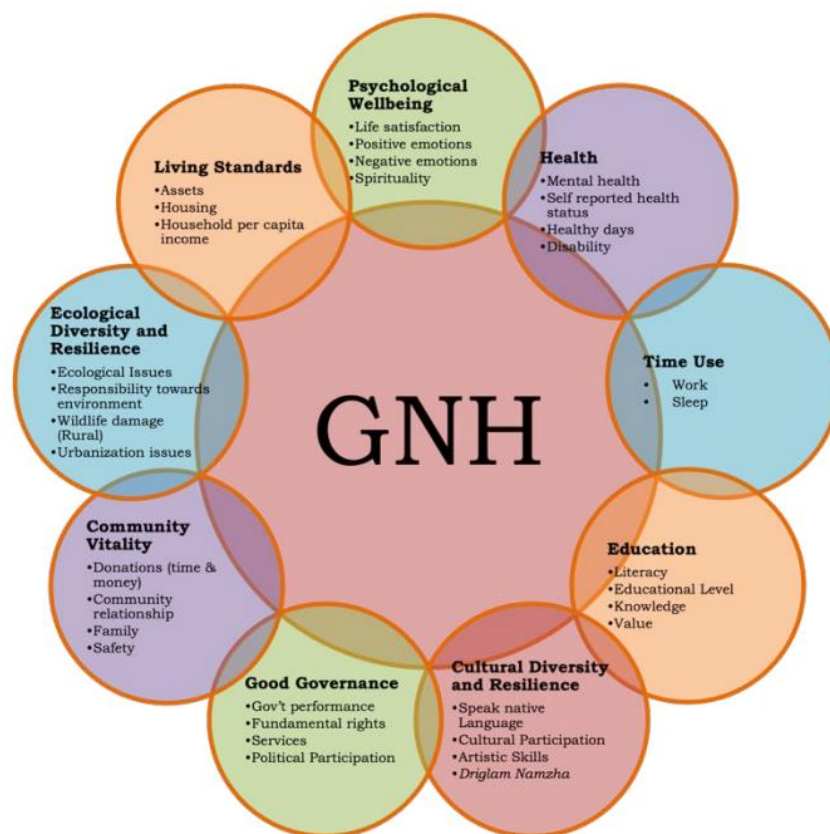


Figure 1  
Domain and indicators of the GNH index in Bhutan (Ura et al., 2023)

### 3 World Happiness Report

In 2011, based on the Bhutan resolution, the United Nations (UN) General Assembly asked national governments to give greater importance to happiness and well-being in determining the achievement and measurement of social and economic development. The first World Happiness Report was published by the Sustainable Development Solutions Network in 2012. It is released annually around the March 20, which was proclaimed the International Day of Happiness. The rankings of countries are based on the Gallup World Poll data, which are based on responses to the main life evaluation question. In the survey, respondents

are asked to think of a ladder (called the Cantril ladder), on which the highest rung represents the best possible life for them (10 points) and the lowest rung represents the worst possible life (0 points). They are then asked to rate their own current life on this scale from 0 to 10. Data are collected in the following six specific categories for each country: Gross Domestic Product per capita, social support, life expectancy in good health, freedom of life choices, the generosity of the population, and assessing the level of corruption. (Helliwell et al. 2023)

## **4 Better Life Index**

Since its foundation in 1961, the Organization for Economic Co-operation and Development (OECD) has been helping governments create better policies so that their citizens can live better lives. The OECD has been actively participating in discussions about the measurement of well-being for a long time. Based on the experiences of the debates, the following 11 topics reflect what the OECD has deemed essential for well-being: housing, income, labour market situation, community support, education, environment, civic engagement, health, life satisfaction, safety, work-life balance. The values of the Better Life Index calculated for member countries can be studied on the website developed for this purpose by the OECD. Each topic is based on one to four specific indicators as shown in Figure 2. For each indicator, the results of men and women can be compared, and it can be also seen how the social and economic situation affects the results.



Figure 2  
Indicators of the Better Life Index (OECD, 2020)

## 5 Human Development Index

Among the alternative approaches, the Human Development Index (HDI) is the most widely accepted. It has been formed by the United Nations to show both social and economic development level of countries. The HDI first introduced in 1990 is focusing on three dimensions of the human development using easy to measure factors: living a long and healthy life, being knowledgeable, and having a decent standard of living. The factors are measured by life expectancy at birth, means of years in school of the adult population and per capita GNI. All dimensions are calculated as a score: 0 is the worst case, 1 or 100% is the best imagined value. A logarithmic scale is used for the income dimension to diminish

the importance of its growth at higher GNI. The index itself is calculated as the geometric mean of the three dimensions' scores. The index can be easily calculated even for historical data, or regardless of the country. The index is suitable for comparing the state of social development outcome of countries having similar income, thus it provides a measure to test national policy choices and stimulates a discussion on its priorities. The HDI, however, is too simple to capture a more complex picture of human development.

<b>Dimension</b>	<b>Measurement</b>
A long and healthy life	Life expectancy at birth
Being knowledgeable	Years in school over age 25
Having a decent standard of living	Per capita GNI

Table 1  
Dimensions and way of measurement of the Human Development Index (UNDP, 2022)

## 6 Genuine Progress Indicator

The idea of Genuine Progress Indicator (GPI) was initiated in 1994 by a policy institute called Redefining Progress in San-Francisco (Cobb et al., 1995). Some economists have asserted that a country's growth, increased goods production, and expanding services have both "costs" and "benefits", not just the "benefits" that contribute to GDP. The Genuine Progress Indicator is an attempt to also take these costs to account. For example, GDP counts the cost of pollution twice as gain: first when created as side-effect of production, second when the pollution is cleaned up. While the US has the highest per capita GDP, half of its population lives in low-income situation or even poverty. On the contrary, GPI counts polluting as a cost or loss rather than gain, and only the clean-up will be accounted as gain. The index is composed from indicators of the categories of Economic, Environmental and Social fields. Some indicators are positive measuring wealth or human development, while others represent damage done and having a cost of reparation to be invested, therefore, calculated as negative values. Figure 3 shows the 26 indicators in use today.



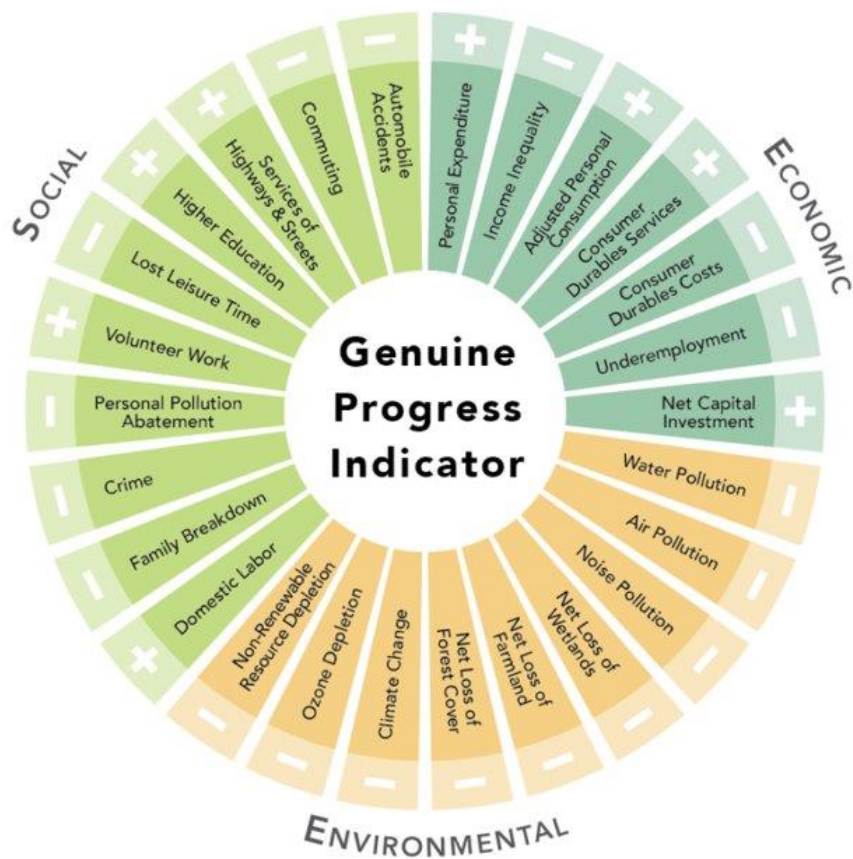


Figure 3  
Composition of the GPI (GNH USA, 2020)

Countries, states of the USA and municipalities already publish their own implementation of the GPI, which are sometimes composed of a different sort of indicators. Such an example is Hawaii where the GPI is published yearly since 2000. (Oleson, 2022).

## 7 Wellbeing economy initiatives

Transition toward establishing wellbeing economy is already on the agenda or even top priority of a few governments and international organizations across the globe. These actors have already understood the importance of operating within the safe limits while attempting to serve the collective wellbeing. They target to fundamentally change their economy to nature-positive and deliver social progress. In 2018, on the OECD World Forum in South Korea, a group of senior officials of Scotland, Iceland and New Zealand together with former OECD officials have formally launched the Group on the Measurement of Economic Performance and Social Progress, shortly referred as Wellbeing Economy Governments (WEGo). Since then, the group has been extended with Finland and Canada. International organizations and NGOs, academists, social networks and responsible businesses and individuals already thinking about the new economy model support the initiative. They are forming a wide-ranging global Wellbeing Economy Alliance (WEAll) with the purpose of coordination, helping and igniting the transition toward the shared goal of sustainable wellbeing economy. (Costanza, 2018)

### Conclusions

We have reviewed some of the approaches to measure the performance of a nation or community to expand the mainly used monetary indicators. International organizations such as the UN and the OECD, and governments already apply different methods. The most widespread method is also the simplest one, and it is the Human Development Index published by the UN since 1990. Due to its simple factors, HDI does not require complex data collection and can be calculated for many countries. Some indicator calculations adopt the structure of the first approach in Bhutan. The Genuine Progress Indicator is unique in that it also considers the side effects and additional costs of production. While HDI is expected to be reported for long, sooner or later a more complex model should be standardized. We have mentioned the initiatives of WEGo and WEAll which may largely help create a widely accepted approach for a sustainable and more beneficial economic development. Our planet Earth and its people deserve introduce a better way.

### References

- [1] Cobb, C., Halstead, T., & Rowe, J. (1995): The Genuine Progress Indicator: Summary of Data and Methodology, Redefining Progress [https://www.academia.edu/2130369/Redefining\\_Progress\\_The\\_Genuine\\_Progress\\_Indicator\\_Summary\\_of\\_Data\\_and\\_Methodology\\_San\\_Francisco\\_CA\\_Redefining\\_Progress\\_1995\\_Repetto\\_op](https://www.academia.edu/2130369/Redefining_Progress_The_Genuine_Progress_Indicator_Summary_of_Data_and_Methodology_San_Francisco_CA_Redefining_Progress_1995_Repetto_op)

- [2] Costanza, R. – Caniglia, E. – Fioramonti L. – Lewis, H – Lovins, L. H. – Mcglade J. – Mortensen, L – Dirk, P – Pickett, K – Ragnarsdottir, K – Roberts, D – Sutton, P – Trebeck, K – Wallis, S – Ward, J. – Weatherhead, M. – Wilkinson, R. (2018): *Toward a Sustainable Wellbeing Economy, Solutions*  
[https://www.researchgate.net/publication/324648188\\_Toward\\_a\\_Sustainable\\_Wellbeing\\_Economy](https://www.researchgate.net/publication/324648188_Toward_a_Sustainable_Wellbeing_Economy)
- [3] Csáth M. (2018): Rendszerszemléletű Gazdaságiteljesítmény-mérés (Measuring Economic Performance in System Approach), *Magyar Tudomány*, 179(7), pp. 1051–1062
- [4] GNH USA: <https://gnhusa.org/genuine-progress-indicator/>
- [5] Helliwell, J. F. – Layard, R. – Sachs, J. D. – Aknin, L. B. – De Neve, J.-E. – Wang, S. (eds.). (2023): *World Happiness Report 2023*, Sustainable Development Solutions Network.
- [6] Kubiszewski, I. – R. Costanza – C. Franco – P. Lawn – J. Talberth – T. Jackson – C. Aylmer (2013): Beyond GDP: Measuring and Achieving Global Genuine Progress, *Ecological Economics*, Volume 93, pp 57-68,  
<https://doi.org/10.1016/j.ecolecon.2013.04.019>
- [7] OECD (2020), *How's Life? 2020: Measuring Well-being*, OECD Publishing, Paris, <https://doi.org/10.1787/9870c393-en>.
- [8] Oleson K. L.L. – Ostergaard-Klem R. (2022): Updating the Genuine Progress Indicator for the State of Hawai'i, University of Hawai'i  
[https://files.hawaii.gov/dbedt/economic/reports/gpi\\_report\\_july\\_2022.pdf](https://files.hawaii.gov/dbedt/economic/reports/gpi_report_july_2022.pdf)
- [9] Rockoff, H.: Off to a Good Start: National Income and Economic Measurement at the NBER, American Economic Association, pp. 9-11.
- [10] Stiglitz, Joseph E. - Amartya Sen - Jean Paul Fitoussi (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,  
[https://www.researchgate.net/publication/258260767\\_Report\\_of\\_the\\_Commission\\_on\\_the\\_Measurement\\_of\\_Economic\\_Performance\\_and\\_Social\\_Progress\\_CMEPSP](https://www.researchgate.net/publication/258260767_Report_of_the_Commission_on_the_Measurement_of_Economic_Performance_and_Social_Progress_CMEPSP)
- [11] UNDP (2022): *Human Development Report 2021-22: Uncertain Times, Unsettled Lives: Shaping our Future in a Transforming World*, New York  
[https://hdr.undp.org/content/human-development-report-2021-22?gad\\_source=1&gclid=CjwKCAiAg9urBhB\\_EiwAgw88mRyDIiwGoN\\_xu4DemblsseOSHHsFTqN6DycUy1xRmd2B6UdJI0MGMrRoCzhEQAvD\\_BwE](https://hdr.undp.org/content/human-development-report-2021-22?gad_source=1&gclid=CjwKCAiAg9urBhB_EiwAgw88mRyDIiwGoN_xu4DemblsseOSHHsFTqN6DycUy1xRmd2B6UdJI0MGMrRoCzhEQAvD_BwE)
- [12] Ura, K. – Alkire, S. – Wangdi, K. - Zangmo, T. (2023): *GNH 2022*, Centre for Bhutan and GNH Studies, Thimpu.

# **What is your firm's readiness for sustainable effectiveness? A descriptive analysis of a UAE-based healthcare firm.**

**Hima Parameswaran**

Assistant Professor, College of Business, City University Ajman, United Arab Emirates.

*Abstract: Organizational development is a long-term process with continuous change by aligning cultural, structural, and strategic veracities of work. This is crucial for the ever-evolving business climate of this tech era. Towards sustainable management organizations, firms need to make a great effort to improve their risk management and problem-solving capacity. It aligns with their ability to cope with the external environment through a planned effort from the top management to all levels of the workforce. In these backgrounds, this study peeps into the sustainable interventions of selected firms based in the UAE. The literature review aids in developing a questionnaire and a survey was conducted in a UAE-based healthcare organization. A stratified proportional sampling method was used to get a valid response from the employees. Both quantitative and qualitative analyses were done using SPSS 25. The result highlights the need for sustainable management (SM) interventions in firms and the role of OD towards SM interventions. It proves that SM organizations (SMOs) are designed to attain sustainable effectiveness. Moreover, it once again clarifies that organizations need to meet the present demands of society without affecting the ability of future generations to meet their own needs. The outcomes from the study contribute to design strategies and objectives that support sustainable effectiveness in the selected firm. Furthermore, it incorporates change management practices into economic, social, and environmental outcomes for a theoretically grounded perspective.*

*Keywords: agile organization; capacity building; sustainable effectiveness; organizational development*

## **1 Introduction**

Organizational development (OD) is a process that encompasses both behavioral sciences and systems thinking and acts together to create capacity building and change management in organizations. It mainly focuses on an organization's current functioning, through an organizational diagnosis, to meet the

organizational goals. For his part, Kenward pointed out that OD aligns structural, cultural, and strategic aspects of work toward the ever-evolving business climate (Kenward, 2018) [1]. This is supported by another view by Burke (1982), that OD maintains a comprehensive system approach with data collection, diagnosis, action planning, intervention, and evaluation [2]. Moreover, it aims at developing creative and innovative solutions to problems, creating alignment between structure, process, strategy, people, and culture, and nurturing a self-renewing capacity. Thus, OD is not only linked to one approach or process but also a wider perspective on organizational effectiveness. Again, this effectiveness can be measured in three dimensions. Firstly, through financial and technical performance, i.e., sales growth, profits, quality products and services, and high productivity. Secondly, by measuring the continuous improvement by recognizing the ability to solve the problems. Lastly, by identifying the engagement, satisfaction, and learning capabilities of existing talents (Cummings, 2022) [3]. Thus, OD interventions have a crucial role in the pursuit of ‘sustainable effectiveness’ (Mohrman & Shani, 2011) [4].

## **1.1 Background to the study**

In this age of Industry 5.0, technology has a strong impact on work systems. It forces the organizations to have a planned change in OD, rather than a change management. Because the latter is a broader concept and narrowly focuses on values, quality, and schedule (Paton, & McCalman 2010; Wornn, et al., 1999; Hayes, 2002) [5] [6] [7]. OD can be executed only through the application of and transfer of behavioral sciences knowledge and practice. Also, the management of planned change comprises pragmatic and expert-driven approaches to change. OD embraces a total change in the system and responds to a larger picture of the environment including customers, stockholders, suppliers, and government agencies. Thus, the performance of the workforce can be enhanced with proper utilization of resources with legitimacies.

## **1.2 Rationale for the study**

A key objective of the United Arab Emirates Ministry of Economy is to achieve economic development in the UAE by enabling business practices, protecting consumers, increasing competitiveness, developing small and medium enterprises, and national entrepreneurship. Also, it emphasizes research, talent development, strategic planning, and tourism, to increase economic development and contribute to achieving sustainable development. SDG negotiations were first conducted in the Open Working Group (OWG) of the United Nations General Assembly

(UNGA), which met 13 times in 2013-2014 and in which the UAE held a seat. Related to the UAE's role in formulating the 2030 agenda for sustainable development, it provided considerable input on issues such as energy, education, global partnership, health, water, and women's empowerment. Moreover, the UAE's Minister of Foreign Affairs, H.H. Sheikh Abdullah bin Zayed Al Nahyan made a report titled 'Resilient People, Resilient Planet' as a key input to the Rio+20 Summit by participating in the UN Secretary General's High-Level Panel on Global Sustainability (UAE and the 2030 Agenda for Sustainable Development, 2017) [8]. Hence, the organizations in the UAE can be elevated to global social change organizations (GSCOS) through planned OD interventions. When OD applies to global social change, it generates not-for-profit and non-governmental entities that are created at the grassroots level to help communities and societies, which in turn addresses poverty, unemployment, race relations, homelessness, hunger, disease, water quality, and conservation and political instability. Thus, OD enhances a self-renewing capacity for the organizations.

### **1.3 Aim of the study**

The study aims to look at the OD interventions that assist organizations in balancing economic, social, and environmental objectives. For this, it stresses the importance of sustainable management organizations, and how OD can assist in their design and development. A global survey highlights that 93 percent of CEOs believe sustainability issues are crucial to the future growth of organizations and have taken various steps towards it (Worley & Feyerherm, 2003) [9]. Despite the economic downturn in 2010, 59 percent of companies increased their investments in sustainability, as mentioned in the second annual Sustainability and Innovation Global Executive study (Kenward, 2019) [10].

Hence, the objectives of the study are:

- To know about the relationship between an agile organization and sustainable effectiveness.
- To identify the relationship between building capabilities and sustainable effectiveness.
- To examine the importance of sustainable effectiveness to social, economic, and ecological outcomes.

## **2 Literature Review**

Sustainable Management Organizations concentrate on a triple bottom line objective; people, planet, and profit, and can be agile toward sustainable

effectiveness. This norm is closely related to the United Nations World Commission on Environment and Development's elucidation of sustainability; "meeting the needs of the present without compromising the ability of future generations to meet their own needs." (Beckhard, 1969) [11]. To have positive economic, social, and ecological results, the firms must be clear in their purpose, decisions, and actions by considering all the stakeholders. Additionally, these firms are committed to innovation, creativity, and implementation that support change.

This idea of SMO is closely integrated into sustainable effectiveness. This can be maintained by proper resource allocations in terms of breadth, aggressiveness, and differentiation. While considering breadth, the firm's operations need to extend in markets, technologies, or products and services. International participation in the above aspects can have a social impact but it needs to be analyzed the impact by outcomes, for instance, water conservation, energy, recycling policies, and systems to maintain appropriate balance.

## **2.1 Agile organization**

Any nation's economy relies on agile organizations. It represents a firm's dynamic capability in its operations (Eisenhardt & Martin, 2003) [12] and effective responses to changing environments and multiple stakeholder demands (Winter, 2003) [13]. The main components of agile organizations are work systems, structures, management processes, and human resource systems. Work systems can be designed into two types of work: (1) core and exploitive and (2) creative and exploratory. SMOs provide the core work with a strategic intent in reliability, practicability, and predictability. It is subject to changes to the changing environment; however, it must be consistent to support the differentiators, meet demand, and generate profit. At the same time, it should meet the social and environmental objectives. This creates value inside the organization through a strong personal relationship with the customers. Thus, reliable, and productive work processes can be maintained to generate positive work experiences in firms[14]. The latter maintains creative work through new projects, services, and innovations; however, this strategy needs to change as per the market demand. This is driven by shared goals and performed by cross-functional teams based on various initiatives.

Structures in agile organizations assist in accomplishing the core work and creative work through member attention, resources, and the external environment. In other words, the ability of the organization to expand its 'surface area' by addressing specific segments externally. In these backgrounds, the first hypothesis was crafted as;

- H1: Agility in organizations has a significant role in sustainable effectiveness.

## **2.2 Building capabilities**

The organization structure must fit with individual job designs. For this purpose, a diagnosis helps to identify the interventions by collecting information about the current functioning of the system, process, and structure. This variable in SMOs aligns with the development of capabilities for sustainable effectiveness. For this, SMOs need to consider stakeholder values/decisions and reflect diverse perspectives in making choices (Worley et al, 2010) [15]. This is linked with all HR best practices, right from staffing, training, rewards, etc. Also, with competencies in strategic planning, organization design, and change management. Additionally, it emphasizes a learning organization through reflective learning to hone change skills in action (Hoffman, 2010) [16]. However, this capacity building requires significant investment in training and development. Organizations like Gap, Inc., GE, Social Accountability International, Loblaw, Unilever, and the World Wildlife Fund are working hard to develop this capability. Larger group intervention (LGI) techniques are necessary to leverage the transformation process, which involves a particular sequence of changes, starting with work system design. Also, the strategies, goals, and objectives to be explained, and needs to be redesigned to encourage agility.

## **2.3 Sustainable effectiveness and organizational development**

It is important to note that SMOs must create positive outcomes to survive and how much profit they make, how they make a profit, and toward what end that profit is used. Moreover, SMOs set sustainable goals for profitability and growth and are not keen on maximizing profit or shareholder returns. Additionally, the ecological outcome stresses its contribution to the planet, for instance, its carbon footprint, waste recycling, electricity consumption, etc. Furthermore, the social outcome identifies diversity and inclusion and contributes to human and cultural well-being. This notion embraces social value and invests in the workforce, communities, cultures, governments, and countries in which it operates. SMOs interventions revolve around the planet, people, and profit and maintain agility to sustain effectiveness.

The strategic intent of SMOs tries to consider three main areas in development such as breadth, aggressiveness, and differentiation. In the first case, participation and collaboration with varied countries, markets, technologies, or products and services increases the complexity of an organization's carbon footprint and social impact. For instance, Starbucks's scope of domestic and international operations, its product mix, and ancillary services have broadened and popularized intensely. It has widened its strategic operations in water conservation, and fairtrade, through appropriate energy and recycling policies [17][18]. Secondly, SMOs are effective competitors and responsive in this fast-changing market. For example, Tartan Yachts, a high-quality manufacturer of sailing boats, faced this dilemma in



the early 2000s. As a result of its success, it received more orders than its single facility could meet promptly, and the growing economy provided a tempting opportunity to support the growth in demand with increased capacity. Additionally, it maintains a close relationship with customers and quality is partly a function of keeping appropriately sized capacity. Thirdly, understanding why customers make purchasing decisions and how the organization's product and service features align with those choices is critical to success[19]. SMOs build features into their offerings that reflect all three outcomes. The sustainability-friendly identity of Microsoft's Windows 7 operating system enabled the company to incorporate several power-saving features that contributed to energy conservation. Microsoft's Windows 7 operating system, for instance, made big improvements over the ill-fated Vista operating system that were crucial to its economic objectives [20] [21].

### **3 Methodology**

Firstly, a pilot study was conducted in a UAE-based healthcare firm to familiarize the work climate and sustainable effectiveness. Based on this, it was decided to conduct deductive research to test the identified hypotheses from detailed literature. Additionally, it attempts to clarify how variables link to cause and effect. The study identifies three objectives with three latent variables, agility, capacity building, and sustainable effectiveness toward organization development for social, economic, and ecological outcomes. To understand the significance of sustainable management organizations' a closed-ended questionnaire (Table 1) was created and sent to 120 staff members of a healthcare institution situated in the UAE. A stratified sample strategy using respondents from various categories was taken into consideration. 114 workers provided pertinent replies. For greater accuracy, data from both quantitative and qualitative sources were collected.

Sl.#	Variables	Items
	Agile organizations	<p>1. My firm enables timely and effective responses to changing environments and multiple stakeholder demands.</p> <p>2. My firm is creative toward future opportunities.</p> <p>3. My firm focuses on member attention and organization resources.</p> <p>4. The information is transparent with decision-making rights.</p>
	Building capabilities	<p>5. My firm provides information on open positions, career paths, and the skills and competencies of employees.</p> <p>6. My firm provides rewards for what we can do with sustainable effectiveness, not for the particular job.</p> <p>7. My firm motivates people to learn new skills and knowledge.</p> <p>8. My firm spreads adaptive leadership across all levels of an organization.</p>
	Sustainable effectiveness and organization development	<p>9. My firm holds values of empowerment or people-centered forms of action in the accomplishment of its global change mission.</p> <p>10. My firm emphasizes multicultural collaboration.</p> <p>11. My firm values to create vision.</p> <p>12. My firm maintains its identity.</p>

Table 1

Variables and Items

Source: Literature review

As a next step, descriptive statistical analyses were carried out to measure the accuracy and dependability of the measurements. The contribution and relevance of the manifest variable route coefficients were then evaluated to test the research

model suggested by the study. SPSS 24.0 was used for hypothesis tests. Additionally, using the goodness of fit metrics, the hypotheses are statistically evaluated to see how well they match the data. The number of factors and the description of the test items that characterize each factor (the so-called indicators), i.e., those that are anticipated to have high to moderately high loadings (or beta coefficients) on the factor, are necessary for the prediction of the factor structure/pattern of a test. "Goodness of fit" or "approximate fit" indices can help with these difficulties and this issue. It is important to express the degree of mismatch between the approximation estimation and the actual estimation, and they can serve as an additional justification for accepting or rejecting a model (Prudon, 2015). As a result, several dependency connections between external (independent) and endogenous (dependent) factors may be examined at once. This was accomplished by the use of a two-stage analysis, in which the measurement model was first estimated and then held fixed in the subsequent estimation of the structural model. This strategy is justified by the idea that it is better to depict the indicators' dependability accurately in two phases to prevent the interaction of structural and measurement models. The priority for establishing significance was set at a level of 0.05. Kenny (2012) suggested that when the correlations between the variables are typically strong, CFI and TLI are artificially enhanced (suggesting a better fit)[22].

	N	Average	Std. Deviation	1	2	3	4
Agility	1	5.427	0.382	1			
CB	114	4.812	0.323	0.723**	1		
Sustainable effectiveness	114	4.687	1.238	0.611**	0.501**	1	
Valid N (listwise)	114						

Table 2

Descriptive Statistics

\*p<0.05 \*\*p<0.01

This table gives descriptive statistics for three latent variables. As questions 1 to 4 comprise the agility, the total score of each individual is 30. Agility is positively correlated with capacity building (5.42 p<0.01), and positively correlated with sustainable effectiveness (0.501, p,0,01).

As questions 5 to 8 comprise the capacity-building items, the total score of each individual is 35. Of which the average total score is 4.8 with the standard deviation being 0.32.

As questions 9 to 12 comprise the knowledge management items, the total score of each individual is 35, of which the average total score is 4.68 with the standard deviation being 1.23.

#### 4.1 Correlation Analysis

		Agility	CB	SE
Agility	Pearson Correlation	1	.979**	.960**
	Sig. (2-tailed)		.000	.000
	N	114	114	114
CB	Pearson Correlation	.979**	1	.983**
	Sig. (2-tailed)	.000		.000
	N	114	114	114
SE	Pearson Correlation	.960**	.983**	1
	Sig. (2-tailed)	.000	.000	
	N	114	114	114

Table 3  
Correlation analysis

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The above analysis explains the correlation between the three variables. All the variables are significantly correlated with each other. It is seen that there is a 98% correlation between agility and capacity building and a 96% correlation between agility and sustainable effectiveness. Also, capacity building is 98% correlated with sustainable effectiveness. All the correlations are significantly linked.

## 4.2 Regression Analysis

### 4.2.1 Agility is taken as a dependent variable and capacity building as an independent variable.

	Unstandardized Coefficients		Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
Constant	-1.172	0.325		-2.781	0.005	-1.759	-0.432
Capacity Building	0.792	0.023	0.897	51.68	0.000	0.875	0.862

Table 4  
Regression Analysis – Agility & Capacity Building

The table confirms the values; Capacity building = 0.897 (agility) -1.172 and ( $R^2 = 0.89$ ). This indicates there is a significant positive relationship between the two variables.

### 4.2.2 The next part tries to find Capacity building as the dependent variable and sustainable effectiveness as the independent variable.

	Unstandardized Coefficients		Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
Constant	-4.493	0.629		-7.139	0.000	-5.740	-3.246
Sustainable Effectiveness and OD	0.885	0.024	0.960	36.18	0.000	0.836	0.933

Table 5  
Regression Analysis – Capacity Building & SE

The table shows the value for capacity building as 0.885 to (SE & OD) - 4.493, and (R2 = 0.96)

As the beta value is 0.96, shows a positive relationship.

**4.2.3 Regression for Capacity Building as the dependent variable and agility as the independent variable.**

	Unstandardized Coefficients		Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
Constant	2.187	0.429		5.093	0.006	1.336	3.038
Agility	1.171	0.023	0.979	50.78	0.000	1.125	1.217

Table 6  
Regression Analysis – Capacity Building & Agility

The value shows for capacity building = 1.171 and (agility) +2.187. The R2 = 0.979.

**4.2.4. Regression for SE as the dependent variable and Agility as the independent variable.**

	Unstandardized Coefficients		Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
Constant	-4.224	0.496		-8.515	0.000	-5.207	-3.241
Agility	1.083	0.019	0.983	56.166	0.000	1.045	1.121

Table 7  
Regression Analysis – SE & Agility

The table indicates the agility = 1.083 and (SE) - 4.224. Also, the R2 = 0.983

**4.2.5 Regression: Sustainable effectiveness and OD are considered as the dependent variable and capacity building as the independent variable.**

	Unstandardized Coefficients		Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
Constant	6.593	0.537		12.288	0.000	5.529	7.656
Capacity Building	1.043	0.029	0.960	36.180	0.000	0.986	1.100

Table 8  
Regression Analysis –SE & CB

$$\text{Sustainable effectiveness and OD} = 1.043 (\text{Capacity Building}) + 6.593 \quad (R^2 = 0.960)$$

## 4 Results and Discussion

Based on the sustainable management organizational implications, this article develops a research model toward an economic, social, and ecological outcome. The results prove the positive relationships between agility, capacity building, and sustainable effectiveness. Initially, the study presents the notion of agility, because agile organization designs support the organization's effectiveness. The study sheds light on the importance of an agile organization for SMOs. The result confirms the significance of reliable and practicable work processes to create positive and valued work experiences internally and externally. For creative teams, the study proves the significance of decision-making, member attention, and the use of proper resources through adaptive leadership. A core work system increases efficiency and effectiveness, on the other hand, creative work develops future opportunities for innovation. Moreover, it extends one's capability to engage in wider communities in addition to working with other functions. This enhances implementation strategies for enterprise customers, markets, or any other important business segment. The selected organization can use the comprehensive model for diagnosing organizational systems, such as organizational level, group level, and individual level (Cummings et al., 2020).

Secondly, this article explores the relationship between capacity building and sustainable effectiveness. Toward capacity building, SMOs need to build their capacities through change management skills, and by need-based training. The study confirms the correlation between this variable with sustainable effectiveness and stresses that firms nowadays are equipped with technical and operational solutions, however, with less ability to manage change. A major step toward becoming an SMO can be made by assessing how both standard and creative work is performed and designing them for sustainable effectiveness. It may be possible to create a foundation for further change by redesigning work in a way that adds economic value while remaining environmentally and socially acceptable. Therefore, the study helps to identify and select diagnostic models and procedures to address the problems presented by the organization and to ensure completeness (Worley et al, 2010; Hoffman, 2010).

Thirdly, the findings indicate that sustainable effectiveness is influenced by agility and capacity building and I exhibited in correlation analysis. The findings stress the importance of achieving triple-bottom-line objectives and creating positive social, economic, and ecological results. From a theoretical perspective, sustainable management organizations enhance innovation, adaptation, agility, and transformation. It requires firms' utilization of knowledge-based resources in the creation of organizational talents and competencies to meet the objectives and for better knowledge application and creativeness (Elikington, 1994; Katz & Kahn, 1978). Therefore, the present study links agility and capacity building in sustainable management interventions toward social, ecological, and economic organizational development.

#### **4.1 Theoretical and Practical Implications**

At the practical level, it examines the drawbacks of the implication of sustainable management organizations as part of organizational development. As the world is changing, firms need to improve their performance. The latent variables can be considered while working with risk management. These can be maintained by relevant strategic intent; breadth, aggressiveness, and differentiation. In contemporary business, value is added by the expertise, skills, experience, comprehension, and know-how of individuals and groups.

#### **4.2 Limitations and Future Scope of the Study**

The study has been conducted in one healthcare sector and can be extended to different sectors in the UAE and internationally as each organizational climate varies according to its corporate social performance. It is also suggested to have a



longitudinal study to grasp the adaptive capacity of the firm or firms in changing socio-economic scenarios.

### **Conclusion**

In sustainable management organizations, the social and ecological outcomes have an equal impact on economic results. Maintaining a balanced revenue for firms along with setting goals for profitability and growth is crucial from an economic perspective. Additionally, creating a positive ecological outcome emphasizes no compromise in the natural environment. It intends to develop business strategies that are built around the productive use of natural resources and can lead to environmental profit. Organizations with clear perspectives on social issues are more likely to have a profit maximization motive. When profit maximization dominates the creation of social and cultural values, organizations can unsuspectingly contribute to cultural homogenization. Therefore, sustainable management organizations need to be agile and build their capacities with the ever-changing socio-economic and technological influences.

### **References**

- [1] Kenward, T. (2018); "What is Organization Development?" (2018) in Cummings, T.G., Worley, C.G., & Donovan, P. (2020) *Organization Development and Change*, 1st Edn Cengage.
- [2] Burke, W., (1982); *Organization Development: Principles and Practices*, Boston: Little, Brown.
- [3] Cummings, T.G., Worley, C.G., & Donovan, P. (2020); *Organization Development and Change*, Cengage.
- [4] Mohrman, S., and Shani, A. (2011); "Organizing for Sustainable Effectiveness: Taking Stock and Moving Forward," in *Organizing for Sustainability*, vol. 1, ed. S. Mohrman and A. Shani, Bingley, UK: Emerald Group Publishing.
- [5] Paton, R. and McCalman, J., (2010); *Change Management*, 3rd ed. (Thousand Oaks, CA: Sage Publications.
- [6] Worren, N., Ruddle, R., and Moore, K., (1999); "From Organization Development to Change Management: The Emergence of a New Profession," *Journal of Applied Behavioral Science* 35: pp.273–86.
- [7] Hayes, J. (2002); *The Theory and Practice of Change Management*, New York: Palgrave.

- [8] UAE and the 2030 Agenda for Sustainable Development [https://sustainabledevelopment.un.org/content/documents/20161UAE\\_SD\\_Gs\\_Report\\_Full\\_English.pdf](https://sustainabledevelopment.un.org/content/documents/20161UAE_SD_Gs_Report_Full_English.pdf)
- [9] Worley, C. and Feyerherm, A. (2003); “Reflections on the Future of OD,” *Journal of Applied Behavioral Science* 39, pp. 97–115.
- [10] Kenward, T. (2019); “What is Organization Development?” (2018). Retrieved from <http://www.roffeypark.com/organisational-development/what-is-organization-development/>. Accessed 4th October 2023.
- [11] Beckhard, R. (1969); *Organization Development: Strategies and Models*, Reading, MA: Addison-Wesley.
- [12] Eisenhardt, K., and Martin, J. (2000) “Dynamic Capabilities: What Are They?” *Strategic Management Journal*, 21, pp.1105–21;
- [13] Winter, S. (2003); “Understanding Dynamic Capabilities,” *Strategic Management Journal*, 24, pp. 991–96.
- [14] O'Reilly and Tushman, M. (2011); “Organizational Ambidexterity in Action: How Managers Explore and Exploit,” *California Management Review*, 53., pp. 5–22.
- [15] Worley, A. Feyerherm and D. Knudsen, (2010); “Building a Collaboration Capability for Sustainability,” *Organizational Dynamics* 39, pp. 325–34.
- [16] Hoffman, A. (2010); “Climate Change as a Cultural and Behavioral Issue: Addressing Barriers and Implementing Solutions,” *Organizational Dynamics* 39, pp. 295–305.
- [17] Elkington, J. (1994); “Towards the Sustainable Corporation: WinWin-Win Business Strategies for Sustainable Development,” *California Management Review* 36, pp 290–100.
- [18] Katz, D., and Kahn, R. (1978); *The Social Psychology of Organizations*, San Francisco: Wiley.
- [19] Weber, M. (1947); *The Theory of Social and Economic Organization*, trans. A. M. Henderson and T. Parsons, London: Collier Macmillan Publishers.
- [20] Katz and Kahn. R. (1978) *The Social Psychology of Organizations*, San Francisco: Wiley.
- [21] Weber. M. (1947); *The Theory of Social and Economic Organization*, trans. A. M. Henderson and T. Parsons, London: Collier Macmillan Publishers.
- [22] Kenny, D. A. (2012); Measuring model fit. Retrieved from <http://www.davidakenny.net/cm/fit.htm>.

# Examining the evolution of controlling attitudes in Hungarian SMEs

**Ferenc Katona**

Óbuda University, Keleti Károly Faculty of Business and Management,  
katona.ferenc@kgk.uni-obuda.hu

*Abstract: In today's fast-paced world, a key issue for businesses is to remain competitive. Controlling can play a key role in this struggle, helping companies to increase their effectiveness by using a more efficient planning, measurement and decision support system. Through primary research in several phases, my work will examine how companies' approach to controlling has changed in recent years. What changes can be observed in their controlling activities and what factors have influenced these changes in controlling tasks.*

*Keywords: small and medium enterprises, family business, controlling, controlling attitude*

## 1 The concept of controlling

In Horváth's (1997) formulation, controlling is a cross-functional management tool, which has the task of coordinating planning, control and information supply.

Weber and Schaffer (2006) argue that controlling is about ensuring rationality. The concrete manifestation of this task can be defined in the context of a given situation. Lack of rationality can also arise from limitations in the manager's will and knowledge.

Küpper (1987) sees controlling as a central goal-setting instrument in the coordination of management. Controlling plays the role of a specific goal-setting instrument in the areas of adaptation and innovation functions, as well as in the areas of goal achievement and service.

According to Reichmann (2006), controlling is a goal-oriented support to management tasks, which performs information gathering, processing, planning, coordination and control functions; it is a system supported by cost accounting and other systems to improve the quality of management decisions at any level of decision-making in the company. The content of corporate goals in terms of controlling mainly refers to economic goals such as profitability, profitability, liquidity and productivity. Thus, it is possible for a value-oriented management to

implement a system of controlling that is best suited to shareholder value (Hornung and Reichmann, 2005).

## 2 The family businesses

The factors that determine family businesses are (Tóth-Bordásné Marosi (2014) and Chua et al (2009)):

- Family ownership and control,
- family ownership, but control is not in the hands of the family,
- family control, but ownership is not family.

Family and non-family businesses differ in a number of characteristics. A summary of these is presented in Table 1.

Viewpoints	Family businesses	Non family businesses
Intent	The continuity	Short-term maximisation of share prices
Purpose	Preserving assets and reputation	Meet the expectations of institutional investors
Founding belief	Protecting against the downside of risks as a priority	More risk can bring more return
Strategic orientation	Adaptation	Continuous growth
Key risk carriers	Customers and employees	Shareholders and management
Management focus	Ongoing, incremental improvements	Innovation
Perception of the business	Social institution	A disposable asset
Personal leadership	Caregiver	Charismatic

Table 1.  
Comparison of family and non-family businesses  
Source: Thomassen (2007, cited in Szabó (2013))

### **3 Method and sample**

The research is based on an online questionnaire survey. The questionnaire was completed by 2,487 enterprises, mostly SMEs, 89% of which were family businesses. The responses were coded in excel and the results were processed in SPSS 25. Sampling was carried out using a snowball method. The sample is not representative and the results obtained are considered valid for the present sample.

In terms of size of staff, small and medium-sized enterprises are over-represented compared to the majority, with 38.5% and 5.5% respectively. On the other hand, micro enterprises are under-represented, with only 54.8% of the sample, and large enterprises 0.7%.

Of the enterprises surveyed, 49% were located in Budapest or in Pest region, 14% in Northern Hungary and 9-9% in Northern or Southern Hungary. The other regions account for between 5 and 7% of the sample.

In terms of market presence, 34% of the enterprises in the sample are active in the consumer services market, 19% in industrial services, 12-12% in raw materials and components and consumer durables, 10% in consumer goods, 5% in other areas and 3% in market equipment.

### **4 The results of the survey**

I asked the SMEs surveyed who had a controlling unit. 8.5% of the enterprises surveyed had a controlling unit and 78.2% did not, while 13.3% said that although they did not have a controlling unit, they did have a controller.

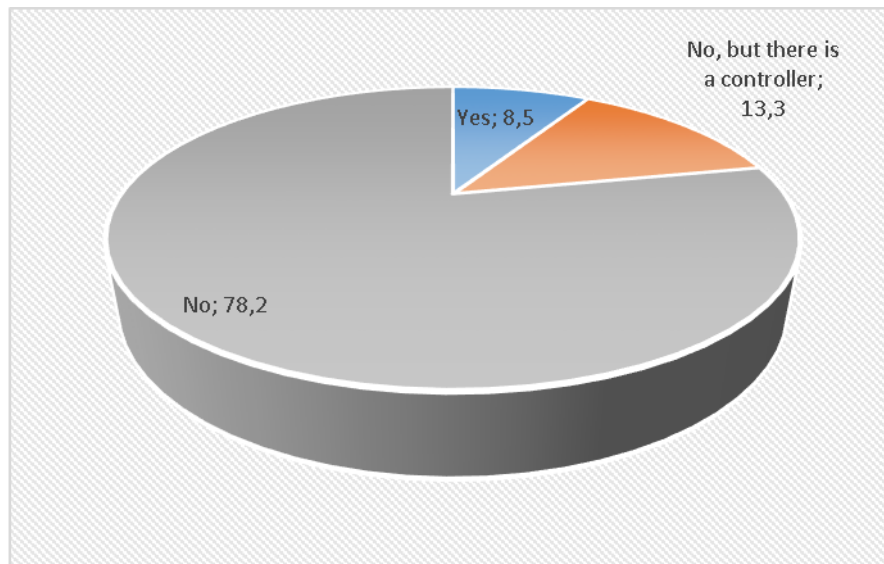


Figure 1.  
Reasons for introducing controlling (%)  
Source: own research

I examined whether there was a significant relationship between the number of enterprises introducing controlling and the number of enterprises not introducing controlling. In the first year of the survey in 2017, 5.7% of enterprises had a controlling unit, 12% had a controlling staff and 82.3% had no controlling unit. In comparison, in 2022, 10.8% of enterprises had a controlling unit, 14.6% had only a controlling employee and 74.6% had no controlling unit. This means that the distribution ratios clearly show a transformation of SMEs in the use of controlling functions. Using a cross-tabulation test, this can be significantly confirmed, as I found a weak relationship between the two variables ( $CV=0.69$ ;  $p=0.023$ ). Thus, in recent years, a positive transformation in the use of controlling can be observed among Hungarian SMEs, with more and more SMEs recognising the need for a controlling function in their business.

In my research, I also asked why companies introduce controlling. The main reason given by the largest proportion of respondents (20.1%) was to support control. 16.7% said it was to support the management of the business, 14.7% said it was to support planning and 13.4% said it was to support quality decision making. 11.5% also cited ensuring the integration of planning and control, 10.5% the provision of information, 7.2% flexibility and 5.9% harmonisation as a controlling role. Looking at the responses, it can be said that, in general, the majority of managers of small and medium-sized enterprises identified the classical controlling tasks as the main functions of controlling in their enterprise.

In other words, it can be said that the managers who have decided to introduce controlling are more or less familiar with the concept and possibilities of controlling.

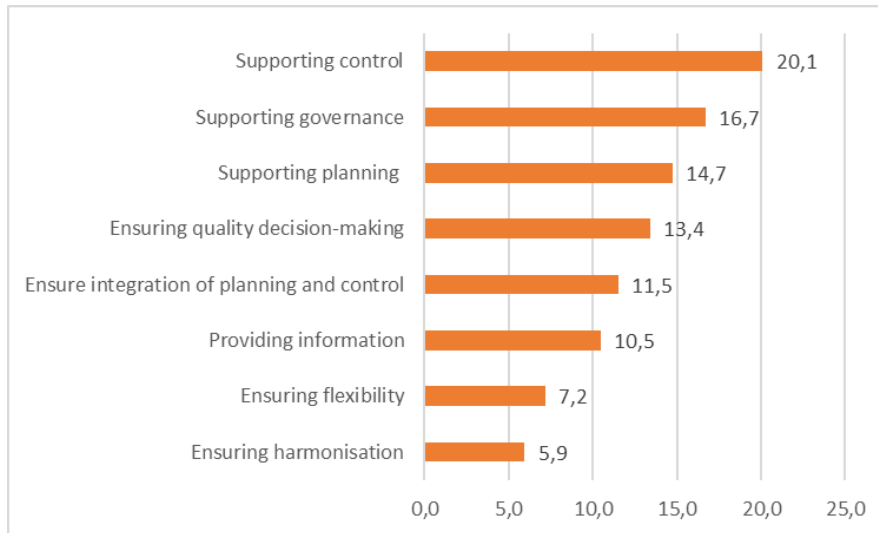


Figure 2.  
Reasons for introducing controlling (%)  
Source: own research

I also looked at the question of what motivated businesses that did not have a controlling function but were planning to introduce one, what motivated them in their decision? Most of them expect transparency in their company from the introduction of controlling (27.8%), 25.5% want help in planning future strategy, 24.6% expect better control of activities, 21.5% expect support from controlling in managerial decision-making, 14.7% expect better implementation of plans, 12.1% expect better coordination between departments and 9.4% want better information availability for all departments of the company.

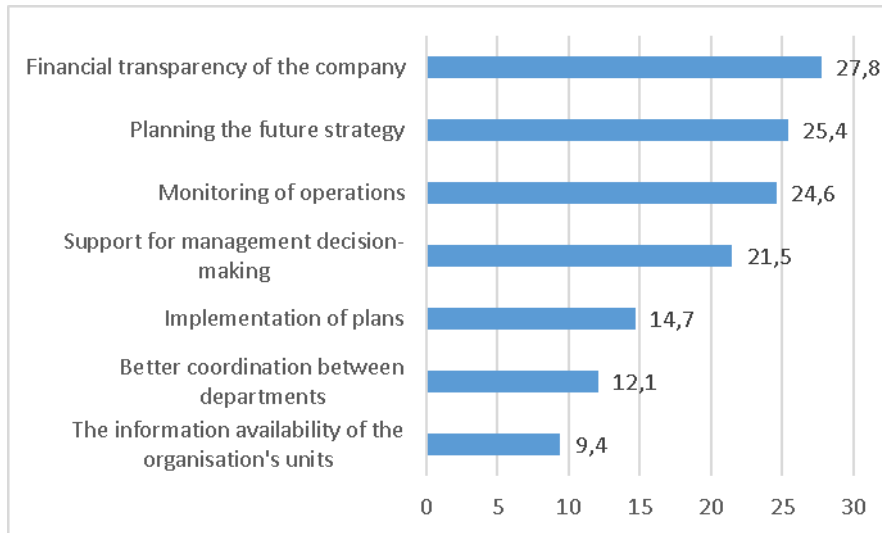


Figure 3.  
 Motivations of enterprises planning to introduce controlling (%)  
 Source: own research

In my research, I also investigated whether a relation can be established between the change over time in the perspective of managers who intend to introduce controlling. According to this finding, a significant relationship between the time periods under study and the intention to introduce controlling can be demonstrated. Thus, the attitude of the managers of enterprises towards the introduction of controlling has changed over the 6 years of the study. The Cramer V indicator demonstrated a relationship of medium strength with a high level of significance ( $CV=0.525$ ;  $p=0.000$ ).

I also asked business managers who did not want to introduce controlling in their company about the reasons for this. 50% of respondents indicated that the main reason for not introducing controlling was that their company was too small. The other reason for not implementing controlling was that they did not think they needed it (26.9%). 15.1% of entrepreneurs said that they had the necessary knowledge and therefore did not implement controlling. The latter group therefore recognised the need for controlling but admitted that they did not have the necessary knowledge. Only 4.8% of respondents gave the reason for not introducing controlling as being expensive. So, contrary to my preliminary assumptions, one of the main reasons for not introducing controlling is not financial, but the lack of awareness of the need for this function in the life of the business.



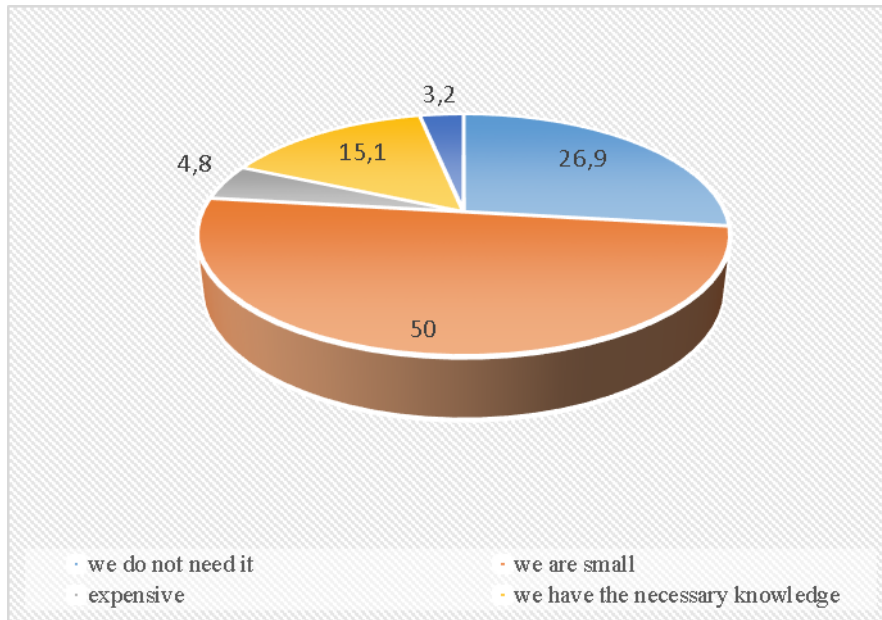


Figure 4.  
 Why not to introduce a controlling activity? (%)  
 Source: own research

I examined the evolution over time of the attitudes of those who do not intend to adopt controlling. In this case, I could not confirm the relationship at a sufficient level of significance ( $CV=0.070; 0.125$ ). In my opinion, this is due to the fact that a high proportion of respondents gave irrelevant answers to the other response option with respect to the question asked.

In my research, I also looked at the activities that managers of enterprises include in the controlling field. Most of the respondents (56.4%) indicated internal audit, 37.7% internal accounting and 37.5% situation analysis. Cost accounting was mentioned by 35.4%, costing by 35.1% and investment analysis by 34.8%. Strategic planning ranks in the middle (29,5%), while operational planning is at the bottom two-thirds (19.8%). Interestingly, forecasting (31.7%), internal reporting (31.1%) and budgeting (30.3%) only rank 8-10. And external accounting and external reporting only rank 19th and 21st (penultimate). Thus, typical controlling tasks appear alongside the classical accounting tasks, but most business managers give more importance to the classical accounting tasks.

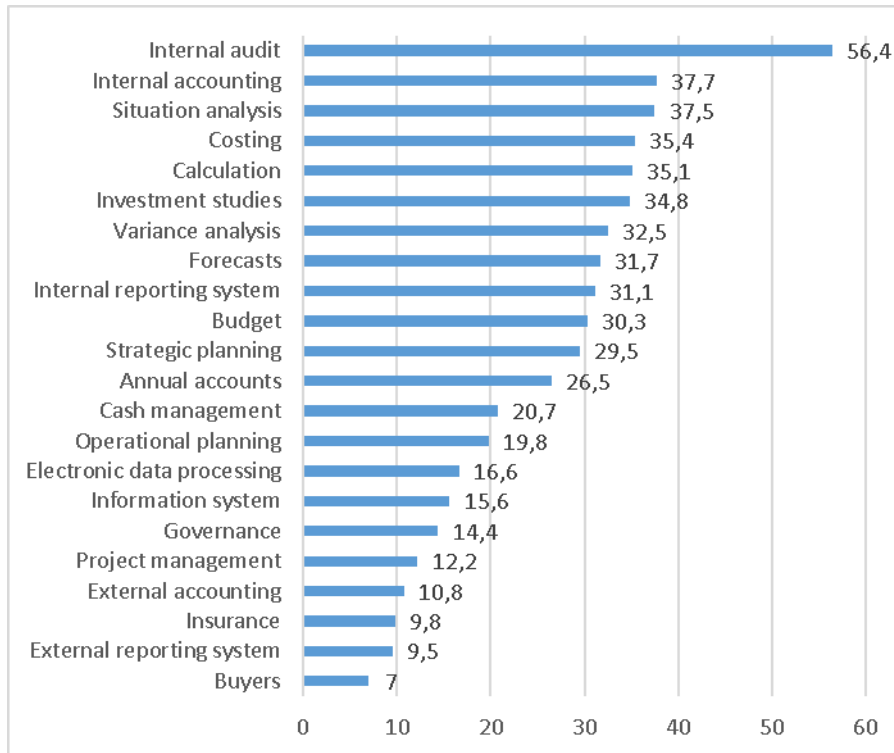


Figure 5.  
Controlling functions (%)  
Source: own research

Due to the role of controlling, I also examined the planning tools used by companies in the marketing planning process. 70.6% of the small and medium-sized enterprises surveyed had not prepared a marketing plan. Most (45.7%) of the enterprises that do prepare a marketing plan use a SWOT analysis as a planning tool. 32.7% calculate a declared payback period, 30.7% carry out a benchmarking analysis, 25.1% use a profitability index, but 24.3% also look at the internal rate of return. Product life cycle analysis is used by 16.6% of firms, gap analysis by 14.4%, net present value calculations by 14.4%, but portfolio analysis techniques by only 11.5%.

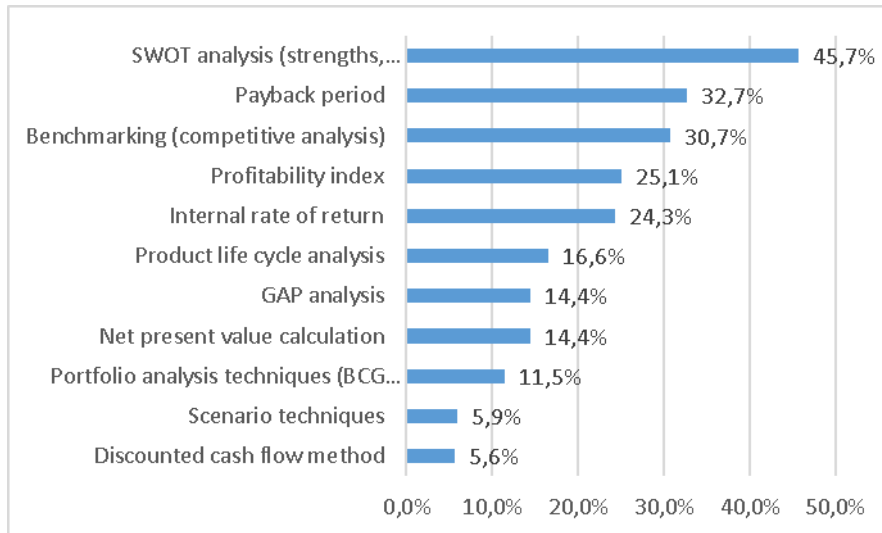


Figure 6.  
Applied planning tools  
Source: own research

As a part of the controlling tools, I have also examined the means of measuring the effectiveness of marketing actions. 55% of the respondents answered that they do not measure the performance of marketing activities. Most entrepreneurs measure the increase in sales (67.5), 31.9% measure consumer satisfaction after a marketing campaign, 27.1% measure the increase in company profit, 26.5% measure the increase in productivity and 20.4% measure the increase in market share. Changes in consumer attitudes are measured by 20.1% of SMEs, ROS by 18.9% of businesses, brand loyalty by 15.4% of respondents and ROI by 14.2% of SMEs.

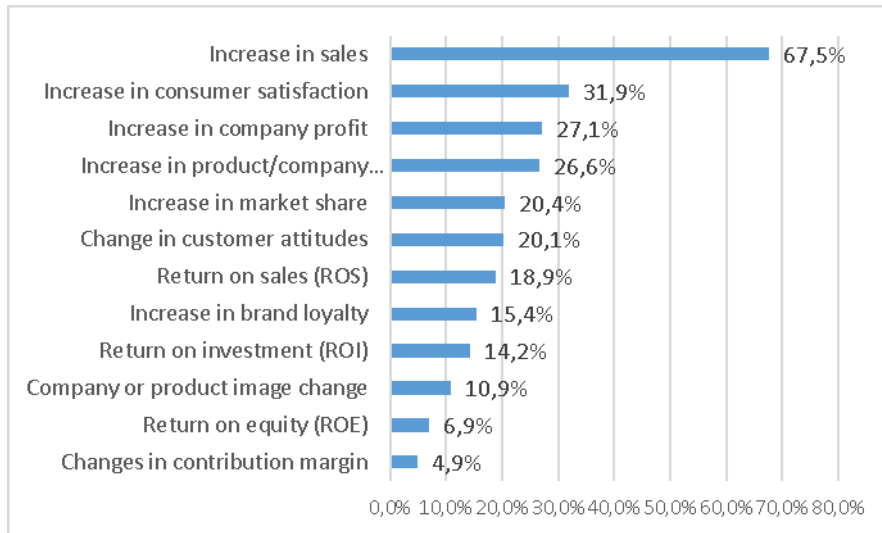


Figure 7.

Applied tools for marketing performance

Source: own research

## Conclusions

The results of my research show that a large proportion of small and medium-sized (family) enterprises do not recognise the importance of controlling for their business. In my opinion, this is largely due to the "incomplete" economic knowledge of small business owners.

Enterprises that have introduced controlling have introduced it mainly to support monitoring, management and planning. The majority of those planning to introduce controlling want to promote financial transparency, strategic planning and decision-making by introducing a controlling function.

My research also showed that only a small proportion of SMEs (5%) reject the use of controlling because of its cost. Although the sample is not representative, the sample of thousands of SMEs confirms that entrepreneurs tend to be discouraged from introducing controlling because they do not recognise the need for this function.

However, as I have shown in my results, a positive trend can be observed in Hungarian (family) businesses, with more and more entrepreneurs recognising the importance of controlling and introducing it in their own businesses.

## References

- [1] Chua, J. H., Chrisman, J. J. and Sharma, P. (1999): Defining the Family Business by Behavior. *Entrepreneurship: Theory and Practice* Summer 1999: 19.
- [2] HORNING, K. – REICHMANN, T. (2005): Moderne Controlling-Konzeption in Theorie und Praxis, in: Tagungsband 20. Deutscher Controlling Congress 2005, pp.17-57
- [3] HORVÁTH & PARTNER (1997): *Controlling. Út egy hatékony controlling-rendszerhez.* KJK, Budapest
- [4] KÜPPER, H.-U. (1987): Konzeption des Controlling aus betriebswirtschaftlicher Sicht, in: SCHEER, A.-W. (Hg.) *Rechnungswesen und EDV*, s.n.: Heidelberg, pp. 82-116.
- [5] Mandl, I. (2008): *Overview of Family Businesses Relevant Issues, Final Report*, KMU Forschung Austria
- [6] REICHMANN, T. (2006): *Controlling mit Kennzahlen und Management-Tools. Die systemgestützte Controllingkonzeption.* Verlag Vahlen, München
- [7] Szabó A. (2013): Family Businesses in the European Union. *Erenet Profile*, 8(4), pp. 5-16.
- [8] Tóth-Bordásné Dr. Marosi Ildikó (2014): *Családi vállalkozások elmélete és gyakorlata.* Óbudai Egyetem, Budapest
- [9] WEBER, J. – SHAFFER, U. (2006): *Einführung in das Controlling.* Schäffer-Poeschel, Stuttgart

# Testing ICT security risk attitude questions on a small scale level for future use

**Fehér-Polgár Pál**

Óbuda University, Keleti Károly Faculty of Business and Management,  
feherpolgar.pal@kgk.uni-obuda.hu

*Abstract: Over the past 30 years, we have witnessed the advance and penetration of ICT not only in our private lives, but also in our corporate lives.*

*However, this new, faster, more efficient way of processing and transmitting information has not only opened up the possibilities for a more modern way of life, but has also opened up the issues of information and IT security inherent in ICT on a societal scale. Our attitudes towards the security risks inherent in ICT technologies have a major impact on security-conscious ICT use. In order to better understand this, I have conducted research in recent years based on the work of Weber, Blais and Betz in The domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors (DOSPERT).*

*In the autumn term of academic year 2023/24, I have worked as a thesis supervisor for Krisztián Radics (Investigating the labour market and social effects of artificial intelligence on Generation Z). We have conducted a primary research conducted with a questionnaire, where we have investigated respondents' attitudes towards artificial intelligence and we have included some questions corresponding to my research.*

*Keywords: ICT Security, Attitude for ICT security*

## **1 The rise of the smartphones**

The rise of smartphones was revolutionary, as it transformed the way we communicate, access information and interact with the world around us. Over the past three decades, these devices have evolved from bulky, feature-limited phones to sleek, high-performance computers that fit comfortably in our pockets.

### **1.1 The early years: 1983-1999**

The first commercial mobile phone, the Motorola DynaTAC 8000x, was released in 1983. Weighing more than two pounds and costing a staggering \$4,000, the device was a far cry from today's smartphones. At the same time, it marked the beginning of a new era of personal communication. (Eagle 2021, Airt 2023)

In the 1990s, cell phones became smaller and more affordable, making them more accessible to the general public. The introduction of text messaging, or SMS, in 1992 revolutionized communication, allowing people to send quick messages without making a phone call. (Eagle 2021, Airit)

## **1.2 The rise of smartphones: 2000-2010**

The first commercially broadly spread real smartphone, the Nokia 7710, was released in 2000. It had a touch screen display, a web browser and a built-in camera. Although it was a pioneering device, it was not without its limitations. The touch screen was not very responsive and the web browser was slow and clunky.

In 2007, Apple introduced the iPhone, which marked a turning point in the history of smartphones. The iPhone featured a user-friendly touchscreen interface, a powerful operating system, and a wide variety of applications. It quickly became the most popular smartphone in the world and set the benchmark for all other smartphone manufacturers. (Eagle 2021, Airit 2023)

In September 2008, the first Android smartphone, the HTC Dream (also known as the T-Mobile G1), was released. It featured a touchscreen display, a QWERTY keyboard, and a 3.2-megapixel camera. It wasn't perfect, but it was a groundbreaking device that set the stage for the future of Android. (Raphael 2021)

## **1.3 The present: from 2010 to the present**

The smartphone market has continued to grow rapidly in recent years, with new devices being released regularly. Smartphones have become more powerful, versatile and affordable than ever before. Today, they are essential tools for communication, entertainment, productivity and education.

Smartphones have had a profound impact on society, changing the way we work, learn and interact with each other. They have also become a major source of information and entertainment. Although there are concerns about the negative effects of smartphones, there is no doubt that they have revolutionized our lives.

## **2 DOSPERT**

### **2.1 Introduction of DOSPERT**

The DOSPERT is a psychometric scale that measures risk taking in five distinct domains:

- Financial decisions (investing)
- Financial decisions (gambling)
- Health and safety
- Recreational activities
- Ethical and social decisions

The scale assesses risk preferences by asking respondents to indicate how likely they would be to engage in various risky activities within each domain. Responses are scored on a 5-point Likert scale, ranging from "Extremely unlikely" to "Extremely likely." (Weber et al 2002), (Balais – Weber 2006)

### **2.2 Modification of DOSPERT**

In a previous research I have modified the DOSPERT questionnaire to be able to measure risk taking in ICT. I have created a set of new questions which represents some risky behaviour of the ICT users.

My questions were highly relevant to security risky behaviour in ICT and have found in my small scale test samples that ICT risk awareness cannot be estimated from the original domains.

### **2.3 Creation of new questions for measuring the attitude to AI handling our data**

For measuring the attitude towards AI handling our data I have created six questions in order to be included in a new questionnaire based on the DOSPERT questionnaire.

These questions are the following:

- In a 1 to 5 scale how confident are you that your data handled by AI is safe?
- Are you taking any steps to restrict big tech companies from accessing your data? (disabling cookies, disabling online activity tracking, using private browsing, VPN...)



- Do you think you should be more protective of your online activities?
- Would you change your online activities to protect your data?
- Would you change the way you use your smartphone to protect your information?
- Is the convenience of online services more important to you than protecting your data?

### **3 Methodology and results of the test**

#### **3.1 Methodology**

In the autumn term of academic year 2023/24, I have worked as a thesis supervisor for Krisztián Radics. His original idea was to conduct a research on the topic of labour market and social effects AI. His final thesis topic has the title: Investigating the labour market and social effects of artificial intelligence on Generation Z in order to specialize his research on generation z people.

For his research he has created a questionnaire based on his literature review, and has included my six questions which are in the topic for this paper.

The sample gathering was done with the so called snowball methodology and was shared by Krisztián Radics.

#### **3.2 Results**

##### **3.2.1 Sample**

The sample size was 111 and all of the respondents were members of the generation z. The gender distribution in the sample was almost identical (49 female 62 male). More than 3 quarters (85) have stated that they are still studying and one third has said they are working in full-time, one third has answered they are working in parttime, and one third stated that they are just studying currently.

We have questioned our respondents if they would have any knowledge of artificial intelligence and more than 90% has answered yes for this question.

### 3.2.2 Answers for the test questions

**In a 1 to 5 scale how confident are you that your data handled by AI is safe?**

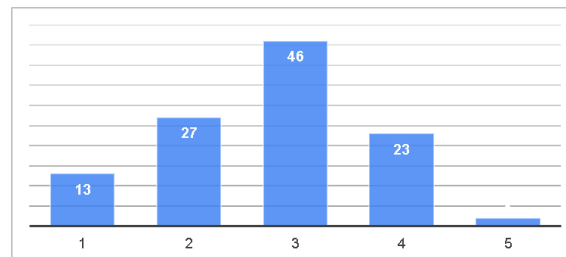


Figure 1

Answers for the first test question 1

As we can see from the figure almost non of the respondants were fully confident about their data is handled by AI while only one tenth of the respondents were fully against of their data handled by AI.

**Are you taking any steps to restrict big tech companies from accessing your data? (disabling cookies, disabling online activity tracking, using private browsing, VPN...)**



Figure 2

Answers for the first test question 2

Almost 2 thirds of the respondents have answered they are taking precautions about data collection of big tech companies.

**Do you think you should be more protective of your online activities?**

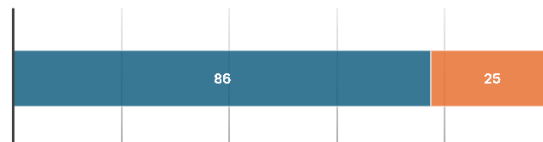


Figure 3

Answers for the first test question 3

More than three quarters of the respondents stated that they should be more protective of their online activities.

**Would you change your online activities to protect your data?**

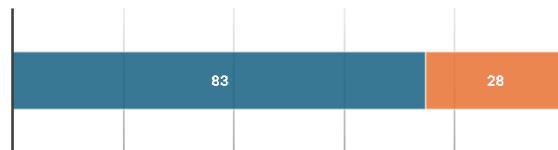


Figure 4  
Answers for the first test question 4

More than three quarters of the respondents stated that they would change in their online behaviour to protect their data online.

**Would you change the way you use your smartphone to protect your information?**



Figure 5  
Answers for the first test question 5

More than two thirds of the respondents stated that they would change in their way of using their smartphones to protect their data.

**Is the convenience of online services more important to you than protecting your data?**

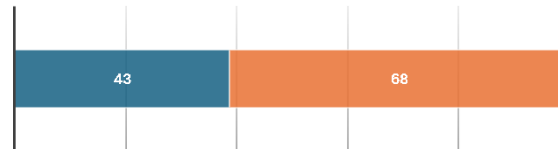


Figure 6  
Answers for the first test question 6

More than 60 percent of the respondents have stated they are choosing data protection in favour of their convenience.

### **Conclusions**

From the responses of the questions we can see that the answerers tend to be data security conscious according to their responses.

But what also can be seen from this test is that the plain answers for these questions have high levels of limits gathering crucial information about the respondents thus further changes and tests need to be conducted.

### **References**

- [1] Airit: How Mobile Phones Have Changed Over the Past 40 Years: <https://www.airit.co.uk/mobile-phones-over-the-years/> (last accessed: 2023-12-10)
- [2] Blais, A. -R., & Weber, E. U. (2006). A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. *Judgment and Decision Making*, 1(1), pp. 33-47.
- [3] Eagle J. (2021) How the Mobile Phone Market Has Evolved Over 30 Years <https://www.visualcapitalist.com/cp/how-mobile-phone-market-has-evolved-since-1993/> (last accessed: 2023-12-10)
- [4] Raphael JR. (2023) Android versions: A living history from 1.0 to 14 Computerworld <https://www.computerworld.com/article/3235946/android-versions-a-living-history-from-1-0-to-today.html> (last accessed: 2023-12-10)
- [5] Weber, E. U., Blais, A.-R., & Betz, N. E. (2002). A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making*, 15(4), pp. 263–290. <https://doi.org/10.1002/bdm.414>

# GREEN BANKING IN ALBANIA. A COSTUMER PERSPECTIVE.

## INTRODUCTION

The banking sector around the world is facing the challenges of creating a sustainable banking system as a result of climate change and increased awareness of environmental protection. Banks have begun to focus on protecting the environment while performing their activities, but also by offering green banking products to customers. The purpose of this work is to analyze the knowledge that clients have about green banking products and how willing they are to use these products. Green loyalty and Green trust of bank customers in Albania will also be measured. To measure these indicators, a questionnaire was distributed to bank clients. A total of 220 questionnaires were completed. Customers were asked how much knowledge they have about green banking products, and how willing they are to use these products. This analysis serves the banks, which receive information on how much customers know and want green products. It will also be evidence of the trust of the clients towards the banks regarding the offering of these products and their loyalty by asking them if they were to change banks, they would be more willing to switch to another bank that offers a wide range of green products or they will be more likely to apply for banking products at a bank that offers a wide range of green products. From the analysis of the questionnaire, it is evident that about 60% of clients in Albania have no information about green banking products.

## METHOD(s)

**Survey instrument**  
 The methodology is based on primary data and the research instrument used to conduct the study is the questionnaire. The questionnaire is composed in three main sections, in the first section are questions related to the knowledge that individuals have about green banking and their willingness to use these products. It also includes questions related to Green loyalty, Green trust of bank customers, Green Image, Intention to use green. The second section includes questions about social capital. In the third section, the demographics of the respondents are collected such as age, gender, education level, and income.

**Sampling and Data Collection**  
 The data was collected in the period October 2022- Shkurt 2023. The questionnaire is distributed online customers of banks operating in Albania. A total of 217 questionnaires were completed.

## THE RESULT(S)

Knowledge about green products	Have you heard about green banking products before?	41.9%	58.1%			
		Strongly Disagree	Disagree	NA/D	Agree	Strongly Agree
	How much do you know about green banking products?	49.3%	24.9%	22.6%	2.8%	0.5%
		Strongly Disagree	Disagree	NA/D	Agree	Strongly Agree
Green trust	The bank's environmental image is generally reliable	7.83%	10.14%	27.1%	24.42%	30.41%
	I believe that sustainable banking services are reliable.	7.37%	7.83%	40.0%	36.87%	7.83%
	The bank's environmental claims are trust-worthy	5.99%	6.45%	40.09%	37.33%	10.14%
	I am satisfied with the bank's environmental products and services	5.53%	7.83%	22.58%	23.50%	40.55%
	I would have more confidence in a bank that offers a wide range of green banking products.	7.83%	10.14%	26.73%	24.42%	30.88%
		Strongly Disagree	Disagree	NA/D	Agree	Strongly Agree
Green loyalty	I will recommend this bank because of its environmental Commitments.	5.53%	6.91%	27.65%	24.88%	35.02%
	If I were to change banks, I would be more willing to switch to another bank that offers a wide range of green products	5.53%	9.68%	26.73%	25.81%	32.26%
	I will be more likely to apply for banking products at a bank that offers a wide range of green products.	6.91%	11.98%	27.65%	24.88%	28.57%

## CONCLUSIONS

Bank customers in Albania lack information about green banking products. Approximately 60% of them have not heard of these products. And the clients who have information are noticed to have very little information. Only 3% of them have a lot of information, the others have little or no information. Regarding green trust, most of the clients are neutral. Aferisht 56% e tyre I would have more confidence in a bank that offers a wide range of green banking products. Approximately 56% of them would have more confidence in a bank offering a wide range of green banking products. Also, 56% of customers think that The bank's environmental image is generally reliable. A high level of green customer loyalty is observed. More than half of them will recommend this bank because of its environmental commitments and will be more likely to apply for banking products at a bank that offers a wide range of green products.

## Maximum of seven references from the scientific paper

ernando, M., & Fernando, K. (2017). Study of Green Banking Practices in the Sri Lankan Context: A Critical Review. *Selected Papers from the Asia-Pacific Conference*. Springer Nature Singapore Pte Ltd. [https://doi.org/10.1007/978-981-10-3566-1\\_10](https://doi.org/10.1007/978-981-10-3566-1_10)

Khairunnessa, F. (2021). A Review of the Recent Developments of Green Banking in Bangladesh. *Sustainability*, 13(1904), 1-21. <https://doi.org/https://doi.org/10.3390/su13041904>

Abuatwan, N. (2023). The Impact of Green Finance on the Sustainability Performance of the Banking Sector in Palestine: The Moderating Role of Female Presence. *Economies*, 247(1-23), 11. <https://doi.org/https://doi.org/10.3390/economies11100247>

Akhtar, C., Ismail, K., & Hussain, J. (2014). Social Capital and Organizational Sustainability: Case of Malaysian SMEs. *2nd International Conference on Business Administration, Marketing and Economics*. Athens, Greece.



# Safe working in healthcare

Mátyás, Simon – Óbuda University, [simon.matyas@phd.uni-obuda.hu](mailto:simon.matyas@phd.uni-obuda.hu)  
Jolán, Velencei, PhD - Óbuda University, [velencei.jolan@kgk.uni-obuda.hu](mailto:velencei.jolan@kgk.uni-obuda.hu)

## INTRODUCTION

As a result of the activities of the health sector, the directives, laws and standards impose several special risk assessment obligations for the employer. These risk assessment obligations are key elements of employer measures to prevent work accidents and occupational diseases, and to create safe and health-free work. The aim of the research is to map and identify the connection points of the various risk assessments prescribed in the Hungarian healthcare field, in order to shed light on possible contradictions and redundancies.



### METHOD(s)

The research methodology is based on the analysis of literature and professional documents, as well as the analysis of professional interviews and case studies.

### THE RESULT AND CONCLUSIONS

The expected result of the research is the compilation of a risk assessment method that can especially support the decision-makers of inpatient care institutions in determining the order of necessary measures for safe and non-threatening working conditions and reducing the remaining risks to an acceptable level.

### References

Photos: <https://pixabay.com>  
2/1998. (I. 16.) MüM  
rendelet



# Comparative Analysis of Regional Meat Traceability Information Sharing Practices

Ma Linfei, Óbuda University, ma.linfei@phd.uni-obuda.hu  
 Jolán Velencei, PhD, Óbuda University, velencei.jolan@kgk.uni-obuda.hu

## INTRODUCTION

**Research Topic:** In recent years, the increasing number of meat food safety cases and the outbreak of COVID-19 have eroded consumer trust in meat safety while at the same time triggering an urgent need for strict production standards to ensure meat safety. In this context of uncertainty, meat traceability is a useful tool to increase trust in the production process, of which how meat traceability information is shared is a particularly important aspect.

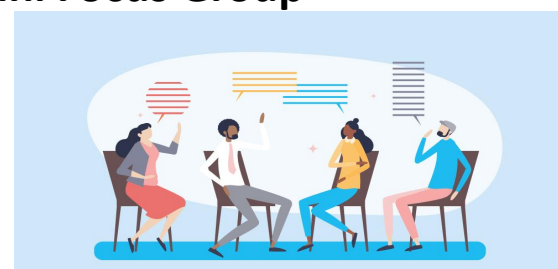
**Research Gap and Aim:** Due to country-specific technological levels, policy contexts, and cultural backgrounds, meat traceability information exchange is difficult to implement. This study will compare meat traceability information sharing practises in the EU, Africa, and China to identify differences, their causes, and future development.



## METHODS



Mini Focus Group



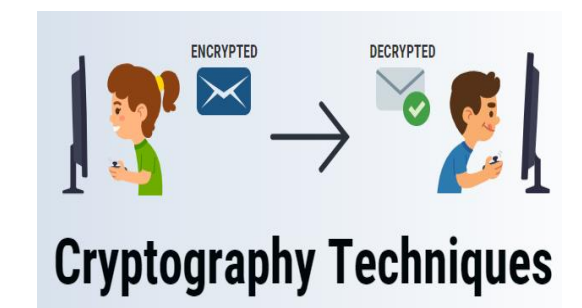
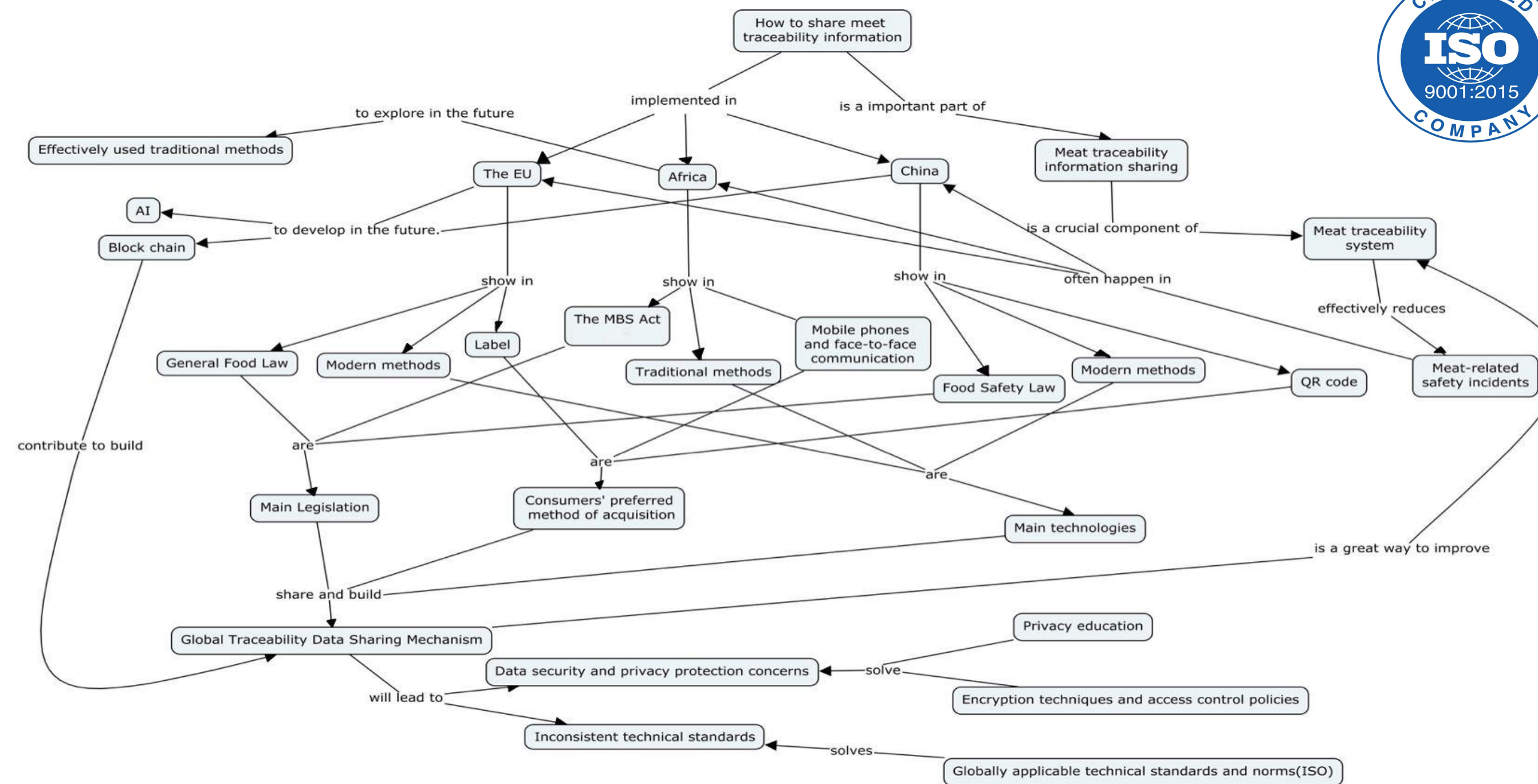
## CONCLUSIONS

**Africa:** Future research could explore how traditional methods can be effectively used to improve supply chain efficiency in African food processing centres

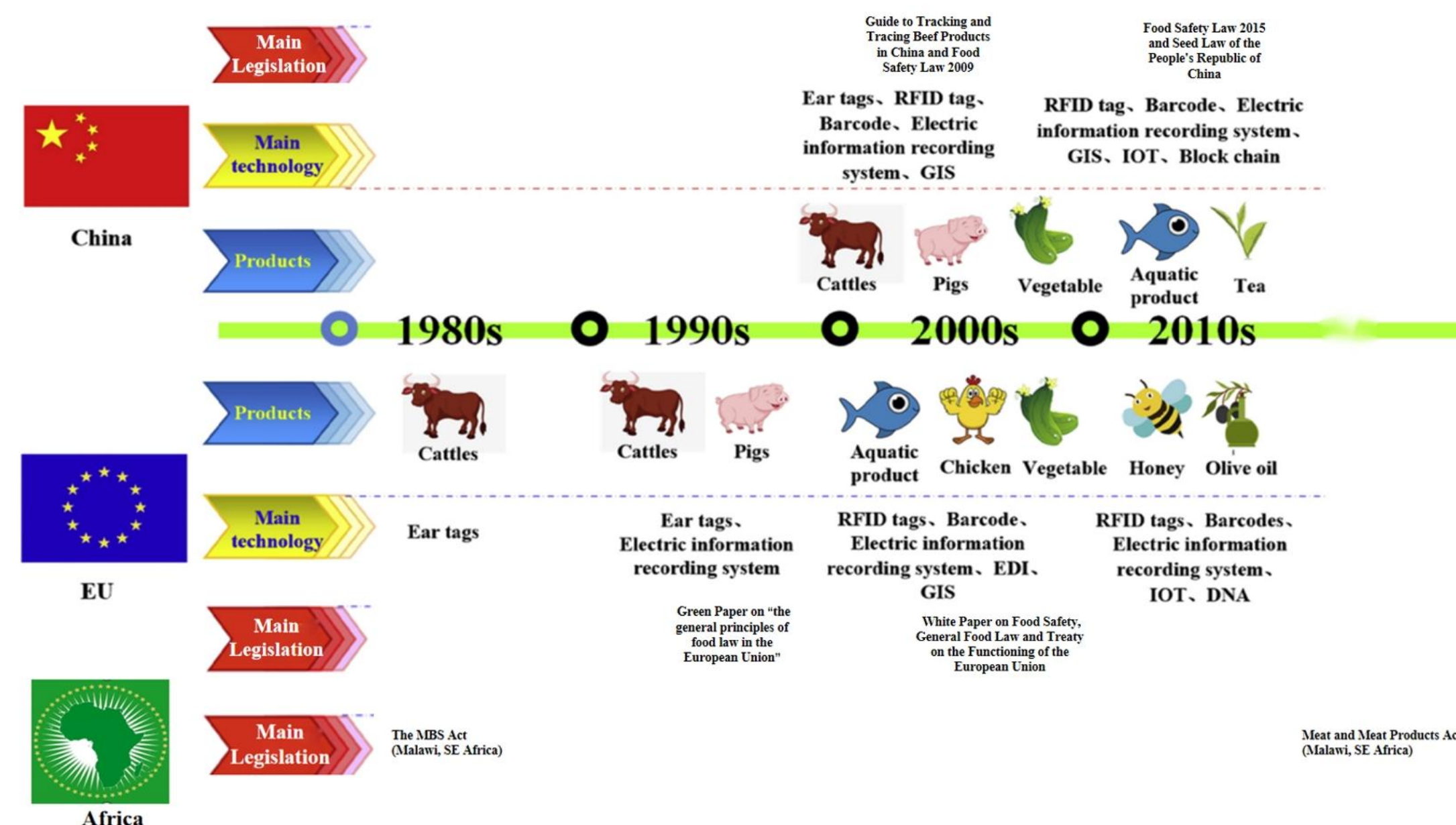
**Europe and China:** as economies where meat supply chains are already very well developed, could focus in the future on:

1. AI could improve traceability system intelligence in food processing.
2. Blockchain could improve the entire food supply chain traceability system, the establishment of blockchain-based transaction systems between China and the EU.

## CONCEPT MAP OF THIS RESEARCH



## HISTORICAL TIMELINE OF TRACEABILITY APPLICATIONS



## MAIN SOURCES





## BEVEZETÉS

Bár jellemzően az egy mennyiségi ismérv szerinti vizsgálat kerül az érdeklődés középpontjába számos esetben, fontos, hogy a vizsgálat tárgyát képező sokaságot más szempontok szerint is rendszerezzük, osztályozzuk. Erre minőségi, területi és időbeli ismérvek szerint is sor kerülhet. Az igazán izgalmas kérdések a megfigyelések során viszont azok, amikor több ismérv szerinti osztályozás esetén kapott értékek együttjárását vizsgálhatjuk meg. Bár számos esetben alapos indokkal feltételezhető az oksági kapcsolat, fontos felhívni a figyelmet arra, hogy az eredmények együttjárása állapítható csak meg megfigyeléssel. Az okság feltárása csak kísérleti úton történhet meg. Az asszociációs kapcsolat során két minőségi és/vagy területi ismérv közötti kapcsolatot vizsgálhatjuk. A kutatás az ilyen kapcsolatok mérésére használt mutatószámokkal foglalkozott, egészen pontosan a Csuprov-féle együttjárásra gyakorolt adott maximális érték hatásának vizsgálatának eredményeit tárja fel a kutatás.

## MÓDSZER

Legyen a keresztábra  $f_{i,j}$  megfigyelt elemeinek sor-oszlop definíciója két,  $A$  és  $B$  változó között  $\sum_i \sum_j f_{i,j} = N$  mellett  $C_i^A$  és  $C_j^B$ , ahol  $i = 2, 3, \dots, s$  és  $j = 2, 3, \dots, t$ , továbbá  $\max(i) = 10$  és  $\max(j) = 10$ .

Ekkor a Csuprov-féle mutató aktuálisan számított értéke:

$$T = \sqrt{\frac{\chi^2}{N\sqrt{(s-1)(t-1)}}}$$

ahol  $\chi^2 = \sum_i \sum_j \frac{(f_{i,j} - f_{i,j}^*)^2}{f_{i,j}^*}$ , ahol  $f_{i,j}^*$  a teljes függetlenség esetén elvárt együttes gyakoriság.

A mutató maximuma, mely kulcsszerepet tölt be az értelemzészor:

$$T_{max} = \sqrt[4]{\frac{s-1}{t-1}} \text{ úgy, hogy } s \leq t \text{ teljesüljön.}$$

Ellenkező esetben a mátrix transzponálása szükséges.

A sztochasztikus kapcsolatot megjelenítő keresztábrás együttes gyakoriságok alapján számított kapcsolatszorosság fix  $T$  értékét feltételezve vizsgáltam a fenti megszorítások mellett a maximum hatását a mutatóra. A szimmetrikus tulajdonságból fakadó előnyök kihasználása okán csupán az átló alatti értékek vizsgálata elegendő a következtetések levonására.

## EREDMÉNYEK

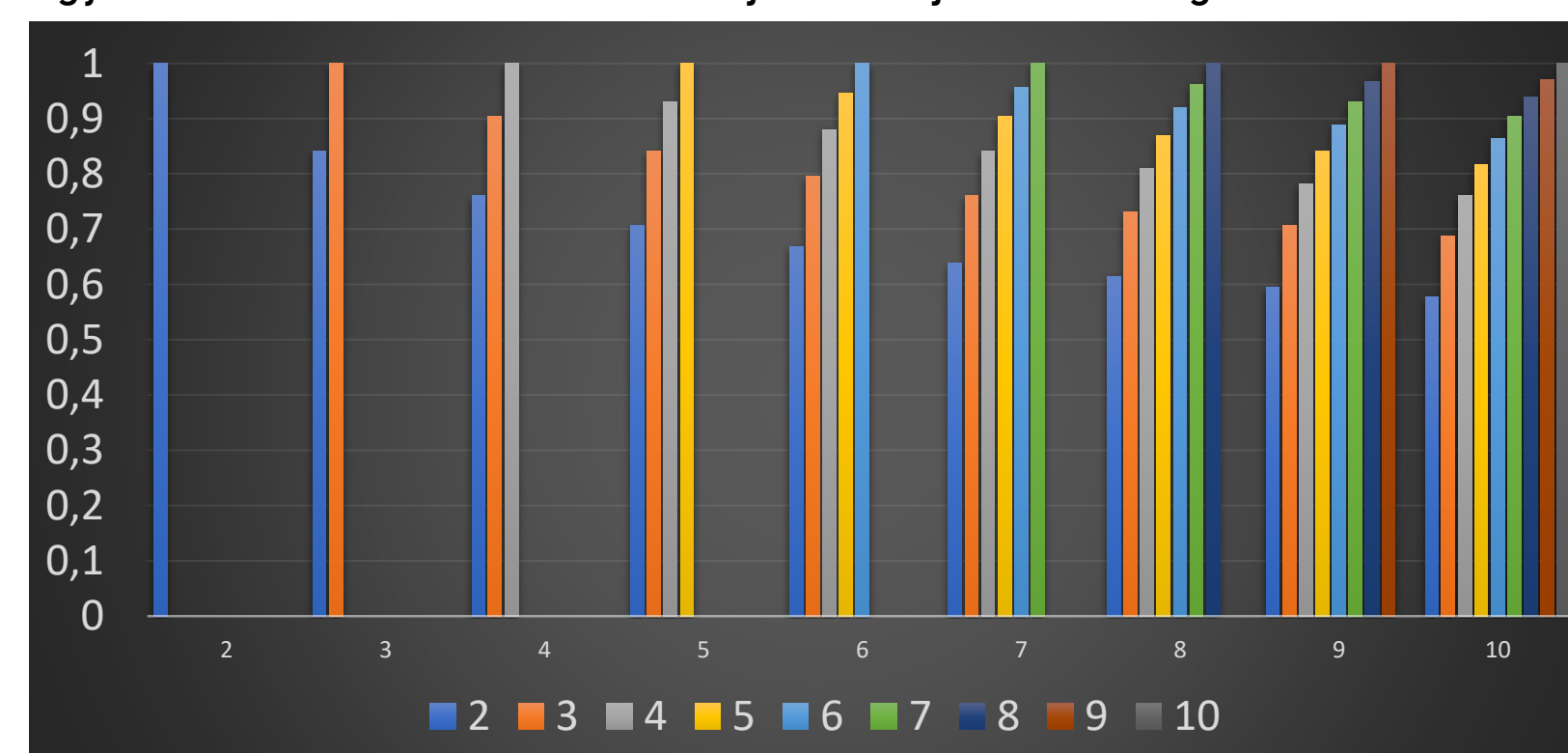
A követelményeknek eleget tevő  $T_{max}$  értékeket tartalmazó tábla (1. táblázat) alapján látható, hogy rögzített  $i$  (vagy  $j$ ) mellett a  $j$  (vagy  $i$ ) érték növelése egyre kevésbé növeli  $T_{max}$  értékét, azaz bár rögzített  $T$  mellett a  $T$  érték relatíve egyre erősebb szorosságot jelez ilyenkor, azaz ugyan növekvő tendenciát mutat, a növekedés mértéke egyre kevésbé jelentős. Amennyiben az előzőekben rögzített  $i$  (vagy  $j$ ) értékének növekedése mellett is tekintjük a  $j$  (vagy  $i$ ) értékek növekedésének hatását, azt is tapasztaljuk, hogy az ilyen irányú változtatások  $i$  (vagy  $j$ ) növelésével is csökkentik minden egyes további  $j$  (vagy  $i$ ) értékekben való 1 egységnyi növekedés hatását a korábbi  $i$  (vagy  $j$ ) értékhez képest is.

$C_i^A$	$C_j^B$									
	2	3	4	5	6	7	8	9	10	
2	1,0000									
3	0,8409	1,0000								
4	0,7598	0,9036	1,0000							
5	0,7071	0,8409	0,9306	1,0000						
6	0,6687	0,7953	0,8801	0,9457	1,0000					
7	0,6389	0,7598	0,8409	0,9036	0,9554	1,0000				
8	0,6148	0,7311	0,8091	0,8694	0,9193	0,9622	1,0000			
9	0,5946	0,7071	0,7825	0,8409	0,8891	0,9306	0,9672	1,0000		
10	0,5774	0,6866	0,7598	0,8165	0,8633	0,9036	0,9391	0,9710	1,0000	

1. táblázat:  $T_{max}$  értékek különböző sor és oszlopszámok mellett.

Forrás: saját szerkesztés.

A szorosság értelmezésében irányadó  $T/T_{max}$  rögzített  $T$  mellett tehát egyre kevésbé nő. Ennek dinamikáját mutatja az 1. ábra grafikusan.



1. ábra:  $T_{max}$  értékek dinamikája.

Forrás: saját szerkesztés

Az 1. ábra rögzített  $i$  (vagy  $j$ ) mellett a  $j$  (vagy  $i$ ) érték lehetséges előfordulásai függvényében mutatja a  $T_{max}$  változtatási hatását, mely minden esetben csökkenő hozzáadott érték mellett közelíti az 1-et.

## KÖVETKEZTETÉSEK

Az osztályozás szempontrendszere által meghatározott  $i$  és  $j$  értékek növelése egyrészt általánosan gyengítheti a kapcsolatot, mivel az egyedi, különböző jellemzőket közelítve egyre inkább széthúzza az elemek sűrűsödését, tehát a mintázatok felfedése ellen hathat, másrészt jelen vizsgálatból általánosan következik, hogy  $i$  és  $j$  értékek növelésével növekvő maximum mellett adott  $T$  érték egyre erősebb kapcsolatot jelez. A két hatás együttes vizsgálata további kutatási irányokat jelölhet ki.

## SZAKIRODALOM

1. Louise Swift and Sally Piff: Quantitative Methods for Business, Management and Finance, Macmillan Education UK, 2014
2. Les Oakshott: Essential Quantitative Methods: For Business, Management and Finance. 6th Edition, Palgrave, 2016
3. Les Oakshott: Quantitative Methods. Palgrave, 2014
4. Robert Donnelly: The Complete Idiot's Guide to Statistics. 2nd Edition, Alpha, 2007
5. Deborah J. Rumsey: Statistics For Dummies. 2nd Edition, Wiley, 2011
6. David Freedman, Robert Pisani, Roger Purves: Statistics (4th Edition), W.W.Norton & Company Inc, 2007
7. Dr. Nagy Viktor (2017): Statisztika I. ÓE-KGK, Budapest, ISBN 978-963-449-056-2



# A zenei hangrögzítő eszközök helyettesítési folyamatának dinamikai vizsgálata logisztikus analízissel

Szilágyi Győző Attila, Óbudai Egyetem, szilagyi.gyozo@kgk.uni-obuda.hu

## BEVEZETÉS

Az elmúlt ötven évben nagymértékű és gyors technológiai fejlődés ment végbe a hangrögzítési eszközök területén. A zenei piacon az új hangrögzítési eszközök egymást követő gyors innovációja miatt az egyes hangrögzítési technológiák gyorsan elavultak és átadták helyüket az új helyettesítő termékeknek. A hangrögzítési technológiához tartozó termékek esetén ez a folyamat több, egymást követő helyettesítési folyamatként zajlott le, aminek során a korábbi zenerögzítő technológiákat, újabbak váltottak fel, kiszorítva a piacról a korábbiakat. A kutatásnak kettős célja volt. Egyrészt, hogy feltárja a helyettesítési folyamatok dinamikai tulajdonságait, másrészt pedig, hogy kimutassa, hogy a zenei piacon a jelenlegi zenerögzítési technológia a termék-életciklus mely fázisában van. A kutatásban a négy legnagyobb volumenben értékesített zenei hangrögzítő eszköz helyettesítési folyamatát vizsgáltam. E négy hangrögzítési eszköz a vinyl (magyar nyelvterületen: bakelit) lemez, az audio kazetta, a CD és a digitális letöltés. Ezek időben egymást követve jelentek meg a zenei piacon, és mivel egymás helyettesítő termékei, piaci elterjedésükkel hatást gyakoroltak egymás eladási dinamikájára, és termék életciklusuk változására. A kutatás feltárta ezeket a hatásokat és azonosította az egyes zenei hangrögzítő eszközök termék életciklusait.

## MÓDSZEREK

A kutatás során az amerikai zeneeladási adatokat használtam a 1973-tól 2022-ig tartó időszakban (RIAA, 2023), a négy legnagyobb eladási volumennel rendelkező zenei hangrögzítő eszközre vonatkozóan. A kutatásban logisztikus helyettesítési modellezést alkalmaztam, amivel vizsgálható az egyes termékek életciklusához tartozó növekedési és hanyatlási dinamika a helyettesítő termékek piaci megjelenésének összefüggésében (Modis, 1992). A logisztikus függvény megjelenését a növekedéssel kapcsolatban először Verhulst vizsgálta (Verhulst, 1884), de a logisztikus modell érvényessége különböző biológia, technikai, gazdasági területeken is megfigyelhető (de Solla Price, 1992). Az elemzés során az egyes hangrögzítő eszközök éves eladási adataiból mindegyikre egy saját, éves kumulált adatsort kell képezni, majd arra egy szimmetrikus logisztikus növekedési görbét illeszteni. A szimmetrikus S-alakú logisztikus görbe az általános logisztikus görbének egy speciális változata (Fokasz, 2004). Ezután az egyes növekedési S-görbéket linearizálni kell, amihez a Fisher-Pry transzformációt kell alkalmazni (Marchetti, 1986). A transzformáció eredményeképpen azt kapjuk meg, hogy az idősor egyes adatai, milyen arányban állnak a szaturációs szinthez képest. Logaritmusos skálát alkalmazva, ha az adatokat megjelenítő pontsor egy egyeneshez illeszkedik, akkor egyrészt igazolható, hogy a logisztikus leképezés megfelelő modell, másrészt kimutatható, hogy mennyire pontos az illeszkedés a növekedési görbére, és hogy milyen növekedési dinamikával rendelkezik a vizsgált idősor (Fisher és Pry, 1971). Az elemzés utolsó lépéseként az egyes logisztikus görbéket együttesen egy normalizált grafikonon kell ábrázolni, ami megmutatja az egyes időpontokhoz tartozó arányokat, valamint a növekedés és csökkenés dinamikáját is.

## EREDMÉNYEK

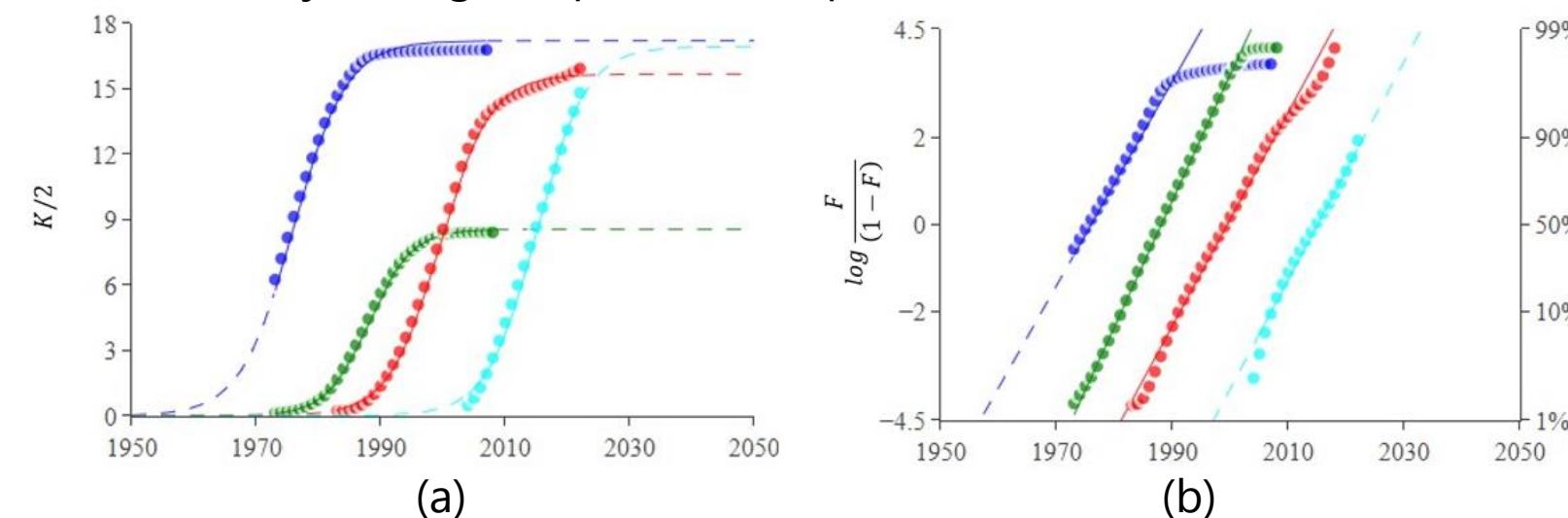
A logisztikus helyettesítési modellel végzett elemzés kvantitatív eredményei alapján számszerűsíthetővé vált az egyes zenei hangrögzítő eszközökhöz tartozó logisztikus görbék meghatározó pontjai, úgy mint az új eszköz termék-életciklusának kezdő (1%) és végpontja (99%), a fejlődés inflexiós pontja (tm), ahol a piaci növekedés jellegét vált, az alsó és felső könyökpont, ahol az érdemi növekedés kezdődik (10%), illetve befejeződik (90%), a növekedési ráta (r), valamint a szaturációs szint (K), ami a görbe által elérhető maximum. Az eredmények az 1. táblázatban láthatók.

	K	r	tm	1%	10%	50%	90%	99%
Vinyl	34.08	0.24	1976	1957	1967	1976	1985	1996
Kazetta	17.10	0.29	1988	1972	1981	1988	1996	2004
CD	31.40	0.25	1999	1981	1991	1999	2008	2018
Letöltés	34.01	0.41	2012	2000	2006	2012	2017	2023

1. Táblázat. Az egyes logisztikus görbék meghatározó értékei

Forrás: Saját tábla

Látható, hogy annak ellenére, hogy az RIAA adatbázisban csak 1973-tól kezdődően vannak adatok, a logisztikus leképezés visszamenőleg is szinte pontosan meghatározta az első vinyl lemez piaci belépési időpontját, mert a valóságban az első vinyl sztereo lemez 1958-ban jelentek meg a piacon. A modell a CD esetén is hasonló pontosságot ért el, mert 1982-ben jelent meg az első CD lemez kereskedelmi forgalomban (Bakonyi et. al, 1994), és 2012-ben állították le a gyártást (INDEX, 2011). A táblázatban 2018 látható, de ha megnézzük az 1.(a) Ábrát, látható, hogy a CD eladások 2012 után is emelkednek ugyan, de az adatok már nem illeszkednek a logisztikus görbére. Ennek oka, hogy a CD az antikvár kereskedelemben is megjelent, és a gyűjtők egy új piacot nyitottak a CD eladások területén. A modell ezt a jelenséget is pontosan képezte le.



1. Ábra. (a) Az egyes zenerögzítő termékek logisztikus görbéi. (b) A logisztikus görbék Fisher-Pry transzformációja

Forrás: Saját ábra

Az 1. Ábrán megfigyelhető, hogy a kazetta viszonylag rövid termék-életciklusa abból adódik, hogy a CD megjelenése a kazetta logisztikus görbéjének jóval az inflexiós pontja előtt jelent meg, jóval az alsó könyökpont előtt. Ez az oka, hogy a kazetta sosem tudta elérni a vinyl és a CD eladási eredményeit. A letöltés megjelenése már sem a vinyl sem a kazetta piaci szereplését nem befolyásolta, mert piacra lépésekor azok már elérték szaturációs szintjüket, de láthatóan a CD eladásokra nagy hatást gyakorolt. A modell szerint a letöltések logisztikus görbéje is elérte a felső könyökpontot, de ennek több értelmezése is lehetséges.

## KÖVETKEZTETÉSEK

A kutatási eredmények igazolták, hogy a vizsgált területen is alkalmazható a logisztikus helyettesítési módszer az egymást váltó, illetve egymással versenyző termékek elemzésére. A módszerrel pontosan feltárható a termék-életciklus görbe, és meghatározható az adott termék növekedési dinamikája mind egyénileg, mind pedig a versenytársakkal kibővített piaci térben.

A kutatási eredmények feltárták az egymást váltó zenerögzítési technológiák termék-életciklusainak fázisait, és a növekedés és hanyatlás dinamikai jellemzőit. Kimutatható, hogy a vinyl lemez piacán egy nagyon kismértékű emelkedés érzékelhető, ami abból adódik, hogy az antik lemez már gyűjteményekben található, és jelenleg csak kismértékű gyűjtői forgalom létezik. A CD esetén is azonosítható további emelkedés, de ez nagyobb, mint a vinyl esetében, ami abból adódik, hogy a nagyszámban kiadott, de el nem adott CD-k még kereskedelmi forgalomban is elérhetőek és ezen a területen is kialakult egy retro jelenség, és az antik kereskedelem. Az eredmények alapján a zenerögzítési eszközök piacán jelenleg egyeduralkodó a letöltés, és a növekedés felszálló ágban van. A modell a letöltések logisztikus görbéjének dinamikájával kapcsolatban azt a becslést adta, hogy az közel jár a felső könyökponthoz. Ebből kétféle következtetést lehet levonni. Az egyik, hogy mivel mind a logisztikus, mind pedig a Fisher-Pry leképezés egyenest ad, még nem dönthető el, hogy a görbe túljutott-e az inflexiós pontján, ezért nem becsülhető meg hibahatáron belül a növekedési előrejelzés. Amennyiben elfogadjuk, hogy a modell helyesen becsli, hogy a felső könyökpontnál tart a letöltések logisztikus görbéje, abban az esetben két másik következtetés lehetséges. Az egyik, hogy egy új zenehozzáférési szolgáltatás megjelenése valószínűsíthető a zenei iparban, a másik, hogy a nem jogszerű letöltések komoly hatást gyakorolnak a letöltési piacra, és ez által komoly fenyegetést jelentenek a jogszerű, fizetős zenei letöltési platformok számára.

## HIVATKOZÁSOK

- RIAA, (2019). Recording Industry Association of America, U.S. Music Revenue Database. <https://www.riaa.com/u-s-sales-database/>
- Modis, T. (1992). Predictions – Society's Telltale Signature Reveals the Past and Forecasts the Future.
- Verhulst, P. (1845). Nouveaux mémoires de l'Académie Royale des Sciences et Belles-Lettres de Bruxelles. L'Académie Royale de Bruxelles et de l'Université Louvain. [http://resolver.sub.uni-goettingen.de/purl?PPN129323640\\_0018](http://resolver.sub.uni-goettingen.de/purl?PPN129323640_0018).
- de Solla Price, D. (1979). Kis tudomány – Nagy tudomány. Akadémiai Kiadó, Budapest.
- Fokasz, N. Káosz és fraktálok (2000). Új Mandátum Könyvkiadó, Budapest.
- Marchetti, C. (1986), Longevity and Life Expectancy, Technological Forecasting and Social Change. Vol. 55. pp. 281-299.
- Fisher, J.C., & Pry, R.H. (1971). A Simple Substitution Model of Technological Change, Technological Forecasting and Social Change. Vol 3. pp. 75-88.
- Bakonyi, G., Drótos, L., & Kokas, K. (1994). Korongba zárt gondolatok. Scriptum Kft.-ComputerBooks Kft. Budapest.
- INDEX, (2011). Sirathatjuk a CD-t is. [https://index.hu/kultur/zene/2011/11/19/mp3\\_kills\\_the\\_cd\\_star/](https://index.hu/kultur/zene/2011/11/19/mp3_kills_the_cd_star/)