

**Varazdin Development and Entrepreneurship Agency and University North, Croatia**  
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**University of Dubrovnik, Croatia**

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**Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat, Morocco**

**Ecole Nationale de Commerce et de Gestion de Tanger - Abdelmalek Essaadi University, Morocco**

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## **Book of Proceedings – Selected Papers**

124<sup>th</sup> esd Bangkok 2025

# **Bridging Economies: The Future of Trade, Investing and Connectivity Between Asia and Europe**

Editors:

**Bordin Rassameethes, Mario Tomisa, Kasin Boonpal**



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# **INFORMED OR INDIFFERENT? GENERATION Z'S ATTITUDE AND BEHAVIOUR TOWARD GOVERNMENT PRICE CONTROL IN CROATIA**

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## **ABSTRACT**

*Some would perhaps agree that "unbothered", "indifferent", mostly virtually invested, and having a "go-with-the-flow" state of mind are common descriptors of Generation Z. However, would these truly be the best words to describe Generation Z when it comes to consumer rebellion in times of economic hardship? In Croatia, consumer voices grew stronger in the beginning of 2025, expressed through a retail sector boycott due to high prices, ultimately forcing the government to intervene by implementing price control mechanisms. Croatian consumers have shown unity in the opinion that the current growth in retail prices is unsustainable, given that wages and pensions cannot keep up with inflation. But what about those who will specifically bear the burden of being the voice of consumers in the future and make decisions on where to spend their hard-earned money? By exploring the attitudes and behaviour of Croatia's Generation Z in the ongoing consumer retail boycott and government-enforced price control, this research aims to answer several key questions. Is Generation Z in Croatia aligned with the rest of the nation in amplifying consumers' voices? Are they aware of the causes that led to this boycott? Do they trust that the government has their best interests as consumers in mind? What is their attitude towards government price control intervention, and in what form have they supported, do they support, or do they plan to support the retail boycott? These are among the key topics explored in this study. Therefore, this study examines Generation Z in Croatia to determine whether its members, as part of a generation that is no stranger to boycotting brands and individuals over perceived wrongful actions, can exhibit the same enthusiasm in their consumer behaviour during times of economic hardship.*

**Keywords:** *Consumer behaviour, Generation Z, Government intervention, Price control, Retail sector*

## **1. INTRODUCTION**

In order to protect the most vulnerable citizens and ease the growing inflationary pressures in Croatia, the government introduced price limits on thirty essential products in September 2023, whereas by the end of January 2025, this list was expanded to include forty products more, due

to Croatian consumers engaging in a collective consumer boycott.<sup>1,2</sup> News of the planned boycott spread at lightning speed across Croatia and beyond, resonating throughout Europe. Consumers were urged to use their purchasing behavior as a means of demonstrating to both retailers and the government that they were unwilling to pay more than necessary for everyday products. The scale of participation in the boycott was striking, highlighting widespread public dissatisfaction. But what role did Generation Z play in this movement, and how did they respond? This paper aims to provide the first insights into these questions. Based on a review of the existing literature and available research, it represents a pioneering effort to bridge the scientific gap in the study of consumer activism in the form of boycotts, situating it within a generational framework - specifically, that of Generation Z. This study serves as an exploratory and preliminary investigation, aiming to provide initial insights into the behavior of Generation Z in the context of consumer activism - specifically, a boycott. By conducting primary research during the ongoing consumer boycott in Croatia, the study seeks to establish foundational guidelines for understanding how this generation engages with such movements. Beyond the general limitations of existing literature on consumer activism, research on consumer boycotts remains relatively scarce. More importantly, to the best of our knowledge, there is an evident gap in studies examining how young consumers, particularly Generation Z, respond to and participate in such actions. This paper, therefore, attempts to address this gap by offering a first look into their behavior and attitudes in this unique economic and social context. The paper is structured to first present an introduction, followed by a comprehensive review of the literature on consumer behavior and attitudes in the context of government price regulation and consumer boycotts. Next, the methodology employed in the research is outlined, along with an analysis of the obtained results. Finally, the paper concludes with recommendations for future research and discusses the broader market implications of the findings.

## 2. LITERATURE REVIEW

Given the limited research on consumer retail boycotts and their attitudes toward price interventions, this literature review is structured chronologically, in order to provide a clearer understanding of how this topic has evolved over time. Barksdale, Darden, and Perreault (1976) argue that inflation has a significant influence on consumer attitudes. During periods of rising prices, consumers often attribute the increasing costs of goods to businesses, particularly intermediaries. Although the precise impact of inflation on consumer perceptions remains unclear, the authors suggest that the rapid rise in prices may have, to some extent, diminished the effectiveness of both business and government initiatives designed to safeguard and promote consumer interests. However, French, Barksdale, and Perreault (1982) found that consumers do not perceive themselves as entirely powerless in response to inflation. The majority of respondents believed that refusing to purchase overpriced products could be an effective strategy for curbing price increases. In their view, this form of consumer-driven action was seen as a more effective approach than government-imposed price controls. Similarly to previous paper, Thies (1988) suggests that consumers' level of knowledge significantly influences their attitudes toward economic policies, including price decontrol. On the other hand, Friedman (1991) presents consumer boycotts as a viable alternative to government intervention in regulating market practices, suggesting that modern consumers prefer collective

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<sup>1</sup> <https://www.france24.com/en/live-news/20250130-fury-over-prices-in-croatia-sparks-growing-retailer-boycotts> (Retrieved on March 19<sup>th</sup> 2025)

<sup>2</sup> <https://www.euractiv.com/section/agriculture-food/news/wave-of-discontent-over-food-prices-spreads-through-eastern-europe/> (Retrieved on March 19<sup>th</sup> 2025)

consumer action as a means of influencing market conditions. However, Morton (2001) explained that government's initiatives to protect the consumers, are not always being perceived as positive, highlighting that price controls are typically introduced as a reaction to consumer dissatisfaction rather than as a well-planned economic strategy, which could disrupt the natural market dynamics. The study of Klein, Smith, and John (2002) highlights how consumers typically do not engage in boycotts for a single reason, meaning their participation is shaped by a combination of psychological, ethical, and economic factors. Same authors continued to explore this topic in 2004, stating that some consumers may choose not to participate, justifying their decision by considering potential negative consequences of the boycott, the temptation to free-ride on the efforts of others, or the belief that their individual actions will not have a meaningful impact. Devlin (2006) examines consumer attitudes toward government regulation in retail financial services, implying that increased exposure to financial markets leads to a heightened awareness of potential risks and the role of regulation in protecting consumer interests. Authors Dutta, Biswas and Grewal (2007) examined consumers' trust in price policies, finding that when consumers realize they have been misled by pricing strategies, any form of compensation will not be sufficient to restore their trust. Another paper that pointed out the negative aspects of price control is the one by Montgomery, Baron and Weisskopf (2007) that highlighted the historically negative consequences of price controls in this sector, explaining that such regulations often exacerbate shortages and lead to higher overall economic costs. Previous finding is supported by Nillesen and Pollitt (2007), showing that expected price reductions were not fully realized, therefore leading to dissatisfaction and a perceived failure in delivering consumer welfare benefits. Wolk and Spann (2008) examine how reference prices influence consumer bidding behavior in interactive pricing mechanisms, underscoring the importance of transparent and credible pricing information, as consumers seek to ensure they are not overpaying relative to other market alternatives. In contrast, Palla, Boutsouki and Zotos (2010) argue that despite encountering unfair pricing, most consumers do not take strong action against it, enabling retailers to continue these practices with minimal consequences. Du, Jiao, Huang, and Zhu (2014) are also among those who show the other side of price regulation coin, explaining that when government measures are perceived as insufficient or ineffective, consumers may lose trust in the market, leading them to seek alternative products or even boycott certain brands. Similar to last mentioned authors, Wu, Zhang, and Qiao (2015) proved that price interventions failed to influence consumer behavior or alter perceptions of healthcare costs, suggesting that price regulations alone were not sufficient to address broader affordability concerns. Makarem and Jae (2015) analyzed consumer boycott behavior through Twitter discussions, highlighting that boycotts are not solely driven by economic concerns but also by broader ethical and psychological motivations. Bond and Saggi (2017) examine the effects of price controls, stating that price regulations may lead to lower product quality and potential delays in availability, raising concerns about long-term market efficiency and innovation incentives. The study of Moshiri (2020) found that consumer perceptions of price controls vary depending on economic and geographical contexts, suggesting that the effectiveness of such policies is influenced by local market conditions and societal expectations. Research done by Palacios-Florencio et al. (2021) showed that when consumers perceive a boycott as desirable, appropriate, and morally justified, they are more likely to engage in it. Additionally, the findings indicate that boycotts serve as an emotional outlet. Hur and Faragher-Siddall (2022) examined young consumers' attitudes toward government intervention, revealing a complex relationship



with regulation. While they support the policies such as taxation, their actual behavior is often influenced by price concerns and doubts about the effectiveness of these interventions. Arikan et al. (2022) analyzed consumer preferences and regulatory impacts in the credit card market, finding that while consumers generally appreciate regulations that reduce costs, their decision-making is still strongly influenced by non-price features offered by the banks. The research done by Ke, Yan and Ji (2023) suggests that consumers perceive government subsidies as beneficial, especially when they lead to lower costs and greater availability of sustainable alternatives. Billerbeck, Breitschopf and Preuß (2023) examined consumer perceptions of price regulation, finding that while regulated pricing is intended to protect consumers, it does not necessarily result in higher satisfaction. Furthermore, Billerbeck et al. (2024) emphasized that a combination of well-designed regulations and their collective impact plays a crucial role in shaping consumer perceptions. Šindelář and Budinský (2024) explored the effects of consumer protection regulations in financial markets, finding that young consumers are significantly influenced by government regulations when making financial decisions, while Ge and Chen (2025) found that excessively generous subsidies may create consumer dependency on financial incentives, leading to a decline in demand once subsidies are withdrawn.

### **3. METHODOLOGY**

To gain a deeper understanding of the behavior and attitudes of Generation Z students at the Faculty of Economics and Business in Dubrovnik, a survey was conducted utilizing a questionnaire. The questionnaire was created via Google Forms and distributed throughout February 2025. Students were informed about the survey and invited to participate through multiple channels; including professors, university secretariat, administrative offices, and online learning platform. The questionnaire began by asking the participants whether they had actively contributed to the ongoing boycott in any way. For those who had not participated, the questionnaire also explored their reasons for abstaining from the boycott. Furthermore, the questionnaire assessed the participants' awareness of the ongoing retail and consumption boycott in Croatia, prompted by rising prices of goods and services. It then explored their knowledge of the boycott and government interventions, including the reasons behind the current boycott and price increases, awareness of the timeline for implementing intervention measures, and familiarity with the specific products and retail chains recommended to boycott. Additionally, respondents were asked about their recollections of previous government interventions, whether during the current boycott or in earlier periods. Following these introductory questions, the survey included a series of statements that participants were asked to evaluate using a balanced 5-point Likert scale, with a neutral midpoint. The scale ranged from 1, indicating "I completely disagree," to 5, indicating "I completely agree." The questionnaire included a series of statements that respondents were asked to evaluate, covering various aspects of the boycott. These statements were developed based on the work of Klein, Smith & John (2004) and Palacios-Florencio et al. (2021). The first section of the questionnaire assessed respondents' perceptions of the boycott's effectiveness (five statements), their personal attitudes toward the boycott (four statements), their behavior during the boycott (five statements), and their intentions to participate in it (five statements). Additionally, two sets of questions focused on the role of the government in the boycott. The first one measured the perceptions regarding the government's interventions effectiveness (four statements), while the second one examined the perceptions relating to the government's responsibility for price increases (three statements).

As no standardized questionnaire was found in the existing literature that specifically captures consumers' perceptions of government intervention in pricing (to our best knowledge), the statements on government effectiveness and responsibility were carefully developed, drawing inspiration from the work of Devlin (2006) and the OECD (2024).

#### 4. RESULTS

The convenience sample gathered in this research, consisted of 102 students from the Faculty of Economics and Business in Dubrovnik belonging to generation Z, of whom 69,6% were female and 30,4% were male. Regarding their level of study, 46,1% were enrolled in university undergraduate programs, 29,4% were students pursuing graduate university studies, 14,7% were in professional undergraduate programs, 2% were engaged in postgraduate studies, and one respondent did not state his level of study. As shown in Table 1, when asked *"Have you supported the current boycott of stores and consumption in Croatia in any way so far?"*, as many as 89,2% declared that they supported the boycott in some form (e.g., avoiding shopping on Fridays, avoiding shopping at stores and businesses that were on the avoidance list, avoiding purchasing products that were recommended not to be bought, deliberately shopping on days when the boycott was not in effect, or some other form of support for the boycott), while only 10,8% said that they did not support the boycott in any way.

<b>Have you supported the current boycott of stores and consumption in Croatia in any way so far?</b>					
<b>Statistics</b>		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>Valid</b>	Yes	91	89,2	89,2	89,2
	No	11	10,8	10,8	100,0
	Total	102	100,0	100,0	

*Table 1: Boycott support in numbers  
(Source: Paper authors)*

The most common reason for not supporting the boycott, cited by 2,9% of respondents, was that they do not shop frequently enough at the affected stores for their participation to make a difference. Similarly, 1% felt that their involvement was unnecessary since enough people were already participating. Another 2,9% expressed concerns that the boycott unfairly affected small, local businesses, which would suffer more than large retail chains. Additionally, 1% worried that the boycott could jeopardize jobs in the retail sector, whereas 1% stated that they did not believe it could lead to price reductions, while another respondent argued that avoiding shopping on Fridays would simply shift purchases to Saturdays, making the boycott ineffective.

<b>Statistics</b>	<b>Boycott usefulness</b>	<b>Boycott behaviour</b>	<b>Boycott attitude</b>	<b>Boycott intentions</b>
<b>Valid</b>	102	102	102	102
<b>Missing</b>	0	0	0	0
<b>Mean</b>	3,88	3,40	3,49	3,70
<b>Std. Deviation</b>	0,95	1,07	1,13	0,93

*Table 2: Boycott usefulness, behaviour, attitude and intentions statistics  
(Source: Paper authors)*

The results presented in Table 2, reveal important insights into how respondents perceive and engage with the boycott. Respondents generally perceived the boycott as being useful, with its mean (Mean = 3,88) indicating that most responses are clustered around this positive perception. However, when it comes to actual boycott behaviour, the mean is slightly lower (Mean = 3,40) suggesting that while many respondents support the boycott in theory, not all engage in active participation. Attitudes toward the boycott is measured with a mean (Mean = 3,49) showing a slightly positive stance toward the movement. Finally, boycott intentions reflecting the likelihood of future participation, scored a mean (Mean = 3,70) suggesting that many respondents intend to continue to support the boycott, although there is still some variability in how committed individuals are to future participation. When asked what they thought were the reasons behind the general price increase in Croatia, one of the most frequently mentioned reasons was inflation. Respondents believe that inflation is a global trend, but that it is particularly noticeable in Croatia due to poor economic policies and weak consumer protection measures. Another notably frequent reason stated, was the introduction of the euro, allowing retailers and businesses to unjustifiably raise prices. Respondents also expressed that the transition to euro was poorly regulated, allowing retailers to exploit the situation. Furthermore, they often mentioned the **retailers' greed** as a major reason for price increase, together with the government being responsible for poor economic policies. Others cited higher business costs, taxation, rising energy prices, and Croatia's heavy reliance on imports. Last but not least, current global conflicts were listed as one of many price increase reasons. Similar factors when expressing opinions about the reasons behind this boycott were mentioned, adding the prices of essential goods, low purchasing power, prices in Croatia being significantly higher than in other EU countries, as well as the general increase of consumer awareness. Regarding the time period the government introduced the anti-inflation package, the majority of respondents (73,5%) stated they do not recall or are unaware when did that take place. In contrast, only 26,5% of respondents stated that they do remember/know when the package was introduced. However, the responses of those stating they do remember, indicate a variety of timeframes, with most mentions referring to 2023, particularly September and late 2023 (October/November). Some respondents mentioned the year 2022, while others pointed to 2024 (Winter/December). When asked about how many products the government currently has price restrictions on (package/basket of products), 77,5% of respondents expressed they do not know how many products are currently subjected to government-imposed price restrictions, while only 22,5% are aware of this information. This suggests that public's awareness of the government's current price control measures is relatively low, with more than three-quarters of respondents lacking knowledge about the policy specifics. Respondents who stated that they know the number of price-restricted products provided their estimates, mentioned figures of 70, 50, and 40. Those considering themselves to be aware of the actual products being recommended to avoid purchasing (40,2%), listed carbonated drinks, bottled water, detergents, cleaning products, dishwashing supplies, chocolate, sweets, pastry, dairy products and meat products as part of the boycott recommendations. The data also indicates that the majority of respondents (74,5 %) were aware of calls to avoid major retail chains, with Konzum, Lidl, and Studenac emerging as the primary focus of consumer action. When asked whether they remember the government intervening in the prices of certain products, services, or economic sectors in the past (excluding the current boycott), 70,6% of respondents stated that they did not recall any such interventions, while 29,4% said they did.

Among those who recalled interventions, the most frequently mentioned periods were during the COVID-19 pandemic, as well as fuel price regulations and electricity/gas price adjustments implemented in response to inflation and broader economic crises.

Statistics	Government effectiveness	Government responsibility
<b>Valid</b>	102	102
<b>Missing</b>	0	0
<b>Mean</b>	2,19	3,94
<b>Std. Deviation</b>	0,90	0,87

*Table 3: Government effectiveness and responsibility statistics  
(Source: Paper authors)*

The data given in Table 3, represent the respondents' sentiment toward government's effectiveness and responsibility regarding this boycott and economic policies. The mean score (Mean = 2,19) suggests that respondents generally view government interventions as ineffective. On the other hand, the mean score for government responsibility (Mean = 3,94) indicates that a strong majority of respondents believe the government holds significant responsibility for current economic conditions in Croatia. Both results could be interpreted as a general lack of students' trust in government measures, paired with a strong belief that the government plays a major role in shaping Croatia's economy.

## 5. CONCLUSION

Examining the findings of this study, which represent only the first insights into the actual behaviors and attitudes of the younger generation in the context of a widespread consumer boycott in Croatia, it is evident that Gen Z students are neither indifferent to unfair pricing practices nor oblivious to the challenging position of Croatian consumers in the current economic climate. The research shows that an overwhelming majority of surveyed students actively engage in the boycott, attribute significant responsibility to the government for the prevailing economic situation, and perceive its measures as largely ineffective. Beyond their participation, students view the boycott as a highly valuable tool for consumer advocacy and express a strong willingness to support similar initiatives in the future if circumstances necessitate further action. To the best of our knowledge, this is the first study to examine consumer behavior and attitudes in the context of consumer boycotts and government price interventions, with a specific focus on Generation Z. Naturally, this paper serves as a preliminary exploration, laying the groundwork for future research. The next steps involve expanding the sample size, refining the questionnaire statements, critically assessing existing models of consumer behavior in the context of economic resistance, and ultimately developing a comprehensive model that integrates these frameworks. Such a model could hopefully provide a solid foundation for further studies on similar consumer movements. The findings of this study suggest that the market must recognize young consumers' willingness to boycott unfair market dynamics, and that they should not be underestimated simply due to their age. This is particularly relevant given that Generation Z is deeply engaged with social media, where they are exposed to diverse sources of information and independently form their own conclusions about issues of interest. In other words, this research challenges the stereotype that Gen Z is fundamentally different from older generations in terms of being less concerned with economic and social issues.

Their active support of the boycott demonstrates a level of consumer awareness and strategic thinking more commonly associated with experienced consumers. The long-term boycott implications as to whether it will lead to sustained consumer consciousness regarding spending

habits, and yield tangible market outcomes remain uncertain. Furthermore, it remains to be seen if the government and retail sector will take meaningful lessons from this movement. However, one thing is clear, Gen Z will be paying attention, take notes – and act.

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# EFFICIENCY OF MERGERS AND ACQUISITIONS (M&AS) WITH DATA ENVELOPMENT ANALYSIS (DEA): A BIBLIOMETRIC STUDY

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## ABSTRACT

*Companies engage in mergers and acquisitions (M&A) for several strategic reasons, aiming to enhance their competitive position and create value. Moreover, the research area of M&As has been a significant research topic in scholarly literature. The extensive body of work on M&As reflects their importance as a strategy for corporate growth, market expansion, and value creation. There is a growing interest in efficiency measurement and evaluation of these transactions. In this context, this study aims to examine the increasing literature on M&A efficiency evaluation, with the application of the leading non-parametric DEA methodology. Utilizing a bibliometric tool and quantitative approach, the research identifies patterns and trends in publications globally. The key terms “DATA ENVELOPMENT ANALYSIS” and “MERGERS AND ACQUISITIONS” were used for the search of one of the most renowned global scientific databases, namely the Web of Science databases with no limitation to the date of publication. The findings of the study reveal the annual scientific production, most relevant authors, top-cited and most relevant sources, most relevant affiliations, and thematic map of themes that are mostly tackled and associated with the application of DEA in M&As. The knowledge and publications synthesis could help highlight the implications of the DEA application and development in the M&As research area, thus serving as a foundation for policymakers, practitioners, and researchers navigating the evolving application of DEA methodology in research M&As’ efficiencies.*

**Keywords:** *data envelopment analysis, mergers and acquisitions, bibliometric study, literature review.*

## 1. INTRODUCTION

Performance can be defined as “the highest degree of utilization of all available resources of businesses to gain a competitive advantage”. Performance measurement, on the other hand, is defined as “the process of collecting data regularly and systematically, analyzing and reporting the collected data to keep track of the resources used by a business or an organization, products or services and outputs of this business or organization” (Ersoy, 2021). Recently, efficiency and performance measurement have been “a subject of tremendous interest as organizations have

struggled to improve productivity” (Cook & Seiford, 2009). For this purpose, both parametric and non-parametric methods are used. Parametric methods include Stochastic Frontier Analysis (SFA), which uses econometric techniques to estimate efficiency from residuals, while non-parametric methods like Data Envelopment Analysis (DEA) use linear programming to assess efficiency relative to best practices (Moshiri et al., 2011). Either way, it has become crucial to understand and implement efficiency measurements for optimal resource allocation and performance auditing in any sector. Moreover, considering the large amount of M&A transactions recently (i.e. more than 790,000 transactions of M&A since 2000, with a known value of over 57 trillion USD (IMAA, 2025)), the question of the efficiency of M&A transactions is posed. Namely, research on mergers and acquisitions (M&A) efficiency reveals various aspects of this complex process. The efficiency and productivity evaluation process commonly employs the Data Envelopment Analysis (DEA) method as a performance measurement tool in various fields (Zubir et al., 2024). Therefore, the main objective of this bibliometric literature research is to identify and analyse the relevant published studies in the Web of Science databases regarding the efficiency of M&A transactions with the application of the DEA methodology. Therefore, in order to sum up and highlight the application of DEA in efficiency measurement and evaluation of M&As, we did not set any restrictions on the date of publication, type of publication or the research subject. Thus, this study will reveal the overall trends in publication in this research area. For this purpose, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were implemented to identify the current trends in publications regarding DEA and the efficiency of M&As. The findings of the research will reveal key themes, trends, most contributing authors, most cited publications and top sources (journals) associated with efficiency measurement of M&As with DEA. The following sections make up the remainder of the study: The detailed description and theoretical background on both the DEA and M&As are highlighted in Section 2. Section 3 illustrates the research methodology and research framework. Section 4 presents the results of the study and Section 5 opens up a thorough discussion regarding the main and most interesting findings and concludes the paper, pointing at important scientific and practical implications and outlining potential future study directions in this field.

## **2. THEORETICAL FOUNDATIONS**

### **2.1.Data Envelopment Analysis (DEA)**

Data Envelopment Analysis (DEA) is a linear programming-based methodology used to evaluate the efficiency of comparable decision-making units (DMUs) that use multiple inputs and transform them into multiple outputs (Bowlín, 1998). Moreover, it currently is the leading non-parametric methodology since its introduction in the paper of Charnes, Cooper and Rhodes (1978), that has found wide application in many sectors. The two basic DEA models are the CCR (constant returns to scale) and BCC (variable returns to scale) models. The CCR model assumes constant returns to scale, resulting in linear efficiency frontiers, while the BCC model allows for variable returns to scale, producing piecewise linear and concave frontier. These models can be classified based on orientation (input or output) and returns to scale (Ćwiąkała-Małys & Nowak, 2009). Unlike parametric methodologies, DEA has some advantages. For example, an *a priori* specification of the model is not necessary; there is no need for pre-required “knowledge of the explicit functional form linking input variables and output variables nor a priori determination of the weights for these variables” (Fotova Čiković & Lozić, 2022);



and most importantly, it handles multiple input and output variables (Fotova Čiković et al., 2022). Despite the stated advantages, there are a few limitations to the DEA methodology. Namely, it gives the most accurate results when applied to small samples, therefore it does not apply to large samples and its main disadvantage is the assumption “that random errors do not exist”, but this leads to “frontier sensitivity to extreme observations and measurement errors” (Jemrić & Vujčić, 2002).

## **2.2. Mergers and Acquisitions (M&As)**

Ever since economic globalization and world integration have accelerated, cross-border mergers and acquisitions have become a favourite and mostly applied strategy for the rapid development of enterprises (Nie & Dai, 2024). According to data from IAAA (2025), “since 2000, more than 790,000 transactions have been announced worldwide with a known value of over 57 trillion USD. In 2018, the number of deals decreased by 8% to about 49,000 transactions, while their value has increased by 4% to 3.8 trillion USD”. According to Shi & Wang (2020), “the global strategic Merger and acquisition (M&A) transaction amounted to 3.4 trillion \$, and the transaction amount in 2019 was 2.9 trillion \$, a decrease from 2018, but still considerable”. Mergers and acquisitions (M&A) are transformative corporate restructuring activities where companies combine assets or one firm purchases another (Terjesen, 2011). M&A types include minority acquisitions, takeovers, and mergers, with acquisitions being more common (Junni & Teerikangas, 2019). M&As can also be considered “structural reforms that can be conducted in a liberalized market” and are vital from the perspective of business growth and enhancing innovation (Goto et al., 2024). Motivations for M&A include financial synergies, market expansion, and psychological factors like empire-building. The nature of M&A has evolved, with an increasing trend towards cross-border transactions (Terjesen, 2011). While successful M&A can create substantial value, failures can result in significant losses for shareholders. Moreover, it has become crucial to assess and evaluate the efficiency of these transactions, as a way to improve M&A outcomes and to prognose the compatibility and potential integration issues that might occur thereafter. Since performance and efficiency evaluation of M&As is the most crucial aspect of the success of M&A transactions, with this bibliometric study, we contribute to this body of research.

## **3. RESEARCH METHODS**

This paper follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The data for this study was extracted in February 2025 from the Web of Science database, without any limitations on the publication year, source, type of research, or time period. The only restriction was made to the language. Namely, only papers written in English entered this bibliometric study. This is presented in subsection 3.2.

*Table following on the next page*

Criteria	Inclusion of Sample	Exclusion of Sample
Search Scope	Web of Science	Other databases
Source	Peer-reviewed journal articles, book chapters, conference papers, and relevant online publications, any other sources, e.g. books or dissertations	No exclusion
Type of Research	Empirical and conceptual papers	No exclusion
Time Period	No exclusion	No exclusion
Search Parameters	Search terms appear in the title, abstract, or keywords provided by the author(s)	Search terms do not appear in the title, abstract, or keywords provided by the author(s)
Language	English	Any other language

*Table 1: Database Search Criteria (Source: Authors)*

### 3.1. Research Questions

Guided by the dearth of literature, four research questions are tackled in this study, and they are shown together with their application in Table 2.

No	Research question	Application
RQ1	What are the current trends in publications regarding DEA and M&As? When did this research area evolve?	To identify and analyse gaps in the intersection between DEA and M&As, thereby providing insights into areas where research and practice require further development.
RQ2	What are the most relevant sources/ journals, and what is the most published type of studies in this area?	To identify top journals and types of publications mostly published in this research area.
RQ3	What are the top cited articles in this research area?	To identify the top contributing authors and articles.
RQ4	What are the predominant topics and trends in this research area?	To review and categorise the key topics and trends.

*Table 2: Research questions of this study and their application (Source: Authors, based on Bibliometrix)*

### 3.2. Search Strategy

A search method was employed that incorporated terms associated with M&As, DEA and their intersection. The key terms used were “mergers and acquisitions” AND “data envelopment analysis”. These terms were entered in the “ALL FIELDS” in the Web of Science database. All of the researchers individually surveyed and selected the most cited publications after carefully reviewing the titles and abstracts. This survey initially resulted in 141 papers, and after the manual screening of both abstracts and full-text papers, 90 relevant papers published in this area entered the inclusion step and are as such, a basis for this bibliometric study.

#### 4. RESULTS

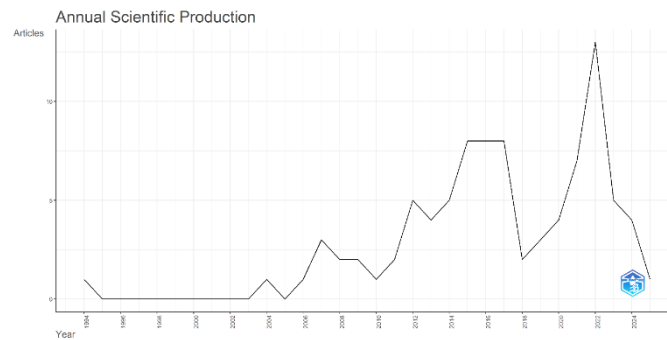
The first data obtained with the use of the Bibliometrix tool for bibliometric analysis is presented in Table 3. Namely, papers employing DEA in M&A have been published in the period from 1994 to 2025. Interestingly, even though the DEA methodology was introduced in 1978, it has not been applied in the research area of M&As. Out of the 90 selected surveyed papers in the Web of Science database, 77 are articles, and 9 are proceedings papers. There are 260 authors altogether, and only 7 papers are single-authored documents.

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1994:2025
Sources (Journals, Books, etc)	72
Documents	90
Annual Growth Rate %	0
Document Average Age	8.34
Average citations per doc	16.47
References	3283
AUTHORS	
Authors	260
Authors of single-authored docs	7
DOCUMENT TYPES	
article	77
article; book chapter	1
article; early access	1
article; proceedings paper	1
letter	1
proceedings paper	9

*Table 3: Main information about data  
(Source: Authors, based on Bibliometrix)*

##### 4.1. Performance analysis (RQ1)

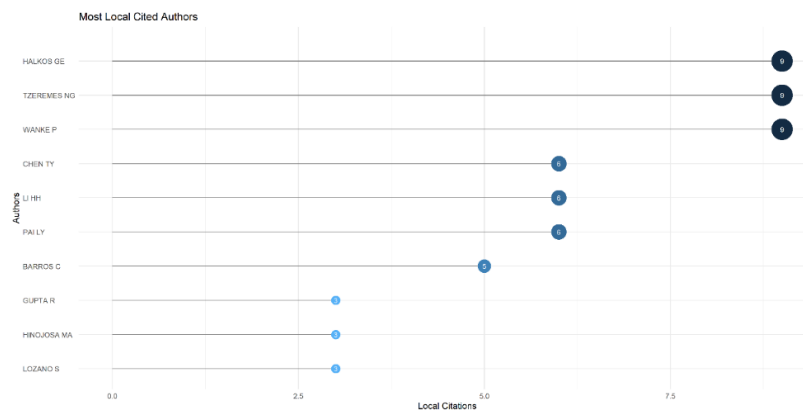
As an answer to the first research question regarding the performance analysis, the annual scientific production figure reveals rather interesting data. Namely, even though the DEA methodology was introduced in 1978 and has been very popular ever since, the first paper published in the area of M&As with its application was in 1994, i.e. 16 years after its introduction. As for the sub-research question of when this research area evolved, it is evident that the first rise in annual publication was in 2007 and the period from 2012 to 2017. The largest amount of papers published in this area was in 2022 and 2023, as presented in Figure 1.



*Figure 1: Annual scientific production  
(Source: Authors, based on Bibliometrix)*

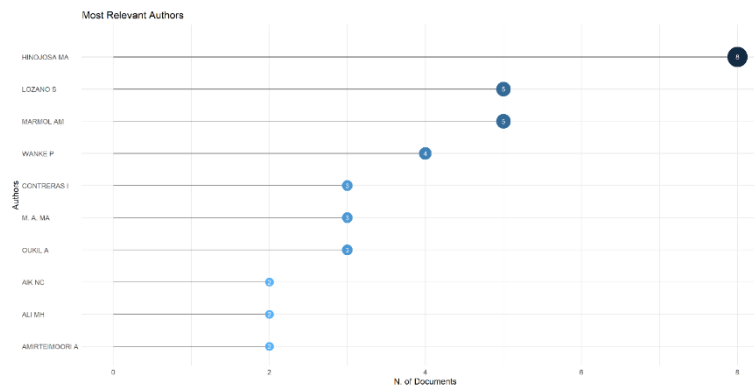
#### 4.2. Bibliometric information regarding the articles (RQ2)

As for the second research question, i.e. the bibliometric information regarding the articles, Figure 2 presents the most local cited authors (with Halkos, G.E., Tzemeris, N.G. and Wanke, P. as the top three contributing authors).



*Figure 2: Most local cited authors.  
(Source: Authors, based on Bibliometrix)*

The most relevant author in this research area is Hinojosa, M.A., as shown in Figure 3.



*Figure 3: Most relevant authors.  
(Source: Authors, based on Bibliometrix)*

### 4.3. Top cited publications (RQ3)

Figure 4 reveals the most cited sources, and the *European Journal of Operational Research* has the biggest influence in this area and is the most local cited source.

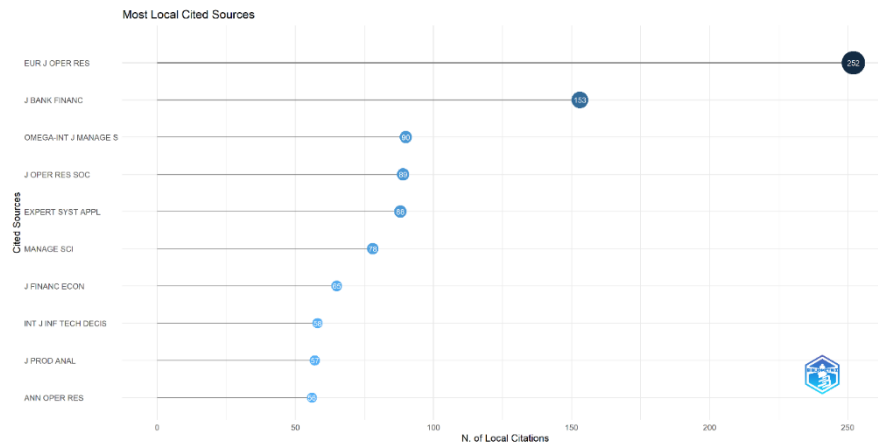


Figure 4: Most cited sources.  
(Source: Authors, based on Bibliometrix)

When analysing globally, the most relevant sources are *Expert Systems with Applications* and *Journal of the Operational Research Society*. This is evident from Figure 5.

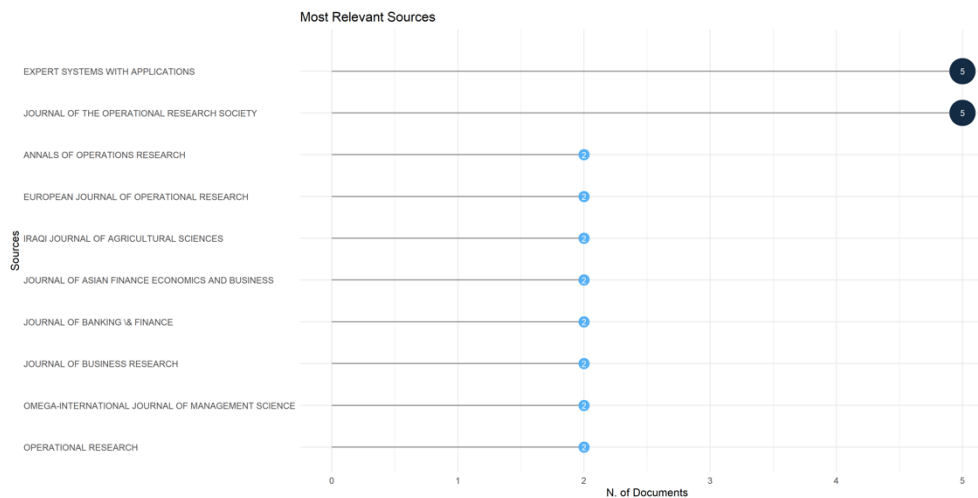
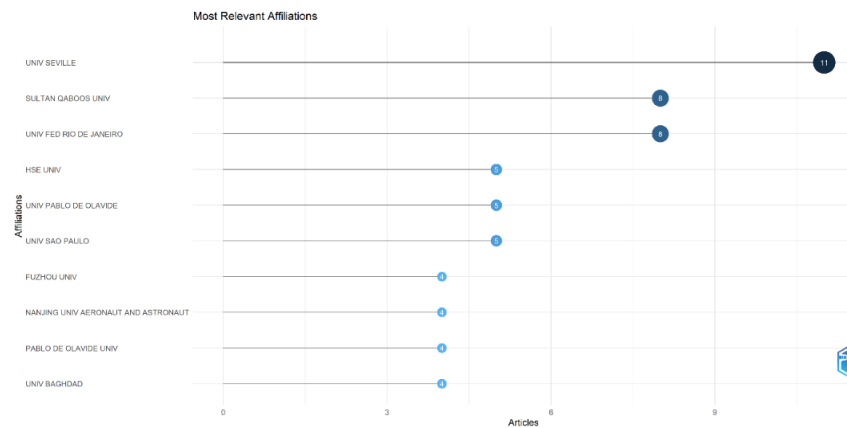


Figure 5: Most relevant sources.  
(Source: Authors, based on Bibliometrix)

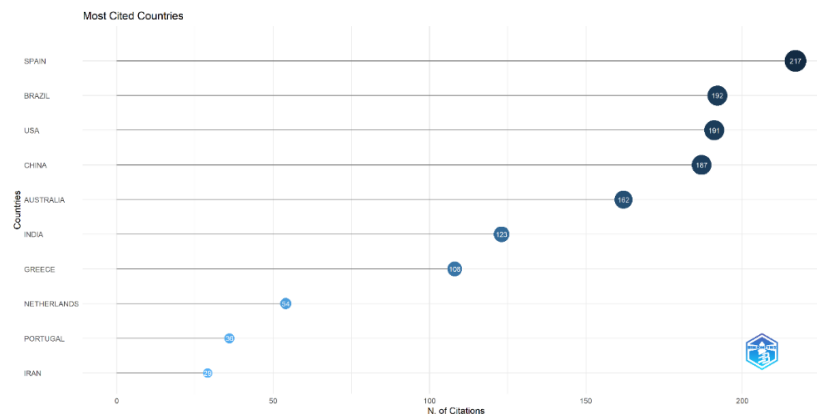
### 4.4. Topics and trends in the research area of M&A with the application of DEA (RQ4)

When tackling this research area, it is vital to identify the topics and trends. However, as a first step towards it, it is crucial to identify the most relevant affiliations. The University of Sevilla is recognized as most relevant affiliation, followed by the Sultan Gaboos University and the University Fed Rio de Janeiro (Fig. 6).

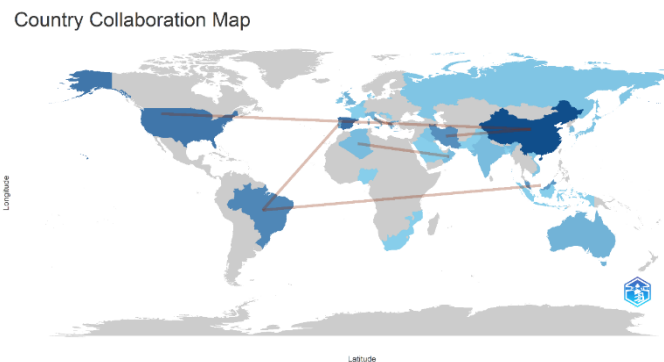


*Figure 6: Most relevant affiliations.  
(Source: Authors, based on Bibliometrix)*

As for the most cited countries, Spain is presented as the most cited in Figure 7, followed by Brazil, the USA, China and Australia. In this context, Figure 8 visually presents the country collaboration map, which shows the strongest bonds between affiliations and countries in the research area of M&As with the application of DEA.



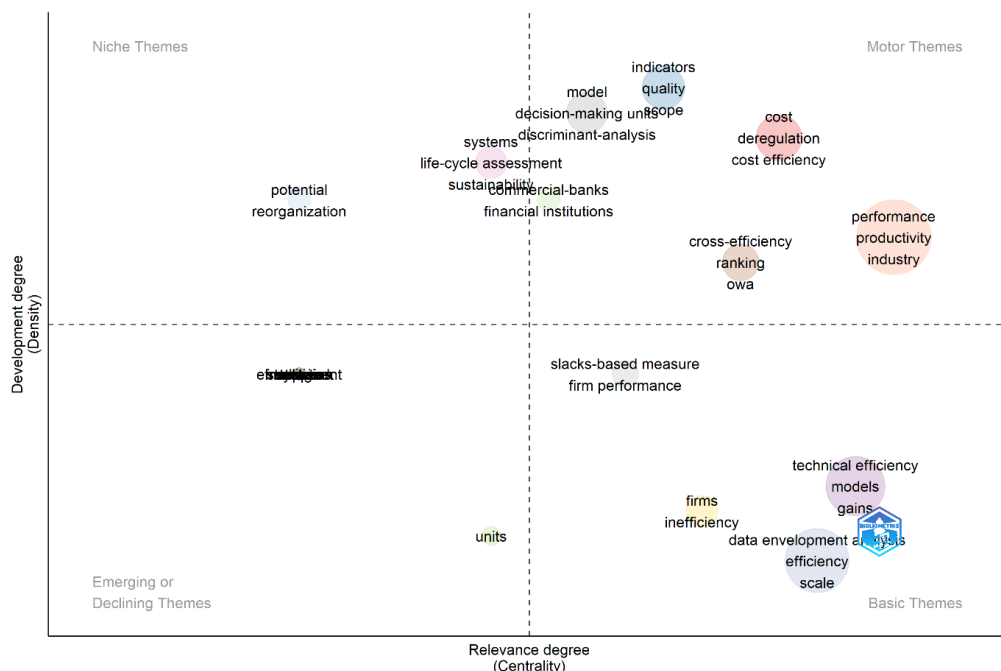
*Figure 7: Most cited countries.  
(Source: Authors, based on Bibliometrix)*



*Figure 8: Country collaboration map.  
(Source: Authors, based on Bibliometrix)*

## 5. DISCUSSION AND CONCLUSION

Mergers and acquisitions (M&As) play a vital role in today's business landscape, offering numerous strategic advantages for companies seeking growth and a competitive edge. Their importance in today's global economy cannot be overstated. They serve as powerful tools for companies to achieve rapid growth, enhance competitiveness, and adapt to changing market conditions. However, it is important to consistently assess the efficiency of these transactions, and the DEA methodology is one way to evaluate their relative efficiency. Therefore, the main goal of this study was to identify and analyse the relevant published studies in the Web of Science databases regarding the efficiency of M&A transactions with the application of the DEA methodology. For this purpose, a PRISMA-guided bibliometric research was conducted with no restrictions to the publication year, source, type of research, time period. The only restriction was made to the language. Namely, only papers written in English entered this bibliometric study. Thus, 90 papers surveyed in the Web of Science scientific database were included in the bibliometric study. The Bibliometrix an R package, was used, which provides a comprehensive set of techniques and is suitable for practitioners through its Biblioshiny interface (Moral-Muñoz et al., 2020). As shown in Figure 9, the thematic map shows a few themes that are often tackled in research regarding M&A and their efficiency with DEA. These are Technical Efficiency, Models and Gains; Firm inefficiency; Firm performance; DEA efficiency scale (as Basic themes), Efficiency and Units (as Emerging or Declining themes), Cost efficiency, deregulation; ranking, DMUs, performance productivity industry (as Motor themes) and Sustainability; Life-cycle assessment; Financial Institutions; Systems and Potential reorganization (as Niche themes).



*Figure 9: Thematic map  
(Source: Authors, based on Bibliometrix)*

The findings of the study revealed significant insights. Even though the DEA methodology was introduced in 1978 and has been very popular ever since, the first paper published in the area of M&As with its application was in 1994, i.e. 16 years after its introduction. Papers employing DEA in M&A have been published in the period from 1994 to 2025. There are 260 authors altogether, and only 7 papers are single-authored documents. The most relevant author in this research area is Hinojosa, M.A; the most local cited authors are Halkos, G.E., Tzemerer, N.G. and Wanke, P. as top three contributing authors; the most relevant sources are *Expert Systems with Applications* and the *Journal of the Operational Research Society*; Spain is the most cited country in this area, whereas the University of Sevilla is recognized as the most relevant affiliation, followed by Sultan Gaboos University and University Fed Rio de Janeiro. This study could represent inspiration to other scholars as well as policymakers, M&A consultants and analysts, and researchers who are interested in the possible and published applications of DEA in M&As thus far. In future work, an empirical study of M&A efficiency with the DEA methodology is planned.

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# EUROPEAN GREEN DEAL ON THE CROATIAN NEWS PORTALS

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## **ABSTRACT**

*The paper analyses the reporting on the European Green Deal on the Croatian news portals Jutarnji.hr and Indeks.hr. in the period from December 2019 to May 2024. It points out the importance of noticing the populist polarization model in news reporting as a reflection of the aggravation and increasing divisions due to global changes such as COVID-19 and the Russian-Ukrainian war. The quantitative analysis conducted showed significant differences in the representation of the topics of the European Green Deal across four periods: before the pandemic, during the pandemic, after the Russian invasion of Ukraine, and after the end of the pandemic. The qualitative analysis explored the content of articles on the European Green Deal: On Indeks.hr, the articles often focused on a sensationalist approach and political conflicts, which reflects the portal's editorial policy aimed at fast and sensationalist news. On the other hand, Jutarnji.hr often offered deeper analyses and a more inclusive approach to the topic, reflecting their print edition. Both portals demonstrated an appellative function, but in different ways: Indeks.hr emphasized political divisions and sensationalism, while Jutarnji.hr promoted a pro-European stance and ecological sustainability. The comparative analysis revealed clear differences in the method of news production. During the pandemic, the European Green Deal became a place of more intense political and social divisions, while during the energy crisis caused by the Russian attack on Ukraine, the approach to the topic was more constructive with a more emphasized appellative, acclamatory function.*

**Keywords:** *European Green Deal, news reporting, global environment, ecological sustainability*

## **1. INTRODUCTION**

Climate change is an important aspect of social and political reality. Since the late 1980s, the political affirmation of this topic has begun, initially in the US Congress, and in the 1990s this form of joint action perspective entered into legislation at the global level through the United Nations Framework Convention on Climate Change (UNFCCC). The agreement entered into force on 21 March 1994 and was signed by 154 countries. The agreement was preceded by the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992. The convention today has almost universal membership (198 countries) and is the basis for the Kyoto Protocol (1998) and the Paris Agreement (2015). The ultimate goal of all three agreements is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, within a time frame that allows for natural adaptation of ecosystems and enables sustainable development.

With the Kyoto Agreements and the Paris Agreements, then, and still today, there were big problems related to ratification by the USA, Canada, China and Australia, because these developed countries, at the same time the biggest polluters with the dominant fossil industry, considered their provisions unfair and tried to use diplomatic and lobbying tools to shift the focus from their responsibility to the responsibility of developing countries. In this context, until the Paris Agreement, which expanded the focus from the amount of greenhouse gas emission concentrations to additional mechanisms (adjustment of industry and mutual cooperation and assistance in order not to deviate too much from "business as usual") in limiting the increase in average temperature to the predicted 2°C above the level of the highest pre-industrial levels at the end of this century, the situation was constructive and optimistic. All member states signed this Agreement, but with a change in the presidential elections, when the Republican representative Donald Trump came to power in January 2017, the USA withdrew from the Agreement again. Already in Trump's first term, the political populist rhetoric around many social and political issues has intensified. There are divisions such as "elite vs. people", "mainstream media vs. truth", "immigrants vs. citizens", "globalism vs. nationalism", "liberal vs. conservative", "rural vs. urban areas", etc. The USA then withdraws from the Paris Agreement, so that with the arrival of Joe Biden in power in January 2021, rejoined. However, although a signatory again, damage has been done in the social and political context because the "green policy" itself, as well as the American Green Deal (June 2019), as a necessary joint action to ensure the economic and social survival of society as we know it, it has become the subject of populist rhetoric, linking itself and others to added labels dividing them into different political and social categories. Although it emerged in a somewhat different historical and cultural context, due to the transplantation of the American market media model, the European Green Deal will also fall under a similar, albeit less intense due to the greater political heterogeneity and long-standing rule of the European People's Party in the European Parliament, populist model of political questioning and media reporting. Further turbulence is expected after Trump's second term begins in January 2025.

## 2. EUROPEAN GREEN DEAL ON THE PORTALS [jutarnji.hr](https://jutarnji.hr) AND [index.hr](https://index.hr)

### 2.1. European Green Deal

The European Green Deal is a strategy of the European Union aimed at transforming Europe into the first climate-neutral continent by 2050. The plan was presented in December 2019, and its main architect is Ursula von der Leyen, President of the European Commission. The plan encompasses a wide range of initiatives and policies covering various areas and consists of several key components:

1. **The "Fit for 55" Package** is a set of legislative proposals and amendments to existing EU legislation aimed at reducing net greenhouse gas emissions and achieving climate neutrality based on sustainability, circularity, and environmental protection by 2050.
2. The **EU Biodiversity Strategy for 2030** aims to contribute to the recovery of biodiversity in Europe by 2030. It includes expanding protected land and marine areas in Europe, restoring degraded ecosystems by reducing pesticide use and harm, and increasing financial support and better monitoring of progress.
3. The **Circular Economy Strategy** separates economic growth from resource exploitation, and together with the transition to circular production and consumption systems, is key to achieving the EU's climate neutrality by 2050. The action plan foresees over 30 measures for the design of sustainable products, circularity in production processes, and strengthening the position of consumers and public procurers. It focuses on sectors such as electronics, ICT, batteries, packaging, plastics, textiles, construction, buildings, and food.

4. The **Farm to Fork Strategy** aims to contribute to EU climate neutrality by 2050 by transitioning from the existing food system to a sustainable model: ensuring sufficient, affordable, and nutritious food within planetary boundaries, supporting sustainable food production, and promoting sustainable consumption and healthy diets.
5. **Industrial Transition and Digitalization** will play a leading role in the transition to climate neutrality based on sustainability, circularity, and environmental protection. The EU is seen as a leader in the green and digital transformation and a global driver of the transition to climate neutrality and digitalization. Given that 75% of greenhouse gas emissions in the EU come from energy production and use, decarbonizing the energy sector is a crucial step toward a climate-neutral EU. Financial and technical support must be provided to regions most affected by the transition to a low-carbon economy. All of this is also viewed in the context of post-COVID-19 recovery. The development and introduction of cleaner energy sources, such as offshore renewable energy (liquefied gas) and hydrogen, promotes the integration of energy systems within the EU and the development of interconnected energy infrastructure through EU energy corridors.

At least 1 trillion euros are allocated for financing the European Green Deal between 2021 and 2030. This amount includes funds from various sources, including the EU budget, national budgets of member states, as well as private investments. It is important to note that a significant emphasis is placed on private investments from the industry itself, which Ursula von der Leyen always highlights in her speeches. The European Green Deal has received broad support in the European Parliament and among EU member states, enabling the adoption of the key legislative and financial frameworks necessary for its implementation. However, the adoption of the plan is a process that occurs in phases, with different initiatives and legislative proposals being gradually adopted and implemented. In this context, the way of media communication and reporting is crucial for its full implementation.

## **2.2. News Production, Expectations, and Interpretive Communities as Important Factors in Media Reception and Production**

The production of news has changed significantly in the digital age since the 1990s. With the development of technology, general digitization, and the focus on multimedia content, readers' attention has significantly decreased, leaving little space for traditional journalistic genres. Editorial offices, where speed and "clickability" are among the main factors, leave little room for analytical approaches that could shed light on a topic in its full complexity (Tkalec, Krušelj, 2019). This phenomenon is particularly important for topics of high social significance, where, due to the mentioned commercial and technical media prerequisites, reporting and content are adjusted to these new demands. Also, the adaptation to the audience—the reader as the primary subject addressed by the media, who is also immersed in the new media-digital context—contributes to simplifying and adjusting topics and reporting styles to meet the expectations of the very audience and readers that the media targets. In this context, it is essential to highlight that topics such as the European Green Deal and long-term sustainable economic policies (which in the public and media space are referred to as "green policies") fall under the same category of media content, i.e., the reader's horizon of expectations, and expectations of the public within a specific type of media production. Furthermore, since the French Revolution and the growing role of the media in shaping "public opinion," media production, and society as a whole, have been largely categorized through various interpretive communities to which they belong or with which they identify (Galić, 2020). Thus, the media news itself, depending on which portal or newspaper it concerns, is directed towards a specific (pre-created) profile of

the reader, and even here there is an adjustment of both form and content (Najbar-Agičić, 2015). Similarly, we could say that in this context, the period following the annexation of Crimea in 2014 and the election of Donald Trump as President of the United States in 2017 changed the horizon of expectations for the era, due to the aforementioned strengthening of populist political rhetoric and new socio-political conditions. The COVID-19 pandemic and the attack on Ukraine will only further accelerate this (Baker, 2019). It must be emphasized that for such socially important topics, the method of production and reporting in already complex and demanding political and social contexts greatly contributes to further polarization.

### **2.3. Populism in the Context of Contemporary Journalism and Global Change as a Factor in Media Reception**

Populism is increasingly used in the media, in line with its growing presence in public political life, as a dominant pattern and method of reporting. In its 2018 global report, Human Rights Watch warned global democracies about the danger of "capitulation" in the face of the "populist challenge." Barack Obama also warned in his various public appearances in 2018 that the strengthening of populist movements contributes to the rise of politics of fear, anger, and restrictions, which pave the way for authoritarianism and potential threats to "mainstream" politics. This is a consequence, among other things, of the failure of governments across the West to produce anything resembling a credible vision of shared prosperity and security in the post-industrial era. We could say that the society, in the context of the "end of the welfare state," as promoted during Margaret Thatcher's period, is fading away. In this context, many movements and new identities are emerging, largely perpetuated through virtual communities and the new media context. Populism is based on simplification, which heavily involves emotions. According to the populist model, the most important division in society is between the "people," considered essentially "good," and the "elite," perceived as fundamentally corrupt and out of touch with everyday life. Another concept on which populism rests is the belief that politics should be an expression of the "general will"—a set of desires presumed to be shared by all "ordinary people." This implicitly assumes the existence of a general will, which does not correlate with societal reality (Baker, 2019). The pattern was further intensified by the emergence and declaration of the COVID-19 pandemic, which briefly redirected the media's focus to the newly emerged pandemic situation. However, in the context of climate change and green policies, it highlighted the importance of small and medium-sized entrepreneurs and economies independent of established economic networks and the petrodollar economy. Still, the remnants of the pandemic conspiracy theory machinery after the pandemic, aided by opportunism in centrist conservative parties and the media, will further sharpen and perpetuate pre-pandemic populist rhetoric (Subversive Festival, 2024). The Russian attack on Ukraine will, in an unusual yet organic way, once again point to the need for energy independence, which, in the context of climate change, will contribute to a different media reception of green policies.

### **2.4. Research Methodology**

There are several hypotheses we will focus on in the analysis of media reception of the European Green Deal. For this research, we selected two sources, the e-publications Jutarnji.hr and Indeks.hr, covering the period from December 2019 to May 2024. The first hypothesis is that the way news is produced in the contemporary digital environment (e-publications) affects the type and nature of the news, making it one of the factors contributing to the polarization of the populist approach to the topic. This approach, in light of the media environment in which it operates, caters to the expectations of the audience and the content itself.

The second hypothesis is that global changes, in this case, the COVID-19 pandemic and the Russian attack on Ukraine on February 24, 2022, alter the media reception of the selected topic, both in terms of its increased or decreased coverage and its different approach appealing for action or categorizing it into different, polarizing socio-political groups. To test these hypotheses, we use both quantitative and qualitative approaches in the analysis. Additionally, we will provide a comparative analysis of the data obtained from the two different portals.

We will conduct the analysis within four distinct time periods:

1. **Before the pandemic** – December 2019 – February 2020
2. **During the pandemic** – March 2020 – January 2022
3. **After the Russian invasion of Ukraine** – February 2022 – February 2023
4. **After the end of the pandemic** – March 2023 to May 2024

Through quantitative analysis, we will determine the representation of content on the portals, as well as the qualitative characteristics, such as the type and nature of content and its functions.

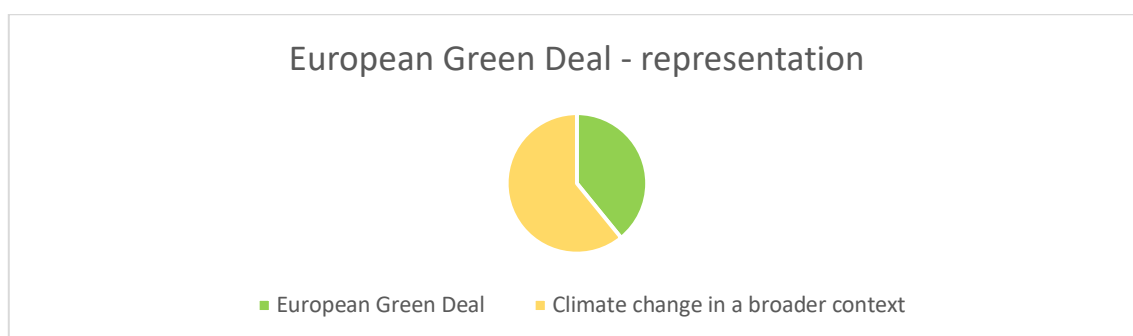
In the qualitative analysis, we will focus on different aspects of the content and its function, such as:

1. **For/Against**
2. **Conservatives/Liberals**
3. **Appealing function:** Encouraging action/making value judgments
4. **Objectivity**
5. **Expertise**
6. **Commercialism** (promotion of new technologies, products, and services)
7. **War discourse/political correctness discourse**

## 2.5. The European Green Deal on the Indeks.hr Portal

### 2.5.1. Quantitative Analysis

The European Green Deal on the Indeks.hr portal has been more or less represented in the observed periods, either directly or indirectly. In the first period, it was covered with only 9 articles, while broader climate-related topics were represented with 14 articles.



*Table 1: Before the pandemic - December 2109 - February 2020*

In the second period, the European Green Deal was represented by 42 articles, and it's important to note that during this period, the European Green Deal was also indirectly covered through articles on the National Recovery and Resilience Plan (NRRP), specifically 33 articles. The National Recovery and Resilience Plans were adopted by all EU member states in July 2021 as part of a broader European economic recovery plan that the European Commission introduced in response to the COVID-19 pandemic. Prior to approval, individual NRRP plans underwent

coordination and control processes before being approved by the European Commission. Topics related to the broader climate context were covered in an additional 94 articles. It is important to note that for national plans to be accepted and for funding to be approved, a condition was set that at least 37% of the funds must be incorporated into projects aimed at achieving climate sustainability and energy transition goals, and 20% for digital transformation in line with the principles of the European Green Deal. Economic recovery projects from the COVID-19 pandemic thus became a driving force for the European Green Deal itself and an opportunity to achieve its goals as much as possible.

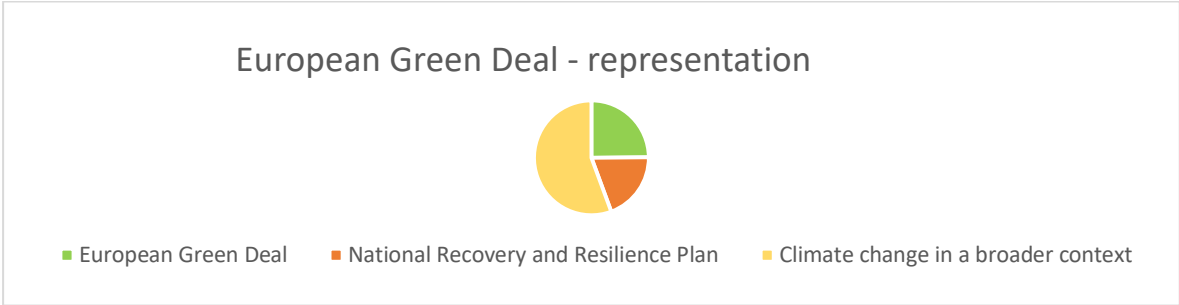


Table 2: During the pandemic - March 2020 - January 2022

The third observed period also shows a dichotomy. The European Green Deal was covered with 22 articles in a narrower sense, while this period, due to the energy crisis as a global factor of change, brought the principles and themes of the European Green Deal into the context of achieving greater energy independence from Russian energy imports. Thus, the European Green Deal was represented through an additional 31 articles. Topics from the broader climate context were represented with an additional 56 articles.

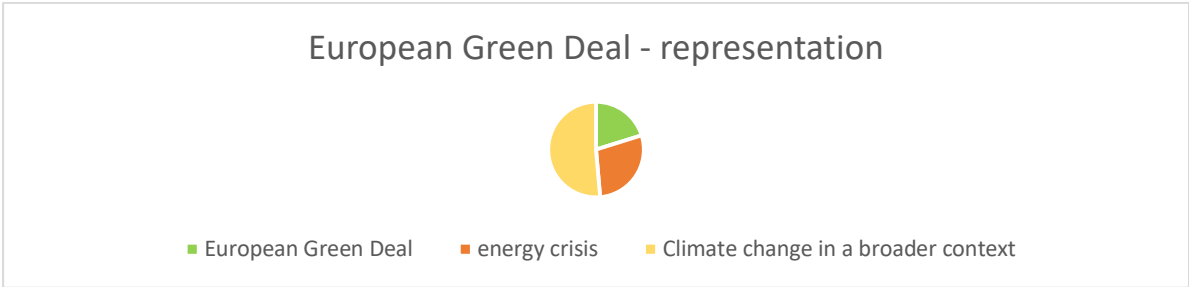


Table 3: After the Russian invasion of Ukraine - February 2022 - February 2023

The fourth period, after the absorption and adjustment to the new changes caused by the Russian invasion of Ukraine, brings a new focus on “green policies,” primarily due to the upcoming European Parliament elections and also showing the consequences of new directions in green economic policies, such as farmer protests across the EU. In this period, the European Green Deal was represented with 40 articles in a narrower sense. Topics from the broader climate context were covered in an additional 64 articles.

## European Green Deal - representation



*Table 4: After the end of the pandemic - March 2023 to May 2024*

Quantitative analysis of representation in the context of climate change shows its more or less equal share, with a noticeable increase in the representation of the European Green Deal in the second period compared to broader climate topics. In the third period, a decrease in representation is observed in the context of a more significant but also more narrowly related factor of global change – the energy crisis.

### 2.5.2. Qualitative Analysis

The articles in the observed period show various elements of social, political, and economic media discourse. In the first period, the articles are more or less sensationalistic in nature, without contextualization and analytical depth. There is a noticeable conservative distancing from the new direction of European green policy. The appealing function of the text tends to move towards political divisions, i.e., the observation of the new policy through the political division between "liberals" and "conservatives". Expertise is not represented, but since articles and information are often transferred from other sources and agencies, objectivity is consequently present, reflecting political heterogeneity at the EU level. Commercialism in the articles is directed towards presenting isolated elements within the European Green Deal through the lens of populist rhetoric, i.e., "progressive" vs. "reactionary", e.g., wind turbines as elements threatening local communities or "insects" becoming the subject of various issues, such as pesticide bans and farmer protests in reaction to new regulations, or insects as a potential new food product. The language used in the articles is politically correct, becoming an end in itself and thus revealing the "conflict" within the narrative structure of the texts. In the second period, the articles cover a range of topics from Tomislav Tomašević's victory in the mayoral elections in Zagreb and the affirmation of the "We Can!" movement as the protagonist of the green-left party at the national level, the broadband 5G network, to the issue of electric vehicles as symbols of the green transformation and also problems in the context of existing industries, such as the automotive sector in Germany. During this period, the COVID-19 pandemic emerges as a global change factor, and we could say that the European Green Deal takes a backseat. However, the National Recovery and Resilience Plan (NPOO) gives it a new momentum in the context of economic recovery due to the pandemic, and also in the context of the opportunity and legislative requirements for green transition and digital transformation. The themes addressed in the European Green Deal during this period are viewed through the lens of political divisions at the EU level. Initially, there is resistance from wealthier countries advocating for austerity policies, and the process of adopting the plan at the Union level is complex, reflecting its heterogeneity. At the same time, green political options are gaining strength across the EU, creating their own governments (e.g., the German Greens). In this context, NPOO provisions and, therefore, the European Green Deal are used as areas for political conflict and polarization. Provisions are presented in different contexts, sometimes in an appealing progressive political light and at other times in a conservative and reactionary context, depending on the need for conflict. Objectivity is present in articles that bring



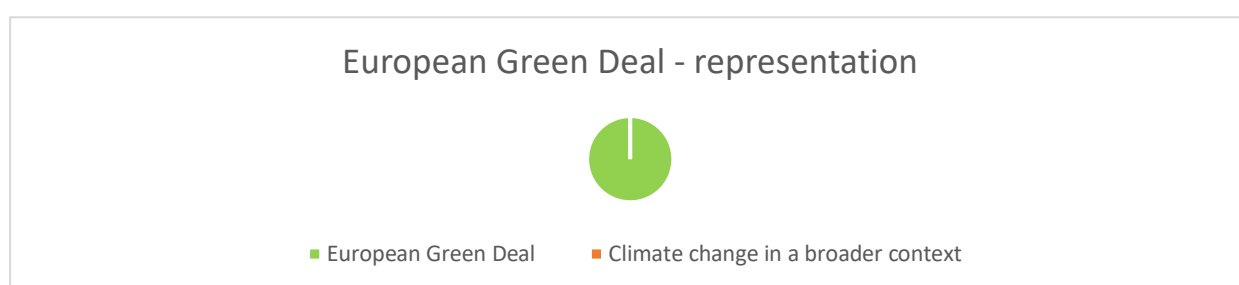
information about the European Recovery and Resilience Plan, as news is taken from news agencies (HINA, AFP, etc.), while Croatia's NPOO is almost exclusively presented through the prism of criticism of the HDZ centrist and interventionist policies, which also represent the European pandemic and post-pandemic policies. Expertise is absent. Commercialism is emphasized in this period through digitalization projects and those related to NPOO, such as Rimac and robotic taxis. The language in this period is more openly dynamic compared to the previous period and shows a lower level of political correctness. In the third period, the key element of global change is the Russian invasion of Ukraine in February 2022, which significantly altered the already recovered political environment and stability at the EU level after the end of the COVID-19 pandemic. Even before the conflict in Ukraine, Russia controlled and conditioned gas supplies based on its own political and economic interests (the situation in Ukraine and its rapprochement with the West, as well as pressure to quickly open the Nord Stream 2 pipeline), which culminated after the invasion on February 22, 2022. In the context of the European Green Deal, the range of topics covered in the articles ranges from agricultural reforms, plans for preserving natural resources (forests, the Adriatic Sea, etc.), to waste management improvements and steering financial markets towards the "green financial sector". Due to the mentioned global factor, there is an escalation in political rhetoric and political division in the EU between those who partially, completely, or not at all condemn the Russian attack. The European Green Deal, in contrast to the previous period, is less represented, but key factors (the use of renewable energy sources) are in focus within the policy of achieving greater energy independence from Russian gas and oil. The appealing function of the articles is emphasized through the escalation of populist rhetoric as a result of the Russian attack and the strengthening of right-wing political options, compared to the peak of green-left political options in the previous period. Even within the articles, there is a reactionary element in the appeal function, dividing those who see the strengthening of economies within the maintenance of established fossil markets and those in centrist positions who are slowly adapting the economy to the model of renewable energy sources. Objectivity is less represented than in previous periods due to the complexity of the energy market. It is difficult to explain sanctions against Russia while simultaneously trading with Russia. Expertise is lacking, although it is slightly more present, as the political narrative is informational and there are clearer divisions into pro-Russian and anti-Russian perspectives. Commercialism promotes new technologies such as green hydrogen, liquefied natural gas, and NLG terminals. The language in this period shows the full spectrum of dynamics, from political correctness attempting to soften pro-Russian and anti-Russian views to open conflict. In any case, the dynamics favor the maintenance of the level of conflict. In the fourth period, after the announcement of the end of the pandemic and the adjustment to the new situation due to the Russian invasion of Ukraine, there is an increased representation of topics from the European Green Deal. In this period, it is not immersed in the context of an additional "crisis" or global factor, so it is addressed more directly. The topics discussed range from green taxes on air traffic, European independence from conventional energy sources and raw materials required for the transition, its self-sufficiency, China's growing influence in the electric vehicle industry, and Germany's encouragement to invest in China, to various national projects for energy efficiency. A sensationalist theme dominating this period is the farmer protests in Germany and France in January and February 2024. The appealing function continues through a polarizing rhetoric, although less represented than in the previous two periods. However, as we approach the EU elections, it intensifies, reflecting the heterogeneity and complexity of the EU's political issues. Objectivity follows the sources from which the news is taken, but expertise is absent. There is no analysis, only a shallow reproduction of political conflict, polarizing rhetoric, and sometimes

openly populist. Commercialism is represented in the intensification of the issue of the removal of diesel and gasoline cars by 2030 at the EU level, as well as the increasingly intensive establishment of China in that market. The promotion of technologies like green hydrogen, building renovations based on energy efficiency, solar panels, and potential dangers like "greenwashing" in airlines continues. The language is politically correct, thereby softening the conflict for the purposes of political promotion and advertising, considering the pre-election campaign for the European Parliament.

## 2.6. The European Green Deal on the Jutarnji.hr Portal

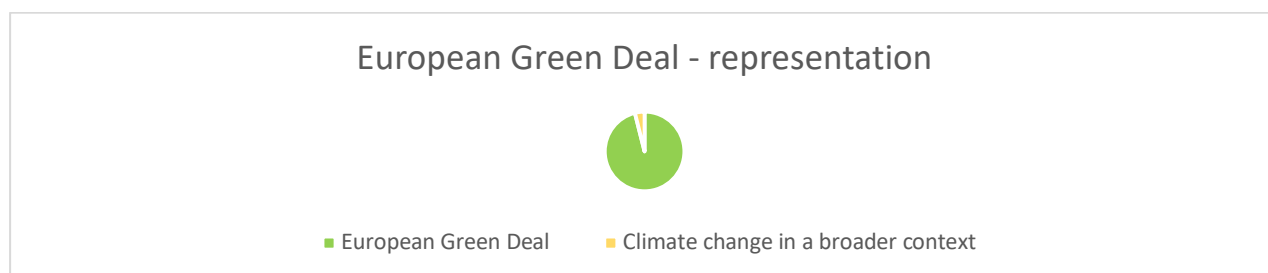
### 2.6.1. Quantitative Analysis

In the first period on the Jutarnji.hr portal, the European Green Deal is represented by 6 articles, while other topics related to broader climate contexts are absent.



*Table 5: Before the pandemic - December 2109 - February 2020*

In the second period, the European Green Deal is represented by 48 articles, whereas broader climate topics are represented by only 3 articles.



*Table 6: During the pandemic - March 2020 - January 2022*

In the third period, the European Green Deal is represented by 21 articles, and broader climate topics are absent.



*Table 7: After the Russian invasion of Ukraine - February 2022 - February 2023*

In the fourth period, broader climate topics are also absent, with the European Green Deal represented by 11 articles.

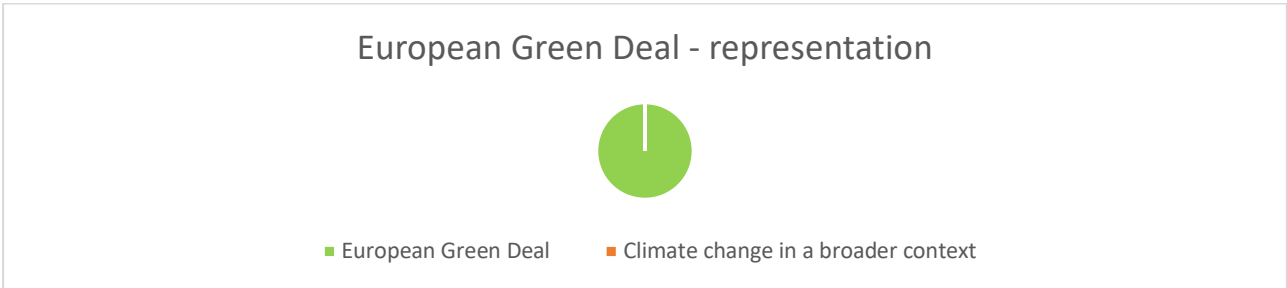


Table 8: After the end of the pandemic - March 2023 to May 2024

The quantitative analysis shows better search engine performance on the Jutarnji.hr portal, which brings us articles closely related to the topic. However, as we will see in the qualitative analysis, the type of articles and the approach to the topic are more narrowly oriented towards the main subject, presented in a more direct way, separated from the prevailing political narratives at the time. This is also a consequence of the portal's structure, as Jutarnji.hr is still somewhat tied to its print edition and maintains more traditional journalistic forms when addressing topics.

2.6.2. Qualitative Analysis

In the first period, the topic is presented in a concise and, in an appeal sense, acclamatory way, where the European Green Deal is seen as a direction of movement toward a common interest. Out of 6 articles, 5 were transferred from specialized subsections or other specialized portals. Three of the articles were taken from the Euractiv.hr portal, which is part of an independent pan-European media network, Euractiv.com, specialized in EU topics. Established in 1999, Euractiv aims to foster discussions among various participants, including government representatives, business sectors, and civil society. Two articles were published in the Novac.hr section of Jutarnji List, which also presents the European Green Deal from the perspective of financial capital, discussing the advantages this direction could bring for the preservation and improvement of industry and the economy. In this first period, there is no political division in the articles. The topic is presented inclusively in an acclamatory way, emphasizing its appeal function – to create a positive stance on the European Green Deal. Since the articles were published on specific portals and subsections, such as Euractiv.hr and Novac.hr, objectivity and expertise are apparent. The language is almost businesslike, with corporate characteristics, reflecting the appeal function and the sections where the articles were published. In the second period, out of the total of 48 articles, 12 were taken from the Euractiv.hr portal. The topics covered range from ecological production in the Zagreb County area, reports from European Commission meetings on the European Green Deal, the promotion of various startups and innovations, to the issue of "social sensitivity" regarding the transition, which is being questioned by Croatian Members of the European Parliament, such as Tonino Picula and Biljana Borzan. The appeal function of the articles moves toward adopting a positive stance on the European Green Deal, while divisions between "liberals" and "conservatives" are somewhat present. Objectivity leans toward the appeal function, while expertise is present in texts that show an analytical approach to the topic, as well as those transferred from the Euractiv.hr portal. The dynamics of the language and structure are moderate and inclusive. In the third period, out of 21 articles, only one article was transferred from the Euractiv.hr portal. The topics covered

range from various analyses of why the European Green Deal is beneficial during the energy crisis and solutions for a better future life to the promotion of various sustainable infrastructure solutions in many European cities. In this period, the appeal function of the articles is extremely emphasized, especially in the context of the energy crisis. We could say that the European Green Deal is presented as a path to energy independence for the EU. The division between "conservatives" and "liberals" is relatively present because the articles are more focused on promoting the solutions offered by the European Green Deal. Objectivity and expertise are present in the analysis of the European Green Deal topics, while objectivity itself serves the appeal function. Even commerciality follows this direction, from recycling at the individual daily life level, "green habits," to the promotion of various lifestyles (such as biking), etc. The language is inclusive and dynamic, following the appeal function of the texts. In the fourth period, the topics covered are more narrowly related to individual provisions of the European Green Deal, primarily the origin and quality of food, as well as initiatives that combine sustainability, inclusivity, and aesthetics, up to the issue of traditional cars and their use until 2030. In this period, there are also 5 articles that point to a broader political context. These texts somewhat present the division between "conservatives" and "liberals" due to the upcoming European elections. However, even though they enter into political analysis, the appeal function reduces the level of conflict, so the language and narrative structure, though dynamic, are inclusive enough to absorb the level of conflict and potential divisions. Objectivity and expertise are more pronounced in this period, as the articles involve analyses and opinions from individual authors, such as Gojko Drljača, but, as in previous periods, objectivity and expertise serve the appeal function of the texts. Commerciality appears in the context of promoting "organic" food production methods and such products within a broader context, as well as focusing on smaller producers mentioned in the context of the "social sensitivity" of the green transition.

## **2.7. Comparative Analysis**

### **2.7.1. Representation and Type of News**

In the observed periods, the European Green Deal (EPZ) is represented differently on each portal. By observing the representation of the European Green Deal on individual portals throughout the analyzed periods, the specificity of each portal and its production methods become apparent, as well as the type of news they produce. Based on both the quantitative and qualitative analysis, it can be concluded that Indeks produces more news articles containing a higher level of conflict and greater division according to the aforementioned principle of populist rhetoric. The production of a larger number of articles incorporating the observed topic supports the media discourse model that Indeks builds. It focuses on the demand for speed, sensationalism, and conflict to attract readers. Jutarnji.hr has a smaller production related to the observed topic and examines it in isolation from the context of ongoing political conflicts in Croatia and the European Union (such as the National Recovery and Resilience Plan or the energy crisis). The articles are often analytical and reflect the broader socio-political context of the topic under review. In the qualitative analysis, the pronounced appeal function of the texts on Jutarnji.hr is evident, and it can be concluded that there is an acclamatory approach to the topic in terms of a pro-European stance and policies that Jutarnji.hr promotes in its articles. As already mentioned, the portal often features articles from other pro-European portals, such as Euractiv.hr. Commercialism is also more prominent on Jutarnji.hr, where the appeal function of the texts is especially apparent. A strong level of support for technological and economic topics, as well as for the relationship between civil society and state market policies in the context of "green policies" and ecological sustainability projects, is evident.

## **2.8. Discussion**

Both hypotheses set forth in the analysis have proven to be correct. The method of news production in the modern digital environment (e-publications) impacts the type and nature of the news and is one of the factors driving the polarizing populist approach to the topic, which, given the media environment it operates in, caters to the expectations of the audience and the media outlet itself. This is particularly visible on the Indeks.hr portal, which builds its editorial policy based on the principles of speed, sensationalism, and conflict, a model that guarantees readership. Jutarnji.hr, in this regard, operates somewhat differently. The demand for speed and sensationalism is less pronounced, as is the level of conflict. The observed topic is presented in a more inclusive and constructive manner, somewhat adhering to the journalistic principles and forms from its print edition.

This is the specific characteristic of Jutarnji.hr due to its gradual transition and retention of both print editions and e-publication/portal. The second hypothesis, that global changes such as the COVID-19 pandemic and the Russian invasion of Ukraine on February 24, 2022, alter the media reception of the selected topic—both in terms of its greater or lesser representation and a different approach to the subject—also proved to be accurate. The European Green Deal became more prominent during the COVID-19 pandemic through various National Recovery and Resilience Plans (NPOO) and recovery programs at the EU member state level, and its principles became an integral part of those programs. Given the polarizing approach during the pandemic and the populist rhetoric that began with Donald Trump's rise to the U.S. presidency, we can say—and this was evident in the qualitative analysis—that the European Green Deal, viewed separately and through the lens of the NPOO, became a space for such divisions. In the case of the energy crisis and the Russian invasion of Ukraine in February 2022, the European Green Deal was recontextualized in a new and different way, becoming once again a battleground and a reflection of the heterogeneity of various economic, political, and social visions for Europe's overall future.

However, unlike the previous period, it was somewhat more acclamatory in the context of energy independence from Russian gas and oil. This shift was particularly evident on the Indeks.hr portal, and especially due to the pronounced appeal function on the Jutarnji.hr portal. The fifth period also demonstrated that a global factor again changes the approach to the topic. In this case, it was the pre-election campaign for the European Parliament.

## **3. CONCLUSION**

The quantitative analysis conducted on the portals Indeks.hr and Jutarnji.hr revealed significant differences in the coverage of the European Green Deal across four periods: before the pandemic, during the pandemic, after the Russian invasion of Ukraine, and after the end of the pandemic. Indeks.hr stood out with a higher number of articles emphasizing sensationalism, speed, and conflict, reflecting an editorial policy aimed at attracting readership through a polarizing approach. On the other hand, Jutarnji.hr published fewer articles, but they were often analytical and inclusive, examining the European Green Deal within a broader socio-political context. The qualitative analysis thoroughly explored the content of the articles about the European Green Deal on these portals during the same four periods. On Indeks.hr, articles often focused on a sensationalist approach and political conflicts, reflecting the portal's editorial policy focused on delivering quick, sensational news.

Conversely, Jutarnji.hr frequently offered deeper analyses and a more inclusive approach to the topic, mirroring the style of their print edition. Both portals displayed an appeal function, but in different ways: Indeks.hr emphasized political divisions and sensationalism, while Jutarnji.hr promoted a pro-European stance and ecological sustainability. The comparative analysis compared the approaches of Indeks.hr and Jutarnji.hr to the European Green Deal over the four periods observed. Differences in the news production styles on these portals were clear: Indeks.hr emphasized sensationalism and conflict, while Jutarnji.hr offered an analytical approach and inclusivity. These findings confirmed the first hypothesis about the impact of the digital media environment on the type and nature of the news. Indeks.hr reflected a polarizing approach to meet the demand for quick sensational content, while Jutarnji.hr maintained more traditional journalistic formats.

Both hypotheses set out for testing were confirmed through the analysis. The first hypothesis examined the impact of the digital media environment on the news production process, showing that portals like Indeks.hr favor sensationalism and quick news to attract readership. Jutarnji.hr, on the other hand, maintained a more analytical and inclusive approach to topics, reflecting their dual presence in print and digital formats. The second hypothesis was confirmed by the changes in the media reception of the European Green Deal during global events such as the COVID-19 pandemic and the Russian invasion of Ukraine. During the pandemic, the European Green Deal became a focal point for intensified political and social divisions, while during the energy crisis caused by the Russian invasion of Ukraine, the approach to the topic became more constructive with a stronger appeal and acclamatory function. In conclusion, the analyses showed that the digital media environment significantly influences the way the European Green Deal is reported on. Indeks.hr serves as an example of a sensationalist and polarized approach, while Jutarnji.hr reflected a deeper analysis and inclusive approach. Global events also demonstrated their impact on the perception of this topic, which confirmed the second hypothesis regarding changes in the media reception of the European Green Deal during crisis periods.

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# JOB SEARCH IN DIGITAL ENVIRONMENT

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## **ABSTRACT**

*Although job searching can be a difficult process, in today's digital environment there are several methods that can make it much easier. One of the key elements of digital job searching is a presence on professional networks such as LinkedIn. Therefore, digital profiles are becoming almost as important as traditional CVs, and a well-optimised profile can increase a candidate's visibility to potential employer. A personalised approach, which involves creating specific applications for each vacancy, significantly increases the chances of being hired. The aim of this paper is to highlight the importance of modern digital tools for individuals in their job search and to analyse which socio-demographic characteristics determine whether people search for job information online. This type of research will add to the existing knowledge about job search in a digital environment and will form the basis for the development of a strategy aimed at improving digital inclusion and facilitating access to information about the labour market. In the paper, an empirical study was conducted on the basis of data collected in two Croatian counties from a sample of 103 respondents. The findings of this research indicate the importance of modern digital tools in the job search process and the influence of certain socio-demographic characteristics on the likelihood of searching for job information online. The results of the binary logistic regression show that variables such as gender, interest in working via a digital platform and education are significant predictors of online job search behaviour. In contrast, age and employment status did not show a statistically significant effect in this sample.*

**Keywords:** *Digital environment, Job search, Socio-economic characteristics*

## **1. INTRODUCTION**

Computer technologies, and in particular the widespread use of the Internet, have greatly changed the methods of communication used in job searches. In the not-too distant past, notice boards and newspapers were the only tools to establish clear communication between job seekers and employers. Job applicants had to visit companies, read advertisements or search through daily newspapers and journals to find a suitable job advertisement. E-recruitment is a term used to describe the process of finding and attracting applicants via the Internet. It is the use of technology and web-based tools to find, attract, select, assess and hire new employees. Job seekers usually search on the websites of companies that offer them the best working conditions. This method requires applicants to be patient and have the perseverance to visit and open job posting sites every day. Another option is to leave their CV-s on the company's website and wait to be invited for an interview when the need for such employees arises. Although job searching can be a difficult process, in today's digital environment there are several methods that can make it much easier. One commonly used social network that has been used very successfully for job searches is LinkedIn. This network not only offers the opportunity to publish job advertisements, but also to make contacts with industry experts. In addition to LinkedIn, job portals such as Indeed, Glassdoor and Monster should also be mentioned. In many countries, there are also national portals that bring employers and jobseekers together and provide information about vacancies in the country's labour market (Croatian Employment



Service - HZZ portal). As networking is the key to a successful job search, social networks such as Facebook are also used alongside LinkedIn to share information about job vacancies. In such networks, groups are formed for specific professions in which advertisements are regularly published. In addition, professional events such as conferences, seminars and job fairs offer opportunities for new employment. Informal contacts should also be mentioned, including family friends, acquaintances and other informal connections, which can be a source of information on potential employment opportunities. Contacting companies directly is also an effective method, and sending open applications to companies, even if they are not looking for workers, can lead to unexpected employment opportunities. Freelance platforms such as Upwork, Fiverr and Freelancer allow professionals to find projects and work remotely. These platforms offer flexibility and the opportunity to work on different projects, which can be useful for gaining experience and expanding your network of contacts. The aim of this paper is to highlight the importance of modern digital tools for individuals in their job search and to analyse which socio-demographic characteristics determine whether people search for job information online. This type of research will add to the existing knowledge about job search in a digital environment and will form the basis for the development of a strategy aimed at improving digital inclusion and facilitating access to information about the labour market. In the paper, an empirical study was conducted on the basis of data collected in two Croatian counties (Dubrovnik-Neretva and Split-Dalmatia) in the period from August 2023 to August 2024 on a sample of 103 respondents. The questionnaire was distributed online and was divided into two parts. One part of the questionnaire was aimed at collecting basic data on the socio-economic characteristics of the respondents, while the second part was aimed at collecting information on the way in which the respondents are looking or have looked for a job. The findings of this research indicate the importance of modern digital tools in the job search process and the influence of certain socio-demographic characteristics on the likelihood of searching for job information online. The results of the binary logistic regression show that variables such as gender, interest in working via a digital platform and education are significant predictors of online job search behaviour. In contrast, age and employment status did not show a statistically significant effect in this sample.

## **2. CONCEPTUAL FRAMEWORK**

Job search theory became popular in the 1970s as an alternative to the standard neoclassical theory of labour supply. The neoclassical model, based on the assumption of perfect information, did not consider unemployment in cases where people were actively looking for work but could not find it. Participants on the supply side of the labour market had only two options, either to be employed or not to be employed (i.e., not to be part of the labour force). However, the situation on the labour market suggests that there are a variety of reasons why people are looking for job. Approximately 20% of all employees have been with their current employer for less than a year. The existence and duration of unemployment were not negligible. This prompted a group of researchers to formulate an alternative theory to explain unemployment, which became known as the "job search theory". The main premise of the job search model is that job search is a dynamic, sequential process and that individuals must decide when to end this process under conditions of uncertainty and incomplete information. Consequently, frictional unemployment is the natural outcome of this process (Faggian, 2021). The economic theory of job search is based on the assumption that it takes time to find an acceptable job, and individuals must make decisions about their job search behaviour since individuals have imperfect information about jobs and wages. The reservation wage, i.e., the wage at which job offers are accepted, and the search effort determine the optimal job search

behaviour. Both components depend on factors such as income during the job search and the probability of receiving a job offer. The search effort can be described by the amount of resources spent on the job search, which can include both the type of search channel and time. The job search process is very often explained with the help of signalling theory, a stream of literature in economics that explains the forces behind the job search decision-making process (Vogel, Döring and Sievert, 2024). According to signalling theory, asymmetric information in the job search process can be reduced by using information from job advertisements (De Carpentier, Van Hove and Weijters 2019; Cooman and Pepermans, 2012). Given that job seekers have incomplete information, potential candidates tend to look for signals in job advertisements that provide important information about what the job and position might be like (Turban, 2001). Previous research suggests that the signals presented in job advertisements influence the success of the recruitment process, as individuals' attitudes towards the job and the employer are primarily based on this content (Connelly et al. 2011; Ehrhart and Ziegert 2005). According to Sharone (2017), a person's presence and participation in professional networks such as LinkedIn serve as additional signals of their competence and engagement in their industry. Carefully created profiles can provide an overview of an applicant's achievements, qualifications and professional connections, further boosting their credibility in the eyes of potential employers. They can also provide job seekers with additional information about employment opportunities and in-demand skills, which can improve hiring outcomes (Baird, Ko and Gahlawat, 2024). A mathematical framework that attempts to describe the emergence of reciprocal customer relationships over time, and is particularly relevant in labour economics to describe the creation of new jobs, is called the search and matching model. The search model examines the microeconomic decision of a single seeker, while matching theory examines the macroeconomic outcome when one or more types of seekers interact. There are several ways to match jobs and skills for online job markets. First, online job market technology is based on artificial intelligence (AI) algorithms. These algorithms generate additional information and display filtered and ranked lists of jobs for job seekers and filtered and ranked lists of candidates for recruiters. The most important input for these AI algorithms is information about the skills required by recruiters and the skills possessed by job seekers (Baird, Ko and Gahlawat, 2024). The literature examining the effectiveness of online job search compared to traditional job search before the Internet was widely used concluded that online job search was not as effective as traditional methods (Kuhn and Skuterud, 2004). However, over the last two decades, with the advancement of online job search platforms, digital search has led to a 25% faster termination of unemployment status than traditional search methods (Kuhn and Mansour, 2014). More recent work supports this hypothesis and shows that online job search platforms lead to faster re-employment and other positive economic outcomes (Bhuller et al. 2023; Choi 2023; Denzer, Schank, and Upward, 2021). The effective use of social media when looking for job is seen as an important aspect of young people's employability (Mowbray et al., 2018). The younger generations are more technologically literate and tend to use digital platforms to find job. Growing up with the internet and social media has led to a natural affinity for these tools. In contrast, older generations often use digital platforms less because they lack the technical knowledge or because they prefer traditional job search methods such as personal recommendations or advertisements in print media (Karácsony, Izsák, and Vasa, 2020). In terms of education, highly educated people tend to have more advanced digital skills and better access to information and are therefore more likely to use digital platforms in job search process. Many highly skilled occupations require knowledge and use of digital tools. On the other hand, less educated individuals may have limited access to digital resources or less developed digital skills, which may affect their ability and willingness to use digital platforms

Wheeler, and Dillahun, 2018). Work experience also plays an important role in digital job search process. Experienced professionals often use digital platforms to network and seek advanced career opportunities, relying on developed professional networks such as LinkedIn. In contrast, those with less work experience use digital platforms to find entry-level jobs or internships, demonstrating a greater openness to different types of jobs and greater flexibility in using different platforms (Harrison and Budworth, 2015).

### 3. DATA AND METHODOLOGY

The methodology of this study is based on a survey created to collect data on the frequency of digital platforms use in the job search process. The location of the respondents includes two Croatian counties: Split-Dalmatia and Dubrovnik-Neretva. The survey was conducted within one year (August 2023-August 2024) and the sample consists of 103 respondents, of whom, 52% are women and 48% men. 83% of respondents are employed, while 63% of them search for jobs online.

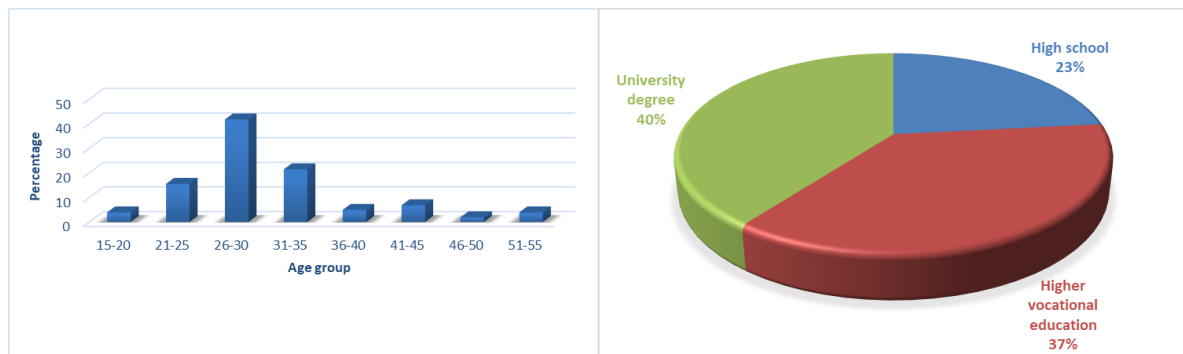


Figure 1: Age distribution and educational structure of the respondents  
(Source: Author's calculations)

The left part of Figure 1 shows the age distribution of the respondents. The most represented age group is 26-30 years (41.7%), which means that the largest proportion of respondents belong to this category, and the least represented is 46-50 years (1.9%). The right-hand side of Figure 1 shows the educational structure of the respondents. The most common level of education among respondents is a university degree, followed by higher vocational education, and secondary school.

	Percentage
Facebook	4,8
Facebook, Instagram	4,8
Facebook, Instagram, LinkedIn	31,7
Facebook, Instagram, LinkedIn, Telegram	17,3
Facebook, Instagram, Telegram	1,0
Facebook, Instagram, Tik tok	1,0
Facebook, Instagram, Tik tok, LinkedIn	20,2
Facebook, Instagram, Tik tok, LinkedIn, Telegram	4,8
Facebook, Instagram, Tik tok, Telegram	3,8
Instagram	6,7
Instagram, Tik tok	2,9

Table 1: Frequency of possessing user accounts on social networks  
(Source: Author's calculations)

All respondents stated that they had an account on one of the following social networks: LinkedIn, Facebook, Instagram, TikTok and Telegram. Table 1 contains data on the use of different social media platforms and shows the percentage of respondents who use certain combinations of platforms. Most people use multiple platforms rather than just one, and Instagram and Facebook are the most commonly used platforms in all combinations. LinkedIn and TikTok also appear in many combinations, suggesting that they are also gaining in popularity. 65% of all respondents stated that they search for job information via online job search platforms. In order to investigate which socio-demographic characteristics determine whether people search for job information online, a binary logistic regression was carried out on the basis of the data collected in the survey. To measure the dependent variable (whether respondents search for job information online), we rely on this yes-or-no question: “Are you looking for job information through online job search platforms?” Independent socio-demographic variables included in our model are:

- Age is a numeric variable;
- Gender is a binary variable, where 1=female and 0=male;
- Interest in working via digital platform (whether respondents are interested in working via a digital labour platform) is a binary variable, where 1=interested and 0=not interested;
- Employment status is a binary variable, where 1=employed and 0=unemployed;
- Education is a categorical variable coded as follows: 1=high school; 2=higher vocational education; 3=university education.

#### 4. RESULTS AND DISCUSSION

The results of binary logistic regression are given in the Table 2. The predictor variable age, if statistically significant, would indicate that the likelihood of a person searching online for information about a job decreases slightly as the age of the respondent increases. This result is consistent with expectations and previous research findings, as young people are more adept at using digital tools, so it is to be expected that younger people will search for job information online (Reddy, Sharma and Chaudhary, 2020). One possible explanation for why this variable is not statistically significant lies in the fact that the largest number of respondents in the sample are aged between 20 and 36, meaning that older respondents are not evenly represented in the sample. The explanation for this result can again be found in the fact that the survey was conducted online and younger people are more experienced in using digital tools.

	Sig.	Exp(B)
Age	,140	,949
Gender	,044	2,793
Interest in working via a digital platform	,007	11,960
Employment status	,947	1,060
Education	,066	
Education (1)	,025	7,513
Education (2)	,029	7,828
Constant	,261	,148

*Table 2: Binary logistic regression on search for job information online*  
(Source: Author's calculations)

The gender variable is statistically significant and indicates that women are 2.8 times more likely to search for job information online than men. This result can be explained by the fact that there are more unemployed women than men in our sample (more than 65% of all unemployed are women), so it is to be expected that unemployed people will search for job information more frequently. As expected, the variable Interest in working via a digital platform is statistically significant and indicates that people who are interested in working via a digital platform are almost 12 times more likely to search for job information online. The Employment status variable is not statistically significant, which leads to the conclusion that employment status has no influence on whether people search for job information online. The estimated coefficients for the Education variable are statistically significant and greater than 1, which means that people with higher vocational education and a university degree are more likely to search for job information online. Specifically, respondents with a higher vocational education are 7.5 times more likely to search for job information online than those with a high school diploma, while this probability is even higher for respondents with a university degree – the probability is 7.8 times higher in this category. This result is in line with expectations, assuming that people with higher education also have better skills in using a wider range of digital tools.

## **5. CONCLUSION**

One of the key elements of the digital job search is a presence on professional networks such as LinkedIn. Therefore, digital profiles are becoming as important as traditional resumes, and a well-optimized profile can increase the visibility of applicants to potential employers. In addition, a personalized approach, where a separate application is created for each position, significantly increases the chances of being hired. Although job searching can be a difficult process, there are a number of innovative tools available in today's digital environment that can make the search much easier. The results of this research show the importance of modern digital tools in the job search and the influence of certain socio-demographic characteristics on the likelihood of searching for job information online. Although it was expected that age would have a significant influence, the analysis did not confirm this assumption, which can be explained by the unequal representation of older respondents in the sample and the fact that the survey was conducted online. On the other hand, gender proved to be a significant predictor, as women are more likely to search for job information online. Interest in working via digital platforms also proved to be a key factor, as people who express an interest in such work are more likely to search for job information online. In addition, the results confirm the assumption that people with higher education have better digital skills and are therefore more likely to use digital tools in their job search. The results of the survey add to the existing knowledge about job search in a digital environment and can serve as a basis for further research and the development of strategies aimed at improving digital inclusion and facilitating access to labour market information. The limitations of the study relate to sample size and geographical coverage, as the study was conducted with only 103 respondents, which represents a relatively small sample and could limit the generalizability of the results to the wider population. The data was only collected in two Croatian counties, which means that the results may not be applicable to the whole of Croatia or other regions with different socio-economic characteristics. Another shortcoming is that the study focuses on a few socio-demographic variables, but does not take into account other potentially relevant factors such as digital literacy, internet access or specific characteristics of the labour market. The limitations of the study also lead to recommendations for future research that should include the whole of Croatia and other characteristics of the respondents so that the results can be generalized and compared with the results of studies in other geographical areas.

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# KNOWLEDGE MANAGEMENT IN ORGANIZATIONS

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## **ABSTRACT**

*The foundation of this paper is based upon knowledge management in organizations. Knowledge management represents a systematic process of establishing, maintaining and directing the entire organization in order to utilize its knowledge and thus create business value and generate competitive advantage. The objective of knowledge management is to enable organizations to improve their management quality via decision-making, thus ensuring the availability of safe and reliable data during the life cycle of their services. For the organization, knowledge represents certain information and values that employees possess, and which are actively contributing to growth and competitiveness of the business. Knowledge can be stored within knowledge databases, repositories, or other digital means of storage. It is vital that every step or process be stored within one of the repositories or databases, so that it can be further transferred to future employees. It can be said that the knowledge databases make for a vital part of every organization, as they represent a set of good practices that the organization uses in order to develop its business strategy. This paper details the conceptual definition of knowledge management, as well as methods of successful knowledge management.*

**Keywords:** *types of knowledge, databases, expert systems, information*

## **1. INTRODUCTION**

Correct knowledge management results in a better market position for the business. One must keep in mind that nowadays, knowledge remains the most important factor of success, as neither individual nor organizational success can occur in its absence (Žugaj, Schatten, 2005). Methodology used in this paper is based upon information collected from available literature, as well as upon the analysis of secondary data. The focus was placed upon analysis of scientific, professional and review papers from online databases such as Google Scholar, Hrcak and Srce. Technological advancement caused a need for support from informational systems, and thus the interest in information technology grew. Understanding and utilizing information technology in order to manage knowledge became one of the main discussion topics in the world. The main reason behind this were quality issues. It was necessary to develop an adequate system focused on the topic of knowledge. Those systems are now called Systems Based on Knowledge or Expert Systems. The main purpose of such systems boils down to their contribution to quality knowledge management. It is important to point out that such systems also deal with human resources management. They are largely used in organizations that are trying to survive the market competition.

Their wide range of application encompasses various areas, such as military, healthcare, and various businesses on the market. It is very important to manage human resources in the correct way - the system must be adapted, or one is directly jeopardizing the outcomes and their quality. If we observe an organization with a large number of employees, the staff is usually comprised of managers, expert teams and other employees. The knowledge-based system of the company is responsible for informing all employees about important information and changes on time. This is its primary purpose. The system is responsible for forwarding such information to every individual employee. This information is used to notify employees about their future direction of action and their relationship with the organization. Knowledge management in organizations bases its strategy on deepening individual knowledge, development of individual skills, and a certain dose of motivation. Naturally, not all employees can be “perfect”, however, there are always individuals who excel in the aforementioned skills. The number of employees who are competent and educated enough to take a more challenging role within the organization (such as a position that calls for important decision-making) has sadly been decreasing. There needs to exist a certain business excellence whereby the knowledge-based system can make decisions, however these decisions cannot be final. The final decision should still be made by an individual. These systems sport large databases; therefore, it is important to correctly integrate such knowledge into the system.

## **2. KNOWLEDGE MANAGEMENT**

Knowledge management is usually illustrated via the Data-to-Information-to-Knowledge-to-Wisdom structure. Davenport and Prusaka 1998 define data as a discrete and objective fact, i.e., something we might find out about a certain agent or event within the business environment. The basic element of information is data; therefore, organizations collect, keep and analyze data in order to predict trends. The majority of the collected data is related to the functional process of the organization. Žugaj and Schatten 2005 define data as a separate set of objective facts about an event, i.e., as a structured record of transactions, measurements, observations or analyses. A piece of data is a set of discrete facts about events. By themselves, these items have little to no meaning (Office of Government Commerce 2007). When it comes to data, responsible data management encompasses data retrieval, identification of relevant data, maintenance of data integrity, as well as archiving or deleting unnecessary data. Most organizations store significant amounts of data in highly structured bases, such as tools / systems and databases. Key knowledge management activities related to data are the abilities to (Office of Government Commerce 2007):

- record correct data,
- analyze, synthesize, and transform data into information,
- identify relevant data and concentrate resources upon their records.

Accumulation of data within a certain context results in information. Davenport and Prusaka (1998) define information as a message that can be used within the context of business decision-making, whereas they regard knowledge as a fluid mixture of relevant experiences, values, contextualized information and expert insight. Žugaj and Schatten (2005) define information as a „set of data with meaning (information is a message in any form)“. Information only becomes knowledge once it is applied, i.e., once it attains added value. Information comes from contextualized data. Data is usually stored in semi-structured contents such as documents, e-mails, and multimedia. The key to knowledge management activities and information is content management. Contents must be managed in a way that facilitates inquiry, finding and reusing data, and learning from experiences.



This way mistakes aren't repeated, and the work isn't duplicated. Responsible Knowledge Management boils down to managing content in a way that enables users ask questions and analyze answers. Within the context of modern-day business, knowledge is considered a strategic resource. Contemporary businessmen find knowledge essential to their businesses. Only knowledge-based organizations can create competitive advantage, which ensures continuous progress. According to Bahtijarević-Šiber et al., 2008, „sharing, transferring and disseminating knowledge within the organization grows the total organizational knowledge“, and thus grows its competitive advantage. Knowledge represents a deeper and more significant product of data- or information analysis. Kovačević and Vukušić (2004) consider knowledge a combination of information, experiences and expert intuition, whereby said knowledge becomes integrated into products and processes of the organization and thus remains within the organization and its environment. Lasić-Lazić (1996) says that knowledge represents our beliefs and values, which are based upon an organized set of information gathered via experiences, communication, and conclusions. Knowledge can be stored within documents, databases, repositories, routines, documented information, procedures and organizational norms. Therefore, knowledge represents relevant information stored within documents, which is necessary for decision-making and used to support business processes (Hinz, 2001). Knowledge is comprised of tacit experiences, ideas, cognition, values, and good judgement of individuals. Therefore, knowledge integrates data and experience. People attain knowledge via peer expertise and data analysis. By synthesizing these elements, new knowledge is created. Knowledge is dynamic and context based. Knowledge molds information into an easy-to-use form, which can facilitate decision-making. During service delivery, said knowledge isn't based solely on the current delivery in progress, but also on experiences gathered during previous deliveries, consciousness about recent and expected changes, and other factors. Knowledge management must support tools that enable users to detect trends and thresholds. Wisdom can be created by utilizing all available knowledge, such as pattern recognition. For example, one can conclude that the recent drop in service quality occurred due to adoption of new procedures. When it comes to wisdom, knowledge management is responsible for the availability of tools that facilitate identification of such patterns. Wisdom provides ultimate resolution to the material, as well as applied and contextual consciousness when it comes to reasoning and good judgement. Based on the previous definition, it is easy to spot the differences between the terms data, information, knowledge and wisdom. One can also spot a certain hierarchy. Accordingly, data takes the bottom spot, whereas wisdom takes the top. The top of the pyramid is reserved for wisdom that comes from all available knowledge. The spot below wisdom is taken by knowledge. This knowledge can come only from possession of certain information; therefore, information is regarded as basis for knowledge. In itself, information possesses limited value. On the other hand, information is built upon data. Data in itself is useless unless it is transformed into any kind of useful information.

## **2.1. Types of Knowledge**

There are many knowledge classifications, however this chapter only offers a brief overview of the most important ones. Accordingly, the basic types of knowledge are as follows (Zack, 1999):

- declarative (static) - knowledge on someone or something
- procedural (dynamic) – know-how,
- causal – why,
- conditional – when,
- relational – who/what with whom/what.

Probably the most well-known categorization of knowledge is that into explicit and implicit knowledge (hidden and tacit), which can be owned by an individual or a company. The aforementioned types of knowledge and their characteristics are shown in Table 1.

	<b>Individual</b>	<b>Organizational</b>
<b>Explicit</b>	<ul style="list-style-type: none"> <li>• <b>information</b></li> <li>• <b>facts</b></li> <li>• <b>science</b></li> <li>• <b>research</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>databases</b></li> <li>• <b>systems</b></li> <li>• <b>procedures</b></li> <li>• <b>rules</b></li> <li>• <b>intellectual property</b></li> </ul>
<b>Implicit</b>	<ul style="list-style-type: none"> <li>• <b>skills</b></li> <li>• <b>intuition</b></li> <li>• <b>experience</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>knowledge integrated into goods and services</b></li> <li>• <b>knowledge integrated into business processes</b></li> <li>• <b>business recognizability</b></li> </ul>

*Table 1. Types of knowledge*

(Source: authors' work according to Bosilj Vukušić and Kovačević (2004))

According to Bosilj Vukušić and Kovačević (2004), explicit knowledge is a type of knowledge that is available to everybody within the organization, whereby the term encompasses available information, facts, and research results that individuals can learn and thus expand their individual knowledge. However, this can also be knowledge owned by the organization, which means it is stored within databases or as intellectual property. Implicit knowledge represents personal knowledge that came from experience, observation, and insight related to some concrete action (Stančić, 2001). This type of knowledge is typically understood and applied on a subconscious level. When we want to transfer implicit knowledge to a certain person, we usually do it via conversation or exchange of experiences. Bosilj Vukušić and Kovačević (2004) define implicit (hidden) knowledge as knowledge that is undocumented and not available to everyone, whereby it is expressed via skill, intuition or experience of individuals whose combined knowledges make for hidden organizational knowledge. According to Bahtijarević-Šiber et al. (2008), implicit knowledge is personal, silent knowledge that isn't visible to the naked eye. It is situated within minds of people and difficult to formalize or transfer. Implicit organizational knowledge is built into the products and services of said organization, as well as into its business processes. Accordingly, implicit knowledge represents added value: it is what makes the organization competitive and thus recognizable on the market.

### **3. DEFINITION OF KNOWLEDGE MANAGEMENT**

Žugaj and Schatten (2005) offer several definitions of knowledge management. They mention the definition given by Shaw et al. (2001), who defined knowledge management as a systematic process of establishing, maintaining, and directing the whole organization with the purpose of knowledge utilization in order to create business value and generate competitive advantage. Knowledge management represents a concept that turns information into applicable knowledge available to individuals who can utilize it in order to reach organizational goals (Mishra, 2009). Recently, knowledge management has been getting more and more attention in both professional and general public, as it is regarded as a foundation for creating new value (Panian, 2003). Alfirević and Šiber Makar (2005) point out that knowledge management comes down to making efficient connections between employees who already possesses the knowledge and employees in need of knowledge. However, it also encompasses collection of lessons learned in order to facilitate future learning within the organization.

If people don't have quality data, the resulting information will lack quality as well, which will ultimately result in dangerous, treacherous, and confusing knowledge. Data management is a basic problem which can lead to problems with Knowledge Management. Organizational success depends on the businesses' capability to turn personal knowledge of its employees, as well as knowledge stored within handbooks and other documents, into a widely accessible organizational knowledge. According to Skyrme (1997), knowledge management is nothing but explicit and systematic management of vital and associated processes of creation, collection, organization, division, usage and exploitation. It calls for transformation of personal knowledge into institutional, i.e., organizational knowledge which can then be used and applied by the entire organization. With the help of the global information infrastructure, electronic document management, and some helpful additions such as the system for identifying changes and monitoring trends according to certain predetermined parameters, it is possible to talk about knowledge management systems. Knowledge always remains a virtue of the user, not the system (Tudman, 2003). Knowledge management is only successful when technology is used to give employees access to necessary information when they need it and in order to solve a certain problem instead of focusing on individual processes and procedures. Knowledge management can be observed from different viewpoints, with the most important ones being as follows:

1. knowledge management as a technology,
2. knowledge management as a discipline,
3. knowledge management as a philosophy,
4. knowledge management as a social and entrepreneurial venture.

The first viewpoint is knowledge management as a technology, given that users often conflate knowledge management with technology. Knowledge management is comprised of a large number of methods, specializations, systems and approaches typically used to manage processes related to knowledge. It also includes a variety of well-defined approaches based on information technology (Žugaj, Schatten, 2005). This viewpoint focuses on usage of knowledge concepts in order to do something for business and operative purposes. The second viewpoint is knowledge management as a business/scientific discipline. It provides the basics necessary to conduct research, education or training; furthermore, it also develops new effective methodologies and approaches (Žugaj, Schatten, 2005). As a discipline, it actually observes the phenomena, mechanisms, and processes that influence knowledge management. Knowledge management as a philosophy makes for the third viewpoint and refers to managers who use Knowledge Management when implementing new business strategies or attempting to improve business results (Žugaj, Schatten, 2005). Management forms perspectives, plans, and steps based on their beliefs and understanding as to why and how knowledge management will lead toward the desired outcomes. This viewpoint focuses on business observation, i.e., how to use and apply knowledge management. Knowledge management as a social and entrepreneurial venture is the fourth viewpoint and refers to the fact that knowledge management has become crucial to maintaining or improving one's market position. This has been a direct result of globalization and has caused a social and entrepreneurial movement rooted in the belief that the era of knowledge is upon us. In this era of knowledge, intellectual capital, if used properly, would make for the basis of market competition. This viewpoint focuses on strategies, politics and resource allocation aimed at building competitive intellectual capital (Žugaj, Schatten, 2005).

#### **4. KNOWLEDGE MANAGEMENT SYSTEM**

According to Firestone (1998), a knowledge management system is defined as a constant and continuous cooperation between employees, with the objective of integrating various other employees, components and activities of the knowledge management system into a planned and lead process that results in the creation, maintenance, and improvement of the knowledge database. Accordingly, a knowledge management system, as the fundamental element, presumes the existence of a knowledge database. Firestone (1998) defines a knowledge database as a set of recorded data, true claims and models of untrue claims, metamodels, and management software. As the quantity of information grows, so do the problems related to content distinction, i.e., distinction between true and untrue information. If the collected data isn't adequately processed, protected, and utilized, it loses its value. Praničević (2014) believes that it is crucial to recognize the need to build knowledge via a controlled and managed process as soon as possible, because that is how an organization can begin functioning in an environment with a well-established flow of information and knowledge. If we desire an efficiently performed and supervised knowledge management process, we need to monitor all knowledge management cycles. Praničević (2014) describes a knowledge management cycle as a circular process that turns data into information and knowledge. According to Bhatt (2001), a knowledge management cycle occurs in several phases: creation, validation, formation, distribution, and application. The approach to knowledge management, observed through cycles, varies from author to author. Bahtijarević-Šiber et al. (2008) claim that the knowledge management process includes: knowledge-building, knowledge-realization, knowledge-distribution or dissemination, knowledge-utilization, and knowledge-management.

Knowledge-building is herein described as a process of creating, stealing, translating, and reinterpreting knowledge. Knowledge-realization represents a transformation of implicit into explicit knowledge, whereas knowledge distribution represents dissemination of knowledge within the organization, i.e., that is how the knowledge becomes available to all members of the staff. Knowledge management systems are based on formalized and written implicit knowledge, as well as logical links. The foundation of a successful knowledge management system is recording knowledge and storing it in a digital form so it can be used and managed via information technology. It was previously mentioned that knowledge management systems rely on electronic document management systems to create a knowledge database. Christensen (2000) states that every knowledge management system must enable creation, recording, dissemination, and distribution of organizational knowledge in a uniform and predictable way. Furthermore, said system must provide several ways to access the recorded knowledge and information, as well as offer the possibility to view the same knowledge from various aspects, but it must also entice teamwork via its improved information flow. The system must also enable its users to record previous work and use it as a basis for future decision-making, create archives of work documents and links to previously used documents, link similar information in a uniform and predictable way, and automate routine tasks so that the employees have more time for creative ventures.

The real value of a knowledge management system has become particularly accentuated in these modern times, due to the nature of the work environment. Some departments aren't situated in the central part of the organization; therefore, a good system enables a quick exchange of knowledge and thus ensures a smooth business operation.

## **5. KNOWLEDGE MANAGEMENT AND STRATEGY**

Strategy plays an important role in knowledge management. Numerous organizations are beginning to view knowledge as an important resource. Any improvement in knowledge utilization can lead to significant positive changes, such as increased productivity or quality levels. If the managers know what their organization knows, they can fulfill their clients' wishes better, they can offer innovative products, they can react to market changes quicker, and they can improve the overall productivity of the business. In order to improve their market position, modern day organizations are focusing on increasing their overall efficiency, whereas the basic competitiveness parameters remain unchanged. Knowledge-focused business management doesn't only require improvement – it requires a slight change, a metamorphosis on the way toward a new, innovation-driven organizational culture. Such culture doesn't just happen overnight; it results from a complex process that must be initiated and maintained during a longer period of time, and it must bring about a change in the organizational culture connected to the reconfiguration of its resources. Such changes cannot be copied or imitated (Volkman, 1995). Knowledge-focused management is the application of knowledge resources in order to increase both the efficiency and the competitiveness of the organization (North, 2008). The objective of a knowledge-focused organization is not only to transform information into knowledge, but also to transform knowledge into competitive advantage which is then reflected in business success. According to Picot (1996), there are three mutually connected forces that best encompass the increasing importance of knowledge as a resource: the structural transformation into a society of information and knowledge, globalization, and information and communication technologies. The first force is structural transformation. Structural transformation refers to the metamorphosis from labor- and capital- intensive activities to activities based upon information and knowledge. Nowadays, organizations are mostly selling information, knowledge, or intelligent goods and services. It is evident that labor and capital are increasingly replacing knowledge as a scarce resource, and that this structural change is also changing organizations and organizational roles. The positions of managers and employees are now regarded with new understanding and from new perspectives (North, 2008). The second force is globalization, which changes the international labor division. Countries that have always been known as industrial nations are transitioning into knowledge nations. Physical production is mostly being allocated to under-developed and developing countries, whereas international learning processes are speeding up so that new competitors can enter the global market. The third force is information and communication technology. These technologies are enabling and facilitating cheap transactions, as well as creating a global information transparency. This clearly results in numerous changes on the market – more innovation, lower prices, shorter product lifecycles, an increased individualization in clients' needs, and the birth of new business fields.

### **5.1. The connection between knowledge and strategy**

The influence of strategy in knowledge management is reflected in the definition of strategic knowledge, coordination of knowledge transfers, and utilization of key knowledge in order to increase effectiveness (Zheng, Yang, McLean, 2010). Strategy may have a direct effect upon the effectiveness of the organization; however, it also causes an indirect effect via its influence on effective knowledge management. As a resource, knowledge arises from the organizational strategy, whereby created and utilized knowledge becomes reflected within the strategic priorities of the organization itself (Zheng, Yang, McLean, 2010). Drew (1999) explored the ways in which managers can integrate knowledge management into the organizational strategy, whereby he made a special review of the possibilities of combining knowledge management

concepts with strategic tools. Moreover, the author also looked into the development of unique, knowledge-based resources which can greatly increase competitive advantage. Drew wanted to point out that strategy, culture, technology, organizations, and people make for key components of successful knowledge management. Teece (2000) believes that knowledge management calls for development of dynamic abilities, i.e., the ability to quickly and effectively spot and take advantage of opportunities. Teece thus points out the connection between strategic management and knowledge management, given that the aforementioned dynamic abilities make for one the most influential concepts of strategic management.

## **5.2. The concept of knowledge strategy**

The foundation for a successful knowledge strategy lies within the ability to identify valuable, unique, and non-imitable resources based on knowledge, as well as resources and abilities that support an organization's market position (Talaja, 2014). It is very important for an organization to form their strategic intent, identify knowledge necessary to conduct said strategy, and compare it to its knowledge in order to spot the gap between existing and necessary knowledge. This serves the purpose of explaining the connection between strategy and knowledge. Zack (1999) classifies knowledge according to its ability to support the organization's market position. According to said classification, knowledge can be categorized as essential, advanced, and innovative. Furthermore, Zack believes that the competitive position of the organization directly forms its need for knowledge, whereas the existing knowledge determines the chances and limitations of success when it comes to attaining available competitive positions. Essential knowledge is the minimum scope and level of knowledge necessary to survive in the industry (Talaja, 2014). These levels of knowledge won't provide long-term competitiveness; however, they can become an obstacle to other companies that would like to enter the industry. Every business within the industry possesses essential knowledge; therefore, essential knowledge cannot provide a solid basis for competitive advantage. Advanced knowledge is knowledge that results in competitiveness. Two organizations may have similar levels, scopes, and qualities of knowledge or competitiveness; however, the contents of said knowledge mostly vary, thus leading to a differentiation of knowledge (Talaja, 2014). Innovative knowledge is knowledge that turns an organization into an industry leader. Such knowledge creates a distinction between a company and its competitors and enables said company to change the rules of engagement (Talaja, 2014). However, knowledge isn't static. Any knowledge that is considered innovative today will probably become essential in the future; therefore, it is vital to ensure continuous learning in order to keep a favorable market position. Knowledge strategy can be observed as a set of strategic choices related to creation or adoption of new knowledge and the ability to manage existing knowledge in order to create new products and processes. Accordingly, a knowledge strategy depends on the organization's willingness to engage several resources in order to collect new, radical knowledge and incrementally increase its existing knowledge database. (Talaja, 2014).

## **6. CONCLUSION**

The role of knowledge and knowledge management has been increasing in the recent years. Nowadays, it is the key strategic matter within every organization. The role of knowledge is to enable the organization to create competitive advantage. Knowledge management is key to market success, as it provides the basic framework that enables sustainable strategic development in all aspects of business. Application of information technology and staff knowledge can create a knowledge management system. A knowledge management system is very important to all organizations, as it changes the manner in which they operate and enables

every employee to take part in the creation, exchange, and evaluation of knowledge. However, implementation of technology is the easy part – the problem lies within the top managers' dedication to intensive work with the employees in order to accelerate development and facilitate the dissemination of knowledge. Like all immaterial assets, knowledge must be regarded more seriously, not only on the general level, but also on the lower levels (for example, on team or group level). Some employees have gathered a lot of knowledge; however, they do not know how to transfer it to other members of the staff. This problem could potentially be solved by structuring knowledge and adapting it in order to facilitate its dissemination. Objectives of knowledge management are as follows: transferring and disseminating knowledge through the entire organization, developing new, high-quality knowledge, making sure that knowledge necessary to make the best business decisions is always available, supporting knowledge-adoption from external sources, and developing the ability to successfully apply and use said knowledge.

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# MANAGERIAL ECONOMICS OF A STATE-OWNED ENTERPRISE USING DIGITAL TRANSFORMATION

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## **ABSTRACT**

*The modern business conditions in which companies operate today face them with numerous challenges to which they need to adapt in order to survive on the market. The most important changes happen with the transition from the traditional to the digital economy through the digitalization process which leads to the development of an economy based on advanced technology and one no longer based solely on labor and capital, but on knowledge. Over the past few years, the concept of corporate social responsibility has become more and more important, requiring changes in numerous aspects of their activities. Thus, sustainability is required in an ecological sense, by fulfilling conditions in accordance with the principles of "green" business. The concept of sustainable business changes both the social and economic dimensions, by changing the attitude towards making a profit, which is still the primary goal of the company, but not at the cost of certain social goals. In addition to all the aforementioned changes in the environment, unexpected crises such as the COVID-19 pandemic also occur, which further emphasize the importance of management and the way they manage those situations and make decisions. State-owned enterprises are specific due to their ownership model, which influences their operating environment and the regulation they are subject to. State-owned enterprises are obliged to achieve broader social goals than private enterprises and for this purpose often sacrifice the company's potential profit. Postal services in most countries are provided by state-owned enterprises, which certainly affects the business models of such enterprises. The postal sector is not exempt from the processes of globalization, digitization, the shift to a knowledge-based economy, and the emergence of the concept of socially responsible business. Adapting to new conditions and achieving positive business results in those is the biggest challenge of modern management. In the postal sector, it is crucial to observe the changing trends in the postal services market and, through investments in the process of digital transformation, adapt all processes and services to the new demands of users and the environment. It is precisely in this that the role of managerial economics is found, which should anticipate and identify changes and provide management with tools for managing changes and challenges in the environment.*

**Keywords:** *state-owned enterprise, digital transformation, business, management, postal services*

## **1. INTRODUCTION**

In today's world, decisions are made in an increasingly unstable and uncertain environment. Management plays a crucial role in determining the best course of action for a company, especially under such conditions. State-owned enterprises differ from other business entities

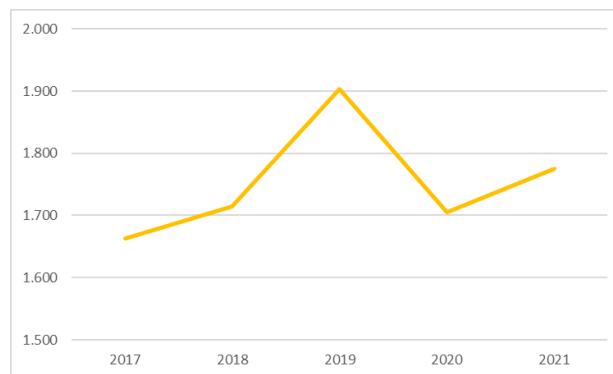
due to the specific legal regulations and government interventions affecting their operations. Like all companies, they face growing challenges, particularly globalization and digitalization, which shape increasingly demanding customers. Additionally, sustainability requirements in social, environmental, and economic aspects are becoming more prominent. In state-owned enterprises, managers must possess specific skills tailored to their unique operational environment. The postal services sector has experienced significant digitalization in recent years, requiring companies to adapt their operations accordingly. This paper aims to present the theoretical framework of managerial economics in state-owned enterprises and analyze the impact of technological advancements on business operations and management's role in digital transformation. To illustrate this, the case of Croatian post (Hrvatska pošta d.d.) will be examined.

## **2. MANAGING BUSINESS DIGITALIZATION: THE CASE OF HRVATSKA POŠTA D.D.**

### **2.1. Business Analysis of Hrvatska pošta d.d.**

Hrvatska Pošta d.d. is one of the largest state-owned enterprises in the Republic of Croatia. It operates as a joint-stock company, with the Republic of Croatia as its sole shareholder, represented by the Minister of the Sea, Transport, and Infrastructure. The company follows a dual management system consisting of three key bodies: the Management Board, the Supervisory Board, and the General Assembly. As a state-owned enterprise, the appointment and dismissal of Management Board members are regulated by a series of national laws. The Management Board can have up to five members, one of whom is appointed as the President of the Board. Hrvatska Pošta d.d. is the largest provider of postal services in Croatia and the sole provider of universal postal services as mandated by the Postal Services Act (Hrvatska Pošta d.d., 2021). According to 2021 data, there were 25 postal service providers in the Croatian market, with Hrvatska Pošta holding an 87% market share. In addition to state regulations concerning the appointment of its leadership, the company is also subject to oversight by other regulatory bodies, such as the Croatian Regulatory Authority for Network Industries (HAKOM). This is particularly significant in terms of pricing changes for postal services, which directly affect the company's profitability. Hrvatska Pošta is structured into a divisional system with four main divisions: Post, Network, Express, and Support. The Post division is the largest segment, encompassing the company's core activities and generating the highest revenue. When analyzing business operations, the main focus was placed on the financial perspective due to its importance for shareholders and company managers. Below are some of the key financial indicators of Hrvatska Pošta d.d.

**Operating Revenues.** The total revenues of Hrvatska Pošta d.d. predominantly consist of operating revenues. The share of operating revenues in total revenues ranged between 86% and 95% from 2017 to 2021. Examining the structure of operating revenues, it is evident that sales revenues dominate, accounting for 90,96% of operating revenues in 2021, with postal services being the most significant contributor. Graph 1 illustrates the total revenue trends of Hrvatska Pošta d.d. (in million kuna) for the period from 2017 to 2021. A growth trend is evident, peaking in 2019, before the COVID-19 pandemic impacted revenues.



Graph 1: Total revenues of Croatian post (mil. kn)

(Source: Prepared by the authors based on: Hrvatska Pošta d.d. (2021) Annual Report for 2021)

The revenue growth was accompanied by an increase in expenses, necessitating a more detailed analysis of their structure. In 2021, operating expenses accounted for as much as 99,4% of total expenses, with personnel costs making up nearly 60% of operating expenses, highlighting the labor-intensive nature of the industry.

**Revenue per Employee.** Revenue per employee is a way of measuring employee productivity within a company. To gain better insight into employees' contribution to the company's revenues, only sales revenues were used in the calculation of revenue per employee. This approach excludes other business and financial revenues, such as revenues from the sale of long-term assets or interest income. During the observed period, this category of revenue averaged 158,688.6 kuna. To examine the relationship between personnel costs and productivity, a correlation analysis was conducted between personnel costs per employee (to eliminate the effect of changes in the number of employees) and revenue per employee. The results of this analysis are presented in Table 1.

Pearson's Simple Correlation Coefficient (r)			
Variables			
X :	Personnel costs per employee (kn)		
Y :	Revenue per employee (kn)		
r :	0,869225127		
TEST			
Standard Error of the Correlation Coefficient		t-Test Statistic	p-Value
$S\sqrt{\frac{1-R^2}{n-2}} = \sqrt{\frac{1-0,869225127^2}{3}} = 0,285451501$		3,045088655	0,023122416
H <sub>0</sub> :	There is no linear correlation		
H <sub>1</sub> :	There is a linear correlation		
Conclusion :			
The p-value of 0.0231 is less than 0.05, indicating that there is a statistically significant linear relationship between personnel costs per employee and revenue per employee at the 5% significance level.			
We conclude that the correlation coefficient r is statistically significant.			

Table 1: Results of the Correlation Analysis Between Personnel Costs per Employee and Revenue per Employee in Hrvatska Pošta d.d.

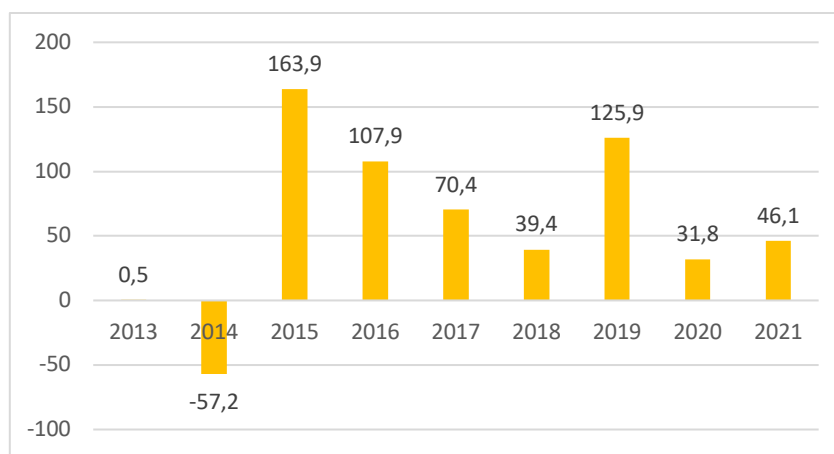
(Source: Prepared by the authors based on: Hrvatska Pošta d.d. and Croatian Bureau of Statistics (DZS))

A part of the personnel costs includes payments to employees as part of the efficiency reward program. Table 2 lists the amounts paid to employees under this program over the last three years. These payments certainly had an impact on employee productivity, which is reflected in the positive correlation between the rewards paid and revenue per employee, as the Pearson correlation coefficient between these variables is 0.9233. However, alongside the rewards paid to employees, there are other variables whose impact on productivity is somewhat more significant.

	Amount of rewards paid (thousand kn)
2019	15.903
2020	14.885
2021	15.496

*Table 2: Amount of rewards paid to employees (thousand kn)*  
*(Source: Prepared by the authors based on: Hrvatska Pošta d.d. (2021) Annual Report for 2021)*

**Net Profit.** One of the most important indicators of a company's financial performance is its net profit. To gain insight into the performance of Hrvatska Pošta d.d., the following graph shows the trend of the company's net profit over the period from 2013 to 2021.



*Graph 2: Net Profit of Hrvatska Pošta d.d. (mil. kn)*  
*(Source: Prepared by the authors based on: Hrvatska Pošta d.d.)*

## **2.2. The impact of market and technological conditions on the sustainability of the business operations of Hrvatska pošta d.d.**

In modern business conditions, companies strive to achieve sustainability in all aspects of their operations. In addition to "green" business practices, sustainability also includes socially responsible business practices, which also affect financial aspects. Business plans must be renewable and long-term (McGuigan et al., 2014.) in order to provide the company with flexibility and the ability to adapt to changes in the environment in which it operates. Similarly, managers, when making decisions, must aim for long-term and sustainable profitability, rather than making decisions that will only have short-term effects.

Business sustainability can be observed through three main dimensions:

1. Ecological sustainability. It requires companies to operate with minimal environmental impact by achieving energy efficiency, reducing waste, decreasing greenhouse gas emissions, and developing strategies to combat climate change.
2. Social responsibility. It is achieved by creating a fair working environment in which all employees have equal opportunities for development, along with a responsible approach to the community and society as a whole.
3. Economic sustainability. It relates to corporate governance and risk management, requiring companies to operate transparently and report in accordance with ethical principles.

At Hrvatska pošta, sustainable business is implemented through the sustainability management strategy called “We Grow Green and Sustainable.” This strategy covers three areas in line with the three described dimensions.

<b>ECOLOGICAL SUSTAINABILITY</b>	<b>SOCIAL RESPONSIBILITY</b>	<b>ECONOMIC SUSTAINABILITY</b>
<ul style="list-style-type: none"> <li>• Reduction of CO2 emissions by 300,000 kilograms annually</li> <li>• Installation of solar panels</li> <li>• Existence of an e-fleet (10% of the total delivery fleet)</li> <li>• Development of a network of e-charging stations</li> </ul>	<ul style="list-style-type: none"> <li>• Opened postal offices in isolated areas</li> <li>• Vaša pošta Foundation</li> <li>• Development of a network of parcel lockers at various locations across Croatia</li> <li>• Hrvatska pošta Academy for employee education</li> <li>• Growth in net wages of employees</li> </ul>	<ul style="list-style-type: none"> <li>• Contribution to the Croatian economy</li> <li>• Focus on service quality</li> <li>• Development of new business models and expansion into new markets through organic growth</li> <li>• Development of strategic partnerships</li> </ul>

*Table 3: Sustainable Business of Hrvatska pošta d.d.  
(Source: Prepared by the authors based on: Hrvatska Pošta d.d.)*

Digitalization has a major impact on the business model of postal companies, primarily due to the growth of e-commerce. As a result of the rise of e-commerce, there has been a shift from letter-based services to parcel-based services, leading to a change in the revenue structure. Over the years, the share of revenue from parcels has increased, while the share of revenue from letters has decreased. This trend has been particularly pronounced since 2019, following the COVID-19 pandemic. A strong emphasis has been placed on green business practices and service sustainability with the focus on emissions-free last-mile delivery in the postal sector (Hrvatska pošta d.d., 2021). To contribute to environmental protection, Hrvatska pošta invests in technology that enables cleaner production and the generation of less waste, as well as more responsible waste disposal. Through the automation of processes and increasing energy efficiency of facilities, the level of pollutant emissions is controlled. The process of digitalization comes with technological changes so to better cope with those, Hrvatska pošta has introduced new technologies aimed at improving communication and reducing administrative costs. In recent years, technological innovations have emerged in the form of cryptocurrencies and crypto stamps.

To keep up with these developments, Hrvatska pošta has been heavily investing in the development of crypto exchange services and crypto stamps since 2020. As a result, in 2021, revenue from stamp sales increased by 4.9 million kuna compared to the previous year, with 1.5 million kuna of that coming from the sale of crypto stamps.

### 2.3. Consequences of the COVID-19 pandemic on Hrvatska pošta d.d.

On March 11, 2020, the World Health Organization declared a global pandemic caused by the COVID-19 virus. In order to protect its citizens, the Government of the Republic of Croatia introduced restrictions on the movement of people and the operations of business entities. The global pandemic impacted the daily lives of individuals but also had significant economic effects, causing disruptions in economic activities, particularly visible in markets heavily reliant on international supply chains and export-oriented companies. The rise in uncertainty led to a decreased demand for products and services and instability of prices and exchange rates. A major change for companies was the introduction of remote work for employees, which required additional adjustments to business models.

	2019	2020	2021
<b>GDP - Real Annual Growth Rate (%)</b>	3,4	-8,5	13,1
<b>Exports of Goods and Services (as % of GDP-a)</b>	51,5	41,5	50,0
<b>General Government Debt (as % of GDP)</b>	71,0	86,9	78,3
<b>Unemployment Rate</b>	6,6	7,5	7,6
<b>Current Account of the Balance of Payments (as % of GDP)</b>	2,9	-0,5	1,8

*Table 4: Impact of the COVID-19 Pandemic on the Economy of the Republic of Croatia  
(Source: Compiled by the authors based on: Croatian National Bank (2023) Main  
Macroeconomic Indicators. Available at:  
<https://www.hnb.hr/statistika/glavni-makroekonomski-indikatori>)*

Like every other sector, the postal sector was also affected by the COVID-19 pandemic, and a rapid adjustment of the network, services, and business priorities of the company was crucial, while also ensuring the safety of employees and other participants in society (Hrvatska pošta d.d., 2020). After the first wave of the pandemic, the Association of European Public Postal Operators, PostEurop, identified key areas of adjustment for postal operators (Hrvatska pošta d.d., 2020.):

- Change in the delivery model. It was necessary to ensure the possibility of delivery while observing social distancing measures, which included contactless delivery, requiring adjustments to working hours and working conditions for employees.
- Impact on parcel volumes. The most significant pandemic trend in the postal sector was a notable decline in letter mail traffic, while there was an increase in parcel volumes in B2C relationships, particularly in areas such as healthcare, electronics, and food.

- Impact on workers. Hrvatska pošta recorded an exceptionally high absenteeism rate, with more than 15% of the workforce absent.
- Change in quality standards. Due to restrictions on cross-border movement, there were delays in international traffic, which affected delivery times.
- Challenges in cross-border delivery.

One of the key phenomena that came with the pandemic was the accelerated growth of global e-commerce, which was expected to continue growing even after the pandemic so the main focus of Hrvatska pošta became parcel business and the digitalization process in all aspects of the postal process. Due to the pandemic, revenues from postal services fell by 8.1% or 101.0 million kuna in 2020. The largest decline occurred in letter mail revenues, which fell by 9.7% or 78.3 million kuna, contrary to revenues from parcels which grew by 10.5% or 21.0 million kuna compared to the previous year. In 2021, due to adjustments in processes and ways of doing business, there was a recovery in postal service revenues growing by 2.6% or 30.1 million kuna compared to the previous pandemic year. Focusing on parcel business required setting up a network of parcel lockers across Croatia. This was a major investment as evidenced by the fact that projects amounting to 32.7 million kuna were implemented during 2020, with 29.7 million kuna specifically allocated for the procurement of parcel lockers. In 2021, the expansion of the parcel locker network continued, driven by a 15% increase in revenue compared to 2020, fueled by the growth of e-commerce and the increased number of parcel lockers. In 2021, projects worth 5.0 million kuna were realized, with the largest portion, 4.9 million kuna, allocated to the procurement of additional parcel lockers. The segment most affected by the pandemic was international postal traffic, which according to the Universal Postal Union, fell by 21% in the first five months of 2020 (Hrvatska pošta d.d., 2020) with difficulties and delays in international transport recorded. In 2017, Hrvatska pošta established its own online store, Žuti klik, which became an important part of the company's strategy during the pandemic and the growing number of users in e-commerce. A summary of the impact of the COVID-19 pandemic on the operations of Hrvatska pošta d.d. is shown in Table 5.

	<b>2019</b>	<b>2020</b>	<b>2021</b>
<b>Operating revenue</b>	1.779,30	1.700,50	1.707,60
<b>EBITDA</b>	170,4	236,2	171,7
<b>EBITDA margin (%)</b>	9,6	13,9	10,1
<b>Net profit</b>	114,0	35,9	48,6
<b>Investments</b>	302,4	190,8	127,8
<b>Market share</b>	84,50%	82,90%	87,00%
<b>Net debt</b>	192,7	223,6	248,9
<b>ROE</b>	10,50%	3,20%	4,20%
<b>ROA</b>	6,00%	1,90%	2,60%

*Table 5: Economic Indicators of Hrvatska pošta d.d. from 2019 to 2021 (mil. kn)  
(Source: Prepared by the authors based on: Hrvatska Pošta d.d.)*

#### 2.4. Application of Digital Transformation in Hrvatska pošta d.d.

The processes of globalization and digitalization are changing people's everyday lives, and thus also influencing their preferences for goods and services. Businesses are expected to adapt their offerings to the changed desires and needs of customers. The COVID-19 pandemic has only proven the importance of timely trend recognition and business flexibility. Hrvatska pošta has been undergoing the digital transformation process for several years, and the pandemic further raised management awareness of the importance of digitalization in all aspects of business, resulting in the development of Pošta2022 business strategy. One of the key pillars of the strategy is the development of core business through digitalization of services and the introduction of new digital channels and platforms as it simplifies processes for both users and employees and will, in the long term, lead to lower costs. A part of the process is investing in logistics and digital infrastructure, such as the opening of the New Sorting Center, the largest capital investment in the history of the company and the development of a platform for multi-channel sales, a digital customer portal, and partnerships with digital payment service providers. Under the same strategy, the company initiated a large investment cycle including the implementation of the parcel locker procurement project, which proved to be key for the company's business results. Significant amounts were also invested in IT equipment and working tools, crucial for the digital transformation of operations. In 2020, 51.9% of total investments were allocated to IT equipment, software, and improvements to IT infrastructure and in the following year, the investment percentage increased even further, reaching 65.6% of total investments. The company launched its own online store, Žuti klik and enabled the ePost service, as well as the customer portal posta.hr. The importance of the development of digital services and channels for financial results and overall efficiency of the company was proven by the COVID-19 pandemic. As shown in Table 6, there was a nearly 220% increase in net profit in 2019. In the following year, due to the pandemic, there was a decline in net profit but the company, thanks to the digitalization activities carried out up to that point, managed to achieve a positive business result.

	ROA	Net profit (mil.kn)
2018	2,30%	39,4
2019	6,00%	125,9
2020	1,90%	31,8
2021	2,60%	46,1

*Table 6: Business Results of Hrvatska Pošta d.d. from 2018 to 2021  
(Source: Prepared by the authors based on: Hrvatska Pošta d.d.)*

### 3. CONCLUSION

The essence of managerial economics lies in the optimal allocation of scarce resources within a company and achieving that largely depends on the managers and their decisions. When making decisions, managers are predominantly guided by the goal of profit maximization, but it is also important to consider the impact on the various stakeholder groups of the company. This is particularly crucial in the case of state-owned enterprises, which are expected not only to achieve profits through certain economic activities but also to pursue broader social goals. Hrvatska pošta d.d. is one of the largest state-owned enterprises in the Republic of Croatia and a sole provider of universal postal services in Croatia, holding a market share of 87%. Like other companies, Hrvatska pošta operates in a contemporary environment and faces challenges related to sustainable business practices in ecological, social, and economic terms.



In addition to the sustainability requirements, it is also essential to adapt to new trends driven by globalization and digitalization processes. Due to digitalization and the growth of e-commerce, there has been a shift in the structure in its revenues, with a noticeable increase in revenues from parcel business and a decrease in revenue from letters. To respond quickly to new trends, the implementation of digital transformation processes was necessary. In addition to the challenges posed by constant changes in the environment through globalization and digitalization, uncertainty was further heightened by the emergence of the COVID-19 pandemic. The pandemic and all its associated restrictions left a significant impact on the business results and presented the company with new challenges. An alleviating circumstance for the company was the fact that the digital transformation process was already underway, which allowed greater flexibility and faster adaptation of the business model. One of the consequences of the pandemic was the additional growth of e-commerce, leading to increased revenue from the postal online store Žuti klik, and creating additional incentives for investment in a new and fully digital delivery channel in the form of parcel lockers. The impact of digital transformation on a company's success, especially in today's dynamic and uncertain business environment, is undeniable. In the case of Hrvatska pošta d.d., the digital transformation process played a significant role in the company's operations and results, and proved to be especially important when the unexpected situation of the COVID-19 pandemic occurred. The fact that the digital transformation process had already begun before the pandemic allowed the company to quickly adjust to the new circumstances and capitalize on new trends that emerged during the pandemic.

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# **PUBLIC RELATIONS IN THE AGE OF SMART TECHNOLOGY AND AUTOMATION**

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## **ABSTRACT**

*New technologies are significantly changing public relations (PR), creating opportunities for better communication, more efficient work, and stronger audience connections. Modern tools help PR experts produce content, follow media coverage, manage interactions with the public, and respond effectively in crises. However, these advantages also come with important ethical and practical risks, such as misinformation, security threats and biases in automated decisions. This paper explores both the positive impacts and challenges brought by new technologies in public relations. It highlights the importance of responsible implementation, ensuring that human creativity, ethical standards, and professional integrity remain at the core of public relations practice.*

**Keywords:** *Public relations, Artificial intelligence, AI tools, Strategic communication*

## **1. INTRODUCTION**

Artificial Intelligence, or AI, is starting to play a big role in many jobs, including Public Relations (PR). Just like it has changed things in journalism (Ioscote, Gonçalves and Quadros, 2024) and marketing (Verma et al., 2021) (Chintalapati and Pandey, 2022), AI is also making big changes in how we do PR. It helps with lots of tasks because it can handle lots of data, make smart predictions, helps organizations talk to target audience through chatbots (Çerçi, 2024), and even write like a human does (Grammarly, n.d.). For example, AI can write news releases, change written words into speech (text-to-speech) (Natural Readers, n.d.) (Play.ht, n.d.), turn audio into written text (speech-to-text) (Google, n.d.), translate materials into different languages (Quillbot, n.d.) and lot more. This shows how AI is starting to bring new creative ideas into PR, which we can call the new era of PR creativity. AI also helps with keeping an eye on what people are saying about companies in the news and on social media (Brandwatch, n.d.). It can look for times when a brand is mentioned in a lot of information, including text,

pictures, and videos, and see what competitors are doing. Artificial intelligence tools have significantly impacted the field of public relations by enhancing efficiency, personalizing communications, adapting to situational factors, and cultivating relationships with the public. The integration of Artificial Intelligence (AI) into Public Relations (PR) represents a pivotal shift, enabling a transformation from traditional methods to a more digitized and efficient approach (Volarić, Tomić and Ljubić, 2024). Additionally, it is possible to automate social media posting processes by scheduling and publishing content across multiple platforms from a single location (Repurpose.io, 2025). The widespread use of AI-based products in social media analytics (Hootsuite, n.d.) marks a significant evolution in public relations, offering deep insights into content engagement. Technologies now available for authenticating videos and identifying "deepfake" content (Deepware, n.d.) provide essential safeguards for maintaining brand integrity. AI's ability to customize narrative angles based on creators' past works and personalities enhances content resonance with target audiences. Large language models are able to make messages more appealing to certain people, improving how we communicate. By using AI in PR, work becomes more efficient and allows for creating more personal and powerful stories. This means the future of PR could be more creative and successful. This paper explores how AI is introducing innovative ideas to the field of PR. It examines the ways in which AI tools are transforming PR practices, enhancing efficiency, and opening up new opportunities. The paper is structured into five sections: the first section provides an introduction, followed by a section on general information about artificial intelligence. The third section focuses on global trends in AI, while the fourth section discusses the potential threats posed by AI tools for PR professionals. The paper concludes with a summary of the key findings.

## **2. ARTIFICIAL INTELLIGENCE**

Artificial Intelligence (AI) is the scientific discipline focused on creating computer systems whose behavior can be interpreted as intelligent. It's the art of making machines perform tasks that, if done by humans, would require intelligence. Last two sentences are paraphrased definitions of John McCarthy and Marvin Minsky from half of the last century and they are still actual. This field is a branch of computer science that deals with processing images and texts, aiding in robotics, education, medicine, and the development of computer games, among others. The advent of big data, increased computing power, and, most notably, the development of powerful graphics cards have encouraged rapid advancements in AI technology.

### **2.1. Ethical and Privacy Concerns**

With AI's integration into various sectors comes a set of ethical and privacy concerns. Questions arise such as who is responsible in the event of an error and how the privacy of processed data is protected. These questions underscore the importance of developing AI with ethical considerations and privacy safeguards in mind.

### **2.2. AI in Everyday Life**

AI devices are ubiquitous, with nearly 77% of devices today utilizing AI in some capacity (Tableau, n.d.). The presence of AI in daily life is growing, with predictions indicating that by the end of 2024, there will be 8.4 billion units of digital voice assistants powered by AI worldwide, surpassing the total global population (LOVO AI, n.d.). Voice-driven searches are becoming increasingly popular, especially among younger demographics, indicating a shift towards more interactive and accessible technology.

### 2.3. A Brief History of AI

- In 1997, a computer succeeded in beating the world chess champion, Kasparov, marking a significant milestone in AI development (IBM, n.d.).
- The DARPA Grand Challenge in 2004 offered a \$1 million prize for the creation of an autonomous vehicle, though no team won that year (DARPA, n.d.).
- 2011 was the year of emergence of virtual assistants, revolutionizing how users interact with their devices.
- Microsoft's ChatBot Tay, launched in 2016, was quickly shut down due to its generation of extreme tweets, highlighting the challenges of AI in understanding and navigating human nuances (Toolify, n.d.).
- ChatGPT was released in 2022, achieving its first million users in just five days and reaching 100 million users within two months (DeVon, 2023).
- Google introduced Bard in 2023, followed shortly by the release of Gemini, a more advanced and sophisticated generative AI model (Anil et al., 2024).
- In 2024, Sora (OpenAI, n.d.) was launched, focusing on video creation, demonstrating the continual expansion and diversification of AI applications.
- In 2025, the Chinese AI models DeepSeek v3 (Liu et al., 2024) and R1 (Guo et al., 2025) emerged, creating disruption in the AI world due to its open-source nature and outstanding performance.

### 2.4. Autonomous Vehicles: The Journey to Full Automation

One of the most intriguing narratives in this arena is Elon Musk's series of predictions regarding the development of Level 5 autonomous vehicles, indicating vehicles that require no human intervention for driving. Elon Musk's Prediction Timeline is as follows:

- **2018:** Musk optimistically announced that fully autonomous vehicles would become a reality by the end of next year suggesting the imminent arrival of technological breakthroughs (Lambert, 2018),
- **2019:** The deadline subtly shifted to "Next year!" maintaining a high level of enthusiasm and expectation among the public (Marshall, 2019),
- **2020:** In late 2020, he said he was "extremely confident" full autonomy would launch in 2021 (Drive, n.d.),
- **2022:** Elon Musk has announced a Fully Self-Driving Vehicle for 2022, with a Humanoid Robot to follow next year (Jin and Balu, 2022),
- **2023:** Tesla will realise fully autonomous vehicles "later this year" (AFP, 2023),
- **2024:** Tesla announced plans to launch FSD (Supervised) in Europe and China, with Musk predicting that supervised FSD will be available in most countries by the end of 2026 (Assis, 2024).

This chronology of statements reflects an evolution in understanding the complexity of the problem behind developing fully autonomous vehicles. Each prediction is not just a shift in timeline but also an acknowledgment that the path to autonomy is neither linear nor predictable. Challenges include not only technical aspects, such as developing reliable artificial intelligence and sensor technologies but also legal, ethical, and safety considerations that require careful deliberation.

## **2.5. Summary**

The evolution of AI from its inception to its current state has been marked by significant achievements, ethical dilemmas, and an ever-expanding presence in both the digital and physical realms. As AI continues to advance, it will undoubtedly bring about further innovations and challenges, shaping the future of technology and society. The ongoing dialogue around AI's ethical implications and its integration into everyday life underscores the need for careful consideration and responsible development of intelligent technologies.

## **3. GLOBAL TRENDS IN AI RESEARCH AND DEVELOPMENT**

### **3.1. AI Publications by Sector and Geographic Area**

The data interpreted in this subsection are taken from (AI Index Report, 2021) and will not be further referenced below. In 2021, the distribution of AI publications by sector and geographic region highlighted a trend that underscores the focal points of global AI research. Educational institutions led the charge, particularly in the United States, where they accounted for 69.17% of total AI publications. This was closely followed by China at 69.23%, with the European Union and the United Kingdom contributing to 77.85%. The nonprofit sector also demonstrated significant activity, especially in the EU and the UK, indicating a strong research interest driven by the public and not-for-profit sectors. Industry and government contributions to AI research were less dominant but still notable.

The industry sector in China published 12.60% of total AI papers, while the government's share showed a marginal presence. This suggests a robust participation of Chinese academia and industry in AI research, reflecting the country's strategic commitment to AI development.

### **3.2. Leading Institutions in AI Research**

The data interpreted in this subsection are taken from (Inwedo, 2024) and will not be further referenced below. From 2010 to 2021, the top ten institutions in AI research witnessed dynamic changes in their rankings. Chinese institutions dominated the list, with the Chinese Academy of Sciences maintaining the number one spot over the 12 years. Tsinghua University and the University of Chinese Academy of Sciences also featured prominently, indicating China's emphasis on developing AI as a national priority. Meanwhile, other notable institutions such as the Massachusetts Institute of Technology (MIT) represented the United States, signaling continued excellence in AI research. The fluctuation in rankings over the years reflects the competitive nature of the field and the ongoing investment in AI by leading educational and research institutions globally. This data reveals not only the significant role of academia in AI development but also the geographic shifts in AI research leadership.

With substantial contributions from the education sector, particularly in China and the US, and the strong showing of EU and UK nonprofits in AI publications, it is clear that AI is a key area of focus across various regions and sectors. These trends suggest that the continued evolution of AI research will likely be driven by academic and nonprofit initiatives, with industry and government playing supporting but vital roles.

### **3.3. Reflections on AI Research and Global Collaboration**

The data from the AI Index Report of 2023 sets a clear indicator of where AI research is most concentrated and where potential collaborations could be strengthened. As AI continues to advance, fostering partnerships among leading research institutions and across sectors will be crucial in addressing global challenges and propelling AI innovation forward.

The intertwining paths of these diverse institutions highlight the interconnected nature of AI development and the need for a collaborative international approach to harness the full potential of AI technologies for the betterment of society.

### **3.4. Trends in Cross-Sector Collaboration in AI Research**

The data interpreted in this subsection are taken from (Inwedo, 2024) and will not be further referenced below. In this subsection we will interpret cross-sector collaboration in AI research through a decade-spanning analysis from 2010 to 2021. The graph underscores the increasing propensity for sectors to combine strengths, resources, and expertise to advance AI knowledge and application. The most striking trend is the burgeoning partnership between the Education and Nonprofit sectors, which leads in the volume of collaborative AI publications. This synergy indicates a shared mission for social advancement and knowledge dissemination, crucial for driving innovation in AI. The graph shows a notable and consistent upward trajectory in this collaboration, suggesting a robust and growing network of cooperation that pools academic research with nonprofit initiatives to maximize impact.

Industry and Education represent the second-highest collaboration, reflecting a practical approach where academic theories and research are aligned with industrial application and development. This alliance has shown a substantial increase, particularly from 2018 onwards, highlighting the importance of applied research in commercial settings. Education and Government collaborations also demonstrate a significant contribution, revealing the vital role that public policies and funding play in supporting educational institutions' research efforts. Meanwhile, collaborations involving Government and Nonprofit, as well as Industry and Nonprofit, show modest but stable engagement over the years. These collaborations are essential as they often bring forward policy-driven research and socially relevant AI applications. However, Industry and Government collaborations are relatively low, which may indicate potential areas for increased partnership, especially in sectors where public-private initiatives could accelerate AI development and ethical governance.

In summary, the graph not only charts a quantitative increase in AI publications through cross-sector collaboration but also tells a story of how different societal sectors are converging in the realm of AI research. The data suggests a promising trend toward a more interconnected and interdisciplinary future for AI development.

## **4. THREATS OF AI FOR PR**

### **4.1. Ethical Implications and the Responsibility of Use**

The integration of Artificial Intelligence (AI) into Public Relations (PR) brings a powerful tool to the table, but it also raises questions about the right way to use it. Imagine robots that could either save lives or engage in warfare; AI has a similar dual potential. It can revolutionize PR with efficient data analysis and personalized content, but it can also be misused if not guided by strong ethical principles. It's our job to ensure AI is used for beneficial purposes. Furthermore, the environmental impact of AI, with its substantial energy requirements, is an urgent concern that needs addressing to prevent harmful effects on our planet (Van Rijmenam, 2023).



#### **4.2. Trust and Reliability in AI Technologies**

AI systems are not infallible—they are created by humans and can inherit our mistakes and biases. The algorithms that drive AI can be flawed, biased, or become outdated if not continuously updated (Manyika, Silberg i Presten, 2019). AI's capacity for creative thought is limited; it excels at tasks with clear rules but struggles with abstract thinking and adapting to change. PR relies on innovation and thinking outside the box, and so while AI can handle routine tasks, it cannot replace the human touch in strategic decision-making.

#### **4.3. Cybersecurity Threats**

The increasing use of AI opens new doors for cybercriminals. Advanced AI tools like FraudGPT or WormGPT are engineered to assist in cybercrime, whether it be tricking users into scams or creating malware (Erzberger, 2023). These tools lurk in the darker corners of the internet, such as the Dark Web, and while not readily available to the average person, their existence is a stark reminder of the potential misuse of AI technologies.

#### **4.4. The Controversial Use of AI in Political Campaigns**

The South Korean president's campaign showcased a unique use of AI with President Yoon Suk-yeol's virtual double answering questions from voters (France 24, 2022). Made by DeepBrain, this digital version used lots of video and audio to create a model that acts like the president. Some people worry that this kind of AI can confuse voters since it's hard to tell if it's really the president talking or just a machine. It's a new thing in politics that could change how we see true and honest communication between leaders and the public.

#### **4.5. AI Against Advertisers**

In the world of PR, getting the message out is key, and email remains a vital communication tool. However, AI systems like those employed by Google to detect spam can mistakenly filter out legitimate PR communications. To combat this, PR professionals must utilize reliable email sending providers to ensure their messages are delivered effectively, maintaining the delicate balance between security and visibility.

#### **4.6. The Future of PR Professionals**

There's a growing concern in the PR industry about AI replacing jobs, especially for those whose skills may become less relevant as technology advances. However, the future doesn't have to be grim; it could be a chance for PR professionals to enhance their skills, working alongside AI to create more impactful strategies. Despite advancements in artificial intelligence and automation, the unique combination of human intuition, reasoning, empathy, and emotion intrinsic to Public Relations work will be difficult for an AI machine to replicate, ensuring that PR professionals remain irreplaceable in the industry (Begum, 2020). It's essential for PR professionals to embrace lifelong learning and adapt to the changing environment by acquiring new skills that complement AI's capabilities.

#### **4.7. Summary**

AI in PR offers incredible opportunities for growth and efficiency but comes with a set of challenges that cannot be ignored. The responsibility lies with the PR industry to employ AI ethically, stay careful against cybersecurity risks, and adapt to AI's influence on communication and employment. Ultimately, the focus should be on leveraging AI as a tool for positive change while maintaining the creative and ethical core of the PR profession.

## 5. CONCLUSION

AI provides new opportunities in public relations (PR), enabling smarter and more personalized communication. It can significantly boost efficiency by automating routine tasks, quickly analyzing large amounts of data, and creating customized content. However, increased reliance on AI brings risks such as misinformation, ethical dilemmas, loss of human oversight, algorithmic biases, and environmental concerns related to energy use. Ensuring transparency and responsible use of AI-generated content is critical for maintaining public trust and professional credibility. Future research should focus on examining specific AI tools and their direct impacts on the effectiveness and productivity of public relations practitioners. Understanding which AI applications best support strategic tasks such as content creation, crisis management, media monitoring, and audience engagement is crucial for maximizing their practical benefits. Additionally, it will be valuable to explore how PR professionals can integrate these tools responsibly, ensuring ethical standards and transparency remain central to their work. Further studies could also investigate how continuous professional training on AI technology usage influences practitioner adaptability and overall success in the evolving PR environment.

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# PREDICTING THE USE OF MOBILE APPS: EXPLORING THE EFFECT OF FEATURES ON APP USAGE

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## **ABSTRACT**

*The increasing use of mobile apps can be seen as one of the most important trends that has become an essential part of users' daily lives. Likewise, mobile apps have become an important communication tool for companies to engage with potential users by offering apps that can influence on user behaviour to install mobile apps. The aim of this study is to explore the differences between the features of a mobile app and the intention to install a mobile app, design credibility and performance. The data was collected between May and September 2023 from a convenience sample of 230 respondents who had used mobile apps in the last 6 months. For this purpose, a confirmatory factor analysis (CFA) and an analysis of variance (ANOVA) were conducted. Three factors were identified in the factor analysis, namely the factors personalization, reliability and simplicity. The results of the analysis of variance show that there is a significant difference between these three factors and the intention to install mobile apps. In addition, the research results show that there are partially significant differences between the extracted factors and the credibility of mobile app design and performance. Significant differences are shown between design credibility and the factors personalization and reliability, but there is no statistically significant difference for the factor simplicity. In addition, the research results show statistically significant differences for app performance and the factors of personalization and reliability, but there is no statistically significant difference for the factor of simplicity and mobile performance. This paper provides both theoretical and managerial contributions.*

**Keywords:** *mobile marketing, mobile apps, user behaviour, intention to install, app performance, design credibility*

## **1. INTRODUCTION**

The number of mobile apps has increased dramatically in recent years as users primarily use mobile apps rather than browsers to access the internet. Mobile users are attracted to apps because they offer a variety of useful and entertaining information and the ability to customize the use of their devices by adding features and programs tailored to their specific needs (Alghizzawi, 2019). The way users react and behave when using mobile apps has changed due to the extensive use of mobile phones as the main tool of communication. The advantages of mobile communications have enabled companies to provide more comprehensive content, as mobile phones are able to accurately identify users' private information. Considering a deep understanding of how individuals use an evolving technology such as mobile apps (Xu et al. 2015; Seethamraju et al. 2018) it is necessary to recognize mobile apps as interactive systems that focus on hedonic and utilitarian needs such as increasing the performance of mobile apps. In recent years, the number of smartphone users worldwide has increased, with almost half of the population now owning a device (Newzoo, 2021). As a result, the smart mobile phones are quickly becoming an important tool in the lives of the users. The rapid development of mobile apps and their features in terms of innovation and accessibility has changed users behavior, the way they experience and use mobile apps and how they install them (Shankar et al, 2016). Mobile apps have become an essential part of any business.

They enable companies to build a relationship with their users and offer them a valuable and customised experience. The range of services available on mobile phones is growing to meet the different needs of users who use these services at different times of the day and in different environments. The increasing use of personalization and targeting in mobile apps therefore includes the delivery of tailored content based on a user's search history and location to increase user trust. Mobile applications are third-party software that can be installed on mobile phones (Wu and Wang, 2005). Islam et al. (2010) defined mobile apps as software that can perform specific tasks for users on their mobile phones. Users usually install mobile apps to search for information, make purchases, or request customer services through their mobile devices (DeCosmo et al., 2021). Therefore, mobile apps use statistics about a user's search history and location to provide them with customized content and offers so that they are satisfied with the service. As a result, the number of mobile apps has increased, as have the needs of the users served by mobile apps (Agrebi and Jallais, 2015).

Mobile app markets have grown rapidly due to increasing user interest in mobile apps, and therefore there is a need to better understand their behavior. Regardless of the fast development of mobile apps and their multidimensional implications, very few studies have been conducted to understand what features can influence users' intention to install mobile apps and how they affect mobile app design credibility and performance. Moreover, little attention has been paid to the topic in the marketing literature and further research is needed to achieve deeper knowledge. Therefore, the aim of this study is to explore the differences between mobile app features and intention to install mobile apps, design credibility and performance.

The study is structured as follows. First, the theoretical background is presented, which includes an analysis of the intention to install mobile apps and an analysis of the design credibility and performance of mobile apps. Then, the research findings and the methodology used are presented. Finally, the research results are given and discussed, followed by the conclusions drawn from these research findings.

## **2. LITERATURE REVIEW**

Advances in the development of communication technology have accelerated the use of mobile apps (Galli, 2018; Smith, 2018). Mobile apps are application programs that are downloadable free of charge and marked by the name and logo of a company to facilitate the brand recognition (Bellman et.al., 2011). Mobile users can download and run apps anywhere, anytime (Goldsmith, 2014) and complete many daily activities faster and easier. Mobile apps, also have been defined as the ultimate marketing tool (Watson et.al., 2013) and an essential advertising tactic (Rohm et.al., 2012) to attract business 'on the go' (Fang 2019). Due to their specific characteristics, they offer excessive potential for customer engagement by sharing personalized content without time or location restrictions. Accordingly, the extensive use of mobile phone has motivated academics to conduct studies on mobile apps and explore the motives that influence users to engage with mobile apps (Carter & Yeo, 2016; Wu et al., 2017).

There have been many studies that have investigated the factors involved in a consumer's adoption of various mobile phones services, such as mobile payments (Lu, Yang, Chau, & Cao, 2011; Liao and Ho, 2021), financial services (Chemingui 2013; Karjaluo et.al., 2019)), health services (Deng et.al., 2014; Galetsi et.al., 2022), mobile data services (Al-Debei and Al-Lozi, 2014; Nikkhah et.al., 2024), mobile games (Ravoniarison and Benito, 2019; Göksu et.al., 2020), and mobile learning (Camilleri and Camilleri, 2019; Callum, Jeffrey, & Kinshuk, 2014;

Khan et.al., 2023) and in tourism (Foroughi et.al., 2024; Šošić et.al., 2024). Companies utilize mobile apps to generate benefits for users in order to create a new communication platform between them and its users as additional place of the company's offers and innovative content. Hence, in view of the advantages offered by the use of mobile apps, companies are increasingly trying to create new company-owned apps to enhance the customer experience, and at the same time promote their products and services (Schmitz et al., 2016).

There are three phases of the journey: Pre-adoption, Adoption and Post-adoption (Stocchi et. al., 2022) The pre-adoption phase concerns customers' experiences and decisions prior to app adoption, which shape consumers' tendencies towards the app. In this phase, the users' attitudes, their individual characteristics and the intention to download are documented. App pre adoption behavior refers to the stage in which mobile apps are evaluated for selection for use. The second phase, adoption, covers customers' experiences with the downloaded apps. The final phase, the post-adoption phase, covers the customer experience resulting from continued use of the app. Harris et al. (2016) investigated the factors that influence a consumer before installing a mobile app (based on perceived risk, trust, perceived benefit and intention to install) and they show that trust and satisfaction increase when users believe that the information provided by mobile apps meets their expectations and requirements. According to Stocchi et.al. (2022), the pre-adoption phase of an app is very extensive and focuses on two parts that predict the users' decision-making process and form their preferences towards the app. They also emphasize that in this phase they evaluate the mobile apps in order to download an app and/or prefer it over other alternatives. They are likely to look for better technological features that match their specific individual characteristics.

The number of people using mobile apps on their mobile phones has increased rapidly because the use of mobile apps provides many benefits in terms of time efficiency, cost and effort (Baker-Eveleth & Stone, 2020). Therefore, if the user thinks that using a mobile app is beneficial, he will be more contentment from its use. Furthermore, users will continue to use these apps if they find them convenient. Any technology is perceived to be useful if a consumer is able to use it easily or the functioning of the technology is free from the effort (Ghalandari, 2012). If consumers perceived the mobile app simple to use and less confusing they would probably use it more often.

Users usually prefer a simple technology with maximum efficiency (Agarwal and Prasad 1999; Davis et al., 1989) that also offers functional advantages (Rogers, 1995). Mobile apps should not demand a great deal of effort from their users so that they learn to use them more quickly and eventually become accustomed to them (Amoroso and Lim 2017). Users are always looking for an app with a high rating and positive reviews so that they can decide whether to install a mobile app or not. But performance metrics alone are not important, as performance depends on the context of use and what is important to the end user (Falaki et al., 2010) i.e. app performance metrics must be aligned closely with users' preferences. Mobile app performance must help users perform certain activities more productively and convenient way. Therefore, performance expectancy can be defined as the degree to which using a technology will provide benefits to consumers in performing certain activities (Venkatesh et al., 2012, p. 159). Performance expectancy can also be interpreted as a person's belief that using a technology will help him or her perform a task (Cimperman et al., 2016). Jambulingam (2013) defines performance as it is individuals' perception that the usage of system will improve the performance of the users (Min et al., 2008;).

Users adopt mobile apps when they believe they save more time and effort compared to traditional tools. Performance of mobile apps is user confidence that a technology is useful and provides benefits in its use. Therefore, when using mobile apps, performance could be one of the main indicators that influence users' willingness to use the apps. This is because, when using the apps, there are benefits and habits that consumers expect when using the apps. The benefit of the technology that provide while using it can be a crucial moment for users to install and customise mobile apps. Therefore, the information provided by the mobile app should be complete, relevant and easy to understand so that users are more inclined to install powerful mobile apps. Thus, if users find that mobile apps provide useful functions, then they would more inclined to use mobile apps. When users feel the benefits of the technology, they will be encouraged to use the technology continuously (Lin et al., 2014). It can be concluded that users are more likely to accept and adopt mobile apps when the app increases.

Mobile apps enhance the interactive relationship with users by providing useful information via mobile phones (Ongsakul et al., 2021). However, mobile apps are more likely to violate users' privacy than other digital devices. Therefore, it is important to know the factors that influence users to determine whether consumers are making thoughtful choices to maximise their security. Studies have identified credibility as a dimension of trust (Doney and Cannon, 1997) and defined it as the extent to which a recipient considers information to be trustworthy (Wathen and Burkell, 2002). Users might rely on the information received from mobile apps if they perceive the source of the content as credible and reliable. A number of empirical studies have confirmed that credibility is a precondition for individuals' perception of the usefulness of information (Camilleri and Filieri, 2023; Kang and Namkung, 2019; Onofrei et al., 2022). Design credibility is defined as a holistic concept that encompasses an online user's perception of safety, reliability, security and privacy while navigating the website (Green and Pearson 2011). Studies have shown that website credibility is one of the biggest challenges for mobile app developers (Allport and Pendley 2010; Abbasi et al. 2015; Lee 2018; Pee et al. 2018). Users will not disclose their private or financial information until they are confident that the mobile app is secure.

Users are exposed to a lot of information but only use information they find suitable or safe for decision-making (Yang, 2015). With such a wide range of apps to choose from, many of which have security or privacy concerns, it is important to determine the factors that influence a user before installing an app. From a developer and market owner perspective, it is important to know these factors in order to maximize sales, but from a user perspective, they need to ensure that the apps they download are safe and harmless for they private data. Nevertheless, previous studies have shown that users are concerned about the credibility of mobile apps (Harris, Furnell, & Patten, 2014; Jones and Chin, 2016), Users need to make privacy-related decisions before installing an app, because once installed, apps can access potentially privacy-sensitive data. Previous research has shown that design can change user behaviour, e.g. the use of a mobile app, acceptance and impact on daily interactions with the app (Green and Pearson 2011; Lowry et al. 2014; Abbasi et al. 2015).

Predicting mobile app usage has become an important task for any company offering services that satisfy needs of its users. Due to the increasing benefits of mobile apps, it is important to recognize which features might influence users' intention to install certain mobile apps. It is also important to explore how mobile app features influence users' mobile app usage in the context of performance and design credibility.



### **3. METHODOLOGY**

The aim of this paper is to explore the features that influence users' intention to use mobile apps. In addition, this study aims to identify the differences between the characteristics and credibility of mobile app design and app performance. The required data was collected between May to September 2023 from a sample of 230 respondents who have used mobile apps in the last 6 months. Data was collected by distributing questionnaires to respondents via Google forms, shared on social media such as Facebook and Instagram. If respondents had not made any mobile purchases, they were excluded from the survey. A convenience sampling approach was used to collect the data. The first section of the questionnaire contained questions on the respondents' demographic data such as age, gender, level of education and monthly income. The research questionnaire consisted of two sections.

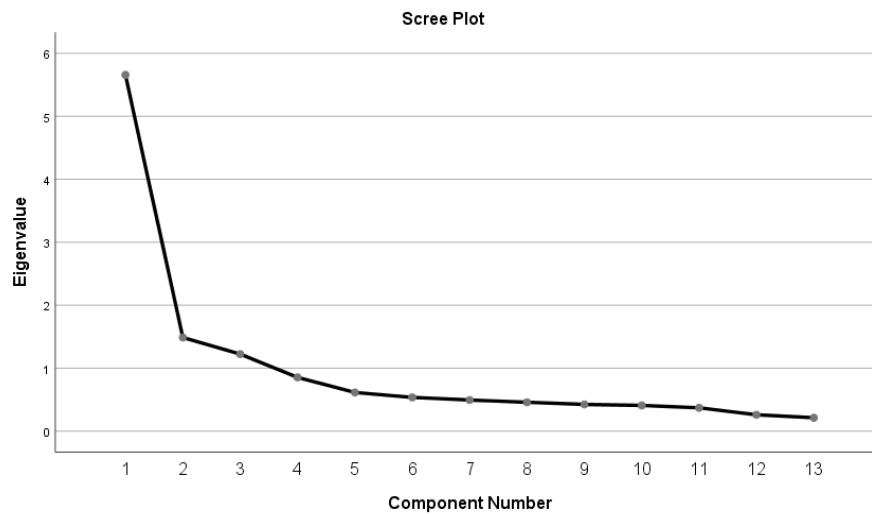
The second section considered mobile app characteristics such as performance, perceived ease of use, service quality, perceived usefulness and perceived informativeness of mobile apps. Performance, perceived ease of use, service quality and perceived informativeness were adopted from Hanjya et al. (2019). The statements intention to install mobile apps and performance were mainly taken from the studies by Tang et.al. (2019). The items on perceived usefulness were modified from the earlier study by Moon and Domina (2015) and the design credibility was adopted from the study by Green and Pearson (2011) and Ku and Chen (2019). The items in the second section of the questionnaire were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). All questions were taken from the existing literature and adapted for this study. The Statistical Package for Social Science (SPSS 25) was used to perform the statistical analysis in this study. The statistical analysis tools used are multivariate statistical analysis, factor analysis and analysis of variance (ANOVA).

### **4. RESEARCH RESULTS**

Cronbach's alpha analysis was used to examine the consistency of the measurement scale, i.e. a reliability analysis. The results showed high reliability of the Cronbach's alpha coefficient (0.887) which indicates of high reliability of the measurement scale of mobile app features. The results of the statistical tests Kaiser-Meyer-Olkin is very high (KMO= 0.878) and Bartlett test of sphericity was statistically significant ( $\alpha \leq 0.05$ ). As the adequacy of the sample was established, further analysis revealed how much of the variance was explained by the variables entered in the extracted factors, which showed that the scale was unidimensional.

*Graph following on the next page*

*Graph 1 Scree plot measurement scale of mobile app features*



*Source: Research findings (N=230)*

The factor analysis was conducted using principal component analysis and the varimax rotation method. The exploratory factor analysis extracted three factors with eigenvalues above 1. The results show that 43,51% of the total variance is explained by factor 1, factor 2 explains 11,44% of the total variance and 9,40% is explained by factor 3. Using the Varimax method of factor rotation, three factors explained 64,36% of the total variance. The factor loadings for all items were greater than 0.50, which indicates good convergent and discriminant validity of the measurement scale. From the content, it can be determined that factor 1 is related to the customized features of using mobile apps and is referred to as the personalization factor, while factor 2 is related to the reliable usage of mobile apps and is referred to as the reliability factor, and factor 3 is related to the ease of using mobile apps and is referred to as the simplicity factor. The factor analysis has achieved its objective and the interpretation of the factors is acceptable. An analysis of variance (ANOVA) was conducted to determine the differences between the factors. Table 1 shows the analysis of variance between the factors and the intention to install mobile apps.

*Table 1 Analysis of variance between factors and the intention to install mobile apps*

	Sum of squares	df	Mean square	F	Sig.
<b>Personalization factor</b>	50,103	34	1,474	1,606	,025
<b>Reliability factor</b>	97,075	34	2,855	4,220	,000
<b>Simplicity factor</b>	47,878	34	1,408	1,516	,043

*Source: Research findings (N=230)*

Results from the table show significant differences between the factors and the intention to install mobile apps. As shown in Table 1, there is a significant difference between personalization factors and intention to install mobile apps ( $p < 0.025$ ,  $F=1,606$ ).

The results indicate that users who use mobile apps based on the personalised information are more inclined to download mobile apps for use. The content provided to these users via mobile apps, which is customised to their needs and requirements, plays a crucial role in user acceptance and satisfaction. It can be seen that the results show that these users will demand personalized content and offers based on their search history and location. The results of the one-way analysis calculated for the reliability factors and the intention to install mobile apps show significant differences ( $p < 0.000$ ,  $F=4,220$ ). These users have high tendency to install mobile apps if they perceive them as a reliable tool for finding the information they need. They will only accept and use mobile apps if they recognise them as a trustworthy place where they can get relevant and exclusive content according to their request. The results for the simplicity factor show that there are significant differences between the simplicity factor and the intention to install mobile apps ( $p < 0.043$ ,  $F=1,516$ ). The differences found indicate that users who use mobile apps that are easy to use and provide the information they need easily are more motivated to download these apps to their mobile phone. In addition, these users consider mobile apps as a valued tool that provides many benefits in their daily lives, such as making it easier to search and find information. The next table shows the analysis of variance between the factors and attitudes towards mobile app performance (Table 2).

*Table 2 Analysis of variance between the factors and attitude towards mobile apps performance*

	Sum of squares	df	Mean square	F	Sig.
<b>Personalization factor</b>	42,467	25	1,699	1,858	,010
<b>Reliability factor</b>	64,502	25	2,580	3,200	,000
<b>Simplicity factor</b>	27,297	25	1,092	1,104	,340

*Source: Research findings (N=230)*

As shown in Table 2, there is a significant difference between the personalization factor and attitude towards the performance of a mobile app ( $p < 0.010$ ,  $F=1,858$ ). The results indicate that users who consider mobile apps as one of the tools that provide accurate and professional information perceive these apps with high performance. When these users use mobile apps to get more customized content, they perceive these mobile apps with high performance and consistent quality. These users prefer mobile apps that meet their need for individual access and the provision of information tailored to their individual needs.

Significant differences were found for the reliability factor and attitudes towards mobile app performance ( $p < 0.000$ ,  $F=3,200$ ). These differences indicate that users who perceive mobile apps as a reliable tool that provides appropriate information consider these apps to be high performing apps. If they recognize mobile apps as trustworthy source of information they are likely to give a positive rating for the high performance of mobile apps. There are no significant differences between the simplicity factor and attitude towards mobile app performance ( $p < 0.340$ ,  $F=1,104$ ). The next table shows the analysis of variance between the factors and mobile app design credibility (Table 3).

*Table 3 Analysis of variance between the factors and mobile app design credibility*

	Sum of squares	df	Mean square	F	Sig.
<b>Personalization factor</b>	35,326	23	1,536	1,634	,039
<b>Reliability factor</b>	58,087	23	2,526	3,044	,000
<b>Simplicity factor</b>	28,305	23	1,231	1,263	,196

*Source: Research findings (N=230)*

The results of the one-way analysis calculated for the personalization factors and the credibility of mobile app design show significant differences ( $p < 0.039$ ,  $F=1,634$ ). Users who value customised content in mobile apps are likely to perceive these apps with the respectable design credibility in mobile apps. For them, mobile app design credibility plays a major role, as these apps convey security and trust and are certainly used more than users who require a customised approach to service delivery. Therefore, these users are more likely to use mobile apps if they provide specific and relevant information for their queries with good design credibility. The result also shows that there is a difference between the reliability factor and the mobile app design credibility ( $p < 0.000$ ,  $F=3,044$ ). The differences indicate that these users consider mobile apps as a safe place to obtain or provide information due to their reliability. Users who use apps with a high degree of reliability are more likely to recognise these apps by the high credibility of the design, which means that these apps are reliable and safe place to provide quality information and services. The results in Table 6 show that there are no significant differences between the simplicity factor and the design credibility of mobile apps ( $p < 0,196$ ,  $F=1,236$ ). The research results reveal that users who search for personalized, reliable and simple content or information through mobile apps tend to install the mobile apps on their mobile phone that meet their needs. In addition, the results indicated that only users who need personalized and reliable access to mobile applications consider these applications to be reliable and with high performance.

## **5. CONCLUSION**

In recent years, mobile market apps have developed dramatically due to the widespread use of mobile devices. A large number of mobile apps have been developed for mobile users and mobile apps have become one of the most essential communication tools for people to obtain information and services. Regardless of the increasing body of research on mobile app usage, little is known about the important role they play in determining the behaviour of mobile users. Given the recent rapid growth of the mobile app market, this study is likely to provide better understanding into mobile user behaviour to help app developers create, adapt and innovate mobile apps that meet users' needs and expectations. The aim of this study was to explore the differences between mobile app features and the intention to install a mobile app, design credibility and performance. In context of results, users who use mobile apps because of the personalised information are more inclined to download and use mobile apps. The content provided to these users via mobile apps, customised to their needs and requirements, plays a crucial role in user approval and satisfaction. The results for the reliability factor, reveal that users who use mobile apps because of their reliable features will have high tendency to use mobile apps if they perceive them as a reliable tool for finding the information they need. The results for the simplicity factor show that there are significant differences indicating that users who use mobile apps that are easy to use and provide the information they need easily are more

motivated to download these apps to their mobile phone. In addition, these users consider mobile apps as a valued tool that provides many benefits in their daily lives, such as making it easier to search and find information. The results between the extracted factors and attitudes towards mobile app performance suggest that users who consider mobile apps as one of the tools that provide accurate and professional information perceive these apps with high performance. For the reliability factor, the differences indicate that users who perceive mobile apps as a reliable tool that provides suitable information consider these apps as high performing apps. If they recognize mobile apps as dependable source of information they are likely to give a positive rating for the high performance of mobile apps. The result for design credibility confirms that users who value customised content on mobile apps are likely to perceive these apps with the great design credibility in mobile apps. For the second factor, the differences show that these users view mobile apps as trustworthy for obtaining or providing information due to their reliability. Users who use apps with a high level of reliability are more likely to recognise these apps by the high credibility of design, which means that these apps are reliable and safe place where quality information and services are provided. The paper extends the theoretical and managerial insights on how installation intention, performance expectancy and design credibility play an important role for mobile phone users. In addition, this study extends the literature on mobile apps and contributes to deeper analysis of mobile users' behaviour. The main limitation is that the study is based on non-probability convenience sample and therefore, the results cannot be generalized as representative of the entire population. Another limitation of this study is that other features of mobile apps that could be crucial for user behaviour were not considered, which also limits the generalizability of the research results. Considering the above limitations, future research should consider focusing on specific generations and including additional variables in this survey to gain a comprehensive insight into mobile app usage. App developers need to focus on the technical aspect of mobile apps and ensure that they function easily and without technical faults or interruption. Therefore, app developers need to develop news mobile apps more performance-oriented and communicate to users that the design signals credibility as safe and trustworthy apps. Since credibility is the main concern of mobile users when using apps, it can be of great importance to help mobile app developers to simply provide a credible design that impacts security and privacy features. High performance and credible design can help mobile app developers create mobile apps with less cost, less time and less effort so that all users are satisfied when using mobile apps. In conclusion, deeper understanding of the differences in mobile app usage can be helpful for both researchers and practitioners to gain better insight into users' mobile behavior.

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## Appendix I

<b>Rotated Component Matrix<sup>a</sup></b>			
	Component		
	1	2	3
Mobile apps provide professional services.	<b>,708</b>		
Mobile apps provide personalized services.	<b>,703</b>		
Mobile apps provide me with quick answers to my questions.	<b>,681</b>		
Mobile apps recommend products.	<b>,669</b>		
Mobile apps are useful.	<b>,666</b>		
Mobile apps help make shopping easier.	<b>,624</b>		
Mobile apps provide me with exclusive information.		<b>,831</b>	
Mobile apps provide me with tailored promotions.		<b>,786</b>	
Mobile apps provide me with relevant information about the products I want.		<b>,768</b>	
Mobile apps provide me with reliable and useful information.		<b>,765</b>	
Using mobile apps are easy to use.			<b>,870</b>
Interaction with the mobile apps is simple and clear.			<b>,830</b>
I find it easy to learn how to shop through mobile apps.			<b>,768</b>
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			

The studies in financial technology explain that performance expectancy is a major driving factor in the adoption of technology (Rahi et al., 2019, Olivera et al., 2016, Morosan & DeFranco, 2016; Chua et al., 2018), while research on social networks also found that the perceived benefits will drive users to continue using the technology (Chua et al., 2018).

Experience in using the application is a needed criterion for further use (Utomo, 2021). The findings are in line with research by Chua et al., (2018), Utomo et.al., (2021). This finding is Design credibility by Oyibo, K., & Vassileva, J. (2017) Chua, P. Y., Rezaei, S., Gu, M. L., Oh, Y., & Jambulingam, M. (2018). Elucidating social networking apps decisions: performance expectancy, effort expectancy and social influence. Nankai Business Review International - The ease of use encourages increased adoption of technology and the perception of the benefits of its users. Oyibo, K., & Vassileva, J. (2017). The interplay of aesthetics, usability and credibility in mobile website design and the effect of gender. Journal on Interactive Systems, 8(2).

# INTERDISCIPLINARY ANALYSIS OF THE IMPACT OF ARTIFICIAL INTELLIGENCE: ETHICAL, ECONOMIC, AND REGULATORY PERSPECTIVES

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## ABSTRACT

*This study analyzes several scientific investigations on artificial intelligence (AI), focusing on its social, economic, and regulatory impact. The selected studies address AI perception, ethical challenges, labor market effects, socioeconomic inequalities, and the need for an interdisciplinary regulatory approach. Methodological approaches include empirical analyses, surveys, literature reviews, and regulatory studies. Findings indicate that AI can enhance productivity and democratize access to knowledge, yet it may also deepen economic disparities and raise ethical concerns. Authors emphasize the necessity of clear ethical and legal guidelines to ensure the fair distribution of AI benefits. Key conclusions highlight the importance of interdisciplinary collaboration in policy development and the need to adapt labor markets to technological changes. The study also identifies limitations in existing research and underscores the importance of continuous monitoring of AI advancements. Future AI technologies are expected to introduce new challenges, necessitating responsible governance and regulatory strategies to maintain a balance between technological progress and societal values.*

**Keywords:** *Artificial Intelligence, Interdisciplinary Approach, Ethical Implications, AI Regulation and Policy*

## 1. INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most influential technological advancements of the 21st century, reshaping various sectors of society, including industry, healthcare, education, and public policy. While AI promises increased productivity, process optimization, and innovation, it simultaneously raises complex questions that extend beyond its technical development. The core challenge of AI lies in its dual nature—on the one hand, it accelerates technological progress, yet on the other, it has the potential to deepen existing social inequalities, compromise privacy, and radically transform labor markets. Despite extensive research, there is still no consensus on how to balance AI's benefits with its potential risks. In July 2024, the European Union adopted the Artificial Intelligence Act (AI Act), the world's first comprehensive legal framework for AI regulation within the EU. This law, which came into effect on August 1, 2024, applies to all areas governed by EU law, except for systems used exclusively for military, defense, and research purposes (EU, 2024).

Additionally, in September 2024, the EU established a panel of AI experts to develop a "Code of Practice" aimed at aligning business operations with new AI regulations. Although not legally binding, this code is intended to serve as a compliance framework for companies and is expected to be finalized by April 2025 (Pehlivan, 2024). One of the key challenges in AI research is its rapid evolution, which often surpasses existing regulatory and ethical frameworks. Most legal and institutional systems are not yet adapted to technologies capable of autonomous learning and decision-making, raising concerns over accountability in cases of AI-related errors or harm. Furthermore, AI frequently reflects societal biases embedded in the datasets on which it is trained, leading to unintended discrimination against certain groups. Although this issue has been acknowledged in academic discourse, universal mechanisms for mitigating these biases remain underdeveloped. Future research should focus on the integration of AI into social systems while ensuring ethical safeguards that promote responsible use. It is crucial to explore how AI can serve as a tool for reducing social inequalities rather than exacerbating them. This study aims to contribute to the academic discussion by analyzing interdisciplinary approaches, emphasizing the need for regulation, labor market adaptation, and the establishment of transparency and accountability in AI applications.

## **2. PREVIOUS RESEARCH**

In this study, relevant scientific papers from open-access databases were selected to provide a comprehensive overview of various aspects of artificial intelligence (AI) and its impact on society. Among the analyzed works, Patrik Deraković-Rakas' research examines AI perception and the ethical dilemmas associated with its application, with a specific focus on public awareness in Croatia. His study includes a theoretical analysis and an empirical survey, the results of which indicate the need for stronger regulation and public education. In contrast, the study by Plantak, Vargović, and Trstenjak addresses the economic, social, and moral implications of AI, emphasizing that unregulated implementation may exacerbate existing socioeconomic inequalities. Their methodological approach is based on a literature review and an analysis of previous research on labor markets, economic growth, and social justice. The study concludes that urgent ethical and legal frameworks are required to prevent the negative consequences of AI on a global scale. Furthermore, Matej Čurek's study focuses on the effects of AI on the labor market, particularly on job automation and employment trends. Relying on secondary data sources and comparative analysis, the author highlights that while AI reduces the demand for human labor in certain sectors, it simultaneously creates new opportunities in technology-intensive industries. His findings emphasize the necessity of workforce adaptation through education and retraining. The study by Venkatasubramanian et al. contributes to the academic discourse by exploring the importance of an interdisciplinary approach to AI. The authors argue that technical AI solutions are often developed in isolation from social contexts, potentially leading to unforeseen ethical and political consequences. Their analysis underscores the need to integrate computer science with social sciences and humanities to ensure a sustainable and responsible AI integration into society. Finally, the research by Capraro et al. examines generative AI and its potential to reshape socioeconomic structures. By analyzing AI's impact on three key domains—labor, education, and healthcare—the authors highlight its ability to reduce informational asymmetries and enhance knowledge accessibility while warning of the risks associated with the concentration of power in the hands of major technology corporations. Their analysis suggests that regulatory mechanisms are necessary to ensure the fair and equitable use of this technology and to mitigate the risks of the digital divide.

Collectively, these studies provide a nuanced understanding of AI's complexity and stress the importance of a balanced approach that fosters technological advancement while preserving societal values.

### 3. METHODOLOGY

The selection of scientific studies on artificial intelligence (AI) was based on criteria of scientific relevance, data accessibility, methodological diversity, and interdisciplinarity. All selected papers were published in open-access databases, ensuring transparency and the verifiability of results. Additionally, these studies employ various research methods, including empirical analyses, surveys, literature reviews, and regulatory studies, offering a comprehensive insight into the social, economic, and political implications of AI. Particular emphasis was placed on an interdisciplinary approach, as AI is not merely a technical phenomenon but also a societal force with far-reaching consequences. In this context, the studies examine AI's impact on perception and ethical dilemmas, socioeconomic inequalities, labor market automation, and the need for regulatory frameworks and policy guidelines. The scientific contribution of the selected studies lies in their ability to provide concrete recommendations for AI policy and regulation. The works of Deraković-Rakas (2023) and Čurek (2023) highlight the importance of education and workforce adaptation to emerging technological challenges, while Plantak, Vargović, and Trstenjak (2023) warn of economic inequalities that AI could exacerbate if not accompanied by adequate regulatory measures. The interdisciplinary approach in the study by Venkatasubramanian et al. (2020) demonstrates how AI interacts with politics, law, economics, and ethics, whereas Capraro et al. (2023) analyze the role of generative AI in shaping socioeconomic structures and public policy. These findings underscore the need for integrating technical and social sciences to ensure responsible AI implementation. The comprehensiveness of the selected studies allows for a better understanding of AI's impact on society and the potential consequences of its unregulated deployment. Despite varying perspectives, all research points to the conclusion that AI brings significant transformation, yet its ultimate effects depend on regulatory frameworks and public perception. Thus, interdisciplinary collaboration is essential for developing guidelines for the responsible use of AI, considering its ethical, economic, and political implications. The scientific contribution of these studies is not only theoretical but also practical, serving as a foundation for the development of public policies, educational programs, and workforce adaptation strategies in response to technological advancements.

### 4. RESEARCH STUDIES

This analysis compares several research studies on artificial intelligence (AI) across four key categories: the research problem and purpose, sample and/or methodology, research objectives and/or hypotheses, and study conclusions. The selected studies were chosen for their relevance in understanding the social, economic, and ethical implications of AI. The research problem and purpose vary among the analyzed studies, but all focus on AI's societal impact. These studies can be grouped into three main thematic categories. The first examines the **social and ethical dimensions of AI**, including Deraković-Rakas (2023), who investigates public perception and ethical dilemmas, and a second study by the same author, which explores the broader societal, ethical, and cultural implications of AI. Similarly, Venkatasubramanian et al. (2020) emphasize the need for an interdisciplinary approach, while Plantak, Vargović, and Trstenjak (2023) focus on moral challenges and fairness in AI benefit distribution. The second thematic category explores **AI's economic and labor market impact**, with Čurek (2023) analyzing AI-driven job automation and labor market transformation, while Plantak, Vargović,

and Trstenjak (2023) also examine economic inequalities caused by AI. The third group of studies investigates **AI regulation and political implications**, with Capraro et al. (2023) discussing how generative AI can deepen the digital divide and economic disparities, while Venkatasubramanian et al. (2020) analyze AI's role in shaping social relations through interactions with politics, law, and economics. Despite their thematic differences, all studies share concerns regarding AI's unpredictable consequences and emphasize the need for continued research and regulatory oversight. Methodologically, the studies employ diverse approaches depending on their research focus. **Empirical investigations** include Deraković-Rakas (2023), who uses survey data from Croatian citizens to assess AI perception, and Čurek (2023), who conducts a comparative labor market analysis to identify sectors most at risk of automation. **Literature reviews and theoretical analyses** are prominent in the works of Plantak, Vargović, and Trstenjak (2023) and Capraro et al. (2023), who examine AI's economic and political effects. Venkatasubramanian et al. (2020) conduct a **meta-analysis of interdisciplinary AI studies**, while another study by Deraković-Rakas (2023) combines a literature review with case studies. **Regulatory framework analyses** are central to Capraro et al. (2023) and Venkatasubramanian et al. (2020), both of which assess AI regulation across different countries and propose guidelines for responsible AI implementation. This methodological diversity enhances the overall understanding of AI's impact, integrating both theoretical perspectives and empirical data. The research objectives and hypotheses of the selected studies can be categorized into three main areas. Studies focusing on **AI's social and ethical aspects** (Deraković-Rakas, 2023; Venkatasubramanian et al., 2020) hypothesize that AI alters social structures and ethical norms and argue that interdisciplinary approaches can aid in understanding these transformations. Research on **AI's economic implications** (Čurek, 2023; Plantak, Vargović, and Trstenjak, 2023) assumes that AI reduces the need for human labor and can exacerbate social inequalities if unregulated. Lastly, studies examining **AI's political and regulatory dimensions** (Capraro et al., 2023; Venkatasubramanian et al., 2020) suggest that AI does not operate in isolation but rather interacts with political and legal frameworks, influencing societal structures. From this comparative analysis, a common conclusion emerges: AI is a transformative technology whose impact depends on ethical, economic, and political frameworks. While some studies emphasize **AI's ethical and social dimensions** (Deraković-Rakas, 2023; Venkatasubramanian et al., 2020), others focus on **economic consequences** (Čurek, 2023; Plantak, Vargović, and Trstenjak, 2023), and some explore **regulatory and political implications** (Capraro et al., 2023). The overarching theme across all studies is the necessity for a deeper understanding of AI's societal impact and the implementation of regulatory measures that maximize benefits while mitigating risks. This analysis underscores how interdisciplinary research on AI provides crucial insights into its consequences and offers essential guidelines for responsible AI development and governance.

*Table following on the next page*

**Table 1.** Comparative analysis of research papers

Author(s) and year	Research problem and purpose	Sample and/or methodology	Objectives and/or hypotheses	Findings
Deraković-Rakas (2023)	Perception and ethical dilemmas of UI in society.	Literature review, survey among Croatian citizens.	AI brings social changes and challenges	UI brings ethical challenges, better information to the public is needed.
Plantak, Vargović & Trstenjak (2023)	UI and socioeconomic inequalities.	Literature review, analysis of economic data.	AI can deepen social inequalities.	Without regulation, UI can deepen economic inequalities.
Čurek (2023)	Impact of UI on jobs and automation.	Literature review, comparative analysis.	AI reduces the need for human labor.	UI can lead to the loss of traditional jobs, but also new opportunities.
Venkatasubramanian et al. (2020)	An interdisciplinary approach in UI research.	Analysis of interdisciplinary research on AI	An interdisciplinary approach allows for a deeper understanding of AI.	Interdisciplinary research is key to shaping policies.
Capraro et al. (2023)	Generative UI and social inequalities.	Analysis of literature and the impact of AI on work, education and health.	Generative AI can increase inequalities without regulation.	Regulation of generative UI needed to reduce inequality.

## 6. CONCLUSION

The analysis of scientific studies on artificial intelligence (AI) has demonstrated its profound and multidimensional impact on society, the economy, and regulatory frameworks. Research findings indicate that AI can enhance productivity, drive technological innovation, and improve decision-making processes, yet it simultaneously raises numerous ethical, economic, and political concerns. Key themes emerging from these studies include the perception and acceptance of AI in society, its influence on employment and socioeconomic inequalities, and the necessity of an interdisciplinary approach to its regulation. Despite the comprehensive nature of this analysis, certain limitations remain. While the selected studies are relevant and cover a broad range of topics, not all industries and regions are equally represented, which may limit the generalizability of the findings. Furthermore, given AI's rapid evolution, some conclusions may become outdated in a short period. Future research should focus on the dynamic shifts in AI usage, particularly concerning advanced generative AI, which is becoming increasingly sophisticated and widespread. AI is expected to further reshape the labor market, education, and healthcare systems, while simultaneously raising new ethical and legal issues related to data privacy, autonomous systems, and technological governance. Developing effective strategies to balance technological advancement with the preservation of societal values will be crucial in ensuring that AI benefits society as a whole rather than exacerbating existing inequalities and risks.

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# POTENTIAL FOR AGILE PROJECT MANAGEMENT IMPLEMENTATION IN THE PUBLIC SECTOR

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## **ABSTRACT**

*The rapid technological development and increasing complexity of the modern business environment necessitate more efficient and flexible project management methods. Agile Project Management (APM), known for its iterative and adaptive approach, is being increasingly adopted in the private sector, particularly in industries such as software development. However, its implementation in the public sector faces challenges due to rigid bureaucratic structures, regulatory frameworks, and traditional project management methodologies such as the Waterfall approach. This paper explores the potential application of agile project management in the public sector, with a particular focus on its advantages and limitations. Key challenges include aligning agile principles with regulatory requirements, transforming organizational culture, and adapting existing hierarchical structures. On the other hand, the potential benefits of APM in the public sector include increased transparency, more efficient risk management, faster adaptation to regulatory changes, and enhanced inclusivity of citizens and stakeholders through continuous feedback loops. Through an analysis of available research and practical examples, this paper explores under what conditions Agile Project Management (APM) can be successfully implemented in public institutions. The research findings contribute to a better understanding of how to modernize project management in the public sector and enable greater flexibility in decision-making. The study concludes that while APM remains challenging to implement in the public sector, it can be effective in specific types of projects, particularly those involving innovation, IT development, and policy experimentation. Additionally, a hybrid project management approach—combining agile principles with structured methodologies—could be a more feasible alternative to the predominantly Waterfall-oriented methods currently in use.*

**Keywords:** *Agile Project Management, Public Sector, Project Management, Flexibility, Organizational Culture, Regulatory Frameworks*

## **1. INTRODUCTION**

The rapid technological development and increasing complexity of the modern business environment require more flexible and efficient project management methods. In the public sector, traditional approaches, such as the Waterfall model, have long dominated due to their structured nature, predictability, and compliance with regulatory frameworks.

However, in dynamic environments where changes are frequent and often unpredictable, these models can be limited in terms of adaptability and response speed. Agile Project Management (APM), known for its iterative nature, adaptability, and emphasis on stakeholder collaboration, is increasingly adopted in the private sector, particularly in industries such as software development and innovation. Its application enables faster responses to change, enhances transparency, and facilitates continuous improvement through frequent feedback loops from users and stakeholders. While Agile principles offer numerous advantages, their implementation in the public sector faces significant challenges, including rigid bureaucratic structures, strict regulations, hierarchical organization, and a culture resistant to change. This paper explores the potential for implementing Agile Project Management in the public sector, analyzing its advantages, challenges, and possibilities for adaptation. A SWOT analysis will be conducted to examine the strengths, weaknesses, opportunities, and threats associated with the adoption of Agile framework in public administration. The goal is to identify key factors that may facilitate or hinder the integration of Agile practices and to explore how identified challenges can be overcome. The findings of this analysis will contribute to a better understanding of how project management in the public sector can be modernized, ensuring greater flexibility, efficiency, and inclusiveness of citizens and stakeholders in decision-making processes. Despite the challenges, the implementation of APM can bring significant benefits to public institutions, particularly in projects related to digitalization, innovation, and the improvement of public service delivery.

## **2. THEORETICAL BACKGROUND AND RESEARCH QUESTION**

Project management in the public sector has traditionally relied on structured methodologies such as the Waterfall model, which emphasizes sequential project execution, detailed upfront planning, and strict regulatory compliance. While this approach ensures control and predictability, it often lacks the flexibility required to respond to rapidly changing environments. Given the growing demand for efficiency, adaptability, and citizen engagement in public administration, Agile Project Management (APM) has emerged as a potential alternative to traditional methods. APM is an iterative and adaptive project management approach that emphasizes continuous stakeholder collaboration, incremental delivery, and responsiveness to change (Highsmith, 2009). It has been widely adopted in the private sector, particularly in IT and software development, where projects require frequent adjustments and user-centered development processes (Schwaber & Sutherland, 2020). Agile frameworks such as Scrum and Kanban prioritize short development cycles (sprints), self-organizing teams, and customer feedback, which contribute to faster decision-making and higher project success rates (Rigby, Sutherland & Takeuchi, 2016). However, implementing Agile frameworks in the public sector presents unique challenges. Bureaucratic hierarchies, rigid regulatory frameworks, and a culture resistant to change often hinder the adoption of Agile principles (Dong et al, 2024). Additionally, public sector projects typically involve multiple stakeholders with competing interests, making iterative decision-making and rapid adaptability more complex (Mergel, 2023). Recent research has identified multiple challenges in adopting Agile methodologies in the public sector, particularly emphasizing issues in project development approaches and lifecycle management (Abdullah et al., 2023). Despite these challenges, the potential benefits of APM in government institutions include improved transparency, better risk management, increased efficiency, and stronger stakeholder engagement through iterative feedback loops (Conforto et al., 2014). A Deloitte report (2024) highlights that governments are increasingly becoming agile in policy-making, regulation, technology development, and procurement, reflecting a shift toward more flexible and responsive public administration.

To address the constraints of public sector governance while integrating Agile frameworks, hybrid project management models have been proposed. Hybrid approaches combine Agile principles with traditional structured methodologies, allowing public sector projects to maintain compliance with regulatory requirements while leveraging Agile's adaptability and iterative delivery. According to Bluescape (2024), effective leadership, agile financing mechanisms, supplier integration, and addressing cultural implications are crucial for successfully adopting hybrid agile practices in public institutions. This hybrid model could be particularly effective in projects related to digital transformation, policy innovation, and technology-driven initiatives in public administration.

### **RESEARCH QUESTION**

To evaluate the feasibility and impact of Agile framework in public administration, this study addresses the following research question:

**What are the challenges of implementing Agile Project Management (APM) in the public sector?**

Through a SWOT analysis, this research explores the strengths, weaknesses, opportunities, and threats associated with Agile adoption in government projects. By identifying the key factors influencing Agile implementation, this study aims to provide valuable insights for public institutions seeking to modernize project management practices while maintaining compliance with regulatory and structural constraints.

## **3. METHODOLOGY, ANALYSIS, AND RESULTS**

### **METHODOLOGY**

This study is based on secondary sources and employs a qualitative research approach to examine the potential for implementing Agile Project Management (APM) in the public sector. Given the complexity and organizational constraints of public institutions, Agile framework requires a nuanced understanding of both internal organizational structures and external environmental factors that influence their adoption. To systematically evaluate these factors, this research utilizes SWOT analysis as the primary analytical tool. SWOT analysis provides a structured framework to assess the strengths, weaknesses, opportunities, and threats associated with Agile implementation in public administration. By applying this method, the study aims to identify key enablers and barriers to Agile adoption and offer insights into how public institutions can effectively integrate Agile framework into their project management practices. This research relies exclusively on secondary data sources, including academic literature, government reports, case studies, and industry white papers on Agile framework in public administration. By synthesizing these sources, the study ensures a comprehensive, evidence-based analysis of Agile adoption in the public sector, offering a balanced perspective on its feasibility and challenges.

### **ANALYSIS**

To evaluate the feasibility of Agile Project Management (APM) in the public sector, this study applies a SWOT analysis, identifying Strengths, Weaknesses, Opportunities, and Threats that influence Agile adoption in government institutions. This structured approach provides a comprehensive assessment of internal capabilities and external factors affecting Agile implementation.

**Strengths (Internal Advantages of Agile in the Public Sector)**

- Enhanced flexibility and adaptability – Agile allow for continuous adaptation to changing policies, regulations, and stakeholder needs, improving responsiveness in government projects (Highsmith, 2009).
- Increased efficiency and faster project delivery – Agile's iterative cycles enable quicker development and testing phases, reducing delays in public sector projects (Rigby, Sutherland & Takeuchi, 2016).
- Improved stakeholder engagement – Agile fosters continuous collaboration between government agencies, citizens, and policymakers, leading to more inclusive decision-making (Mergel, 2023).
- Better risk management – Agile framework emphasizes incremental development, allowing for early risk identification and mitigation, reducing project failures (Conforto et al., 2014).
- Greater transparency and accountability – Regular Agile reviews and sprint planning provide real-time project updates, enhancing public sector accountability (Dong et al, 2024).
- Improved innovation and adaptability to digital transformation – Agile supports public sector innovation by enabling faster adoption of new technologies and iterative improvements, making government services more responsive to emerging digital trends (Dingsøyr, Nerur & Moe, 2018).
- Enhanced team collaboration and productivity – Agile promotes self-organizing teams and cross-functional collaboration, leading to higher efficiency and motivation among employees (Moe, Dingsøyr & Dybå, 2010).
- Higher responsiveness to citizen needs – By incorporating frequent feedback loops, Agile enables public institutions to tailor services to citizens' evolving expectations, fostering greater trust in government initiatives.

**Weaknesses (Internal Challenges of Agile in the Public Sector)**

- Rigid bureaucratic structures – Many government organizations have hierarchical decision-making processes, which can slow down Agile workflows (Mergel, 2023).
- Regulatory and compliance constraints – Public sector projects must follow strict legal and procedural requirements, which may conflict with Agile's flexible nature
- Cultural resistance to change – Employees accustomed to traditional project management approaches (e.g., Waterfall) may resist Agile adoption (Dong et al., 2024).
- Lack of Agile expertise – Many public sector employees and managers lack formal training in Agile frameworks, requiring extensive capacity-building efforts (Conforto et al., 2014).
- Difficulty in measuring project success – Unlike traditional project management, Agile does not always define clear KPIs in the early stages, making success evaluation challenging for government agencies (Schwaber & Sutherland, 2020).
- Limited scalability of Agile in government institutions – While Agile works well in small teams, scaling it across multiple departments in public administration remains challenging due to interdepartmental dependencies.
- Budgeting and funding challenges – Public sector projects often operate under fixed annual budgets, whereas Agile thrives in flexible, iterative funding models (Patanakul, et al. 2016).
- Mismatch with traditional contract management – Many government projects rely on long-term, fixed-price contracts, which do not align with Agile's adaptive, evolving project scope (Flyvbjerg, 2009).

### **Opportunities (External Factors Supporting Agile Adoption)**

- Digital transformation in public administration – Many governments are investing in e-Government platforms, creating a strong foundation for Agile-driven IT projects (Gemino et al., 2021).
- Growing demand for citizen-centric services – Agile's user-focused approach aligns with the increasing public expectation for personalized, efficient, and responsive government services (Mergel, 2023).
- Policy reforms promoting innovation – Several governments have launched public sector modernization initiatives, creating a favorable environment for Agile experimentation (Dong et al., 2024).
- Advancements in technology – The rise of cloud computing, AI, and automation supports Agile's iterative development cycles in digital government projects (Rigby, Sutherland & Takeuchi, 2016).
- Successful case studies in other governments – Agile has been successfully implemented in countries like the UK and Estonia, providing models for broader adoption (Gemino et al., 2021).
- Increased focus on open government and transparency – Agile framework align with initiatives promoting open data, collaborative governance, and real-time accountability, making them an attractive option for modernizing public administration (Tomažević et. al).
- Cross-sector collaboration opportunities – Agile fosters collaboration between government, private sector, and research institutions, helping public agencies leverage best practices from the private sector (Osborne, 2006).
- Global push for adaptive governance – International organizations such as the OECD and the UN advocate for adaptive and responsive governance models, which align with Agile principles and encourage public sector innovation (Mergel, 2023).

### **Threats (External Challenges and Risks)**

- Legal and compliance risks – Agile's incremental nature may conflict with government contracting models that require detailed upfront specifications, making Agile less compatible with traditional public procurement processes (Highsmith, 2009).
- Resistance from top management – Senior public officials may prefer traditional approaches, viewing Agile as risky or unproven for large-scale government projects (Mergel, 2023).
- Limited funding for Agile transformation – Budget constraints can limit investment in Agile training, coaching, and process redesigns, slowing down Agile adoption in public administration (Gemino et al., 2021).
- Difficulties in scaling Agile beyond pilot projects – While Agile can work well in small teams, scaling it across multiple government agencies remains a significant challenge due to organizational silos, inconsistent adoption, and interdepartmental resistance (Schwaber & Sutherland, 2020).
- Potential mismatch with long-term policy cycles – Agile's short-term focus may not always align with multi-year policy planning, fixed government budgets, and rigid approval processes, making long-term Agile integration difficult (Dong et al., 2024).
- Challenges in measuring Agile success in government projects – Unlike traditional project management methodologies, Agile lacks standardized performance metrics, making it harder for public sector agencies to evaluate project impact and accountability.

- Lack of clear Agile governance models in public administration – Government agencies often lack formal Agile governance structures, leading to inconsistencies in decision-making, project prioritization, and cross-departmental coordination.
- Risk aversion in public institutions – Public organizations tend to be risk-averse, prioritizing predictability and regulatory compliance over innovation, which contradicts Agile’s experimental and adaptive nature.

### Summary of SWOT Analysis

Factor	Key Aspects
Strengths	Flexibility, faster project delivery, stakeholder engagement, better risk management, transparency
Weaknesses	Bureaucracy, regulatory constraints, cultural resistance, lack of Agile expertise, unclear KPIs
Opportunities	Digital transformation, citizen-centric services, policy reforms, technology advancements, successful case studies
Threats	Legal compliance risks, resistance from management, funding limitations, difficulty in scaling, mismatch with policy cycles

## RESULTS

The results highlight bureaucracy, legal constraints, cultural resistance, and operational barriers as key obstacles to Agile adoption in the public sector.

This section presents key challenges identified through the SWOT analysis, addressing the research question: What are the challenges of implementing Agile Project Management (APM) in the public sector?

### Structural Challenges

**Bureaucratic Rigidity and Hierarchical Structures** – Public institutions follow rigid, top-down decision-making processes, which conflict with Agile’s decentralized and adaptive approach (Mergel, 2023).

**Resistance from Leadership** – Senior officials often prioritize control and predictability, making them skeptical of Agile’s flexibility and lack of fixed long-term plans (Gemino et al., 2021).

### Regulatory Challenges

**Strict Legal and Procurement Requirements** – Agile requires adaptive contracts, but public sector procurement mandates fixed scopes, budgets, and timelines, limiting Agile’s flexibility (Conforto et al., 2014).

**Accountability and Transparency Demands** – Agile’s iterative nature lacks predefined deliverables, making it harder for public institutions to meet strict documentation and reporting standards (Mergel, 2023).

### Cultural Challenges

**Resistance to Change** – Government employees, accustomed to traditional project management, struggle to adopt Agile principles, leading to slow organizational acceptance (Schwaber & Sutherland, 2020).

Lack of Agile Expertise – Unlike the private sector, public institutions have limited experience and training in Agile framework, requiring significant investment in capacity building (Gemino et al., 2021).

### **Operational Challenges**

Scaling Agile Beyond Pilot Projects – While small Agile projects succeed, expanding Agile across government agencies is difficult due to organizational silos and regulatory constraints (Mergel, 2023).

Mismatch with Long-Term Planning – Government projects follow multi-year budgeting and policy cycles, which conflict with Agile's short iterative sprints (Dong et al., 2024).

## **4. CONCLUSION**

Agile Project Management has proven to be an effective methodology for increasing flexibility, efficiency, and stakeholder engagement in dynamic environments. However, its implementation in the public sector presents unique challenges due to bureaucratic structures, regulatory constraints, and organizational resistance to change. While Agile offers numerous advantages, its success depends on how well it is integrated into the existing public administration framework. Rather than fully replacing traditional project management approaches, a hybrid model that combines Agile principles with structured methodologies may provide the most effective solution. This approach allows public institutions to maintain regulatory compliance and accountability while benefiting from Agile's adaptability and iterative improvements. Governments seeking to transition to Agile should do so gradually and strategically, ensuring that employees receive adequate training and that organizational culture shifts in a way that supports iterative workflows. Ultimately, Agile is not a one-size-fits-all solution. Its success in the public sector depends on careful planning, phased implementation, and a balanced approach that blends agility with necessary governance structures. By taking a step-by-step approach, public institutions can modernize their project management practices without compromising stability, compliance, or accountability.

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# LEGAL CHALLENGES AND INNOVATIVE MECHANISMS IN THE IMPLEMENTATION OF THE RENEWABLE ENERGY DIRECTIVE (RED III) IN THE EUROPEAN UNION: SYSTEMATIC REVIEW AND COMPARATIVE ANALYSIS WITH SPECIAL EMPHASIS ON DIGITALIZATION AND ENERGY COMMUNITIES

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## **ABSTRACT**

*This systematic review analyzes legal challenges and innovative mechanisms in implementing the Renewable Energy Directive (RED III) in the European Union. Through comprehensive literature review and comparative analysis, the study investigates key barriers and enablers for accelerated energy transition. The systematic methodology included analysis of 85 sources: EU legal acts, national legislation, peer-reviewed articles, and institutional reports published 2020-2025. Inclusion criteria focused on RED III implementation, legal frameworks, digitalization, and energy communities. Quality assessment prioritized official EU documents, peer-reviewed publications, and authoritative institutional analyses. The review identifies administrative procedures, grid integration challenges, and legal uncertainty as primary implementation barriers. Digitalization and energy communities emerge as transformative mechanisms requiring new regulatory frameworks. Comparative analysis of Croatia, Germany, Denmark, and Ireland reveals diverse approaches and implementation gaps. Critical synthesis highlights contradictions between ambitious EU targets and inadequate national administrative capacities. The study concludes that successful RED III implementation requires coordinated legal reforms, enhanced administrative capabilities, and stakeholder engagement. Key recommendations include establishing one-stop-shop permit procedures, developing comprehensive energy community frameworks, and investing in digital infrastructure. The methodology combines systematic literature review with comparative legal analysis, providing evidence-based insights for policymakers, legal practitioners, and researchers in energy law.*

**Keywords:** *comparative analysis, Croatia, digitalization, energy communities, legal challenges, RED III, renewable energy*

## **1. INTRODUCTION**

The European Union faces an unprecedented challenge in balancing energy security with ambitious climate neutrality goals by 2050. The Renewable Energy Directive (RED III), formally Directive (EU) 2023/2413, represents the EU's most ambitious legislative response to this challenge. This directive not only elevates renewable energy targets to at least 42.5% by 2030 but introduces transformative legal mechanisms designed to accelerate implementation across member states. RED III implementation presents complex legal and administrative challenges that vary significantly across member states. While the directive provides clear targets and mechanisms, national transposition reveals substantial disparities in administrative capacity, regulatory frameworks, and implementation strategies. These variations create both opportunities for learning and risks of uneven progress toward EU-wide energy transition goals. This systematic review addresses three critical research questions: What are the primary legal challenges hindering RED III implementation across member states?

How do digitalization and energy communities function as innovative mechanisms for accelerating renewable energy deployment? What lessons can be drawn from comparative analysis of implementation approaches in different national contexts? The study focuses particularly on legal frameworks governing digitalization and energy communities as key enablers of decentralized, citizen-centered energy systems.

### **1.1. Key Concepts and Definitions**

This review employs precise definitions of key concepts to ensure analytical clarity. RED III refers specifically to Directive (EU) 2023/2413, which amends previous renewable energy legislation and introduces accelerated implementation mechanisms. Energy communities are defined as legal entities enabling collective citizen participation in renewable energy projects, encompassing both renewable energy communities and citizen energy communities as defined in EU legislation. Digitalization encompasses the integration of digital technologies, smart meters, IoT devices, data analytics, and artificial intelligence in energy systems to optimize performance and enable new business models. Go-to areas represent designated zones where renewable energy projects are presumed to have minimal environmental impact, enabling streamlined permit procedures within one year. Prosumers are energy consumers who simultaneously produce energy, typically through distributed renewable installations. Administrative barriers refer to procedural, regulatory, and institutional obstacles that delay or prevent renewable energy project development. These definitions provide the analytical framework for examining implementation challenges and innovative solutions across different national contexts.

### **1.2. Methodology**

This systematic review employs a comprehensive methodology combining systematic literature review with comparative legal analysis. The literature search strategy targeted multiple databases including Web of Science, Scopus, EUR-Lex, and institutional repositories of EU agencies. Search terms included combinations of "RED III", "renewable energy directive", "energy communities", "digitalization", "implementation", "legal challenges", and "comparative analysis". The temporal scope covered publications from January 2020 to December 2025, capturing both pre-RED III baseline studies and early implementation analyses. Inclusion criteria required sources to: address RED III implementation or related renewable energy legal frameworks; focus on EU member states with particular attention to Croatia, Germany, Denmark, and Ireland; examine legal, regulatory, or administrative aspects; and be published in English or Croatian. Exclusion criteria eliminated purely technical studies without legal analysis, non-EU contexts, and sources lacking methodological rigor. Quality assessment prioritized peer-reviewed academic publications, official EU documents, national legislation, and reports from authoritative institutions such as the European Commission, CERRE, and national energy agencies. The final corpus comprised 85 sources: 23 peer-reviewed articles, 15 EU legal acts and official documents, 12 national policy documents, 18 institutional reports, and 17 expert analyses. Source evaluation considered methodological rigor, institutional authority, recency, and relevance to research questions. The comparative analysis framework examined implementation approaches across four dimensions: legal and regulatory frameworks, administrative procedures, stakeholder engagement mechanisms, and innovation adoption. Data synthesis employed thematic analysis to identify patterns, contradictions, and gaps in current knowledge. Limitations include the nascent stage of RED III implementation, limiting availability of empirical implementation data. The focus on four member states, while enabling deep analysis, may limit generalizability.

Language restrictions may have excluded relevant sources in other EU languages. Despite these limitations, the methodology provides robust foundation for evidence-based analysis of RED III implementation challenges and opportunities.

## **2. LEGAL FRAMEWORK OF THE RENEWABLE ENERGY DIRECTIVE (RED III): EVOLUTION AND CRITICAL ANALYSIS**

### **2.1. Legislative evolution: From RED I to RED III**

The evolution of EU renewable energy legislation reveals increasing ambition coupled with growing implementation complexity. RED I (Directive 2009/28/EC) established the first binding EU-wide target of 20% renewable energy by 2020, introducing cooperation mechanisms and sustainability criteria. However, Chen and Vandendriessche (2023) critically note that RED I's support schemes often lacked market integration, leading to subsidy dependencies and grid integration challenges that persist today. RED II (Directive 2018/2001) marked a paradigmatic shift toward market-based mechanisms, raising targets to 32% by 2030 and introducing energy communities. Yet the Ecologic Institute (2024) analysis reveals significant implementation gaps, with many member states failing to fully transpose energy community provisions or establish adequate support frameworks. This implementation deficit undermines RED II's democratization objectives and highlights persistent regulatory fragmentation across member states. RED III represents both continuity and rupture with previous approaches. While maintaining market-based principles, it introduces unprecedented acceleration mechanisms including go-to areas and streamlined procedures. However, CERRE (2024) warns that these mechanisms may create new legal uncertainties, particularly regarding environmental assessment procedures and local community consultation requirements. The directive's ambitious 42.5% target, while necessary for climate goals, may exceed current administrative and grid infrastructure capacities in several member states.

### **2.2. Critical assessment of RED III innovations**

RED III's go-to areas concept represents a significant legal innovation, but implementation reveals substantial challenges. The presumption of minimal environmental impact, while accelerating procedures, may conflict with established environmental law principles requiring case-by-case assessment. National implementation approaches vary dramatically: Denmark has designated extensive go-to areas based on comprehensive spatial planning, while Croatia's approach remains fragmented and limited in scope. The directive's sectoral targets (29% in transport, 49% in buildings, 42% renewable hydrogen in industry) reflect sophisticated policy design but create implementation complexity. KPMG (2025) analysis suggests these targets may be unrealistic without massive infrastructure investments and regulatory reforms that many member states have yet to initiate. The transport sector target particularly faces challenges from limited biofuel availability and slow electrification progress.

### **2.3. Digitalization and energy communities: Legal framework analysis**

RED III's digitalization provisions require non-discriminatory data access and smart meter deployment, but implementation faces significant legal obstacles. GDPR compliance creates tensions between data sharing requirements and privacy protection. The UNECE (2024) report highlights regulatory gaps in defining data ownership, access rights, and cybersecurity responsibilities. These gaps particularly affect energy communities, which require extensive data sharing for effective operation. Energy community provisions in RED III expand previous frameworks but reveal persistent implementation challenges.

The Oxford Academic (2025) study identifies contradictions between EU-level energy community definitions and national legal frameworks. Many member states lack adequate legal forms for energy communities, creating barriers to establishment and operation. The Energy Management Framework (2024) emphasizes that successful implementation requires comprehensive legal reforms extending beyond energy law to corporate, tax, and planning legislation.

### **3. LEGAL CHALLENGES IN RED III IMPLEMENTATION: SYSTEMATIC ANALYSIS OF BARRIERS**

RED III implementation encounters multifaceted legal challenges that vary significantly across member states but share common structural characteristics. This systematic analysis identifies three primary challenge categories: administrative and procedural barriers, system integration complexities, and legal uncertainty stemming from regulatory fragmentation.

#### **3.1. Administrative barriers: Beyond permit procedures**

While permit procedure delays receive significant attention, deeper analysis reveals more fundamental administrative challenges. The CERRE (2024) comprehensive study identifies administrative capacity deficits as the primary implementation barrier, with many member states lacking sufficient qualified personnel to process applications within RED III timeframes. This capacity deficit is particularly acute in newer member states, where energy transition administrative frameworks remain underdeveloped. Spatial planning integration presents another critical challenge inadequately addressed in current literature. Go-to area designation requires sophisticated spatial analysis capabilities that many member states lack. The European Court of Auditors (2024) report reveals that only six member states have completed comprehensive spatial planning exercises necessary for effective go-to area implementation. This planning deficit creates bottlenecks that may negate RED III's acceleration mechanisms. Coordination between administrative levels compounds these challenges. Federal systems like Germany face particular difficulties coordinating between federal, state, and local authorities. The Presto (2025) comparative analysis demonstrates that centralized systems achieve faster permit processing but may lack local acceptance, while decentralized systems ensure stakeholder engagement but suffer coordination delays. This trade-off between efficiency and legitimacy remains unresolved in current implementation approaches.

#### **3.2. System integration: Legal frameworks for technical challenges**

Grid integration challenges require sophisticated legal frameworks that many member states have yet to develop. Variable renewable energy integration demands flexible grid codes, market mechanisms for ancillary services, and storage integration rules. However, the "Waste heat inconsistencies" (2024) analysis reveals significant regulatory gaps in flexibility mechanisms, particularly regarding demand response and sector coupling. Market design inadequacies compound technical integration challenges. Current electricity market structures, designed for centralized generation, inadequately accommodate distributed renewable resources. The Financial Mechanisms (2024) review identifies regulatory barriers preventing effective price signals for flexibility services. These market design flaws particularly affect energy communities, which require sophisticated market access mechanisms to operate effectively. Cross-border coordination presents additional legal complexities inadequately addressed in current frameworks.

High renewable energy penetration requires enhanced regional cooperation, but existing legal frameworks prioritize national sovereignty over regional optimization. This regulatory nationalism may undermine RED III's effectiveness in achieving EU-wide targets.

### **3.3. Legal uncertainty: Regulatory fragmentation and investment impacts**

Legal uncertainty emerges as a critical barrier to RED III implementation, with multiple sources creating cumulative investment risks. Frequent regulatory changes, retroactive policy applications, and unclear directive transposition create unpredictable investment environments. The Ecologic Institute (2024) longitudinal analysis demonstrates correlation between regulatory stability and renewable energy investment levels, with unstable regulatory environments deterring long-term capital commitments. Regulatory fragmentation across policy domains compounds uncertainty. RED III implementation requires coordination between energy, environmental, planning, and tax legislation. However, most member states approach transposition in sectoral silos, creating regulatory inconsistencies and implementation gaps. This fragmentation particularly affects innovative mechanisms like energy communities, which operate across multiple regulatory domains. Judicial interpretation uncertainties add another layer of complexity. RED III's innovative mechanisms lack established jurisprudence, creating interpretation risks for investors and developers. The "Planning for renewable energy" (2025) analysis highlights conflicts between renewable energy acceleration and environmental protection that courts must resolve without clear legal precedents. These interpretation uncertainties may delay implementation until judicial clarity emerges.

## **4. INNOVATIVE MECHANISMS FOR RENEWABLE ENERGY ACCELERATION: CRITICAL SYNTHESIS OF DIGITALIZATION AND ENERGY COMMUNITIES**

RED III's innovative mechanisms represent paradigmatic shifts from traditional centralized energy systems toward distributed, digitalized, and democratized approaches. However, implementation reveals significant gaps between policy ambitions and regulatory realities. This critical synthesis examines digitalization and energy communities as transformative mechanisms while identifying implementation barriers and contradictions in current approaches.

### **4.1. Digitalization: Promise and regulatory reality**

Digitalization promises to revolutionize energy systems through real-time optimization, predictive analytics, and automated demand response. The ScienceDirect (2024) comprehensive analysis demonstrates digitalization's potential for integrating variable renewable sources and optimizing grid operations. However, implementation faces substantial regulatory obstacles that current literature inadequately addresses. Data governance presents the most significant regulatory challenge. GDPR requirements conflict with energy system optimization needs, creating tensions between privacy protection and system efficiency. The UNECE (2024) report identifies regulatory gaps in data ownership, access rights, and sharing mechanisms. These gaps particularly affect energy communities and aggregators, which require extensive data access for effective operation. Current regulatory frameworks provide insufficient clarity on balancing privacy protection with energy system optimization needs. Cybersecurity regulation remains underdeveloped despite increasing digitalization. Smart meter deployment and IoT integration create new attack vectors inadequately addressed in current legal frameworks. The Clean Hydrogen Observatory (2024) analysis highlights cybersecurity vulnerabilities in digitalized energy systems but notes regulatory responses lag behind technological deployment.

This regulatory lag creates systemic risks that may undermine digitalization benefits. Market structure adaptation presents another critical challenge. Traditional energy markets assume predictable, centralized generation patterns incompatible with digitalized, distributed systems. Current market rules inadequately accommodate new actors like aggregators and flexibility service providers. The Financial Mechanisms (2024) review reveals regulatory barriers preventing effective market participation by digitalized resources, limiting digitalization's transformative potential.

#### **4.2. Energy communities: Democratization versus implementation reality**

Energy communities represent RED III's most ambitious democratization mechanism, enabling citizen participation in energy transition. The Oxford Academic (2025) comprehensive study demonstrates energy communities' potential for increasing renewable energy acceptance and reducing energy poverty. However, implementation reveals substantial gaps between policy rhetoric and regulatory reality. Legal form inadequacies present fundamental implementation barriers. Most member states lack appropriate legal structures for energy communities, forcing adaptation of existing corporate or cooperative forms. The Energy Management Framework (2024) analysis reveals that inappropriate legal forms create operational difficulties, tax disadvantages, and liability uncertainties. These legal form inadequacies particularly affect small-scale community initiatives lacking sophisticated legal advice. Market access barriers compound legal form challenges. Energy communities require sophisticated market participation mechanisms including grid access, energy trading, and balancing responsibilities. However, current market rules favor large-scale operators, creating barriers for community-scale initiatives. The ISCC EU (2024) analysis demonstrates that market access costs often exceed community project budgets, limiting participation to well-resourced initiatives. Financing framework inadequacies present additional implementation barriers. Energy communities require patient capital and risk-sharing mechanisms unavailable through traditional financing channels. Current state aid rules limit public support for community initiatives, while private financing remains expensive and difficult to access. These financing gaps particularly affect rural and disadvantaged communities, potentially exacerbating energy inequalities rather than reducing them.

#### **4.3. Integration challenges: Systemic barriers to innovation adoption**

Digitalization and energy communities face systemic integration challenges that current literature inadequately addresses. These mechanisms require coordinated regulatory reforms across multiple policy domains, but implementation typically occurs in sectoral silos. This fragmented approach limits innovation potential and creates regulatory inconsistencies. Grid integration presents particular challenges for both mechanisms. Digitalized energy communities require sophisticated grid management capabilities and market mechanisms that many distribution system operators lack. Current grid codes assume passive consumers rather than active prosumers, creating technical and regulatory barriers to community participation. The Eurostat (2024) analysis reveals significant disparities in grid modernization across member states, limiting innovation adoption in less developed regions. Capacity building requirements extend beyond technical capabilities to include regulatory, financial, and social competencies. Successful innovation adoption requires coordinated capacity building across multiple stakeholder groups, but current approaches focus primarily on technical aspects. This narrow focus limits innovation effectiveness and may exacerbate existing inequalities in energy transition participation.

## 5. COMPARATIVE ANALYSIS OF RED III IMPLEMENTATION: LESSONS FROM DIVERGENT APPROACHES

Comparative analysis of RED III implementation across Croatia, Germany, Denmark, and Ireland reveals significant variations in approaches, priorities, and outcomes. These variations provide valuable insights into effective implementation strategies while highlighting persistent challenges that transcend national contexts. This analysis examines both successful practices and implementation failures to identify transferable lessons and systemic barriers.

*Table 1: Comparative Analysis of RED III Implementation in Selected Member States*

Aspect	Croatia	Germany	Denmark	Ireland
RES Target 2030	36.4%	80%	55%	80%
Permit Duration	2-4 years	1-2 years	6-12 months	1-2 years
Energy Communities	Early stage	Well developed	Advanced	Developing
Digitalization Level	Medium	High	Very high	High
Main Challenge	Administrative capacity	Grid integration	System flexibility	Island constraints

*(Source: Author's analysis based on national energy plans and EU reports)*

### 5.1. Croatia: Emerging challenges and missed opportunities

Croatia's RED III implementation reveals both the challenges facing newer member states and missed opportunities for learning from established practices. The country's 36.4% renewable energy target by 2030, while ambitious, faces significant implementation barriers stemming from administrative capacity limitations and regulatory fragmentation. Current permit procedures require 2-4 years, substantially exceeding RED III requirements and deterring investment. Administrative capacity represents Croatia's primary implementation challenge. The European Commission (2023) assessment reveals insufficient qualified personnel in key agencies responsible for permit processing and environmental assessment. This capacity deficit is compounded by fragmented institutional responsibilities across multiple agencies lacking effective coordination mechanisms. Recent administrative reforms have yet to address these fundamental capacity constraints. Energy community development remains in early stages despite significant potential. Croatia's 2023 energy community regulations provide basic legal framework but lack implementation support mechanisms. Rural areas with strong social cohesion and renewable energy potential remain underutilized due to inadequate financing mechanisms and technical assistance programs. This represents a significant missed opportunity for democratic energy transition participation. However, Croatia's late implementation provides learning opportunities from other member states' experiences. The country can avoid early implementation mistakes and adopt proven best practices. Recent government commitments to one-stop-shop procedures and digitalization initiatives suggest recognition of implementation challenges, though concrete progress remains limited.

### 5.2. Germany: Energiewende lessons and persistent challenges

Germany's Energiewende provides extensive lessons for RED III implementation, demonstrating both successful strategies and persistent challenges. The country's 80% renewable electricity target by 2030 reflects decades of policy learning and institutional development. However, implementation reveals ongoing difficulties in grid integration, cost management, and social acceptance.



Germany's citizen energy company concept demonstrates successful energy community integration. Preferential treatment in auctions and simplified procedures have enabled widespread community participation in renewable energy development. The Pressto (2025) analysis shows that citizen energy companies account for significant renewable capacity additions, demonstrating effective democratization mechanisms. However, recent auction design changes have reduced community advantages, potentially limiting future participation. Grid integration challenges persist despite extensive experience. North-south transmission bottlenecks limit wind energy utilization and increase system costs. The European Court of Auditors (2024) report highlights ongoing grid expansion delays that may constrain renewable energy integration. These challenges demonstrate that technical solutions require coordinated regulatory and investment frameworks extending beyond energy policy. Cost management remains contentious, with renewable energy surcharges creating political tensions. While costs have declined significantly, distribution impacts across consumer groups remain uneven. This experience highlights the importance of designing equitable cost allocation mechanisms that maintain social acceptance for energy transition policies.

### **5.3. Denmark: Wind energy leadership and system flexibility**

Denmark's wind energy leadership provides valuable insights for managing high renewable energy penetration. With over 50% wind electricity generation, Denmark demonstrates successful variable renewable integration through sophisticated market mechanisms and grid management. The country's 55% renewable energy target by 2030 builds on established capabilities and institutional frameworks. System flexibility mechanisms represent Denmark's key innovation. Advanced forecasting systems, flexible demand response, and regional market integration enable effective wind energy management. The Financial Mechanisms (2024) analysis highlights Denmark's sophisticated balancing markets and cross-border trading mechanisms as models for other member states. These mechanisms demonstrate the importance of market design in enabling renewable energy integration. Long-term political consensus provides crucial stability for investment and innovation. Cross-party agreement on energy transition goals has enabled consistent policy frameworks spanning multiple electoral cycles. This political stability contrasts sharply with more volatile policy environments in other member states and demonstrates the importance of building broad political coalitions for energy transition. However, Denmark's small size and strong institutional capacity may limit transferability to larger, more complex member states. The country's homogeneous society and strong social trust facilitate consensus-building that may be difficult to replicate in more diverse contexts. These limitations highlight the importance of adapting rather than directly copying successful practices.

### **5.4. Ireland: Island constraints and innovative solutions**

Ireland's island electricity system presents unique challenges and innovative solutions relevant for other constrained systems. The country's 80% renewable electricity target by 2030 requires sophisticated grid management and market mechanisms to maintain system stability with limited interconnection capacity. Grid code innovations enable high renewable penetration despite system constraints. Ireland has developed advanced grid codes allowing up to 75% instantaneous renewable generation, among the highest globally. These innovations required extensive stakeholder consultation and gradual implementation, demonstrating the importance of collaborative approaches to technical standard development. The Renewable Electricity Support Scheme (RESS) combines auctions with long-term contracts, providing investment certainty while maintaining cost efficiency.

Community participation requirements in RESS auctions demonstrate innovative approaches to combining competitive mechanisms with democratization objectives. However, implementation reveals challenges in defining and verifying community participation, highlighting the complexity of combining multiple policy objectives. Energy storage and demand response investments address system flexibility needs. Ireland's significant investments in battery storage and demand response programs provide models for other systems facing integration challenges. However, regulatory frameworks for storage and flexibility services remain underdeveloped, limiting market participation and investment incentives.

### **5.5. Synthesis: Transferable lessons and persistent challenges**

Comparative analysis reveals several transferable lessons while highlighting persistent challenges that transcend national contexts. Successful implementation requires long-term political commitment, adequate administrative capacity, and stakeholder engagement mechanisms. However, approaches must be adapted to specific national contexts rather than directly copied. Administrative capacity emerges as a critical success factor across all cases. Countries with well-developed administrative capabilities achieve faster implementation and better outcomes. This highlights the importance of capacity building investments, particularly in newer member states. However, capacity building requires long-term commitments that may exceed political cycles, creating implementation challenges. Stakeholder engagement mechanisms vary significantly but consistently influence implementation success. Denmark's consensus-building approach contrasts with Germany's more technocratic methods, but both achieve stakeholder buy-in through different mechanisms. This suggests that engagement approaches must align with national political cultures and institutional frameworks. Grid infrastructure and market design represent persistent challenges across all cases. Even advanced countries like Denmark and Germany face ongoing grid integration difficulties. This highlights the need for coordinated infrastructure investment and market reform that extends beyond individual member state capabilities, suggesting the importance of enhanced EU-level coordination.

## **6. CONCLUSION AND RECOMMENDATIONS**

This systematic review reveals the complexity and multidimensionality of RED III implementation across the European Union. While the directive provides ambitious targets and innovative mechanisms, implementation faces significant legal, administrative, and systemic challenges that vary substantially across member states. The analysis identifies both successful practices and persistent barriers, providing evidence-based insights for improving implementation effectiveness.

### **6.1. Key findings and critical insights**

The review identifies three primary implementation challenges: administrative capacity deficits, regulatory fragmentation, and systemic integration barriers. Administrative capacity emerges as the most critical factor, with many member states lacking sufficient qualified personnel and institutional frameworks for effective implementation. This capacity deficit is particularly acute in newer member states but affects all countries to varying degrees. Regulatory fragmentation across policy domains creates implementation complexities that current approaches inadequately address. RED III implementation requires coordination between energy, environmental, planning, and tax legislation, but most member states approach transposition in sectoral silos. This fragmented approach limits innovation potential and creates regulatory inconsistencies that deter investment and delay implementation.

Digitalization and energy communities represent transformative mechanisms with significant potential, but implementation reveals substantial gaps between policy ambitions and regulatory realities. Current legal frameworks inadequately accommodate these innovations, creating barriers to adoption and limiting their transformative potential. Successful implementation requires comprehensive regulatory reforms extending beyond energy law to encompass data governance, market design, and financing mechanisms. Comparative analysis demonstrates that successful implementation requires adaptation to national contexts rather than uniform approaches. Countries with strong administrative capabilities and political consensus achieve better outcomes, but approaches must align with institutional frameworks and political cultures. This suggests the need for flexible implementation strategies that accommodate national variations while maintaining EU-wide coherence.

## **6.2. Recommendations for policy and practice**

Based on systematic analysis, this review provides evidence-based recommendations for multiple stakeholder groups. For EU policymakers, the analysis suggests the need for enhanced implementation support mechanisms, including capacity building programs, technical assistance, and coordination frameworks. Current implementation support focuses primarily on legal transposition but inadequately addresses administrative capacity and institutional development needs. For national governments, the review recommends comprehensive administrative reforms extending beyond energy agencies to encompass spatial planning, environmental assessment, and grid regulation authorities. One-stop-shop procedures require institutional coordination mechanisms and information systems that many member states lack. Successful implementation also requires long-term political commitment and stakeholder engagement strategies adapted to national contexts. For legal practitioners and researchers, the analysis highlights the need for interdisciplinary approaches that integrate legal, technical, and social perspectives. Current legal scholarship focuses primarily on directive transposition but inadequately addresses implementation challenges and innovation adoption barriers. Future research should examine the effectiveness of different implementation approaches and develop evidence-based recommendations for regulatory design. For energy communities and civil society organizations, the review emphasizes the importance of capacity building and advocacy for supportive regulatory frameworks. Current energy community initiatives often lack technical and legal expertise necessary for effective operation. Successful democratization requires coordinated support mechanisms including financing, technical assistance, and legal advice programs.

## **6.3. Future research directions**

This review identifies several critical areas requiring further research. Implementation effectiveness studies should examine the outcomes of different approaches and identify factors contributing to success or failure. Current literature focuses primarily on policy design but inadequately addresses implementation outcomes and their determinants. Social and distributional impacts of RED III implementation require systematic investigation. Energy transition policies may exacerbate existing inequalities if implementation approaches favor well-resourced actors over disadvantaged communities. Research should examine how different implementation strategies affect various social groups and develop recommendations for ensuring just and inclusive transitions. Innovation adoption mechanisms require interdisciplinary research combining legal, technical, and social perspectives.

Current approaches to digitalization and energy communities often fail due to inadequate understanding of adoption barriers and enablers. Research should examine how regulatory frameworks can better support innovation while maintaining system stability and consumer protection. Regional coordination mechanisms represent another critical research area. High renewable energy penetration requires enhanced cooperation between member states, but current frameworks prioritize national sovereignty over regional optimization. Research should examine how EU-level coordination can be enhanced while respecting national competencies and democratic accountability.

#### **6.4. Final reflections**

RED III implementation represents both an unprecedented opportunity and a formidable challenge for European energy transition. The directive's ambitious targets and innovative mechanisms provide frameworks for transformative change, but implementation success depends on coordinated efforts across multiple levels and stakeholder groups. This review demonstrates that legal frameworks alone are insufficient; successful implementation requires administrative capacity, political commitment, stakeholder engagement, and adaptive management approaches. The energy transition represents one of the defining challenges of our time, requiring unprecedented coordination between legal, technical, and social systems. RED III provides important tools for this transition, but their effectiveness depends on implementation quality and adaptation to diverse national contexts. Success requires learning from both achievements and failures, adapting approaches based on evidence, and maintaining long-term commitment despite short-term challenges. This systematic review contributes to evidence-based understanding of RED III implementation while highlighting areas requiring further research and policy development. The transition to sustainable energy systems requires continued collaboration between researchers, policymakers, practitioners, and civil society to develop effective, equitable, and democratic approaches to energy transition. Only through such collaborative efforts can the EU achieve its ambitious climate and energy goals while ensuring just and inclusive transitions for all citizens.

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# WHY ARE YOUNG PEOPLE ENCOURAGED TO VOLUNTEER, BUT BRICKLAYERS ARE NOT: “VOLUNTEER OPPORTUNITIES” THAT ARE JUST FRONTS FOR FREE LABOUR

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## **ABSTRACT**

*There is a huge difference between volunteering and free labour. While the free labour is more structured commitment (e.g., specific hours, duration), volunteering relies on flexibility. On the other hand, in the financial context, it is easy to track the benefits in the form of cash flow for those organizations that intentionally or unintentionally advertise that they are looking for volunteers, when they are really looking for someone who will do the job for free, helping them cut the costs. In this sense, we recognize youth and young professionals as vulnerable group, i.e., target for exploitation. The main goal of this paper is to shed light on the difference between free labour and voluntarism. In order to achieve this goal, appropriate methods are used: literature review, comparison method, compilation method, classification method, description method, analysis and synthesis. Contribution to science: we define main difference between free labour and voluntarism, and, on this basis, we suggest a) a way to recognize free labour advertised as volunteering; b) numerical evidence in financial statements that might point free labour. Since volunteers are not counted as part of labour force (if they are simply volunteering while unemployed), this has a great impact on many economic variables, from those recognized in macroeconomic context to those in specific areas like finance. Contribution to practice: according to the study results, we encourage companies involved in financial revision of institutions that they pay attention to hidden free labour, advertised as voluntarism. Also, we invite organizations that they improve their transparency linked with these matters in order to preserve their reputation.*

**Keywords:** *cash flow, financial statements, non governmental organizations, voluntary arrangement, unpaid work*

## **1. INTRODUCTION**

Volunteering is noble giving of the time, usually to help achieve some great causes that will make a difference. Unfortunately, it can be seen that there are organizations and companies that are using this good reputation of volunteering to name something very different: free labour. Sugar – coating free labour may leave a bitter taste for those who applied for volunteering, when, in fact, they were exploited for a great deal of work. Volunteers are mostly young people (Martin et al., 2012; Bazueva & Artamonova, 2021), youth and young professionals with great hopes for their future.

Volunteering is often offered to them as an opportunity to differ themselves from others, to gain some skills and competencies, and to “win a badge” for their CV. Consequently, youth and young professionals are often recognized as targets for exploitation, i.e., vulnerable group. Aside of those organizations which advertise that they are looking for volunteers instead of unpaid workforce deliberately, there are also those that are not aware of the difference between free labour and volunteering. Accordingly, the main goal of this paper is to shed light on the difference between free labour and voluntarism, and also to improve possibility of recognizing bad practices. Therefore, research questions are following:

**RQ1:** How to define main difference between volunteering and free labour?

**RQ2:** In which way it is possible to differ one from another, i.e., is there some way to recognize when the organization seeks for unpaid workers, instead of volunteers?

**RQ3:** Is it possible to track and prove arrangement of unpaid workers instead of volunteers in financial statements, i.e., to find numerical evidence?

Another great problem can be observed from the macroeconomic level, and that is the price of the work. Young people are usually underpaid in relation to the education they have gained which, consequently, can have impacts on demography, problems with housing affordability, and so on. One of the reasons why price of work may decrease is also willingness to work for free, expecting significant impacts of the gained skills in the future (Feldman, 1996; Gneezy et al., 2011). This underlines the significance of study on the broader level.

## **2. THEORETICAL BACKGROUND AND PREVIOUS RESEARCH**

Recently, many authors (Alfonso-Costillo et al., 2021; Shamir-Tixell, 2022; Escallon-Barrios et al., 2024) have attempted to address the topic of volunteering from different perspectives. Once a topic that was exclusively associated with positive connotations, today it increasingly has a negative connotation as numerous organizations exploit the kindness and willingness of volunteers to help, for purposes that actually involve only cutting costs. According to Pološki Vokić et al. (2013, p. 225), volunteering can be defined as the “activity of people who freely give their time in order to bring new contents and values into the lives of others, without expecting any financial gain in return, i.e. without being paid.” Wilson (2000, p. 215) defined volunteering as “any activity in which time is given freely to benefit another person, group or cause. Volunteering is part of a cluster of helping behaviors, entailing more commitment than spontaneous assistance but narrower in scope than the care provided to family and friends.” Volunteering is especially important for those with disabilities. Buettgen & Klasse (2020) noted that the non-profit sector, through its volunteer programs, plays an important role in creating inclusive employment. Volunteers are needed in various organisations, like in health care, or care for older people (social care services), like Cameron et al. (2022), or Johnson et al. (2023) noticed. Dowling (2024) in her article suggested that ad hoc volunteering opportunities cannot be a solution for deeper problems in managing business, and that is needed to form sustainable and acceptable solutions. On the other hand, lots of organisations also rely on volunteers in accidents, or to improve resilience in the cases of various types of disasters (Meng et al., 2025). Overgaard (2019, p. 128) tried to underline concerns regarding “the ways in which volunteering is presently conceptualized, theorized, and studied by positioning it as a form of unpaid labor.” She introduced over six focal points, determined as those that need to be investigated to a greater extent: “the question of when volunteering is work; the formal-informal and paid-unpaid distinctions of work; the notion of “choice,” especially volunteering as the lack of paid work choices; the assumption that volunteer work is similar to informal work; and a recognition that volunteering consists of many different forms of activities, not just one”

(Overgaard, 2019, p. 128). Armstrong et al. (2022) explored health component of volunteering. Using econometric regression techniques, they concluded that “volunteering is a robustly significant predictor of health, and positively affects life satisfaction for all but those aged under 35” (Armstrong et al., 2022, p. 336). The key to this may be in the tendency to exploit young people and offer them fake volunteer opportunities, which in reality are something else, for example unpaid work, or free labour. Nam (2018) used “free labour” as a term that is included in cognitive capitalism of the organisations, along with hope labor (Kuehn & Corrigan, 2013), affective labor (Hardt, 1999), and immaterial labor (Lazzarato, 1996), all gathered under cognitive capitalism of the organisations as an umbrella term. This is significant because free labour in this case represent very valuable asset of the company, often underrated, and considered easily replaceable. Similarly, Fast et al. (2016) detected 7 oftenly used metaphors (among them is also “the volunteer”), that are actually used when organization needs free labour. Their key conclusion was that “free labor is performed by different actors at either end of increasingly complex and temporally stretched out value chains” (Fast et al., 2016, p. 963). Allan (2019) actually descibed volunteering as a form of hope labour. He argued that for the organisations volunteering is similar like intership, premised on the logic of investment, and especially because “hope labour promises that exposure and experience will possibly lead to employment in the future” (Allan, 2019, p. 66). These hopes, of mainly young people, are nowadays exploited, which can be linked with previously mentioned results by Armstrong et al., 2022, and that is decrease in happiness for young volunteers, under 35 years. The last one oftenly used expression is unpaid work. Craig (2012, p. 456) defined it as “work that has economic value but is not remunerated.” This type of work is actually often linked with the domestic labour, and obligations that were once those of housewives. However, unpaid work should be included in economic evaluations in order to improve well-being and happiness of included parties, and also to improve life quality (Krol & Brouwer, 2015). Culturally, different nations have different views on unpaid work, which consequently leads to the creating economic value that is not paid, and this is why many authors argue that unpaid work should be measured as part of the GDP (its share) of each nation (Craig, 2012). Baines et al. (2017) conducted their research on organizations in nonprofit social services in Canada. They underlined that employers use various business schemes to “*fill the gaps* in funding through the extraction of unpaid work in various forms” (Baines et al., 2017, p. 625). Furthermore, they highlited the expectations that “students will undertake unpaid internships is increasing the norm for degree completion and procurement of employment” (Baines et al., 2017, p. 625). This research is significant for potential comparison because it was used the same case study approach. Maury (2020) came to the similar conclusions, highlighting that many of non-EU/EEA student-migrants in Finland are exploited due to their temporary legal status, which allows employers to impose precarious jobs and unpaid work to them. Furthermore, Maury (2020) statted that unpaid work can be a driver of precarisation, which consequently may have an impact on forming future salaries. Read (2021) suggested that the organisations should have a volunteer management, part of human resources management, with expertise that is a guarantee for maximization and efficiency of volunteers' activities. Nevertheless, Barford et al. (2021) noticed that young people in lower income countries tend to volunteer, hoping that such arrangements will provide decent work for them, but organisations often use that. Despite these topic is very sensitive, there are various points of view, that offer different insights. Still, there are many research gaps, and lack of definitions that will include some numerical restrictions. Besides, there are different definitions of volunteering in different countries because of difference in regulations, and legislative framework. All together, this makes investigations regarding topics in this field very challenging.



### 3. METHODOLOGY

In order to achieve above mentioned goal, appropriate methods are used: literature review, comparison method, compilation method, classification method, description method, analysis and synthesis. In empirical part of this paper, case study approach as research method gave a strong basis for conclusions of this research. Case study approach, answering on questions like "how" and "why", gives a broader context, even applicable on region (Stoecker, 1991; Hedrick & Bickman, 1993). The main advantage of case study approach is bringing particularities and specifics in the research, since it does not require control over the events (Yin, 2003). Moreover, case study as a research strategy has the ability of making scientists figure out complex social phenomena (Feagin et al., 1991). This kind of explanatory studies can be perfected by two other kinds: explorative studies and descriptive studies. Case study research can be used perfectly fine in economics in situations like investigating the economy of a region or city or building frameworks based on previous cases. It allows the researcher to extract characteristics of events from real life, like life cycles, managerial and organizational processes, and changes in vicinities, international affairs and development of industries (Boruch, 1993). Choosing a big, widely known organization as an example for case study, in this case IPMA, can have a great impact and establish a great role model.

### 4. RESULTS

In this section, the results are divided into three subsections. Firstly, the definition of volunteering in comparison with free labour has been given. In the second part, the example of advertising free labour as volunteering has been shown. Thirdly, there is a suggestion for numerical evidence in financial statements that might point free labour.

#### 4.1. Definition of volunteering in comparison with free labour

Based on theoretical background, here is the proposal for differing volunteering / free labour / unpaid work:

- Volunteering is the voluntary investment of personal time, effort, knowledge and skills to perform services or activities for the benefit for the common good, without the condition of payment of a monetary reward or claim of other material benefits for the volunteering performed, limiting up to 4 hours per week, with a maximum continuity of three months.
- Free labour is additional labour that contributes company value, in any sense, whether financial or as cognitive asset. There is no flexibility when it comes to free labour, i.e., the tasks have to be done. The probability to return or continue the arrangement is very low in this case, and person is usually asked to work even up to 8 hours per week.
- Unpaid work is work that creates economic value, that takes equally, or more than 8 hours per week, but is not either financially, or in any other way, paid. In some cases, it can be awarded with different compensations, but that compensation has to be only for that person (e.g., gift card for specific shop). This sort of work has noticeably low probability to return or continue the arrangement, and there is no significant flexibility.

In Croatia, the Act on Volunteering (Official Gazette 84/21, Article 11, Paragraph 2) foresights the principle of prohibiting the exploitation of volunteers by stating that: "Volunteering for more than 38 hours per week for a period longer than three months without a break of at least three months is not permitted, as is long-term or continuous performance of volunteer work that would otherwise constitute paid contractual relationships."

However, through this definition, it is foreseen that in three months a volunteer can do 494 hours of unpaid work (calculation based on maximum 38 hours per week multiplied by 13 weeks, average duration: 3 months in weeks). What is unclear here is the break in volunteering. If organization seeks for volunteers, that will work 30 hours per week, but six months, it will result in much more working hours (780 hours in total). That is why we suggested a different distribution, as well as some numerical indicators that can be included in the definitions, as it is shown in Table 1. Furthermore, we suggest that duration of arrangement is limited to 160 hours per whole year for individuals. There is currently no mechanism to regulate and control the calculation of hours required for the preparation of the volunteering itself (for example, when volunteering involves providing instruction, preparing for meetings, leading and managing a project, etc.).

Parameter to check	Organization can pay workers	Weekly duration of arrangement	Flexibility	Probability to return or continue the arrangement
Sort of arrangement				
Volunteer	No	$\leq 4$ hours	Yes	High
Free labour	Yes	4 – 8 hours	No	Low
Unpaid work	Yes	$\geq 8$ hours	No	Very low

*Table 1: Parameters that differ sorts of arrangements  
(Source: Authors' own)*

These definitions will also help in the implementation of those requirements to finally recognize volunteering as work, or will act in such a way as to improve the transparency of what organizations are really looking for, which is why it is possible to expect a reduced number of consents to "volunteering".

#### 4.2. Free labour advertised as volunteering?

For case study, it has been chosen of project *Young project manager of the year* (YPMY 2025), under the IPMA. According to the official webpages, project started on January 20<sup>th</sup> 2025, and the end date will be October 31<sup>st</sup> 2025. Project type is hybrid, which means that part of the project is conducted online, and part is conducted on site (My IPMA, 2025). Since there is lot of overlapping between the definitions, it can be challenging for HR in the organization to define what they are really looking. Here is an example of the organization that is looking for volunteers (Figure 1).

*Figure following on the next page*

myipma.ipma.world/project-role/26/application-process-and-applicants

Home
Projects
Young Project Manager of the Year 2025 (YPMY2025)
APPLICATION PROCESS AND APPLICANTS

## APPLICATION PROCESS AND APPLICANTS

The position of Application process and applicants expert requires handling of the application process for the Young Project Management of the Year (YPMY) Award including all the necessary actions to streamline the application process. When potential applicants register on the IPMA Award platform they need to be engaged in order to help them and boost their confidence in the decision to apply and to ensure the smooth application process. After applicants finish their applications communication with them remains the priority as they need to receive the info on whether they become finalists and in the end everyone needs to receive a feedback report.

Apply >

### Responsibilities


- Communication with national YCs' running the Award
- Communicate with registered/potential applicants
- Communicate with participants (applicants) and finalists
- Conduct research to identify potential Assessors
- Following up feedback reports preparation
- Send feedback report to participants and finalists
- Manage logistics with finalists
- Ensure proper workflow and fulfillment of the agreed responsibilities

### Qualifications

- Negotiation and communication skills
- Ability to build a strong people-to-people connection
- Good knowledge of written English
- Work with official documents

### Closing informations

### Project



Young Project Manager of the Year 2025 (YPMY2025)

#### Details

Occupation:

Voluntary

Career level:

Global Team Member

Role type:

User Experience and Support Manager

#### Skills

Figure 1: Ad for volunteers (Source: <https://myipma.ipma.world/project-role/26/application-process-and-applicants>, retrived: 28.03.2025.)

According to previous Table 1, it is possible to check all parameters. Can this organization pay for workers it may be questionable because we couldn't find their financial statements that usually should be publicaly reacheable. Weekly duration of engagement, as it is stated, is up to 7 hours, but it is not clear what is included in these 7 hours, or how long it will take each person to prepare for meetings, when tasks include, for example "writing a complete marketing plan". There is no total flexibility, because volunteer engagement includes meetings 2 times a week for the whole project team, and delivery of results / deliverables. For the last parameter, *Probability to return or continue the arrangement*, the team members should be contacted, but it can be indicative that in the very beginning two out of four team members (50%) didn't want to continue their arrangement. Therefore, it is understandable that the question arises, how does this "volunteer" opportunity differ from work for which an individual would normally be paid?

#### 4.3. Numerical evidence that might point free labour

In the last chapter of the analysis, what might definitely point that this is not volunteering, is necessity for applicants to pay fee in order to even be considered as nominees (Figure 2). In this project, there are several stakeholder groups: applicants (that will once became nominees), project team (voluntary team that is operating the whole project), and management. Applicants, which are considered for Young project manager of the year, pay for that ("Every application require a separate entry fee payment", IPMA, 2025, p. 3), at the same time when the project team, responsible for complete organisation of the project, is not even invited to the main event, unlike management.

#### 4.4 Application fee


The application will only be final once payment is received by the IPMA. The IPMA has the right to cancel/decline the application if the payment is not received within 14 days after the invoice submission.

Where an Applicant applies for more than one category, a separate fee applies to each application.

If the application is cancelled by IPMA for this reason, the applicant is obliged to pay 20% of the fee to cover the costs already made by the IPMA. The initial fee will not be charged.

The price depends on the country of residence of the applicant. To see the list, click here: <https://data.worldbank.org/country>.

The following fees apply to the IPMA Global Individual Award categories:

Pricing		
Price	Categories	Application Fee Includes
€200/ €250/ €300/ €350*	Project Manager of the Year** ?	 Submission based application and judging process
	Agile Leader of the Year** ?	
	Sustainability Project Manager ?	
€100/ €130/ €170/ €200*	Young Project Manager of the Year*** ?	
	Sustainability Young Project Manager*** ?	

\* The price depends on the country of residence of the applicant. To see the list <https://data.worldbank.org/country>.

The finalists are offered a pre-paid ticket to the IPMA Awards Gala and an entry to the IPMA Awards Winners Club.

Finalists of the Young Project Manager of the Year Award additionally receive the IPMA Global Young Crew Workshops ticket.

Figure 2: Organization asked for application fee (Source: [https://awards.ipma.world/wp-content/uploads/2021/11/IPMA\\_Global\\_Individual\\_A\\_Submission\\_Guideline\\_2025.pdf](https://awards.ipma.world/wp-content/uploads/2021/11/IPMA_Global_Individual_A_Submission_Guideline_2025.pdf), retrived: 28.03.2025.)

According to the the Croatian Act on Volunteering (Official Gazette 84/21, Article 11, Paragraph 2): “Volunteering that completely replaces work performed by employees in accordance with the law governing employment relations is prohibited.” There are regularly employed marketing experts, management experts, project leaders, etc. Besides, the whole project depends on the teams’ performance. So, it is quite clear that volunteering arrangement in this case completely replaces work performed by potential employees. Again, according to the the Croatian Act on Volunteering (Official Gazette 84/21, Article 11, Paragraph 4): “It is prohibited to exploit and misuse volunteers for the purpose of gaining or increasing profit or gaining personal gain.” As it is previously mentioned, management has personal gain because they can participate in main event, including awards ceremony, gala dinner, etc. Detailed analysis of financial statements would perhaps even confirmed evidence of gaining profit through, i.e., that due to this project organization had financial benefits.

## 5. DISCUSSION & CONCLUSIONS

Theoretical part of this paper provided insights in differently formulised definitions of very similar ways of giving away time for free. All in all, it can be seen that most of the authors (e.g. Baines et al., 2017) recently noticed examples of bad practices of using something so noble as volunteering is. Encouraging young people to volunteer can have a significant negative effect in the context of forming their salaries later: young educated personnel are encouraged to think in the direction of reducing the value of their own work, which is one of the reasons why they initially agree to lower salaries. Businessmen take advantage of this situation, which is one of the reasons why paradoxes occur in (perhaps, less developed) markets: employees engaged in primary and secondary jobs (for example, bricklayers, ceramicists) have greater negotiating power than young educated personnel for whom the state had much higher expenditures. All this consequently leads to the accumulation of dissatisfaction on the one hand, and underestimation of the value of work on the other. Companies and organizations that make a certain profit through projects, but for the implementation of the project itself require volunteers (who carry the entire implementation on their shoulders), primarily seek to reduce the cost of their own business. For the organization itself, this can have very negative implications for its reputation. Financial analysts, considering that the top management of the organization, but not the volunteers, are paid by the project to participate in the event itself where the project results can be seen, can easily see a Ponzi scheme here. Therefore, there are some advices to recognize fake volunteering opportunities:

- a) Look for publicly available financial reports: if participants have to pay to participate in a project, and members of the project team are supposed to work for free, then it can be considered a red flag.
- b) Ask yourself: do you really think this company can't afford to pay someone? Or are they using '*For the greater good*' as an excuse to make more money and cut costs? Don't fall into the trap of "*noble act*" / "*volunteering*" / "*it will pay off someday*" / "*make a difference*" unless you know that your time/effort spent will mostly benefit the intended purpose rather than the good of the organization.
- c) Those human resource managers who are more "fair", instead of fake volunteering, advertise that they are looking for students for internships.

Provided scientific contribution in this paper may be a trigger for new scientific discussion regarding numerical limitations in this blurred field in unpaid labour market. All in all, there is still a problem with law and regulative framework that is not clear, and detailed. And, above that, both employers, and organizations use the fact that good associations are linked to volunteering to get workers who will do something for them for free, relying on the organization's current good reputation. In this paper, we analysed a good example of bad practice. It can be noticed that IPMA uses the fact that it is well-known organisation that it does not have to pay people because they will work for free as a result of its reputation. The organization in this example should see this as an opportunity for advancement and a free external audit suggesting more transparent advertising of what is really required and expected of unpaid employees, as well as an opportunity to revise business policies, and practice.

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# THE INFUENCE OF BEHAVIORAL MARKETING AND DIGITAL COMMUNICATION TOOLS ON AUDIENCE PERCEPTION

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## **ABSTRACT**

*Behavioral marketing examines consumer behavior to optimize communication strategies and tools. By analyzing individuals' behavioral patterns and emotional states, this approach facilitates innovative methods for shaping user perceptions and enhancing the effectiveness of marketing messages. The application of behavioral marketing spans the commercial sector, political arenas, and media discourse, with digitalization and the proliferation of social networks significantly contributing to its evolution. Given that behavioral marketing extensively employs digital communication tools and media platforms to personalize messaging, this paper investigates its role in crafting targeted messages and the impact of such strategies on audience perception. The primary aim of the research is to assess respondents' awareness of their susceptibility to behavioral marketing techniques. Three specific research objectives emerge: (1) to examine how the effectiveness of certain digital communication tools varies across different age groups; (2) to analyze the structuring processes of marketing communication based on user behavior and emotional reactions; and (3) to evaluate the efficacy of various digital communication techniques and tools across digital platforms within the context of behavioral marketing. The research methodology encompasses both quantitative and qualitative methods to gain deeper insights into the influence of behavioral marketing on user perception. The anticipated outcomes aim to enhance understanding of how digital tools shape personalized marketing communication and its potential within the contemporary digital landscape.*

**Keywords:** *audience perception, behavioral marketing, digital media platforms, digital communication tools, social media*

## **1.INTRODUCTION**

The emergence of digital marketing has led to market segmentation, with globalization and technological advancements increasing interest in human emotions as a resource. This has driven the development of behavioral and neuromarketing. Behavioral marketing studies consumer behavior by analyzing emotions and interaction patterns through search data, clicks, and social media, relying on personalized communication. According to Vlahović (2023: 285), personality analysis in behavioral marketing enables the creation of more effective marketing and sales campaigns tailored to target groups.



As sophisticated technologies continue to evolve, the application of behavioral marketing is expanding, raising ethical concerns regarding the boundary between targeted promotion and manipulation. According to Vlahović (2023), the line between targeted advertising and manipulation is thin, and it is expected that, in the near future, algorithms will determine content and choose the appropriate moment to display persuasive messages based on real-time data collected. This research aims to gain a deeper understanding of the impact of behavioral marketing on user perception. The expected outcomes should contribute to a better understanding of how digital tools shape personalized marketing communication and their potential in the contemporary digital landscape.

## **2. THEORETICAL FRAMEWORK**

According to Kotler, Wong, Saunders, and Armstrong (2006), marketing is essential for organizations, whether local or global. Its primary objective is to identify, satisfy, and retain demand for products or services through strategic approaches. Key components include market segmentation, target audience identification, product development and promotion, distribution, and performance analysis. Market segmentation facilitates the customization of marketing messages to diverse consumer groups, while understanding target audiences is crucial for designing effective campaigns based on demographic, psychographic, and behavioral factors. Technological advancements have led to the utilization of human emotions as a marketing resource, fostering the development of behavioral and neuromarketing. Kotler et al. (2006) assert that consumer behavior is influenced by cultural, social, personal, and psychological factors. Culture, as a fundamental determinant of consumer preferences, encompasses subcultures—smaller groups with shared values that play a critical role in testing and personalizing marketing campaigns. Social class further influences purchasing behavior, with luxury brands such as Burberry appealing to higher-income groups, while mass-market brands like Coca-Cola and Nike transcend class boundaries. Reference and aspirational groups also shape consumer choices. Family remains integral in shaping purchasing decisions. While marketing traditionally targeted women, contemporary strategies emphasize broader consumer segments. Personal factors (e.g., age, gender, religion, interests) and psychological determinants (e.g., personality, self-perception) further influence consumer decision-making. Products frequently embody identity value—e.g., the iPhone functions as both a technological device and a status symbol. Kesić (2003) classifies information sources into marketing (advertisements, promotions), consumer (peer recommendations), and neutral (independent organizations, media), with neutral sources often perceived as most credible. Marketing professionals employ diverse methodologies to tailor consumer communication, integrating behavioral insights with sociocultural and psychological dimensions. Although behavioral marketing enhances targeting precision and personalization, it raises ethical concerns regarding the boundary between strategic influence and manipulation.

## **3. EMPIRICAL RESEARCH**

Building on the theoretical concepts presented in the preceding section, which elucidate the role of marketing communication strategies in enhancing consumer perception, the primary objective of this study was to investigate the extent to which respondents are aware of their susceptibility to infiltrated marketing communication. From this central aim, three secondary objectives were derived: (1) to analyze the extent to which the effectiveness of specific communication techniques varies in relation to the respondents' age; (2) to examine how communication is structured in accordance with user behaviors and emotional responses;

and (3) to assess whether certain communication techniques exhibit varying levels of effectiveness across different platforms within the context of behavioral marketing. In this regard, the study poses three key research questions (RQ):

RQ1: Does the effectiveness of specific communication techniques vary according to the respondents' age?

RQ2: Are respondents conscious of their susceptibility to infiltrated marketing communication?

RQ3: Is there a difference in the effectiveness of communication depending on whether the message is transmitted by traditional or contemporary communicators?

### 3.1 First research – online survey

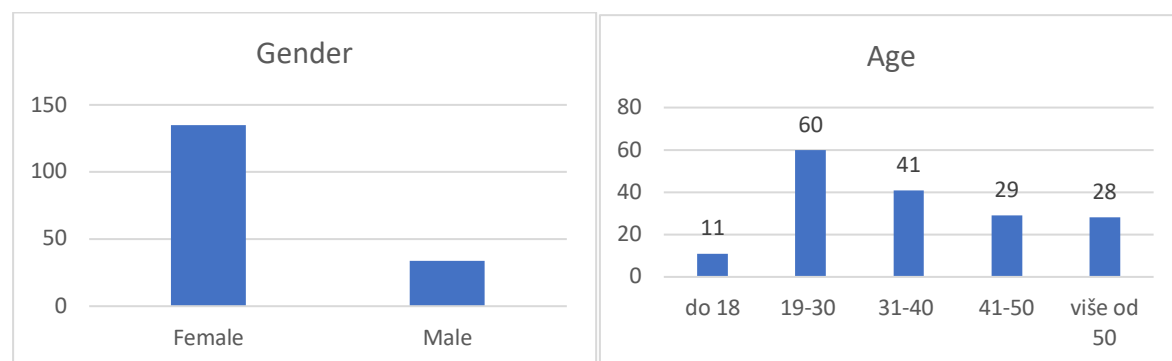
According to Verčić, Ćorić, and Vokić (2010), the online survey is the most commonly employed data collection method in social research. An invitation to participate in the online survey was distributed to potential respondents via Facebook, where they were briefly introduced to the research topic, and the purpose of the study was explained. Participation in the survey was voluntary. The results of the survey are both anonymous and confidential, with the collected data being used exclusively for the development of the research paper. The survey was conducted from July 1st to July 7th, 2024, and completed by 169 respondents. Given the method of data collection and the selection process of respondents, the sample is non-probabilistic, and based on the type of sampling, it can be classified as a voluntary sample.

Based on the literature review and research questions, a survey questionnaire was developed, comprising two sections. The first section investigates the respondents' awareness of the concept of behavioral marketing and its operational mechanisms. The second section examines the extent to which the communication strategies employed in behavioral marketing influence the respondents and their awareness of such influence. The questionnaire consists of 10 questions, all of which are structured in a way that allows for a single answer to be selected, and the data collected is entirely quantitative in nature.

#### 3.1.1 Results of the first research

##### *Socio-demographic characteristics of the respondents*

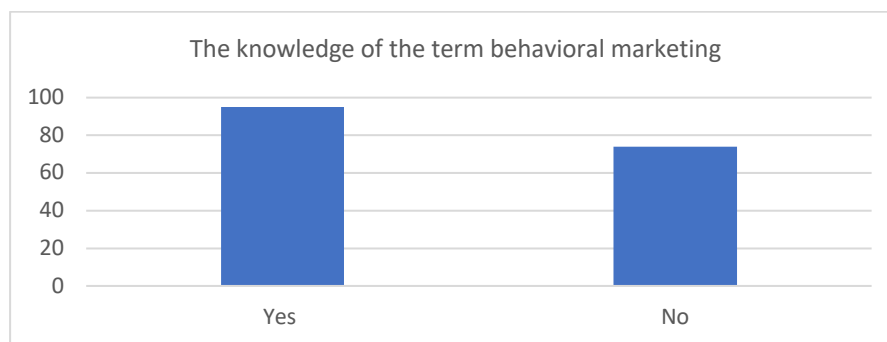
The realised sample included a total of 169 respondents (research participants), of which 135 were women and 34 were men. Considering the age structure of the respondents, the research sample included 71 members of the youngest age group (18 to 30 years), 28 member of the oldest age group (50 year and older), and 71 members of other, central age groups (31 to 50 years).



*Charts 1 and 2 – Socio-demographic characteristics of the respondents by gender and age*

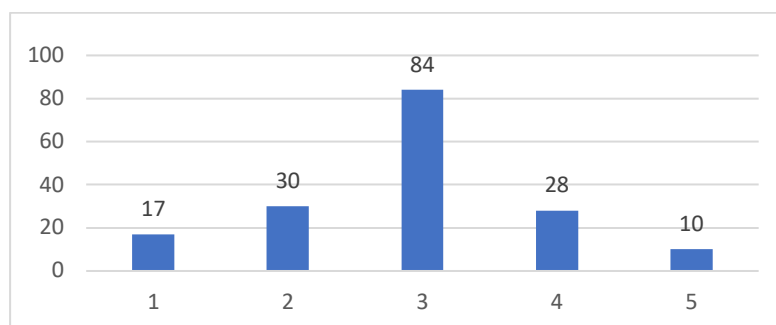
Of the total 169 respondents, the results indicated that 34 males, representing 20.1%, and 135 females, representing 79.9%, completed the survey. This finding suggests that women may be more engaged in personal involvement in communication processes and emotional understanding. Regarding the age distribution of respondents, this information was valuable as it allowed for the analysis of potential differences in interest between younger and older individuals concerning the topic under investigation. The largest proportion of respondents fell within the age group "19–30," which accounted for 35.5%. This outcome was expected, as the subject of the research is primarily related to the media advertising space, which is predominantly engaged by "Generation Z."

Concerning the role of communication processes in behavioral marketing, respondents were asked, "Have you ever heard of the term 'behavioral marketing'?" The options provided were "Yes" and "No."



*Chart 3 - The knowledge of the term "behavioral marketing"*

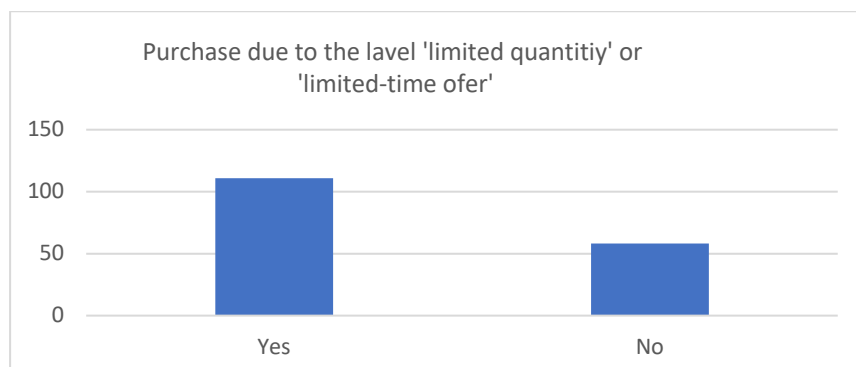
The response "No" was given by 44% of the respondents, which corresponds to 74 out of the total 169 participants, while 56% of respondents, or 95 individuals, answered "Yes." When these data are compared to the respondents' level of education, it can be concluded that as the level of education increases, so does the knowledge and interest in this topic. The next question was related to the impact on respondents' purchasing habits, which was phrased as, "On a scale from 1 to 5, how much do advertisements influence your purchasing habits?"



*Chart 4 - The impact of advertisements on the purchasing habits of respondents.*

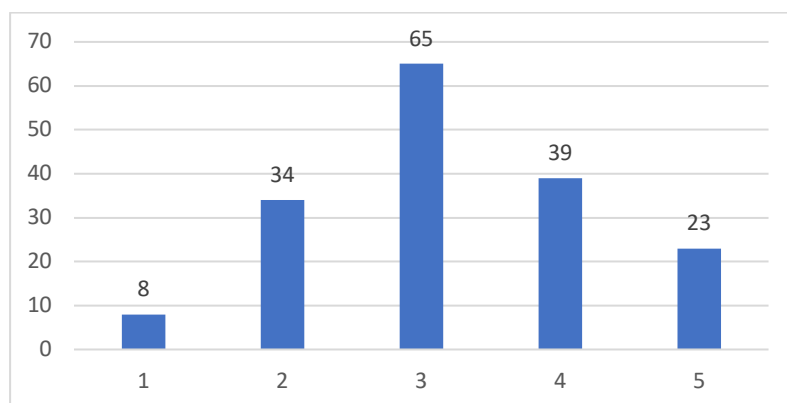
Along with the question, a response scale was provided, accompanied by instructions, where the number one was associated with the instruction "does not influence at all," while number five indicated "influences completely." The most frequent response was number 3, representing the neutral value. Interestingly, there was a small difference between those who claim that advertisements do not influence them at all and those who assert that advertisements influence them completely.

Although only 10 respondents indicated that advertisements completely influence their behavior, when asked, "Have you ever purchased a product because of the label 'limited quantity' or 'limited-time offer'?" 111 respondents, or 66%, answered "Yes," while 58 respondents, or 34%, answered "No."



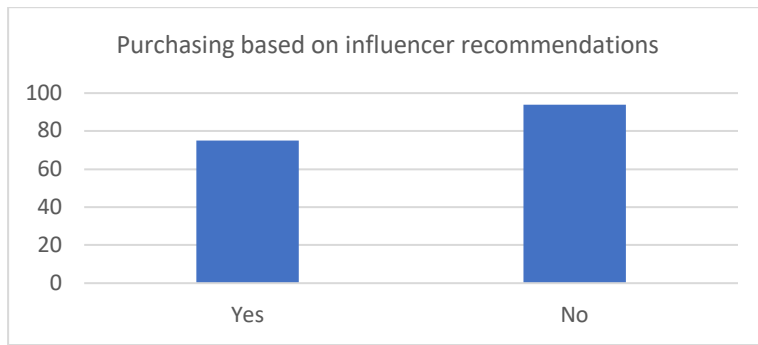
*Chart 5 - Purchase due to the label "limited quantity" or "limited-time offer"*

Due to the increasing use of the internet as a platform for advertisers, the research continued by investigating respondents' perceptions of social media in the context of communication transmitters. When asked, "On a scale from 1 to 5, how often do you engage with advertisements displayed on social media?" (where 1 implies "never" and 5 implies "very often"), 4.73% of respondents answered "never," 58.46% gave a neutral response, and 36.69% responded with 4 or 5, indicating that they use social media as a source of information



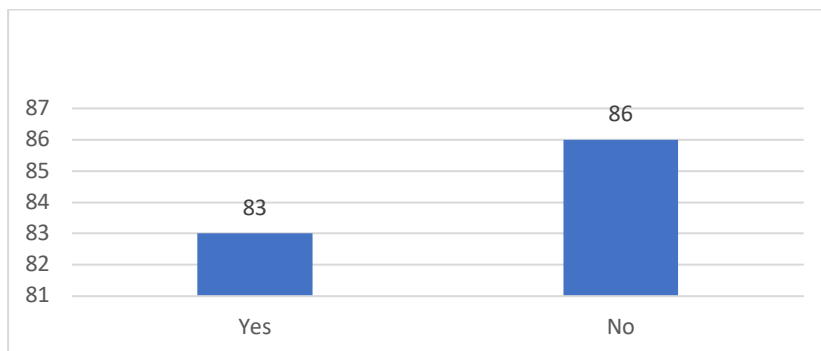
*Chart 6 - The frequency of viewing advertisements on social media*

The next two questions were related to purchase recommendations, specifically whether the respondents have ever purchased a product based on the recommendation of an influencer or an email notification.



*Chart 7 - The depiction of data on purchasing based on influencer recommendations.*

The response "Yes" was given by 75 respondents, representing 44%, while 94 respondents, or 55.6%, answered "No." This result was surprising, considering that the largest proportion of respondents fell within the age group "between 19 and 30 years." What is not surprising, however, is that out of a total of 11 respondents aged 18 or younger, 10 of them reported having purchased a product based on an influencer's recommendation. On the other hand, among respondents aged over 50, 23 individuals stated that they had never purchased a product based on such a recommendation, which accounts for 84.14%.



*Chart 7 - The depiction of data on purchasing based on email notification.*

The final question in the survey asked, "Have you ever purchased something after receiving an email notification about discounts and promotions from an online store?" This question was crucial for the study, as it aimed to assess age-related preferences regarding communication transmitters on digital platforms. Interestingly, the results revealed almost equal percentages in responses. Of the 169 respondents, 86 (50.9%) stated they had never purchased something based on an email notification, while 83 (49.1%) confirmed they had. The study further explored the age groups of those who answered positively and negatively. Among the 83 respondents who answered "Yes," 19 were over 50 years old, 26 were between 19 and 30, and 19 were between 31 and 40. Among the 31-40 age group, 17 respondents answered "Yes." This result may suggest a preference for "older" internet platforms as effective communication transmitters for advertising among middle-aged and older adults. The fact that no respondents under 18 answered positively may also indicate that Generation Z and Generation Alpha do not view older communication channels like email as suitable or accessible for advertising.

### 3.2. Second research – semi-structured interview

In this part of the study, a semi-structured interview was conducted, which is defined as an interview in which the researcher allows some thematic deviations from the set questions (Croatian Professional Terminology, 2024). A behavioral and neuromarketing expert, Dalibor Šumiga, was interviewed. He was selected due to his extensive experience and lectures worldwide on behavioral marketing, psychology, and advertising communication.

#### 3.2.1 Results of the second research

Regarding various platforms used as marketing communication transmitters, Šumiga explains their effectiveness as follows: *"It depends on what you want to compare and how you define effectiveness. If your definition of communication with the target is interaction level, social media wins, but only because they are inherently designed for two-way communication."*

With the emergence of behavioral marketing, assumptions have arisen about it being pure manipulation, so it was explored whether people are aware of their susceptibility to marketing communication and whether this can be called manipulation. *"Infiltration into the target's consciousness is a misnomer. First of all, we don't infiltrate or manipulate consumers' thoughts. Also, it's not about consciousness, it's about the subconscious. That's where the real 'decision maker' lies. Infiltration and manipulation are overly sensationalized terms that unnecessarily harm our industry. We can't force people to eat broccoli if they don't like it, nor make leftists vote for a right-wing candidate. The point of behavioral marketing is to simply explain the benefits of a product that customers already want to buy, but are unsure between two or more similar options. There is no such thing as subconscious advertising, and manipulation (which I again refute) doesn't work either. You can tell people whatever you want, but they will still act irrationally."*

Since different generations have different needs, the question arose as to whether there is a difference in the success of communication processes between those over 50 years old and those belonging to Generation Z. Šumiga explains this concisely: *"Generational marketing is one of the biggest failures of the marketing industry. The division into older or younger generations is not an effective division. A better division is between high-purchasing-power consumers and low-purchasing-power consumers, as well as by the K-factor. For example, marketing today largely ignores people over 50, although they have the highest purchasing power. If you look at the average age of customers buying a new Apple laptop, house, or car, you'll see they are around or over 50 years old. When we talk about the K-factor, it's partially related to purchasing power. People with a lower K-factor tend to make impulse purchases, and these are usually lower-income individuals who are the most loyal followers of influencers, achieving the best sales results with them. Each brand must assess whom they are targeting and what strategy they want to build. Some want to quickly increase sales and, in that case, target people with a low K-factor. Others want to build a long-term story, knowing that their product isn't affordable for everyone. In this case, they target people with higher purchasing power and build a long-term marketing strategy, not expecting immediate sales, and often not using the 'Buy Now!' approach but focusing on brand image instead."*

Šumiga asserts that there is no such thing as "infiltrated marketing communication" in the sense of manipulation, but rather it is about recognizing subconscious desires and subtly bringing them to consciousness. He provides an example of a global company that wanted to be transparent with its customers and show prices without "marketing tricks," leading to a strong negative reaction even though the prices remained the same, but without promotional labels.

Therefore, behavioral marketing does not deal with manipulation, but with raising awareness of existing desires and needs that customers already have. Interestingly, he does not believe in generational divisions, claiming that the only effective division in marketing communication is based on purchasing power (K-factor). He questions generational segmentation altogether, as it has changed frequently over time, making it irrelevant. Regarding transmitters, the entire Internet is cited as a platform for behavioral marketing communication, but he particularly emphasizes social media, asserting that "social media wins because they are inherently designed for two-way communication." Thus, newer media are more successful transmitters due to their interactive nature, offering two-way communication.

#### 4.CONCLUSION

The research successfully addressed the three research questions through both the survey and the semi-structured interview with an expert in behavioral marketing. Research Question 1 (Does the effectiveness of certain communication techniques vary based on the respondents' age?) found that age influences how individuals perceive and respond to marketing techniques. Younger respondents (under 18) are more likely to purchase based on influencer recommendations, while those over 50 are more likely to be influenced by email marketing notifications. However, from the expert interview, it became evident that age alone does not determine communication effectiveness. Instead, purchasing power plays a key role, with older individuals having higher purchasing power, which directly impacts their receptiveness to marketing communication. Research Question 2 (Are respondents aware of their susceptibility to infiltrated marketing communication?) showed that respondents are generally familiar with behavioral marketing but remain unaware of the extent to which marketing communication influences their decisions. More than half of the participants reported purchasing products due to limited-time offers, and susceptibility to influencer recommendations was nearly evenly split, with 55.6% acknowledging susceptibility. This suggests that consumers are not fully conscious of the impact of marketing communication on their daily lives. Research Question 3 (Is there a difference in communication effectiveness depending on old and new message transmitters?) concluded that differences do exist between old and new communication channels. Newer digital platforms, such as social media, are more effective because they enable two-way communication, allowing feedback and measurable results. In contrast, traditional methods like email are more effective for middle-aged and older individuals, while they have minimal impact on younger respondents, especially those under 18. Overall, the study confirms that there are significant differences in how consumers engage with various marketing techniques based on their age and purchasing power. While the research provided valuable insights, further studies should explore the role of interpersonal and mass communication in spreading marketing messages and delve deeper into the differences between influencer marketing and traditional media. Additionally, there is a need for increased education on digital and marketing literacy, particularly for younger generations, and efforts should be made to present behavioral marketing as non-manipulative to enhance public understanding.

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