DIGITALISATION AS A DRIVER OF BUSINESS EFFICIENCY IN LOGISTICS COMPANIES: THE CASE OF NORTHWESTERN CROATIA

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Abstract: *Digitalisation represents one of the key processes of modern society and the economy. It refers to the systematic use of digital technologies to improve business processes, increase efficiency, create new value, and provide additional opportunities for generating revenue. Digitalisation is changing the way businesses operate, communicate, manage resources, and connect with customers and partners. The European Union recognizes digitalisation as a strategic priority through initiatives aimed at strengthening digital infrastructure, skills, and innovation, while Croatia actively participates in these processes by supporting businesses and modernizing the public sector. To investigate the impact of digitalisation on business efficiency, a quantitative study was conducted using a survey among logistics companies in northwestern Croatia. The results show that digitalisation positively affects business operations, particularly in warehouse operations, cost management, and employee productivity. The study concludes that continuous investment in digital solutions and employee training is essential for sustaining competitiveness in today's business environment.*

Keywords: *digitalisation; digital business; companies; Northwestern Croatia*

1. Introduction

In the past decade, digitalisation has become indispensable across all sectors, gaining particular momentum during the COVID-19 pandemic. The accelerated development of digital solutions, changes in consumer behavior, and the need for more flexible business models have led to the increasing adoption of digital tools in everyday operations. Companies have recognized the necessity of adaptation and investment in digital solutions to ensure resilience, competitiveness, and long-term growth.

The purpose of this study is to examine the importance of digitalisation in the contemporary business environment and to analyze its impact on company operations, with a particular focus on logistics companies operating in northwestern Croatia. Digitalisation is viewed as a means to enhance the efficiency of business processes, improve internal organization, and strengthen a company's market position. In this study the research as a contribution is related to the understanding of the role of warehouse processes, and in the presentation of how SME logistics companies deal with digitalisation.

The aim of this study is, through a theoretical review, to present the development and significance of digitalisation at the level of the European Union and the Republic of Croatia during the period from 2020 to 2023, with particular attention to the COVID-19 pandemic, which had a significant impact on accelerating digital processes, while later sources are included as a supplement. The research part of the study focuses on examining the concrete effects of digitalisation on business efficiency and on the results that companies achieve through the application of digital technologies in warehouse and operational processes. By collecting and analyzing data from logistics companies in northwestern Croatia, the study seeks to determine the actual contribution of digitalisation to their business development.

In addition to the quantitative research method, namely the survey questionnaire, this study also employed a secondary research method based on the analysis of scientific articles and professional literature. As digitalisation is examined across multiple disciplines, sources from various research fields were used. The Google Books platform was utilised to identify relevant books, while publications of the European Commission and the European Investment Bank were analysed, together with academic and professional papers published in peer-reviewed journals.

Since trends and approaches depend on the research period, only reports and publications from the 2020–2023 period were taken into consideration, while older sources were used exclusively in the theoretical overview (definitions and historical development). The search for relevant literature was conducted using the following keywords: digitalisation, digital development, digital business, enterprises, Northwestern Croatia, COVID-19, cost management, competitiveness, business efficiency, digital tools, and warehouse processes. A total of 15 publications were used, including six books and academic papers (40%), four articles from scientific journals (26.7%), and five reports and papers issued by international institutions (33.3%). A detailed analysis of these sources formed the main thematic framework of the study.

2. Theoretical Background: Concept and Development of Digitalisation

One of the most important aspects and dimensions of Industry 4.0 is the digitalisation process. Digitalisation is the use of digital technologies to transform a business model and create new opportunities for revenue and value, representing the process of transitioning to a digital business. It includes the ability of digital technology to collect data, identify trends, and make better business decisions. (Marszałek & Ratajczak-Mrozek, 2021)

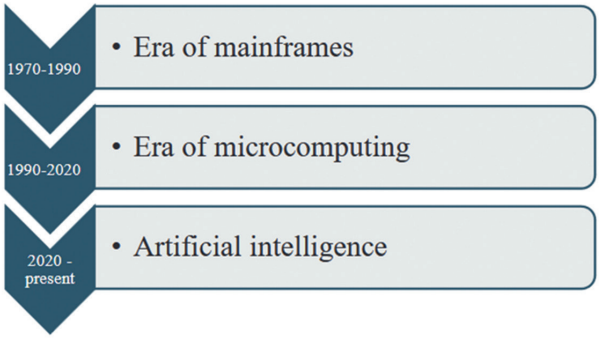
Digitalisation is a process aimed at digitizing an object, tool, process, or profession to improve its efficiency, while considering the socio-technical impact of digital technology on society, organizations, and individuals. It transforms a company's business model or entire value chain within a sector, reconfiguring its products, processes, and customer experiences, while balancing costs and benefits for consumers or industrial clients (Matoušková, 2022).

The term "digitalisation" was first mentioned in 1959 in the Merriam-Webster Dictionary, where it was defined as the use of digital technology to transform a business model and create new revenue and value. It refers to the comprehensive application of digital technology in production and products, as well as to a socio-technical process that goes beyond mere cost reduction, contributing to more efficient processes and an enhanced customer experience. (Lozić, 2023)

Although many researchers consider the terms "digitalisation" and "digitization" to be synonymous, there is an ongoing debate in the academic field regarding their precise definitions. Various scholars have historically used these two terms interchangeably. However, as confusion grew and the need for clarification increased, a consensus began to emerge. Digitization is generally understood as the technical process of converting, generating, storing, or processing data. In contrast, digitalisation refers to the broader socio-technical changes resulting from the use of digital technologies and their impact on society, businesses, and individuals. Digital transformation goes further, encompassing technological innovations while also considering the human factor and organizational adaptation. (Matoušková, 2022)

3. Development of Digitalisation

The development of human civilization entails the continuous creation and transmission of cultural concepts and technological knowledge. However, resources in each historical period were limited, and the amount of knowledge that could be preserved and shared was therefore constrained. As a result, many significant inventions and insights were often lost over time. Digital technologies now allow information to be stored at minimal cost and remain accessible regardless of material limitations. (Yu & Jiang, 2024)



Source: Matoušková (2022, p. 53).

Figure 1. Development of digitalisation.

The development of digitalisation can be summarized in three stages. The first is the era of mainframes, which lasted from 1970 to 1990. These were large mainframe computers used to perform a very small number of repetitive tasks, such as company payslips or other administrative tasks. After that came the era of microcomputing, which lasted from 1990 to 2020. During this period, computers became accessible to everyone and provided users with a graphical interface to manage various tasks. This period made IT more accessible to users and reduced the need for specialized personnel. (Matoušková, 2022)

Significant changes emerged in 2010, when the Web had already begun to offer new possibilities for information exchange and fostered the development of new communication tools. Two powerful drivers accelerated the digitalisation of society: mobile phones and the Web. After being developed separately in the 2000s, they converged, making the process of digitalisation deeper and faster. Driven by the falling cost of computing components, mobile phones and the Web enabled the emergence of new consumer and worker behaviors. The digital wave significantly changed the way companies produce goods and services, going beyond simply equipping themselves with computers to automate processes. (Matoušková, 2022)

The final phase is the era of artificial intelligence, which enables the solving of complex tasks under high uncertainty by estimating the probability of correct answers within milliseconds and presenting results in an understandable format. With this technological advancement, companies are increasingly adopting strategies based on information and communication technologies to anticipate customer needs. (Matoušková, 2022)

4. The impact of digitalisation

Pioneers in the business application of new technologies are entities in the financial sector. Banks, insurance companies, and investment funds naturally adopted new technologies, fostering the development of digital devices and instruments. However, digitalisation quickly proved to be highly important for companies in other industries operating across various markets. Moreover, electronic channels and innovations have fostered stronger connections between manufacturing, trading, and service companies and the financial institutions with which they collaborate. (Marszałek & Ratajczak-Mrozek, 2021)

The impact of digitalisation on the economy is manifested through several indirect channels. Digital technologies enable companies to access larger, often global, markets, fostering growth and competitiveness. They also change strategies, resources, and business processes. The adoption of new technologies brings managerial challenges, as it requires adjusting business models and developing new strategies, while also empowering consumers with new means of influence and higher expectations. Furthermore, digitalisation causes changes in the labor market, promotes new production solutions, and replaces human labor with robotic systems. It also affects financial markets and institutions, creating new types of instruments and payment methods while increasing transaction speeds. The proliferation of digital technologies has become an important factor in macroeconomic competitiveness, influencing business models, production, logistics, marketing, and markets. (Marszałek & Ratajczak-Mrozek, 2021)

The impact of digitalisation on production processes can be summarized as the removal of spatial barriers, enabling companies to relocate production to countries with lower costs while maintaining real-time control over information. Automation of basic and repetitive tasks simplifies processes and eliminates certain steps. Although it requires significant initial investment, digitalisation brings substantial savings, such as reduced transportation costs and increased sales through online channels, as illustrated by the fashion retailer Zara. It also allows banks to access global financial markets and conduct transactions in real time. (Matoušková, 2022)

Despite its numerous advantages, digital transformation also brings significant challenges. The main challenge is the lack of digital culture and skills in organizations. Successful digitalisation requires a focus on people and the continuous development of their digital competencies. Organizations that fail to invest in education and cultural change risk falling behind in a rapidly evolving digital environment. (Parida, 2018)

5. Digital Business Transformation

A digital enterprise is an information-driven business and production system in which all data is stored electronically and can be accessed from anywhere within the company at any time. This structure enables the direct exchange of digital information with business partners, government institutions, and financial organizations, while also automating and integrating business processes in a virtual environment. (Majdandžić, 2020)

Within a digital enterprise, a distinction is made between internal and external digitalisation. Internal digitalisation involves converting analog processes into digital ones, such as enabling digital communication among departments, employees, and machines, or between employees and machines. It also includes transforming paper-based documentation into digital records and integrating applied software systems with ERP. External digitalisation, on the other hand, refers to connecting the enterprise digitally with other

companies, government agencies, customers, suppliers, and institutions such as chambers of commerce, financial organizations, and educational institutions. (Majdandžić, 2020)

The changes brought about by digitalisation have a profound impact on business strategies and reshape the fundamental frameworks of enterprise operations. Digital technologies have transformed the way we approach data. In traditional enterprises, data were costly and difficult to access, whereas today they are generated at extraordinary speed, and systems for storing and processing them are simple and widely accessible. The key challenge is no longer collecting data, but rather turning large volumes of data into useful information. (Rogers, 2016)

Digitalisation has reshaped customer relationships by turning one-way communication into a two-way dialogue, where consumer reviews and experiences significantly influence business operations. The view of competition has also changed, as enterprises now compete not only within their own industry but also with organizations from other sectors that offer innovative digital solutions. Innovation processes have become faster and more accessible thanks to digital tools that allow the testing and development of prototypes at minimal cost. Ultimately, digital technologies redefine how enterprises create value for customers and demand continuous adaptation, innovation, and rapid response to market changes. (Rogers, 2016)

Technology has become a key driver of business growth. From customer relationship management (CRM) systems to marketing automation tools, technology enables enterprises to scale operations efficiently and effectively. Automation tools allow companies optimize repetitive tasks, such as email marketing, social media management, and data processing. Artificial intelligence (AI) further allows enterprises to personalize customer interactions on a larger scale, predict consumer behavior more accurately, and optimize marketing campaigns. Digital consumers behave differently from traditional ones, being more informed, having access to vast amounts of information, and expecting personalized experiences. Understanding these changes is crucial for the development of effective digital strategies. (Hossain, 2024)

6. Europe's Transition to Digitalisation

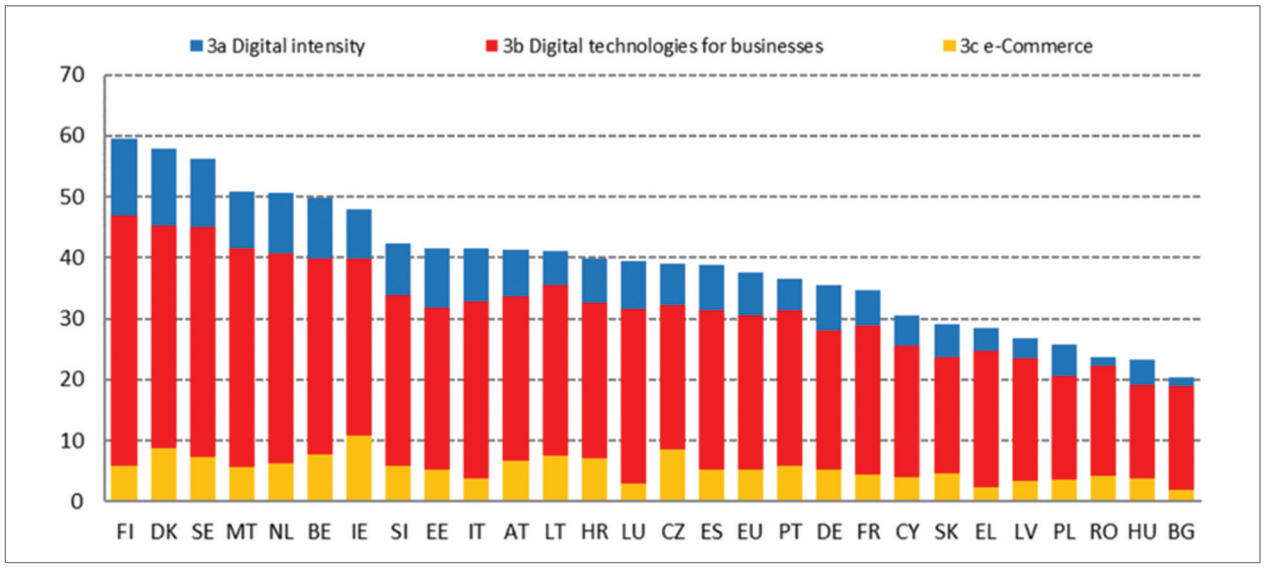
The contemporary business environment faces numerous challenges, including rapid technological changes, shifts in consumer behavior, and unexpected crises such as the COVID-19 pandemic and the war in Ukraine. These crises have caused disruptions in supply chains, restricted mobility, and interrupted regular business operations. In response, business digitalisation has emerged as a crucial solution to ensure continuity and resilience. (Has i Knežević, 2024)

6.1. Digital Development of Europe in 2020–2021: A Focus on the COVID-19 Pandemic

Data from 2020 and 2021 indicate that the digital revolution has already transformed industries, production processes, and ways of living and working, although many changes are still in their early stages. Most European enterprises participating in the Investment Survey (EIBIS) believe that the COVID-19 pandemic will further accelerate the adoption of digital technologies. Early leadership is crucial for long-term competitiveness, yet Europe still lags behind the United States. By 2020, 37% of European Union enterprises had not adopted any advanced technology, compared to 27% in the U.S. The digital divide particularly affects small businesses and less developed regions, although some EU countries are at the global forefront of digital transformation. Nevertheless, digitalisation represents a significant opportunity, as digital enterprises are more productive, employ more highly skilled workers, and anticipate higher employment growth in the future. (European Investment Bank, 2021)

The European Union lags behind the United States and China in digital adoption and innovation, as reflected in a lower number of patent applications for technologies related to "Industry 4.0." Companies that invest in digital technologies, particularly in areas such as artificial intelligence, demonstrate higher productivity, employment growth, and revenue, and are more likely to export their products and services. Although Europe still trails the U.S. in the share of digital enterprises, it leads in combining digital investments with efforts to address climate challenges, with 32% of EU companies taking this approach compared to 28% in the U.S. Moreover, the share of companies investing exclusively in climate initiatives without adopting digital technologies is almost three times higher in the EU than in the U.S. (14% versus 5%). (European Investment Bank, 2021)

The EIBIS Business Digitalisation Index evaluates the level of digital technology adoption in the European Union and the United States, summarizing indicators of digitalisation as well as enterprises' assessments of digital infrastructure and



Source: European Commission (2021, p. 5).

Figure 2. DESI 2021.

investment. According to 2020 data, Denmark and the Netherlands rank first and second in terms of digitalisation, followed by Finland and Sweden. (European Investment Bank, 2021)

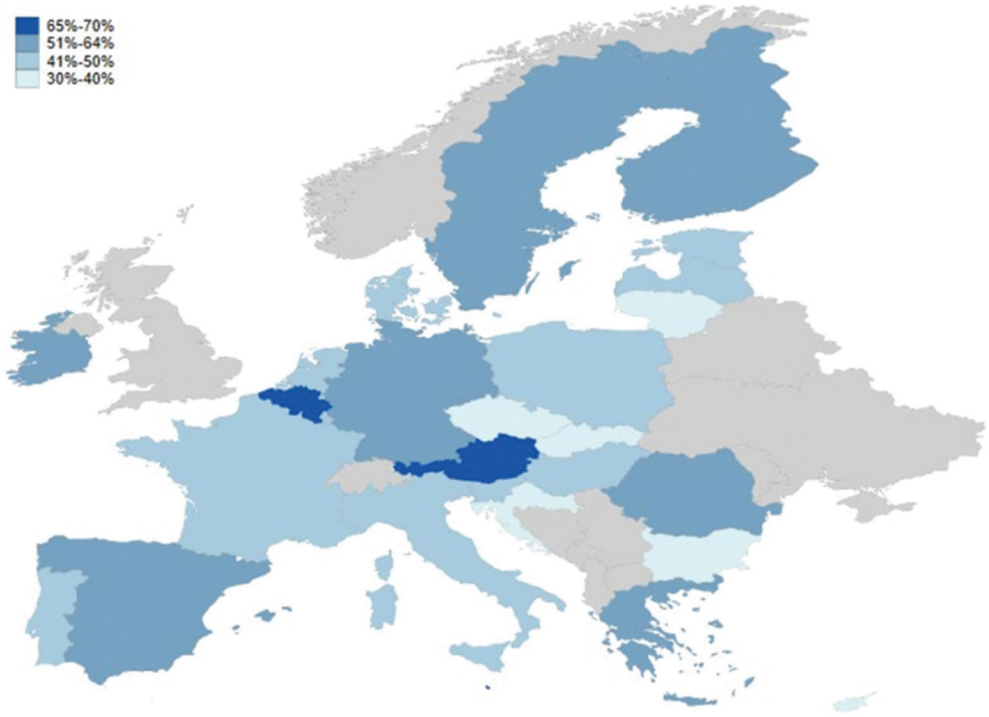
The European Commission monitors the progress of member states in digitalisation through the Digital Economy and Society Index (DESI), with annual reports published since 2014. The 2020 DESI report highlighted the increased use of digital solutions during the COVID-19 pandemic, confirming accelerated digitalisation among EU citizens and enterprises, including remote work, e-commerce, and automation, while also negatively affecting labor mobility. According to 2021 data, Finland, Denmark, and Sweden achieved the best results in integrating digital technologies, whereas Bulgaria, Hungary, and Romania recorded the weakest performance. (European Commission, 2021)

Before the COVID-19 pandemic, significant differences in digitalisation existed among countries, sectors, and companies, contributing to performance disparities. In 2019, 82% of workers in Sweden used a computer with internet access, compared to only 38% in Greece. Similar differences were observed across sectors, with contact-intensive industries and small enterprises exhibiting lower levels of digitalisation. The COVID-19 pandemic accelerated digital adoption, particularly in countries and sectors that initially had low levels. Over the two-year period, the share of workers using a computer with internet access increased from an average of 56% to 61%, with Greece experiencing nearly a 20% rise. Increased investment in less digitalised entities was also evident across sectors and companies. (Jaumotte et al., 2023)

6.2. Digital Development of Europe in 2022–2023

In the period 2022–2023, the European Union reduced the digital gap with the United States, as more than half of European enterprises increased their investments in digitalisation and accelerated the adoption of advanced technologies. Despite this progress, Europe still lags in digital innovation, which creates a risk of dependence on a few key technologies. Digital enterprises have shown greater resilience to economic and trade disruptions caused by the COVID-19 pandemic and the war in Ukraine, and they have adapted more effectively to market changes. In addition, digital enterprises generally achieve higher productivity, participate more frequently in international trade, and invest more in addressing physical and transitional risks related to climate change. (European Investment Bank, 2023)

Micro and small enterprises in the EU lag behind medium and large companies in digitalisation. In 2022, only 30% of microenterprises had taken steps toward digitalisation, compared to 62% of large enterprises. European micro and small enterprises also invest less in digitalisation than their American peers. After putting these processes on hold in the first year of the pandemic, European companies are accelerating the adoption of advanced digital technologies, reducing the gap



Source: European Investment Bank (2023, p. 2).

Figure 3. Investment in digitalisation as a response to COVID-19 (% of firms), by country.

with the U.S. The share of EU enterprises implementing advanced digital technologies increased from 2021 to 2022, reaching 69%, compared to 71% in the U.S. (European Investment Bank, 2023)

Based on the EIBIS index, Finland and Denmark are the most digitally advanced EU countries, closely followed by Belgium and Sweden. Across specific dimensions of digitalisation, different member states demonstrate particular strengths: Slovenia leads in the use of advanced digital technologies, Austria in digital adoption during the COVID-19 pandemic, Estonia in digital infrastructure, Malta in software and data investment, France in employee training, and Finland in employing formal systems for strategic business monitoring. (European Investment Bank, 2023)

The digital divide between firms may continue to grow over time. Looking ahead to the next three years, the top investment priorities for more digitally advanced firms are expanding capacity and developing new products, processes, or services. On the other hand, less digitally advanced firms are more likely to focus on replacing existing capacity, with around 20% having no investment plans at all. More advanced companies are also more optimistic about business prospects and expected sales growth. In the EU, only 35% of less digital companies expected an increase in sales in 2022, compared to 46% of digitally advanced companies, while in the US the gap was even more pronounced (33 percentage points). (European Investment Bank, 2023)

6.3. Croatia's Digital Development in 2023

The years 2023 and 2024 have been watershed years for the EU's leadership in the digital age and its role as a bolder, world-class regulator inspiring other regions of the world to act. During its 2019–2024 mandate, the European Commission has overhauled the digital policy landscape by proposing and negotiating 23 legislative acts that have strengthened the EU's position in the Digital Decade. (European Commission, 2024)

When it comes to Croatia, the country made significant progress in digitalisation in 2023, particularly in increasing the number of ICT specialists and advancing the digitalisation of small and medium-sized enterprises. The share of ICT specialists in total employment reached 4.3%, slightly below the European Union average of 4.8%, but representing a 16.2% increase compared to the previous year. Business digitalisation increased to 56%, bringing Croatia closer to the EU average of 57.7%. The country also stood out for its high share of companies using data analytics, 51.7%

compared to the European average of 33.2%, as well as for notable progress in introducing gigabit connectivity in urban areas. (European Commission, 2025)

On the other hand, Croatia continues to face significant challenges in the digitalisation of public services and the connectivity of rural areas. The share of households with access to very high-capacity networks stands at 67.8%. Despite an annual increase of 10.3%, this remains below the European Union average of 78.8%. Rural areas lag particularly behind, with coverage of only 25.5% compared to 55.6% in the EU. In addition, digital public services are still underdeveloped. Scores stand at 67.2% for citizens compared to 79.4% in the EU, and 66.2% for the business sector compared to 85.4% in the EU, highlighting the need for further investments and reforms to achieve full digital inclusion. (European Commission, 2025)

7. The Impact of Digitalisation on the Development of Logistics Companies in Northwestern Croatia

The study was conducted using a questionnaire, one of the most widely used quantitative research methods. It took place between April and June 2025 and involved ten logistics companies from northwestern Croatia, with the aim of gaining insights into business performance following the adoption and implementation of digitalisation.

The questionnaire was created using Google Forms, and respondents' anonymity was fully guaranteed. It consisted of 11 closed-ended questions, and participants represented companies of various sizes, years of operation, and levels of average annual revenue. The findings are presented using charts, diagrams, and tables.

Although digitalisation is often promoted as a necessary step toward business modernization and growth, there remains limited concrete evidence on its impact on business performance, particularly for small and medium-sized enterprises at the regional level. The research problem stems from the need to examine the real effects of digitalisation on business processes, warehouse operations, employee productivity, and overall organisational efficiency of logistics companies in northwestern Croatia.

The focus of this research is the impact of digitalisation on the operations of logistics companies in northwestern Croatia. The study aims to analyze the specific changes companies have implemented as part of digitalising their business processes, with particular emphasis on warehouse operations, distribution, work organization, employee training, reducing operational costs, and improving efficiency and productivity.

The study also aims to examine the extent to which digitalisation contributes to increased profitability and analyzes its impact on employee motivation and productivity. Additionally, it investigates how well the implemented digital systems are adapted to the specific needs of individual companies and to what extent companies have invested in employee training during the digitalisation process.

Based on the objectives outlined in the previous section, two hypotheses were formulated. The first hypothesis states that digitalisation has a positive impact on business efficiency. This implies that the introduction of digital tools and technologies is expected to improve work organization, enable faster and more accurate execution of tasks, reduce operational costs, and increase employee productivity. The study examines whether companies achieve these effects following the implementation of digitalisation. The second hypothesis states that the digitalisation of warehouse processes in logistics companies in northwestern Croatia has a positive impact on business performance. This implies that the introduction of digital technologies in warehouse management is expected to improve efficiency, reduce costs, and increase the speed of business operations, which will be reflected in overall business performance.

The questionnaire begins with questions about the companies, including their size, years of operation, and average annual revenue. The results are presented in Table 1.

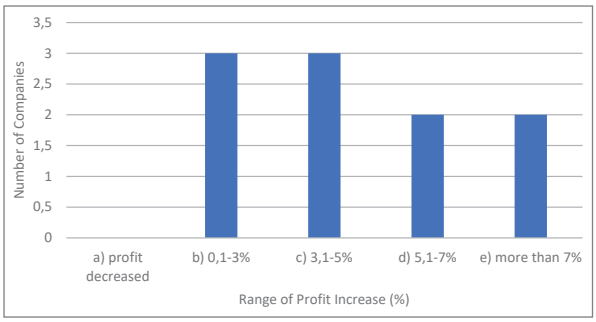
Based on the collected data, it is evident that the majority of surveyed companies have more than 151 employees, and most have been in business for over 25 years, reflecting a sample dominated by experienced, larger companies. In terms of average annual revenue, most companies generate between €5 and €15 million, while none exceed €50 million. These results provide a basic overview of the sample structure and provide a foundation for further analysis of the impact of digitalisation on various aspects of business operations.

Table 1. Surveyed Companies by Number of Employees, Years in Business, and Annual Revenue

Category		Number of Companies
Number of Employees	Less than 20	2
	21-50	1
	51-150	1
	More than 151	6
Years in Business	Less than 5 years	0
	6-15 years	2
	16-25 years	2
	More than 25 years	6
Annual Revenue	Less than €5 million	3
	€5–15 million	4
	€16–50 million	3
	More than €50 million	0

Source: Author's own work.

7.1. The Impact of Digitalisation on Profit Growth



Source: Author's own work.

Figure 4. The Impact of Digitalisation on Profit Growth.

In response to the question regarding the impact of digitalisation on company profits, the majority of respondents reported a profit increase of 5% or less. Specifically, three companies experienced growth between 0.1% and 3%, while another three reported an increase of 3.1% to 5%. Two companies recorded a profit increase of 5.1% to 7%, and the remaining two stated that profits had risen by more than 7%. No company reported a decrease in profits following the implementation of digitalisation. These results indicate a positive effect of digitalisation on financial performance, with growth most frequently observed in moderate ranges.

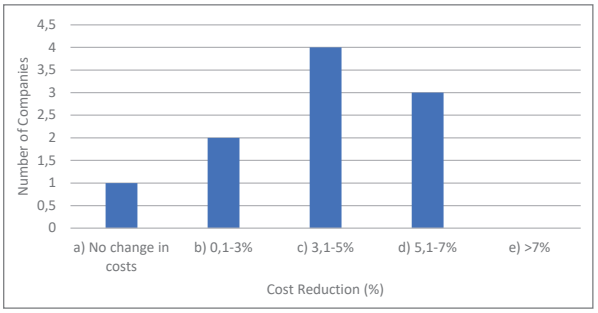
7.2. Impact of Digitalisation on Work Speed in Warehouses

Based on responses from the surveyed companies, digitalisation has significantly contributed to faster warehouse operations. Three companies reported that work speed increased by more than 5%, while two companies observed an increase between 4.1% and 5%, and another two reported increases between 3.1% and 4%. Finally, three companies noted a moderate increase of 0.1–3%. These results indicate that digitalisation has accelerated warehouse processes in most companies, particularly in terms of goods flow and shipment processing, which can substantially enhance operational efficiency and improve customer service.

7.3. The Impact of Digitalisation on Sales and Procurement Growth

The results indicate that digitalisation has a significant impact on the expansion of sales and procurement markets in most surveyed companies. None of the companies reported no market growth following the implementation of digitalisation. Two companies reported minor expansions of up to 1%, while the majority (six companies) experienced growth between 1% and 3%. Additionally, two companies indicated expansions exceeding 3%. Overall, these findings suggest that digitalisation positively contributes to business growth and the potential to capture new markets.

7.4. The Impact of Digitalisation on Inventory, Storage, and Administrative Costs



Source: Author's own work.

Figure 5. The Impact of Digitalisation on Inventory, Storage, and Administrative Costs.

The results indicate that digitalisation has contributed to a reduction in inventory, storage, labor, and administrative costs in most companies. Three companies achieved a significant cost reduction of 5.1–7%, while four companies reported decreases between 3.1% and 5%. Two companies experienced minor reductions of up to 3%, and one company reported no cost change. These findings confirm that digitalisation can be an effective tool for optimizing business expenses, particularly in storage and administrative areas.

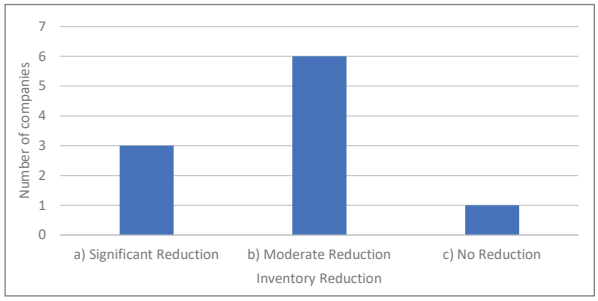
7.5. The Impact of Digitalisation on Warehouse and Inventory Organization

The majority of surveyed companies (six out of ten) reported that digitalisation has significantly improved warehouse and inventory organization. Benefits include real-time inventory tracking and more efficient planning and ordering of goods, often facilitated through QR code technology. Three companies indicated only partial progress, still relying on manual records, which may lead to data inconsistencies. One company noted that the system is not fully integrated, so warehouse organization remains a challenge. Overall, these findings confirm that digitalisation generally enhances warehouse management, although further improvements are still needed.

7.6. The Impact of Digitalisation on Accelerating Goods Delivery

The results indicate that digitalisation has had a positive impact on accelerating goods delivery in most surveyed companies. Five companies (half of the sample) reported a moderate increase in delivery speed of 1–3%, two companies observed improvements between 3% and 5%, and three companies highlighted increases of over 5%. Notably, no company reported that digitalisation had no effect. These findings suggest that digital tools, such as route planning and delivery tracking systems, have a tangible operational impact on optimizing logistics processes.

7.7. The Impact of Digitalisation on Warehouse Inventory Reduction



Source: Author's own work.

Figure 6. The Impact of Digitalisation on Warehouse Inventory Reduction.

The majority of companies (six out of ten) reported that warehouse inventory has been partially reduced, although full optimization has not yet been achieved. This suggests that digital tools are in place, but their full potential is still being developed, particularly through data analysis and adjustments to procurement strategies. Three companies highlighted that, thanks to digitalisation, they have significantly reduced inventory levels through automated consumption tracking and precise planning. Only one company continues to maintain higher inventory levels despite using a digital system. Overall, these findings demonstrate that digitalisation contributes to more efficient inventory management, even though its full benefits have not yet been realized in all companies.

7.8. Post-Digitalisation Investments in Employee Training and Development

According to the survey results, the majority of companies (six out of ten) reported that investments in employee training following digitalisation have remained roughly the same. Three companies indicated an increase of more than 20%, while one company reported an increase of up to 20%. Notably, no company stated that digitalisation required no additional training, suggesting

a general recognition that digital solutions still demand employee preparation and upskilling. Overall, these findings imply that, although the need for training is acknowledged, most companies have not significantly altered their approach to investing in employee knowledge.

7.9. The Impact of Digitalisation on the Efficiency of Goods Receipt and Shipment Processes

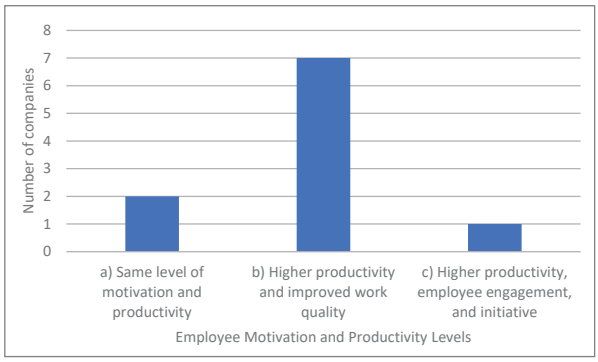
The vast majority of companies (seven out of ten) reported that goods receiving and dispatch occur significantly faster following digitalisation. Two companies observed a slight acceleration, while one company noted no change. No company reported any slowdown in these processes. These results indicate that digital solutions, such as automated shipment tracking and processing systems, positively impact warehouse operations. Faster goods flow further enhances overall operational efficiency and customer satisfaction.

7.10. Adaptation of Digital Systems to Company Needs

The results indicate that the majority of companies opted for a high degree of customization of digital systems to suit their operational needs. Four companies developed internal systems fully tailored to their business processes, while another four adapted existing tools to their tasks. Two companies use specialized proprietary systems specifically designed for their requirements, including the management of sales, customers, and inventory. These findings suggest that companies in northwestern Croatia are actively ensuring that digital solutions are highly functional and closely aligned with their business processes, thereby enhancing efficiency and accuracy.

7.11. The Impact of Digitalisation on Employee Motivation and Productivity

The majority of companies (seven out of ten) reported a significant increase in employee productivity following the implementation of digitalisation. This increase is evidenced by faster task completion, fewer errors and complaints, and a higher number of successfully completed projects. Two companies indicated no change in motivation or productivity levels, while one company reported increased employee engagement, including greater initiative, creativity, and collaboration. These findings suggest that digitalisation



Source: Author's own work.

Figure 7. The Impact of Digitalisation on Employee Motivation and Productivity.

not only contributes to operational improvements but can also positively affect employees psychologically and organizationally, particularly through better access to information and more structured work processes.

The research results clearly demonstrate the positive impact of digitalisation on the operations of logistics companies in northwestern Croatia, confirming the first hypothesis regarding increased business efficiency. The majority of surveyed companies reported profit growth and faster warehouse processes, highlighting the importance of digital technologies in optimizing business activities.

Digitalisation affects not only financial indicators but also employee organization and motivation. Most employees have become more productive and engaged as a result of better access to information, automation of routine tasks, and more clearly defined processes. This contributes to a motivated workforce and a more effective work environment, which are essential for the long-term success of the company.

The second hypothesis, regarding the impact of digitalising warehouse processes on business results, is also confirmed. Digital solutions have enabled better inventory management, reduced storage costs, and accelerated the flow of goods, thereby enhancing the competitiveness of companies. However, some challenges remain: certain companies do not fully utilize the benefits of digitalisation, system adaptation varies, and investments in employee training are inconsistent, which can affect the speed and quality of implementation. For logistics managers in the region, this suggests three priorities: (1) customized WMS systems instead of generic solutions; (2) systematic investment in training, and (3) a combination of digital tools for routes and warehouses as a „minimum package."

The study has limitations, including a small sample size of ten companies and a focus on northwestern Croatia. Future research should expand the scope to other regions or sectors. In conclusion, digitalisation is a key factor in business improvement, but achieving maximum benefits requires ongoing investment in employee training and system adaptation.

8. Conclusion

The theoretical part of the study shows that digitalisation is not a passing trend but a long-term transformation in the way companies operate and create value. It enables the streamlining of business processes, improved efficiency, greater market adaptability, and more informed data-driven decision-making. Digitalisation is not limited to technology adoption and also involves changes in organizational culture, structure, and strategy. The results are based on respondents' perceptions, not objective financial reports, while future research will include a combination of quantitative KPIs (measured before and after the implementation of digital solutions) and qualitative interviews. Continuing research will focus on companies that systematically invest in digital solutions and their strategy to demonstrate greater adaptability to environmental changes and achieve long-term competitive advantages.

Digitalisation simultaneously impacts internal business efficiency, customer relations, the speed of product and service delivery, and the development of innovative business models. In both the European and Croatian context, the COVID-19 pandemic and EU digital policy objectives have accelerated this process. While the level of digitalisation varies across countries and sectors, the common conclusion is clear. Without its adoption, companies struggle to maintain relevance and market position in an increasingly digital competitive environment.

The research confirmed that digitalisation significantly improves the operations of logistics companies in northwestern Croatia. Digital tools and systems contribute to increased profits, more efficient warehouse management, cost reductions, and enhanced employee productivity and motivation. Although companies demonstrate varying levels of digital adoption, the overall trend is clear. Implementing digital technologies brings substantial benefits and can be a key driver of market competitiveness. Continuous investment in employee training and system adaptation tailored to each company's needs is essential to maximize these advantages. Given the limited number of surveyed companies, future research should expand to a larger and more diverse sample while including other regions and sectors to provide a broader understanding of the impact of digitalisation on business operations.

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