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IMPACT OF DIGITALISATION ON COMPANIES' PERFORMANCE DURING COVID-19

Milan Talíř [1], Ekaterina Chytilová [2]

[1]Brno University of Technology, Institute of Management, Faculty of Business and Management, Kolejní 2906/4, Brno, 612 00, Czech Republic
[2] Institute of Technology and Business in Ceske Budejovice, Faculty of Corporate Strategy, Nemanická 436/7, 370 10 České Budějovice, Czech Republic

E-mails: [1] 252620@vutbr.cz; [2] chytilova@vste.cz

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Abstract. The main objective of this paper is to investigate how different digitalisation measures have affected business performance in Czech companies during the pandemic. A questionnaire survey of Czech companies from various business sectors was used for data collection. The sample was defined randomly based on voluntary completion. For testing the hypotheses, the instruments used were one-factor ANOVA, Pearson Chi-square test. The study determines the digitalisation measures used and the change in the level of digitalisation of business processes. It provides an overview of the short-term impact of the measures on business performance. It confirmed the link between the growth in the level of digitalisation of external communication and the business sector (for industrial enterprises). Confirmed the association between the digitalisation of product offerings and service measures) and the level of digitalisation of marketing, the level of the website, the education and training of staff (measures), and the level of external communication. The association between the measures taken and the enterprise's financial situation during the pandemic was not confirmed. The results are limited to the Czech environment and the pandemic period. Due to how the sample is defined, insights regarding the wholesale and retail sectors are inconclusive. The study does not take into account long-term follow-up of changes**.**

Keywords: general management; management of non-government organisations; research methods; business processes

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JEL Classifications: M21, L14, L26.

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1. Introduction

The COVID-19 pandemic had a significant impact on businesses around the world, causing widespread disruption and unprecedented financial losses. Major economic impacts of epidemics include supply chain disruptions, reduced consumer demand, or increased operational costs due to the need for personal protective equipment, disinfection, and other measures to ensure the safety of employees and customers (Harel, 2021). Unlike other previous epidemics, this pandemic affected all links and linkages in the supply chain, significantly disrupting the flow of the supply chain (Gunessee and Subramanian, 2020; Paul and Chowdhury, 2021). The pandemic affected supply chain activities, operations, processes, and management due to supply disruptions, demand fluctuations, and government measures to combat the crisis (Pollak et al., 2021). Factory closures, border restrictions, travel bans, port closures, and suspended shipping disrupted the supply network, leading to shortages (Magableh, 2021). Sammarco et al. (2022) have shown that adopting certain technologies during a

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2024 Volume 11 Number 4 (June)
http://doi.org/10.9770/jesi.2024.11.4(16)

disruptive event, such as the COVID-19 outbreak, can positively impact organisations' ability to be resilient. Overall, the COVID-19 outbreak had a significant impact on business performance and forced many companies to rethink their business strategies and goals (Civelek et al., 2021). According to (Igbinakhase 2021), the digitalisation of key business activities will be one of the essential aspects for enterprises to achieve competitiveness in the post-pandemic era. By adopting digital technologies, enterprises have reorganised their business processes to increase productivity, reduce costs and innovate. Digital transformation includes using the Internet as a data-driven management model in design, production, marketing, sales, and communication (Civelek et al., 2021; Zheng and Sun, 2022). Significant technological developments have brought new digital technologies and opportunities for their use (Frenzel et al., 2021; Lincenyi et al., 2023).

Hellsten and Paunu (2020) define digitalisation as the creation and implementation of changes associated with applying digital technologies in all components of human civilisation. Sandberg et al. (2020) state that digitalisation changes the firm's organisational logic and introduces new features to product platforms. The greatest impact of digitalisation on business processes has been seen in sales or online payments, which have saved countless businesses in this crisis (Civelek et al., 2021). Specifically, Clancy et al. (2022) conclude that the introduction of digitalisation in the manufacturing sector minimises waste, resulting in cost savings and increased efficiency in the production process. Thus, digitalisation plays a significant role in optimising business processes (Zotov et al., 2021). Digitalisation of business processes has a positive impact on the utilisation of the potential of the enterprise (Schaupp et al., 2017). However, it is necessary to determine which digitalisation measures contribute to increasing the performance of the enterprise and raising the level of business processes within the value chain concept.

The main objective of this paper is to find out how different digitalisation measures have affected enterprise performance during the pandemic in Czech enterprises.

To fulfil this main objective, the following research questions were set:
Research question 1: Is the change in the level of digitalisation of business process components related to the size of the enterprise and the business sector?
Research question 2: How have digitalisation measures affected the level of digitalisation of individual business process components?
Research question 3: How have digitalisation measures affected the economic efficiency of the enterprise?

2. Theoretical background

The current view of management defines each firm and its processes as being characterised by a value chain, a continuous set of core business and supporting activities. The current priorities and objectives of each specific enterprise define the division into main and supporting processes. (De Meio Reggiani et al., 2022; Linkov et al. 2020). The COVID-19 pandemic changed consumer habits and innovation processes of organisations, leading to an accelerated digital transformation of micro, small, and medium enterprises (MSMEs) and large firms (Gavrila Gavrila and De Lucas Ancillo 2022; del Olmo-García et al. 2020). The impact of the pandemic is evident for all companies, regardless of their size and market position (Guan et al., 2020; Dvorak et al., 2021; Khan et al., 2021). The impact of the pandemic on the economy has caused an economic downturn, a reduction in GDP, high inflation rates, and significantly lower government revenues (Chiaramonti and Maniatis, 2020; Nicola et al., 2020). Global trade, the health sector, unemployment, manufacturing, foreign direct investment, and tourism have also suffered (Khan et al., 2021). The crisis has had an impact on business operations and financial performance. Because of this, strategies were forced to focus on reducing costs by reducing supplies, production, and sales volume (Danielak, 2021). The decline in product demand has led to many companies experiencing a reduced cash flow due to order cancellations, interruptions in domestic or international logistics, and unfulfilled orders due to limited production capacity (Sharma et al., 2020). Limited production capacity has led companies to reduce employment or work hours. The financial crisis due to the pandemic may have caused the temporary closure of the business or suspension of current investments and R&D activities (Danielak, 2021). During a recession, the structure of demand changes, competition increases, and uncertainty arises (Kim et al., 2020). The management of a company must emphasise both core and supporting processes (Komodyova et al., 2020). Of all business processes, core processes contribute the most to performance (Gošnik and Stubelj, 2022).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 11 Number 4 (June)
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Process optimisation means improving existing company processes to enhance competitiveness (Shen and Han, 2020; Rubinsin et al., 2022).

In the current understanding, firm performance is how effectively and efficiently a firm uses its limited resources (land, labour, capital) at its disposal to create value (Aifuwa, 2020). Performance measurement can be understood as indicators that assess an organisation's effectiveness and efficiency and its ability to attract and retain customers in an increasingly competitive market (Lukáč, 2020; Kollmann and Dobrovic, 2022). Any organisation that wants to manage its operations, activities, and supply chains must start with performance measurement (Yousuf et al., 2021). Enterprise-level performance is evaluated in many different ways. The most common categories of indicators tracked to determine an organisation's performance are financial and non-financial (Tulcanaza-Prieto et al., 2020). These indicators include accounting profitability ratios, financial analysis, total factor productivity, and the Balance Score Card (BSC) method (Suryaatmadja,2020; Sharma et al., 2021; McCormack et al., 2020). Rudewicz (2021) focuses on the contradiction between optimisation and strategic stabilisation during the pandemic. In addition to the direct effect on performance change, the firm in a recession is also modelled by the relationship between opportunity recognition and performance (Conti et al., 2020). The COVID-19 pandemic has increased interest in digitising processes (Bikse et al., 2021; Sagapova and Dusek, 2021). Today, enterprise performance is related to continuous digitalisation. Digitalisation has become part of products and services and increasingly supports business processes (Truant et al., 2021). Companies interested in digitising processes during COVID-19 realised the importance of digital transformation to sustain business in times of crisis. This digital transformation includes various business processes such as sales, marketing, human resources, operations, finance, research and development, and customer support services (Antonizzi and Smuts, 2020). Today's economy is often called the "digital economy," characterised by hyperconnectivity, data sharing, and automation (Harasim and Klimontowicz, 2021). Today, business performance is related to continuous digitalisation (Sabino, 2020).

The digitalisation has become part of products and services and increasingly supports business processes. Many industrial countries have embraced automation with the advent of digitalisation, which has fundamentally changed their manufacturing and industrial processes (Leal Filho et al., 2022; Kádárová, 2022). The adoption of digital tools to support the daily operations of a company is still in its embryonic stage (Truant et al., 2021). According to (Renn et al., 2021), the dynamic development of digitalisation has both positive and negative effects. The positive impact relates to business markets and increasing consumer choice and employee freedom (Jurasek et al., 2021).

On the other hand, the development of digitalisation can uncontrollably increase employee insecurity and competition between local and global companies (Renn et al., 2021; Androniceanu and Marton, 2021). Digitalisation has distinct impacts on enterprise performance and contributes to enterprise value (Wang et al., 2022; Tsou and Chen, 2022; Deng et al., 2022). Martínez-Caro et al. (2020) have shown that the greater the extent of digitalisation in an enterprise, the higher the likelihood of being able to develop enterprise performance and thus achieve higher value.

Several studies have examined the impact of digitalisation components on firm performance. For example, Yu et al. (2021) focus on researching the nature of the relationship between enterprise digitalisation and financial performance. In a quantitative empirical survey of Chinese enterprises, it was found that there is an inverted-U-shaped relationship between enterprise digitalisation and financial performance (Yu et al., 2021). Research (Okfalisa et al., 2021) focuses on analysing the determinants of digital transformation readiness in small and medium-sized enterprises. Readiness factors (priority indicators in measuring small and medium-sized enterprises' readiness) include business activities (supply chain activities), transactions (commercial activities to transmit and treat digitised data), marketing, management, micro-environment, and macroenvironment. IT perspectives included culture, education, financial resources, and technical infrastructure. The empirical research was conducted through interviews with experts from IT and business academics (Okfalisa et al., 2021). In the Czech environment, digitalisation in business is addressed, for example, in a study by (Kwarteng et al., 2022), which examines the drivers and barriers related to the tendency of owner-managers of small and medium-sized enterprises to digitalise. The survey was conducted through a questionnaire survey with Czech small and medium-sized enterprise owners (Kwarteng et al., 2022).

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2024 Volume 11 Number 4 (June)
http://doi.org/10.9770/jesi.2024.11.4(16)

According to the nature of the research questions and the results of these studies, the current research will be conducted as a questionnaire survey, and correlation methods will be used for data processing.

3. Research objective and methodology

The research questions of the study were set as follows:
Research question 1: Is the change in the level of digitalisation of business process components related to the size of the enterprise and the business sector?
Research question 2: How have digitalisation measures affected the level of digitalisation of business process components?
Research question 3: How have digitalisation measures affected the economic efficiency of the enterprise?
To answer the research question, a questionnaire survey will be conducted in Czech enterprises from different sectors. The sample will be drawn using non-probability sampling based on voluntariness. The minimum return threshold in this research has been set at 200 enterprises. Figure 1 shows the schematic structure of the empirical research.

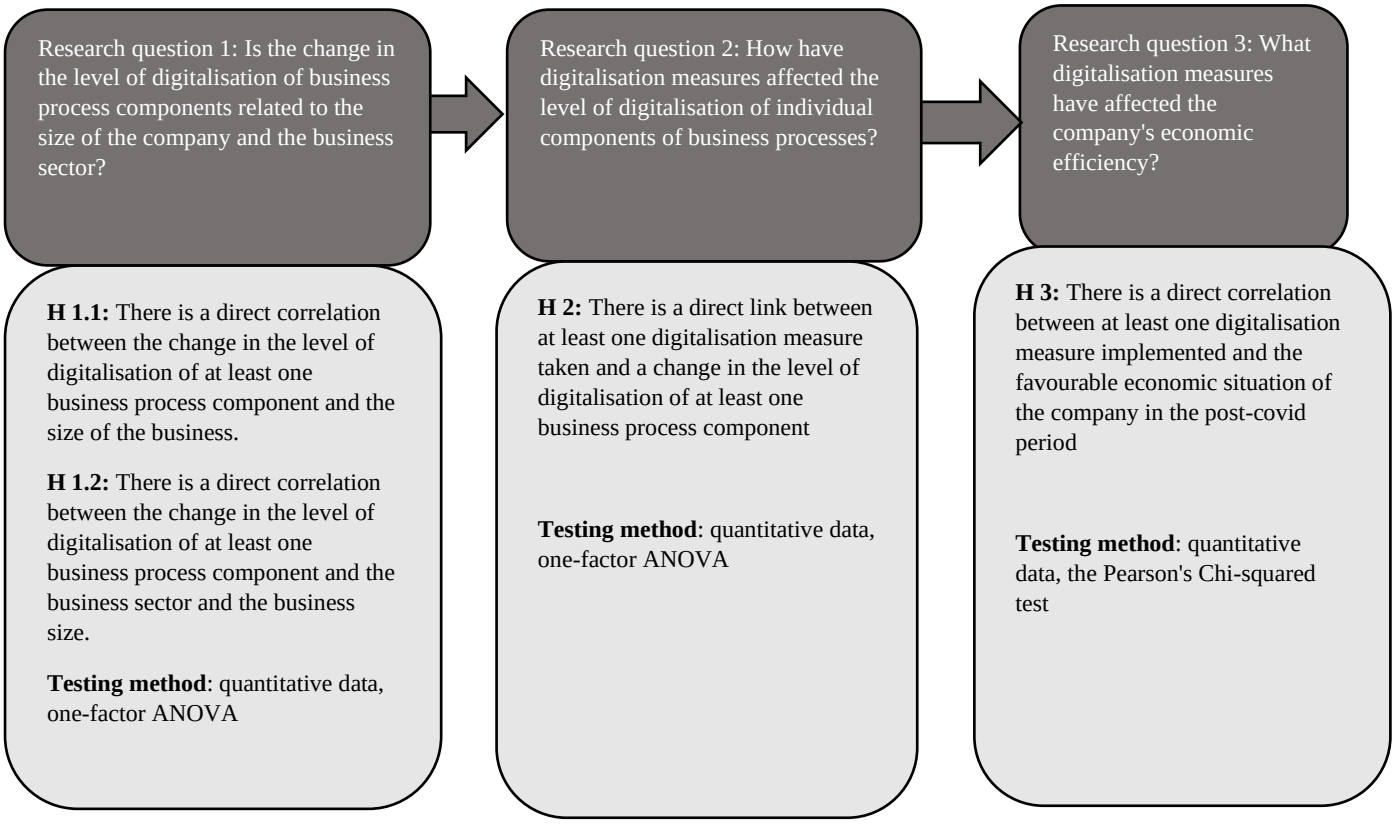

Figure 1. Brief structure of the empirical research
Source: own processing

The first research question reads: Is the change in the level of digitalisation of business process components related to the size of the company and the business sector? To answer research questions 1 and 2, hypotheses were constructed, which will be referred to as H1.1 and H1.2.

Hypothesis H1.1 is defined as: There is a direct relationship between the change in the level of digitalisation of at least one business process component and the size of the enterprise.
Hypothesis H1.2 is formulated as follows: There is a direct correlation between the change in the level of digitalisation of at least one business process component and the business sector and business size.

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2024 Volume 11 Number 4 (June)
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To answer this and other research questions in the questionnaire, the following questions were formulated:

1) Business size (answer options: micro-businesses, small businesses, medium-sized businesses, large businesses),
2) Business sector (answer options: service sector, industry sector, wholesale and retail sector),
3) Evaluate the level of digitalisation of the enterprise before the pandemic (February 2020). Business process components:
   - Websites (e-shop, web configurators, web chat etc.),
   - Digital marketing (traffic and conversion measurement, SEO/SEM, social media, Emailing and other),
   - Measurement of processes productivity and monitoring,
   - External communication,
   - Data use and personalisation (personalisation, product offering, pricing etc).
   - The level of digitalisation can be selected by respondents according to the scale of Basic, Intermediate, Advanced, and Excellent.
4) Evaluate the company's current level of digitalisation (October 2021). Business process components: website, digital marketing, processes and productivity, external communication, data use and personalisation. The level of digitalisation has response options: Basic, Medium, Advanced, and Excellent.
5) Have you taken any digitalisation measures that have helped you? If yes, in which area?
   - I have not taken any measures in the area of digitalisation,
   - Communication with customers,
   - Team communication (internal management processes and communication),
   - Communication between organisational units within the company,
   - Data and document sharing, use of internal data,
   - Production (new machines and technologies),
   - Product/service offering (creation of an online shop – introduction of online sales of education and training),
   - Other .....
6) How do you assess the company's situation at the moment (as of October 2021)?
   - We are considering closing the business,
   - We are trying to recover, but the situation is still uncertain; we have several problems,
   - We have almost recovered, and we are continuing the business,
   - We are fully recovered and continue as before the pandemic,
   - We are fully recovered and doing better than before the pandemic,
   - The pandemic has not hurt the business.

To test hypothesis H1.1, the answers to questionnaire tasks 1, 3, and 4 will be analysed. The change in the level of digitalisation of business process components will be defined as the difference in answers between questions 4 (during the pandemic) and 3 (before the pandemic). For the testing of hypothesis H1.2, the analysis of the answers to questions 2,3, and 4 will be carried out.

The second research question is formulated as follows: Which digitalisation measures have influenced the level of digitalisation? To answer the second research question, hypothesis H2 was formulated: There is a direct link between at least one digitalisation measure taken and the change in the level of digitalisation of at least one business process component. In this case, the answers to tasks 3,4,5 in the questionnaire will be analysed. The change in the level of digitalisation of business process components will be the same as in the case of testing hypothesis H1.1 and hypothesis H1.2.

The third research question was defined as: What digitalisation measures have affected the economic efficiency of the company? To answer research question 3, the following hypothesis H3 was set: there is a direct link between at least one digitalisation measure implemented and the favourable economic situation (based on the subjective opinion of the entrepreneur) of the company in the post-Covid period. To test hypothesis H3, the answers to questions 5 and 6 will be analysed in the questionnaire.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 11 Number 4 (June)
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Hypothesis H 1.1 and hypothesis H 1.2, which are aimed at establishing the link between the change in the level of digitalisation of business processes and the factors of size and sectoral focus, will be tested using the one-factor ANOVA in the tool Recommander (Recommander Team, 2023). The significance level will be set at 5 per cent. The one-factor ANOVA aims to demonstrate the dependence of the explained variable Y (quantitative variable) on the explanatory variables (factors) and to determine whether the differences found are statistically significant or random. The result of the analysis is the determination of the p-value. An association is not confirmed if the resulting significance value for a given group is more significant than 0.05 (p-value > 0.05), i.e. there is no significant difference. An association is considered to be established if the significance is less than or equal to 0.05 (p-value ≤ 0.05), i.e., a significant difference between the groups.

Hypothesis H2, oriented to investigate the relationship between the measures taken and the change in the level of digitalisation of business processes, will be tested using one-factor ANOVA in Recommander. The significance level will again be set at 5 per cent.

Hypothesis H3, which is aimed at proving the link between the measures taken in the digitalisation field and the company's economic situation in the post-covariance period, will be tested using Pearson's Chi-squared test in Recommander, observing the X-squared parameter. The significance level will be set at 5 per cent. Pearson's chi-squared test is a common test for determining significance that links two categorical variables. It can be used to test whether the two variables are independent or dependent (Xu et al., 2019). The result of the analysis is the determination of the p-value. A relationship between variables is considered to be established if the significance is less than or equal to 0.05 (p-value ≤ 0.05); that is, there is a significant difference between the groups.

4. Results and discussion

A total of 251 different enterprises participated in the survey. After selecting relevant respondents (leaving blank responses), 225 enterprises remained. The survey was conducted in October 2021 in Czech enterprises. The industrial sector in the sample represented 82 enterprises from the following sectors: wood processing, paper, electricity, heat, gas, water, waste, food processing, construction and crafts, textiles and clothing, footwear and leather, agriculture, livestock, forestry, fishing, and manufacturing. The services sector in the sample represented 123 enterprises in the following sectors: security services, personal protection; travel agency; transport, postal, and courier services; event and experience agencies; IT; hospitality; consultancy; intermediation; business and professional services; personal services; health; ambulance services. There were 20 enterprises in the sample that reported retail trade as their main activity. Table 1 presents the results of testing H1.1 and H1.2, using the one-factor ANOVA tool in Recommander software.

Table 1. Testing the association between the change in the level of digitalisation of business process components and the factors of enterprise size and business sector

Hypothesis H1.1	*Tested factor: Business size*				
	Df	**Sum Sq**	**Mean Sq**	**F value**	**Pr (>F)**
Web	3	0.40	0.1334	0.297	0.828
Residuals	221	99.44	0.4500		
Processes and productivity	3	1.15	0.3846	1.127	0.339
Residuals	221	75.44	0.3414		
External communication	3	3.25	1.0842	2.196	0.0895
Residuals	221	109.13	0.4938		
Digital marketing	3	0.82	0.27850	0.698	0.554
Residuals	221	87.02	0.3937		

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2024 Volume 11 Number 4 (June)
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Hypothesis H1.1	*Tested factor: Business size*				
	Df	**Sum Sq**	**Mean Sq**	**F value**	**Pr (>F)**
Data use and personalisation	3	1.29	0.4301	1.229	0.3
Residuals	221	77.35	0.35		
Hypothesis H1.2	*Tested factor: Business sector*				
Web	2	1.93	0.9667	2.192	0.114
Residuals	222	97.91	0.4410		
Measurement of processes productivity and monitoring	2	0.60	0.3025	0.884	0.415
Residuals	222	75.99	0.3423		
External communication	2	4.26	2.131	4.375	0.0137*
Residuals	222	108.12	0.487		
Digital marketing	2	0.83	0.4139	1.056	0.35
Residuals	222	87.01	0.3919		
Data use and personalisation	2	0.46	0.2320	0.659	0.518
Residuals	222	78.18	0.3521		

Source: own processing

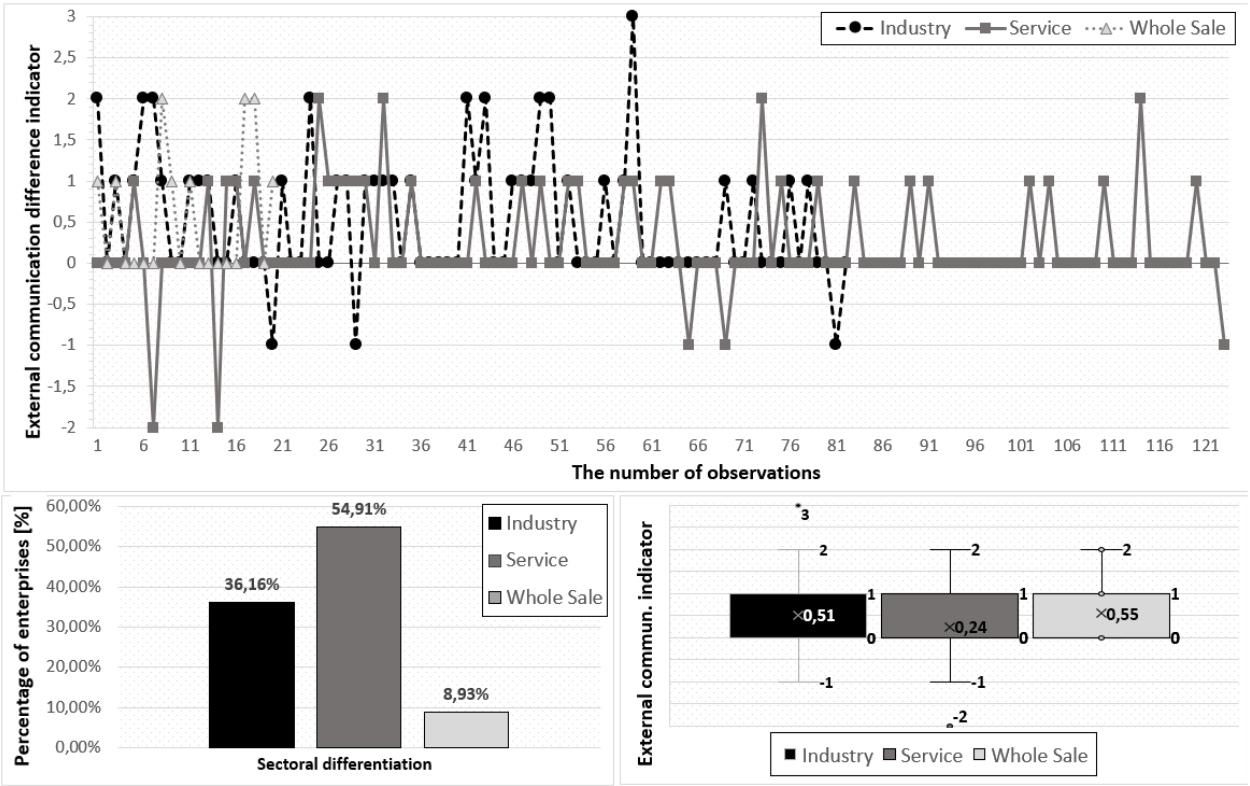

Figure 2. Data distribution in H1.2 testing
Source: own processing

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 11 Number 4 (June)
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Hypothesis H1.1 testing showed a slight indication of an association only between the change in the level of digitalisation of external communication and the company's size. However, the associations still needed to be confirmed. Hypothesis H1.1 is rejected; therefore, the change in the level of digitalisation of any of the business process components was unrelated to firm size. In testing hypothesis H1.2, only the association between the sector and the increase in the level of digitalisation of external communication was confirmed (the association is more pronounced for service providers). The association with the business sector was not confirmed for the other observed components of business process digitalisation. Hypothesis 1.2 is confirmed, and the link between external communication and business size is demonstrated. Table 2 presents the selected results of testing hypothesis H2 using a one-factor ANOVA.

Table 2. Selected results of testing H2: the link between digitalisation measures taken and the change in the level of digitalisation of business process components

	Df	**Sum Sq**	**Mean Sq**	**F value**	**Pr(>F)**
Measures: digitalisation of product and service offerings					
Changing the level of digital marketing	2	1.248	0.6241	3.42	0.0355
Residuals	137	25.002	0.1825		
Measures: digitalisation of communication with customers					
Changing the level of digital marketing	2	0.04	0.02176	0.089	0.915
Residuals	137	33.56	0.24494		
Measures: digitalisation of product and service offerings					
Changing the level of the website	2	1.31	0.6549	3.597	0.03
Residuals	137	24.94	0.1820		
Measure: communication between organisational units					
Changing the level of external communication	2	0.89	0.4450	2.358	0.0984
Residuals	137	25.85	0.1887		
Measure: digitalisation of product and service offerings					
Changing the level of external communication	2	1.05	0.5250	2.854	0.061
Residuals	137	25.20	0.1839		
Measures: education and training of staff					
Changing the level of external communication	2	0.921	0.4607	3.728	0.0265
Residuals	137	16.929	0.1236		

Source: own processing

The hypothesis H2 testing confirmed the link between the digitalisation of product offerings, services (measures), and the change in the level of digital marketing. There is no direct link between the measure (communication with customers) and the change in the level of digital marketing. The measure (digitalisation of product and service offers) impacted the change in the level of the website. There was no confirmed clear, direct correlation between the measure of inter-organisational communication and the change in the level of external communication. The results of testing also indicate that there is a slight indication of a correlation between the measured digitalisation of product and service offerings and the change in the level of external communication. Also, there is a confirmed correlation between the measure of education and staff training and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 11 Number 4 (June)
http://doi.org/10.9770/jesi.2024.11.4(16)

the change in the level of digitalisation of external communication. In summary, the hypothesis H2 is confirmed. The testing results indicate a correlation between the digitalisation measures taken and the change in the level of digitalisation of some components of business processes.
The results of hypothesis H3 testing are presented in Table 3 using the Pearson Chi-Square tool.

Table 3. Results of testing H3: the relationship between digitalisation measures taken and the financial situation of the company during the pandemic

Pearson's Chi-squared test results, Hypothesis H3			
Measures taken	**X-squared**	**df**	**p-value**
Communication between organisational units within the company	3.0524	4	0.5491
Communication with customers	6.7095	4	0.1521
Team communication (internal processes, management, and communication)	1.6204	4	0.8051
Offer of products and services (creation of an online shop, introduction of online sales)	3.3914	4	0.4946
Data and document sharing (use of internal data)	2.818	4	0.5887
Production (new machines and technologies)	5.46	4	0.2433
Education and training	2.0646	4	0.7239
We have not taken any action on digitalisation	17.671	4	0.001431
Relationship between the number of measures taken and the financial situation after COVID-19	*12.405*	*9*	*0.1914*

Source: own processing

Empirical data suggest that there is no clear direct correlation between the digitalisation measures taken and the financial situation of businesses during the pandemic. Hypothesis H3 is rejected; the individual measures taken did not have a direct impact on the financial situation of the enterprise during the pandemic Covid- 19.

The research questions were defined as follows:
Research question 1: Is the change in the level of digitalisation of business process components related to the size of the enterprise and the business sector?
Research question 2: How have digitalisation measures affected the level of digitalisation of business process components?
Research question 3: How have digitalisation measures affected the economic efficiency of the enterprise?

The correlation between the change in the level of digitalisation and the size of enterprises has not been demonstrated. The literature concludes that it is more difficult for small and medium-sized enterprises to achieve investments in digitising business processes (e.g., Ingaldi & Klimecka-Tatar, 2022). The benefits of digitalisation for all sizes of enterprises are evident from the results of several studies (e.g., Doyle & Cosgrove, 2019; Osmonbekov et al., 2022). Thus, it can be assumed that the change in the level of digitalisation due to COVID-19 in the short term has occurred at a similar rate for enterprises of all sizes. Further, it can be concluded that although larger enterprises are assumed to have higher investments in digitalisation, the rate of visible changes in the level of digitalisation of business processes is similar for enterprises of all sizes. Further, it can be summarised that the lack of correlation between the change in the level of digitisation and the size of the firm may be related to the different initial level of digitisation. Despite the undisputed benefits of digitisation for businesses of all sizes, the opportunities for larger firms are quite different from those for smaller companies.

The correlation between the change in the level of digitalisation of business process components and the business sector has only been partially demonstrated. According to the results, only the digitalisation of external communication was influenced by the business sector (the link is more evident for service providers than industrial enterprises). The result follows the findings of (Ingaldi & Klimecka-Tatar, 2022) regarding the benefits of digitalisation within the supply chain in the service sector. In contrast, the result only partially confirms the findings of (Abdallah et al., 2022) on the increase in the level of digitalisation in industrial firms due to COVID-19. Thus, it can be concluded that although there has been an increase in the use of digital technologies in both these sectors, the service sector shows a stronger trend. This finding is logical because external communication is vital for implementing its processes for service providers, especially during service restrictions.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 11 Number 4 (June)
http://doi.org/10.9770/jesi.2024.11.4(16)

The correlation between the digitalisation measures and the change in the level of digitalisation of individual components of business processes was partially demonstrated. The confirmed links include:

- the digitalisation of product and service offerings (measures) and the level of digitalisation of marketing,
- the digitalisation of product and service offerings (measures) and the level of websites,
- staff education and training (measures) and the level of external communication.

These results are indirectly related to the findings of (Okfalisa et al., 2021). (Okfalisa et al., 2021) cite staff education in different areas of business operations, level of business processes, and level of external communication as critical determinants of readiness.
The research findings also build on an article (Wilkinson et al., 2021) on the impact of digitalisation on HR management development.

The results are also in line with the findings of (Franco et al., 2021), which state that customer relations and the behaviour of co-workers are crucial in the digitalisation and management of small and medium-sized enterprises. Thus, the measures (digitalisation of product and service offerings, education and training of staff) directly impact the development of the components of business processes (marketing, web development, and external communication). Thus, developing a knowledge base of employees is an effective tool in implementing the elements of digitalisation and, consequently, a tool for achieving flexibility in times of crisis.

Conversely, interesting unconfirmed relationships include:

- communication with customers (measures) and the level of digitalisation of marketing,
- communication between organisational units (measures) and the level of external communication,
- the digitalisation of product and service offerings (measures) and the level of external communication.

Integrated marketing communication in the context of digital marketing and its impact on buyers' purchase decisions is the result of research (Bormane, 2019). Although the digitalisation of customer support may not primarily affect the growth of digital marketing, their common goal is being met. The linking of internal and external communication is the object of research (Rauwers et al., 2016). It cannot be ruled out that these variables will be interrelated in the long run. According to the current state of scientific knowledge, the digitisation of external communication leads to a change in the digitisation of internal documentation to unify the qualitative requirements for information flows. The digitalisation of product offerings and services is logically linked to the level of external communication. An unconfirmed relationship may imply an uncontrollable diversity of IT tools within the external communication partners.

The research results build on the findings of (Papagiannidis et al., 2023) regarding the change in consumer behaviour during a pandemic and the subsequent adoption of digitalisation tools to achieve competitiveness.

The link between the measures taken and the company's financial situation during the pandemic was not confirmed. The authors consider this conclusion one of the most important in their research. The conclusion needs to be consistent with several studies. For example, (Yu et al., 2021) confirm the impact of digitalisation on firm economic performance, and (Etienne Fabian et al., 2023) find a potential positive impact of small and medium-sized enterprises' digitalisation on performance improvement according to small and medium-sized enterprises' characteristics. The difference, in conclusion, may be due to the different time perspective of the observation. Another reason is the comparison of the impact of digitalisation implementation as a whole without breaking down the individual measures within the implementation of digitalisation. Thus, what needs to be demonstrated at a sub-level may be shown at a higher level. Small and medium-sized enterprises that focus on radical change and are more rigid are disadvantaged and achieve lower returns from digitalisation and implementing elements. It can be assumed that the crisis period distorts the real effectiveness of implementing

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digitalisation elements. On the other hand, digitisation has helped the flexibility of the business in times of crisis, and without the implementation, more companies would have considered ending their business.

Conclusions

The main objective of this paper was to find out how digitalisation measures affected business performance during the pandemic of Covid- 19 in companies in the Czech Republic. The novelty of the findings lies primarily in the complexity of the view of the impact of the pandemic on business behaviour from the perspective of digitalisation. The study determines the digitalisation measures used and the change in the level of digitalisation of business processes. It provides an overview of the short-term impact of the measures on business performance.

In the context of the study's results, some practice recommendations, i.e. the target segment, can be made.

The introduction of digitalisation into business processes must be accompanied by measuring individual effects and evaluating benefits. Measuring the effectiveness of introducing digitisation tools may reflect, among other things, the business sector, so measuring the performance of the implementation of digitisation elements cannot be approached as a universal value. In the service sector, it is recommended that the digitalisation of in-house processes be focused on as a recognised tool for achieving competitiveness. It is essential to view the digitalisation of internal processes as a complex process that has a cumulative effect on business performance. It is crucial to monitor the impact of the digitalisation of individual components over a long time horizon. The results of the study show that measures that can bring an immediate effect in the short term include digitalisation of product and service offerings (to achieve a higher level of digitalisation of marketing and to improve the website), last but not least, staff training (to increase the level of digitalisation of external communication). It can also be recommended in relation to measuring the effectiveness of staff training to focus on "output indicators" in the short-term and long-term.

The research results have some limitations. Due to the geographical distribution of respondents, the conclusions are valid only in the Czech environment. Further research may show that such findings could apply to the conditions of the Visegrad Group countries or economies similar to the Czech Republic. Based on the available data, it is not possible to generalise the conclusions for wholesale and retail due to insufficient sample size. The study does not consider the impact of long-term changes on the object of research. The findings are tied to specific periods before and during the pandemic and thus may not be valid for other periods. The performance measurement for this study is relatively narrow and does not consider the monitoring of dynamic indicators. The results can also be distorted by the subjectivity of the respondents' perception of some values in the questionnaire.

Future work in the field should focus primarily on examining the differences in the level of digitalisation over the long term across sectors and across firms of different sizes and lines of business. Furthermore, research can focus on monitoring the impact of the digitalisation of business process components on the quality of value chain functioning at the enterprise and inter-enterprise levels. Another interesting question for future research is whether adequate methods can be provided for evaluating the effectiveness of introducing digitalisation elements tailored to the actual conditions of a particular company. Concerning HR management, we can also note the current research direction on the effectiveness of staff training in the dimension of explicit and implicit knowledge in single-sector industries.

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Ing. Milan TALÍŘ is the Ph.D. student in Institute of Management, Faculty of Business and Management, Brno University of Technology. Research interests: Process management, Data analytics, Statistical modeling.
ORCID ID: https://orcid.org/0000-0002-6510-1297

Ekaterina CHYTILOVÁ, Ph.D. is the Assistant Professor in Institute of Technology and Business in Ceske Budejovice. Research interests: Value Chain, Supply Chain, efficiency measurement.
ORCID ID: https://orcid.org/0000-0002-8559-5669