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IMPACT OF HRM DIGITALISATION ON COMPANIES' PERFORMANCE*

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Abstract. The article's main aim is to specify the importance of HR digitalisation from two points of view: economic short-term impact and perceived meaning for the company. Two questionnaire surveys were carried out: in the Czech Republic in 2020-2021 to determine the short-term impact of selected elements of digitalisation on the change in economic performance during a pandemic; in Bulgaria in 2023-2024 to determine the perceived meaning of HRM digitalisation during a pandemic and post-pandemic recession. There was no association between the change in the level of digitalisation and the change in economic performance. Data and document sharing are associated with improved economic performance in the short term. Although HR training in IT is not related to improving the financial result in the short term, it is perceived by the podcasts as part of the long-term development plan of the companies and as an opportunity to improve the employees' work. The main recommendation for the target segment is to monitor the long-term impact to specify the expected effect on the company's overall efficiency. The results have limitations in the field of the specific research period, the geographical aspect of entrepreneurship, and the limited scope of examined links. The basic directions for future research include conducting international research on a broader scale and over extended periods, involving more aspects of HRM digitalisation among the elements studied.

Keywords: HR digitalization; training; support activities; effectiveness

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JEL Classifications: M10, M15, M53

1. Introduction

Changing economic, political, and societal conditions have significantly influenced the nature of the business environment (Nguyen, 2022; Peterková et al., 2022; Necula et al., 2023) and requirements for sustainable efficiency of the enterprise (Butt, 2022; Straková & Talíř, 2020). Digitalisation is one of the often-discussed tools to ensure adaptability to external changes and sustainable competitiveness (Vadana et al., 2020; Chen et al., 2022; Dabbous et al., 2023). Digitalisation is an essential mechanism for increasing the sustainable competitiveness of economies worldwide (Petkovski et al., 2022; Szanyi-Gyenes & Almási, 2023). Digital

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technologies have created new business opportunities for entrepreneurs and institutions (Zimmermannova et al., 2022; Galindo-Martín et al., 2023). Competitiveness factors depend on macroeconomic factors, business environment and consumer demand (Boikova et al., 2021).

One of the advantages of a value chain is the ability to assess which links in the Global Value Chain (GVC) contribute to value creation and what extent (Gereffi, 2019). The pandemic has significantly affected the performance of supply chains (Zighan, 2022). The traditional approach to measuring corporate performance focuses on monetary terms (Dyckhoff & Souren, 2020). Business performance is influenced by, among other things, business process innovation (Wei et al., 2020).

It can be concluded that the digitalisation of business models impacts the HR field (Minbaeva, 2021). Recent years have shown that the use of ICT in human resource management opens new horizons for both employees and their managers (Aliane et al., 2023; Angelova et al., 2023; Vevoda et al., 2023; Mugunzva & Manchidi, 2024).

The effectiveness of HR is based on complex factors such as organisational structure (Váchal & Talíř, 2020), knowledge management (Koh et al., 2022; Mohapatra et al., 2023) and others. The analysis of digital transformation in human resource management is one of the key issues in the corporate environment (Zhao et al., 2024). Digital technologies are changing the way business functions operate, which is also true for the HRM function (Chapano et al., 2022).

The scientific aim can be summarised as follows: specify the importance of HR digitalisation from two points of view: economic short-term impact and perceived meaning for the company. Based on the aim of this study, the following research questions were formulated:

RQ1: How has enterprise digitalisation affected the economic results during the recession?

RQ2: How do enterprises perceive the role of digitalisation in corporate training?

2. Review of literature

The number of studies focusing on digitalisation from an HR management perspective is relatively high. Below are some of the key aspects considered. Galanti et al. (2023) researched the impact of digitalisation on the work environment. The interview method was used for data collection, and data processing was done using mixed methods (Galanti et al., 2023). Angelova et al. (2023) focused on understanding young people's views on using ICT and AI in companies. Data collection was conducted through a questionnaire survey among students. Similarly, Zhou et al. (2021) collected data through a questionnaire survey. Data was processed using hierarchical regression analysis.

Zhao et al. (2024) explored the mechanism of digital transformation in organisations' human resource management (HRM). The research was based on multiple case studies. Chapano et al. (2022) investigated the rate of adoption of digital strategy in HRM. Data collection was done through a questionnaire survey in companies, and data processing was done through exploratory factor analysis (EFA), descriptive, paired-sample tests, Pearson correlations and regression analysis.

Fellman et al. (2020) studied working memory (WM) training to determine whether WM generates task-specific strategies that facilitate performance on the trained task and its untrained variants. Data collection and processing were a large-scale, pre-registered, randomised controlled trial using a 4-week adaptive WM training with a single-digit back task (Fellman et al., 2020).

Kortmann et al. (2023) investigated the link between participation in training and the extent of digitalisation in employees' occupations in the second half of their working lives. Data from the German Ageing Survey was used for the research. Data processing was carried out using logistic regressions. The research findings indicate, among other things, positive associations between changes in the level of occupational digitalisation and (the desire for) participation in training (Kortmann et al., 2023).

The question of the potential of online training, the reasons for it and the reactions of trainees are addressed in a study (Batita et al., 2023). Data collection was conducted using online training in user interface and user experience (UIX) and social media marketing, which more than 400 Indonesian participants attended. The study revealed that the learners responded positively to the training procedures and learning approaches. The authors concluded that skill-based online training can improve industry-required skills (Batita et al., 2023).

The organisation's knowledge acquisition and sharing issue is addressed by Mehner et al. (2024). Data was collected through a questionnaire survey among the employees and qualitative interviews with the trainees. Data processing was done through Cronbach's alpha method. The study's results suggest that training transfer and knowledge sharing significantly affect individual organisational outcomes. The qualitative research results reported that participants gain new contacts within their organisation. That knowledge transfer allows for the change in the number of contacts in the network (Mehner et al., 2024).

The above studies look at HR digitalisation in terms of the perceived benefits of digitalisation by HR employees, the performance of trainee programmes, etc. However, there is a gap in a comprehensive assessment of the perceived importance and real impact of HR digitalisation with international overlap.

3. Research objective and methodology

The article discusses the importance and impact of digitalisation from an HR management perspective. To achieve the objective, two surveys were conducted as a questionnaire survey. The first research was carried out in the years 2020-2021 in the Czech Republic and focused on the perceived level of digitalisation of the company, its longer aspects (internal communication management, communication between organisational units within the company, data and document sharing, use of internal data, education and training) and the impact on the change in economic performance in the recession period.

The second research focused on the role of digitalisation in HR training and was conducted in Bulgaria in 2023-2024. The role of digitalisation will be investigated from two perspectives: training in the IT fields (IT, digital marketing) and the perceived meaning of training as a tool for the realisation of the strategy and/or a tool for the development of the knowledge potential of the company. Another perspective is the change in the share of online training and its relation to the perceived shift in efficiency. The following table presents the hypotheses tested to answer the research questions.

Table 1. A framework of research questions and hypotheses

Impact of digitalisation on economic results, Czech Republic survey, "digitalisation and economic results"	Digitalisation training impact, Bulgarian survey, "digitalisation and training"
<i>RQ1: How has enterprise digitalisation affected the economic results during the recession?</i>	<i>RQ2: How do enterprises perceive the importance of digitalisation in corporate training?</i>
H1.1. There exists a correlation between the change of perception, the level of digitalisation, and economic results	H2.1. There exists a correlation between digitalisation training (IT and digital marketing) and the perception of training as part of the company's improvement strategy
H1.2. There exists a correlation between the direction of digitalisation (H1.2.1-internal communication management, H1.2.2-communication between organisational units within the company, H1.2.3-data and document sharing, use of internal data, H1.2.4-education and training) and the change in the economic result.	H2.2. There exists a correlation between digitalisation training (IT and digital marketing) and the perception of training as part of the strategy to increase knowledge in the company
H1.2.5. There exists a correlation between at least one of the previous measures and a change in economic result	H2.3. There exists a correlation between the share of online training and the perceived effectiveness of training

Source: own processing

The minimum number of responses in every questionnaire survey is set at 200. The questions in the questionnaire in the first survey, "digitalisation and economic results", are defined as follows. Relevant questions of the survey focused on the economic impact of HR digitalisation include descriptive questions: business size, business sector:

- Change in sales: How do you rate the change in sales between 2020 and 2021? Response options: sales growth, no change (stagnation), slight to moderate decrease in sales (0.01-30 per cent), significant to a very substantial reduction in sales (more than 30 per cent).
- How do you rate the state of digitalisation of HR processes in 2020 and 2021? Answer options are basic, medium, advanced, and excellent.
- HR digitalisation measures: Have you implemented any of the following measures in HR? (Internal communication management, Communication between organisational units within the company, Data and document sharing, use of internal data, Education and training). Response options: yes, no.

The questions in the questionnaire in the second survey "digitalisation and training", are defined as follows:

1. Descriptive questions: business size, business sector,
2. Topics of training in the enterprise during the last two years (Company-specific training, Quality management, Customer Service, Teamwork training, Marketing and sales, Communication training, Motivational training, Project management, Information Technology, Language training, Strategic and business planning, Management, Financial management, Accounting, Business Economics, Human resource management, Digital marketing, Other (please specify)),
3. Continuing training and education from the company's point of view is:
 - Part of the company's overall improvement strategy,
 - Part of the strategy to increase knowledge in the company,
 - Beneficial to all staff,
 - Based on an analysis of employee training needs,
 - Part of the company's long-term development plan,
 - Regulatory requirement,
 - Loss of money.

Each statement could be rated on a scale from 1 (strongly disagree) to 5 (strongly agree).

4. Costs for training during COVID-19: grew, didn't change, decreased, didn't apply.
5. Training effectiveness during COVID-19: grew, didn't change, decreased, didn't apply.
6. Share of online training during COVID-19: grew, didn't change, decreased, didn't apply.

A one-factor ANOVA model will be used within the Recommender software tool to test each hypothesis. The significance level will be set at 5 per cent.

3 Research outcomes

3.1. Description of respondents

251 Czech enterprises participated in the questionnaire survey under dimension 2 (Economic impact of HR digitalisation) in 2020-2021. After cleaning, the sample consisted of 233 enterprises. A total of 280 Bulgarian enterprises participated in the questionnaire survey that was conducted in the year 2024. Table 2 presents the distribution of respondents from the Czech Republic and Bulgaria by business sector.

Table 2. The sector of entrepreneurship

	Core sample, Bulgaria	Core sample, Czech Republic
<i>Number of respondents</i>	280	251
A_Agriculture, forestry and fisheries	2,50%	2,39%
B Extractive industries	2,14%	0,00%
C Manufacturing	30,36%	15,54%
E_Water supply; sewerage services, waste management and remediation	1,79%	3,98%
F_Construction	6,79%	10,36%

G_Trade; car and motorcycle repair	33,93%	8,37%
H_Transport, Warehousing and Posts	3,57%	5,98%
I_Hotel and restaurant industry	5,71%	15,54%
J_Creation and dissemination of information and creative products; telecommunications	2,14%	3,19%
L_Other services (Real estate operations, Professional activities and research, Education, Culture, sports and entertainment)	5,00%	24,70%
M_Human health care and social work	0,71%	3,19%
N_Other activities	3,21%	6,77%
Total	100,00%	100,00%

Source: own processing

Table 3 presents the composition of respondents by size (number of employees).

Table 3. Composition of respondents by size of enterprise

	Core sample, Bulgaria	Core sample, Czech Republic
<i>Number of respondents</i>	280	251
Micro companies (0-9 employees)	30,71%	43,43%
Small businesses (10-49 employees)	30,36%	19,92%
Medium and large companies (50+ employees)	38,93%	36,65%
Total	100,0%	100,00%

Source: own processing

Given the similarity in the composition of the respondents (both in terms of size of business and type of business activity), research results can build on each other.

3.2. Description of survey results

3.2.1. Digitalisation and economic results

Aspects of digitalisation and the development of the economic situation of enterprises in the Czech Republic are presented in Figures 1-3.

Figure 1 shows the responses to the question about the change in the economic situation of the enterprise during the pandemic.

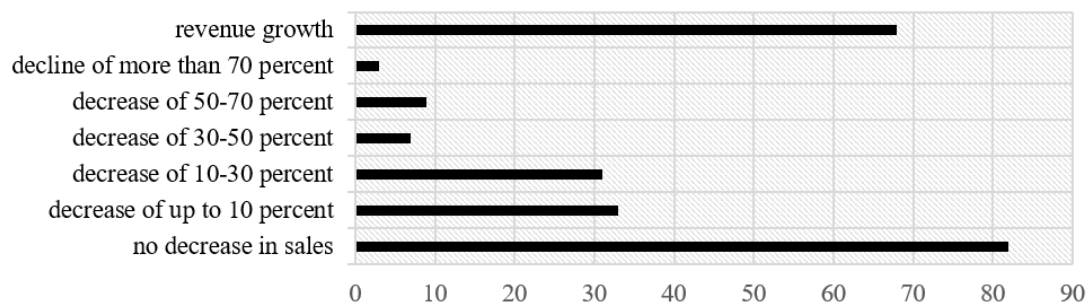


Figure 1. The change of economic results during the COVID-19 pandemic, Czech Republic

Source: own processing

It can be noted that almost a third of the respondents did not experience a change in profitability during the COVID-19 pandemic. A quarter of the respondents even admitted that profits increased during the pandemic. Figure 2 shows the response distribution in the task of digitalisation directions during COVID-19.

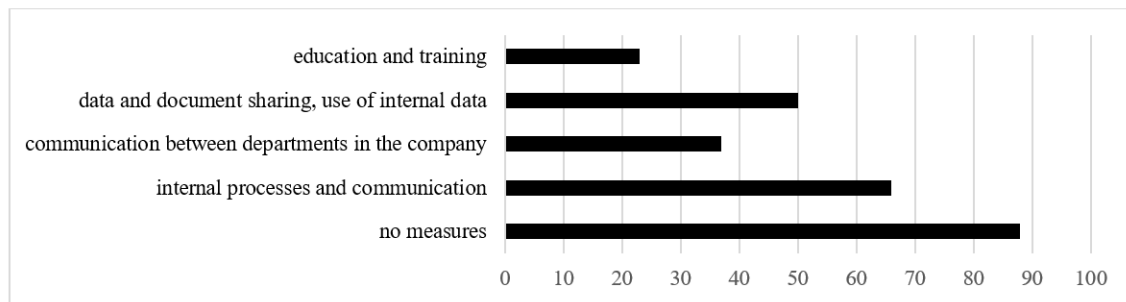


Figure 2. Digitalisation directions during COVID-19 pandemic, Czech Republic

Source: own processing

Respondents mentioned internal processes and communication as the most common direction of digitalisation. The second most common answer was data and document sharing using internal data. Nearly 90 respondents indicated that digitisation did not strengthen during the pandemic. According to the initial results of the evaluation of the questionnaire survey, digitalisation was a pressing issue for businesses during the pandemic. Figure 3 shows responses to questions about the perceived level of the company's digitalisation in the years 2020 and 2021.

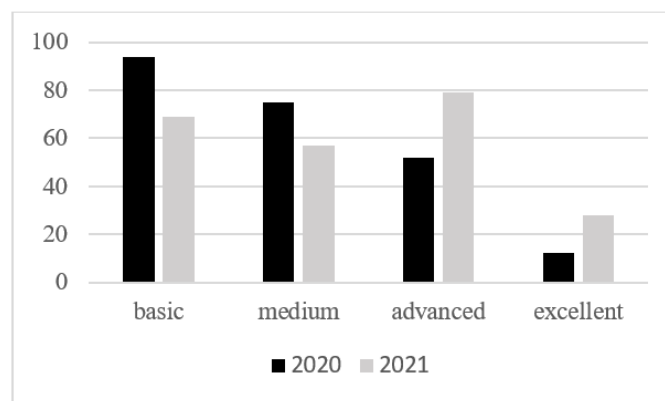


Figure 3. The perceived level of the company's digitalisation, Czech Republic

Source: own processing

From Figure 3, it can be concluded that during the pandemic, businesses developed measures that led to an increase in the perceived level of digitalisation. If, at the beginning of 2020 (before the pandemic), most respondents perceived the level of digitalisation in the enterprise as basic, by the end of 2021 (during the pandemic), most respondents rated their level of digitalisation as advanced.

3.2.2. Digitalisation and training

Figures 4-6 show the results of the survey in Bulgaria. Figure 4 presents responses to questions about training topics in the last two years.



Figure 4. Topics of training in the enterprise during the last two years, Bulgaria

Source: own processing

The majority of the training focused on areas specific to the company. The next most common training topic was customer service. IT training was delivered in less than 10 per cent of enterprises. Less than 5 per cent of respondents focused on digital marketing as part of their training. Figure 5 shows responses about the perceived meaning of training for the enterprise.

Most respondents strongly agree that training is a part of the company's overall improvement strategy. However, a significant number of respondents (more than 20 per cent) indicated that they do not see training as part of their corporate strategy. Almost 60 per cent of respondents agreed that training is part of the strategy to increase the company's knowledge. More than 50 per cent of respondents perceived training as part of a long-term plan for enterprise development.

Only 15 per cent of respondents do not think training benefits all employees. Conversely, I strongly agree with the benefits of training for all employees, more than 30 per cent of respondents. Training is not perceived as a regulatory requirement by more than 20 per cent of respondents. The company's training is based on employee needs, according to 50 per cent of respondents.

Even more surprising is the distribution of responses on whether training is a loss of money. Less than 40 per cent strongly disagree, but almost 20 per cent think that, indeed, in the case of training, it is a loss of money.

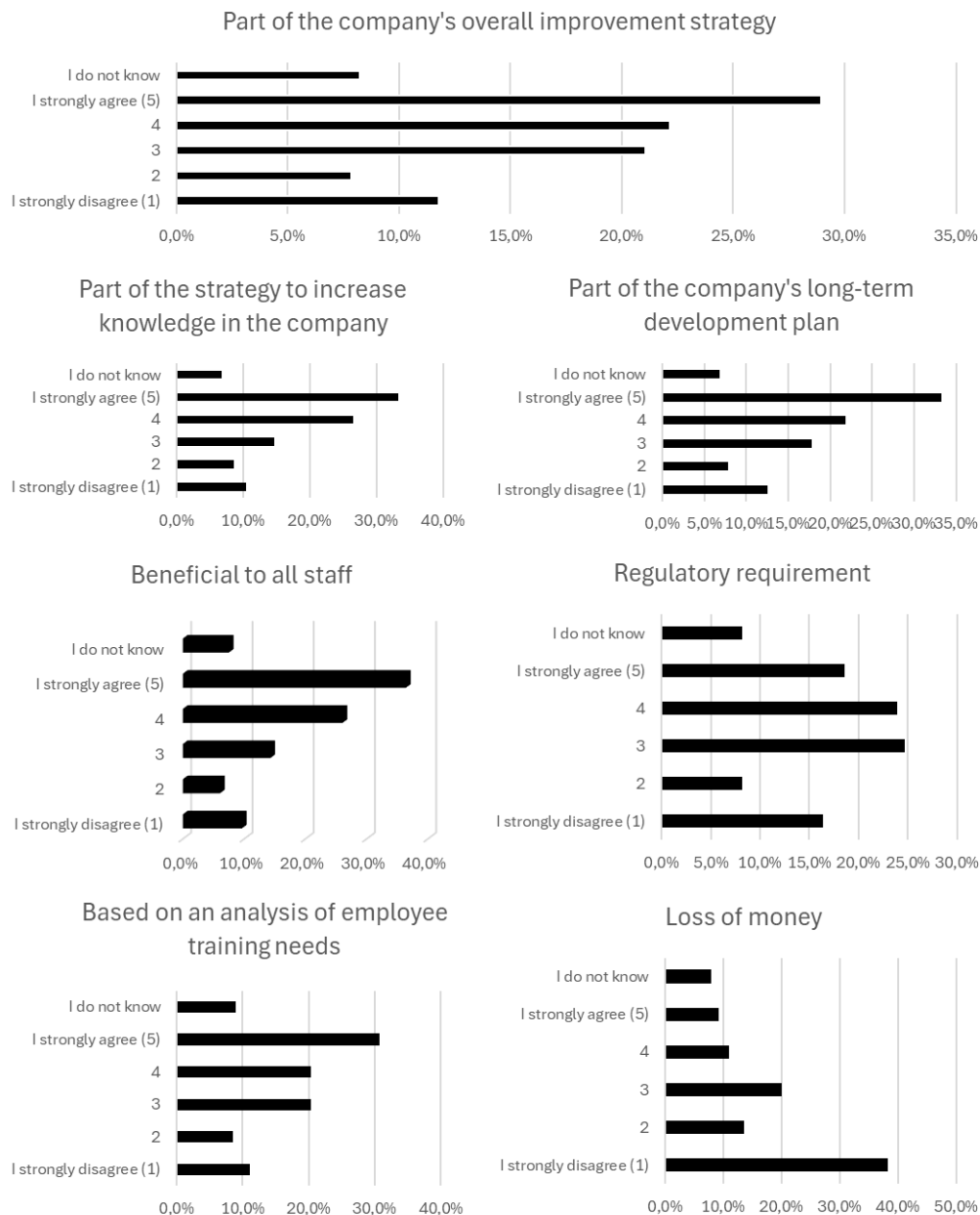


Figure 5. Continuing training and education are, from the company's point of view, Bulgaria

Source: own processing

Figure 6 presents responses to questions about the impact of the COVID-19 pandemic on costs, the effectiveness of enterprise training, and the sharing of online training from all training conducted during the COVID-19 pandemic. Over 35 per cent of respondents reported that the cost of training remained unchanged during the pandemic. Nearly 20 per cent of respondents reported a rise in costs. When asked about changes in training effectiveness during a pandemic, more than 40 per cent of respondents perceived no difference. The proportion of online training increased for nearly 10 per cent of respondents, with no change for more than 35 per cent.

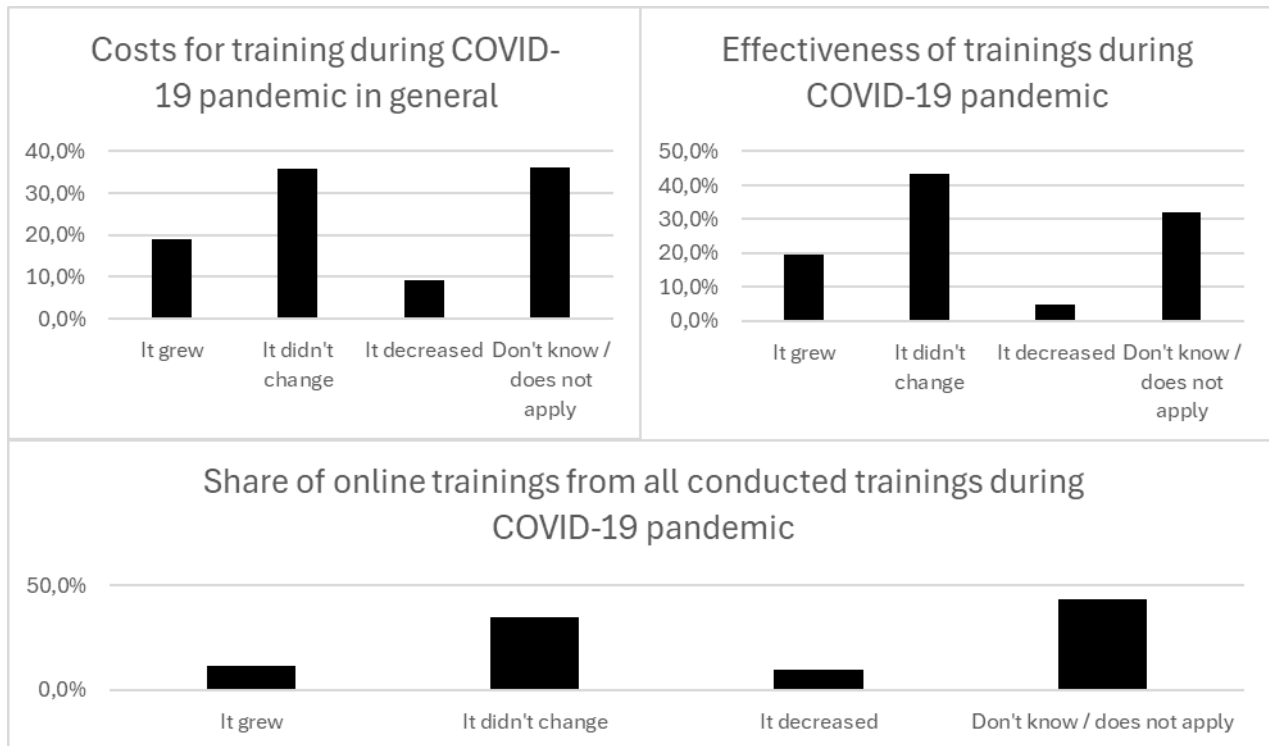


Figure 6. Impact of the COVID-19 pandemic on costs and effectiveness of enterprise training in Bulgaria

Source: own processing

3.3. Hypothesis testing results

3.3.1. Digitalisation and economic result

The first part of the survey (from the Czech Republic) is focused on the economic impact of HR digitalisation aspects. In Table 4, hypothesis H1.1 is shown. Testing shows the correlation between the change of perception, digitalisation level, and economic result.

Table 4. H1.1. testing results

Test H1.1, one-criterion ANOVA test					
	Correlation between the change in perception of the level of digitalisation and economic results				
	Df	Sum Sq	Mean Sq	F value	Pr (>F)
H1. Digitalisation HR improvement					
<i>Changing of economic results</i>	7	9.57	1.3665	1.57	0.145
<i>Residuals</i>	227	197.61	0.8705		

Source: own processing

Based on the results of the testing, it can be concluded that hypothesis H1.1 was not confirmed; there is no direct correlation between the development of HR digitalisation and the development of sales. Table 5 presents the results of testing H.2.

Table 5. H1.2 testing results

Test H1.2, one-criterion ANOVA test					
	Change of economic result				
	Df	Sum Sq	Mean Sq	F value	Pr (>F)
H 1.2.1 Internal communication management					
<i>Changing of economic results</i>	1	1.48	1.4807	1.697	0.194
<i>Residuals</i>	231	201.56	0.8725		
H 1.2.2. Communication between organisational units within the company					
<i>Changing of economic results</i>	1	1.4	1.3999	1.604	0.207
<i>Residuals</i>	231	201.6	0.8729		
H 1.2.3. Data and document sharing, use of internal data					
<i>Changing of economic results</i>	1	3.49	3.488	4.038	0.0457*
<i>Residuals</i>	231	199.55	0.864		
H 1.2.4. Education and training					
<i>Changing of economic results</i>	1	0.01	0.0061	0.007	0.934
<i>Residuals</i>	231	203.03	0.8789		
H 1.2.5. Total (at least one from previous measures)					
<i>Changing of economic results</i>	1	2.08	2.078	2.388	0.124
<i>Residuals</i>	231	200.96	0.870		

Source: own processing

Based on the results of the testing, it can be concluded that only hypothesis H1.2.3. was confirmed. Data and document sharing and the use of internal data correlate with the changes in the economic results. The digitalisation of training has not primarily led to an improved financial situation. Thus, internal data is associated with improving economic results from the above-mentioned areas of digitalisation, data, and document sharing. In a temporal context, document disclosure is a tool for achieving flexibility and resilience during the recession.

3.3.2. Digitalisation and training

The second part of the survey (from Bulgaria) is focused on digitalisation training.

Table 6 shows the results of testing H2.1.: *there exists a correlation between IT training and the perception of training as part of the company's improvement strategy*

Table 6. H2.1. testing results

Test H2.1., one-criterion ANOVA test					
	Correlation between digitalisation training (IT and digital marketing) and perception of training as part of the company's improvement strategy				
	Df	Sum Sq	Mean Sq	F value	Pr (>F)
Training as a part of the company's improvement strategy					
Training in IT and digital marketing	5	0.719	0.14372	2.544	0.0285*
<i>Residuals</i>	274	15.478	0.05649		

Source: own processing

H2.1. is confirmed. There exists a slight correlation between the realisation of IT training and the perception of training as a part of an improvement strategy. Thus, it can be summarised that currently, companies that see the potential of training to fulfil the strategy are implementing IT training for their employees. Table 7 shows the results of testing H2.2: the correlation between IT training and perception of training as a part of the strategy to increase knowledge in the company.

Table 7. H2.2. testing results

Test H2.2, one-criterion ANOVA test					
	Correlation between digitalisation training (IT and digital marketing) and perception of training as part of the strategy to increase knowledge in the company				
	Df	Sum Sq	Mean Sq	F value	Pr (>F)
Training as a part of the strategy to increase knowledge in the company					
Training in IT and digital marketing	5	0.547	0.10935	1.915	0.092
Residuals	274	15.650	0.05712		

Source: own processing

H2.2. is not confirmed. There is no correlation between digitalisation training (IT and digital marketing) and the perception of training as part of the strategy to increase knowledge in the company. IT training is not considered a tool for expanding knowledge in the company.

For testing H2.3, respondents who answered "Don't know/does not apply" were excluded from the following questions: share of online training and perceived training effectiveness. Table 8 shows the testing results of H2.3: There is a correlation between the share of online training and the perceived training effectiveness.

Table 8. H2.3. testing results

Test H2.3, one-criterion ANOVA test					
	Correlation between the share of online training and the effectiveness of training				
	Df	Sum Sq	Mean Sq	F value	Pr (>F)
Effectiveness of training					
Online training during COVID-19	2	9.29	4.646	14.18	0.00000223***
Residuals	154	50.48	0.328		

Source: own processing

It can be stated that H2.3. is confirmed. There exists a correlation between the share of online training and the perceived effectiveness of training. Test results indicate that the use of online training is directly related to the perceived effectiveness of training. Thus, digitalisation in the form of online training increases the effectiveness of training in the eyes of entrepreneurs. Table 9 shows the results of testing H2.4: There exists a correlation between the share of online training and the effectiveness of training.

4. Discussion

The study poses two research questions.

RQ1: How has enterprise digitalisation affected the economic outcome during the recession?

The answer to RQ1 can be summarised as follows t

- There was a slight correlation between the improvement in the level of digitalisation in the enterprise and the change in the economic result. In the short term, during a recession, the digitisation of business processes does not bring an immediate effect in the form of an improvement in the economic result.
- Looking in detail at the individual measures in the area of digitalisation of business processes, it can be concluded that only Data and document sharing and use of internal data correlate with changes in the economic results. In times of recession and in the short term, internal data sharing can support the positive development of the economy. Yet, the digitalisation of the training process has no direct correlation with positive economic growth.

The findings of other studies are similar to our results. Silverio-Fernández et al. (2021) describe, among others, the positive impact of digitalisation on the efficiency of enterprises in the construction industry. Szalavetz (2022) states that one of the main objectives of digitalising business processes is to achieve competitiveness through technological diversification. (Donaldson, 2022) states that digitalisation in agriculture contributes to increasing the competitiveness of enterprises. According to Chapano et al. (2022), HRM digitalisation supports achieving business goals.

RQ2: How do enterprises perceive the role of digitalisation in corporate training?

The answer to this RQ2 can be summarised in the following points:

- Implementing training focused on digitalisation (IT and digital marketing) is linked to the perception of training as a tool to fill the corporate strategy. Thus, enterprises that perceive training as a tool for strategy fulfilment tend to implement training in IT and digital marketing. On the other hand, digitalisation training (IT and digital marketing) is not associated with the perception of training as a tool to increase the knowledge potential of the enterprise. Thus, in the eyes of entrepreneurs, IT training is a necessary tool for properly functioning business processes, not for achieving the greater knowledge potential of the enterprise.
- The strengthening of online training is linked to the evolution of perceived efficiency and the rising training costs in the pandemic era. Thus, on the one hand, the digitisation of training does not have a short-term positive effect on the bottom line; it is associated with perceived cost growth, but on the other hand, the digitisation of training is a symptom of the streamlining of training in the eyes of entrepreneurs.

Chapano et al. (2022) conclude that the contribution of digital strategies to achieving corporate goals is high. The results of their research follow the claim that digital technology in HRM is used as a performance management tool (Zhao et al., 2024). Zhou et al. (2021) state that firm performance depends on HRM digitalisation, system maturity and HR strategic engagement. HRM digitalisation and system maturity can interact in predicting firm performance, and the effect of their interaction will be influenced by the level of HR strategic and business engagement (Zhou et al., 2021).

5. Conclusions

The scientific aim can be summarised as follows: to specify the importance of HR digitalisation from two points of view - economic short-term impact and perceived meaning for the enterprise.

This objective was fulfilled with the help of primary quantitative research in the Czech Republic and Bulgaria. The following contexts were confirmed:

- 1) there is a positive relationship between data and document sharing, internal data use and changing economic results;
- 2) there is a positive relationship between the realisation of IT training and training in digital marketing and perception of training as a part of improvement strategy;
- 3) there is a positive relationship between the share of online training and the perceived effectiveness of training.

Recommendation for the target segment to monitor the real impact in the long term. The introduction of digitalisation makes information flows more flexible, which was confirmed during the pandemic. Despite the

increased cost of implementing HRM training, performance and efficiency can be expected to increase. The following recommendation is to adapt the elements of digitalisation implementation to the needs of the enterprise. IT training is a necessary step for digitalising core and support processes in an enterprise. The research results have *some limitations*. First of all, it is a specific research period. Thus, the findings may not be valid outside of pandemic and recessionary periods. Another limitation is geographical. Despite the similarity in the composition of respondents in both surveys, it does not mean that the findings will be valid for other territories. The last limitation is object-based. The study discusses only selected aspects of HR digitalisation. Thus, it cannot be excluded that different aspects of HRM digitalisation will have the same or similar correlation with perceived cost, efficiency, and changes in economic performance.

The results of the study suggest some directions for *future research*. To achieve research validity internationally, conducting research with the same focus in more countries would be advisable. Future research could focus on the qualitative parameters of digitalisation in enterprises. Another research direction is developing a model to assess the effectiveness of using the digitalisation element from an HRM perspective and the impact of HRM digitalisation on value chain performance.

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