

# THE ROLE OF DIGITALIZATION IN THE CONTEXT OF HUMAN RESOURCE DEVELOPMENT AND PERFORMANCE IN SMALL AND MEDIUM-SIZED ENTERPRISES

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## Abstract

In the context of relentless technological advancement, digitalization is profoundly reshaping the operational landscape of small and medium-sized enterprises (SMEs). Although digitalization is often associated with increased productivity, its impact on human resource development (HRD) and overall organizational performance has yet to be fully established through rigorous empirical investigation. The aim of this study was to analyse the relationship between digitalization and human resource development (HRD), as well as the relationship between digitalization and the performance of small and medium-sized enterprises (SMEs). The data were analysed using the Kendall's Tau-b and were gathered from SMEs operating across a range of industrial sectors. The results of the Kendall's Tau-b revealed a statistically significant, medium strong positive correlation between digitalization and organizational performance and medium strong positive correlation between digitalization and HRD in SMEs. The findings of this study emphasise the importance of digitalization for human resource development and its subsequent impact on the performance of small and medium-sized enterprises. It is therefore recommended that further exploration and the application of digital technologies that could help optimise human resources and increase the overall competitiveness of SMEs be conducted.

**Key words:** digitalization, human resource development, performance, SMEs, Kendall's Tau - b

**JEL Code:** L25, O15, O33

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## Introduction

The process of digitalization has become a crucial factor in the transformation of businesses across all sectors, including small and medium-sized enterprises (SMEs). As technological advancements continue to evolve, SMEs are faced with the need to adapt their operational processes, particularly in the realm of human resource development. The integration of digital

tools and technologies in HR practices is not only reshaping the way employees are recruited, trained, and managed, but also plays a significant role in enhancing overall business performance. According to Denicolai et al. (2021), readiness for artificial intelligence positively impacts the international performance of small and medium-sized enterprises (SMEs). While digitalization and sustainability are interrelated and mutually supportive, they become competing growth strategies when it comes to international expansion. Ma However, it does not mediate the influence of digital strategy or employee skills on performance. Chen et al. (2024) argue that the alignment of digital technologies with business activities and external social capital serves to enhance the positive impact of digitalization on the performance of small and medium-sized enterprises (SMEs), while simultaneously mitigating any negative effects. Broccardo et al. (2024) extend this perspective, demonstrating that digitalization offers significant benefits, including improved enterprise performance and more efficient internal and external communication. Additionally, the study indicates that the primary drivers of digitalization are top management, human resources, and financial resources. Moreover, the study revealed that medium-sized enterprises are more actively engaged in digital transformation. Despite these advantages, SMEs often face challenges in implementing digital strategies, especially in human resource management (HRM). Kmecová et al. (2021) indicates that while there is a robust linear correlation between the advancement of digitalization and its perceived importance for enterprises, the prevailing demands for the digitalization of human resource management activities in small and medium-sized enterprises (SMEs) exceed their capacity to implement them in practice. The primary reason is that small businesses do not generate sufficient financial returns to invest in the comprehensive restructuring of their business systems and structures, hindering the digitalization of most of their departments. Ma (2023) supports this view, noting the profound impact of digitalization on HRM practices, including data management, job role redefinition, and workplace restructuring. Ma further encourages organizations to invest in advanced HR software and prioritize employee development to optimize their HR activities. Kareem (2019) emphasizes the importance of HR practices such as talent development, training, and career development, which have a significant and positive influence on organizational effectiveness. These practices are integral to fostering organizational efficiency, which is increasingly dependent on the digital transformation of HRM. Additionally, Wongsansukcharoen (2023) reveals a significant correlation between the implementation of innovative human resource management practices, the development of innovative capabilities, the competitive advantage and performance of small and medium-sized enterprises (SMEs). The success of innovations in human resource practices is contingent upon

a number of key factors, which indirectly influence the performance of SMEs through the development of innovative capabilities and the attainment of competitive advantage. Finally, Kallmuenzer et al. (2024) confirm that utilizing a range of digital tools and applications can markedly improve enterprise performance by streamlining internal processes, strengthening relationships with external stakeholders, and reinforcing connections with existing clients. As SMEs continue to explore digitalization, it is clear that its impact is broad-reaching, particularly in the realm of human resource development and organizational performance. The aim of this study was to analyse the relationship between digitalization and human resource development (HRD), as well as the relationship between digitalization and the performance of small and medium-sized enterprises (SMEs). The following is a description of the structure of the paper: In the first section - introduction is presented existing literature on the current issue. The second section outlines the methodological approach. The third section presents the results and discussions, and finally are presented conclusions in which are also described implications for future research and limitations of the paper.

## **1 Methodological Approach**

The aim of this study was to analyse the relationship between digitalization and human resource development (HRD), as well as the relationship between digitalization and the performance of small and medium-sized enterprises (SMEs). Although the authors examined the influence of digitization on the performance and human resource practices of SMEs, a more thorough investigation of the interrelationships between these variables is still required. Therefore, the research gap pertains to the dearth of knowledge concerning the interrelationships between digitization, human resource development and the performance of small and medium-sized enterprises (SMEs). In light of the identified research gap, the following research questions were formulated:

- RQ1: What is the relationship between digitization and performance in SMEs?
- RQ2: What is the relationship between digitization and human resource development in SMEs?

The data were gathered from small and medium-sized enterprises (SMEs) operating across a range of industrial sectors, while number of respondents in the study is 128. The respondents were invited to indicate their level of agreement with the statement on a 5-point Likert scale (1=totally disagree, 5=totally agree). Categories 1 and 2 were merged into one group, while categories 4 and 5 were merged into another group. In this way, new answers with

values 1(disagree), 3(don't know) and 5(agree) were created, which enabled more efficient processing and interpretation of the data. The variables in our study were: 1) digitalization (ordinal variable), 2) performance (ordinal variable), 3) HRD (ordinal variable). To simplify and more accurately determine the strength of the relationship between the analysed variables, individual responses from the respondents were averaged within the respective categories, resulting in an aggregated outcome for each respondent. The data were analysed using Kendall's Tau – b in SPSS Statistics. Given that we were working with ordinal variables and had a small number of categories, we used the crosstabs method and, according to Vaus (1990), we applied Kendall's tau-b coefficient to the analysis, which is used for square tables. We used the Kendall's Tau coefficient to study the correlation, because the variables used in this study were non-parametric variables (Betáková et al., 2021). For Kendall's Tau-b the hypothesis are as follows:

- Null hypothesis ( $H_0$ ): The data follow a normal distribution.
- Alternative hypothesis ( $H_1$ ): The data do not follow a normal distribution.

To perform the analysis, we subjected individual variables to normality testing using the Kolmogorov-Smirnov test ( $n > 50$ ). We can conclude that the p-value in each observation was less than the  $\alpha = 0.05$  significance level, which confirms the rejection of null hypothesis ( $H_0$ ) and the acceptance of alternative hypothesis ( $H_1$ ). This result proves that the data comes from a non-normal distribution.

## 2 Results and discussion

In this section we analysed the relationship between variables digitalization and performance in SMEs and digitalization and HRD in SMEs.

### 2.1 Digitalization and performance in SMEs

**Tab. 1: Case Processing Summary (digitalization and performance)**

	Case Processing Summary					
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Digitalization * Performance	128	100,0%	0	0,0%	128	100,0%

Source: own processing

The Case Processing Summary table provides an overview of case processing in the digitization-performance analysis, with a total sample of 128 cases. All these cases are valid, which means that the analysis does not include any missing data. The number of missing cases is zero, confirming that the data for both variables (digitization and performance) are complete. Valid cases account for 100% of the total, ensuring that the analysis was performed on the full sample without loss of data.

**Tab. 2: Crosstabulation (digitalization and performance)**

**Digitalization \* Performance Crosstabulation**

			Performance			Total
			1	3	5	
Digitalization	1	Count	12	8	7	27
		Adjusted Residual	3,5	,9	-3,6	
	3	Count	7	9	14	30
		Adjusted Residual	,5	1,0	-1,2	
	5	Count	7	13	51	71
		Adjusted Residual	-3,3	-1,5	4,0	
Total	Count	26	30	72	128	

Source: own processing

Table 2 presents the results of respondents' answers processed in the form of a contingency table. Out of a total sample of 128 responses, 51 respondents indicated that with an increasing level of digitalization, they also observed an increase in organizational performance. Conversely, 12 respondents did not identify any growth in digitalization nor an increase in organizational performance. If the adjusted residuals value is higher than 1.96, we can conclude that there are significantly more observations in the given cell than expected. On the other hand, if the value is lower than -1.96, there are fewer observations in the cell than anticipated. Our analysis found significantly more observations in four cells, while significantly fewer observations were recorded in two cells.

**Tab. 3: Symmetric Measures (digitalization and performance)**

**Symmetric Measures**

		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	,365	,075	4,746	,000
N of Valid Cases		128			

Source: own processing

For Kendall's Tau-b the hypothesis are as follows:

- Null hypothesis ( $H_0$ ): There is no statistically significant positive relationship between digitization and SMEs performance.
- Alternative hypothesis ( $H_1$ ): There is a statistically significant positive relationship between digitization and SMEs performance.

The value of Kendall's tau-b is 0.365, which is a medium positive correlation between the two variables. This result shows that, as we increase the digitization carried out in enterprises, there is a tendency towards a higher performance evaluation. A p-value lower than 0.05 means that the detected correlation is statistically significant at the 0.05 significance level. For these reasons, we reject null hypothesis ( $H_0$ ) and accept alternative hypothesis ( $H_1$ ). These results show that there is a statistically significant relationship between digitization and performance within the analysed SMEs.

## 2.2 Digitalization and HRD in SMEs

**Tab. 4: Case Processing Summary (digitalization and HRD)**

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Digitalization * HRD	128	100,0%	0	0,0%	128	100,0%

Source: own processing

The Case Processing Summary table provides an overview of case processing in the digitization-HRD analysis, with a total sample of 128 cases. All these cases are valid, which means that the analysis does not include any missing data. The number of missing cases is zero, confirming that the data for both variables (digitization and HRD) are complete.

**Tab. 5: Crosstabulation (digitalization and HRD)**

			HRD			Total
			1	3	5	
Digitalization	1	Count	16	4	7	27
		Adjusted Residual	4,5	-1,2	-2,9	
3	Count	8	12	10	30	
	Adjusted Residual	,1	2,4	-2,2		
5	Count	9	14	48	71	
	Adjusted Residual	-3,8	-1,1	4,2		
Total	Count	33	30	65	128	

Source: own processing

Table 5 displays the results of respondents' answers in the form of a contingency table. Out of a total of 128 responses, 48 respondents indicated that with an increase in the level of digitalization, they also observed an improvement in human resource development. Conversely, 16 respondents did not observe either growth in digitalization or improvement in human resource development. An adjusted residual value exceeding 1.96 signals that there are significantly more observations in the given cell than expected, while a value lower than -1.96 indicates that the number of observations is significantly lower than anticipated. The analysis identified statistically significantly higher numbers of observations in three cells, while in another three cells, a statistically significantly lower number of observations was found.

**Tab. 6: Symmetric Measures (digitalization and HRD)**

		<b>Symmetric Measures</b>			
		Value	Asymptotic Standardized Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	,391	,076	5,001	,000
N of Valid Cases		128			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Source: own processing

For Kendall's Tau-b the hypothesis are as follows:

- Null hypothesis ( $H_0$ ): There is no statistically significant positive relationship between digitization and HRD in SMEs.
- Alternative hypothesis ( $H_1$ ): There is a statistically significant positive relationship between digitization and HRD in SMEs.

The value of Kendall's tau-b is 0.391, which is a medium positive correlation between the two variables. This result shows that, as we increase the digitization carried out in enterprises, there is a tendency towards a human resource development. A p-value lower than 0.05 means that the detected correlation is statistically significant at the 0.05 significance level. For these reasons, we reject null hypothesis ( $H_0$ ) and accept alternative hypothesis ( $H_1$ ). These results show that there is a statistically significant relationship between digitization and HRD within the analysed SMEs.

Based on our results in this study, we can answer the RQ1 (What is the relationship between digitization and performance in SMEs?) and RQ2 (What is the relationship between digitization and human resource development in SMEs?)

Answer on RQ1: The analysis indicates a statistically significant positive relationship between digitization and performance in SMEs. The value of Kendall's tau-b is 0.365, indicating a medium positive correlation between the two variables. This result demonstrates that increased digitization within enterprises correlates with higher performance evaluations. As with the previous analysis, the p-value is less than 0.05, leading us to reject the null hypothesis ( $H_0$ ) and accept the alternative hypothesis ( $H_1$ ). Therefore, digitization is shown to significantly enhance performance in the SMEs analysed.

Answer on RQ2: Similarly, the study reveals a statistically significant positive relationship between digitization and human resource development (HRD) in SMEs. Specifically, the value of Kendall's tau-b is 0.391, suggesting a medium positive correlation. This implies that as the level of digitization increases in these enterprises, there tends to be an improvement in HRD. The p-value is below the 0.05 significance level, allowing us to reject the null hypothesis ( $H_0$ ) and accept the alternative hypothesis ( $H_1$ ), confirming that digitization positively impacts HRD in the analysed SMEs.

The findings of our study support previous research, particularly by Eller et al. (2020), which shows a strong link between digitalization and organizational performance. Our results also align with Kareem (2019), highlighting the importance of HR practices in enhancing effectiveness through digitalization. Additionally, Broccardo et al. (2024) emphasize the benefits of digitalization, which our respondents echoed by linking increased digitalization to improved performance. Overall, this study reinforces the idea that SMEs should embrace digital strategies to enhance both human resource development and organizational performance.

## **Conclusion**

The aim of this study was to analyse the relationship between digitalization and human resource development (HRD), as well as the relationship between digitalization and the performance of small and medium-sized enterprises (SMEs). The methodology employed tools to assess the strength of relationships between non-parametric variables, specifically Kendall's tau-b, and contingency tables for the interpretation of respondents' answers. The results revealed a statistically significant, moderately strong positive correlation between digitalization and organizational performance. The contingency table indicated that the majority of respondents associate increasing levels of digitalization with improvements in organizational performance.



In the case of the relationship between digitalization and HRD, a statistically significant moderately strong positive correlation was identified. Furthermore, the contingency table suggests that most respondents perceive the growth of digitalization as a factor supporting HRD. The findings of this study emphasize the crucial role of digitalization and its positive impact on both organizational performance and HRD, which can contribute to more effective strategy implementation in these areas. Based on these results, we recommend that future research examines causal relationships and identifies specific factors of digitalization that influence organizational performance and HRD. As part of the limitations of our research, we must emphasize that due to the small sample of respondents, we were not able to apply more complex statistical methods.

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