

The role of human resource practices in the implementation of digital transformation

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THE ROLE OF HUMAN RESOURCE PRACTICES IN THE IMPLEMENTATION OF DIGITAL TRANSFORMATION

Structured Abstract:

Purpose: Professionals and academics need to know what human resource practices are necessary in this Industry 4.0 environment and digital revolution. This research studies some human resource practices in the digital age that favor the implementation of digital transformation. Our arguments suggest that for personnel to be a key asset in digital transformation processes, a strategic alignment is necessary to drive the company towards these objectives.

Design/Methodology/Approach: The hypotheses were tested in a representative sample of 184 manufacturing companies with ten or more employees located in the southeast of Spain, using Partial Least Squares.

Findings: Our findings show that human resource practices partially mediate the relationship between strategic alignment and digital transformation. Based on the contingent approach, we also maintain that the company must implement human resource practices that encourage employee behaviors that are consistent with the organization's strategy. This strategic alignment and these human resource practices enable companies to achieve digital transformation in search of superior performance.

Originality/Value: To the best of our knowledge, this empirical study has not been previously carried out. The theoretical model and hypothesis testing provide strategic value for understanding some of the determinants of digital transformation in relation to human resource management.

Practical Implications: In the new digital environment, companies must adopt a set of human resource practices that favor innovative employee behavior that helps digitally transform their businesses.

Research limitations/implications: Longitudinal and multilevel studies could increase the strength of the research, which could also include companies from other sectors. This research implies that HRM practices such as teleworking, teamwork or promoting employee participation in strategic decision-making are essential to complete the digital transformation process.

Keywords

Strategic alignment, human resource practices, innovative work behavior, digital transformation.

1. Introduction

The integration and exploitation of new digital technologies are some of the main challenges facing companies nowadays (Hess et al., 2016) because people are permanently connected to electronic devices (Bag et al., 2021b). These changes can bring about numerous advantages, such as improved efficiency, accessing new markets or improving brand image or reputation (Ferreira et al., 2019). This revolution is driven by internal forces (e.g. changes in organizational structure and in required skills and training) and external forces, such as changes in technological applications (Telukdarie et al., 2018).

To achieve digital transformation, companies require two fundamental aspects: one is related to the use of technologies in the value chain, and the other is related to changes that affect their people, culture and knowledge. The resources required by companies to achieve Digital Transformation (DT) are made up of tangible resources (IT infrastructure), human resources (technical and management skills) and intangible resources (knowledge, customer orientation and synergy) (Bharadwaj, 2000). Human resources provide a competitive advantage in any organization (Bag et al., 2021d) and companies need to integrate the management of the latter with operations management to offer the best results. Furthermore, the advancement of Industry 4.0 technology, such as artificial intelligence and the internet of things, has led to the automation of many jobs (Bag et al., 2021e), which has generated a change in job requirements. Technical skills requirements will include experience in

programming, Big Data analytics, robotics, and smart systems maintenance (Bag et al., 2021d). Soft skills, continuous learning, analytical, innovative and critical thinking are also increasingly required (Jerman et al., 2020).

Therefore, our research questions are: Do Human Resource Management (HRM) practices in the digital age help explain how decisions made by management foster digital transformation practices? Do digital HRM practices promote innovative behaviors that help the digital transformation of companies? The advancement of digital technologies requires innovative practices to close the skills gap (Bag et al., 2021c, Minbaeva, 2020). Thus, our objective is to provide solutions for professionals to help them overcome the challenges of human resource development, as well as to identify or propose new methods, tools or innovative practices that can help eliminate challenges in this digital age. Likewise, the Industry 4.0 revolution has highlighted the need for companies to adopt new ways of managing human resources and to know how this management is integrated with their operations. Consequently, the paper tries to fill this gap by finding innovative solutions to adapt workers, support them in new socio-technical relationships in organizational systems, and improve performance.

Previous empirical research has not delved into the role of HRM in the DT so this work analyzes how this function becomes highly relevant in order to produce adequate human capital. Specifically, an essential contribution is to analyze the partial mediating role of these innovative HRM practices in the relationship between strategic alignment and DT.

Strategic alignment has been introduced as an antecedent to digital transformation and digital HRM practices because it allows a management team to integrate digital technology with their business strategy and HRM. Moreover, Fenech et al. (2019) have highlighted the importance of recognizing the HRM practices appropriate to DT. We find that teleworking, teamwork or promoting employee participation in strategic decision-making are essential to complete this process. This represents a first step forward in determining how HRM should be adapted to this new digital environment. Furthermore, we have discovered that HRM practices in the digital age promotes innovative work behavior in its employees, which is essential in order to implement and develop DT processes. This is consistent with a contingent approach (Woodward, 1958), which states that if an employer knows what behaviors are needed from its employees, then the organization will adopt practices and procedures that induce those behaviors. Thus, the company would align the interests of the employer and the employee to achieve a better organizational performance.

Furthermore, strategic alignment is a necessary element for achieving digital transformation (Matt et al., 2015). Moreover, we study of the mediating role of HRM practices in the relationship between strategic alignment and digital transformation because it has demonstrated the importance of an alignment of human resource practices with the company's strategy in the search for innovation (Naranjo-Valencia et al., 2018). In fact, previous literature has shown the importance of a fit between business strategy and HRM (Paauwe and Farndale, 2017). It can be presumed that strategies aimed at promoting digital transformation processes are also a powerful determinant for the promotion of HRM practices oriented to this end. Finally, we provide a DT measure following Verhoef et al. (2019), that has established the need to generate applied definitions of DT.

This paper continues with a review of the literature which relates strategic alignment, HRM practices, innovative behavior and DT, using contingency theory (Woodward, 1958). The following section explains the methodology and presents a description of the main empirical results and conclusions. The paper ends with a description of its main limitations and future lines of research.

2. Literature review and hypothesis development

The digital transformation of an organization refers to the change in its business model using new digital technologies in the processes, products or services offered to clients. This implies the use of digital resources, which vary depending on the moment: Big Data, Artificial Intelligence, 3D printing, Quantum computing or Virtual reality. Moreover, this process implies multiple aspects (Verhoef et al., 2019, Fischer et al., 2020), ranging from the design of digital strategies (Matt et al., 2015, Verhoef et

al., 2019) to the change of organizational structure (Hanelt et al., 2021, Choudhury et al., 2021) towards greater flexibility, agility and incorporating digital functional areas. This change also promotes the creation of adequate digital metrics and objectives or key performance indicators to adjust the business. Such transformation can be divided into three phases: Firstly, *digitization* implies that companies transform analog information into digital information (Verhoef et al., 2019); for example, companies digitize internal and external documentation but do not modify value creation activities. Secondly, *digitalization* describes how IT or digital technologies can be used to alter existing business processes (Li et al., 2016a). Finally, *digital transformation* implies that companies simultaneously address digitization from several dimensions, such as strategies, organizational structure, operations or culture.

2.1. Strategic alignment

To compete in an environment of digital revolution, companies that are not digital natives and have a more traditional business model need to adopt strategies that allow them to compete with more agile and disruptive companies (Hess et al., 2016, Matt et al., 2015). Strategy is the creation of a unique and valuable position in the market (Porter, 1997), which provides a guide for the most appropriate decisions to face the opportunities and threats that arise from the environment.

Digital technology-business strategic alignment is the degree to which the mission, objectives and plans contained in the business strategy are shared and supported by the IT strategy (Gerow et al., 2014), so that it acts as a unifying link between them (Ismail et al., 2017, Matt et al., 2015). A well-established partnership between both areas provides more fluid and efficient decision-making, facilitating the implementation of digital technology, especially when radical business changes are required in turbulent markets (Li et al., 2021) and can be carried out through, for example, structural changes or through the talent inside the organization (Akter et al., 2020). The literature has shown how some HRM practices may fit differently with various strategic positions and how these practices relate to the company performance (Delery and Doty, 1996). Furthermore, it is shown that the relationship between the use of specific HR practices and organizational performance depends on the organization's strategy (Woodward, 1958).

The alignment between digital and business strategies could create a competitive advantage and allow to take advantage of the full potential of the information technology (Gerow et al., 2014). This is a continuous process (not an event) and a requirement for digital transformation, being linked to organizational performance (Li et al., 2016b, Gurbaxani and Dunkle, 2019). Moreover, the alignment is decisive to start major processes in the company; in fact, it is necessary for the company to take into account information technologies during the strategy design stage, involving the professionals of these areas.

Accordingly, there are three key elements to assess the degree of strategic alignment. Firstly, the existence of collaboration between the different departments of the company to make compatible their different visions and plans. Secondly, employees share the importance of digital technology in the design of the strategy, and, finally, technology is taken into account when designing it.

Delving deeper into the review of empirical studies, some authors have found evidence supporting the above arguments. They state that the adoption of digital strategies was positively related to the digitization of 193 small and medium size enterprises (Eller et al., 2020) and have a positive effect on short-term and long-term financial performance in 152 Chinese companies (Wang et al., 2020). However, as this is an incipient topic, there is a dearth of empirical studies linking strategic alignment with digital transformation.

Consequently, according to the previous arguments, we study a positive relationship between both variables:

H₁: Adopting a *strategic alignment* is positively associated with the *digital transformation* of a company

2.2. The role of HRM practices in digital transformation

One of the great challenges that companies will face in the coming years is to have a team of professionals who can function in the digital environment derived from digital transformation (Ismail et al., 2017). This will inexorably require modifying how to manage people within companies, in order to facilitate the cultural change to cope with the new forms of work. In this study, we consider that HRM practices in the digital age can be the means by which the digital strategy achieves the proposed objectives (Porfirio et al., 2021).

The literature has shown that there are various HRM practices favorable to DT such as teamwork (Schwarz Müller et al., 2018) or promoting employee autonomy and team cohesion (Bartsch et al., 2020). However, there is still a shortage of knowledge as to what practices can cause employees to adopt behaviors that facilitate the DT of the company. Firms can achieve a sustainable competitive advantage when HRM practices are aligned with the organizational strategy (Chowhan, 2016). Furthermore, the literature shows the supporting role of an adequate HRM in the strategic alignment of IT and business functions (Oehlhorn et al., 2020), as well as the importance of a contingent approach in strategic HRM (Delery and Doty, 1996).

A company can adopt HRM practices that ensure that people with the required skills are hired and retained, as well as use HRM practices to ensure that employees are motivated to behave in a manner consistent with the company's strategy. Therefore, we could assume that strategic alignment favors the adoption of certain useful HRM practices in the digital age. Therefore, HRM practices in the digital age have to include teleworking, promote the involvement of employees to achieve the goal of digital transformation and incentivize a suitable leadership style.

However, there is a lack of studies about the relationship between strategic alignment and these practices. Digital HRM practices can help employees become allies to achieve the digital transformation within an organization. In fact, Potemkin and Rasskazova (2020) demonstrate that the management of companies must consider employees to be the most valuable resource in order to achieve the strategic goals of the company. Contingency theory implies that the proper implementation of the strategy depends to a large extent on the behavior of the employees (Woodward, 1958). Despite the absence of research linking HRM practices with DT, different studies have shown there is a relationship between HRM practices and different types of innovation (Díaz-Fernández et al., 2017, Barba-Aragón and Jiménez-Jiménez, 2020, Kianto et al., 2017). On the other hand, Bag et al. (2021a) show how e-HRM systems are positively associated with company performance.

Consequently, according to the previous arguments, this paper proposes a positive relationship between the following variables:

H₂: Digital *HRM practices* mediates the relationship between *strategic alignment* and *digital transformation*

2.3. The mediation of innovative work behavior

HRM practices are capable of promoting a series of behaviors in employees that encourage them to develop the actions that the company requires (Kooij and Boon, 2018). DT processes consist, to some extent, in the introduction of innovations in the company (Akter et al., 2020). Apart from involving changes in the organization and even in the production process, there is also an innovation in the business model. The literature on employees' behavior has highlighted the need for employees who exhibit innovative behavior to introduce any type of innovation in the company. Innovative Work Behavior (IWB) is the intentional creation, introduction and application of new ideas within a work role, the group or the organization, in order to benefit role performance, the group, or the organization (Janssen, 2000). Moreover, these behaviors imply the identification of problems or opportunities, the generation and evaluation of ideas, their promotion, the search for followers, the development of implementation plans and the funds required to carry out them (Sanz-Valle and Jiménez-Jiménez,

2018). In fact, employees achieve digital transformation of the organization as another innovation process.

Although HRM can help define different types of behaviors in employees (Schuler and Jackson, 1987), we focus on the study of HRM practices in the digital age that can drive technological innovation processes. Employees benefit from HRM practices implemented by and for DT. In addition, through contingency theory, they could contribute to the transformation and improvement of the organization's productivity by adopting innovative attitudes (Woodward, 1958). An organization's strategy needs behavioral requirements to be successful. The adoption of digital HRM practices can reward and control employee conduct through their organizational commitment and innovative behavior.

Therefore, IWB implies considering several stages in which employee can improve the way the company operates. Starting with the proposal of new ideas, their ability to promote them in the company, and their capacity to integrate those ideas in the company.

The previous literature has shown how practices such as teamwork or teleworking can improve the generation of new ideas and creativity (Hoegl and Parboteeah, 2007, Naotunna and Zhou, 2018), which are key in DT (Tekic and Koroteev, 2019). Moreover, there are some studies that have demonstrated the positive relationship of specific HRM practices (Widmann and Mulder, 2018, Tung, 2016) or HRM practices as a whole in IWB (Bos-Nehles and Veenendaal, 2019, Prieto and Pérez-Santana, 2014). Finally, there are studies that show a positive relationship between HRM practices and innovation in companies (Lee et al., 2019).

Although there is a lack of empirical studies of the relationship between IWB and DT, the literature show a positive relationship between IWB and innovation in companies (Noopur and Dhar, 2019). In spite of the relevance of this argumentation, to our knowledge, the mediating effect of innovative behavior in the relationship between HRM practices and innovation has rarely been tested empirically (Sanz-Valle and Jiménez-Jiménez, 2018). Consequently, according to the previous arguments, this paper proposes a positive relationship between both variables.

H₃: IWB mediates the relationship between HRM practices and digital transformation

Therefore, in our model (see Figure 1) there is a strategic alignment between the business and the IT functions of the company to obtain a digital transformation. In this process, HRM practices play a partial mediating role, as employees are a basic element for a successful digital transformation; also, it affects IWB, which partially mediates HRM practices and the final goal. Thus, when the strategic direction of companies is aligned with their IT function, digital transformation takes place. Likewise, the management of HRM practices in an environment where businesses are being digitally transformed plays a key element in enabling employees to adopt innovative work behaviors that are favorable to the transformation of the company's business model. This is possible thanks to the fact that the company provides them with training and HRM practices adapted to the digital age (such as teleworking or an adequate leadership style), favoring individual and collective performance through the transformation of the company.

3. Methodology

3.1. Data collection and sample

Various business associations were contacted and then the study was presented to their members to encourage their involvement. Feedback was obtained from the managers of the associations to make sure that no problems would arise from the wording of the question and a pretest was carried out. An electronic questionnaire was administered via e-mail in March 2020 and was distributed to companies with more than ten employees located in Murcia (southeast Spain). The collecting process ended in April 2020. The population is made up of 974 manufacturing companies affiliated to the most relevant business organizations in this area. We use the code from Spanish Clasificación Nacional de Actividades Económicas (CNAE 2009) to classify the firms. The study includes firms from a variety of sectors, not

only form the code C “Manufacturing industry”, as many firms could be classified in two codes (for example, code A, “Agriculture”, due to the strong export-proned food-processing sector in the region). Through collaboration with these associations, contact information and a research support letter were available.

The study design aimed to ensure representation in terms of size, sector, and geographic distribution. We used the database of SABI (“Sistema de Análisis de Balances Ibéricos”) to assess that our final sample was representative of the population. The survey was directed to the CEO of the company, as he or she would possess a broader vision of all the processes encompassed in the study. Information was collected through an institutional website for conducting surveys. Cover letters were sent explaining the purpose of the research, data collection procedures, and confidentiality policies. Finally, 184 valid responses were collected, which represents a response rate of 19% of the study population.

3.2. Measures:

Seven-point Likert scales were used for all measurements. All of the scales used were translated into Spanish to send the questionnaires to the CEOs and then translated back into English. The questionnaire included the following scales:

Digital technology-business strategic alignment, using the Li et al. (2021) scale and *HRM practices* are measured by the scale of Goswami and Upadhyay (2019).

Employee’s IWB was measured using the scale developed by Scott and Bruce (1994) which was complemented using some items from the scale created by Kleysen and Street (2001).

We measured *digital transformation* with a practical adaptation of the theoretical study of Verhoef et al. (2019). After the depuration process, two items were erased.

The final items used, after the confirmatory factor analysis, are presented in Table 1.

INSERT TABLE 1 AROUND HERE

Henseler (2017) establishes three main types of measurement models depending on how the variables are defined (composites, reflective and causal-formative). Our variables are all derived from scales with a theoretical background. Therefore we have used Mode A composites to operationalize them (Henseler et al., 2016).

3.3. Data analysis

The structural equation model (SEM) was tested using the Partial Least Squares (PLS) technique. PLS-SEM was selected because of the characteristics of our model and the nature of composite constructs. Also, this method was employed with a confirmatory purpose (Henseler et al., 2016). The software employed is SmartPLS 3.3.3.

For testing the hypotheses, PLS-SEM uses a two-stage approach. Firstly, the measurement model is studied to assess the adequacy of the construct. Secondly, the structural model is evaluated, and provides the significance of the coefficients derived from each of the hypotheses analyzed.

To confirm the measurement model, several tests were developed with the goal of testing the reliability and validity of the composites (see Table 1). The individual indicator reliability values were higher than 0.7 (Chin, 1998). Also, Cronbach’s Alpha values and Dijkstra and Henseler (2015) rho alpha are well within the accepted range and composite reliability (CR) values (Bagozzi and Yi, 1998) were greater than 0.7. Finally, convergent validity was evaluated using the Average Variance Extracted index (AVE) (Fornell and Larcker, 1981), that provides values for all of the constructs above 0.5 (Bagozzi and Yi, 1998).

INSERT TABLE 2 AROUND HERE

Discriminant Validity was tested using two methods. Firstly, we compare whether the square root for each AVE value is greater than the correlation values among the latent variables (Fornell and Larcker,

1981). Secondly, we apply the heterotrait-monotrait (HTMT) criterion (Henseler et al., 2015). Table 2 shows in bold on the diagonal the square root of each AVE value, which exceeds the correlation with any other latent variable (values under the diagonal). The values for the HTMT criterion are shown above the diagonal and all of them are less than 0.85. Thus, from an examination of the results in Table 2, we can state that all of the constructs are reliable.

4. Results

The structural model resulting from the PLS-SEM analysis is summarised in Figure 1. The stability of the estimates is examined by using the t-statistics obtained from a bootstrap test with 5000 resamples. All the hypothesised relationships are significant, and, therefore, the hypotheses are supported.

INSERT FIGURE 1 AROUND HERE

As can be seen in Table 3, there is a significant relationship between the strategic alignment of companies and DT ($\beta = 0.419$, $p < 0.001$). Thus, we empirically contrasted that companies that are capable of aligning their business strategy and their digital strategy can undertake digital transformation more effectively.

INSERT TABLE 3 AROUND HERE

In order to deepen our understanding of how strategic alignment facilitates DT, the possible mediation of implementing some HRM practices was analysed. Firstly, it there is proof that the strategic alignment contributes to adopting some HRM practices ($\beta = 0.744$, $p < 0.001$), while HRM practices are also related to digital transformation ($\beta = 0.298$, $p < 0.05$). In addition, the existence of a significant indirect effect through these specific HRM practices is verified ($\beta = 0.222$, $p < 0.05$). All of this highlights that adopting some HRM practices partially mediates the relationship between strategic alignment and the achievement of digital transformation. This implies that HRM practices play a crucial role in the implementation of a DT process.

Moreover, we found the existence of significant relationships between HRM practices and IWB ($\beta = 0.736$, $p < 0.001$), as well as between IWB and digital transformation ($\beta = 0.196$, $p < 0.01$). In addition, our results show evidence of the partial mediation of IWB ($\beta = 0.144$, $p < 0.01$) in the relationship between HRM practices and DT. This means that employees with innovation-oriented behaviors will be able to face digital processes with a greater guarantee, since they will be able to learn, assimilate changes and solve the problems that digital transformation requires.

5. Discussion

The implementation of DT depends on the skills of employees and management can influence these capabilities by hiring experts or modifying HR policies (Bag et al., 2021d). In our study, a theoretical model was presented which demonstrates how HRM practices in the digital age and employee behavior play a decisive role so that companies can obtain the expected results in their organizational strategies. This in turn leads to digital transformation.

Firstly, regarding the relationship between strategic alignment and digital transformation, our findings emphasize the importance of the participation and agreement of employees from different areas of the company. These results are in line with other research that indicates the importance of adopting an appropriate DT strategy (Ismail et al., 2017, Matt et al., 2015). Secondly, our results show that digital HRM practices positively mediate the effect of a strategic alignment on DT. This highlights the importance of the role of HRM in the transformation process of companies. It suggests that the success of this type of strategy not only resides in good technological equipment, but also in effective management of the human capital of companies. These results also respond to the request for an in-depth study of HRM for digital transformation proposed by authors such as Fenech et al. (2019).

Finally, our study also shows that HRM in the digital age favors the development of employee innovative behaviors, which were configured as an explanatory mechanism of how innovation processes are implemented. These findings are in line with other works (Sanz-Valle and Jiménez-

Jiménez, 2018, Naranjo-Valencia et al., 2017), but more linked to technological innovations. Therefore, we address this lack of literature. When people from different areas of the organization understand and align themselves to formulate a digital transformation strategy, it can be effective in carrying out successful digital transformation of companies. Thus, we found new consequences of the strategic alignment process in companies.

5.1. Theoretical contributions

This paper widens the understanding of the importance of personnel management in the digital transformation process, considering both the perspectives of HRM practices and that of employee behaviors. The main contributions are the following:

Firstly, despite the importance attributed to digital transformation in the company (Verhoef et al., 2019, Vial, 2019), there is a lack of research into the role of HRM in its implementation. In fact, Bag et al. (2021f) point out that aligning human resource practices with the Industry 4.0 is expected to enable digitization of trainings, empowerment of employees, cross-functional teamwork and learning. Our study analyzed how the HRM function acquires a very relevant role in order to produce adequate human capital. Specifically, an essential contribution is the analysis of the partial mediating role of digital HRM practices in the relationship between strategic alignment and digital transformation. This is an issue which had not been previously addressed by other empirical studies.

Secondly, we expanded the literature on specific HRM practices in the digital age that facilitate DT processes. Fenech et al. (2019) highlight the importance of knowing the HRM practices appropriate to DT. In this case, maintaining a suitable leadership style, adopting teleworking opportunities and creating a good climate or employee participation in strategic decision-making are essential to this process.

Thirdly, previous research frequently assumes that HRM practices improve company results due to their influence on employee behavior. In fact, Porfírio et al. (2021) have pointed out the need to explore how to obtain the commitment and involvement of employees in the DT process. Here, we show that HRM practices adapted to this digital environment promote an innovative behavior of the employees which is essential in order to implement and develop DT processes.

Moreover, we contribute to the literature with the identification of some factors that decisively influence DT. Beyond what has been said about HRM practices and innovative behavior, we draw attention to the need of seeking a strategic alignment. This is relevant since the company's strategy is essential to implementing any process that affects the business model followed by the company. Thus, this research can further contribute to understanding the new antecedents of the HRM practices in the digital age and DT in companies. This is in line with the contingency theory, which states that the company must implement HRM practices that encourage employee behaviors that are consistent with the organization's strategy (Woodward, 1958). This alignment of strategy and HRM practices allows companies to achieve DT in search of superior performance.

Finally, this study makes a relevant effort to measure the DT processes of companies. Although the literature frequently points out the importance of digital transformation (Verhoef et al., 2019, Vial, 2019), there is a shortage of empirical research, based more on case studies.

5.2. Practical implications

Managers must begin to design their organizational strategies, taking into account the internal technological and human resources with which they can face the external challenges of the environment. Thus, they can adapt their business models. This also means developing a strategic approach to HRM that leads companies to consider their employees when designing business strategies. From this perspective, managers must be more sensitive to the need to make greater investments in their human capital through human resource practices adapted to the digital environment.

Managers and HRM professionals must adopt training practices related to emerging technologies, encourage teleworking (Schwarz Müller et al., 2018, Bennett and McWhorter, 2021), allow employees to participate in strategic decisions and have more agile organizational structures (Verhoef et al., 2019). These practices can make the employees more involved, engaged with the organization, adopt innovative behaviors, and contribute more to the digital transformation of the organization.

6. Limitations and future research

Industry 4.0. needs more research related to the field of human resource development. Our paper constitutes a significant progress in understanding why and how employees carry out the DT of companies after the strategic alignment. However, there are limitations.

Firstly, we only obtained one response per company. Given that the questionnaire was addressed to the CEO, who possesses a global vision, it would be noteworthy to collect information at the employee level and assess a multilevel study. Therefore, longitudinal studies and multilevel analysis could advance research in this area. Secondly, the survey did not include questions to assess and correct for the common method bias problem, as suggested by Tehseen et al. (2017).

Furthermore, we focus on the manufacturing sector as there is a greater scope for integrating practices derived from DT. These companies are involved in greater automation processes of their production processes than those derived from the service or purely agricultural sectors. In any case, in future lines of research we propose to extend this study to other sectors.

Finally, analyzing the effect of other companies' HRM practices and policies on the digital transformation process studied in this paper would help to understand how employees and organizations could be more efficient in generating innovative behavior to make their company more competitive.

7. Conclusion

The Industry 4.0 revolution has highlighted the need for companies to adopt new ways of managing human resources and to know how this management is integrated in their operations. Consequently, this paper fills this gap by finding innovative solutions to adapt workers, support them in new socio-technical relationships in organizational systems, and improve performance.

These include a series of HRM practices which must be implemented to favor the digital transformation process of companies: Aligning employees with the vision and values of the company, implementing teleworking policies, creating a good work environment through proper leadership, generating a reward system for deserving employees based on objective criteria. Furthermore, involving employees in the strategic decision making of the company, allowing employees to participate in strategic decisions or creating a culture of teamwork conform to practices that we must adopt in the digital age.

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Figures and tables

Figure 1: Results of the structural model

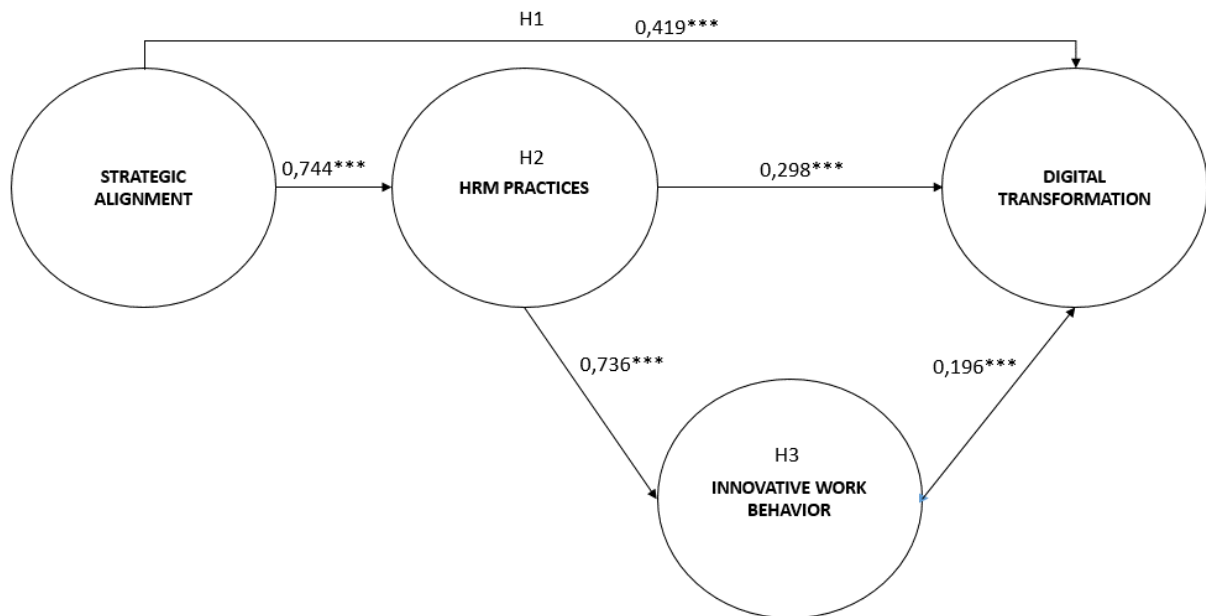


Table 1: Measurement and factor loading

Constructs	Measures	Loadings	Standard Deviation	T-values	Reliability ^a
	In our company: (1- Totally disagree; 7- Totally agree)				
<i>Digital technology-business strategic alignment</i>	1. Digital technology has been integrated with the commercial strategy so that they are developed together.	0.864	0.022	39.178	$\alpha=0.858$ $\rho_A=0.859$ $SCR=0.904$ $AVE=0.703$
	2. The employees share the importance of digital technology in the design of the strategy	0.876	0.024	36.083	
	3. The business strategy has been designed with digital technology in mind.	0.860	0.029	29.401	
	4. Other department heads or managers are consulted before making strategic decisions	0.749	0.040	18.924	
	During the last 3 years to what extent has been achieved (1 = totally disagree; 7 = totally agree)				
<i>Digital HRM practices</i>	1. Align employees with the vision and values of the company	0.883	0.018	50.449	$\alpha=0.934$ $\rho_A=0.936$ $SCR=0.947$ $AVE=0.719$ $R^2=0.551$
	2. Create a good work environment through proper leadership	0.899	0.018	50.742	
	3. Generate a reward system for deserving employees based on objective criteria	0.811	0.028	28.545	
	4. Implement telework policies	0.738	0.032	23.084	
	5. Involve employees in the strategic decision making of the company	0.861	0.024	35.296	
	6. Make strategic decisions	0.846	0.025	33.629	
	7. Teamwork	0.886	0.017	51.275	

		Indicate how often the employees of your company, in their daily work, adopt the following behaviors: (1 = Never; 7 = Always)			
<i>Innovative work behavior</i>	1. Seek how to improve existing processes, technology, products, services, or work relationships	0.892	0.019	46.781	
	2. They propose creative ideas	0.909	0.014	66.503	$\alpha=0.964$
	3. They test new ideas, trying to evaluate them	0.923	0.011	84.916	$\rho_A=0.966$
	4. Promote and defend the new ideas of others	0.907	0.015	59.628	SCR=0.966
	5. They try to persuade others of the importance of a new idea or solution	0.868	0.035	25.013	AVE=0.801
	6. They try to find the necessary funds to start the new ideas	0.831	0.025	33.001	$R^2=0.540$
	7. They develop adequate plans and programs to implement the new ideas	0.912	0.015	61.173	
	8. In general, they are innovative	0.913	0.014	66.948	
		Our company uses: (1 = Little use; 7 = Much use)			
<i>Digital Transformation</i>	1. A flexible organizational structure that allows us to face the changes derived from DT	0.745	0.036	20.846	
	2. Digital components in the product or service offered to customers	0.784	0.032	24.438	
	3. Digital channels of communication with employees: employee portal, email or whatsapp groups, digital newsletter, etc.	0.810	0.029	28.202	
	4. Communication channels with suppliers: online orders, digital purchasing center, etc.	0.752	0.041	18.279	$\alpha=0.931$
	5. Digital order forms	0.714	0.040	17.769	$\rho_A=0.935$
	6. Digital applications for internal financial statements or Blockchain	0.845	0.022	37.928	SCR=0.941
	7. Internal and external digital documentation	0.749	0.036	20.781	AVE=0.593
	8. Big Data analysis of information	0.741	0.040	18.696	$R^2=0.678$
	9. Digital surveys to measure customer satisfaction	0.804	0.029	27.692	
	10. Digital metrics to measure customer satisfaction: Visits to the web, visits to digital channels, interactions on social networks, etc.	0.816	0.027	29.907	
	11. Dashboard on company results	0.700	0.042	16.682	

^a α : Cronbach alpha; ρ_A : Dijkstra-Henseler (2015); SCR: ^a Scale composite reliability; AVE: Average variance extracted.

Table 2: Correlations matrix and reliability

Constructs	Correlations			
	1	2	3	4
1. Strategic alignment	0.839	0.831	0.725	0.850
2. HRM practices	0.744	0.848	0.773	0.798
3. IWB	0.660	0.736	0.895	0.721
4. DT	0.770	0.754	0.692	0.770
Notes: Diagonal elements (bold figures) are the square root of the variance shared between the constructs and their measures. Below diagonal elements are the correlations between constructs. Above diagonal elements are the Heterotrait-Monotrait Ratio (HTMT) values				

Table 3: Structural model

Paths	Standardized coefficient	Standard Deviation	Confidence interval	
			LL	UL
Direct effects				
Strategic alignment → HRM practices	0.744***	0.034	0.684	0.796
Strategic alignment → DT	0.419***	0.069	0.310	0.534
HRM practices → IWB	0.736***	0.037	0.674	0.794
HRM practices → DT	0.298***	0.073	0.178	0.415
IWB → DT	0.196***	0.065	0.089	0.300
Indirect effects				
HRM practices → IWB → DT	0.144**	0.049	0.065	0.224
Strategic alignment → HRM practices → IWB	0.548**	0.043	0.475	0.618
Strategic alignment → HRM practices → DT	0.222**	0.056	0.131	0.314

Note: *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$; Bootstrapping based on $n = 5.000$ subsamples; LL=Lower 95% percentile confidence

interval; UL= Upper 95% percentile confidence interval