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Unveiling the dimensions of digitalization: Evidence from peruvian SMEs

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Abstract

Peruvian companies have started to invest in digital transformation initiatives. However, they are not yet seeing results. This situation may be explained by the fact that these companies have low levels of digitalization, which is a step prior to digital transformation. This gap is even higher when small and medium enterprises (SMEs) are assessed, considering that their investment in technologies is low. It is thus important for SMEs to improve their digitalization levels in order to access the associated benefits of digital transformation in the future, especially if it is considered that the use of technologies has exponentially increased during the pandemic as various companies rely on them to continue their businesses. Digitalization, however, is a broad concept that is difficult to measure and, in the absence of indicators, assessing companies' progress in digitalization may be limited. On this basis, this study aims to determine the potential dimensions of digitalization at the company level through empirical evidence. This research dealt with 38 variables taken from relevant literature, with principal components analysis used as the analytical technique. Findings suggest that digitalization at a company level has seven dimensions. Finally, implications are discussed.

Keywords: digitalization, dimensions, SMEs, principal component analysis

Introduction

Companies have increased their usage of technology in recent years. They are using technologies in a wide range of activities such as those related to customer experience, operational processes, and business models (Morakanyane et al., 2017). This trend has led us to the concept of digital transformation. Digital transformation is a multidisciplinary phenomenon defined as a process that consists of employing technologies to develop new digital business models that enhance value creation for the firm (Verhoef et al., 2021). According to Li et al. (2018) such transformation affects not only organizational capabilities but also operational routines as well as business processes. Digital transformation has three stages. The first is digitization, which refers to the process of converting physical items to digital (Kim et al., 2021). The second is digitalization, which involves the transformation or improvement of an existing business process using digital technologies (Verhoef et al., 2021). The last is digital transformation itself, which refers to the innovation of business processes and value creation (Verhoef et al., 2021).

Digital transformation has become a necessity in all business sectors and firms, including small and medium enterprises (SMEs). In the case of Peru, SMEs represent 99.5% of the formal companies in the country and account of over 59% of employment (Ministerio de Producción, 2019). However, these companies represent only 46.63% of the country's value-added services (Ricalde-Chahua & Libaque-Saenz, 2021) (Ricalde-Chahua & Libaque-Saenz, 2021). This situation can be the consequence of Peruvian SMEs' low investments in digital technologies. For instance, 79.5% of firms do not train their workers in the use of

information technologies (ITs), 69% do not have a web page, and 73.3% do not invest in digital technologies (INEI, 2020). The low levels of digitalization of this type of organizations stand as a barrier to any further digital transformation initiative. Additionally, the lack of results may discourage these companies from engaging in IT projects because of their budget limitations. For example, Peruvian companies increased their investment in technological projects by an average of 30% in 2020; however, a report shows that 95% of the surveyed companies admitted they had not seen the benefits of these projects (Escuela de Dirección de la Universidad de Piura, n.d.). Thus, it is important to determine the dimensions of this technological trend in order to further prioritize them.

Based on the above discussion, Peruvian SMEs may not yet be ready for digital transformation. They should first strengthen their digitalization level (second phase) to achieve the associated benefits of digital transformation in the future. In fact, prior studies have shown that digitalization is a key factor in SME performance that can led to digital transformation (e.g., Bellakhal et al., 2020), because this phase creates new value, generates new revenue opportunities (Fachrunnisa et al., 2020; Sklyar et al., 2019), and also provides opportunities for internationalization (Cassetta et al., 2019). Several studies have investigated the benefits resulting from the adoption of digital tools. For example, Westerman & McAffee (2012) found that digitalized firms have the highest performance in terms of revenue generation, profitability, and market valuation. Moreover, digitalization facilitates the commercialization of products or services of SMEs by providing new marketing and commerce options, and diversifying their communication channels (mobile, website, social media) through e-commerce platforms (new digital sales channels) and online transactions (Matarazzo et al., 2021).

Although digitalization has benefits as mentioned above, it is a broad concept that is difficult to measure (Mammadli & Klivak, 2020). Digitalization can include lots of technological alternatives such as e-commerce, business intelligence, radio frequency identification, and the internet of things. In addition to technological infrastructure, the skills and experience of the workers may be also important along with other characteristics of digitalization (Teichert, 2019; Zaharia & Pietreanu, 2018). It is thus important to clarify all the dimensions underlying digitalization so future studies can prioritize them, or find the specific factors that can impact on each dimension for a deeper understanding of SMEs' digital needs. Although prior studies have suggested that digitalization is made up of various dimensions, these dimensions have not been clearly identified, as will be highlighted in the following section. Accordingly, the goal of the present research is to identify the various dimensions of digitalization. To this end, this study will undertake a literature review, followed by the conceptualization and statistical validation of the dimensions of digitalization.

Literature Review

This section includes a revision of prior research on digitalization at the company level. It was found that research streams in this domain focused on four broad categories: 1) studies on the effect of digitalization on firms' activities, 2) studies on the role of digitalization for improving firms' general performance as a growth strategy or business model disruptor, 3) studies on issues linked to the digitalization process, 4) studies on how to measure digitalization. In the first category, Gbadegeshin (2019) assessed the impact of digitalization on the commercialization of high-tech solutions, while Almeida (2020) studied its impact on social relations, marketing, and sales. Westerlund (2020) addressed the relationship between digitalization and internationalization orientation, while Vadana et al. (2020) focused on digitalization's effect on international marketing. All of these studies found support for a significant impact of digitalization.

In terms of the second category, Isensee et al. (2020) systematically reviewed the relationship between organizational culture, sustainability, and digitalization, while Denicolai et al. (2021) studied how

digitalization, sustainability, and internationalization interact with each other as growth strategies. Bouwan et al. (2019) analyzed the positive impact of business model innovation (through digitalization) on firms' performance, and Gebauer et al. (2020) focused on three technology-based growth paths to improve performance. Also looking at firms' performance, Martin-Peña et al. (2020) analyzed the effect of servitization and digitalization in the manufacturing sector, Fernandez-Portillo et al. (2019) focused on digitalization and innovation as important factors, while Nasiri et al. (2020) studied the impact of digital-related capabilities. Amaral & Pecas (2021), for their part, proposed digitalization as an enabling factor that sets companies on the right track towards Industry 4.0.

In the case of the third category, Parviainen et al. (2017) established a model to help companies handle the challenges associated with digitalization, using a case-study methodology. For their part, Sestino et al. (2020) studied the role of the internet of things (IoT) and big data on firms' digitalization process, finding that these technologies are considered reengineering factors for business processes. Furthermore, Vasilev et al. (2020) assessed digitalization peculiarities in the case of universities and enterprises finding that trust, competition, entrepreneurship, and property rights are relevant factors in this process.

Finally, for the last category, Kotarba (2017) conducted a qualitative research that summarizes all potential variables that can measure digitalization in companies, while Kontić & Vidicki (2018) also suggested potential dimensions for digitalization. In spite of these efforts, digitalization remains a complex phenomenon that is difficult to measure. For example, from the abovementioned studies, some did not directly measure digitalization because of their methodological approach (e.g., Almeida et al., 2020; Amaral & Peças, 2021; Parviainen et al., 2017), while others measured digitalization based on the use of specific technologies such as artificial intelligence (Denicolai et al., 2021). On the other hand, although Kotarba (2017) proposed a list of digitalization indicators, he did not show empirical evidence about how these variables can be grouped into dimensions. Fernandez-Portillo (2019) empirically assessed various measures of digitalization, but focused on determining an overall value of digitalization rather than exploring the dimensions underlying this broad concept. Furthermore, Martín-Peña et al. (2020) proposed potential dimensions of digitalization but without empirical evidence. They used categorical variables, and the overall value of the dimension was found as the sum of these variables. Similarly, Kontić & Vidicki (2018) suggested potential dimensions for digitalization but showed only the average for each dimension, without empirical evidence to validate them. Finally, Nasiri et al. (2020) proposed four digital capabilities needed at the company level; however, other characteristics such as infrastructure were not included in their conceptualization of digitalization.

Based on the above analysis, prior studies theorized some dimensions of digitalization but without empirical evidence and in a fragmented way. Indeed, some studies focused on digital capabilities, others on infrastructure, or others on general views of this construct but no study integrated these measures to fully characterize digitalization. This weakness is important because a poor conceptualization of a construct may have severe consequences for the validity of the research, and thus, conceptualization may comprise a discussion about constructs' dimensionality (MacKenzie, 2003). Hence, the present study aims to fill this gap by empirically determining the dimensions of digitalization at the company level. Finally, it is expected that future research will work on a prioritization of these dimensions and in understanding the causal chain surrounding each one.

Conceptual Framework

Identification of Variables

The present research focused on the studies of Fernandez-Portillo (2019), Martin-Peña et al. (2020), Kontić & Vidicki (2018), and Kotarba (2017) because they measured digitalization at the company level by including not only characteristics of infrastructure but also of worker capabilities. Nevertheless, after examining the variables in each paper, it was decided not to include Martín-Peña et al. (2020)'s measures because they are categorical variables, and this research will use a dimension-reduction technique to identify the components of digitalization, which is a technique dealing only with metric variables (Lattin et al., 2003).

The indicators proposed by Kotarba (2017) are objective measures that may be difficult for company representatives to reply accurately. For example, they proposed digital spending, quantity of digital assets in the firm, number of digital transactions and others. Although for a proper evaluation, this type of measure seems to be the most appropriate, not all individuals have access to these data or have the knowledge to give suitable answers. In such cases, Wall et al. (2004)'s study claims that subjective measures are more reliable than objective measures. Accordingly, Kotarba (2017)'s indicators were also not included.

The studies by Fernandez-Portillo (2019) and Kontić & Vidicki (2018) both deal with subjective measures of digitalization by including various of its characteristics such as infrastructure and digital capabilities. Considering that subjective measures are cost effective because data can be collected through questionnaires or surveys that simultaneously elicit information on practices (Wall et al., 2004), the present study will rely on these studies' instruments.

Fernandez-Portillo (2019) suggested 14 variables to measure digitalization, while Kontić & Vidicki (2018) used 32. There are similar variables in both studies, which are shown in detail in Table 1. Some of the proposed variables in Fernandez-Portillo (2019) in some sense group together those proposed by Kontić & Vidicki (2018). Table 1 shows those variables in Fernandez-Portillo (2019) that have their equivalent in Kontić & Vidicki (2018). Accordingly, in these cases it was decided to use the variables from Kontić & Vidicki (2018) because its granularity may help a deep understanding of digitalization. (See Appendix 1 for the final list of variables included in the present study.)

Table 1. Equivalences of variables from Fernandez-Portillo (2019) and Kontić & Vidicki (2018).

Fernandez – Portillo (2019)	Kontić & Vidicki (2018)
Access to collaboration data and tools	Communication and collaboration tools are developed
Access to company data and tools	Integrated end-user data Integrated financial data Integrated operational performance data Integrated product/service performance data Integrated supply-chain performance data
Access to customer data and tools	Real-time customer data
Data-based decisions	Decisions based on data and analytics
Technological experience	Employees have experience with mobile devices and applications Employees have experience with social media tools and data Employees have experience with meta data Employees have experience with artificial intelligence Employees have experience with the internet
Digital skills	Employees have digital skills Employees have the skills necessary to conduct digital transformation
Digitalized operations in the company	The core operational processes are automated and digitized
Digital thinking	Employees think of digital technologies when they consider ways to improve

Research Methodology

Measurement Instrument

All the final 38 variables were measured on a 5-point Likert scale, following Fernandez-Portillo (2019) and Kontić & Vidicki (2018). Here, the respondents chose an option on a symmetrical scale for a series of statements. The purpose of the range of the Likert scale is to capture the intensity of respondents' feelings for a specific variable (i.e., subjective measures). Appendix 1 shows the mean and standard deviation associated with each variable.

Data Collection

The empirical approach of the present study consists of the collection of data through a survey. The survey was sent to representatives of current Peruvian SMEs. The sampling method was a non-probabilistic

technique, as the SMEs' contacts were obtained from colleagues. The profile of the 40 firms that responded to the survey is shown in Table 2.

Table 2. Profile of firms that participated in the survey

Characteristic	Answer	Absolute Frequency	Relative Frequency
Market sector	Agricultural	1	2.5%
	Construction	2	5%
	Consulting and professional services	8	20%
	Mass consumption	4	10%
	Corporations / Business groups	2	5%
	Entertainment and culture	2	5%
	Government / Non-Profit	2	5%
	Industrial / Manufacturing	2	5%
	Media, press and related	0	0%
	Mining and oil	1	2.5%
	Health	1	2.5%
	Supply services	1	2.5%
	Educational services	3	7.5%
	Financial services	1	2.5%
	Technology	6	15%
	Transportation	0	0%
	Insurance	2	5%
	Telecommunications	2	5%
	TOTAL	**40**	**100%**
Firm's size	Micro	5	12.5%
	Small	11	27.5%
	Medium	9	22.5%
	Large	15	37.5%
	TOTAL	**40**	**100%**
Firm's age	Less than 5 years	16	40%
	6 – 10 years	6	15%
	11-20 years	6	15%
	More than 20 years	12	30%
	TOTAL	**40**	**100%**

Data Analysis

As mentioned in the previous sections, the variables need to be grouped in order to identify dimensions. To achieve this goal, variables will be assessed according to their similarities through a dimension reduction technique, specifically, principal component analysis (PCA). PCA is a technique used to reduce the dimensions of a large dataset to a few components, which are taken by linear combinations of the

original variables (Lattin et al., 2003). These few components retain most of the original data's variance, while simplify the model (Lattin et al., 2003). Hence, PCA is suitable for this study.

In terms of sample size, various rules of thumb were proposed for PCA. For example, Gorsuch (1983) suggested a minimum sample size of 100, while Hatcher (1994) proposed that the sample size should be larger than five times the number of variables. Other studies have suggested more requirements on the sample size, suggesting at least 150 observations (e.g., Cattell, 1978; Hutcheson & Sofroniou N., 1999). However, other research streams have demonstrated that a sample size of 25-50 would be sufficient (Forcino, 2012), or even a sample size of 19 (Dochtermann & Jenkins, 2011). In a more recent study, through simulations, Shaukat et al. (2016) found that a sample size of 40 was sufficient to achieve the stability of eigenvalues and eigenvectors of PCA. Based on this discussion, the sample size used in the present study may be adequate; however, it will be noted in the Limitations subsection that future studies might collect larger sample sizes to validate these findings.

Results

PCA was run on the 38 questions measuring digitalization. The suitability of PCA was assessed prior to analysis. Inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3 (Laerd Statistics, 2015). In addition, Bartlett's test of sphericity was statistically significant ($p = 0.000$), indicating that PCA is feasible (Leech et al., 2004).

PCA revealed seven components that had eigenvalues greater than one and which explained 48.923%, 11.426%, 5.401%, 4.225%, 3.543%, 3.235% and 2.955% of the total variance, respectively. Hence, the seven retained components together explain almost 80% of the original data. Consequently, the seven components met the interpretability criterion, as it is suggested that the number of components that can explain at least 60% or 70% be retained (Laerd Statistics, 2015).

Furthermore, varimax orthogonal rotation was employed to aid interpretability. In general, there is a simple structure as almost every variable has only one component that loads strongly on it. However, in the case of components that loaded on more than one variable, it was decided to retain them on the variables with the highest loading. The labels given to each component and the variables loaded for each component are presented in Table 3.

Table 3. Components retained with labels

Component N°	Label of the component
1	Collaboration, support, structure, and organizational culture
2	Data and employees' analytical skills
3	Employees' technological skills and mindset
4	Technological infrastructure
5	Value obtained from the use of technology and analytics
6	External connectivity
7	Standardized processes

The first component captures the organizational preparedness to implement and boost digitalization in the company. Components 2 and 3 refer to two types of skills needed by the employees: the first makes clear the need of analytical skills, while the second refers to technological skills and mindset. Component 4 involves IT resources that the organization has, while component 5 refers to the ability of the organization to transform its technological infrastructure and analytical capabilities into organizational value. Component 6 encompasses the digitalization of transactions with external agent such as suppliers. Finally, component 7 bears on processes of the company that are standardized. For more detail about which variables are included in each component, see Appendix 2.

Discussion and Implications

The present study gathered data from Peruvian SMEs to shed light on the dimensions of digitalization. PCA results suggest that digitalization at a company level has seven dimensions: 1) collaboration, support, structure, and organizational culture; 2) data and employees' analytical skills; 3) employees' technological skills and mindset; 4) technological infrastructure; 5) value obtained from the use of technology and analytics; 6) external connectivity; and 7) standardized processes. These findings improve the current understanding of this variable.

Theoretical implications

The Literature Review section discussed the fact that, although prior studies theorized some dimensions of digitalization, they did so in a fragmented manner and in the absence of empirical evidence for their proposals. Given that digitalization is a broad concept, a poor conceptualization and validation of this construct may limit the generalization and deep understanding of this phenomenon, as suggested by MacKenzie (2003). Accordingly, this study contributes to the theory by embracing various indicators of digitalization at the same time, including not only infrastructure but also skills and value. Moreover, the methodological approach enabled this study to empirically validate those dimensions, capturing the abovementioned digitalization indicators. It thus found that digitalization is more than the dimensions of infrastructure or capabilities that were addressed by prior research; it further includes organizational characteristics, analytical skills, external connectivity, standardization of processes, and the ability to transform these features into value for the company.

Future research can also benefit from these findings. For example, academicians can further understand the role of each dimension on the well-known consequences of digitalization, and prioritize them. It would also be important to understand the causality chain for each dimension, to highlight their causes, for instance.

Practical implications

The present study also has practical implications. Managers could use these dimensions to further understand the whole digitalization process. For instance, they can prioritize dimensions to wisely invest in those that are more relevant, which is important for SMEs that have a limited budget. They can further develop a strategy to achieve the digitalization level they would like to reach. For example, components 2 (data and employees' analytical skills), 3 (employees' technological skills and mindset), and 4 (technological infrastructure) would be necessary as a previous step to achieving component 5 (value obtained from the use of technology and analytics). In addition, component 1 (collaboration, support, structure, and organizational culture) would require a longer period to change organizational culture but is also needed along the complete digitalization process. Thus, managers can use this study's findings to set a roadmap for their digitalization path.

It is also possible that managers can further assess the causes impacting on each dimension to complement their digitalization strategy, or conduct in-depth interviews to determine the best practices in each dimension to refine the whole digitalization process. In the particular case of the technological infrastructure dimension, these in-depth interviews can shed light on the specific technologies that are required by each type of company. Likewise, experts can suggest specific analytical tools or skills for dimension 2 (data and employees' analytical skills), which could vary from company to company.

Limitations and future studies

This study presents some limitations. Firstly, sample size is small. Although authors have not reached an agreement about sample requirements, prior rules of thumb suggest that this study's sample size may not be adequate. (Other studies, however, support the adequacy of the sample size.) Accordingly, future studies may collect larger sample sizes to validate these findings.

Secondly, the collected sample is made up of Peruvian SMEs, so future research may include other types of companies and other countries to further increase the external validity of these findings. Finally, in line with the previous subsections, future studies may conduct a study to prioritize these seven dimensions, to understand the causal chain for each one, and to establish best practices at each step.

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Appendix

Final list of variables taken from Kontić & Vidicki (2018) and Fernández-Portillo et al. (2019)

No.	Variables	Source	Mean	Standard Deviation
5-points Likert scale: (1) Needs significant improvement – Outstanding strength (5)				
1	Perception of ICT by the employer	Fernández-Portillo et al. (2019)	3.75	1.06
2	Employees have experience with mobile devices and applications	Kontić & Vidicki (2018)	3.93	0.97
3	Employees have experience with social media tool and data	Kontić & Vidicki (2018)	3.70	1.07
4	Employees have experience with meta data	Kontić & Vidicki (2018)	3.20	1.20
5	Employees have experience with artificial intelligence	Kontić & Vidicki (2018)	2.70	1.29
6	Employees have experience with the internet	Kontić & Vidicki (2018)	4.18	0.93
7	Employees have digital skills	Kontić & Vidicki (2018)	3.58	0.93
8	Real-time customer data	Kontić & Vidicki (2018)	3.43	1.01
9	Integrated end-user data	Kontić & Vidicki (2018)	3.53	1.01
10	Integrated financial data	Kontić & Vidicki (2018)	3.30	1.11
11	Integrated operational performance data	Kontić & Vidicki (2018)	3.33	1.10
12	Integrated product/service performance data	Kontić & Vidicki (2018)	3.33	1.05
13	Integrated supply-chain performance data	Kontić & Vidicki (2018)	3.33	1.07
5-points Likert scale: (1) Never / Almost never – Almost always / Always (5)				
14	ICT tools available in the company	Fernández-Portillo et al. (2019)	3.78	1.14
15	ICT Human Resources available in the company	Fernández-Portillo et al. (2019)	3.70	1.09
16	Employees think of digital technologies when they consider ways to improve	Kontić & Vidicki (2018)	3.73	1.11
17	Employees monitor operations in real time	Kontić & Vidicki (2018)	3.43	1.01
18	We make decisions based on data and analytics	Kontić & Vidicki (2018)	4.15	0.80
19	We define clear expectations and metrics for roles	Kontić & Vidicki (2018)	3.93	0.92
20	We systematically gather and analyze data	Kontić & Vidicki (2018)	3.88	1.04

No.	Variables	Source	Mean	Standard Deviation
21	Leaders encourage collaborative problem solving	Kontić & Vidicki (2018)	4.20	0.91
22	Employees have access to flexible computing power and storage	Kontić & Vidicki (2018)	3.58	1.13
5-points Likert scale: (1) None / Almost none – Most of them / All (5)				
23	The core operational processes are automated and digitized	Kontić & Vidicki (2018)	3.60	0.93
24	Transactions with suppliers are digitized	Kontić & Vidicki (2018)	3.60	0.98
25	Processes are standardized	Kontić & Vidicki (2018)	3.73	0.96
5-points Likert scale: (1) Strongly disagree – Strongly agree (5)				
26	Accessibility of ICT tools and infrastructures	Fernández-Portillo et al. (2019)	3.75	1.06
27	High commitment to the digitalization of the company	Fernández-Portillo et al. (2019)	3.85	1.08
28	Collaborative learning	Fernández-Portillo et al. (2019)	4.03	0.95
29	We take advantage of digital solutions whenever possible	Kontić & Vidicki (2018)	3.93	1.00
30	Collaborating is multidisciplinary as well as a across specialties	Kontić & Vidicki (2018)	3.78	1.03
31	The culture of experimentation and learning are promoted in organization	Kontić & Vidicki (2018)	3.98	1.03
32	We have centralized and decentralized decision-making process	Kontić & Vidicki (2018)	3.80	1.04
33	Our values are transparent and open	Kontić & Vidicki (2018)	4.25	0.81
34	Employees have the skills necessary to conduct digital transformation	Kontić & Vidicki (2018)	3.83	1.15
35	Employees are self-motivated	Kontić & Vidicki (2018)	3.60	1.15
36	Employees are highly competent	Kontić & Vidicki (2018)	4.03	0.83
37	Employees have entrepreneurial instincts	Kontić & Vidicki (2018)	3.78	0.89
38	Communication and collaboration tools are developed	Kontić & Vidicki (2018)	3.93	0.92

Components retained with their respective variables

Component 1: Collaboration, support, structure and organizational culture		
N° Variable	**Statement**	**Load**
37	Employees have entrepreneurial instincts.	0.852
31	The culture of experimentation and learning are promoted in the organization among employees.	0.840
28	The company encourages collaborative learning.	0.839
30	Collaboration is multidisciplinary as well as across specialties among employees.	0.826
38	Communication and collaboration tools are developed.	0.807
32	We have centralized and decentralized decision-making process among employees.	0.788
35	Employees are self-motivated.	0.742
21	Leaders of the company encourage collaborative problem-solving.	0.718
34	Employees have the skills necessary to conduct digital transformation.	0.688
33	The company has transparent and open values.	0.623
27	There is high commitment to digitalization of the company.	0.532
Component 2: Data and employees' analytical skills		
N° Variable	**Statement**	**Load**
9	Integrated end-user data.	0.865
8	Real-time customer data.	0.828
10	Integrated financial data.	0.792
12	Integrated product/service performance data.	0.792
11	Integrated operational performance data.	0.781
13	Integrated supply-chain performance data.	0.718
4	Employees' experience with meta data.	0.567
5	Employees' experience with artificial intelligence.	0.564
17	Employees are able to monitor operation in real time.	0.533

Components retained with their respective variables

Component 3: Employees' technological skills and mindset		
N° Variable	**Statement**	**Load**
2	Employees' experience with mobile devices and applications.	0.786
6	Employees' experience with the internet.	0.773
16	Employees think of digital technologies when they consider ways to improve.	0.723
7	Employees' digital skills.	0.711
23	The core operational processes are automated and digitized.	0.530
3	Employees' experience with social media tools and data.	0.522
Component 4: Technological infrastructure		
N° Variable	**Statement**	**Load**
15	ICT Human Resources are available in the company.	0.790
14	The company has ICT tools available.	0.752
36	Employees are highly competent.	0.615
1	Perception of ICT by the employer.	0.574
26	The company has full accessibility of ICT tools and infrastructures.	0.542
22	Employees have access to flexible computing power and storage.	0.506
Component 5: Value obtained from the use of technology and analytics		
N° Variable	**Statement**	**Load**
18	The company makes decisions based on data and analytics.	0.718
19	The company defines clear expectations and metrics for roles.	0.707
20	The company systematically gathers and analyzes data.	0.615
29	The company has gained an advantage from digital solutions.	0.524
Component 6: External connectivity		
N° Variable	**Statement**	**Load**
24	Transactions with suppliers are digitized.	0.586
Component 7: Standardized processes		
N° Variable	**Statement**	**Load**
25	The company has standardized processes.	0.641