

SME and digital transformation: a dream too far?

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Abstract

Digital transformation is a critical process given its correlation with innovation, new competitive advantages and ultimately with a superior business performance. However, digital transformation in SMEs is less investigated and only a small number of rather personal factors – such as owner-manager's gender, age and educational background – were identified to influence the digitalization process. This study investigates the extent to which SMEs have adopted new digital technologies and what other organizational factors are correlated with a higher level of digitalization. Data were collected from 249 organizations through a CATI survey at the beginning of COVID pandemic and were analysed using bivariate statistical methods. The results indicate that less than 2% of SMEs have a strong degree of digitalization, while almost 80% of them have a weak level. Additionally, we identified three factors which influence the degree of digitalization, namely: industry, company's age and type of product sold. Thus, professional services industry has a high degree of digitalization, while retail has the lowest one. Older companies and those which provide mostly services have recorded a higher level, while startups and enterprises which offer physical goods are the least digitized. Surprisingly, there is no correlation between the size of the firm or its organizational structure (traditional, fluid or mixed) and the degree of adoption of digital technologies. Although the digitalization is relatively weak, the pandemic was an accelerator of digital transformation that has forced companies to test and implement new business models.

Keywords: digital transformation, digitalization, SMEs, COVID pandemic.

JEL classification: M10, O33.

1. Introduction

Digitalization is not only a buzzword nowadays but is a reality which businesses cannot ignore. Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities (Gartner, 2023). Today companies have at their disposal new technologies that can be integrated into business processes to generate value, such as: big data analytics and advanced algorithms, cloud computing, location detection technologies, advanced human-machine interfaces, IoT platforms, 3D printing, multilevel customer interaction and customer profiling, or augmented reality (Martínez-Caro, Cegarra-Navarro and Alfonso-Ruiz, 2020).

The problem is that digitalization is often confused with the concept of digital transformation. Although it is a term that has started to be widely used in business, there is no clear understanding of the concept (Salesforce, 2018). More than defining digital transformation, it is important to know what the benefits are and why companies should pursue it. Previous research has shown that the more prepared organizations are to adapt to digital transformation, the more likely they are to innovate and identify new competitive advantages. If organizations develop and strengthen their ability to innovate by digitizing their business

processes, this will contribute to increased performance and competitiveness in the market (Ferreira, Fernandes and Ferreira, 2019).

Beyond the advantages offered by digital technologies, the possible downsides should not be ignored, as they can have a negative impact both at individual, organizational or societal level (Berger et al., 2021). Lack of trust in digital tools - in terms of security, confidentiality and privacy - is among the most frequently mentioned disadvantages (Salesforce, 2018). In addition, potential negative effects can also be observed at the macroeconomic level and relate to the widening gap between developed and emerging economies about how much value they can create and capture (Berger *et al.*, 2021).

However, the disadvantages are outweighed by the advantages of digitalization. This is why it is important to know to what extent companies - and SMEs in particular - are prepared for the digital transformation process. SMEs are known to have erratic behaviour in information and communication technology investments and need support to integrate digital transformation into their business strategy (Ulas, 2019).

Previous research found out that digital technologies adoption rate is low among small enterprises even for technologies that are particularly relevant, such as cloud computing. The rate at which SMEs embrace digitalization is decidedly mixed (Li *et al.*, 2018).

According to other sources (Ferreira, Fernandes and Ferreira, 2019) older entrepreneurs, university graduates and female entrepreneur are more inclined to use digital tools and integrate them into business processes. In addition, digitalisation also depends on the sector of activity.

These findings were also highlighted by other research that explained the lagging behind of SMEs in terms of business model digitization due to SME owners and managers who are not prepared for this process (Straková, Talíř and Váchal, 2022). Interestingly, the COVID pandemic has accelerated the digitization process and forced a cultural change in small firms. Due to the social restrictions imposed during the pandemic, personal interaction was limited which forced managers and employees to use new digital technologies and digital workflows such as virtual meeting technologies. This forced adaptation gave them the opportunity to see the benefits of using such tools and to convince them to continue using them afterwards (Kraus *et al.*, 2020). Moreover, for some companies the pandemic not only did not paralyze their activity but stimulated it by using digital channels and exploiting new opportunities (Gavrila Gavrila and De Lucas Ancillo, 2022).

Even though SME digitalization has received some attention (Beatty, 2017) it is still under-researched. In addition, most of the identified factors influencing SME digitization are rather personal such as owner-manager's gender, age or educational background (Ferreira, Fernandes and Ferreira, 2019). However, there is research suggesting that digitization is more advanced in certain industries and requires other types of organizational structures. Given this gap, the purpose of this paper is to identify and highlight the correlation between various organizational factors and SME's digital transformation. Thus the research question is: what organizational factors influence the degree of digitalization of an SME?

The remainder of this article is organized as follows. The following section presents the literature review while section 3 describes the research methodology. In section 4 we will discuss our results and final section concludes the paper by presenting final remarks, limitations and future research directions.

2. Literature review

Nowadays, the terms digitization and digital transformation are used interchangeably, although they mean different things. The problem is that there is no consensus on the definition of digital transformation: for example, some authors (Reis *et al.*, 2018; Vial, 2019) consider that digital transformation implies the use of digital technologies to create new business

models, which change the company's value creation path. Others (Gartner, 2023) consider that this means digitization, not digital transformation.

In fact, the two concepts actually represent distinct stages of the digital transformation process (Verhoef *et al.*, 2021). The first stage - called digitization - involves the digitization of internal and external documentation processes, without changing value creation activities (for example the use of digital surveys, online forms for the ordering process, etc.) The second stage - called digitalization - is based on the adoption digital technologies to optimize existing business processes, such as communication, distribution or relationship management. The last stage is digital transformation and involves changing the entire business model by adopting digital technologies.

However digital transformation is far too distant for SMEs given the limited resources they have. Since the large majority of resource-constrained SMEs are not equipped for this level of complexity, we can talk about digitalization not digital transformation (Eller *et al.*, 2020). Beyond budget deficiencies, other obstacles to the digital transformation of SMEs are: lack of understanding of how digital technologies work, the benefits they can bring, poor connection problems, data security and privacy issues and last but not least, the lack of a skilled workforce. Currently, SMEs use these technologies in a limited way to collect information, to keep in touch with clients by email, for online banking services, for placing orders to partners or paying invoices and taxes (Ulas, 2019).

Nevertheless the benefits of a high degree of digitalization are significant. Previous research demonstrates that digital transformation greatly improves the performance of the organization by reducing costs, increasing revenues, improving efficiency and encouraging innovation (Peng and Tao, 2022). In fact, this is the mechanism through which digital technologies ultimately lead to increased performance: the more advanced a company is on the digital transformation path, the more it strengthens its ability to innovate and identify new competitive advantages ahead of the competitors, which leads to superior performance (Ferreira, Fernandes and Ferreira, 2019). This mechanism was highlighted in certain industries, such as manufacturing (Zhao *et al.*, 2022), but it is strongest in digital related service industries (Li *et al.*, 2023). However, the simple adoption of digital technologies does not automatically improve the company's performance, unless the business model is redesigned. The problem is that SMEs have limited time and resources to experiment with new business models (Bouwman, Nikou and de Reuver, 2019). Moreover, the effect of implementing digital technologies differs from one company to another, depending on the technical background and existing infrastructure. That is why it is necessary to take into account the cost effectiveness ratio (Kilimis *et al.*, 2019) when implementing a new digital technology.

For an organization, adopting a new technology is not enough, the question is how it will be exploited? Investments made in new digital technologies must be translated into value activities such as generating new knowledge for innovation, facilitating decision making, improving relationship management in order to be effective. After all, digital transformation is about strategizing as it is about technology (Volberda *et al.*, 2021). Which means that a company needs both a strategic orientation that integrates these technologies into value creation processes (Kindermann *et al.*, 2021) and a digitalization capability that supports all value chain activities. For example, the ability to use artificial intelligence, machine learning and marketing analytics have a positive impact on logistic performance, sales process and marketing activities (Ritter and Pedersen, 2020).

Other authors distinguish more than one ability. For example, some (Verhoef *et al.*, 2021) consider that a diversified set of capabilities is needed such as: digital agility – to sense and exploit market opportunities, digital networking – to co-create value with digitally connected organizations and big data analytics – to analyze and utilize big data for decision making.

Digitalization and digital transformation can only be achieved if employees work together in a different way, by collaborating and breaking down functional silos (Holmström, 2022) to learn from one another. A flexible organizational structure could be: a) separate business units from the headquarters – a solution preferred by incumbents, b) agile organizational forms or c) digital functional areas – with IT function playing a proactive role in supporting digital value creation (Verhoef *et al.*, 2021).

Given the human, financial and organizational challenges faced by SMEs (Kraft, Lindeque and Peter, 2022), a valid question is to what degree should these firms transform digitally?

The COVID-19 pandemic has accelerated both consumers' habits changes and organizations' innovation and digital transformation, breaking with the past and leading to new business models (Gavrila Gavrila and De Lucas Ancillo, 2022). Moreover, it is considered that companies that managed to survive and prosper during the pandemic by digitalizing their processes, will serve as leadership models for the next generations of businesses (de Lucas Ancillo and Gavrila Gavrila, 2023).

3. Research methodology

As we have mentioned earlier, the goal of this research was to examine organizational factors which leads SMEs to digitalization. To achieve this goal, we conducted a survey between June-July 2020 during the state of alert generated by COVID-19 pandemic in Romania. Due to social distancing restrictions, the quantitative data was collected using a CATI method, and the questionnaire was reviewed by three university academics and pre-tested. The questionnaire was administered to 249 Romanian SMEs (between 1 and 249 employees) from different industries.

We structured the sample by quota, to ensure that it is representative in terms of company's size and economic activity. We have selected businesses from all industries: Wholesale and retail trade, Services (real estate, leasing, administrative), Professional services (legal, accounting, management, architecture, engineering), Manufacturing, Accommodation and food service activities, Transport and storage, and Construction (see Table 1). Additionally, we have included also Professional/business associations due to the fact that they offer paid services to their members therefore it may be considered an enterprise activity (European Commission, 2023). The respondents were key informants such as business owners and/or top management team members.

Table 1. Characteristics of respondents

Industry	Frequency
Wholesale and retail trade	101
Services (tourism, real estate, leasing, administrative etc.)	27
Professional/business associations	26
Production	25
Accommodation and food service activities	24
Professional services (legal, accounting, management, architecture, engineering etc)	17
Construction	13
Transport and storage	12
Education	4
TOTAL	249

To identify which organizational factors influence digitalization, we have decided to test the followings: the industry in which the organization operates, company's tenure in the market

and number of employees. Another factor is related to the organizational structure, as the digitalization process requires new arrangements. It is known that traditional structures, organized hierarchically on management levels with a chain of command from top to bottom, are ineffective in the process of digital transformation. Therefore, flexible structures are needed based on autonomous teams in which employees have the freedom to get involved in various tasks without being assigned functional roles. Consequently, we will test to what extent the organizational structure of SMEs - traditional, fluid or mixed - can facilitate digital transformation. In addition, we also tested the type of products offered (goods, services, both of them) to see if there is a connection with digitalization.

The degree of digitalization was measured using a 7-points rating scale, where 1 is very low, and 7 is very high.

After data cleaning was performed to eliminate errors and identify outliers, data was analyzed using IBM SPSS® Statistics and. For some types of scale, the data were transformed (converted from nominal variables to metric variables and vice versa), and some new variables were calculated. During the data analysis process we have used basic statistical methods, (such as frequencies distribution, mean, standard deviation), crosstabs and contingency coefficient.

4. Results and discussions

Regarding respondents' profile out of 249 organizations, 88.4% are micro-enterprises (0-9 employees), 10% are small enterprises (10-49 employees) and the remaining 1.6% are medium-sized enterprises (50 -249 employees).

Table 2. Distribution by company's size

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-9 employees	220	88.4	88.4	88.4
	10-49 employees	25	10.0	10.0	98.4
	50-249 employees	4	1.6	1.6	100.0
	Total	249	100.0	100.0	

Most companies (34.5%) have been in the market for 4-9 years, 30.% are between 10-20 years (30.5%), 23.7% are start-ups (0-3 years) while 11.2% are "mature" (over 20 years old).

Table 3. Distribution by company's age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-3 years	59	23.7	23.7	23.7
	10-20 years	76	30.5	30.5	54.2
	4-9 years	86	34.5	34.5	88.8
	Over 20 years	28	11.2	11.2	100.0
	Total	249	100.0	100.0	

An interesting finding was about the way in which SMEs are organized. Thus, although a significant percentage (38%) declares that the activity is carried out in a traditional way with specialized activities organized by departments (production, accounting, human resources, etc.) an even higher percentage (43%) operates with a mixed structure. Some activities are performed in specialized departments, while others are carried out fluidly depending on needs. Almost 1 in 5 respondents indicate that company's structure is flexible because employees are organized on projects in which people with different skills work together (see Table 4):

Table 4. Distribution by organizational structure

	Freq	%	Valid %	Cumulative %
Flexible organization structure	47	18.9	18.9	18.9
Mixed organization structure	108	43.4	43.4	62.2
Traditional organization structure	94	37.8	37.8	100.0
Total	249	100.0	100.0	

Considering the type of market addressed (consumer, business or mixed), we found out that SMEs serve all types of market. However, there is a statistically significant difference between the type of product offered and the way in which the activity is organized. Thus, 70% of the companies that sell physical goods prefer a traditional organizational structure, while 25% a mixed one. Unlike those companies, the majority of enterprises that sell services prefer a mixed organizational structure.

Digitalization is measured by the degree of adoption of new digital technologies in business processes such as digital platforms, artificial intelligence, virtual reality, blockchain, Internet of Things, robotization of process automation.

Regarding the level of digitalization (from 1=very low, to 7=very high), we found out that the mean is 2.85 and the standard deviation 1.088. The distribution of the answers is presented in the following table:

Table 5. Level of digitalization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	8.4	8.4	8.4
	2	74	29.7	29.7	38.2
	3	98	39.4	39.4	77.5
	4	39	15.7	15.7	93.2
	5	13	5.2	5.2	98.4
	6	2	.8	.8	99.2
	7	2	.8	.8	100.0
	Total	249	100.0	100.0	

Most respondents (39.4%) rated at 3 the level of adoption of digital technologies in their firm, 29.7% estimated at 2, 15.7% rated 4, 8.4% rated 1 and 5.2% rated 5. Very few respondents gave scores of 6 or 7.

To test if there is a link between the degree of digitalization and variables such as industry, company's age, size, organizational structure and type of product offered, a transformation of the variable from a metric to a categorical one was carried out. Thus, taking into account the fact that the average is 2.85, we decided that those who gave scores of 1 and 2 will form the low digitalization category, those with a score of 3 - medium digitalization and those with scores of 4, 5, 6 and 7 - high digitization. The distribution of respondents according to the field of activity is presented below:

Table 6. Industry and level of digitalization

		Other services	Associations	Trade	Production	Professional services	Total
Digitalization	High	16	8	16	5	11	56
	Low	26	7	49	11	2	95
	Medium	35	11	36	12	4	98
Total		77	26	101	28	17	249

We find that 49% of firms in trade have a low level of digitization, while 65% of firms offering professional services have a high level. Medium level of digitalization can be found in manufacturing, other services and associations. We tested the relationship between the two variables and found that there is a medium but statistically significant association between the two variables (contingency coefficient = 0.308, p-value 0.001).

We also tested the level of adoption of digital technologies and company's age. We found that start-ups have low digitalization, firms aged 4-9 years and 10-20 years have a medium level and mature companies with more than 20 years in the market have a high digitalization. Again, the correlation between these two variables - degree of digitalization and age - is medium but statistically significant (contingency coefficient 0.305, p-value 0.000).

Table 7. Age and level of digitalization

		0-3 years	10-20 years	4-9 years	Over 20 years	Total
Digitalization	High	10	11	23	12	56
	Low	35	27	25	8	95
	Medium	14	38	38	8	98
Total		59	76	86	28	249

Considering company's size and digitalization, it was found that there is no association between the two variables. There is also no association between the degree of digitalization and the organizational structure of the firm.

However, there is a partial association between the type of product sold and the level of digitalisation. Thus, 62% of companies that sell physical goods have a low level of digitalisation while firms offering services have - on the other hand - a medium level of digitalisation. The link between the two variables is weak but statistically significant. However, there is no association between those with a mixed offering (both physical goods and services) and the degree of digitalisation.

5. Conclusion

This study aimed to find out the level of digitalization of SMEs and what are the organizational factors which influence the adoption of digital technologies. As expected, an insignificant percentage of less than 2% of respondents affirm that the level of adoption of digital technologies (such as digital platforms, artificial intelligence, virtual reality, blockchain, Internet of Things, robotic process automation) is high while almost 80% declared that it is medium or low.

Considering the association between industry and business digitalization, our research confirms previous results (A4), namely, some industries are more digitized than others. Thus, companies offering professional services (consulting services, advertising, market research design, etc.) have a high degree of digitalization while firms in commerce have the lowest level. Manufacturing, construction, tourism and transport companies have a medium level of digitalization. Although it is surprising that retailers have the lowest level of digitalization, a possible explanation could be the reluctance of their own customers to use these technologies, preferring direct and personalized contact rather than robots, artificial intelligence and virtual reality.

On the other hand, digitalization correlates with company age, with companies over 20 years old having the highest adoption rate and start-ups the lowest. This result is somewhat unexpected, given that our assumption was that start-ups would be more agile and innovative

than older companies. One possible explanation is the experience that mature firms have: with a good knowledge of the market as well as the industry and competitors, they can afford to invest only in useful technologies, therefore the risk is much lower for them.

However, no correlation was found between firm size and degree of digitalization. We expected that small firms - given their limited resources compared to medium or large firms - would have a lower degree of digitization. It seems that it is not resources that explain the adoption of new technologies but rather the market experience.

Interestingly, there is no connection between the organizational structure and company's digitalization. This result contradicts previous research (A1) which suggested that digital transformation requires a much more fluid organizational structure than the traditional one based on specialized functions and departments.

In terms of product types, firms selling physical goods have a low level of digitalization while those providing services have a medium level of digitalization. Although the production of physical goods offers opportunities for automation and robotization, it seems that firms offering services are more likely to take advantage of new technologies.

The present study, however, is only a descriptive research that highlights organizational factors that are correlated with the degree of digitalization of SMEs. However, it would be interesting to investigate to what extent these correlations are maintained in the case of large companies.

In addition, the research was conducted in the first year of the COVID pandemic. Given the role of the pandemic as an accelerator of the digital transformation process, it would be useful to conduct a longitudinal research and find out how things have evolved in the last years.

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