

Original Research

Impact of Firm Size on Digitalization of Management Control: Evidence from Morocco

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Abstract

For several years, and especially during the health crisis caused by the Covid-19 pandemic, digitalization has become one of the major challenges for all companies. In this regard, several research works have been carried out to understand the possible effects of digitalization on some areas of management, such as finance (Vasarhelyi et al. 2015, Pan and Seow 2016, etc.), work organization and jobs (Dorn, 2017, etc.), Human resources (Audrin et Davoine, 2017), etc. Unfortunately, this type of work is still absent in the field of management control (Quatrone 2016; Möller et al. 2020). In this context, this article, based on a survey carried out among forty-two Moroccan companies, aims to answer two main questions. First, how can we judge the degree of management control digitalization in the studied companies? Second, does the firm size impact this digitalization? The results obtained show that the management control digitalization is considered to be "moderate" in studied companies. It has also been shown that firm size does not have a statistically significant impact on this digitalization.

Keywords: Digitalization, Management control, Firm size, SMEs.



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Introduction

For several years, with smartphones, tablets, internet, applications, artificial intelligence (AI), etc., digital is everywhere and has invaded our personal and professional lives. If the industrial revolution has changed the society of the 19th century, it is sure that digitalization is deeply changing ours. This phenomenon is accelerating more and more with the current health crisis caused by the Covid-19 pandemic. According to the international agency We Are Social and the Hootsuite platform, in 2021, 4.66 billion internet users are counted worldwide, among them, 4.2 billion people use social media.

Following Schumpeterian logic, Metais-Wiersch and Autissier (2016) demonstrate that digitalization, and to find solutions to the economic crisis of 2008, is considered a differentiation strategy adopted by companies to improve their performance. According to a 2014 study by Capgemini consulting and the MIT Center for Digital Business, the most mature companies in terms of digital transformation outperform others in their sector (Bonnet, Westerman and McAfee, 2014). Also, according to a research study by McKinsey Global Institute (MGI) on the state of digitalization in the U.S. economy, the most digitalized companies achieve higher productivity and profit margins (Gandhi et al. 2016). According to a 2019 survey conducted by The Economist Intelligence Unit in collaboration with DXC Technology of 621 companies with annual revenues of more than \$500 million, 68% of respondents confirmed an increase in annual profitability following the introduction of digitalization in their companies. Also, a 2018 survey conducted by the Bank of France showed that the use of digital technologies (cloud and big data) improves labor productivity by about 23% and overall factor productivity by about 17%. In the same vein of ideas, a survey by Deloitte (2016) showed that digitalized French SMEs are four times more likely to export than the average SME.

Aware of these advantages of digitalization and in order to position itself as an emerging country in the digital economy and ICTs (Information and Communication Technologies), Morocco has adopted several measures and plans. In 2009, the "Maroc Numeric 2013" plan was adopted, which essentially contributed to the implementation of several online administrative service sites. In 2016, Morocco adopted a new five-year plan, entitled "Maroc Digital 2020", which aimed to complete the major projects that remained open from "Maroc Numeric 2013" as well as to achieve other objectives.

In companies, digitalization affects all departments and functions: marketing, Human Resources, logistics, etc. In financial services, digitalization facilitates the collection, processing and production of data. To better understand this problematic, a few studies have been conducted during the last years (Vasarhelyi et al. 2015; Pan and Seow, 2016; Al-Htaybat and von Alberti-Alhtaybat, 2017; Cavelius et al., 2018; etc.). However, there is still a significant lack of research on management control digitalization (MCD) (Quatrone 2016; Möller et al. 2020). In this context, this study aims to highlight the MCD in forty-two companies located in Morocco. Our objective is twofold and we will therefore try to answer two main questions. First, how can we qualify the maturity degree of MCD in Moroccan companies? Second, does firm size affect significantly the MCD?

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A review of the literature related to our problematic (§1) and a presentation of our research methodological choices (§2) are necessary to conduct the statistical analysis and to present the main results obtained (§3).

Digitalization, management control and the possible impact of firm size

In this first section, we will first present the phenomenon of digitalization and its relation to management control (1.1), and then we will expose the possible effects of firm size on management control and its digitalization (1.2).

Digitalization of management control

Since the 1990s, the emergence and development of the Internet has led to a profound transformation of the production system, commonly referred to as the "digitization of the economy" or "digitalization". "Big data", "artificial intelligence", "cloud computing", "internet of things", "social networks", etc. are technologies that are imposed on all organizations and are among the main challenges for many companies around the world (Trabucchi et al., 2017). A digital company can be defined, according to Cavelius et al. (2018), as "one that has brought the use of innovative digital tools, such as Big Data, artificial intelligence, cloud computing, social networks, and the Internet of Things, into its daily operations." According to Bos (2018), digitalization is defined as the adoption of readily available technology skills that transforms the organization's responsiveness to market changes. Also, Benedetto-Meyer and Boboc (2019) consider that, the notion of digital transformation refers to the introduction of digital tools in the work activity (new equipment such as smartphones, tablets, instant communication tools, applications that allow the sharing of documents, videos, agendas, etc.).

Digitalization is leading to radical transformations that influence many areas such as strategic direction, competitiveness, business model, decision making, etc. These transformations present significant opportunities for companies (Cohen et al. 2017; Li et al. 2018). With more innovative products, giants such as Amazon, Facebook, Airbnb, Uber, etc. have really disrupted the traditional market and they are able to compete with large companies in their industries (Brasseur and Biaz, 2018). Digitalization is a decisive competitive advantage. In this context, during the last decades, some research works have been done on the advantages and benefits of digitalization for companies. According to Westerman et al, (2014, p. 33), digital should be a tool that could allow the company to achieve certain objectives such as "getting closer to their customers, empowering their employees and transforming their business processes". In the same sense, Matt et al (2015) show that the exploitation of new technologies affects productivity, business processes and innovation management. Also, Sestino et al (2020) highlights how digital transformation (Internet of Things and Big Data) can have a positive impact on many facets of business. In Morocco, according to a survey conducted by the Association des Utilisateurs des Systèmes d'Information Au Maroc (AUSIM) (Association of Users of Information Systems in Morocco) (2019), 57% of respondents confirmed that digitalization allows for "better customer service," 30.2% for "process improvement," and 10.5% for "time savings".

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In view of all these advantages, Morocco adopted a five-year program in 2009, the "Maroc Numeric 2013" plan, which focuses mainly on the following areas: broadband Internet; e-government; the local IT sector; and the computerization of small and medium-sized enterprises. In 2016, the Moroccan government adopted the "Maroc Digital 2020" plan, which is considered a four-year strategic plan and which essentially aims to develop digitalization and ICTs in the country. This plan had as objectives the dematerialization of 50% of administrative procedures, the connection of 20% of Moroccan SMEs and the reduction of the digital divide by half. Despite these efforts, the digitalization of companies in Morocco is far from a certain digital maturity. According to a survey conducted by AUSIM (2019), only 16.3% of respondents believe that their companies are advanced in the process of digitalization.

For several years, and like all other facets of organizational management (marketing, logistics, finance, etc.), management control has been strongly influenced by this phenomenon of digitalization. Management control is defined by Anthony (1965) as "the process of assuring that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" (p. 17). According to Anthony and Govindarajan (1995), management control is "the process by which managers influence other members of the organization to implement the organization's strategies" (p. 8). Since the 1990s, ERPs (Enterprise Resource Planning) have driven some MCD and are a central element in the digitization of businesses (Ross et al, 2017). However, lately, huge volumes of data, coming from multiple internal and external sources are beginning to be considered a real challenge in front of the traditional information systems of companies, hence the concept of "Big Data" which have very high capacities of storage and processing of data and characterized by the 5V: Volume, Velocity, Variety, Veracity and Value (Vasarhelyi et al., 2015). The use of this Big Data in management control is inevitable. According to a survey conducted by the International Management Control Observatory (DFCG, 2016), management control benefits from Big Data in order to improve its analytical capacity (79% of respondents) and optimize processes and costs (55% of respondents), etc.

Digitization impacts all management control tools, including management accounting, budget management, etc. Regarding management accounting, according to Becker and Nolte (2019), through digitalization, management accounting allows for improved quality, efficiency, speed, and decision making (Becker & Nolte, 2019). In budget management, a few authors (Heimel and Müller, 2019; Schön, 2018) have recently shown that, thanks to automation and predictive analytics, forecasts are made more accurately. This forecast accuracy improves the quality of analysis and decision-making. According to a survey conducted by the International Management Control Observatory (DFCG, 2016), 60% of respondents consider the management controller to be active, as a contributor or leader, in their company's digital transformation projects. According to this survey, digitalization leads to changes in tools (57%), processes (53%) and consistency capabilities (52%).

Impact of firm size on management control and its digitalization

The influence of firm size on the organization and its internal management has long been demonstrated (Mintzberg, 1982; etc.). Several research studies, both empirical and



theoretical, show that firm size is a crucial variable in explaining the diversity of content of management control tools (Chenhall, 2003). Merchant (1981), Kalika (1987), Jorissen A. et al (1997), Elhamma (2011, 2012, 2015, 2017), etc. have highlighted that management control tools are more sophisticated and developed the larger the size of the companies. This variable also has a remarkable influence on the nature of the indicators integrated in the dashboards and the adoption of some new methods of management accounting such as the ABC method (Activity Based Costing) for example.

The firm size can be considered as an important factor in the digitalization of companies. This can be explained by the human, technical and financial resources available to large companies to succeed in their digital transformation. According to a study conducted by Deloitte in 2016, 11.5% of French SMEs are able to sell their products online, compared to 47% of large companies. Also, only 11% of SMEs use digital tools compared to 36% of large companies. In addition, in the same sense, a study conducted by BPI France Le Lab (idea laboratory for SMEs-ETIs) among 1,800 leaders of SMEs and ETIs in 2017, showed that 45% of respondents still do not have a vision for the digital transformation of their company. Unfortunately, and to our knowledge, no empirical study has been conducted on the possible effects of firm size on the MCD. We can therefore formulate the following hypothesis:

H₁: Firm size has a positive impact on management control digitalization.

Methodological framework

In this second section, we will first present the characteristics of the study sample (2.1) and second, we will outline the study variables and their operationalization (2.2).

The Sample of the Study

The main characteristics of our sample are summarized in the table below.

Sector of activity		Number of employees		
Services	38,1%	Less than 100	28,6%	
Industry	33,3%	Between 100 and 200	21,4%	
Commerce	19%	Between 200 and 500	11,9%	
Construction	9,5%	More than 500	38,1%	
Total	100%	Total	100%	

Table 1. Study sample description

Regarding the sector of activity, 38.1% of the companies in the sample operate in the service sector, 33.3% of industrial companies, 19% of commercial companies and 9.5% operate in the BTP (Buildings and Public Works). Regarding the size, we have retained 50% of SMEs (with less than 200 employees according to the SME charter in Morocco) and 50% of large companies.

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The variables

In this research, to collect information on the MCD, we opted for a perceptual approach. This approach consists of an assessment by the respondent, on a five-point scale, of the average level of Management Control Digitalization in his or her company. The following question was asked: How do you rate the level of MCD in your company? (A brief explanation was provided: digitalization is the use of new information and communication technologies, the Internet, networks, applications...). The respondent had the choice between 5 answers: from "very weak digitalization" to "very strong digitalization".

In order to differentiate between companies according to their size, three main criteria or parameters can be used: share capital, turnover or number of employees. In this research, we retain the third indicator for reasons of availability of information. According to Chenhall (2003), firm size is often measured by the number of staff. Therefore, we consider as SMEs those companies employing less than 200 people according to the legislation in force in Morocco (SME Charter).

Results and discussion

This third section will be devoted to the presentation of the results of our study. We will first present the results related to the maturity degree of MCD in the studied companies (3.1), and then we will test our research hypothesis (3.2).

Maturity degree of digitalization of management control

The main results of our survey are summarized in the table below:

Table 2. Degree of MCD in the studied companies

Scale	Percentage
Very low digitization	2,4%
Low digitalization	23,8%
Medium digitization	47,6%
Strong digitization	16,7%
Very strong digitization	9,5
Total	100%



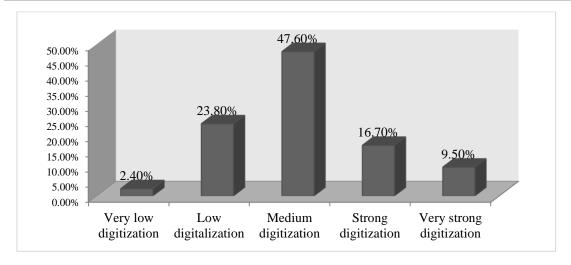


Figure 1. Maturity degree of MCD in the studied companies

The first results of this research show that the MCD can be qualified generally as "moderate". More than 47% of respondents confirmed that their management control is moderately digitalized. On the other hand, only 26.2% judged that this digitalization is "strong" or "very strong". In order to exploit all the answers in their entirety and thus have a clearer idea of the maturity degree of MCD in the studied companies, we will code the answers obtained (ranging from 1: "very weak digitalization" to 5: "very strong digitalization"). The average score obtained is 3.0714, while the maximum score is 5. Therefore, we can calculate a rate that we will call the "perceptual rate of MCD". The decision rule is the following:

Table 3. Decision rule for the perceptual rates of DMC

Average scores	Min (=1)		N	1ax (=5)
Perceptual rate of MCD	Very low if between 20% and 36%*.	Low if between 36% and 52%*.	Moderate if between 52% and 68%*.	Strong if between 68% and 84%*.	Very strong if between 84% and 100%*.

^{*} Class size= [maximum rate (100%)-minimum rate (20%)]/5

The perceptual rate of MCD is therefore equal to 3.01714/5=61.43%. These results show us that the MCD in the studied companies can be qualified as "moderate", and therefore we are far from a certain digital "maturity" of management control in the studied companies.

Digitization of management control according to the firm size

The main results concerning the possible links between firm size and the MCD are summarized in the table below:



Table 4. Maturity Degree of MCD according to the firm size

Scale	Large companies	SME
Very low digitalization	00%	4,8%
Low digitalization	19%	28,6%
Moderate digitalization	42,9%	52,4%
Strong digitalization	28,6%	4,8%
Very strong digitalization	9,5%	9,5%
Total	100%	100%

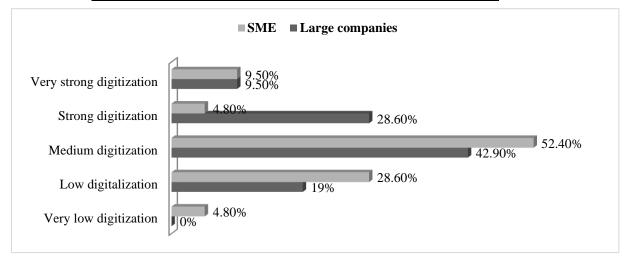


Figure 2. MCD according to the firm size

38.1% of large companies consider that their management control is "strongly" or "very strongly" digitalized, compared to only 14.3% of SMEs. On the other hand, 19% of large companies and 33.4% of SMEs consider their management control to be "weakly" or "very weakly" digitalized. These initial results support our research hypothesis that management control is more digitalized in large companies than in SMEs. To test the possible relationship between firm size and MCD, we will calculate the mean scores and perceptual rates of MCD for each category of companies.

Table 5. Average scores and perceptual rate of MCD according to the firm size

Size		Average score on 5 points		Perceptual rate of DMC		
CME	Less 100	3,1667	2 0048	63,33% (moderate)	58.10%	
SME	Between 100 and 200	2,5556	2,9048	51,11% (low)	(moderate)	
Large	Between 200 and 500	3,0000	3,2381	60% (moderate)	64.76%	
companies	More than 500	3,3125	3,2361	66,25% (moderate)	(moderate)	



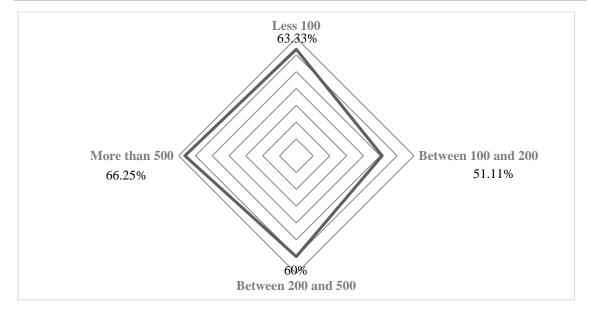


Figure 3. Perceptual rate of MCD according to the firm size

In general, the perceptual rate of MCD in large companies (64.76%) exceeds that observed in SMEs (58.10%). However, and surprisingly, the MCD in companies with less than 100 employees (63.33%) is considered higher than that observed in companies with between 100 and 500 employees (between 100 and 200, the rate is 51.11% and 60% for companies with between 200 and 500 employees). Unfortunately, these results do not allow us to make a definitive decision on the impact of firm size on the MCD in the studied companies. For this purpose, a linear regression will be used.

Table 6. Linear regression of MCD according to the firm size

Model	Non-standardized coefficients		Standardized coefficients	t (de Student)	Sig.
	В	Standard error	Beta	Student)	
(Constant)	2,871	0,229		12,527	0,000
Firm Size	0,001	0,000	0,176	1,131	0,265

According to the results of our analysis, firm size does not have a statistically significant impact on the maturity degree of Management Control Digitization in the studied companies (Beta=0.176; p>10%). The research hypothesis is rejected by our analysis. The firm size has a non-significant impact on MCD. This result is mainly explained by the acceleration of digitalization experienced by SMEs following the health crisis caused by the Convid-19 pandemic. According to a survey conducted by CISCO (2020) among SMEs in eight countries (USA, Canada, Mexico, Brazil, Chile, UK, Germany and France) shows that 70% of these SMEs are accelerating their digitalization efforts due to Covid-19. Also, a GoDaddy survey of 5265 small business owners in Australia, Canada, Germany, India, Mexico, the Philippines, Spain, Turkey, the UK, and the US (2020) shows that of those owners who have a website, more than half increased their online presence during the Covid-19 pandemic. In the same vein of ideas, and according to a Connected Commerce Council report on the digitalization of small

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businesses (2020), 72% of these businesses accelerated the use of digital tools during the Covid-19 pandemic. Also, As of May 2020, a survey by the U.S. Chamber of Commerce shows that the share of small businesses transitioning all or some of their employees to telecommuting has increased from 12% to 20%.

Conclusion

The objective of this article was to present the main results of a survey on the digitalization of management control in Moroccan companies. This study can be considered as a pioneer not only in this country but in the whole MENA region (North Africa and the Middle East). In this work, we have shown that the companies studied are far from a certain digital "maturity" in management control. We have also shown that the firm size does not have a significant impact on this digitalization.

The results obtained must be interpreted with caution in view of the limitations of our research. Two major methodological limitations must be emphasized: the small sample size and the use of a perceptual approach to collect data. In this respect, Nobre (2001) states that there can be a significant gap between discourse and actual practice.

There are many possible avenues of research, the most important of which are to answer the following questions: Compared to developed countries, why do companies in Morocco not adopt sufficiently digitalized management control? What impact does culture have on this situation? What are the main difficulties encountered by these companies in their digitalization? Etc.

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