ESI Preprints **Not Peer-reviewed**

Impact of corporate strategy on the digitalization of management control: evidence from Moroccan companies

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Doi: 10.19044/esipreprint.11.2024.p26

Approved: 07 November 2024
Posted: 09 November 2024

Cite As:
El-Moumane R. & Elhamma A. (2024). *Impact of corporate strategy on the digitalization of management control: evidence from Moroccan companies*. ESI Preprints.
https://doi.org/10.19044/esipreprint.11.2024.p26

Abstract

For several years, digitalization has become a significant and essential strategic issue for companies, affecting all their functions, including Human Resources Management (HRM), logistics, finance, etc. It is the subject of several research studies, especially in developed countries. Unfortunately, this type of work is still largely absent in developing countries. In this context, this paper, based on a survey conducted among forty-two companies in Morocco, attempts to answer two main questions. First, how can we assess the degree of digitalization of management control in these companies? Second, does corporate strategy have a significant impact on this digitalization? The main study results indicate that the level of digitalization can be classified as "moderate." Additionally, we have shown that strategy has a significant impact on the digitalization of management control; specifically, prospector companies adopt more digital management control systems than defender companies. This research work makes important contributions at both the theoretical and managerial levels.

Keywords: Digitalization, Management control, Corporate Strategy, Moroccan Companies

Introduction

The Introduction states the research question, why the research is important, and briefly reviews relevant literature and previous work.

Nowadays, digital technologies, New Information and Communication Technologies (NICT), and Artificial Intelligence (AI) are among the most commonly used terms in our daily lives. Tablets, the Internet, social networks, applications, and more are ubiquitous, affecting everyone. In January 2023, according to a report issued by "Hootsuite" and "We Are Social":

- The number of Internet users worldwide has reached 5.16 billion (98 million new users compared to 2022).
- The number of social network users is 4.76 billion (137 million new users compared to 2022).
- The number of people with cell phones is 5.44 billion (an increase of 168 million compared to 2022).

In the business world, these new technologies provide companies with tools that enable them to achieve digital transformation. These tools include websites, e-commerce platforms, and management software such as CRM (Customer Relationship Management), social networks, etc. According to Cavelius et al. (2018), a digital company can be defined as "one that has integrated innovative digital tools such as Big Data, artificial intelligence, dematerialized IT systems, social networks, and the Internet of Things into its daily operations". Bos (2018) defined digital transformation as "the adoption of readily available technological skills that transform the organization's responsiveness to market changes". According to Benga and Elhamma (2024), “digitalization offers tremendous opportunities for improving efficiency, speed, and quality of work, reducing costs, enhancing asset utilization, and optimizing the use of raw materials, labor, and other key aspects of business performance” (Benga and Elhamma, 2024, p. 110).

Given these advantages, and with information and communication technologies, artificial intelligence, Big Data, the Internet of Things, etc., all corporate functions are concerned, including HRM, marketing, logistics, etc. To better understand the use of digitalization in these departments, some research studies have been conducted in recent years (Vasarhelyi et al., 2015; Pan and Seow, 2016; Al-Htaybat and von Alberti-Alhtaybat, 2017; Cavelius et al., 2018; etc.). However, there remains a significant gap in research concerning the digitalization of management control (Elhamma and El-Moumane, 2023).

In this context, we are interested in studying the digitalization of management control in forty-two companies based in Morocco. We will attempt to answer two main questions: First, how can we assess the degree of

digitalization of management control in Moroccan companies? Second, how can we explain the variation in the digitalization of management control in relation to corporate strategy? In other words, does corporate strategy influence the digitalization of management control in Moroccan companies? The main results of this research indicate that management control systems are moderately digitalized in the surveyed companies. Additionally, corporate strategy has a significant impact on the digitalization of management control: prospector companies adopt more advanced digital management control systems compared to defender companies.

The findings of this study enhance the existing literature on the level of digitalization in management control and the potential influence of corporate strategy on this digitalization. Additionally, this research is particularly relevant for policymakers in defender Moroccan firms. To strengthen the digitalization of their management control systems, several measures should be implemented, enabling them to compete more effectively with prospector firms.

The paper is structured as follows: Section 2 summarizes previous literature reviews on related topics, while Section 3 outlines our theoretical and methodological approaches. The results are presented in Section 4. Finally, Section 5 concludes the paper by synthesizing the main contributions and implications, acknowledging the study's limitations, and proposing new avenues for future research.

Digitalization of management control and the eventual impact of the strategy

Digitalization of management control

In the business world, digitalization presents a significant strategic challenge across all sectors. Technologies such as "big data," "artificial intelligence," "cloud computing," "internet of things," and "machine learning" are increasingly influencing all corporate functions (Elhamma and El-Moumane, 2023). To better understand this issue, several studies have been conducted to explore the potential effects of digitalization on various areas of management, such as finance (Vasarhelyi et al., 2015; Pan and Seow, 2016) and work organization and jobs (Dorn, 2017). However, research on management control and its digitalization remains largely absent (Elhamma and El-Moumane, 2023).

Since its inception at General Motors in the 1920s, management control has been challenging to define, with no universally accepted definition to date. The most frequently cited formal definition comes from Robert Anthony in the early 1960s, who described management control as “the process by which management ensures that resources are obtained and used effectively and efficiently to achieve the organization's objectives”

(Anthony, 1965). This definition emphasizes setting objectives, typically derived from strategy, and verifying the effective and efficient use of resources to minimize waste. However, it reflects a primarily accounting-centric perspective, focusing on mechanical operations while neglecting the strategic and operational dimensions of organizations. In response to these limitations, Anthony redefined management control in 1988 as "the process by which managers influence other members of the organization to implement the organization's strategies" (Anthony, 1988).

For several years, management control, like all other aspects of organizational management (HRM, marketing, finance, etc.), has been significantly influenced by what is referred to as digitalization or digital transformation. This digitalization affects all management control tools, including management accounting (Appelbaum et al., 2017), budget management (Warren et al., 2015), and particularly ERP systems, which have been undergoing digitalization since the 1990s and are central to the digital transformation of companies (Ross et al., 2017). The table below (Table 1) summarizes some of the impacts of digitalization on management control.

Table 1. Impacts of digitalization on management control instruments

Management control instruments	Impacts of digitalization
Reporting	• "Digitalisation helps to improve the reporting process by enabling a higher degree of automation and standardisation (Rowbottom et al., 2021)" (Fähndrich, 2023). • "digitalisation is leading to a further increase in the use of external data, especially big data, in corporate management and reporting (Al-Htaybat & Alberti-Alhtaybat, 2017)". (Fähndrich, 2023).
Budgeting	• "The integration of external data such as big data is capable to significantly increase the accuracy and timeliness of budgeting activities (Bergmann et al., 2020)" (Fähndrich, 2023). • "The importance of the planning function is positively associated with the use of business analytics in the budgeting processes (Bergmann et al., 2020)". (Fähndrich, 2023).
Other Management Control instruments (activity-based costing; balanced scorecard; benchmarking, etc.)	• "Traditional instruments remain popular (Burns & Vaivio, 2001). However, they are used alongside new and so-called advanced MC instruments such as rolling forecasts, activity-based costing and the balanced scorecard (Burns & Vaivio, 2001, p. 390)". (Fähndrich, 2023).

Source: Author according to Fähndrich (2023).

According to a survey of companies in 38 countries conducted by the International Observatory of Management Control (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%). In addition, the results for the objectives of using big data for management controllers were as follows (Table 2):

Table 2. The main objectives of using big data for management controllers.

Objective	%
Improve analysis capability (achieved / planned)	79%
Adapting the business model to market changes	63%
Optimize processes and costs	55%
Improve the company's financial results	54%
Seek growth opportunities	52%
Enable the company to adapt to its market	46%
Adapt products/services to market needs	46%
Activate the fight against fraud	30%

Source: International Observatory of Management Control (DFCG, 2016)

Strategy and digitalization of management control

Bouquin (1999) defines strategy as "the set of actions that sustainably determine the success of an organization". Its relationship with management control has been the subject of several research studies (Simons, 1987). The literature on management control shows that strategy is an important contingent factor widely used in this type of works. In this context, Trahand (1982) shows that "there are several models, and that these models are mainly constructed on the basis of the conditions of the company's context and strategy". Langfield-Smith (1997) has also demonstrated that management control should be aligned with the strategy pursued by the organization. According to this author, "it has been suggested -in the literature- that management control systems should be explicitly tailored to support corporate strategy in order to lead to competitive advantage and superior performance".

Bouquin (1999) shows that the traditional management control model is more adapted to “cash cow” companies and those pursuing a defender strategy. De La Villarmois and Tondeur (2005) have demonstrated, based on a study of 135 large French companies, that the control systems adopted by prospector firms are more developed than those adopted by defender companies. These results are confirmed empirically by Elhamma (2011, 2012, 2013) and Elhamma and Zhang (2013) in the Moroccan context. The following hypothesis can therefore be formulated:

Research hypothesis: *In prospector companies, management control is more digitalized than that in defender companies.*

Theoretical and methodological frameworks

Contingency theory: the chosen theoretical framework

The contingency approach provides a coherent framework for analyzing organizations and is currently the dominant paradigm in the study of control systems. As Pock (2007) notes, "contingency theory posits that the internal or external environment or context of a system or organization significantly impacts its performance and efficiency." Thus, an organization must adapt to its context to improve performance.

Contingency theory is not a novel concept; it has evolved from the work of various researchers focused on organizational design, such as Mintzberg (1979). The fundamental idea is that managers and entrepreneurs tailor their organizations based on their technologies and the environments they inhabit. Ezzamel and Hart (1987) argue that "the organization of a company must account for its specific circumstances." Friedberg (2001) characterizes contingency theory as a perspective that analyzes established organizations, emphasizing how variations in their forms can be explained through social dynamics and inter-organizational or societal forces.

In the realm of management control, contingency theory suggests an interaction between management control tools, contingent factors (such as strategy, structure, and technology), and organizational performance. Otley (1980) demonstrated that for optimal performance, management control tools must align with these contingent factors. In this context, Fisher (1995) argues that “the contingent management control literature is based on the correct relationship between contingent factors and corporate control tools to achieve better performance” (Desreumaux, 1998).

Research on the digitalization of management control through the lens of contingency theory remains limited. The empirical study conducted by Elhamma and El-Moumane (2023) found that “firm size does not have a statistically significant impact on the maturity of management control digitization in the studied companies (Beta=0.176; p>10%)” (Elhamma and El-Moumane, 2023, p. 420). Similarly, Elhamma (2023) noted that “the average level of management control digitalization in service companies exceeds that of companies in other sectors; however, the difference is statistically insignificant. Thus, the sector of activity does not have a statistically significant impact on the digitalization of management control” (Elhamma, 2023, p. 65). Additionally, Elhamma (2023) confirmed that “environmental uncertainty does not significantly affect the digitalization of management control” (Elhamma, 2023, p. 8).

Methodological framework

✓ *The sample*

This study will explore the digitalization of management control in Moroccan companies. Morocco is a country located in North Africa. Historically, Morocco was influenced by Spanish and French protectorates, leading to the adoption of many management tools from the French system (Elhamma and Moalla, 2015). Recently, Moroccan companies have begun embracing modern practices, including international accounting standards (IFRS) (Elhamma, 2023, 2024), contemporary management control tools (Elhamma, 2012), and new financing methods like Islamic finance (Bennani and Elhamma, 2015).

The main characteristics of our sample are summarized in the table below (Table 3):

Table 3. The main characteristics of the sample

Legal status		**Sectors of activity**		**Employees**	
Foreign group subsidiaries	31%	Services	38.1%	Less than 100	28.6%
Moroccan group subsidiaries	45.2%	Manufacturing sector	33.3%	Between 100 and 200	21.4%
Independent companies	23.8%	Commerce	19%	Between 200 and 500	11.9%
-	-	Construction	9.5%	More than 500	38.1%
Total	100%	Total	100%	Total	100%

Our sample consists of 23.8% independent companies and 76.2% subsidiaries (31% subsidiaries of foreign groups and 45.2% subsidiaries of Moroccan groups). In terms of business sector, 38.1% of the companies operate in the service sector, 33.3% in manufacturing sector, 19% in commerce and 9.5% in construction. In terms of size, we selected 50% SMEs (with less than 200 employees, according to Morocco's SME charter) and 50% large companies.

✓ *Variable measurement*

In this research, we have a dependent variable: the digitalization of management control, and an independent variable: corporate strategy.

In this research, we adopted a perceptual approach to gather information on the digitalization of management control. The following question was posed: “How do you rate the level of digitalization of management control in your company?” (A brief explanation was provided: digitalization refers to the use of new information and communication technologies (ICTs), the Internet, networks, applications, AI, etc.). Respondents had five options to choose from, ranging from "very weak digitalization" to "very strong digitalization."

In contingent research on strategy and control, three types of strategy operationalization are generally used: by positioning, by mission, or by the typology of Miles and Snow (1978). In this research project, we have chosen the latter typology. These authors identified four types of companies based on their strategy: prospectors, defenders, analyzers, and reactors. The distinction between these four types is based on their tendency to modify their products and the markets in which they operate. The characteristics of each strategic behavior can be summarized in the following Table (Table 4):

Table 4. General characteristics of the strategic behaviors described by Miles & Snow (1978)

Strategic behavior	Characteristics
Prospector	The company is constantly seeking to develop its commercial activities and seize opportunities. It innovates, regularly experimenting with responses to environmental trends.
Defender	The company seeks to exploit new opportunities while maintaining a stable base of activities. The changing part of the portfolio is nurtured by selecting and imitating the best products and markets developed by innovative companies in the sector.
Analyst	The company is looking for a well-defined, stable field of activity in which to build a leading position in terms of quality and/or price.
Reactor	The company has not made a clear choice between the previous behaviors.

Source: Adapted, De La Villarmois and Tondeur (2005)

It necessary to point out that this typology highlights four strategies, of which only two are "pure" types (prospectors and defenders). For this reason, we retain these two strategic behaviors in this work.

Results and discussion

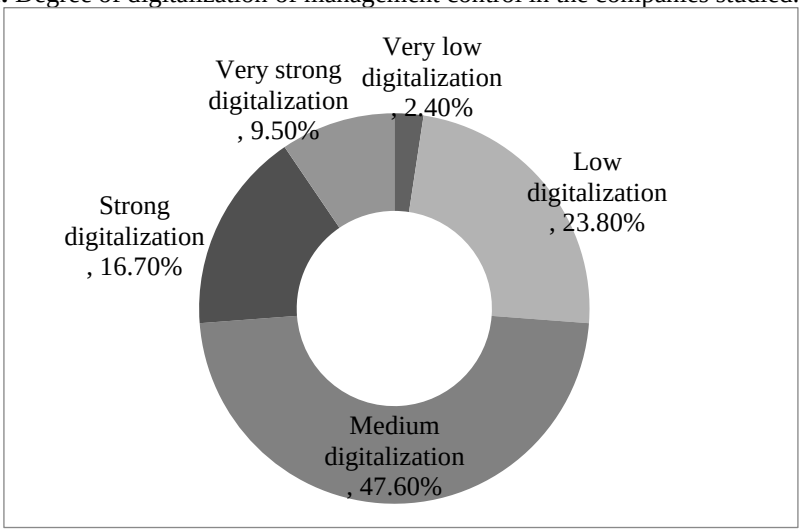
Degree of digitalization of management control in Morocco

The main results of our survey are summarized in the table below (Table 5):

Table 5. Degree of digitalization of management control in the studied companies.

Degree of digitalization of management control	Number	Percentage
Very weak digitalization	1	2.4%
Weak digitalization	10	23.8%
Moderate digitalization	20	47.6%
Strong digitalization	7	16.7%
Very strong digitalization	4	9.5%
Total	**42**	**100%**

Graph 1. Degree of digitalization of management control in the companies studied.



Over 47% of respondents confirmed that their management control is moderately digitalized. On the other hand, only 26.2% judged this digitalization to be "strong" or "very strong". These results confirm those obtained in a survey on the overall digitalization of companies carried out by the Association of Information Systems Users in Morocco (AUSIM) (2019). According to this study, 64% of respondents state that the digital transformation process is underway in their company. On the other hand, only 16.3% feel that their companies are advanced in this process.

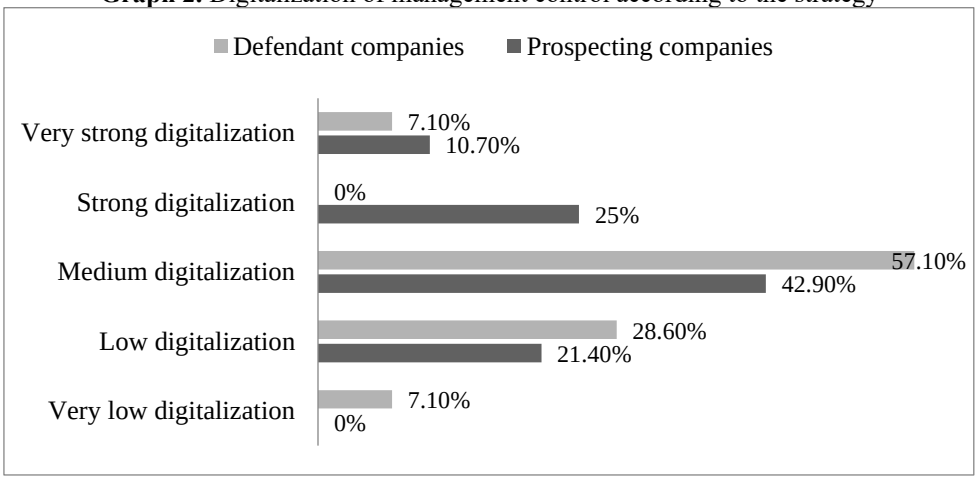
Impact of corporate strategy on digitalization of management control

The results relating to the degree of digitalization of management control as a function of strategy are summarized in the following Table (Table 6):

Table 6. Degree of digitalization of management control according to the strategy

	Prospector companies	Defender companies
Very weak digitalization	00%	7.1%
Weak digitalization	21.4%	28.6%
Moderate digitalization	42.9%	57.1%
Strong digitalization	25%	00%
Very strong digitalization	10.7%	7.1%
Total	100%	100%

Graph 2. Digitalization of management control according to the strategy



Among prospector companies, 35.7% of respondents confirmed that their management control is "strongly" or "very strongly" digitalized. In contrast, this rate is only 7.1% for defender companies. These initial results support the validation of the research hypothesis. To statistically confirm this finding, a Student's t-test for the comparison of two means will be used (Table 7).

Table 7. Student's t-test for the comparison of two means of digitalization of management control according to the strategy

	Prospectors	Defenders	Difference	test-t	Sig.
Means of digitalization of management control	2,2500	1,7143	0,53571	0,772	0,084*

** Significant at 10% level.*

The mean of the digitalization of management control in prospector companies (2.25) exceeds that in defender companies (1.71). The difference between these two means is positive (+0.53) and statistically significant at the 10% level. This result confirms the validation of our research hypothesis according to which management control is more digitalized in prospector companies than in defender companies. These results can be explained by the fact that prospectors are organizations known for their capacity to innovate through their R&D activities, which are always seeking to produce new products adapted to the new needs of their customers, and they often introduce changes in their sectors. Defenders, on the other hand, concentrate generally on activities that they have mastered, without adopting new innovations.

Conclusion

This research aimed to achieve two primary objectives: first, to assess the level of digitalization in management control among companies in Morocco, a developing country; and second, to evaluate the impact of corporate strategy on this digitalization. A questionnaire survey was conducted to meet these goals. Three key findings emerged:

- The digitalization of management control is considered 'moderate,' indicating that the studied companies have not reached a high level of digital maturity in their systems.
- Corporate strategy significantly influences the degree of digitalization in management control, with prospector companies exhibiting more advanced digitalized systems than defender firms.

This study significantly contributes to the literature on digitalization and management control by enhancing our understanding of the relationship between the digitalization of management control and corporate strategy. In contrast to much of the previous research, which has mainly addressed digitalization in general, this study is one of the first to specifically investigate the digitalization of management control in developing countries.

The findings must be interpreted with caution due to several methodological limitations inherent in our research. Specifically, these include the small sample size of only forty-two companies and the reliance on a perceptual approach for data collection. Such limitations may introduce discrepancies between reported perceptions and actual practices within the studied companies.

In this research, we studied the possible impact of strategy on the digitalization of management control. However, other factors or variables may also be used in other research works, such as managerial profile, culture, environment, etc.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

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