



Unveiling Critical Drivers for Effective Digital Transformation Leadership and its Influence on Corporate Economic Performance: A Conceptual Model and Empirical Analysis in the Landscape of Emerging Economies

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Abstract

This paper aims to conceptualize the success factors of a digital transformation (DT) strategy and analyze its impact on a company's economic performance. We explore the concepts that affect the field of DT definition and the key drivers that lead to successful DT. Through these key drivers considered as success factors, we propose a research framework linking these drivers to the DT strategy and then corporate economic performance in emerging markets. To test the research model empirically and provide a contextualized interpretation of the results, we adopted a sequential explanatory design. Initially, we performed a quantitative study through a survey among companies listed on the Casablanca Stock Exchange in Morocco. We then analyzed the collected data using the structural equation method. Next, to explain the results, we conducted a qualitative analysis through interviews with semi-structured questions. The findings show that in an emerging economy context such as Morocco, placing the customer at the core of the DT strategy, aligning the organization with the DT strategy, adopting a value system imbued with DT values, and establishing an operational roadmap to drive the change can enhance the company's digital transformation. These drivers contribute to 59.5% of the implementation of the DT strategy. Driving a DT strategy has a significant impact on companies' economic performance, contributing to 21.5% of their commercial and financial outcomes. This study highlights that the maintenance of a "phygital" business model, which mixes digital and physical business models, and the lack of human resources involvement in the DT process are specific to the emerging market context studied.

Keywords: Digital transformation, Success factors, Economic performance, Conceptual framework, Structural equation modeling, Sequential explanatory design

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Introduction

Similar to the first three industrial revolutions, this fourth one is reshaping the internal and external business environment in both developed and developing countries. As a consequence of Industry 4.0, we are assisting the emergence of Company 4.0. Balantzian defines “company 4.0” as a cognitive, ubiquitous, and connected enterprise that integrates data from both cyber and physical space. It relies partially or fully on artificial intelligence, data, and Web 4.0 technologies to generate value (Balantzian, 2018). Therefore, digital transformation (DT) goes beyond a simple dematerialization of the company's management processes. DT involves changing the company's business model to be aligned with the new DT strategy. Gong and Ribiere, in an attempt to develop a unified definition, defined DT as “A process of fundamental change, enabled by the innovative use of digital technologies accompanied by strategic leverage of key resources and capabilities, aimed at radically improving an entity (organization, business network, industry, or society) and redefining its value proposition for its stakeholders.” (Gong & Ribiere, 2021, p. 12).

Therefore, DT is a global vision of the company based on innovation that focuses on stakeholders and differentiates the company in its competitive environment. The objective is to integrate digital at the core of the company's operating system and make it a management practice for executives and operators.

DT in emerging market companies differs from DT in developed countries due to several characteristics. Emerging market businesses are characterized by a high level of informality, fragmented markets, a lack of technological infrastructure, and inadequate skills among the workforce (Ma & Zhu, 2022). Emerging market companies are more likely to adapt to local market conditions and customer preferences to create solutions that fulfill their needs (Dutta & Sarma, 2020). In contrast, developed countries usually possess more advanced technological infrastructure, greater access to funding, and a more skilled workforce. Consequently, they may be better positioned to implement large-scale DT initiatives (Rassool & Dissanayake, 2019).

Considering these factors, and intending to embrace a DT strategy, our objective is to ascertain the essential success factors required for the company to thrive in its DT journey and enhance its economic performance within an emerging market.

To begin, we discuss the research hypotheses that examine the role of each success factor in the DT strategy and the company's economic performance (1). Next, we outline the methodology used (2) and subsequently conduct an empirical test of the hypotheses using a mixed approach consisting of a quantitative structural equation study and a qualitative explanatory study (3). Lastly, we discuss the findings (4).

Literature review

According to Gong and Ribiere's Digital Transformation (DT) is defined as a process generated by a technical innovation in information technology (IT) to optimize the company's performance. This DT involves an in-depth rethink of the company's business model, necessitating organizational adjustments and placing the customer at the center of its strategy. Therefore, DT impacts the company's operational processes, value system, and human resources to digitize them (Gong & Ribiere, 2021). Below, we present the key success drivers of DT including "IT and innovation", "Business performance", "Digital Business model", "Digital Customer experience", "Organizational adjustment", "Operational process", "Digital value system & culture", and "Human Resources". We then propose hypotheses and a research model of DT success factors and their impact on performance.

The launch of the digital market was initiated by Web 2.0. Access to the Internet played an essential role in integrating digital habits into customers' lifestyles. The Digital Report 2021¹ shows the world's customer habits are transforming rapidly towards digital. Indeed, globally, 66.6% of the population has access to a smartphone or mobile phone, of whom 89.3% are connected via their mobile device. Further, 59% of the world's population is connected to the internet, with 53.6% actively using social media. In addition, 81.5% of the connected population has conducted online research for products or services, and 76.8% have concluded an online purchase. The DT has a significant impact on customer habits (Reinartz et al., 2018; Uribe-Linares et al., 2023). This evolution of habits affects the majority of customer needs. The company, putting the customer at the heart of its strategy, must be responsive to this evolution and even take proactive measures through data science.

In the same perspective, many authors have identified new customer experiences by using digital technologies like social networking, mobile, analytics, or embedded devices as key DT drivers (Brown et al., 2014; Horlacher & Hess, 2016; Ismail et al., 2017; Mićić, 2017; Morakanyane et al., 2017; Paavola et al., 2017; Piccinini et al., 2015; Schuchmann & Seufert, 2015; Solis & Szymanski, 2016). More explicitly, according to several authors, increased

¹ <https://datareportal.com/reports/digital-2021-global-overview-report>, consulted on 23/01/2022

productivity and sales, innovations in creating value, and innovative ways of interacting with customers are examples of a successful DT strategy (Gurbaxani & Dunkle, 2019; Kim et al., 2021; Koilada, 2019). Schuchmann & Seufert state that the DT focuses on the process of adjusting technology and developing new business models to better engage with digital customers at every stage of their customer experience (Schuchmann & Seufert, 2015). Stone et al. research suggests that businesses can enhance customer satisfaction, loyalty, and retention by implementing customer-centric strategies (Stone et al., 2017). Furthermore, studies have demonstrated that data analytics can be used to personalize customer experiences and increase sales (Kim et al., 2021). As a result, companies that want to stay competitive in the digital era must adopt customer-centric strategies and exploit data analytics to provide personalized experiences for their customers.

Therefore, we propose the following hypothesis: Putting the customer at the center of the DT would be a success factor of the DT strategy (H1).

According to several authors, the DT concept is in lack of a unified definition (Gong & Ribiere, 2021; Morakanyane et al., 2017; Trushkina et al., 2020; Vial, 2019). However, researchers commonly characterize DT as a major organizational change following the common use of digital tools (Brown et al., 2014; Chantias, 2017; Fitzgerald et al., 2014; Horlacher & Hess, 2016; Paavola et al., 2017; Piccinini et al., 2015).

Since 2011, Westerman has evoked the importance of DT and the use of technology in managing information (Westerman et al., 2011). Indeed, information management is an essential aspect of organizational management, whose mission is to ensure the most optimal flow of information to achieve organizational and operational objectives (Riedl et al., 2017). Companies must be prepared to invest in the required digital infrastructure and the talent necessary to support DT (Pan et al., 2022; Zhang et al., 2022).

Several authors have emphasized the importance of having a clear Information Technology (IT) strategy that is aligned with the goals of DT (Jonathan et al., 2023; Ochs & Riemann, 2019; Zhang et al., 2022). In fact, in their studies of successful DT initiatives, Jonathan et al. and Ochs et al. found that a well-defined digital strategy and information system (IS) architecture was a key success factor (Jonathan et al., 2023; Ochs & Riemann, 2019). Similarly, Zhang et al. identified IS infrastructure as a critical enabler of digital capabilities (Zhang et al., 2022).

In addition to a clear IT strategy, the importance of having a well-integrated IS infrastructure with the rest of the organization has been highlighted by several authors (Baiyere et al., 2020; Horlacher & Hess, 2016; Matt et al., 2015; Nwankpa & Roumani, 2016; Schuchmann & Seufert, 2015; Sebastian et al., 2017; Singh et al., 2018). According to these authors, successful DT initiatives are characterized by integrating digital technologies into

existing business processes. Therefore, we suggest the following hypothesis: setting up an IS infrastructure adapted to the vision of the DT Strategy would be a success factor (H2).

Since 2011, Liu et al. describe DT as "an organizational transformation that incorporates digital technologies and business processes in a digital economy." (D.-Y. Liu et al., 2011, p. 1728). According to Westerman et al., digital orientation is crucial for the success of the DT Strategy (Westerman et al., 2014). They argued that DT should start with clear and well-defined corporate and business strategies with digital orientations. This means that companies should prioritize the use of digital technologies to develop new business models and improve the customer experience. DT affects the business model in two aspects: how value is generated for customers and how value is captured.

Similarly, Trischler and Ying suggest that organizations should develop a digital business model that aligns with their overall business model. This alignment can help companies achieve their DT goals (Trischler & Li-Ying, 2023). They argued that a digital business model should be designed to leverage digital technologies to create value for customers and attain a competitive advantage.

Implementing a business model with a digital orientation can be considered a significant success factor in achieving the objectives of a DT strategy. Therefore, we maintain the following hypothesis: Implementing a digitally oriented business model would be a success factor for the DT strategy (H3).

To align with DT orientations, the company must adapt its organizational structure to optimize the DT process. The organization must be flexible with an organic organization to ensure transversal and efficient collaboration to manage the change and carry out the company's DT strategy.

Indeed, DT requires a comprehensive transformation of the organization, which should include cultural, strategic, and structural changes (Westerman et al., 2014). Thus, it is essential to adjust the company's organization according to the DT strategy. In their study, Martina et al. found that organizational factors such as leadership, communication, and culture were significant predictors of successful DT implementation (Frost et al., 2020). Similarly, other researchers have emphasized the importance of organizational changes in the success of DT initiatives (Kiron et al., 2016; Pan et al., 2022; Zhang et al., 2022).

Structural changes may be necessary for the organization to implement DT successfully. This may include changes to the organizational hierarchy, such as the creation of new departments or positions, or the formation of cross-functional teams to promote collaboration and innovation. Kiron et al. found that organizations that had dedicated DT teams were more successful in implementing DT initiatives (Kiron et al., 2016).

Therefore, we propose the following hypothesis: Adjusting the organization structure according to the DT strategy would be a success factor (H4).

According to Hinings et al., the DT deep mutation would affect the organization's values and belief systems (Hinings et al., 2018). Simons (1995) identifies the belief system as one of the four control levers for setting up a new strategy. The belief lever is used to define and communicate the core values, goals, and direction of the organization regarding the new strategy (Simons, 1995).

The digital belief system refers to the set of values, attitudes, and beliefs that an organization holds towards digital technology and its potential impact on business performance. Several studies have explored the relationship between digital beliefs and the success of DT (Bellini & Raglianti, 2023; Eikebrokk & Olsen, 2020; Solberg et al., 2020). For instance, Solberg et al. found that organizations with a digital mindset and a strong belief in digital technology as a driver of business growth had a higher success rate with their DT initiatives (Solberg et al., 2020). Also, Bellini & Raglianti highlighted the importance of having a digital mindset in the context of DT (Bellini & Raglianti, 2023). They argued that companies should embrace digital technologies and develop a digital mindset that values innovation, agility, and customer-centricity. In addition, Eikebrokk and Olsen found that a positive attitude towards digital technology among employees can facilitate the adoption and implementation of new digital tools and processes (Eikebrokk & Olsen, 2020). A digital mindset can help companies create value for customers, improve business processes, and achieve competitive advantage.

Organizational culture plays a crucial role in determining the success of DT strategy (Al-Faihani & Al-Alawi, 2020; Teichert, 2019). Indeed, top management needs to be fully on board with the DT Strategy and take the lead in incorporating digital tools into their work processes. Frimousse and Peretti underline that "one of the barriers to the development of digital in companies could be the low involvement of managers" (Frimousse & Peretti, 2017, p. 202). The authors explain that "To support the digital transformation in African VSEs/SMEs, it is necessary to increase the awareness and train managers to the challenges of digitalization that concern their vision, their organization, and their customer relations" (Frimousse & Peretti, 2017, p. 202). Successful implementation of DT by businesses has generated a digital culture that values innovation, experimentation, and risk-taking. A digital culture encourages employees to explore new technologies and ways of working that can improve business performance and create new value for customers (Kiron et al., 2016).

The transition will be smoother and more committed if the DT process is embraced by teams and managers. Therefore, we retain the following hypothesis: The lever of the digital value system would be a success factor of the DT strategy (H5).

Involving teams requires not only adherence to the value system but also a well-structured and formalized human resources strategy. A growing body of research indicates that a successful DT strategy needs the human resources (HR) department's involvement (Abbu et al., 2022a; Bajer, 2017; G. Kane, 2019).

Frimousse and Peretti affirm that the successful implementation of a digital strategy requires the involvement and support of HR during the conception and implementation phases (Frimousse & Peretti, 2017). The HR function plays a pivotal role in recruiting, developing, and retaining talent with vital digital skills to drive the transformation process (Abbu et al., 2022b; G. Kane, 2019; G. C. Kane et al., 2019). Through collaboration with HR, organizations can identify current and future skills requirements and provide employees with the necessary training and development opportunities (Bajer, 2017). Indeed, DT affects the talent, expertise, and network of HR within the company. Ismail et al. highlight the DT's simultaneous impacts on the business model, customer experience, operations, HR (including skills, talent, and culture), and networks (including the entire value system) (Ismail et al., 2017).

The HR function is also responsible for designing and implementing the appropriate organizational structure, policies, and procedures to support the transformation process (Kane & Palmer, 2019). This includes redefining job roles, creating cross-functional teams, and establishing new ways of working, such as agile methodologies and collaborative platforms (G. Kane, 2019).

The HR function can play a crucial role in driving the cultural change necessary for implementing the DT strategy (G. C. Kane et al., 2019). By promoting a culture of innovation, risk-taking, and continuous learning, HR can help employees adapt to the DT and adopt innovative ways of working (Abbu et al., 2022b; G. C. Kane et al., 2019).

HR function involvement in DT can lead to better transformation outcomes, including improved employee engagement, increased digital skills, and higher DT success rates. Therefore, we suggest the following hypothesis: The involvement of the human resources function would be a success factor for the company's digital transformation (H6).

For optimal resource allocation, the DT strategy must be broken down into multiple projects with specific objectives. The aim is to rank these objectives according to their importance and priority and set a clear DT roadmap. Schallmo and Williams explain that "the DT roadmap aims to drive the digital transformation of the company's business model. In addition to applying the entire model, it is also possible to customize the DT roadmap by combining several phases and activities" (Schallmo et al., 2018, p. 67).

Zaoui and Souissi state that the primary focus of DT actors is to establish a roadmap for the DT strategy (Zaoui & Souissi, 2020). This roadmap plays a crucial role in aligning the organization towards a common objective and providing clear paths to follow. It should define the roles, responsibilities, and timelines for each stage of the DT (Lacity & Willcocks, 2016).

Research indicates that the creation of an operational roadmap is crucial to the success of the DT Strategy. According to a survey conducted in 2015 by MIT Sloan Management Review and Deloitte, companies that develop a digital roadmap are 1.5 times more likely to achieve their DT objectives (MIT and Deloitte, 2015)².

In summary, an operational roadmap is a critical success factor in the DT. It provides a clear path to follow, aligns the organization towards a common objective, and ensures that the DT strategy is integrated with the overall business strategy. Companies that adopt a DT roadmap are more likely to achieve their DT objectives. Therefore, we propose the following hypothesis: Setting up an operational roadmap would be a success factor for the DT Strategy (H7).

Driving a DT strategy can positively impact companies' economic performance, as highlighted by several studies. For instance, a study conducted by the MIT Sloan Management Review and Deloitte revealed that companies that adopted a DT strategy outperformed their counterparts (MIT and Deloitte, 2015)³. Similarly, a McKinsey survey indicated that companies that invested in DT experienced an average increase of 9% in revenue and 26% in profits (McKinsey, 2017)⁴. Other studies have also shown that DT can positively influence some key performance indicators such as productivity, operational efficiency, and customer satisfaction. For example, a PwC study revealed that firms that invested in DT saw their productivity increase by 15% to 20% (PwC, 2016)⁵, while a Capgemini and MIT Sloan management study demonstrated that such investments led to a 13% improvement in customer satisfaction (Capgemini and MIT, 2017)⁶.

In the academic community, Varenne highlighted that the transition from a traditional business model to a digitalized business model could enhance performance (Varenne, 2020). Bughin et al. affirm that companies that successfully implement DT can see significant enhancements in business performance (Bughin et al., 2018). Guo and Wang find that DT has a favorable impact on firm performance, particularly on revenue growth and operational efficiency (Guo et al., 2023). The relationship between performance and DT has been

² <https://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/> , consulted on 10/04/2023

³ <https://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/> , consulted on 10/04/2023

⁴ <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-case-for-digital-reinvention>, consulted on 10/04/2023

⁵ <https://www.pwc.com/gx/en/industries/industries-4.0/landing-page/industry-4.0-building-your-digital-enterprise-april-2016.pdf>, consulted on 10/04/2023

⁶ https://www.capgemini.com/wp-content/uploads/2017/07/The_Digital_Advantage__How_Digital_Leaders_Outperform_their_Peers_in_Every_Industry.pdf, consulted on 10/04/2023

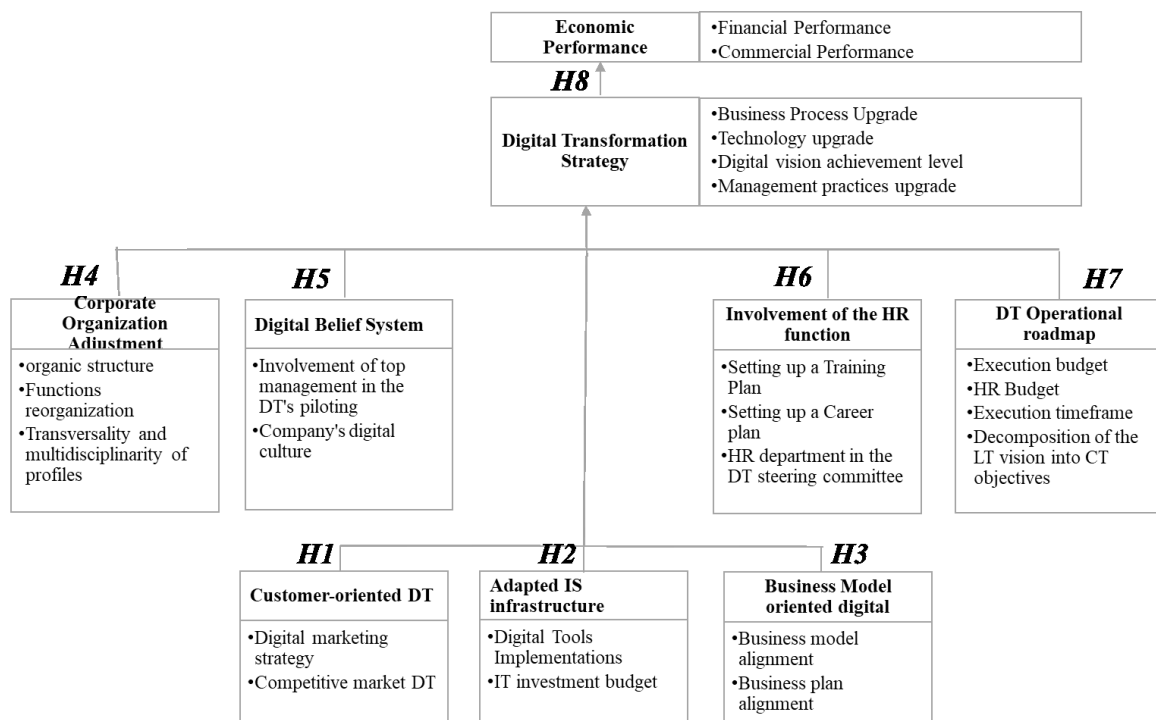
examined and demonstrated in various empirical contexts by multiple authors (Guo et al., 2023; Mubarak et al., 2019; Nwankpa & Roumani, 2016; Teng et al., 2022; Westerman et al., 2011). They argued that the digital transformation has a positive effect on performance. In the long term, DT exerts a robust and favorable influence on performance. However, in the short term, its impact remains positive but relatively weak.

Based on these professional and academic studies, we propose the following hypothesis: Setting up a DT strategy would impact the company's economic performance (H8).

Based on the different drivers of DT strategy identified as success drivers, we can present the following research model (Figure 1):

Figure 1

Proposed research model of DT success factors and their impact on Performance



Source: the authors

Methodology

We conducted explanatory sequential research according to Crewell's research design (Chih-Pei & Chang, 2017; Creswell & Creswell, 2017; Ivankova et al., 2006; Toyon, 2021). Explanatory sequential design is a research method that combines quantitative and qualitative approaches in a sequential manner. Its purpose is to enhance understanding of a phenomenon through a two-phase process. This method increases the validity of research findings by incorporating both quantitative and qualitative data. It involves an iterative process where

qualitative findings inform the design of the subsequent quantitative phase. By triangulating multiple data sources, methods, or perspectives, the explanatory sequential design provides a comprehensive basis for decision-making and practical implications (Creswell & Creswell, 2017; Ivankova et al., 2006).

First, we conduct a quantitative study of public-trade Moroccan companies. The purpose of this phase is to identify patterns, trends, or relationships between variables. Then, we conduct a qualitative study to contextualize and interpret the quantitative data and to identify nuances, complexities, and exceptions to the patterns observed in the first phase.

Sample and data collection method

The initial public offering (IPO) is an indicator of the financial health and economic performance of the company. In Morocco, the IPO remains highly regulated and limited to the most economically successful and reliable firms. Therefore, the data was collected from firms listed on the Casablanca Stock Exchange (CSE) in Morocco. The companies surveyed belong to various sectors of activity, such as industry (44.1%), services (35.3%), trade (8.8%), banks and insurance (8.8%), and other sectors.

Among the 76 listed companies in CSE⁷ surveyed by e-mail, the number of responses obtained was 34 valid forms, which is a response rate of 44.73%. The questionnaires were filled out by IT directors or digital chief officers. Generally, these managers are involved in all decisions made within the organization, including decisions related to DT strategy. Therefore, they are the most suitable persons to answer the questionnaire in their respective companies.

90.4% of the companies surveyed have a turnover exceeding 50 million dirhams, compared to only 8.8% with a turnover between 10 and 50 million dirhams. 44.1% of the companies surveyed say that the objective of DT is to upgrade the information system and improve workflow management. 32.4% consider that the objective of DT is to improve the operational performance of the company, while 23.5% consider that DT aims to dematerialize and promote sustainability. The adoption of a DT strategy is highly recommended within companies listed on the CSE since it encourages the inclusion of extra financial information related to digitalization in their reporting.

The qualitative explanatory study was carried out with the 34 valid respondents selected from the quantitative study sample and described above. They were asked open-ended questions using an interview guide. The asked questions were about how the managers explain if the key factors identified have an impact on the DT strategy from their perspective. We stopped at six interviews of in sample after reaching saturation of the collected answers.

⁷ www.casablanca-bourse.com, consulted on 16/01/2022.

Survey instruments

According to the literature review, the company should apply the following seven drivers to ensure DT Strategy implementation and improve its economic performance: adopt a customer-centric approach (DT-oriented customer: DTOC) (Horlacher & Hess, 2016); put in place an information system infrastructure that aligns with the DT Strategy's goals (Adapted IS infrastructure: AISI) (Riedl et al., 2017); develop a business model that incorporates the DT strategy's goals (Business model oriented digital: BMOD) (Iansiti & Lakhani, 2014); put in place a flexible and transversal organization structure (Corporate Organization Adjustment: COA) (B. Liu & Fu, 2011); involve the top management and commit the teams to the DT Strategy (Digital value system: DVS) (Frimousse & Peretti, 2017); involve the HR function in the DT Strategy (Involvement of the Human Resources Function: HR) (Abbu et al., 2022b); and put in place an operational roadmap (DT Operational roadmap: OR) (Zaoui & Souissi, 2020). In the context of this study, these variables are thought to be the most suitable. We employed a 5-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree". The list of success factors for the company's DT was approved via interviews with five Digital Chief Officers/IT Directors from CSE-listed companies. These five respondents were selected based on their participation in executing DT strategies within their companies and a minimum of three years of experience.

According to Creswell, in explanatory sequential design, we look for the explanation and confirmation of the results, trying to understand why we obtained these results that may converge or diverge from the theoretical context and if these results are specific to the empirical context (Creswell & Creswell, 2017). We carried out a qualitative study involving six case studies selected from the 34 companies that participated in the quantitative survey. We conducted individual semi-structured interviews using an interview guide. The interviews lasted from 33 to 55 minutes, with an average duration of 42 minutes. Every interview was audio recorded and transcribed into text to ensure comprehensive coverage. The study aimed to understand, as perceived by the managers surveyed, the effects of the 7 key factors outlined in our research model on the DT Strategy. The discussions focused on the critical aspects of a successful DT and its impact on business performance.

Data analysis method

For the quantitative study, we used the partial least squares (PLS) structural equation modeling method (J. F. Hair et al., 2019) to test the hypotheses and research model. According to Sosik et al. and Lacroux, the method PLS is appropriate for exploratory analyses and the testing of partial models in which the researcher isn't always likely to have access to significant sample sizes or reliable measurement scales (Lacroux, 2011; Sosik et al., 2009). This is typically the case for research conducted in the field of DT.

Using IBM SPSS Statistics 26, descriptive statistics were generated. In addition, the outer model and inner model were evaluated using Smart PLS-3 software. The validity of the measurement models is examined in the first step of the PLS methodology using convergent and discriminant validity.

It is necessary to evaluate several criteria, including factor loadings, average extracted variance ($AVE \geq 0.5$), reliability of individual items (≥ 0.7), and composite reliability ($CR \geq 0.7$). Variable correlation and cross-loadings are the three criteria that need to be examined to evaluate discriminant validity (Henseler et al., 2015).

The PLS method's second phase involves assessing the structural model following several factors, such as the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). According to Hair et al., this procedure is performed to test the hypotheses and research model (J. Hair et al., 2017).

For the qualitative study, responses were transcribed onto an Excel worksheet, with the companies interviewed in the columns and the semi-directive questions in the rows. This chart allowed us to construct an analysis grid at two levels: a vertical analysis within each case study to develop a comprehensive view of DT in each surveyed company, and a horizontal analysis across the cases to examine and compare the impact of each key factor on DT strategy among all surveyed companies.

Results

Following the exploratory stage and the various principal component analyses (PCA) carried out on the constructs making up the research model, the measurement scales appear stable. At this step, it is necessary to confirm these conclusions by integrating all the concepts into a single model. In this perspective, we proceed to the evaluation of the measurement model (outer model) to validate the psychometric qualities of the measurement instruments used (validity and reliability). We only have reflective constructs.

Then, we focus on the evaluation of the structural model (inner model) which allows us to verify the quality and the relations between the constructs. Then, we test the hypothesis formulated previously (rejection or acceptance) based on the significance of the path coefficient, which helps to verify the existence or not of the relationship between the different variables of the model.

Validity and reliability of reflexive constructs

For each of our reflective constructs, we check internal validity, convergent validity, and discriminant validity. Usually, internal validity is confirmed by the reliability of the items and the constructs. The reliability of the items lies in the fact that each item will share more

variance with its construct than with its error. The reliability of the constructs, or composite reliability, represents the indicators selected that will reliably compose the same construct at the level of each latent variable.

The items in the measurement model must demonstrate convergent and discriminant validity as a condition for confirming construct validity. As recommended by Hair et al. (2006), factor loadings, composite reliability, and average variance extracted (AVE) were used to assess convergent validity (J. F. Hair et al., 2006).

In general, the measure of item reliability is shown by the factor loadings of the measurement indicators (Factor loading > 0.70), construct reliability (composite reliability) (C.R. > 0.70), and convergent validity (AVE > 0.50).

In Table 1, we present the indicator loadings/weights, reliability, and AVE for all items in the model. According to Table 1, we see that all factor loadings exceed the required threshold of 0.70, except for the AISI1 item. Nevertheless, this item was not removed from the analysis, as it is still capable of producing results and exceeding at least the minimum value of 0.50 as suggested by Hair et al. (J. F. Hair et al., 2006).

Table 1

Reliability and convergent validity

First-order constructs (reflective nature)	Items	Factor Loading	Composite reliability	Average variance extracted (AVE)
DT oriented Customer	DTOC1	0.761	0.795	0.660
	DTOC2	0.861		
Adapted IS infrastructure	AISI1	0.671	0.789	0.657
	AISI2	0.929		
Business model-oriented digital	BMOD1	0.952	0.951	0.906
	BMOD2	0.952		
Corporate Organization Adjustment	COA1	0.927	0.907	0.830
	COA2	0.895		
Digital value system	DVS1	0.717	0.780	0.642
	DVS2	0.877		
Involvement of the Human Resources Function	HR1	0.925	0.872	0.773
	HR2	0.831		
DT Operational roadmap	OR3	0.923	0.897	0.813
	OR4	0.880		
Digital transformation strategy	DTS1	0.924	0.919	0.851
	DTS3	0.921		
Economic Performance	EP1	0.966	0.978	0.936
	EP2	0.979		
	EP3	0.957		

Source: The authors

According to Table 1, items COA3, HR3, OR1, OR2, DTS2, and DTS4 were removed from the model because they failed to reach the minimum value of 0.50. The composite

reliability values for all reflective constructs exceeded the cut-off value of 0.70 recommended by Black, W., and Babin, B. J. (2019). while the AVEs for each construct were above the recommended value of 0.50 as suggested by Fornell and Larcker in 1981 (Ab Hamid et al., 2017). To summarize, convergent validity has been established.

It is also necessary to check the discriminant validity of our constructs. By reading the results of Table 2, we notice that the values of the square roots of the A.V.E. (diagonal) are higher than the correlations between the different constructs (off-diagonal). This allows us to conclude that there is discriminant validity between the different constructs (Chin, 2009).

Table 2

Discriminant Validity

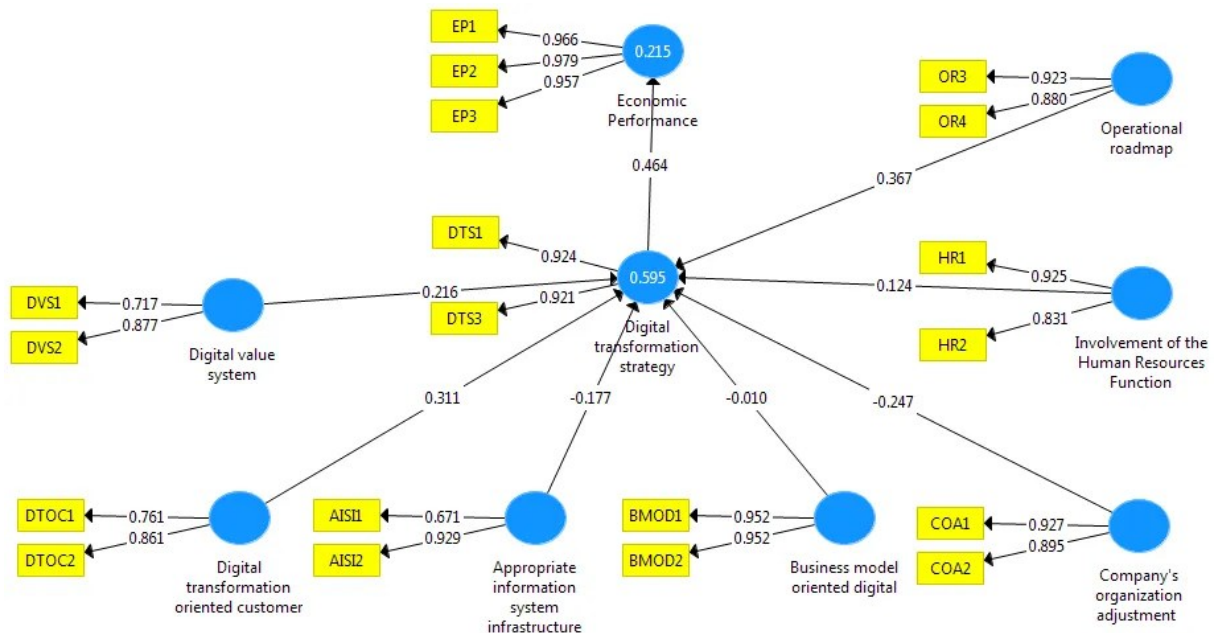
	DTOC	AISI	BMOD	COA	DVS	HR	OR	DTS	EP
Digital transformation-oriented customer (DTOC)	0.813	-	-	-	-	-	-	-	-
Adapted IS infrastructure (AISI)	-0.012	0.811	-	-	-	-	-	-	-
Business model oriented digital (BMOD)	0.537	0.196	0.952	-	-	-	-	-	-
Corporate organization Adjustment (COA)	0.005	0.423	-0.049	0.911	-	-	-	-	-
Digital value system (DVS)	0.468	0.346	0.641	0.198	0.801	-	-	-	-
Involvement of the Human Resources Function (HR)	0.255	0.414	0.405	0.159	0.301	0.879	-	-	-
DT Operational roadmap (OR)	0.363	0.243	0.476	-0.196	0.541	0.570	0.902	-	-
Digital transformation Strategy (DTS)	0.573	-0.072	0.498	0.166	0.481	0.360	0.579	0.922	-
Economic Performance (EP)	0.305	0.228	0.484	0.073	0.608	0.230	0.380	0.464	0.967

Source: the authors

After validating our measurement model, we present, in Figure 2 below, the graphical representation of the structural model specified by the SmartPLS.3 software.

Figure 2

The structural model estimated by the Smart PLS software



Source: The authors via Smart PLS-3

Validity of the structural model

After evaluating the measurement model, we analyze the structural model. The structural model includes the hypothesized relationships between the exogenous and endogenous variables in the model. Table 3 shows the results of the structural model. The explicative capacity of the estimated model can be evaluated by observing the R² of the endogenous constructs. Based on the suggestions of Falk and Miller, the R² values are greater than 0.10 so they are accepted (Falk & Miller, 1992).

The R² of digital transformation (DT) is 0.595, which indicates that the factors of DT explain 59,5% of the DT strategy. The R² of economic performance is 0.215, so DT explains 21.5% of the company's economic performance. In this study, the f² of DTOC; AISI; BMOD; COA; DVS; HR, and OR on DTS are 0.153, 0.048, 0.000, 0.114, 0.050, 0.021, and 0.170, respectively, which means that their effect sizes are acceptable, except for BMOD. In addition, the f² of DTS on EP is 0.274 which reflects a strong effect size. Accordingly, the findings show that all Q² index values are greater than zero, proving that the constructs have predictive relevance for the endogenous construct under consideration (J. Hair et al., 2017).

Furthermore, we find that DT oriented customer (DTOC) (β=0.311, p<0.01), company's organization alignment (COA) (β= -2.397, p<0.05), Digital value system (DVS) (β=3,924, p<0.01) and operational roadmap (OR) (β=2,837, p<0.01) have a significant effect on DT.

Although it was found that the company's organizational adjustment is significantly related to DT, the direction of its relationship is negative instead of positive hypothesis. Thus, the impact of DT Strategy (DTS) ($\beta=3.926$, $p<0.01$) has a significant impact on economic performance (EP). In contrast, the other relationships are not significant ($p\text{-value}> 0.05$).

hypotheses H1, H4, H5, H7 and H8 are accepted, while hypotheses H2, H3 and H6 are rejected ($p\text{-value}> 0.05$).

Table 3

Results of the Structural Model

Hypothesis	Description	Coefficient β	T-Value	R^2	Hypothesis status
H1	DTOC \rightarrow DTS	0.311	2.806**	0.595	Accepted
H2	AISI \rightarrow DTS	-0.177	0.858		Rejected
H3	BMOD \rightarrow DTS	-0.010	0.047		Rejected
H4	COA \rightarrow DTS	-0.247	2.397*		Accepted
H5	DVS \rightarrow DTS	0.216	3.924**		Accepted
H6	IHRF \rightarrow DTS	0.124	0.613		Rejected
H7	OR \rightarrow DTS	0.367	2.837**	0.215	Accepted
H8	DTS \rightarrow EP	0.464	3.926**		Accepted

Source: The authors

Discussion

To discuss the main findings, we focus on the statistical results related to the empirical tests of the relationships between the independent and dependent variables.

As shown in Table 3, the R^2 value of 0.595 indicates that 59.5% of the variation in driving a successful DT strategy can be explained by: putting the customer at the center of the DT strategy, adjusting the organization according to the DT, enhancing the digital value system, and setting up an operational roadmap. However, providing an appropriate IS infrastructure, setting up a business model oriented digital, and involving the HR function have no impact on the success of a DT strategy in the Moroccan context. Also, the presumed relationship between the adoption of a DT strategy and the economic performance of the firm is statistically significant, The R^2 value of 0.215 indicates that 21.5% of the variation in economic performance can be explained by setting up a DT strategy.

To explain the results, which are mainly related to the empirical ground, we refer to the qualitative explanatory study (Creswell & Creswell, 2017) to deepen the understanding of the DT phenomenon in our empirical context and to explain and increase the validity of the research findings.

H1: Putting the customer at the center of the DT would be a success factor of the DT strategy. (Hypothesis accepted)

In the Moroccan context, according to the Digital Report 2021⁸, 98.1% of the national population has access to a smartphone, and 89.6% have a mobile connection. Therefore, the digital economy has a large national market, and the potential customer has the technological device required to access this market. Therefore, the studied companies argue that the purpose of the DT strategy is to improve the customer experience and provide them with relevant and original added value.

The result is supported by various authors who affirm that orienting the DT strategy towards the customer is one of the factors contributing to its success (Brown et al., 2014; Horlacher & Hess, 2016; Ismail et al., 2017; Paavola et al., 2017; Piccinini et al., 2015; Solis & Szymanski, 2016). One of the key elements that impacts customer acceptance of digital innovation is customer experience. Ramesh explains that the success of DT hinges on digital customer experience (Ramesh, 2022).

Overall, the hypothesis suggests that a focus on customer-centric orientation is an important success factor in a DT strategy. The statistical results show a significant correlation between customer-centric orientation and DT strategy.

H2: Setting up an IS infrastructure adapted to the vision of the DT strategy would be a success factor (Hypothesis rejected).

Several sources support the importance of having a robust IS infrastructure to enhance the success of DT. Indeed, the DT of the company has been defined by several authors as the integration of new digital technology in the managerial processes (Brown et al., 2014; Fitzgerald et al., 2014; Gong & Ribiere, 2021; Jonathan et al., 2023; Schwertner, 2017; Westerman et al., 2011, 2014). Additionally, a study by Srinivasan and Chen in the Harvard Business Review found that successful digitalized firms have a strong focus on digital technology and invest in domains such as data analytics, cloud computing, and mobile applications (Srinivasan & Chen, 2019).

However, in the Harvard Business Review, Tabrizi et al. found that successful DT is not about technology. According to the authors, many companies struggle with their DT initiatives because they tend to focus on technologies rather than integrating the change into their overall business strategy (Tabrizi et al., 2019).

In the Moroccan context, the companies are all computerized and have the necessary IS infrastructure to implement the DT strategy. However, this IS infrastructure is not integrated into the managerial processes necessary to accomplish a real DT. According to an interviewed manager from our sample, he explains that “The digitalized enterprise is based on a networked economy and linked to digital platforms. In this context, the IS infrastructure

⁸ <https://datareportal.com/reports/digital-2021-global-overview-report>, consulted on 23/01/2022

becomes an imperative that represents a barrier to entry for the DT Strategy”. Thus, the availability of an IS infrastructure is not a success factor for the company's DT, but its unavailability can be a barrier to DT.

To sum up, the integration of IT into the managerial processes would impact the DT strategy. This result is consistent with the rejection of hypothesis H3. Indeed, as the managerial processes and business model are not completely digitalized, the IS infrastructure wouldn't be a success factor.

H3: Implementing a digitally oriented business model would be a success factor for the DT strategy (Hypothesis rejected).

Contrary to the postulates of several authors who affirm that the adoption of a DT strategy is accompanied by a fundamental change in the business model (Hartl & Hess, 2017; Horlacher & Hess, 2016; Iansiti & Lakhani, 2014; Ismail et al., 2017; Paavola et al., 2017; Piccinini et al., 2015), our empirical results show that, in the Moroccan context, the companies don't prioritize redesigning their business model when implementing a DT strategy. The business model is not aligned with the DT strategy, regardless of its maturity phase. To explain that, an interviewed manager from our sample affirms that: “although the digital economy market targets a potentially large and accessible national customer population, this population does not fully adhere to the concept due to the cultural blockage that prevents the transition to the digital market”. Indeed, according to the Digital Report 20219, 81.5% of the Moroccan population has done an online search to buy a product or a service, and only 2% of this population has concluded this purchase online.

Again, according to a second interviewed manager from our sample: “The Moroccan customer practices "research online and purchase offline". This forces our company to maintain physical stores while giving them more importance over digital commerce platforms”. As a result, the revenue generated from the digital economy remains limited in the Moroccan context, and Moroccan companies are reluctant to adopt a new business model. In some cases, companies adopt a “phygital business model”, which combines the traditional physical business model with some modern digital processes. E-commerce revenue in developed countries represents a larger portion of overall retail sales, while in emerging countries, e-commerce is still growing and represents a smaller portion of retail sales (Global, s. d.; Mirmiran & Shams, 2014).

H4: Adjusting the organization according to the DT strategy would be a success factor (Hypothesis accepted).

⁹ <https://datareportal.com/reports/digital-2021-morocco?rq=morocco>, consulted on 23/01/2022

This hypothesis can be interpreted through contingency theory, which suggests that an organization must adapt its structure and operations to its environment and objectives. In the case of a DT strategy, the environment is characterized by rapidly changing technology and practices, which require a high degree of flexibility and adaptability from the organization. So, the adjustment of the company's organizational structure is essential to implement a specific strategy, and in our case a DT strategy. This affects the organization's design through a transformation of the value-creation process in companies (Kretschmer & Khashabi, 2020). DT requires a change in organizational structures because companies must establish managerial practices to regulate this complex transformation (Matt et al., 2015). The DT process also necessitates restructuring functions after the structural reorganization. It is necessary to refocus on high-potential functions to enhance the DT strategy's success.

However, in the Moroccan context and through the sample studied, which is composed of companies listed on the stock exchange, all these companies have a hierarchical structure that lacks flexibility. Although they are conscious of the importance of structural flexibility in terms of efficiency in the management of profound changes, they remain not very open to the execution of this organizational adaptation.

H5: The lever of the digital value system would be a success factor of the DT strategy (Hypothesis accepted).

This result indicates that leveraging the digital value system is a reliable predictor of DT success. The ability of organizations to cultivate a digital value system is a critical success factor in DT Strategy. Cultivating digital skills, knowledge, and culture is part of the digital value system (Bughin et al., 2018).

Developing a digital value system entails creating a digital corporate culture to influence the employees' mindsets (Solis & Szymanski, 2016). The responsibility of top management is to promote this digital culture and encourage employees' involvement in this value system (Simons, 1994). Several studies have highlighted the importance of cultivating a digital value system in DT strategy. For instance, Bughin et al. (2018) found that organizations that invested in developing digital skills, knowledge, and culture were more likely to accomplish their DT goals and generate new sources of value for their customers (Bughin et al., 2018). Similarly, studies by Hemerling and Weritz et al. showed that organizations that promoted a digital culture were more likely to succeed in their DT and form a more agile and innovative organization (Hemerling et al., 2018; Weritz et al., 2020).

According to the findings, the leadership of top management, through the introduction of digital culture and the involvement of employees in this culture, favors the implementation of the DT Strategy. This result highlights the importance of cultivating a digital mindset and an innovation culture in the Moroccan context.

H6: The involvement of the HR function would be a success factor for the company's digital transformation (Hypothesis rejected).

While HR can play a crucial role in driving DT by hiring and developing the necessary talent, shaping the organizational culture, and aligning employee performance with digital objectives (G. Kane, 2019), the empirical evidence on the impact of HR involvement on the success of DT is mixed.

Some studies suggest that the involvement of HR is positively associated with the success of DT initiatives. For example, a survey by Deloitte in 2017 found that companies involving HR in DT strategy were more likely to achieve their goals and have a positive return on investment (Digital HR, s. d.). Similarly, a study by Abbu et al. states that companies investing in HR practices such as talent management and performance assessment are more likely to enhance DT success (Abbu et al., 2022b).

However, other studies have found a partial correlation between HR involvement and DT success. Nicolas-Agustin et al. found that HR involvement was not a fully significant predictor of DT success in Italian firms (Nicolas-Agustin et al., 2022). Another study by Yakhontova found that HR involvement had a weak and indirect effect on DT success through its impact on other factors such as leadership and innovation (Yakhontova Yelena, 2019).

The implementation of the DT strategy impacts the structure and organization of the company (Matt et al., 2015). With this organizational change, the functions and skills would change according to the DT Strategy. Among the companies studied, only two include the HR manager as a member of the DT steering committee. These companies do not have career or training plans because they do not give much importance to the social aspect of DT. This social aspect isn't considered a priority as long as their business model remains unchanged. To explain this, according to one of the managers interviewed in our sample: “involving human resources to accompany the digital transformation is a relatively early action considering the maturity level of our digital transformation. We have not yet reoriented our business model towards a digital one; the current changes are not generating resistance, and the profiles recruited are still traditional and not DT-oriented”.

Consequently, while the involvement of HR can be a critical enabler of DT success, the empirical evidence regarding its impact suggests that HR function involvement is not a crucial success factor for the DT strategy in our study context.

H7: Setting up an operational roadmap is a success factor for the DT Strategy (Hypothesis accepted).

In practice, companies face difficulties implementing the DT strategy due to the depth and complexity of the resulting change. This change affects all aspects and levels of the organization (Issa et al., 2018; Ziyadin et al., 2019). Leading the DT strategy implementation is an imperative felt by the studied companies. They sometimes rely on an external Chief Digital Officer to lead the project and guarantee DT success. The DT is managed by breaking down long-term orientations into short-term objectives. Execution time and project management are the factors that have the highest impact on the relevance of the DT roadmap.

Several studies have found that companies that develop a detailed operational roadmap are more likely to achieve their DT objectives (Al-Ruithe et al., 2018; Ismail et al., 2017; Matt et al., 2015; Mičić, 2017; Morakanyane et al., 2017; Paavola et al., 2017; Solis & Szymanski, 2016). Also, a survey conducted by PwC in 2018 affirms that companies with a clear DT roadmap were 1.5 times more likely to achieve their objectives than those without (PWC, 2018) 10.

To sum up, setting up an operational roadmap is a success factor for the DT Strategy. A clear and detailed roadmap can help organizations align their activities and priorities and ensure that all stakeholders are working towards the same goals.

H8: Setting up a DT strategy would impact the company's economic performance (Hypothesis accepted).

The hypothesis suggests that the adoption of a DT strategy would affect the economic performance of companies. The findings indicate a positive relationship between the two variables, and the adoption of the DT Strategy can explain 21.5% of the improvement in economic performance.

The scientific community has linked DT to economic performance (Li, 2022; Manfren et al., 2022; Zhai et al., 2022). Indeed, according to a study carried out in 2013 by the Massachusetts Institute of Technology, companies that implemented a DT strategy were 26% more profitable than the standard, generated 9% more income from their assets, and earned 12% higher stock market values than other large companies in similar industries (Chris, 2016)11.

Overall, and following several authors (Galindo-Martin et al., 2019; Gong & Ribiere, 2023; Ismail et al., 2017; Morakanyane et al., 2017; Nwankpa & Roumani, 2016; Paavola et al., 2017; Zhai et al., 2022) the result suggests that adopting a DT strategy is profitable for companies' economic performance. By investing in DT initiatives, companies can improve

¹⁰ PwC. (2018). Industry 4.0: Building your digital enterprise. Retrieved from <https://www.pwc.com/gx/en/industries/industries-4.0/landing-page/industry-4.0-building-your-digital-enterprise-april-2018.pdf>, consulted on 16/04/2023

¹¹ <https://ide.mit.edu/insights/digitally-mature-firms-are-26-more-profitable-than-their-peers/#:~:text=Digitati%20%E2%80%94%20the%2025%25%20of%20firms,large%20firms%20in%20their%20industries>. Consulted on 13/02/2022.

their revenue, profitability, and productivity, which can have a significant impact on their overall financial success. In conclusion, setting up a DT strategy impacts the companies' economic performance positively.

Conclusion

Our conceptual model includes the main concepts used to implement corporate DT strategy. We have identified these concepts as imperative drivers or success factors of the DT Strategy. In this way, we can make a scientific contribution with our definition of corporate DT, which we define as “a profound transformation enabled by the use of new technologies and which affects the culture, organization structure, business processes and, consequently, the business model of the firms to make it more pragmatic by optimizing the company's economic and operational performance” (the authors).

Through the empirical quantitative testing of the model, the results obtained show that putting the customer at the center of the DT strategy, adjusting the company organization, adopting a digital value system, and setting up a roadmap explain 59.5% of the DT strategy success. The DT strategy explains 21.5% of the company's economic performance.

Prioritizing investments in the right digital technologies that support the DT strategy objectives is no longer considered a success factor but an essential requirement for DT. What makes the IS infrastructure a success factor for DT is its integration into the overall digital strategy and business model.

The contextualization of our theoretical model in the Moroccan emerging market allowed us to identify some specificities of DT in this emerging context. The results of the explanatory qualitative study allowed us to conclude that companies belonging to an emerging market do not engage in the redefinition of their business model and their HR policies towards a completely digitalized model. Indeed, in our Moroccan emerging market context, the involvement of HR in the DT strategy is not considered a crucial driver, even though the HR function can identify skills gaps, develop talent acquisition and retention strategies, and promote a culture of digital innovation. Similarly, adopting a digital business model that aligns with the company's goals and objectives and outlines how the company will leverage digital technologies to improve its customer experience isn't yet a policy applied by managers in emerging markets due to the minor digital market share. The potential customer still prefers the physical market in developing countries.

The main limitation of our work is related to the empirical inability to measure the maturity level of DT, especially since the companies studied are in the primary phase of their DT strategy (Teichert, 2019). The maturity of DT is a critical element for the DT strategy of the studied companies, considering the fast transformation of the international market and its

globalization. Working on the measurement of DT maturity and expanding the sample of the empirical study to make it representative are research issues that will allow us to improve our model and generalize the findings to all emerging markets. Also, exploring the impact of DT on different industries, organizational sizes, and geographic regions can be a research issue to gain a comprehensive understanding of the factors that influence DT success.

Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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