

Examining the Necessary Conditions for Successful Digital Transformation: A Case Study of Moroccan Companies

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ABSTRACT

Internet spread and digital technology reshapes the landscape of whole industries and revolutionizes the traditional flows of goods. This technological development, which affects the world economy, is not without consequences for Moroccan firms, as they have to initiate and achieve a competitive digital transformation. This digitization is a matter of companies having a clear and coherent digital strategy, integrating new technology tools, questioning their business models and how value is built and delivered. This paper aims, particularly for companies at national level, to address and analysis the challenges and opportunities that are presented by digital transformation. In terms of methodology, with Moroccan companies we have adopted an exploratory qualitative-quantitative approach. The results of this study highlight the fact that human capital, funding and methodological support are the major challenges facing Moroccan companies.

Keywords: Digital Transformation, Digitization, Supply Chain, Sustainable Development, Smart Factories.

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I. INTRODUCTION

Technological revolutions are disrupting the economic sectors of the 21st century as the industrial revolution did before in the 19th century. According to Agrawal and his colleagues (2015) technical progress, which opens up new economic opportunities, gives rise to new products, services, and working methods (Agrawal *et al.*, 2015). Digital transformation is now a key requirement for a business to succeed on its market, which is also a true lever for performance. In fact, companies are being digitalised, this is no longer an option. The way companies operate is disrupted. It forces firms, by a paradigm change imposed by new technologies, to reinvent themselves during a forced march. It affects relationships and interactions within their teams, but also in their external relationships (Okorie *et al.*, 2018).

In addition, it offers huge opportunities for information processing and analysis in companies in all fields: it allows cost reduction, creates a new dialog with customers, and improving the efficiency of businesses. Companies are aware of these opportunities and are involved in a digital transformation process (Smith, 2016). This latter transforms the organization of work: not because it allows all the organization processes to be digitised, but above all because it requires a new balance between autonomy and control over employees to be redeveloped in detail in each company.

At a point when, through economic partnerships in the EU in particular and free trade arrangements with Arab countries, the Moroccan economy is opening up increasingly to international markets, Moroccan companies are confronted by ever-increasing competition, which inevitably leads to

failure of some, to survival of others and to success of those who will be able to take the digital transformation train already underway (Hatim, 2020).

In line with this view, a number of business leaders may consider digital transformation a source of anxiety. They need to experiment with new methods of work that combine experience sharing, teamwork, strong customer collaboration, creativity and innovation. Digital technology can help solve these challenges if we know how to take advantage of the opportunity. In this context, the following problem arises: **What are the key competencies and capabilities for the success of company digitalisation?**

This paper will explore the perception of managers of companies regarding the possibilities arising from digitalization. To that end, with Moroccan companies, we have adopted a quality-quantitative exploratory approach. The aim of the study is to understand and to identify the opportunities offered by the revolution and the challenges to be overcome in order to continue the digital transition of companies in Morocco. As through the literature multiple factors were required for the success of digital transformation, these factors were resumed as three assumptions as follows; **(H1)** The achievement of the digital transformation depends on certain competencies, **(H2)** the innovation and collaboration capacity of the company is connected to a developed digital transformation level and **(H3)** The absence of digital incorporation in a business strategy links to a weak digital transformation.

The remainder of this paper is explained as follows: Section I entails the introduction, Section II discusses the

previous studies regarding digital transformation and its requirements, Section III states the methodology used for this research paper, Section IV indicates the results, Section V states the discussion of the research and last the conclusion which includes the resume of the paper's outlines and limits.

II. GENERAL FRAMEWORK: BEHIND THE TRANSITION TO DIGITAL

Modern history knew what is called Gille (1978) the first periods of technological systems which changed relationships between power, hustled the architecture of value, and finally destabilized institutions. Not in recent years and exactly in the 1980s Foster (1986) had already predicted that the manufacturing industry and a large part of the servicing industries would undergo changes when computerization started to spread in economic and social life (Foster *et al.*, 1986). Simultaneously, Porter and Millar (1985) emphasized the way IT changes the way companies operate, creating new processes which generate greater value for their clients (Porter & Millar, 1985). These statements were as a strongly accurate prediction with the major and biggest advancement in technology in the 2000s.

In order to understand the extent of digital transformation, it will first be necessary to understand the computerization of the economy which, according to Degryse (2016), is the source of globalization and financialization with the impact of the transformation of nature. of products, how they are produced, the definition of skills and jobs, the form of competition, market balance and the relationship between nations (Degryse, 2016). For this he suggests not to distinguish between usage that is the consequences and causes of computerization, because the computing application is designed and managed by the enterprises that have invested in computer programs and plain (Degryse, 2015). It also suggests that there will be an obvious relation between the ubiquity of the IT resource and globalization of the economy. In order to avoid dissociating uses resulting from computerisation and from computerisation, Degryse (2016) questions the apparent link between the ubiquity of IT resources and the globalization of the economy, because the designs of computer applications are carried out by companies which are investing in computer programmes and which are platform-based (Degryse, 2016).

Throughout the literature, multiple contributions related to computerization were found. Researchers studied the magnitude of digitalisation from different perspectives. Distance barriers have been removed by computerization. Companies are able to relocate their production to low-cost countries with a curfew for real-time access to information. Thanks to automation, computerisation has enabled estimating transport costs (Delmond *et al.*, 2016). Computerization allows banks to access finance markets around the world simultaneously, using powerful algorithms for transactions in real time (Schinckus, 2018). Vial (2019) defines the transformation of digital technology as transformations induced at an alarming pace by developing digital technologies, which disturb the way value is created, social interactions, and business conduct (Vial, 2019). Digital transformation is part of what Kotarba (2018) calls

innovation through full transformation which, along with procedural novices, product innovation and business valuation innovation, is a fourth and ultimate type of innovation (Kotarba, 2018). Experience of the customer. Digital transformation as an innovation strategy promotes business performance through new ICT investments or the strengthening of the use of existing ICT (Majchrzak *et al.*, 2016).

Digital transformation is more effective as it fully transforms a company's business model or the entire value chain into one industry, configuring its products, procedures and customer experiences with a fair cost-benefits-for-consumer or industrial buyer-to-consumer balance. The digital transformation can be seen as a threat as well as an opportunity according to Bermen and Marshall (2014); from one hand, the frenetic rates of changes brought on by digital technologies disrupt business practices that threaten existing business models. From the other hand, in a wide variety of industries, digital systems provide new opportunities for the development of business models (Berman & Marshall, 2014).

According to Smith (2016) The digital economy is a training economy, a knowledge economy, systemic and network operations, an economy that plays with time and space (Smith, 2016). It leads to the development of new business models based on an interactive customer relationship (Bukht & Heeks, 2017). Economic digitalization generates networks based on additional products and services, which create digital innovations such as banking cards and ATMs (Skotarenko *et al.*, 2019). The traditional intermediaries are disappearing, consumers undoubtedly crossed service providers. The Internet enables the company to facilitate business / client relations so that information on current or prospective custodians' tastes can be collected (Mottaeva *et al.*, 2021).

Choy (2020) says that the combination of digitally transforming systems involves the effects of automation, dematerialisation and reorganization (Choy, 2020). Each of these three effect categories interacts and supports the other two in this interaction. Everyone can be divided into 3. Behind automation, as we have known in previous computerization phases, the effects of performance development play on the use of production factors. Through the literature, authors discussed multiple effects related to digital transformation. The effects were grouped under three categories; (1) Effects related to productivity, (2) effects related to resources and (3) management practices (Table I).

The inclusion of digital technology in business governance has changed the buy-and-call process (Forbes Insights, 2016). Efficient database management leads the company to improve individual consumer aspirations. Thus, the enterprise can perform customized production and ensure a personalized relationship between the sale and distribution of services and products (Berman & Marshall, 2014). The technological transformation modifies market dynamics to renew or obsolete them (Smith, 2016). The Internet is transforming markets through access to products and services that is universal and unlimited. Result: New competitors arrive, driven by the prospects of future gains from new IT and the emergence of new diversified players (Reis *et al.*, 2018).

TABLE I: SUMMARY OF DIGITAL TRANSFORMATION'S EFFECTS FROM THE LITERATURE

	Effects	Authors
Productivity	Labour productivity	(Dengler & Matthes, 2018)
	Capital productivity	(Nwankpa & Roumani, 2016)
	Energy and raw materials productivity	(Kunkel & Matthes, 2020)
Resources	New communication and distribution channels.	(Kotarba, 2018)
	Production costs' Reduction	(Galindo-Martín <i>et al.</i> , 2019)
	Data resource	(Reis <i>et al.</i> , 2018)
Management practices	Competition and market	(Osmundsen <i>et al.</i> , 2018)
	Database's segmentation and evolution	(Korhonen & Halén, 2017)
	Transformation from traditional marketing to digital marketing	(Kayumovich & Annamuradovna, 2020)

The analysis of databases using new technological tools allows efficient customer relationship management in order to identify interested customers and buy-ready individuals (Choy, 2020). Following several events summarized several items may have led to the evolution of the marketing landscape and its transformation towards digital marketing (Yoon *et al.*, 2016):

- 1) The Internet has a central role to play in the information integration between suppliers, customers and the organization,
- 2) New and more elaborate indicators are being developed for better marketing performance assessment,
- 3) Wireless networks have proliferated and increased the use of consumer electronic devices,
- 4) The emergence of new, more refined marketing performance assessment indicators.

III. CONCEPTUAL FRAMEWORK: TOWARDS DIGITAL TRANSITION

Info-technology has been an opportunity for companies to organize their work since the introduction of IT. The results of IT integration in many areas are also of great benefit to the company (increased productivity). Business computerization also contributed to the development of individual computer literacy. Because the equipment was very costly at the beginning, people who had access to these technologies were rare (Agrawal *et al.*, 2015). The use of these technologies in the workplace has enabled us to discover the use of IT. The company was the body that promoted the use of these technologies. Digital technologies are no longer the case. For the first time, technology is accessible to people massively before the company is taken over. If we see the previous technological disruptions (telephone, fax, Internet, etc.), then companies are the driving force for their deployment (Buttle & Maklan, 2019). The phenomenon has been reversed with digital technologies and firms are questioning whether they should use this kind of technology to improve their practice. The enterprise now lags behind its employees' innovations and uses. This technological evolution, such as the progressive learning of new practices in information distribution and management by individuals, has changed the views of companies on the impact of ITs on the organization (Li *et al.*, 2020).

The digital economy is based on the use of data and in particular on the evaluation of the free work provided by users; without a monetary compensation for the latter and from which the digital company creates its value chain, whose positive outputs are incorporated in the production chain as a

result of data (Moon *et al.*, 2018). Furthermore, customer personal data management is now at the core of everyday business. Data safety and privacy are key enablers but also possible barriers to companies. They will need to identify new protection and privacy guarantees that meet their and their customers' expectations (Almaazmi *et al.*, 2020). She's increasingly expressing herself on the Internet and social networks. The quality of the software, platform or application that is offered no longer measures the value of a business by its producing product and/or the service it provides. An icon in the most prestigious areas on as many smartphones as possible has become profitably more profitable than a store (De Carolis *et al.*, 2017). Brands also diversify their digital communications and use people who work on social networks, who have the ability to influence consumption habits through their status, location or media exposure.

The digital revolution has empowered the consumer who is no longer a captive but has become a zapper. The customer now has the ability to interact with the business (Ismail *et al.*, 2017). Communication has become two-way and interactive, it no longer goes only from the company to the customer, but the latter also has the possibility of responding, reacting, speaking, expressing an opinion, an opinion or dissatisfaction. Through their comments on social networks, the consumer in turn becomes a consumer prescriber (Rindfleisch *et al.*, 2017). The consumer wants tailor-made products. He (Consumer) wants us to produce for him, he wants the company to be a co-creator, to be heard and to take his views into account. He is unpredictable, a camel, in search of feelings and new "experiences." New consumer requirements want all stakeholders to talk to them immediately, to inform them, to answer questions and to be treated personally (Peiling & Tingting, 2018). Intelligence artificial also interferes with managing relationships with customers; all tools and techniques for capturing, processing and analyzing customers and perspectives information in order to retain the information by providing or offering services (Skotarenko *et al.*, 2019).

There are several theoretical implications of the conceptual framework developed. As for the strategic digitalisation renewal, many companies seem intuitive in their digitisation initiatives to focus on issues related to technology. Although convincing technology solutions are important, an overemphasis on technology, in particular on IT, is adverse (Agrawal *et al.*, 2015). Indeed, this trend limits most transformation initiatives to their potential benefits, since this restricts digitization strategic space and leads companies to exclude potential pathways from the start. An imminent discussion, for example, on the technological challenge of developing a company's product range in the direction of intelligently connected products may result in the neglect of

the great possibilities offered by new digital solutions (Porter & Heppelmann, 2014). This strategic focus can also be seen in many digitizing initiatives by companies, despite the negative impact of a high technology focus (Almaazmi *et al.*, 2020; Korhonen & Halén, 2017; Majchrzak *et al.*, 2016). Interestingly, the focus is often especially strong among experts without a strong background in information technology (Grimes & Yang, 2018). Software experts often understand the technological opportunities and challenges clearly and are aware of the appropriate business models to take advantage of digital technologies. Managers with limited software know-how often want to do things on

the basis of a swift technological move (Delmond *et al.*, 2016). The necessary business models only emerge when the solutions are in the market, which usually restrict the profitability of the new digital products and services (Schallmo *et al.*, 2017).

IV. METHODOLOGY

In this research, the methodology proposed is based on a qualitative approach. This approach facilitates the search for information that is rich and extensive. The collection of information by means of semi-structured individual interviews was indeed established in the implementation of a quantitative study that allows an in-depth investigation of the phenomena related to digitization, function and adaptation strategies for responding to it (Cavana *et al.*, 2001).

A quantitative survey is carried out on a random sample of firms from the open data database site. The industries were selected based on second data from the government side about the most dominant industries in Morocco. In order to understand what the capabilities and skills are essential to successful companies' digitalisation. Between January 2020 and July 2021, over 400 online questionnaires were sent. We chose an analysis in the main component of the research results and analysed it with MAXQDA software, to answer our question. This decision is based on the fact that this method is suitable in the exploratory studies, which allows raw data from a number of variables to be collected, in a smaller number of factors which group strongly correlated variables (Phalp & Shepperd, 2000).

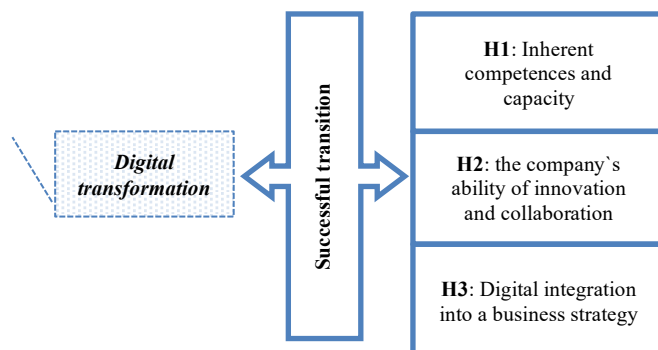


Fig. 1. Conceptual framework for successful digital transition based on the literature (own illustration).

In addition, the application of owner managers or managers is regarded as an information source to understand the logic and trend towards the digital of the studied companies. Many researchers recommend this method for the collection and validation of the collected data.

A total of 120 companies have agreed to take part in the survey and their owners have shown interest in sharing their experiences for the sake of this research. The companies were grouped by industries. In order to guarantee the anonymity of the players interviewed, we have assigned codes to different analysis units. The coded names and information assigned to the companies can be found in Table II.

TABLE II: RESEARCH SAMPLE

Industry	Number of companies	Interviewed	Interviewed experience
Automotive	35	Sales manager, IT manager, RD specialist	5-8 years
Ports	4	Lean expert, performance specialist, operations manager, chief officer	10-13 years
Textile	17	Production manager, line supervisor, store manager	4-9 years
Agriculture	15	Account executive, senior recruiting officer,	6-12 years
Construction	6	1) Buyer, Customer Service Representative	2-5 years
Manufacturing	16	2) Customer Service Representative, logistics coordinator	3-8 years
Mining, energy	3	IT coordinator, maintenance planner	2-7 years
Food	10	B. Training Manager, Database administrator	4-8 years
Services	8	1) Customer Service Representative, data quality clerk	1-6 years
Tourism	7	Branch manager, hotel manager, Travel agent	3-12 years

With open questions, we allow people to speak freely so that as much information as possible is generated. From time to time, we led them when they were beyond the subject. Also, follow-up questions are asked to ensure the meaning they want to mean by taking the last words of their answers. This guide is organized around three research topics:

- Perceptions of and maturity towards digital transformation;
- Opportunities for the company represented by digital transformation;
- Challenges and problems.

V. RESULTS AND ANALYSIS

Table III shows that 76,7% of respondents either strongly agree or agree that their organizations are digitally present. This shows the importance for companies examining the dissemination of digital technologies.

TABLE III: THE PRESENCE OF DIGITAL IN THE ORGANIZATION

	Frequency	Percentage (%)	Cumulative (%)
Strongly agree	58	48.33	48.33
Agree	34	28.35	76.68
Neutral	8	6.66	83.34
Disagree	12	10	94.34
Strongly disagree	8	6.66	100
Total	120	100	-

The companies by industry are described in Table IV. It is noted that 29.16% of the automotive industry dominates and in second place is 15.16% the textile industry.

TABLE IV: THE DISTRIBUTION OF COMPANIES BY SECTOR OF ACTIVITY

Sector	Frequency	Percentage (%)	Cumulative (%)
Automotive	35	29.16	29.16
Ports	4	3.33	32.49
Textile	17	14.16	46.65
Agriculture	15	12.5	59.15
Construction	6	5	64.15
Manufacturing	16	13.33	77.48
Mining, energy	3	2.5	79.98
Food	10	8.3	88.28
Services	8	6.66	94.94
Tourism	7	5.06	100
Total	120	100	-

Table V shows that 66.66 percent of respondents agree that their large and medium-sized industries are disrupting digital technologies.

TABLE V: THE EXTENT OF THE DIGITAL TECHNOLOGY
DISRUPTION IN THE INDUSTRY

	Frequency	Percentage (%)	Cumulative (%)
Large scale	41	34.16	34.16
Moderate scale	39	32.5	66.66
Small scale	21	17.5	84.16
None	13	10.84	95
Neutral	6	5	100
Total	120	100	-

Table VI shows the results for a digital transformation strategy given by respondents at a scale of 1 to 10. It is noted that the low mark of 27.37% (1-4) while the average mark of 29.99% (7 to 10). In terms of high marks, they are 42,64 % (5 to 7).

TABLE VI: DIGITAL TRANSFORMATION STRATEGY'S LEVEL
ACCORDING TO THE RESPONDERS

Scale	Frequency	Percentage (%)	Cumulative (%)
1	8	6.66	6.66
2	3	2.5	9.16
3	13	10.71	19.87
4	9	7.5	27.37
5	22	18.33	45.7
6	11	9.31	55.01
7	18	15	70.01
8	22	18.33	88.34
9	7	5.83	94.17
10	7	5.83	100
Total	120	100	-

Table VII provides the final evaluation of the key component analysis of Moroccan companies' digital maturity levels; 1st column includes the components and the variables; 1st Component groups together the most important variables in companies with developed digital maturity and 2nd component groups together the most important variables in companies with low digital maturity. The variation explained by the factor model is presented in column 3. The model itself "explains" the digital maturity level to 59,3%; that is, 40,7% of the digital maturation level is unexplained by the selected variables.

TABLE VII: PRINCIPAL COMPONENT ANALYSIS OF THE DIGITAL MATURITY LEVEL

Component	Variable	Coefficient	Real variance (%)	Internal variance (%)
Company with developed digital maturity	Collaboration	0.842	47.2	79.61
	Willingness to respond to digital trends	0.803		
	Leadership and experience for a digital strategy	0.789		
	Innovation	0.736		
	Reaction to threats and opportunities	0.716		
	Reaction to digital trends	0.666		
	Consideration of digital as an opportunity	0.526		
Company with low digital maturity	Importance of digital in three years	0.859	12.13	20.44
	Importance of digital in a year	0.785		
	Importance of digital today	0.708		
	Impact of digital on the sector	0.684		
	Digital as a threat (-)	-0.457		

In Table VIII, The KMO (Kaiser-Meyer-Olin index for measuring sampling quality) test is 84.8 percent, indicating a high validity. The test by Bartlett shows that the hypothesis H0 (the variables are globally independent) should be rejected (the test result must be equal to or less than 0.05). Therefore, the search for parts is justified.

TABLE VIII: THE KMO INDEX AND BARTLETT TEST

Kaiser-Meyer-Olin index for measuring sampling quality	0.878
Bartlett's sphericity test	χ^2 -distribution 610.126
	Dof 92
-	Signification 0.000

VI. DISCUSSION

The analysis of the major components of the digital process level tends to show that two types of businesses exist:

- (1) Developed digital transformation enterprises: These are innovative and collaborative enterprises with the ability to implement a digital strategy, to face digital trends and market opportunities and threats in comparison to their competitors. These are companies that react rapidly to digital trends and see their business as opportunities and competitive advantages.
- (2) Low digital transformation companies: These are companies which, although they believe their sector is disrupted, do not view digital as an immediate priority. Paradoxically, these companies are aware that digital technology could be an opportunity to develop and

does not threaten their business (negative correlation-45.7 percent on the variable "digital is a threat"). There is therefore a voluntary digitisation backlog of companies that could lead to losses to competitors or are forced to disappear from the market.

The results of the current study demonstrate the intrinsic capacities and abilities of digital technology companies that are ahead in their digital transformation. This confirms the 1st assumption (H1).

Innovation and collaboration are levers that enable firms to reach a more developed level of maturity through their internal resources and/or external skills. Hence, the 2nd hypothesis (H2) is confirmed.

Lastly, a company without a vision of digital integration into its strategy and without monitoring current trends and future trends will risk delaying or endangering its development. This last confirms the last hypothesis (H3).

The variation in the perception of digital transformation between different companies is no longer marked, as ten people say they are aware of the trend. So this revolution seems to be very well known for the Moroccan company. Although the IT function is fairly classic or traditional, there is a low presence of digital functions. In fact, IT, rather than digital or new technology, are the terms used by companies. In addition, nearly a third of executives indicate that digital transformation is part of their overall project. In this context, at the level of the implementation of projects related to the subject, the questionnaires ensured a diversity of profiles between companies that have carried out digital transformation projects.

This study shows that there are a number of major challenges for the companies concerned in the digital transition, namely the lack of digital technical skills. Most small and medium-sized enterprises believe that the human problem is one of the main challenges, insisting on new skills. The rest believe that the financial resources can be a big challenge. In the broad sense, the human factor therefore weighs more heavily than the lack of budgetary resources. A human challenge in terms of increasing the skills of internal resources to be able to support this transformation. The second challenge concerns the financing of this transformation, because it induces an investment. Certainly, there is a return to investment, but for companies, it is first necessary to succeed in mobilizing resources. To mention that there are other obstacles to the lack of time and resources, the concern for confidentiality and lack of trust, the complexity of the process and the ignorance of existing opportunities.

The study unites three important dimensions in an exploratory way, namely the view of Moroccan small and medium-sized business leaders, challenges and questions relating to digital transformation. Research widely shares the results on the requirements of digital transformation for business practices. Here we cite Smith's work, which emphasizes the present debate between those who consider digitalization to be a tool for job elimination other than financial and human problems, and those who believe this is a tool for liberating employees, so that employees can devote themselves more effectively to their task (Smith, 2016).

VII. CONCLUSION

Analysis of the average digital maturity level shows that different managers view the potential of digital as a factor in the company's development. However, little investment remains in digital and real digital strategy implementation. The main finding is that digital priorities of companies remain relatively fundamental and focused on the traditional IT function. The question of supporting such companies is therefore clearly identified as a challenge for them to take action and initiate a digitalisation process. This challenge is often also problematic because qualified resources are available, or skills are developed in this field. Innovation in new digital tools such as digital marketing, support customer service, revenue generation, information sharing and coordination with their suppliers are essential for Moroccan companies to improve their performance. Therefore, it is important to understand the key to success of this digital transformation, the subject of our article, in these abilities and capabilities.

As a result of our contribution, (Korhonen & Halén, 2017) emphasized what they call the dynamic capacity, which can be utilized, adapted, integrated and re-configured in response to development and integration of digital technologies. In view of the results of our study, we highlighted three capabilities, namely the capacity for innovation and collaboration, as well as the strategic vision. Our research confirmed the work of (Osmundsen *et al.*, 2018) who consider innovation as a facilitating element in the integration of digital technologies, particularly in the service sector (our sample is represented more than 73%). Another contribution and in order to overcome the delay in the digital transformation of Moroccan companies, we propose to adopt the model of (Barholomae, 2018) who propose a digital transformation process that takes into account how to start, to manage, and generate sustainable development for their digital transformations.

This research is far from over based on our analysis and the potential of digital transformation and its effect on business. An extensive study effort should also be made to enhance our understanding of the phenomenon, including other stakeholders, including staff. We consider that our sample is the principal limitation of this investigation, which may be researched in future.

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