Revue Internationale des Sciences de Gestion
ISSN: 2665-7473
Volume 7 : Numéro 3

The adoption of digital transformation process by SMEs in Moroccan context: state of play

L'adoption du processus de transformation digitale par les PME dans le contexte Marocain : état des lieux

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Date submitted : 23/06/2024

Date of acceptance : 11/08/2024

To cite this article :

BELLANY K. & DHIBA Y. (2024) «The adoption of digital transformation process by SMEs in Moroccan context: state of play», Revue Internationale des Sciences de Gestion « Volume 7 : Numéro 3 » pp : 1228 - 1251

Abstract :

Today, interest in digital is unavoidable in companies at all levels, from small and medium-sized enterprises (SMEs) to large corporations and international groups. Companies now understand that they need to integrate digital into their overall strategy, in order to take full advantage of the opportunities offered by new digital technologies. This global trend is essential for adapting to a constantly economic environment, making digital transformation vital for any business entity. However, adopting digital transformation presents a variety of challenges, depending on the company's sector of activity and the needs dictated by changing markets. Through a systematic review of the literature, this article examines the key elements in the adoption of digital transformation by Moroccan SMEs, analyzes the state of their use of digital technologies and the prospects for their transformation in the Moroccan context. Finally, this article proposes an adoption model with three main components: " Field of adoption; Adoption; Effetcs and adoption Scenarios ".

Key words : Digital Transformation ; Digital Technologies ; Moroccan SMEs ; Transformation Process ; Adoption.

Résumé :

L'intérêt pour le digital est aujourd'hui incoutournable dans les entreprises à tous les niveaux, qu'il s'agisse de petites et Moyennes entreprises (PME), de grandes entreprises ou de groupes internationaux. Les entreprises comprennent désormais qu'elles doivent recourir vers l'intégration du digital dans leur strétégie globale, afin de tirer pleinenement des opportunités offertes par les nouvelles technologies digitales. Cette tendance globale est essentielle pour s'adapter à un ennvironnement économique en constante évolution, rendant la transformation digitale vitale pour toute entité économique. Cependant, l'adoption de la transformation digitale présente des enjeux variés, en fonction du secteur d'activité de l'entreprise et des besoins dictés par l'évolution des marchés. À travers une revue systématique de la littérature, cet article examine les éléments clés de l'adoption de la transformation digitale par les PME marocaines, analyse l'état de leur utilisation des technologies digitales et les perspectives de leur transformation dans le contexte marocain. Enfin, cet article propose un modèle d'adoption à trois composantes principales : "Champ d'adoption – Adoption – Effets et Scenarios d'adoption".

Mots clés : Transformation Digitale ; Technologies Digitales ; PME's Marocaines ; Processus de Transformation ; Adoption.

Introduction

Digital Business transformation refers to the involvement of technology to create new business models, processes, software and systems, thereby increasing revenues, strengthening competitive advantage and improving overall efficiency (Schwertner, 2017). Thanks to these new digital technologies such as social networks, big data, the Internet of Things and other innovations such as blockchain, companies now have a unique opportunity to radically transform their business models (Ziyadin, and al., 2020). Similarly, SMEs are also subject to this digital transformation, which is essential for their development, given their important role in stimulating economic growth and regenerating the economic fabric in many countries and regions. This study aims to shed light on the state of adoption of digital transformation by Moroccan SMEs. It is based on a systematic literature review of studies conducted in this field of research, combining qualitative and quantitative methods in order to offer a comprehensive and rigorous vision of digital transformation in this context. This objective led us to pose a two-dimensional research question, which is as follows: *What is the level of adoption of digital transformation in Moroccan SMEs, and what process must be followed to achieve this transformation*?

This paper is organized into four main sections. The first one covers the theoretical foundations of the study. The second highlights Moroccan SMEs and the country's digital strategies. A more in-depth analysis is provided in the third section, which presents the research methodology adopted and discusses the main findings. The fourth section outlines the research conceptual framework, followed by conclusions and perspectives for consideration.

1. Theoretical foundations

1.1. Digital transformation

Digital transformation represents a fundamental change in organizational thinking (BRIBICH, and al., 2021), which needs to be managed with extreme caution, like any organizational change initiative (Wade & Marchant, 2014). It is comparable to previous industrial revolutions, insofar as the latter first changed uses, then society, and finally, consumption patterns. This transformation refers to the changes brought about by information technology as a means of partially automating tasks (Legner, and al., 2017). The use of this term is closely linked with the use of digital technologies to create value, modify established models and processes, or support organizational structures, resources or stakeholder relations (Plekhanov, and al., 2022). It thus introduces changes in business processes (Li, and al., 2018), value creation processes

(Gölzer & Fritzsche, 2017), operational routines (Chen, and al., 2014), and organizational capabilities (Tan, and al., 2015). Indeed, in the literature, several authors have attempted to define and discuss this concept. Table 1 summarizes some of these definitions.

Table N°1: Definitions of digital transformation

Definitions	Authors
Digital transformation refers to the changes that digital technologies can bring to a company's business model, resulting in modified products or organizational structures or the automation of processes.	(Hess, and al., 2016)
Digital Transformation is about the combination of numerous digital innovations resulting in new actors, structures, practices, values and beliefs that change, threaten, replace, or complement the existing rules of the game within organizations, ecosystems, industries, or fields.	(Hinings, and al., 2018)
Digital transformation is understood as the use of new digital technologies enabling significant business improvements and affecting all aspects of customers' lives.	(Reis, and al., 2018)
Digital transformation is the integration of digital technology into all areas of a business to change the way the business operates to create added value for its customers.	(Mignot, 2019)
Digital transformation is a process to enhance an entity by triggering significant changes in its properties via the combinations of information, computing, communication and connectivity.	(Vial, 2021)
A continuous, incremental, and holistic process of change where the pressure from external and internal factors creates disruptions within the organization, driving it to adapt its overall strategic response through technological innovations to satisfy user needs and create new value.	(Kamal & El Qour, 2024)

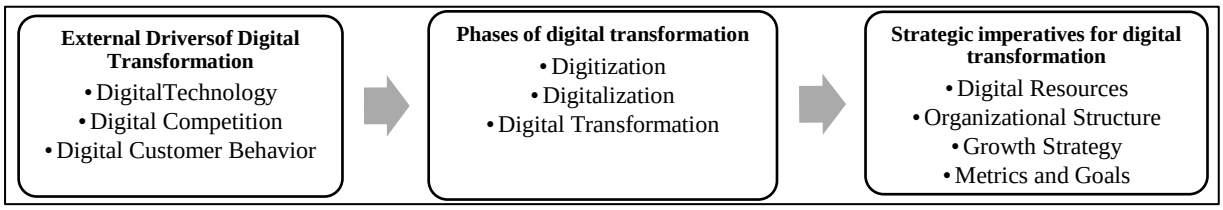
Source : Authors

These carefully chosen definitions have enabled us to identify different perspectives on the concept of digital transformation. Some opt for a technological vision, emphasizing the changes brought about by the use of digital technologies. (Hess, and al., 2016; Reis, and al., 2018; Mignot, 2019). (Hinings, and al., 2018; Kamal & El Qour, 2024), share the idea that digital transformation leads to profound changes within organizations, through technological and digital innovations. A more inclusive vision is put forward by the definition of (Vial, 2021), which can be applied to various entities, be they organizations, companies, industries, while considering improvement as an expected result without guaranteeing it. In addition, the definition is aligned with the concept of digitalization and deliberately excludes the use of the term "digital technologies", in favor of a broader definition of the means used. This diversity of definitions reveals that digital transformation is a complex, multi-faceted concept, including changes that profoundly affect companies and other entities (HILMI, & KAIZAR, 2023).

1.2. Digital transformation process

According to (Verhoef, and al., 2021), digital transformation takes place in three progressive phases. First, digitization, which consists in converting analog into digital for storage and use on computers (Pearce-Moses & Baty, 2005), limited to the transformation of paper data into electronic format (Abdallah, and al., 2021). The second phase, digitalization, uses information technology to modify existing processes. It focuses on the socio-technical processes involved in the adoption and use of these technologies in a variety of individual, organizational and societal contexts (Legner, and al., 2017). Finally, digital transformation, the most advanced, involves global changes to organizations' business models in order to generate new sources of value (Verhoef, and al., 2021; Bumann & Peter, 2019). These phases represent different levels of digital transformation maturity, as illustrated in Figure N°1.

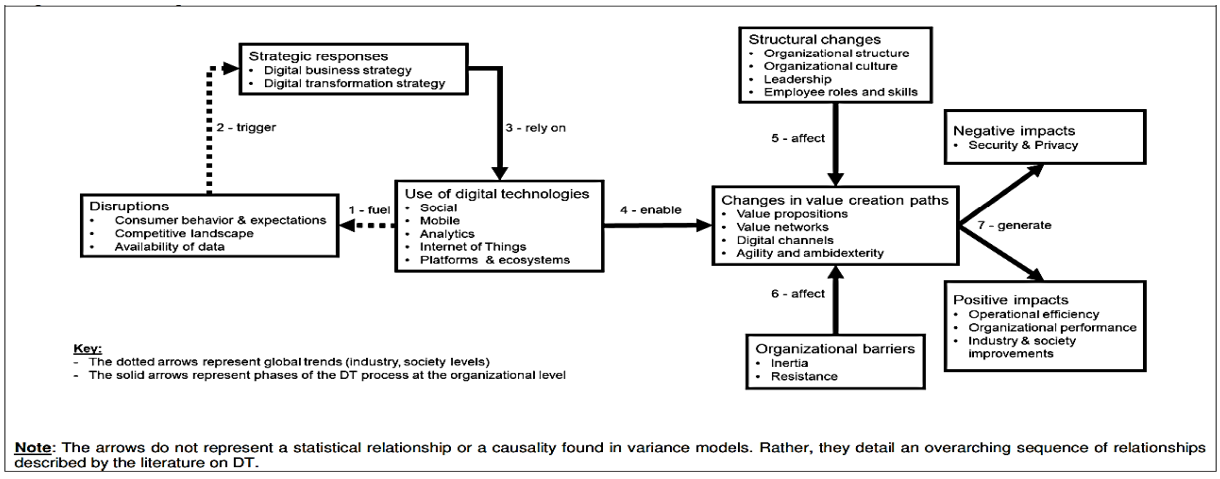
Figure N°1: Digital transformation phases model



Source: based on the model from (Verhoef and al, 2021)

We present in the following a precise model by Vial (2021), who conceptualizes digital transformation in eight blocks, as illustrated in figure N°2.

Figure N°2: Components of the digital transformation process



Source: (Vial, 2021)

This framework presents the relationship between eight basic blocks describing the process of digital transformation, where digital technologies play a central role in creating and reinforcing the disruptions that occur at the level of society and industry. These disruptions call for strategic

responses from organizations, who turn to digital technologies to modify their value creation pathways and remain competitive. They must then implement structural changes and overcome obstacles. These changes have positive implications for organizations, as well as for individuals and society, but they can also have negative consequences. This model will be used in this research as a basis for studying the adoption of digital transformation by Moroccan SMEs.

1.3. Theories and Models of Technology Adoption

Many theories and models address the adoption and diffusion of innovations and technologies. These models aim to explain the decision to adopt technologies based on various explanatory factors. The main difference between these models lies in the different significance attributed to categories of explanatory variables, sometimes to the detriment of other variables. Table N°2 summarizes some of the theories and models developed over time to better understand the process of technology adoption by individuals and organizations.

Table N° 2: The principal theories and models of technology adoption

Theory / Model	Determinants / Factors influencing adoption	Author / Year
The Classical Theory of Organizational Change	Group dynamics and resistances	(Lewin, 1947)
The technology acceptance model: TAM	Perceived usefulness and Perceived ease of use.	(Davis,1989)
The Model of PC Utilization (MPCU)	Job Fit, Complexity, Long Term Consequences, Affect towards use, Social factors, Facilitation conditions	(Thompson, and al., 1991)
Innovation Diffusion Theory (IDT)	Determining the elements that affect the speed with which an innovation is adopted in a social group.	(Rogers,1995)
The Technology Acceptance Model 2: TAM 2	Prediction and explanation of the adoption or non-adoption of a technology by means of variables (perceived usefulness - perceived ease of use) and attitudes that will induce behavioral intentions of use.	(Venkatesh & Davis, 2000)
The Theory of Innovation Adoption: TIA	The adoption from an organizational standpoint through the primary adoption which builds on the decisions of the organization to spread a technology and the secondary adoption which is based on the decision of being used effectively by the users.	(Gallivan, 2001)
Unified Theory of Acceptance and Use of Technology: UTAUT	Expectations of performance, expectations of exertions, social impact, and conditions of facilitation.	(Venkatesh, and al., 2003)
The Technology Acceptance Model 3: TAM 3	Anchoring: The sensation of self-efficacy, the perception of external control, the computer anxiety and the playfulness of the computer. This group refers to all the beliefs that people have about computers and their use.	(Venkatesh, & Bala, 2008)

	Adjustment: It reflects the reactions of the users of the computer after having used the system in question (perceived satisfaction and objective use).	
Unified Theory of Acceptance and Use of Technology: UTAUT 2	The expected performance, the perception of the effort to be expended, the social impact and the enabling conditions, but also through hedonic motivation, the price and the habit.	(Venkatesh, and al., 2012)

Source : Authors

By understanding these theories and models of technology adoption, it becomes possible to predict and influence the adoption decisions of individuals and organizations.

2. The Moroccan SME and the national digital strategies

Previous studies have paid less attention to the digital transformation strategies of Moroccan SMEs, hence the importance of revealing them in this article. This section then aims to identify some current and future plans for SMEs to begin their transformation process. In Morocco, SMEs are the backbone of economic growth, representing around 95% (about 70,000 enterprises) of the national economic fabric, according to statistics from the Federation of SMEs in Morocco - affiliated with CGEM, contributing 51% of national investments and 31% of exports and 40% of production, as well as employing 50% of the workforce. However, there is no unique definition of SMEs, as they vary from country to country, complicating the application of policies and creating unequal competition. Each economist adopts distinct criteria to define them (Mylenko, and al., 2011) cited by (Mouhallab & Jianguo, 2016). The same question also arises in the Moroccan context, where a standardized definition of SMEs needs to be established, based solely on sales revenue, excluding the number of employees and other criteria. In order to connect with the whole world in the digital age, Morocco has set up programs for the development of technological innovation, including programs for SMEs.

- **The e-Maroc 2010 program:** This program highlights the need to facilitate access to financing for SMEs in the ICT sector, by implementing the (National Upgrading Fund) and the (Financial Restructuring Guarantee Fund). It also calls for the introduction of financial incentives to encourage innovation and the adoption of ICT by these companies.
- **The Maroc Numeric 2013 Plan:** The plan's priorities include encouraging SMEs to computerize in order to boost their productivity, and supporting their technological investments.
- **The Digital Morocco 2020 Plan:** This plan is a continuation of the Maroc Numeric 2013 strategy, aimed at integrating Morocco into the digital economy by reducing the digital divide and connecting 20% of Moroccan SMEs.

- **The Moussanada IT Program:** This program ensures the practicability of information technologies and accelerates their use by SMEs in various sectors. ANPME assists in financing up to 70% of the total cost, with a limit of 400,000 DH including tax, for the acquisition of information systems, including functional modules offered by Moussanada TI, namely hardware and associated IT infrastructure.
- **The creation of the Digital Development Agency:** ADD, for its part, focuses on SMEs, with the aim of providing them with a complete digitalization package to support them in their digital transformation.
- **The National Agency for the Promotion of Small and Medium Enterprises:** In 2020, Maroc PME launched a program to develop the Maroc PME CONNECT platform, offering digitalized support services via four sub-platforms: Jisr l'moukawala, Skills Transfer Platform, "Nawat Digital" Platform and Virtual Academy.

These programs testify to the country's implementation of a multi-faceted digital development policy, capable of fostering the digital transition of SMEs.

3. Results

The aim of this study is to carry out a systematic review of the literature on digital transformation. To this end, we refer to Okoli & Schabram's (2010) approach, combining qualitative and quantitative methods. Having identified our research problem, we attempt to answer the questions posed below, in order to highlight Moroccan researchers' interest in digital transformation.

Q1 – How has the frequency of article publications on the theme of digital transformation evolved over time?
Q2 – What are the most commonly used research methodologies?
Q3 – What specific interest is attributed to the study of SMEs in this field of research?

- **Quantitative analysis**
  - ✓ **First selection :**

Research in the digital field uses a wide range of keywords to signify the transition from traditional to digital. However, we are particularly interested in studying the concept of digital transformation, excluding potentially biased terms. To do this, we start with the inclusion criteria by looking for the concept of digital transformation in the title of Moroccan articles. This initial selection includes studies that go beyond SMEs, covering a variety of research fields and organization types, to reflect the interest of Moroccan researchers in this hot topic. The selection process for the systematic literature review is presented in Table N°3.

Table N°3: Literature review process

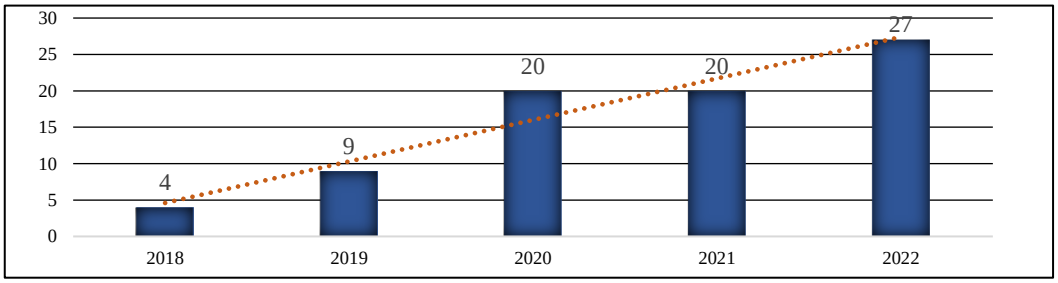
ScienceDirect – Google Scholar - Moroccan Institute of Scientific and Technical Information 'IMIST'	
Criteria	**Filters**
Basic keyword in each article subject	Digital transformation
Restrictions	Subject (Title)
Type of document	Articles and Conference papers
Language	French and English

Source: elaborated by our care

- **Data extraction :**

The results presented in Figure 3 show that prior to 2018, Moroccan literature on digital transformation was almost non-existent. From 2018 onwards, research began to emerge, with a significant increase in publications from 2019 onwards, with the number of articles published up to October 2022 almost six times the total number of publications marked in 2018. This reflects the growing importance attached to digital transformation. Moreover, the articles cover a variety of fields, including insurance, public institutions and business, reflecting a growing awareness of the concept in different sectors.

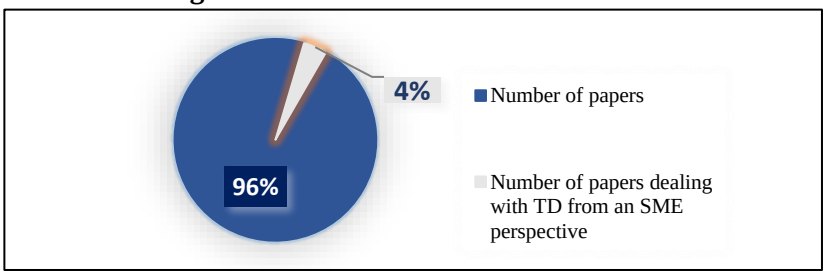
Figure N°3: Distribution of articles by publishing year (n = 80)



Source: elaborated by our care

Among all the articles collected, only 4% deal with digital transformation at the SME, while 96% address other aspects, as illustrated in Figure N°4.

Figure N°4: Distribution of the articles



Source: elaborated by our care

This percentage indicates the lack of articles dealing with the aspect of digital transformation among SMEs in Morocco. To remedy this, we evolve our search using an approach similar to the Boolean method. We continue our search through terms associated with digital

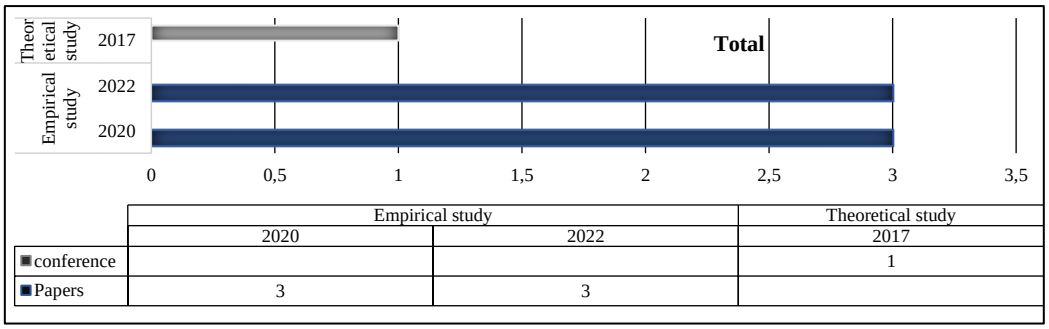
transformation, both in keywords and in abstracts and titles, using the logical operators OR/AND. The query is shown below:

ALL (("Morocco")) AND TITLE (("Digitalization" OR "Digital" OR "Industry 4.0" OR "Smart" OR "Digital Transformation" OR "Technological Adoption")) AND TITLE-ABS-KEY (("Small and Medium-sized Enterprises" OR "SME")).

- ✓ **Second selection :**

We then proceeded to the filtering phase, varying the use of keywords and limiting our search to journal articles and conference papers published in English and French that dealt specifically with SMEs. On the basis of the title, keywords, abstract and, where applicable, the full text, we selected articles whose theme was similar to our research objective. The figure N°5 below shows the results obtained, broken down by year of publication, type of publication and nature of study.

Figure N°5: Distribution of articles by type and year of publication (n = 7)



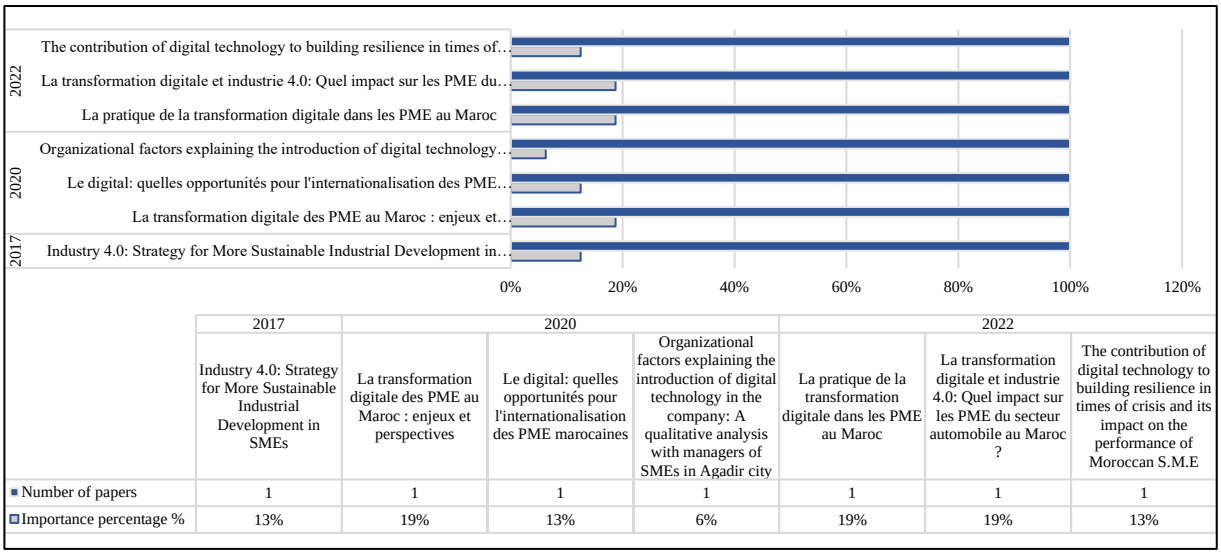
	Empirical study		Theoretical study
	2020	2022	2017
conference			1
Papers	3	3	

Source: elaborated by our care

We note that the number of papers identified between 2017 and 2020 shows a preponderance of empirical studies, accounting for 86% of publications, with a strong trend towards publication in academic journals. Publications in 2020 and 2022 are exclusively empirical articles, highlighting a significant increase in practical research compared to theoretical studies, which were not published after 2017. This reveals a recent trend in favor of empirical studies to explore digital transformation. Nevertheless, the reason for these very limited figures in Morocco could be due to the delayed adoption of smart technologies in most business sectors.

Figure N°6 shows the result of a distribution of articles according to their level of importance in relation to the research question (RQ). Articles are divided into three levels: closely related to the research question (level 3), moderately related to the research question (level 2) and weakly related to the research question (level 1).

Figure N°6: Distribution of articles by degree of importance



	2017	2020			2022		
	Industry 4.0: Strategy for More Sustainable Industrial Development in SMEs	La transformation digitale des PME au Maroc : enjeux et perspectives	Le digital: quelles opportunités pour l'internationalisation des PME marocaines	Organizational factors explaining the introduction of digital technology in the company: A qualitative analysis with managers of SMEs in Agadir city	La pratique de la transformation digitale dans les PME au Maroc	La transformation digitale et industrie 4.0: Quel impact sur les PME du secteur automobile au Maroc ?	The contribution of digital technology to building resilience in times of crisis and its impact on the performance of Moroccan S.M.E
Number of papers	1	1	1	1	1	1	1
Importance percentage %	13%	19%	13%	6%	19%	19%	13%

Source: elaborated by our care

The figure shows a variation in the importance of the articles collected. Articles published in 2020 represent 43% of the total and contribute 45% of the overall importance. Articles published in 2022 also represent 43% of the total, but contribute 51% of the usefulness for our research. The remaining article, published in 2017, represents only 6% of the total importance. The graphical representation reveals that articles from 2020 and 2022 are considered more relevant to the research question, underlining the importance of recent developments in this field.

The most relevant articles are those dealing specifically with the digital transformation of Moroccan SMEs, with this topic clearly indicated in the title and extensively developed in the content. Articles with a significance rate of 13% examine the impact of digital technologies on SMEs through empirical studies. The least relevant article adopts a theoretical approach and does not address our research question in depth, nor does it place any specific emphasis on SMEs.

- Data synthesis and qualitative analysis:

Having collected academic articles on the digital transformation of Moroccan SMEs, this section aims to provide an overview of academic contributions. We will examine how these works align with or diverge from our research question. We will analyze each article in our database to identify the key phases of the digital transformation process, highlighting the elements that enrich this process. The results of this analysis are presented in Table N°4.

Table N°4: Analysis of academic cases

Scientific paper	Objectives of the study	Results
The digital transformation of SMEs in Morocco: challenges and prospects (JANATI-IDRISSI, 2020)	The objective of this article is to discuss and analyze the challenges and opportunities brought by the digital transformation of SMEs in Morocco.	- The benefits of digital transformation of SMEs (Improved work-chain - organized work - strengthening the level of exports, assurance of supply chain management - development of new services, assurance of better-quality productions, optimization of production costs, development of employees' skills, promoting the image of a company) - The digital transformation of SMEs presents major challenges, namely the lack of technical and digital skills. - The digital transformation of SMEs presents challenges and obstacles, namely employees' skills and financial resources, lack of time and means, confidentiality concerns and lack of trust, process complexity and lack of knowledge.
Digital transformation and industry 4.0: What impact on SMEs in the automotive sector in Morocco? (Brahim, 2022)	The objective of this article is to measure the impact of digital transformation on Moroccan SMEs in the automotive sector.	- The main factors of digital transformation are related to the skills of the personnel, financing capacity and the lack of tax incentives - Digital transformation must be achieved by the existence of digital solution providers, principals, universities and research centers and therefore must be based on collaboration - The digital transformation opens the opportunity for improved productivity, organized work, realized subcontracting and the implementation of marketing and direct sales. - The study shows that there is no prospect of radical change in the next few years in the sector studied. - The main obstacles to the transition to Industry 4.0 are the lack of expertise, funding and support from the state as well as the existence of a culture resistant to change. - The use of digital transformation is exploited through the use of website, Facebook page, online sales, information systems and software packages.
The practice of digital transformation in SMEs in Morocco (Al Haderi, 2022)	The objective of this article is to study the involvement of Moroccan SMEs in digital transformation and to identify challenges they face.	- The use of digital transformation by Moroccan SMEs is marked by a real awareness of the operational and strategic importance of digital transformation. However, the application of the internal digitalization strategy is still limited. - The adoption of a global digital transformation has a low percentage by SMEs in Morocco. - Most SMEs are limited to their presence on social networks, websites, and use of mailing and SMS, but the transformation process has not yet reached the desired level.

		- The difficulty of starting the digital transformation is due to investment problems, security issues and the complexity of the digitalization subject. - SMEs' use of digital resources and solutions is mainly linked to mobile applications and dematerialization platforms. - Digital transformation is a major or minor concern for Moroccan SMEs, depending on the manager's awareness of the concept.
Digital: opportunities for the internationalization of Moroccan SMEs (Belferza, and al., 2020)	The objective of this article is to determine the impact of digital usage on the internationalization process of SMEs in the Souss-Massa region.	- The SMEs studies showed a very limited and basic level of exploitation in the contributions of digital - The Moroccan digital market is lagging behind the international market - The use of digital is limited to the partial use of the website and the existence of SMEs in social networks.
Organizational factors explaining the introduction of digital technology in the company: A qualitative analysis with managers of SMEs in Agadir city (BOUHOUILI, 2020)	The objective of this article is to expose the main organizational factors affecting the introduction and improvement of digital technologies in organizations.	- Technology is at the heart of the activity of the company's studies, where a simple technological blockage leads to bankruptcy. - The use is limited in (internet, fax, software, fixed line and cell phone and social networks). - Companies ensure a better follow-up and sharing of information through the use of integrated management software, connected objects and solutions for the digitalization of all functional areas. - Digital ensures a level of responsiveness in terms of responses to customer requests, as well as allowing the presentation of offers to the public in a more attractive way - Digital technology avoids delays and reduces the time of transit and shipment of goods and ensures a good management of logistic operations - Digital technologies protect companies and guarantee a high level of traceability - The factors that block the adoption and introduction of digital technologies in companies refer to the resistance to change, the limited budgets reserved for this adoption, the technological investment decisions that are centralized and require a strategic choice. - The lack of training and trainers in the region and the weak support of the State - organizational factors that mainly concern the support of senior management and the role of management in the decision-making process, the participation of employees in technology projects, as well as excess resources and the availability of financial means.

The contribution of digital technology to building resilience in times of crisis and its impact on the performance of Moroccan S.M.E (HABBANI & EL JAMOUSSI, 2022)	The objective of this article is to expose the relationship between digital means and organizational resilience and its impact on performance achievement in a context marked by uncertainty.	- The implementation of digital technologies allows companies to be resilient, to cope with shocks, and to maintain and support the efforts made earlier in the continuous process of improving performance. - SMEs that adopt digital technologies have shown a certain level of resilience in times of crisis, which has affected their performance - Moroccan SMEs have demonstrated the use of digital technologies in the management of the sales, delivery, HR, marketing, and production functions, as well as in security and data sharing in times of crisis. However, according to these SMEs, digital does not affect purchasing and supply management to an advanced level. - Most of the SMEs surveyed ensure the implementation of an information systems department, with a strong dependence on new technologies - SMEs are interested in allocating an interesting part of their budget to IT tools.
Industry 4.0: Strategy for More Sustainable Industrial Development in SMEs (Bakkari & Khatory, 2017)	The objective of this article is to highlight the importance of the strategic vision of industrialized countries for Horizon 2030, and the relationship between Industry 4.0 and sustainable development.	- Morocco has deployed two major sectoral strategies, namely "E-Maroc" and "Maroc Numeric 2013", and is adapting a long-term industrial strategy up to 2030, covering a wide range of themes: smart cities, innovation, education and training, digitization of the State, electronic commerce and industry. - Technological development, especially new information and communication technologies, offers a wide range of IT products and industrial solutions as levers for sustainable development. - The adoption of Industry 4.0 requires an open culture rather than resistance to change - The implementation of Industry 4.0 is based on an organizational situation that requires collaboration between the company's team and the adoption of a multidisciplinary organizational approach.

Source: elaborated by our care

Based on a detailed analysis of Moroccan articles addressing the link between SMEs and digital, we have identified the results we present in Table N°5. Indeed, after introducing the basic blocks of digital transformation illustrated in figure N°2 (Vial, 2021), we will use this model to assess the state of digital transformation of Moroccan SMEs. The various scenarios developed in the articles will enrich the blocks of the transformation model.

Table N°5: Coverage of the phases of digital transformation from the literature review

Key Factors	Factors	Sources	Main assumptions
The use of digital technologies	- Traditional IT - The use of digital transformation is exploited by the use of the website, Facebook page, mobile applications and dematerialization platforms, online sales, information systems and management software packages - HR ..., - The use is limited to the partial utilization of the website and the existence of SMEs within social networks - The use of Internet, fax, software, fixed line and cell phone and social networks - The use of integrated management software (developed and specialized software), connected objects, information technology platforms and management software for logistics platforms and GPS 2.	(JANATI IDRISSI, 2020) - (Brahim, 2022) - (Al Haderi, 2022) - (Belferza, and al., 2020) - (BOUHOUILI, 2020).	**H3.** Moroccan SMEs would utilize digital technologies in a conventional manner.
Disruptions	- Awareness of the existence of the trend and technological revolution - The perception of the potential of digital as a factor of development of companies - The existence of digital solution providers, contractors, universities and research centers - Interest in digital transformation after the experience of the "covid 19" epidemic - new development model of the country - the transition of the traditional automotive industry from thermal to electric and from mechanical to digital - Awareness of the operational and strategic importance of digital transformation - online business - competition and development of image and reputation and the rapprochement of target customers - Internationalization and international trade - international competition - international market penetration - Mitigation of crisis risks introducing organizational changes - Customers are also a factor that requires the use of new technologies.	(JANATI-IDRISSI, 2020) - (Brahim, 2022) - (Al Haderi, 2022) - (Belferza, and al., 2020) - (HABBANI & EL JAMOUSSI, 2022) - (BOUHOUILI, 2020).	**H1.** Moroccan SMEs would be driven towards digital transformation by various disruptions.

Strategic responses	- Moroccan SMEs reserve a place for digital transformation in their global project vision - digital transformation projects underway and projects in the process of starting up - few investments launched in digital and in the implementation of a real digital strategy - Cooperation for the implementation of digital transformation - the intention to acquire new technologies and develop know-how - At the national level, Morocco has deployed two major sectoral strategies, namely "E-Maroc" and "Maroc Numeric 2013", as well as adapting a long-term industrial strategy covering: smart cities, innovation, education and training, digitization of the state, e-commerce and industry.	(JANATI-IDRISSI, 2020) - (Brahim, 2022) - (Al Haderi, 2022) - (HABBANI & EL JAMOUSSI, 2022) - (Bakkari & Khatory, 2017)	**H2.** Moroccan strategies would tend towards the implementation of digital transformation at the SME level as well as at the national level.
Changes in value creation path	- A computerized and connected company - a robotized company - an intelligent company - Reactivity in terms of responses to customer requests - attractiveness in terms of presenting offers to the public - Resilience and performance of company's - Sustainable development.	(Brahim, 2022) - (BOUHOUILI, 2020) - (HABBANI & EL JAMOUSSI, 2022) - (Bakkari & Khatory, 2017)	**H4.** Moroccan SMEs would enhance value creation through advanced technologies, improving responsiveness, attractiveness, and resilience.

Structural changes	- Cooperation - the trend towards the development of know-how - Awareness of the operational and strategic importance of digital transformation - the trend towards inclusion in a global digitalization strategy - The establishment of an information systems department - the trend towards allocating an interesting part of the budget to IT tools - Need for an open culture rather than resistance to change - Collaboration and adoption of an interdisciplinary organizational style.	(Brahim, 2022) - (Al Haderi, 2022) - (HABBANI & EL JAMOUSSI, 2022) - (Bakkari & Khatory, 2017)	**H5.** Moroccan SMEs would undergo structural changes to better integrate digital transformation.
Organizational barriers	- Lack of skills in digital techniques - financing of this transformation - budgetary resources - lack of time and means - Human factor - lack of financing - lack of expertise - lack of support from the State - non-incentive tax framework - resistance to change - lack of a digital culture - underestimation of the value of innovation - skepticism of managers - Limited vision on digital - confidence of managers - Resistance to change, limited budgets, centralized investment decisions - Lack of training and trainers in the region - Poor support from the state - Support from senior management - Employee involvement in technology projects - Lack of effective technology solutions and few companies specializing in the field.	(JANATI-IDRISSI, 2020) - (Brahim, 2022) - (Belferza, and al., 2020) - (BOUHOUILI, 2020)	**H6.** Strong organizational barriers would affect the adoption of digital transformation by SMEs.

Positive impacts	- Improved work chain - organized work - export level strengthened - supply chain management ensured - new services developed - quality productions ensured - production costs optimized - employees' skills developed - company image promoted - Improved productivity - organized work - subcontracts realized - direct sales and marketing - costs saved, better management of the SME's functionalities ensured - improved internal communication - Cost controlled, time and quality of services - have new markets, internationalization of the SME - Better tracking and sharing of information - reduced delays - reduced transit and shipping time of goods - good management of logistics operations - high level of traceability - Coping with shocks, performance improvement - management of various business functions - security - data sharing - improved customer satisfaction and quality of services.	(Janati-Idrissi, 2020) - (Brahim, 2022) - (Al Haderi, 2022) - (Bouhouili, 2020) - (Habbani & EL Jamoussi, 2022)	**H7.** Digital transformation would positively impact various functions within Moroccan SMEs, improving overall performance and competitiveness.
Negative impacts	- The suppression of employment- the concern for confidentiality and lack of trust, the complexity of the process and lack of knowledge - The problem of managing cybersecurity.	(JANATI-IDRISSI, 2020) - (Brahim, 2022)	**H8.** Digital transformation could negatively impact Moroccan SMEs by causing job losses, increasing concerns about privacy and cybersecurity, and adding complexity to processes.

Source: elaborated by our care

The articles reviewed presented the state of digital transformation in Moroccan SMEs, and provided an overview of the level of adaptation to this transformation at national level. This situation calls for tailor-made solutions to overcome the difficulties and obstacles identified. The early adoption of the digital transformation process was made possible by its importance in the current global context, as well as by awareness of its potential benefits in the business world. As a result, small and medium-sized Moroccan businesses have embarked on the integration of these digital solutions, with a view to creating significant economic and managerial value.

The SMEs examined in the articles collected show that participants recognize the value brought about by digital transformation, as a side-effect of digital solutions in their various functions. However, these case studies highlight a significant under-utilization of digital technologies,

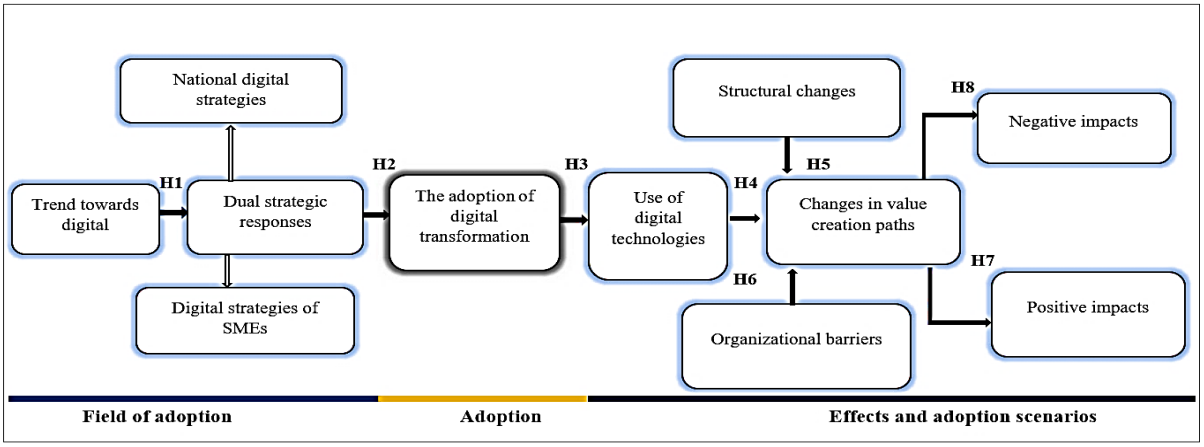
with the dominance of traditional technology solutions and a strong absence of innovative technologies such as blockchain, BDA and other emerging technologies. In addition, various studies have indicated that the adoption of digital transformation is not yet sufficiently advanced to identify significant negative effects. However, other research has highlighted the potential for negative effects in the future, such as concerns about work confidentiality, lack of trust, process complexity, knowledge gaps and the problem of managing cybersecurity. Furthermore, we can strongly observe that the adoption of digital transformation by Moroccan SMEs has been restricted in its early stages, given that we can see that the building blocks of the transformation process have been partly fuelled by elements from the literature, revealing a significant gap in the use of advanced digital solutions.

Finally, we present in figure N°7, a model that can contribute to the understanding and management of our research problem by illustrating the different interactions between the variables deduced from the cases treated.

4. Proposal of a conceptual research model

Figure N°7 illustrates the emerging model of digital transformation developed by Vial, enriched by our hypotheses deduced from previous analyses, illustrating the state of adoption of this transformation by Moroccan SMEs. This model highlights the factors influencing the adoption of digital technologies, as well as those hindering the process. It also highlights the potential positive and negative impacts of this transformation.

Figure N°7. Blocks of digital transformation adoption in Moroccan SMEs based on the Vial process



Source: elaborated by our care

Indeed, the study carried out on theoretical data shows that the digital transformation blocks adopted by (Vial, 2021), are valid for the adoption of digital transformation by Moroccan SMEs. Although (Vial, 2021)'s digital transformation process model is based on the use of

numerous digital technologies in the technological block, SMEs, up to the time of the analysis of these cases, have relied on a limited use of a few classic technologies. However, this illustrates the level of progress in digital transformation within these entities.

Based on these analyses, we can suggest three main phases in the adoption of the digital transformation process: " Field of adoption; Adoption; Effetcs and adoption Scenarios ". The first phase is mandatory and decisive. In our case, this stage includes the catalysts of digital transformation as well as the necessary preparatory elements, which significantly influence the launch and operation of the other blocks of the process. In this case, the adoption of a reflective theory would be appropriate to analyze the framework of adoption and preparation for this transition. In this regard, we cite the TOE "Technology - Organization - Environment" theory developed by Tornatzky and Fleischer in 1990 and the HOT "Human - Organization - Technology" model, which may be a compatible combination for addressing this phase, given that they include the human, technological, organizational and environmental factors necessary for technology adoption, as proposed by (Alam, and al., 2016) in their development of a conceptual framework for human resources information system adoption (El Idrissi, and al., 2021). Thus, it is very important at this stage to rely on elements stimulating this adoption, especially for small structures which often present a certain resistance to change, as mentioned in most of the papers studied. To overcome this resistance, we propose the use of theories and models, such as the Revised Technology Acceptance Model (TAM 3) by Venkatesh & Bala in 2008 and the Unified Theory of Technology Acceptance and Use (UTAUT2) by (Venkatesh, and al., 2012). These theories reinforce the strategic responses that enable successful adoption. Moreover, national digital strategies can be important catalysts for this adoption, as they can significantly improve the performance of SMEs' strategic responses.

The adoption stage includes the limited use of digital technologies by SMEs, a situation that needs to be improved. At this stage, it is important to refer to relevant theories, such as Gallivan's Theory of Innovation Adoption (TIA) (Gallivan, 2001), which helps improve the decision on the effective use of technologies by users. In the final stage, concerning effects and adoption scenarios, a series of organizational obstacles and structural changes need to be considered and managed, in order to overcome the challenges associated with value creation, especially as the results show that significant organizational obstacles can impact the adoption of digital transformation by SMEs.

SMEs need to continually improve their strategies to ensure successful adoption. The creation of added value also results from the implementation of the right strategies, which increase the

connectivity, responsiveness, attractiveness, resilience and sustainable development of SMEs. These improvements have a positive impact on the company's various functions, their execution, control and the SME's overall performance. However, this digital transformation can also have negative effects, such as reduced recruitment, the emergence of privacy and security complications, more complex processes and a lack of knowledge. Although these challenges are still a long way off for Moroccan SMEs, they can be prevented by implementing preventive value-creation strategies. The digital transformation of SMEs in particular requires the planning and implementation of a veritable digital strategy that goes beyond the adoption of the latest trendy application. Thus, the transition from a traditional SME to a digital SME must be based on a well-designed digital transformation plan, rather than on random, isolated and unfounded actions.

Conclusion

This literature review was undertaken at the most important and earliest moment to clarify the concept of digital transformation and reveal the Moroccan situation in this digital world. It will be important for SMEs to understand the phases of the process, its principles, strategies and opportunities linked to the adoption of digital technologies within the country, in order to prepare them for the transition to the digital world.

Based on a systematic review of the literature, this article analyzed and mapped the process of digital transformation adoption by Moroccan SMEs, and modeled its components and their associated development. In addition, this work has positioned the main concept of our research in the literature, tracing a path between this concept and Moroccan SMEs. This includes plans already adopted as well as those that could potentially be implemented to achieve the goal of digital development in Morocco. However, studies dealing with this research topic are still rare, which means that digital transformation and its dimensions are new in the Moroccan context. The results confirm that digital transformation is emerging as a new paradigm in Morocco. On the one hand, this process faces resistance to change on the part of professionals, and on the other, it is characterized by prospects for adoption and openness to digital and its intelligent solutions. In conclusion, we can affirm that Morocco, through the implementation of digital adoption strategies, is developing an infrastructure conducive to the adoption of digitalization, thus opening up a favorable path to the digital transformation of companies, including SMEs. Although limited by the small number of studies included, this analysis provides an important basis for future research into the digital transformation of Moroccan SMEs. It offers a synthetic

view of the strategies to be followed and enriches the literature on digital transformation in emerging economies, particularly in Morocco. This study will serve as a reference to assess, in future scientific contributions, the ability of the proposed transformation model to guarantee the digital transformation of Moroccan SMEs.

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