

Digital Transformation : A Catalyst for Moroccan SMEs

[Transformation Digitale : Un Catalyseur pour les PME Marocaines]

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ABSTRACT: (Digital transformation has now become a powerful engine of business change in the economy, particularly for small and medium-sized enterprises (SMEs) striving to boost their competitiveness and sustainability. This literature review investigates the role of digital transformation as a driver for Moroccan SMEs, and its implementation, challenges, and impact on business performance. This study provides synthesis of current knowledge on digital transformation initiatives in Morocco's SME sector underpinned by systematic review of academic literature, industry reports, and policy documents released from 2015 to 2024. The results show that Moroccan SMEs' adoption of digital technologies continues to grow, but there remain critical issues linked to limited levels of digital literacy, financial resources and infrastructure. However, the review also highlights successful cases of digital transformation among Moroccan SMEs and identifies multiple success factors such as government support programs, digital skills development, and strategic partnerships. Therefore, the contributions of this study to the literature will be specific and practical within the context of the current and complex globalised realities of sustainable digital economy development in the context of Morocco and similar developing economies while also offering policy recommendations to encourage the digital adoption transition amongst SMEs.

KEYWORDS: Digital Transformation, Moroccan SMEs, Business Innovation, Digital Adoption, Technological Integration.

RESUME: La transformation digitale est désormais un puissant moteur de changement pour les entreprises, en particulier pour les petites et moyennes entreprises (PME) qui cherchent à renforcer leur compétitivité et leur durabilité. Cette revue de littérature analyse le rôle de la transformation digitale comme levier pour les PME marocaines, en examinant son déploiement, ses principaux défis et ses effets sur la performance. Elle propose une synthèse des travaux récents portant sur les initiatives numériques dans le secteur des PME au Maroc entre 2015 et 2024. Les résultats montrent une progression continue de l'adoption des technologies numériques, tout en soulignant des limites persistantes en matière de compétences digitales, de ressources financières et d'infrastructures. La revue met aussi en évidence des expériences réussies de transformation digitale et des facteurs clés de succès, notamment les programmes publics de soutien, le développement des compétences numériques et les partenariats stratégiques. Elle offre enfin des pistes de recommandations pour accompagner la transition numérique des PME dans le contexte marocain et dans d'autres économies en développement.

MOTS-CLEFS: Transformation digitale, PME marocaines, innovation, adoption numérique, intégration technologique.

Digital transformation has become a vital driver of economic growth and competitiveness for Small and Medium Enterprises (SMEs) in Morocco. As the backbone of the Moroccan economy, SMEs account for approximately 95% of the country's economic fabric, emphasizing their pivotal role in national development [1]. The rapid advancement of technology and the evolving global business landscape have made digital adoption not just an option but a necessity for Moroccan SMEs. This shift offers significant opportunities to enhance productivity, expand market reach, and foster innovation while also presenting challenges that require strategic interventions.

Morocco has progressed in promoting technological transformation with the numerous initiatives directed at improving digital infrastructure, helping businesses in acquiring more advanced technologies, and increasing workers level of digital literacy. Morocco's digital transformation initiatives have been significantly bolstered by programs like Maroc PME CONNECT and Moussanada IT, which offer crucial financial and technical support to SMEs in their journey towards digitalization. The government's strategic emphasis on nurturing sectors such as fintech, e-commerce, and AI underscores its dedication to elevating Morocco's standing in the global digital landscape. These concerted efforts aim to enhance the country's competitiveness and solidify its position as a key player in the rapidly evolving digital economy.

Despite these efforts, digital adoption among Moroccan SMEs remains limited. While many businesses have embraced basic technologies such as social media platforms and email communication, the integration of advanced tools like AI, cloud computing, and data analytics is still underdeveloped [2]. This gap highlights the need for more comprehensive strategies to support SMEs in overcoming barriers to digital transformation. Challenges such as limited financial resources, inadequate technical expertise, and cultural resistance to change continue to hinder progress [3].

Digital transformation offers substantial advantages for small and medium enterprises (SMEs) in Morocco. By adopting cutting-edge technologies, these businesses can enhance their operational effectiveness, lower expenses, and utilize data-driven insights to boost overall performance. For instance, implementing Enterprise Resource Planning (ERP) systems and cloud-based platforms allows SMEs to optimize their processes and increase productivity. These digital solutions empower Moroccan companies to modernize their operations, stay competitive in the global market, and drive economic growth within the country. Furthermore, the adoption of e-commerce platforms has allowed many SMEs to expand their customer base beyond local markets while improving customer engagement through personalized marketing strategies.

As Morocco continues its journey toward becoming a regional leader in digital innovation, the successful transformation of its SMEs will play a critical role in achieving this vision. Addressing key challenges such as skill gaps, financial constraints, and resistance to change will require collaborative efforts from policymakers, private sector stakeholders, and educational institutions. By fostering a supportive ecosystem for innovation and equipping businesses with the necessary resources and knowledge, Moroccan SMEs can unlock their full potential in the digital economy and contribute significantly to national economic growth.

2 THEORETICAL FRAMEWORK

2.1 DIGITAL TRANSFORMATION

Digital transformation for Small and Medium Enterprises (SMEs) refers to the comprehensive integration of digital technologies into all aspects of business operations, fundamentally altering how these organizations function and deliver value to customers. This process goes beyond merely automating existing processes; it involves a strategic reimagining of business models, operational workflows, and customer interactions through the lens of digital innovation [1].

For SMEs, digital transformation often entails transitioning from traditional, manual, or paper-based systems to automated digital workflows powered by advanced technologies. This shift typically encompasses the adoption of cloud computing, mobile technology, data analytics, artificial intelligence (AI), and the Internet of Things (IoT) [4].

Digital transformation for SMEs encompasses several crucial elements. Firstly, it involves the digitization of fundamental business functions, including finance, stock control, workforce management, and internal/external communications. Adopting cloud-based technologies is another key aspect, enabling SMEs to improve flexibility and minimize IT expenses. The transformation also emphasizes data-centric decision-making, with small businesses utilizing analytical tools to extract valuable insights on consumer patterns, industry shifts, and operational productivity. Lastly, establishing a strong digital footprint and e-commerce functionality is typically essential, empowering SMEs to broaden their market influence and interact with customers through online platforms.

The imperative for digital transformation in SMEs is driven by several factors, including accelerating technology innovation cycles, evolving customer expectations, the rise of data-driven business models, and increased global competition. By embracing digital transformation, SMEs can boost productivity, make faster and more informed decisions,

provide enhanced customer experiences, and tap into new growth opportunities. This process is essential for long-term resilience and competitiveness, particularly as industries continue to be disrupted by digital innovations [5].

However, the journey of digital transformation for SMEs is not without challenges. Many face resource constraints, lack of digital skills, and organizational resistance to change. Overcoming these hurdles requires a strategic approach, often involving partnerships with technology providers, upskilling of staff, and a cultural shift towards innovation and digital-first thinking. Despite these challenges, the potential benefits of digital transformation make it a crucial endeavor for SMEs looking to thrive in the digital age [6].

2.2 KEY COMPONENTS OF DIGITAL TRANSFORMATION

Digital transformation for Small and Medium Enterprises (SMEs) encompasses several key components that work together to fundamentally alter how these organizations operate and deliver value. These components include technology adoption, business model innovation, and organizational change.

Technology Adoption is a crucial aspect of digital transformation for SMEs. This involves integrating digital technologies into all areas of the business, transitioning from manual or paper-based processes to automated digital systems and workflows [2]. Key technologies that SMEs can leverage include cloud computing, which allows access to computing resources without large upfront costs and enables remote working capabilities [4]. AI streamlines recurring processes and operations, as chatbots manage basic client queries. IoT enables live performance monitoring and automated inventory control. These technologies collectively enhance efficiency and responsiveness in various business domains, from customer service to supply chain management. By leveraging AI, chatbots, and IoT, organizations can optimize their operations, reduce manual workload, and improve decision-making based on real-time data insights. Crucial innovations encompass e-commerce systems, mobile solutions, and data-driven insights. These technologies play a vital role in shaping modern business landscapes and consumer experiences. E-commerce platforms facilitate online transactions, mobile technology enables on-the-go connectivity, and data analytics empowers informed decision-making across various industries.

Business Model Innovation is another critical component of digital transformation for SMEs. This involves rethinking and changing how the business creates, delivers, and captures value in the digital age [5]. Digital transformation often requires SMEs to fundamentally reimagine their business models, moving beyond mere process optimization to create new value propositions and revenue streams. This can include developing new digital products or services, leveraging data to create personalized customer experiences, or adopting platform-based business models. For example, a traditional retail SME might develop an e-commerce platform, not just as an additional sales channel, but as a core part of its business model, integrating online and offline experiences [6].

Organizational Change is the third key component of digital transformation for SMEs. This involves adapting the company's culture, structure, and processes to support and enable digital initiatives [2]. It requires fostering a culture of innovation and digital literacy among employees, often necessitating significant investment in training and skill development. Organizational change also involves restructuring teams and workflows to become more agile and responsive to digital opportunities and challenges. This might include adopting flatter organizational structures, implementing cross-functional teams, or creating new roles such as Chief Digital Officer [4].

Digital transformation success for SMEs hinges on the synergistic integration of three key elements. Addressing technology adoption, business model innovation, and organizational restructuring concurrently is crucial for optimal outcomes. Implementing cutting-edge technologies without corresponding shifts in business strategies or company structures often yields limited advantages. Likewise, pursuing innovative business models lacking the requisite technological infrastructure or organizational adaptability is prone to falter. These interlinked facets bolster one another, necessitating a holistic approach to transformation. SMEs must tackle all three dimensions in tandem to achieve meaningful and sustainable digital evolution in today's rapidly changing business landscape.

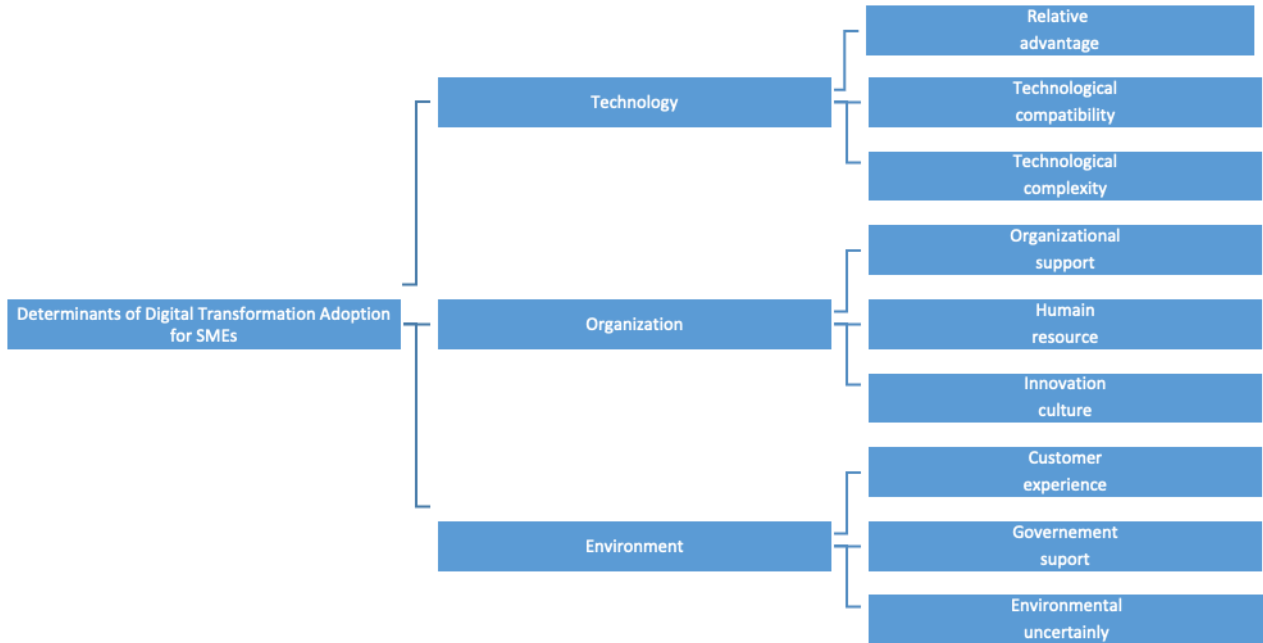


Fig. 1 Determinants of Digital Transformation Adoption for SMEs source: [7]

2.3 THEORIES AND MODELS RELEVANT TO DIGITAL TRANSFORMATION IN SME

Several theories and models are relevant to understanding digital transformation in Small and Medium Enterprises (SMEs). These frameworks provide valuable insights into the adoption, implementation, and impact of digital technologies in smaller organizations.

The Technology Acceptance Model (TAM) is a foundational theory that explains how users come to accept and use new technologies. For SMEs, TAM highlights the importance of perceived usefulness and perceived ease of use in driving digital adoption [2]. This model suggests that SME leaders and employees are more likely to embrace digital transformation when they clearly understand the benefits and find the new technologies easy to integrate into their workflows.

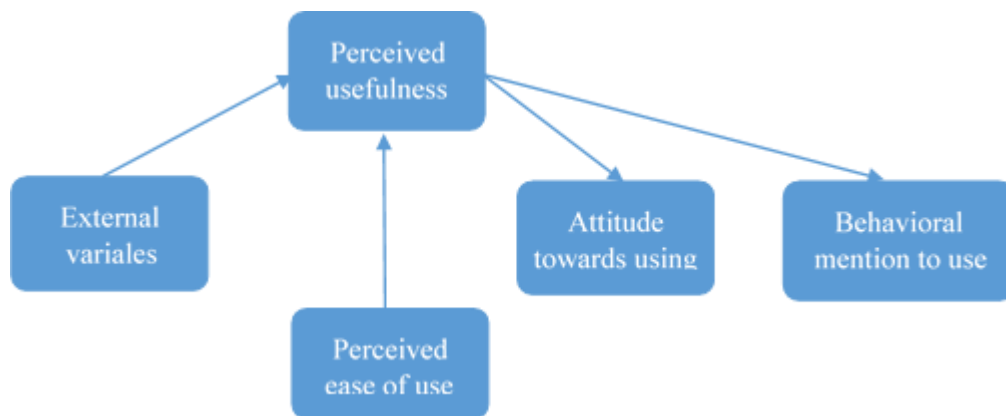


Fig. 2 The Technology Acceptance Model (TAM) Diagram (source [8])

The Unified Theory of Acceptance and Use of Technology (UTAUT) expands on TAM by incorporating additional factors such as social influence, facilitating conditions, and behavioral intention [2]. For SMEs, this model emphasizes the role of organizational culture, peer influence, and available resources in shaping digital transformation efforts. It suggests that successful digital initiatives in SMEs require not only technological readiness but also a supportive social and organizational environment.

Fig. 3. The Unified Theory of Acceptance and Use of Technology Diagram (source: [9])

The Resource-Based View (RBV) theory is particularly relevant for SMEs undergoing digital transformation. This theory posits that a firm's competitive advantage stems from its unique resources and capabilities [4]. In the context of digital transformation, RBV suggests that SMEs should focus on developing and leveraging their digital capabilities as key strategic assets. This may involve investing in employee training, acquiring specialized digital tools, or partnering with technology providers to enhance their resource base.

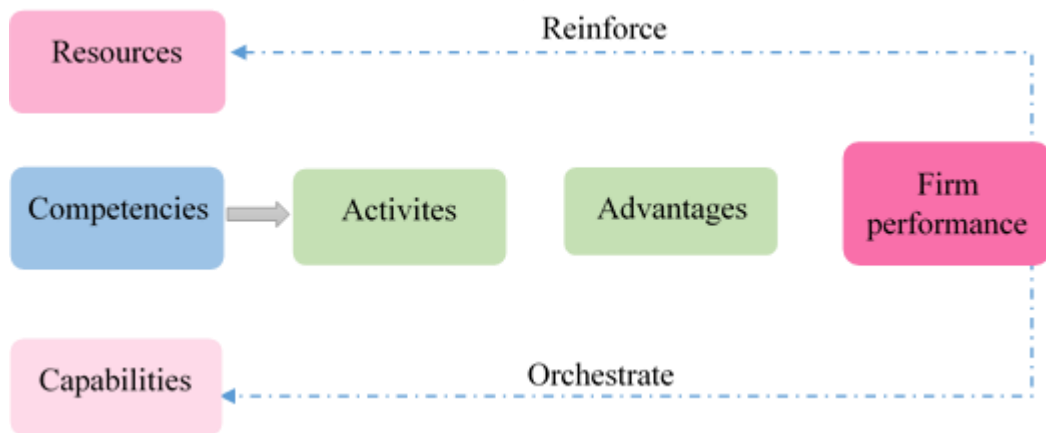


Fig. 4. The Resource-Based View Diagram (source: gitmind)

3 STATUS OF DIGITAL TRANSFORMATION IN MOROCCO

3.1 THE SITUATION OF DIGITAL ADOPTION AMONG MOROCCAN SMEs

The adoption of digital transformation among Moroccan Small and Medium Enterprises (SMEs) is progressing, but it remains uneven and faces several critical challenges. Moroccan SMEs, which make up 95% of the country's economic fabric, are increasingly recognizing the importance of digital tools for improving efficiency, competitiveness, and market reach. However, their use of digital technologies is often limited to basic functionalities such as maintaining a presence on social media platforms, websites, and using email or SMS for communication. Advanced technologies like artificial intelligence (AI), data analytics, and cloud computing are still underutilized, with only a minority of SMEs implementing comprehensive digital transformation strategies [1], [10].

One of the key drivers of digital adoption among Moroccan SMEs is the growing internet penetration in the country. As of early 2024, Morocco had an internet penetration rate of 90.7%, with over 34.47 million internet users. This widespread

access to the internet provides a foundation for SMEs to adopt digital tools and expand their online presence [11]. Additionally, sectors such as fintech and e-commerce have shown significant growth. For example, fintech solutions like HiPay and Jumia Pay have introduced efficient payment systems that streamline financial operations for businesses and consumers alike. Similarly, e-commerce platforms are becoming more popular among SMEs as they seek to reach broader markets and enhance customer engagement [4].

Despite these advancements, Moroccan SMEs face persistent barriers to full-scale digital adoption. One major challenge is the lack of technical skills among employees. Many workers are not adequately trained to use advanced digital tools such as AI or data analytics, creating a gap between technology availability and effective utilization [10]. This skills gap is often attributed to a disconnect between the education system and market needs, leaving businesses struggling to find qualified personnel. Financial constraints also remain a significant obstacle; many SMEs lack the resources to invest in costly technologies or upgrade their existing infrastructure. Older businesses, in particular, are hesitant to adopt expensive tools due to concerns about return on investment and risks associated with innovation [1].

Cultural resistance to change further slows down digital transformation efforts. Some SMEs continue to rely on traditional business models and are reluctant to adopt new technologies due to fears of disruption or mistrust in digital solutions. This resistance is particularly noticeable in older organizations where leadership may not fully understand the potential benefits of digital transformation [2]. Additionally, cyber security concerns pose another significant barrier. Many SMEs lack robust security measures and are wary of potential data breaches or cyber-attacks that could compromise their operations [4].

In conclusion, while Moroccan SMEs have made progress in adopting digital tools, their overall transformation remains limited by structural and cultural challenges. The increasing penetration of the internet and growth in sectors like fintech and e-commerce provide promising opportunities for further digital adoption. However, addressing barriers such as skill shortages, financial limitations, cultural resistance, and cyber security concerns will be essential for enabling Moroccan SMEs to fully embrace digital transformation and unlock its potential benefits for competitiveness and growth.

3.2 GOVERNMENT INITIATIVES AND POLICIES SUPPORTING DIGITAL TRANSFORMATION

The Moroccan government has implemented several initiatives and policies to support digital transformation, particularly focusing on Small and Medium Enterprises (SMEs) and the public sector. These efforts aim to accelerate the adoption of digital technologies and enhance the country's competitiveness in the digital economy.

One of the key strategies implemented by the Moroccan government is the "Maroc Numeric 2013" plan, which was later extended to the "Digital Morocco 2020" plan. These initiatives aimed to integrate Morocco into the digital economy by reducing the digital divide and connecting 20% of Moroccan SMEs [2]. The plans prioritized encouraging SMEs to computerize their operations to boost productivity and supported their technological investments. This strategic approach demonstrates the government's commitment to fostering a digital ecosystem that promotes innovation and competitiveness, especially for SMEs and startups [10].

Another significant initiative is the Moussanada IT Program, which ensures the practicability of information technologies and accelerates their use by SMEs across various sectors. This program provides financial assistance, covering up to 70% of the total cost (with a limit of 400,000 DH including tax) for the acquisition of information systems, including hardware and associated IT infrastructure [2]. This financial support is crucial in addressing one of the main barriers to digital adoption among SMEs: limited financial resources.

The creation of the Digital Development Agency (ADD) represents another important step in the government's efforts to support digital transformation. The ADD focuses specifically on SMEs, aiming to provide them with a complete digitalization package to support their digital transformation journey [2]. This tailored approach recognizes the unique challenges faced by SMEs in adopting digital technologies and offers targeted support to overcome these obstacles.

In 2020, the National Agency for the Promotion of Small and Medium Enterprises launched the Maroc PME CONNECT platform, offering digitalized support services through four sub-platforms: Jisr l'moukawala, Skills Transfer Platform, "Nawat Digital" Platform, and Virtual Academy [2]. This initiative demonstrates the government's efforts to provide comprehensive digital resources and training to SMEs, addressing the critical need for digital skills development.

The Moroccan government has also focused on digitalizing public services through the "e-Gov" program, which aims to modernize public administration and improve service delivery to citizens and businesses [1]. This initiative not only enhances the efficiency of public services but also creates an enabling environment for businesses to engage with government agencies more effectively.

These government initiatives and policies reflect a multi-faceted approach to digital development, capable of fostering the digital transition of both SMEs and the public sector. However, challenges remain, particularly in terms of digital skills gaps and strategic coordination across different sectors. Future policies may need to address these challenges more directly to ensure the successful implementation of digital transformation across the Moroccan economy.

3.3 CHALLENGES AND OPPORTUNITIES SPECIFIC TO THE MOROCCAN CONTEXT

The Moroccan context of digital transformation presents a dual landscape of challenges and opportunities, particularly for Small and Medium Enterprises (SMEs). These businesses, which constitute 95% of Morocco's economic fabric, face significant barriers that hinder their ability to fully embrace digital technologies. However, the evolving digital ecosystem also offers promising opportunities for those able to overcome these obstacles.

Challenges in Digital Transformation : One of the most pressing challenges for Moroccan SMEs is the lack of technical and digital skills among employees. Many SMEs struggle with a workforce that is not adequately trained to adopt and manage advanced digital tools such as artificial intelligence, cloud computing, and data analytics [2]. The innovation divide is amplified by a lack of synergy between academic research institutions and small to medium enterprises, hindering SMEs' ability to leverage cutting-edge technologies and advancements. This misalignment not only widens the competency chasm but also restricts the flow of groundbreaking ideas from laboratories to practical business applications. Without sufficient collaboration between academia and industry, SMEs are unable to leverage research outputs or benefit from tailored training programs.

Financial constraints also pose a significant barrier. Many Moroccan SMEs lack the resources to invest in costly digital tools or infrastructure upgrades. Strict lending criteria from banks further exacerbate this issue, particularly for startups and businesses in their growth phases. Additionally, the asymmetry of information between investors and SMEs creates difficulties in accessing financial products that are suited to their needs (Report by the Ethics Council for Securities, 2011). This financial fragility limits the ability of SMEs to implement comprehensive digital transformation strategies.

Cultural resistance to change within organizations is another major challenge. Many SME managers remain hesitant to transition from traditional business models due to concerns over costs, risks, and the complexity of digitalization processes [12]. Older businesses, in particular, often lack leadership that prioritizes innovation, further slowing down the pace of transformation [13]. Additionally, cyber security concerns remain prevalent among Moroccan SMEs. The fear of data breaches and insufficient knowledge about implementing robust security measures deter many businesses from adopting digital solutions [4].

Opportunities in Digital Transformation : Despite these challenges, Morocco's digital ecosystem offers significant opportunities for SMEs willing to embrace change. The rapid growth of internet penetration—reaching over 90% as of early 2024—has created a strong foundation for digital adoption [2]. This connectivity enables SMEs to expand their online presence through e-commerce platforms and digital marketing tools. E-commerce has shown particular promise as a growth area for Moroccan SMEs, allowing them to reach broader markets and enhance customer engagement despite initial challenges such as legislative gaps and cyber security concerns [4].

The emergence of fintech solutions also presents an opportunity for Moroccan SMEs. Platforms like Jumia Pay have revolutionized payment systems by offering efficient financial management tools that enhance transparency and reduce transaction costs [13]. Similarly, sectors such as agriculture and healthcare are increasingly leveraging digital tools like IoT devices and telemedicine platforms to improve operational efficiency and service delivery.

A crucial avenue for growth involves cultivating collaborations between small and medium-sized enterprises (SMEs) and tech companies or academic institutions. These joint ventures can address the skills shortage by providing customized training initiatives and facilitating access to cutting-edge technologies. For instance, programs designed to connect universities with regional businesses could establish a steady stream of qualified graduates prepared to tackle the challenges of an increasingly digital economic landscape. Such partnerships not only enhance the competitiveness of SMEs but also contribute to the overall technological advancement of the business ecosystem.

Finally, Morocco's improving digital infrastructure creates a conducive environment for transformation. Investments in fiber optic networks and plans for 5G deployment will enhance connectivity across urban and rural areas alike. These advancements will enable SMEs in remote regions to participate more actively in the digital economy [4].

4 IMPACT OF DIGITAL TRANSFORMATION ON MOROCCAN SMEs

The impact of digital transformation on Moroccan Small and Medium Enterprises (SMEs) has been profound, influencing various aspects of their operations, competitiveness, and overall performance. While digital transformation offers significant opportunities for growth and innovation, it also presents challenges that require strategic management.

Operational Efficiency and Productivity: Digital transformation has enabled Moroccan SMEs to streamline their operations and enhance productivity. By adopting digital tools such as Enterprise Resource Planning (ERP) systems, cloud computing, and data analytics, SMEs have improved their internal processes, including inventory management, customer relationship management (CRM), and financial reporting [3]. These technologies allow businesses to automate repetitive tasks, reduce human error, and allocate resources more efficiently. For instance, cloud-based platforms enable SMEs to access real-time data, facilitating faster decision-making and better coordination between departments [13]. This operational efficiency is particularly crucial in competitive markets where agility and responsiveness are key to success.

Market Expansion and Customer Engagement: Digital transformation has also opened new avenues for Moroccan SMEs to expand their market reach and improve customer engagement. The proliferation of e-commerce platforms and social media has allowed businesses to target a broader audience beyond their immediate geographic location [3]. Digital marketing practices, such as search engine optimization (SEO), social media advertising, and email campaigns, have become essential tools for SMEs to attract and retain customers [2]. Moreover, the integration of data analytics enables businesses to gain insights into consumer behavior, preferences, and purchasing patterns, allowing them to offer personalized products and services.

Resilience During Crises : The adoption of digital technologies has demonstrated its value in enhancing the resilience of Moroccan SMEs during crises. For example, during the COVID-19 pandemic, businesses that had already embraced digital tools were better equipped to adapt to disruptions. Digital platforms enabled remote work arrangements, online sales channels, and virtual customer support systems [13]. This adaptability not only helped SMEs maintain operations during challenging times but also highlighted the importance of digital transformation as a long-term strategy for risk management.

Challenges in Implementation: Despite these benefits, the impact of digital transformation on Moroccan SMEs is constrained by several challenges. One major issue is the lack of internal resources and technical expertise required to adopt advanced technologies effectively [3], [13]. Many SMEs face difficulties in recruiting skilled professionals who can manage digital tools or implement complex systems like AI or machine learning. Additionally, resistance to change within organizations remains a significant barrier. Employees and managers often hesitate to adopt new technologies due to fears of job displacement or a lack of understanding about the potential benefits [3].

Financial constraints further complicate the adoption process. Many Moroccan SMEs operate on tight budgets and struggle to allocate funds for costly digital tools or infrastructure upgrades [13]. The absence of targeted financial incentives or subsidies exacerbates this issue. Furthermore, cyber security concerns pose risks for businesses transitioning to digital platforms. Without robust security measures in place, SMEs are vulnerable to data breaches and cyber-attacks that can compromise sensitive information.

Competitive Advantage: For those Moroccan SMEs that successfully navigate these challenges, digital transformation offers a significant competitive advantage. Businesses that integrate digital technologies into their operations are better positioned to innovate, adapt to market trends, and deliver superior customer experiences. This not only enhances their market position but also fosters long-term sustainability in an increasingly digitized global economy [2], [13].

5 BARRIERS TO DIGITAL TRANSFORMATION

The barriers to digital transformation in Moroccan Small and Medium Enterprises (SMEs) are numerous and multifaceted, stemming from internal, external, and systemic challenges. These obstacles significantly hinder the ability of SMEs to fully embrace digital technologies and leverage their potential for growth and competitiveness.

One of the most critical barriers is the lack of technical skills and expertise within SMEs. Many employees lack the necessary training to adopt and manage advanced digital tools such as artificial intelligence, data analytics, and cloud computing . This skills gap is further intensified by the weak collaboration between Moroccan universities, research institutions, and SMEs, limiting opportunities for innovation and technological advancements. Without adequate training programs or partnerships to bridge this gap, many SMEs struggle to implement even basic digital solutions effectively.

Another significant obstacle is financial constraints, which remain a persistent challenge for Moroccan SMEs. Digital transformation often requires substantial investments in software, Financial constraints pose significant challenges for small and medium-sized enterprises (SMEs), particularly in acquiring essential equipment and facilities. While these businesses often require substantial capital for physical assets and operational frameworks, they frequently encounter obstacles when seeking loans from traditional banking institutions. This predicament is especially pronounced for newly established

companies or those undergoing growth phases, as stringent borrowing requirements imposed by lenders create barriers to obtaining crucial financial resources. Additionally, many SME managers are unaware of available financial products or find that existing options are not tailored to their needs. This financial barrier limits their ability to modernize operations and adopt cutting-edge technologies.

Cultural resistance to change within organizations also plays a major role in slowing down digital transformation efforts. Many SME leaders and employees remain hesitant to transition from traditional business models due to fears of disruption, high costs, or skepticism about the return on investment [12]. This resistance is particularly pronounced in older businesses where leadership may lack awareness of the benefits of digitalization. Moreover, habitual aversion to change among employees further complicates efforts to integrate new technologies into daily operations [13].

The complexity of digitalization processes is another barrier that discourages SMEs from embarking on transformation initiatives. Many businesses perceive the adoption of digital tools as overwhelming due to the strategic planning required and the technical challenges involved (Mina, 2024). This complexity is compounded by cyber security concerns, as many SMEs lack robust security measures to protect sensitive data from breaches or cyber-attacks. These fears often deter businesses from fully embracing digital platforms [13].

Additionally, limited access to market data poses a challenge for technological integration. Many SMEs lack reliable insights into market trends or customer behavior, making it difficult to align digital strategies with business goals [4]. The absence of comprehensive legislative frameworks for digital commerce further complicates matters by creating uncertainty around compliance and operational risks [2].

Despite these barriers, there are opportunities for Moroccan SMEs to overcome these challenges through targeted interventions. Expanding collaboration between universities and businesses could address skill shortages by providing tailored training programs. Financial support mechanisms such as grants or subsidized loans could alleviate funding constraints. Additionally, fostering a culture of innovation within organizations through leadership development programs could help mitigate resistance to change.

Addressing these barriers is essential for enabling Moroccan SMEs to fully capitalize on the benefits of digital transformation. By tackling issues such as skills gaps, financial limitations, cultural resistance, and cyber security concerns, Moroccan SMEs can enhance their competitiveness in both local and international markets while contributing more effectively to national economic growth.

6 FUTURE DIRECTIONS AND RECOMMENDATIONS

The future of digital transformation in Moroccan Small and Medium Enterprises (SMEs) depends on addressing existing challenges while leveraging opportunities to create a sustainable and competitive digital ecosystem. Several strategic directions and recommendations can guide the way forward, focusing on skill development, financial support, infrastructure enhancement, and fostering innovation.

Building Digital Skills and Capacity: One of the most critical areas for future development is addressing the digital skills gap among SME employees. Moroccan SMEs face significant limitations due to a lack of technical expertise, which hampers their ability to adopt and manage advanced digital technologies like artificial intelligence (AI), cloud computing, and data analytics. To overcome this, targeted training programs should be developed in collaboration with universities, vocational training centers, and private sector stakeholders. These programs should focus on equipping employees with practical skills in digital tools and emerging technologies.

Enhancing collaboration between academic institutions and small to medium-sized enterprises (SMEs) can effectively align research outcomes with industry requirements. Universities might consider creating innovation centers that offer SMEs direct access to cutting-edge technology, expert guidance, and research capabilities. This approach would facilitate the transfer of knowledge from academia to the business sector, promoting practical applications of scientific discoveries. Such partnerships could drive innovation, boost competitiveness, and foster economic growth by enabling SMEs to leverage academic resources and expertise in their product development and problem-solving processes. This collaboration would not only enhance workforce capabilities but also promote a culture of continuous learning within organizations.

Enhancing Financial Support Mechanisms: Financial constraints remain a major barrier to digital transformation for Moroccan SMEs. Many businesses lack the resources to invest in costly technologies or upgrade their infrastructure [13]. To address this issue, it is essential to expand financial support mechanisms tailored specifically for SMEs. Government programs like Moussanada IT have already made progress by subsidizing up to 70% of IT system acquisition costs; however, these initiatives need to be scaled up further [1].

In addition to subsidies, the creation of low-interest loans or grants specifically for digital transformation projects could encourage more SMEs to invest in technology. Financial institutions should also develop specialized products that align with the unique needs of smaller businesses. Furthermore, public-private partnerships could play a crucial role in mobilizing resources to fund large-scale digital initiatives.

Strengthening Digital Infrastructure: Improving digital infrastructure is another key priority for advancing SME digital transformation in Morocco. While internet penetration in urban areas has reached significant levels, rural regions still face connectivity challenges that limit access to digital tools [4]. Expanding broadband networks and accelerating the deployment of 5G technology are essential steps toward ensuring equitable access across the country.

The development of national cloud services is also critical for providing affordable and secure data storage solutions for SMEs. A hybrid cloud model—combining sovereign clouds for sensitive data with public clouds for general business operations—could offer a balanced approach that meets both security requirements and cost considerations [13]. Such infrastructure improvements would enable SMEs to adopt advanced technologies more effectively while reducing operational costs.

Promoting Innovation Through Startups: Encouraging innovation within the SME ecosystem is vital for sustaining long-term growth. Morocco's focus on supporting tech startups through incubators and accelerators provides a strong foundation for fostering entrepreneurship [1]. Expanding these programs to include mentorship opportunities, access to venture capital funding, and international networking platforms can further enhance their impact.

Moreover, incentivizing SMEs to collaborate with startups can drive innovation by integrating cutting-edge solutions into traditional business models. For instance, partnerships between established businesses and fintech startups could revolutionize payment systems or streamline financial management processes [4].

Developing a Supportive Legal Framework: A robust legal framework is essential for fostering trust in digital technologies and ensuring their safe adoption by Moroccan SMEs. Laws governing data protection, cyber security, and e-commerce need continuous updates to keep pace with technological advancements [12]. Simplifying administrative procedures related to digital adoption can also reduce bureaucratic hurdles that discourage businesses from transitioning to digital platforms.

Encouraging Cultural Change: Finally, addressing cultural resistance to change within organizations is crucial for driving digital transformation. Leadership development programs that emphasize the benefits of digitalization can help SME managers adopt a forward-thinking mind-set [13]. Creating awareness campaigns that highlight success stories of digitally transformed businesses may also inspire other SMEs to follow suit.

7 CONCLUSION

The digital transformation of Moroccan SMEs is a critical pathway for enhancing their competitiveness, resilience, and contribution to the national economy. However, the journey toward full digital integration is hindered by significant challenges, including skill shortages, financial constraints, cultural resistance, and inadequate infrastructure. Addressing these barriers requires a multifaceted approach that leverages academic insights and evidence-based strategies.

First, the lack of technical expertise among employees remains one of the most pressing issues for Moroccan SMEs. Research highlights the importance of targeted training programs and partnerships between academia and industry to bridge this gap [10]. By fostering collaboration between universities and businesses, SMEs can gain access to innovative technologies and skilled graduates equipped to meet the demands of a rapidly digitizing economy.

Second, financial limitations continue to restrict SMEs' ability to invest in digital tools and infrastructure. Studies emphasize the need for tailored financial mechanisms, such as grants, low-interest loans, and public-private partnerships, to alleviate these constraints [13]. Expanding existing programs like Moussanada IT while introducing new funding models can provide SMEs with the resources necessary to embark on comprehensive digital transformation initiatives.

Third, improving digital infrastructure is essential for ensuring equitable access to technology across Morocco. Academic research underscores the importance of expanding broadband networks and accelerating 5G deployment to bridge the urban-rural divide [4]. Investments in national cloud services can also offer affordable and secure solutions for data storage and management, enabling SMEs to adopt advanced technologies more effectively.

Finally, fostering a culture of innovation within SMEs is crucial for sustaining long-term growth. Promoting leadership development programs that emphasize digital literacy and highlighting success stories of digitally transformed businesses can

help overcome cultural resistance [13]. Additionally, creating a supportive legal framework for data protection, cyber security, and e-commerce will build trust in digital technologies and encourage their adoption [12].

In conclusion, the future of Moroccan SMEs lies in their ability to embrace digital transformation as a strategic priority. By addressing barriers through skill development, financial support mechanisms, infrastructure enhancement, cultural change initiatives, and legal reforms, Morocco can create an enabling environment that empowers its SMEs to thrive in an increasingly competitive global economy. These efforts will not only strengthen individual businesses but also contribute significantly to Morocco's broader economic growth and technological advancement.

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