

The Impact of Information and Communication Technologies on the Competitiveness of Smes in Morocco: An Approach Based on the Technology Acceptance Model



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ABSTRACT: This article examines the impact of Information and Communication Technologies (ICT) on economic competitiveness in Morocco, with a focus on ICT adoption among small and medium-sized enterprises (SMEs). Through an analysis based on the Technology Acceptance Model (TAM), the study identifies key challenges faced by companies in integrating ICT and highlights opportunities presented by government initiatives such as the "Digital Morocco Plan 2020." The findings indicate that the acceptance and increased use of ICT are essential for fostering innovation and enhancing the performance of Moroccan businesses, thereby contributing to sustainable economic growth.

KEYWORDS: Information and Communication Technologies (ICT) - Economic Competitiveness - Small and Medium-sized Enterprises (SMEs) - Technology Acceptance Model (TAM) - Innovation

I. INTRODUCTION

In the current global context, Information and Communication Technologies (ICT) play a crucial role in economic development. They have become a driving force for innovation and growth, enabling countries to transform their economies and enhance their competitiveness on the international stage. According to the Organisation for Economic Co-operation and Development (OECD, 2021), ICT adoption is essential for boosting productivity and creating new business opportunities. The World Bank (2016) also highlights that ICT offers "digital dividends" that can significantly contribute to economic growth, particularly in developing countries. In Morocco, the importance of ICT is recognized, as demonstrated by the Digital Morocco Plan 2020, which aims to strengthen digital infrastructure and promote the use of technologies across various sectors (Ministry of Industry, Trade, Green and Digital Economy, 2020). However, the country faces several challenges that hinder its full potential for economic competitiveness. The High Commission for Planning (2020) reports that gaps persist in internet coverage, especially in rural areas, and that the population's digital skills require significant improvement to foster ICT adoption. Additionally, as indicated by the World Economic Forum (2020), cultural and regulatory barriers also limit the integration of ICT into Moroccan industrial strategies.

This article aims to explore ICT acceptance in Morocco and analyze its impact on economic competitiveness and industrial strategies. By examining the factors that influence ICT adoption, we hope to understand how these technologies can strengthen the country's economic position in the global market. Furthermore, this article will shed light on the potential synergies between ICT integration and industrial strategies, offering recommendations to enhance Morocco's competitiveness.

II. CONCEPTUAL FRAMEWORK

A. Acceptance of Technologies

The acceptance of Information and Communication Technologies (ICT) is essential for their successful adoption in any economic environment. Two of the most influential theoretical models explaining this acceptance are the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). The TAM, developed by Davis (1989), posits that two main factors influence the intention to use technologies: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Users are more likely to adopt a technology if it is perceived as useful for accomplishing tasks and easy to use. This model has been widely validated in various contexts, including studies on ICT acceptance in Morocco (Mohamed, 2017).

In parallel, the UTAUT model, proposed by Venkatesh et al. (2003), integrates several additional dimensions, including Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. These dimensions provide a more comprehensive view of the factors influencing technology acceptance, accounting for social and organizational contexts. Applying this model in the Moroccan context can reveal significant insights into how these dimensions interact within specific environments, particularly within SMEs (Hafsi, 2019). Other models, such as Everett Rogers' Diffusion of Innovation Model, may also be relevant

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in explaining how ICT is adopted across various industries in Morocco. Adapting these models to Morocco's unique cultural and economic characteristics is crucial to understanding the challenges and opportunities associated with ICT acceptance.

B. ICT and Economic Competitiveness

The impact of ICT on economic competitiveness is well documented. ICT is considered a key driver of innovation, productivity, and market access. According to the World Bank report (2016), countries that rapidly adopt ICT can witness a significant improvement in their economic performance. In Morocco, this adoption is particularly relevant in the SME sector, which constitutes a substantial part of the economy. ICT integration fosters innovation by enabling companies to develop new products and services and improve existing processes. For instance, the use of digital platforms in the agriculture sector has allowed Moroccan farmers to access new markets and manage their resources more effectively (ECA, 2015).

Additionally, ICT adoption is associated with productivity gains. Katz and Koutroumpis (2013) note that companies integrating digital technologies into their operations can not only reduce costs but also improve operational efficiency. This productivity enhancement is crucial for strengthening the competitiveness of Moroccan businesses on the global stage. Lastly, ICT adoption greatly facilitates access to international markets. The rise of e-commerce offers Moroccan companies an unprecedented opportunity to reach customers beyond borders, a vital advantage in a globalized economy (OECD, 2021).

However, it is important to acknowledge that challenges remain, particularly concerning infrastructure and digital skills, which can limit the positive impact of ICT on economic competitiveness (Zhang & Lee, 2021). In summary, ICT acceptance and its integration into industrial strategies are essential to enhancing Morocco's economic competitiveness. By analyzing theoretical models and examining the relationship between ICT and economic performance, we can better understand the challenges and opportunities within Morocco's current technological landscape.

III. STATE OF ICT IN MOROCCO

A. Technological Infrastructure

The state of Information and Communication Technology (ICT) infrastructure in Morocco has seen significant progress in recent years. The country has invested in expanding broadband Internet coverage, which has become a key pillar of economic development. According to the World Bank report (2020), Internet access has been expanded through initiatives like the "Digital Morocco 2020" program, aimed at bridging the digital divide, particularly in rural areas. Despite these advancements, gaps remain. The quality of Internet services, especially in remote areas, continues to be a major concern, limiting access to information and digital services for a substantial portion of the population (ECA, 2018). Moreover, improving infrastructure reliability is essential, as noted by Katz and Koutroumpis (2013), to support the competitiveness of Moroccan businesses in the global market.

B. Public policies and initiatives

Public policies play a fundamental role in promoting ICT adoption in Morocco. The Digital Morocco Plan, implemented by the government, aims to integrate digital technologies across all sectors of the economy. As highlighted by GIZ (2020), this initiative seeks to create a supportive digital ecosystem that encourages innovation and attracts investments. Regulations supporting these initiatives have also evolved, focusing on user protection and promoting competition within the telecommunications sector. The regulatory framework has been strengthened to foster the development of new digital services and improve Internet access (OECD, 2021).

Furthermore, public-private partnerships are essential for accelerating innovation in the ICT sector. Hafsi (2019) reports successful projects where collaborations between the government and the private sector have accelerated the adoption of digital technologies. These partnerships illustrate the impact of combined efforts to establish a digital environment that supports economic growth and technological advancement in Morocco.

C. ICT adoption by businesses

The adoption of ICT by Moroccan businesses presents a varied landscape. According to Chkir and Jiddou (2020), ICT adoption rates vary significantly across different sectors. Industries such as e-commerce and financial services have demonstrated proactive digital technology adoption, enhancing innovation and productivity. However, other sectors, such as agriculture and manufacturing, face barriers that slow their digital transformation. These obstacles include a lack of financial resources, insufficient training, and a corporate culture often reluctant to embrace new technologies (Mchombu, 2021). Case studies reveal that certain companies, such as Afriquia Gaz, have successfully integrated ICT into their operations to boost efficiency and competitiveness. These examples underscore the critical role of executive commitment in driving digital transformation (Tazi, 2015).

IV. IMPACT OF ICT ON THE COMPETITIVENESS OF THE MOROCCAN ECONOMY

A. Improving productivity

Information and Communication Technologies (ICT) play a crucial role in optimizing production processes in Morocco. By enabling task automation and improving workflow, ICT contributes to a significant reduction in operational costs. According to a World

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Bank report (2020), the integration of digital solutions has allowed many Moroccan businesses to achieve increased operational efficiency, resulting in higher productivity (World Bank Group, 2020). Additionally, the study by Hassan and Khalil (2020) highlights that ICT adoption facilitates effective resource management, particularly through better inventory management and optimized logistics. As a result, businesses can lower both fixed and variable costs, enabling them to offer products at more competitive prices in the market. These savings are particularly evident in the manufacturing sector, where ICT enhances quality monitoring and control (Hassan & Khalil, 2020).

B. Innovations and new opportunities

Information and Communication Technologies (ICT) also promote innovation by stimulating the development of new products and services. The study by Benkhaled and Kharraz (2020) indicates that emerging technologies, such as artificial intelligence and Big Data, provide new opportunities for Moroccan businesses to innovate and differentiate themselves in the market. Indeed, the ability to analyze vast amounts of data allows companies to better understand consumer needs and adapt their offerings accordingly. Alami and Dhiab (2021) highlight the rise of e-commerce in Morocco as a significant innovation that contributes to the creation of economic opportunities. By facilitating access to international markets, e-commerce enables small and medium-sized enterprises (SMEs) to market their products on a global scale, thus enhancing their competitiveness (Alami & Dhiab, 2021). Furthermore, government initiatives, such as the Morocco Digital Plan, support this momentum by providing resources and training to entrepreneurs (OECD, 2019).

C. Access to international markets

Finally, ICT is essential for facilitating Moroccan businesses' access to international markets. According to the OECD report (2019), the use of digital platforms and e-commerce solutions has significantly broadened the commercial horizons of Moroccan companies, allowing them to reach customers beyond national borders. This development is crucial for Morocco's integration into global value chains. The report by Benkhaled and Kharraz (2020) reveals that the logistical optimization brought about by ICT has also strengthened Moroccan companies' positions in international trade. By improving communication and collaboration with international partners, companies can navigate the complexities of global markets more effectively.

In summary, ICT plays a decisive role in enhancing productivity, innovation, and access to international markets for the Moroccan economy. While challenges remain, the opportunities created by integrating ICT are substantial and essential for strengthening the country's economic competitiveness.

IV. CHALLENGES TO ICT ADOPTION

The adoption of information and communication technologies (ICT) in Morocco faces several challenges that may hinder the country's economic development and digital integration. This section explores three main categories of challenges: cultural and social factors, infrastructure and investment, as well as policies and regulations. .

A. Cultural and social factors

Cultural factors play a crucial role in the acceptance of information and communication technologies (ICT) in Morocco. Cultural attitudes can influence how individuals perceive and use new technologies. For example, some studies indicate that local beliefs and values may create resistance to the adoption of ICT, favoring personal interactions over digital transactions (Gonzalez & Henao, 2019). Furthermore, limited digital skills within certain populations represent a significant barrier. A lack of digital literacy can diminish individuals' ability to effectively use ICT, exacerbating the digital divide (Alderete, 2020). Finally, socioeconomic inequalities, particularly between urban and rural areas, further complicate the adoption of ICT by creating disparities in access to technology (Gonzalez & Henao, 2019).

B. Infrastructure and investment

The state of ICT infrastructure in Morocco also poses a significant challenge. Although progress has been made, the quality and availability of technological infrastructure, such as access to broadband Internet, remain inadequate in certain regions. This prevents a large number of users from accessing digital services effectively (Bencherki & Benslimane, 2020). Additionally, there is a critical need for investments in technological infrastructure to modernize existing systems and support a robust technological ecosystem (Azzari & Bensalah, 2020). Partnerships between the public and private sectors could play a key role in financing and developing this infrastructure, but investment barriers, such as political instability and a lack of clear regulations, continue to hinder these efforts.

C. Policies and regulations

Policies and regulations regarding ICT in Morocco can either facilitate or hinder the adoption of technologies. The existing regulatory framework, while favorable in certain respects, requires improvements to encourage technological innovation. The Morocco Digital Plan 2020 was established to support digital transformation, but it is essential to assess its effectiveness in the face of persistent challenges (Ministry of Industry, Trade, and Green and Digital Economy, 2020). Furthermore, data security and privacy

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standards play a crucial role in user trust regarding digital technologies. Strict regulations can sometimes serve as barriers to adoption, especially if they are not clearly defined (Benkirane & Kettani, 2021). Lastly, complex administrative procedures can also complicate the adoption of ICT, thereby discouraging businesses from fully engaging in digitization. In summary, the adoption of ICT in Morocco faces cultural, infrastructural, and regulatory challenges that must be overcome to promote successful digital integration. Improving digital skills, strengthening technological infrastructure, and implementing appropriate policies are essential to create an environment conducive to ICT adoption and, consequently, enhance the competitiveness of the Moroccan economy.

V. RECOMMENDATIONS FOR INCREASING ACCEPTANCE OF ICT

To promote the adoption of information and communication technologies (ICT) in Morocco and strengthen the competitiveness of its economy, it is crucial to adopt effective strategies at both the public policy and private initiative levels. This section presents recommendations based on recent analyses of the challenges and opportunities related to ICT in the Moroccan context.

A. Strategies for public policy

Public policies play a fundamental role in promoting ICT. The Morocco Digital Plan 2020, implemented by the Ministry of Industry, Trade, Green and Digital Economy, constitutes an ambitious strategic framework for accelerating the country's digital transformation (DGI, 2018). However, it is imperative to assess the impact of these policies and introduce adjustments based on feedback from the stakeholders involved (Khalfi & Aoufi, 2020). A participatory approach could facilitate the inclusion of various stakeholders, including businesses and citizens, in the design and evaluation of initiatives. It is also essential to encourage investments in ICT infrastructures, which remain a weakness for the country. Data from the World Bank (2016) highlight that robust infrastructures are crucial to support the digitization of Moroccan enterprises. Thus, the government must allocate adequate financial resources for the development of these infrastructures while facilitating public-private partnerships to optimize the use of available resources (Fassi & Hakkou, 2019).

B. Initiatives for companies

From the perspective of businesses, it is recommended to implement training and awareness programs to improve employees' digital skills. According to Larabi and Naciri (2020), a skilled workforce is essential to leverage the benefits offered by ICT. Furthermore, integrating digital solutions into operational processes can help optimize productivity and reduce costs (Oussaid & Soudani, 2021). Companies should also be encouraged to adopt innovative business models that fully exploit digital technologies. By adopting innovation-oriented strategies, as highlighted by the OECD (2018), businesses can not only enhance their competitiveness in the local market but also facilitate access to international markets. Finally, it is crucial to foster collaboration between the public and private sectors to create an ecosystem conducive to innovation and ICT adoption. Initiatives such as technology clusters or business incubators can play a central role in this dynamic (UNCTAD, 2021). By integrating ICT into global value chains, Moroccan companies can not only improve their competitiveness but also contribute to the overall economic development of the country.

CONCLUSION

The adoption of information and communication technologies (ICT) has proven crucial for enhancing the economic competitiveness of Morocco. This article highlighted several key points, notably the importance of ICT infrastructure, public policies, and business initiatives in this process. As indicated by Khalfi and Aoufi (2020), digital development policies are essential for encouraging innovation and improving the efficiency of business processes. Furthermore, the World Bank study (2016) emphasizes that robust infrastructure is a prerequisite for effective integration of ICT in Moroccan businesses, thereby promoting productivity and access to international markets. We also observed that culture and digital skills play a decisive role in the acceptance of ICT, as explained by Oussaid and Soudani (2021). Moroccan companies, in particular, must invest in training their personnel to fully leverage the advantages of ICT. Finally, challenges related to infrastructure, investments, and regulatory policies require ongoing attention to ensure the successful adoption of digital technologies (Fassi & Hakkou, 2019). The future prospects for ICT development in Morocco appear promising, especially with the ongoing implementation of strategies such as the Digital Morocco 2020 Plan. This plan aims to integrate ICT into various economic sectors, thereby fostering innovation and competitiveness. According to the Organisation for Economic Co-operation and Development (OECD, 2018), the development of ICT is not only a lever for economic growth but also plays a key role in the digital transformation of the country. In the future, it is essential to strengthen partnerships between the public and private sectors to create an ecosystem conducive to innovation. Businesses should also consider exploring new digital business models to adapt to a constantly evolving economic environment. By integrating advanced technological solutions, such as artificial intelligence and big data, Morocco can enhance its competitiveness on the global stage (UNCTAD, 2021). In summary, to fully realize the potential of ICT in economic development, it is crucial for all stakeholders to collaborate in overcoming current challenges and seizing the opportunities offered by digital transformation.

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