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The Key Role of Managerial Capabilities in AI Adoption: The Case of Companies Operating in Tunisia

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***Abstract*—The integration of Artificial Intelligence (AI) represents a major strategic challenge for companies, a challenge that is strongly conditioned by the managerial capabilities of their leaders. In Tunisia, mastery of these competencies has become an essential issue for developing effective and context-appropriate AI integration strategies. The objective of this research is to examine the impact of managerial capabilities on AI adoption in companies operating in Tunisia. A questionnaire was distributed to a representative sample of executives and senior managers from various economic sectors, selected using a probabilistic sampling method to ensure representativeness. The results highlight that general digital maturity is a necessary but insufficient condition for AI adoption. For Tunisian decision-makers, the challenge is no longer merely to "digitize," but to transform leadership in order to manage complexity and risk. The study suggests moving beyond conservative visions and strengthening AI-specific training to overcome execution constraints.**

Keywords—Companies Operating in Tunisia- Artificial Intelligence (AI)- Digital Transformation- Managerial Capabilities.

I. INTRODUCTION

In a context of accelerated digital transformation, marked by the rise of disruptive technologies such as artificial intelligence, big data, and robotics, companies are facing a profound reconfiguration of their organizational and strategic models [14]. The integration of artificial intelligence (AI) technologies within companies is becoming a major strategic challenge, shaped by the managerial capabilities of leaders. Indeed, these capabilities encompass a range of skills such as strategic vision, change management, and the ability to mobilize the necessary human and technical resources that determine the perception, preparation, and implementation of technological innovations [19]. Although the benefits of AI are recognized, their realization depends heavily on the managerial capabilities of leaders [8]. In the Tunisian context, characterized by specific economic and institutional features, these capabilities play a crucial role in overcoming obstacles to AI adoption, such as a lack of resources or specialized expertise [11]. Within this framework, the main objective of this article is to examine the influence of managerial capabilities on AI adoption in companies operating in Tunisia. Our study is organized as follows: Section 1 presents a literature review, focusing on the theoretical foundations of managerial capacity dimensions and their relationship with artificial intelligence. The following section describes the methodology used. Then, we present

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and analyze the findings of our study. Finally, we highlight the theoretical and managerial implications, as well as avenues for future research.

II. LITERATURE REVIEW

Digital transformation is defined as the strategic integration of digital technologies into organizational processes and business models, with the aim of creating value and strengthening competitive advantage [1]. It is recognized as a key strategic priority for organizations [14]. This dynamic relies on the development of advanced technological capabilities and high-performing information systems, which foster improved operational performance [12]. In this context, artificial intelligence, considered a disruptive technology and a major driver of organizational performance [10], appears as a natural evolution of this digital trajectory. Several studies also highlight that value creation from AI technologies depends on the prior existence of robust digital capabilities and a clear strategic orientation toward digital transformation, conditioning both the necessary infrastructure and the potential for organizational impact [10]. Based on these observations, we formulate the following hypothesis:

H1: *A clear digital vision has a positive impact on the adoption of AI.*

According to [17] and [2], digital culture is defined as the set of values, beliefs, and behaviors shared within an organization that actively enhance and support the digital transformation process. [15] specifies that, to integrate artificial intelligence, leaders must establish an organizational learning culture in which AI is considered complementary to human skills. This engagement and openness to cultural change are therefore fundamental to the successful integration of AI. Furthermore, culture is considered a crucial prerequisite for digital transition, influencing technology adoption and the overall effectiveness of digitization initiatives [12].

H2: *Engagement and a culture of change have a positive impact on AI adoption.*

Organizational capabilities are defined as the result of the strategic combination and deployment of complementary resources within a company, with the aim of acquiring a sustainable competitive advantage [10]. The concept of AI governance, for its part, is characterized as a set of tools, solutions, and levers intended to influence the development and applications of AI [5].

According to [7], it is crucial to differentiate between IT governance, which manages hardware and software assets to automate tasks, and data governance, which oversees these resources as valuable information assets. Based on these previous studies and the existing literature that addresses value creation through governance [16], we formulate the following hypothesis:

H3: *Effective governance and steering have a positive impact on AI adoption.*

Digital leadership is defined as a dynamic capability essential to the success of digital transformation [9]. According to [4], this leadership is based on fundamental principles such as agility, strategic thinking, effective communication, commitment, and continuous learning. [3] further develops this perspective by specifying that the primary role of the digital leader is to use their influence, similar to transformational leadership, to encourage innovation and foster organizational adaptation to change.

There is broad consensus in the scientific literature on the importance of establishing strong digital leadership [6] and cultivating a suitable digital culture to ensure the success of digital transformation [18]. This allows us to formulate the following hypothesis:

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H4: *Strong digital leadership has a positive impact on AI adoption.*

III. RESEARCH DESIGN AND DATA ANALYSIS

A. Data Collection

To study the impact of digital capabilities on AI adoption among companies operating in Tunisia, an empirical study was conducted using an online and paper questionnaire.

A total of 102 valid questionnaires were used for the analysis. The sample of companies consisted of 58.8% private companies, 27.5% public companies, and 13.7% semi-public companies.

Regarding the nature of capital, Tunisian companies overwhelmingly dominate the sample, representing 75.5% of the businesses. Companies with foreign capital (15.7%) or mixed capital (8.8%) constitute a significant minority. In terms of size, the sample focuses on larger businesses: medium-sized (41.2%) and large (40.2%) companies together make up 81.4% of the surveyed entities. Small businesses (18.6%) are proportionally less represented. Finally, the sectors of activity are concentrated around the production and service sectors, with Services (30.4%) and Industry (28.4%) accounting for nearly 60% of the sample. Telecommunications (16.7%) and Public Administration (11.8%) complete this picture, while Banking/Finance (8.8%) and Agriculture (3.9%) remain the least represented sectors.

In terms of job title, the respondents are predominantly managers: Senior Managers (26.5%), Administrative Staff (22.5%), and Engineers/Technicians/Researchers (22.5%). Executive positions (13.7%) and Communication/Marketing Officer roles (6.9%) are the least common. Analysis by age reveals a particularly young workforce: the 30–39 age group is the largest (44.1%), followed by those under 30 (28.4%). Thus, nearly three-quarters (72.5%) of respondents are under 40, indicating strong involvement of younger generations in the surveyed companies. Finally, the gender distribution is almost equal, with a slight predominance of women (52.9%) over men (47.1%).

B. Hypothesis Testing

The results of the structural model revealed that Digital Leadership has a positive impact on the adoption of Artificial Intelligence ($\beta = 0.290$; $t = 2.096$; $p = 0.036$), thus supporting hypothesis H4. Conversely, the results show that the following variables Governance and Steering ($\beta = 0.159$; $t = 1.179$; $p = 0.238$), Cultural Involvement ($\beta = 0.180$; $t = 1.352$; $p = 0.176$), and Digital Vision ($\beta = 0.108$; $t = 1.027$; $p = 0.305$) have a non-significant impact on the adoption of Artificial Intelligence. Therefore, hypotheses H1, H2, and H3 were rejected.

IV. DISCUSSION OF RESULTS

The results of this research demonstrate that digital vision has a negative impact on the adoption of AI. These findings diverge from previous studies [1], [14], which have shown that strategic clarity is important in promoting the adoption of digital technologies in the context of human resource management and emerging technologies. This highlights that, in the context of Tunisian companies, despite the maturity of digital vision, it remains too conservative and focused on traditional digitalization. Furthermore, this paradoxical impact can be explained by the fact that rigorous strategic alignment becomes a barrier. Indeed, the overall strategy of companies may be dominated by financial prudence, margin optimization, and risk aversion in the face of an uncertain economic environment. In addition, this study revealed that engagement and a culture of change have no significant effect

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on AI adoption, a finding that diverges from prior studies [13], which position digital culture as a key prerequisite. This lack of significance indicates that the influence of these organizational factors is neutralized by higher-level constraints, suggesting a decoupling between organizational maturity related to general digital processes and the specific requirements of artificial intelligence adoption.

This result confirms that the existence of a culture of change constitutes a necessary but not sufficient condition for AI adoption. Engagement and a culture of change (ECC) appear to be overshadowed by more influential non-cultural barriers, such as a lack of specialized technical skills, financial constraints, or infrastructural limitations. Consequently, the practical difficulties encountered in AI implementation stem primarily from these constraints, indicating that adoption is driven mainly by strategic and technical factors that take precedence over purely organizational willingness.

Similarly, the hypothesis concerning the impact of effective governance and steering mechanisms on AI adoption was rejected, contradicting prior research [10]. Although digital transformation roles are clearly defined, these governance elements remain insufficient to stimulate AI adoption, showing an insufficient focus on the specific infrastructure required by AI [7]. Furthermore, in the Tunisian context, the rejection of this hypothesis reveals a misalignment between investments in digital skills development within human resource governance and the acquisition of the specialized expertise required for AI implementation. While digital initiatives are generally coordinated through interdepartmental steering, current governance frameworks maintain a broad focus on digital transformation rather than adopting a distinct, rigorous, and targeted AI governance model. This gap reflects a limited level of organizational maturity in translating conventional digital management practices into a coherent AI adoption strategy that requires highly specialized human resources and a dedicated strategic vision.

Conversely, the hypothesis that strong digital leadership has a positive impact on AI adoption was accepted. This result indicates that proactive and effective leadership exerts a positive and significant influence on AI adoption, thereby confirming previous findings [6]. These findings suggest, first, that in the context of companies operating in Tunisia, AI adoption is driven by active leadership support for digital initiatives and the consistent communication of digital values across all organizational levels, ensuring strategic alignment and stakeholder engagement. Second, leadership effectiveness is reinforced through cross-functional collaboration, as reflected in the close cooperation between business and IT managers on AI projects. This collaboration enables AI solutions to be aligned with organizational objectives. Consequently, action- and communication-oriented leadership contributes to rigorous performance management of digital initiatives and facilitates successful AI adoption.

V. CONCLUSION

The objective of this study was to examine the impact of managerial capabilities: namely digital vision, involvement and a culture of change, governance and steering, and digital leadership: on the adoption of artificial intelligence within the specific context of Tunisian companies.

The analysis highlighted the crucial role of digital leadership, whose positive and significant influence on AI adoption confirms the predominance of active leadership support in the strategic allocation of resources and in ensuring effective cross-functional alignment of AI projects. However, the study also revealed paradoxical results, as the negative effect of digital vision suggests that overly cautious strategies or those focused on traditional digitalization hinder the innovative investments required for AI adoption. Furthermore, organizational factors such as a culture involvement and governance and steering were found to be insignificant, as their influence is neutralized by higher-level execution constraints, including a lack of specialized technical skills and AI-specific infrastructural limitations.

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From a theoretical perspective, this research enriches the literature on technology adoption in emerging economies. The findings indicate that organizational maturity developed through general digital transformation is a necessary but insufficient condition for AI adoption. Moreover, this study emphasizes the need to refine existing analytical frameworks to account for the paradoxical effect of a conservative strategic vision, which may hinder AI adoption, while underscoring the central role of leadership as a key mechanism for overcoming such strategic resistance.

From a managerial perspective, the findings suggest that companies need to move beyond traditional digital strategies to develop dedicated AI strategies. In this regard, leaders are required to cultivate a leadership style that not only communicates the value of AI but is also capable of managing its technical complexity and fostering a culture of calculated risk-taking. Such leadership is essential to overcoming practical implementation barriers, particularly those related to the management of specialized talent and resistance to technological change.

Despite its contributions, this study has certain limitations, particularly regarding the generalizability of its findings, which is constrained by the specific economic and institutional characteristics of the Tunisian context. Future research could adopt qualitative or longitudinal approaches to explore the mechanisms through which digital vision may become an obstacle to AI adoption. It would also be valuable to examine the moderating effects of implementation barriers, such as financial and infrastructural constraints, in order to better explain the role of cultural and governance factors. Such investigations would contribute to a deeper understanding of the conditions required for successful AI adoption in emerging economies such as Tunisia.

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