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THE SHIFT TOWARDS DIGITAL LEADERSHIP AS A STRATEGIC OPTION TO ENHANCE DIGITAL MATURITY AT OOREDOO ALGERIA: A STUDY BASED ON THE WESTERMAN MATRIX AND COLLEAGUES

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ABSTRACT

Digital leadership plays a vital role in enhancing digital maturity in the business sector in Algeria by relying on digital technologies and adopting electronic communication methods within its institutions, especially economic ones. This approach raises the level of digital maturity by increasing operational efficiency and improving productivity, enabling them to reach new markets and expand their business through e-commerce and online marketing. Additionally, digital leadership enhances communication and collaboration within the organization, contributing to better information management and increasing data availability for improved decision-making. Moreover, digital technologies can also bolster research and development processes and encourage innovation in Algerian companies, leading to greater success and increased competitiveness on both national and international levels.

This study employs a case study methodology, deemed most suitable for the research topic. Semi-structured interviews and the Westerman Matrix were selected to analyze the digital maturity level in some branches of Ooredoo in eastern Algeria, which were chosen as the focus of our study. The results indicate that Ooredoo does not possess a high level of digital maturity, despite having transformative digital leaders. However, it needs to optimally utilize the available technology to develop work methods and create differentiation and added value. Therefore, enhancing its digital maturity requires supporting digital leadership values of participation and collaboration with employees to create an organizational environment that promotes digital transformation goals and encourages the acceptance of change as part of the organizational culture by adopting modern technologies and striving to master them.

KEYWORDS

Digital Leadership, Digital Maturity, Digital Transformation, Westerman Matrix

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1. Introduction.

The widespread adoption of technology in the business sector has led to a digital revolution, resulting in the emergence of new digital products and services, innovative business models, and the creation of new industries. Conversely, this shift has caused the decline of some traditional industries and the loss of prominence for many companies due to their inability to adapt to the transformations and demands of the digital age. For instance, a comparative study between FUJIFILM and KODAK showed that Kodak failed to adapt to the digital transformation brought about by the digital revolution, unlike Fujifilm, for several reasons, the most significant of which was its delayed response to the digital era's demands and its conservative stance,

particularly in the field of innovation. Additionally, Kodak was characterized by complacency in its offerings (Yakeshi, 2018). Moreover, continuous changes in the hierarchy of power hindered the adoption of a successful strategy to address the challenges posed by resistance to change from workers in Kodak's lower levels (Ho & Chen, 2018).

Worker resistance to change, especially at lower levels, has become one of the major challenges in the era of digital transformation. This resistance stems from workers' fears of being replaced by machines, as well as their inability or unwillingness to learn new skills required to manage new technologies (Kane et al., 2015). Therefore, organizations must adopt a well-planned organizational and communicative strategy to manage the digital transformation process in phases. This transformation should not be seen merely as a technological goal but as a strategic objective that takes into account the cultural characteristics of the workforce, alongside the financial capabilities, timeline, and the organization's desire to maintain its market position (Westerman et al., 2014). According to recent studies, careful organization and communication are essential components for the success of the digital transformation process, particularly when dealing with human challenges related to changing organizational culture (Verhoef et al., 2021).

In the business sector, both public and private, the digital evolution has had a significant impact, particularly in Algeria, which transitioned to a free-market economy in the late 1980s, opening its doors to global markets and the resulting strong competition. Algerian companies have become exposed to this foreign competition, increasing the need for digital transformation to enhance their competitiveness and better serve their customers. Digital technology is now the driving force behind change and innovation in organizations, requiring effective digital leadership capable of guiding institutions toward adopting these technologies (Westerman et al., 2014). According to recent studies, digital leadership is considered a key driver in achieving digital transformation and fostering innovation within organizations (Verhoef et al., 2021).

The impacts of digital transformations demand new leadership styles that align with the rapidly changing environment. Studies have shown that the digital business environment requires leadership characterized by flexibility, risk-taking, and the ability to make quick decisions, making the leader's personality a crucial factor in successful digital transformation (Oswald & Kleinemeier, 2017).

An example is the banking institution (Barings), which successfully underwent digital transformation according to "CIO" through decisions made by the institution's CEO, Andy Lennon. He took responsibility for consolidating all IT portfolio activities into a single team, stating, "I spent time coordinating these entities and getting them to work as one team." He also built a data center to leverage new technologies while adjusting regulatory requirements to benefit from these actions. In addition to Barings, (Johnson Controls) was listed by "CIO" as one of the institutions that successfully transformed digitally due to decisions made by CEO Nancy Berce, who ordered the adoption of digital technologies and sent her employees to startups and leading digital companies in Silicon Valley to benefit from their experiences (Boulto, 2021). Moreover, many studies have indicated that technology leaders in companies like Walmart and Bed Bath & Beyond guided digital transformation by adopting strategies based on cloud computing, advanced analytics, and artificial intelligence. This transformation helped improve efficiency and meet customer needs. Blouto noted that digital leadership was crucial during the COVID-19 pandemic in accelerating innovation and achieving business resilience (Boulto, 2021). Furthermore, research has shown that effective leadership in digital transformation requires four essential elements: transformational vision, digital governance, employee engagement—ensuring all employees contribute to the transformation process—and the relationship between IT and business (Westerman et al., 2017).

Organizations seeking to achieve digital transformation as a primary goal must do so by fostering a desire for innovation, defining desired outcomes, involving everyone within the organization in the digital transformation journey, and designing a governance system specific to digital transformation. Additionally, institutions aiming for digital transformation must establish a dedicated digital transformation office, appoint leadership roles responsible for the transformation with clear duties and powers, and provide the necessary support (OECD, 2018).

In this context, the telecommunications sector in Algeria is one of the vital sectors contributing to local economic and social development. It has seen significant growth in recent years due to the size of the Algerian market in this field and its investment potential. Among the key players in this field is Ooredoo, a major industrial hub competing fiercely for market position, particularly in providing internet services in Algeria.

Ooredoo Algeria enjoys a strong reputation in the telecommunications field, having recognized the importance of digital transformation and digital leadership in enhancing its competitiveness and better serving its customers. The company employs digital technology at all organizational levels and within its marketing

strategies, relying on IT in all its administrative and managerial operations (Algeria, 2024). Over the past few years, it has been committed to adopting and developing these technologies to maintain its position and ensure its continuity by acquiring the latest devices and software (Ooredoo, 2024). However, the question remains : to what extent can it control and promote these technologies ? Therefore, Ooredoo must possess digital leadership with a clear vision that encourages investment in this field and helps the company evolve and survive, ensuring it achieves what is known as digital maturity. Digital maturity refers to the stage where the company is well adapted to modern technological trends and operates effectively with the many digital processes integrated into the organization, making digital transformation a natural part of its daily strategy, no longer seen as a transitional phase but as a fundamental part of its ongoing strategy .

In this context, the Westerman Matrix, designed to assess the levels of digital maturity in business organizations, focuses on two dimensions : digital leadership, with an emphasis on rethinking and improving business practices, customer engagement, and business models through the use of modern technology in all organizational and managerial processes within the company, and leadership capabilities, through envisioning and leading digital transformation. These aspects help companies evaluate the risks and opportunities associated with digital transformation, allowing them to make informed strategic decisions (Westerman, Bonnet, & McAfee, 2014). The book *Leading Digital: Turning Technology into Business Transformation*, which we have relied on for this study, serves as a key reference in understanding how companies succeed in adopting digital transformation. The authors provide valuable insights into how to turn digital technology into a competitive advantage and how companies can sustain and maintain their market share.

By utilizing the Westerman Matrix, Ooredoo Algeria can assess its success in adopting digital leadership and identify areas that need improvement. This matrix provides a systematic framework for assessing risks and opportunities, helping the company identify its strengths and weaknesses, and develop effective strategies to enhance digital transformation. This reflects Ooredoo's commitment to digital excellence and its desire to remain at the forefront of innovation. By evaluating its achievements in digital transformation, Ooredoo can continue to grow and evolve, strengthening its position in the competitive telecommunications market (Westerman, 2001).

Moreover, the Westerman Matrix can play a vital role in managing operational risks. By assessing risks related to human resources, internal operations, and supply chain management, Ooredoo can identify potential vulnerabilities and implement preventive measures. The company may face risks such as service disruptions due to system failures or a shortage of qualified staff. By using the Westerman Matrix, Ooredoo can develop contingency plans and train employees to ensure business continuity (Westerman, 1984).

Thus, the research problem becomes evident given the increasing importance of digital transformation for the business sector in Algeria and the impacts its applications have had on organizations gaining competitive advantages and the maturity of this transformation. Based on the above, we aim to address this issue through a field study of Ooredoo’s digital transformation maturity by posing the main research question that will guide both the theoretical and field aspects of this study, which we formulate as follows.

How does digital leadership help achieve digital maturity in the organization under study?

This main question branches into the following sub-questions :

- What is the current state of IT usage in the organization under study?
- What is the level of digital maturity that Ooredoo holds according to the Westerman Matrix ?
- Does the adoption of digital leadership in the organization under study help achieve digital maturity?

2. Study Methodology.

The methodology refers to the approach used to organize the research steps triggered by the study’s problem. Its selection is not random but rather serves the study’s topic and objectives, which dictate the appropriate method.

Given that our study revolves around "The Role of Information Technology in Enhancing Digital Maturity at Ooredoo," a company with unique characteristics and features compared to its counterparts in the same field, we have chosen the "Case Study" method.

Ahmed Ben Mersli defines it as: "a study based on an in-depth investigation of the overall situation of a unique, previously unknown case, aiming to uncover its hidden aspects for the first time. It may also apply to one or more representative cases to understand their internal situation and obtain scientific results that could help in studying these or similar cases" (Ben Mersli, 2014,).

Our choice of this method stems from the distinctive competitive features of the company under study. Ooredoo has often been a pioneer in adopting various modern technologies, making it a unique case, as demonstrated by the following:

- Ooredoo was the first operator to provide 4G coverage in all 48 provinces of Algeria in 2018.
- Ooredoo was the first company to receive the Technological Leadership Award from Cofcas, a global leader in contract digitization technologies through mobile solutions. This recognition was for its strategy focused on modern technologies, which materialized in the launch of the new "Made in Algeria" solution aimed at replacing paper versions of customer contracts by adopting digital signatures and tracking them electronically.

3. Research Population.

The selection of the research population and sample is one of the most critical steps in the research process. The sample is determined based on the research problem, hypotheses (if any), and the tools the researcher intends to use. In this study, the researchers relied on a "comprehensive survey".

The research population consists of all employees from Ooredoo branches in the provinces of Skikda, Annaba, Constantine, and Oum El Bouaghi, totaling 85 individuals.

4. Data Collection Tools.

To answer the research question, the study relied on the "Westerman Matrix Test" to determine Ooredoo's level of digital maturity, supported by an "interview" conducted by the researchers to explore various dimensions and indicators under study. Below is an explanation of the data collection tools that will be used to analyze the study results.

4.1 Westerman Matrix Test.

The Westerman Matrix Test consists of a set of evaluative statements organized into two separate tables, as shown below. These tables contain:

- Ten (10) statements related to digital leadership and
- Ten (10) statements related to digital capabilities.

Each statement is rated on a five-point Likert scale by Ooredoo employees.

In light of the above, the hypotheses of the current study are formulated as follows:

- Ooredoo’s possession of information technology enhances its ability to achieve digital maturity.
- The level of digital maturity in Ooredoo aligns with the Westerman Matrix and its co-authors.
- Digital leadership in Ooredoo effectively contributes to enhancing digital maturity and achieving digital transformation goals.

4.2 Directed Interview.

The face-to-face interaction produced by the interview makes it a flexible tool. This flexibility allows the researcher to directly gather responses and data from the interviewee without relying on others. This is what the directed interview offers, which is defined as: "an interview where the researcher prepares the questions in advance in a structured manner before conducting the interview. The conversation proceeds accordingly and does not deviate from its structure, strictly adhering to the questions as posed, without using complementary questions, as is the case with the semi-directed interview" (Al-Tayeb, 2015).

The interview was conducted with communication officers and IT department heads in the branches where the study was carried out. The main objectives were:

- Understanding the level of human resource recruitment in the field of information and communication technology.
- Assessing the importance of having digital databases specific to the institution.
- Identifying the various digital tools and devices owned by the institution.
- Gauging employees' acceptance of the new technologies and techniques adopted by the institution.
- Revealing the main software and networks currently used by the institution in its management and organizational operations.

5. Analysis of the Results of the Westerman Matrix Test for Ooredoo.

Table 1.
Represents the Level of Digital Capabilities Possessed by the Institution.

N°	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Arithmetic mean	Standard Deviation	Sample Direction	Statement Rank
01	We use digital technology (social media, data analytics, mobile technology) to understand our customers	43	31	1	4	0	4,43	0,76	Strongly Agree	3
02	We use digital channels such as digital platforms, social networks, and apps to market products and services	54	22	0	3	0	4,61	0,68	Strongly Agree	1
03	We sell goods and services through digital channels (online)	3	6	8	39	23	2,08	1,02	Disagree	10
04	Technology has enabled us to communicate with customers and perform various tasks in new ways	29	36	14	0	0	4,19	0,71	Agree	4
05	Core operations in our organization are conducted automatically	17	45	7	6	4	3,82	1,02	Agree	6
06	Technology allows us to connect with customers personally and perform operational tasks in new ways	6	6	4	51	12	2,28	1,05	Disagree	9
07	We have integrated core operations with data obtained from customer interactions	19	55	5	0	0	4,18	0,52	Agree	5
08	Management relies on data analysis for decision-making processes	5	43	12	10	9	3,32	1,13	Neutral	8
09	We use digital technology to improve performance and increase revenue value for current products and services	21	37	1	16	4	3,7	1,21	Agree	7
10	We have launched new business models based on digital technology foundations	49	23	5	2	0	4,51	0,73	Agree	2
Overall axis average	Arithmetic mean		Standard Deviation				Sample trend			
	3.71		1.25				Agree			

The test statements above, adopted by Westerman and his colleagues to measure the digital capabilities of economic institutions, reflect the evaluations for each item in the table. The overall average score is 3.71, with a standard deviation of 1.25, indicating that Ooredoo has a high level within the Westerman Matrix. The statements regarding the possession of necessary technology for managing organizational processes and

customer relations received agreement from the respondents. This was confirmed by the information systems officials of the institution in all its branches, who stated that the company possesses numerous modern and advanced information and communication technology tools (computers and their peripherals, switches, fiber optic lines, and satellite-linked phones).

Among these, the most important devices are the advanced computers in our institution, represented by the I5 and I7 generations, which are currently among the latest computers available, along with all their accessories (scanners, printers, mice). These are available in all branches across the country, forming the physical infrastructure for information technology equipped with various software and connected to multiple networks distributed across all administrative departments.

Additionally, the institution's point-of-sale systems are equipped with special devices to facilitate sales operations and customer identification, linking directly to the institution's network without the need to manually enter customer data later. This technology is unique to Ooredoo compared to its competitors in the Algerian market, such as Djezzy and Mobilis, according to the statements of the information systems and IT officials in the studied institutions.

This indicates that the institution is focused on the type of devices and technological equipment it uses, ensuring that it has the latest gear, which is utilized by carefully selected and skilled personnel. The results show an awareness of the importance of using digital technology as a foundation for understanding customer needs and behaviors in preparing a modern marketing strategy. This means the institution recognizes the significance of big data and precise analytics in achieving this goal, suggesting that it bases its strategic decisions on insights derived from data, thereby enhancing its competitive capability.

The communication officer confirmed during our interview that Ooredoo invests in information and communication technology equipment according to its needs and the current era, which is considered one of its main competitive advantages today. Research conducted in the United Kingdom shows that companies with higher levels of investment in digitization equipment and intensive use of computers exhibit high productivity levels (Rabhi, 2010). Additionally, a study of 700 Danish companies found that those investing in electronic equipment also achieve high productivity, are more innovative, employ more skilled labor, and frequently engage in research and development activities (Wang, 2016, p. 118). A study conducted across various European and Asian countries confirmed that among the key dimensions of information technology, the dimension of equipment and technology is paramount for reaping the expected benefits from investments in modern technologies.

The results also indicated strong agreement, with an average score of 4.61 and a standard deviation of 0.68, regarding the importance of using digital channels for marketing by leveraging social media and digital platforms to reach a wider audience and build stronger relationships with customers. This interest reflects the institution’s understanding of modern market changes and shifts in consumer behavior, who increasingly rely on digital platforms for their purchasing decisions. Respondents confirmed that the institution relies on customer data to enhance operational processes. The integration of data and operations reflects digital maturity, as data is used not only to understand customers but also to guide internal processes. This indicates that the institution recognizes the value of data in enhancing operational efficiency and improving overall performance. Such integration can lead to improved service quality and better customization to meet customer needs.

Furthermore, the results showed agreement among respondents with an average score of 4.51, indicating that the institution adopts new business models based on digital technology, suggesting innovation and a quick response to market changes. This indicates a proactive approach by the institution in leveraging opportunities offered by digital technology to develop its business and provide new services in the telecommunications sector, ensuring that these models are sustainable and offer expected long-term returns.

Regarding the management's reliance on data analysis for decision-making, the respondents' stance was neutral, suggesting that while data analysis may be present, it is not sufficiently utilized to effectively support strategic decisions. This could be attributed to a lack of appropriate analytical tools, reflecting management's hesitance to fully depend on data analysis results and a preference for traditional methods in decision-making. This could limit the institution's ability to respond quickly and effectively to market changes, despite adopting new digital business models.

The weakest evaluation in the table above was related to the statement about selling goods and services through digital channels (online), with an average score of 2.08 and a standard deviation of 1.02. The marketing officer confirmed that there is a deficiency in executing electronic sales operations and that all of the institution’s digital platforms and social media accounts are not designated for sales. Instead, they are used for brand awareness and promoting services, as well as informing customers about updates and current offers. This issue can be attributed to the low level of digital transactions in Algeria, where most Algerians do not have electronic payment cards. Even those who do prefer direct transactions due to fears and lack of trust in online transactions, as Algeria is lagging in this area.

The results also reflected a level of opposition, with an average score of 2.28, regarding the effectiveness of technology in achieving personal connections with customers. This can be interpreted as a shortcoming in applying technology in a way that meets customer expectations, especially if technology is used in a manner that does not enhance personal connections. This situation can lead customers to feel a sense of disconnection from the brand, indicating a need to rethink how technology is utilized to strengthen personal bonds with customers.

Table 2.
Represents the Level of Digital Leadership Competencies.

N°	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Arithmetic mean	Standard Deviation	Sample Direction	Statement Rank
01	The general manager has a vision aimed at developing the organization to meet the demands of the digital world (digital transformation goal of the organization)	45	19	7	3	5	4,22	1,15	Strongly Agree	3
02	The general manager and middle management share the same vision for digital transformation	24	34	4	11	6	3,75	1,24	Agree	6
03	Everyone in the organization has an opportunity to share their opinions and ideas regarding the organization's digital transformation	31	29	6	5	8	3,89	1,27	Agree	5
04	Our organization promotes a shift in work culture to better align with the digital business environment	47	19	3	10	0	4,3	1,02	Strongly Agree	1
05	Our organization invests in acquiring talent with digital skills and digital technology	44	21	5	9	0	4,27	1	Strongly Agree	2
06	The digital initiatives launched by the organization are shared across various departments and branches (there is coordination between departments)	18	53	5	3	0	4,09	0,66	Agree	4
07	The tasks and responsibilities for implementing digital projects (initiatives) are clearly defined	20	33	3	19	4	3,58	1,24	Agree	7
08	There are clear metrics to evaluate the progress and success of digital initiatives in the organization	7	34	13	25	0	3,29	1,01	Neutral	8
09	The IT department head and the general manager work together as partners	6	35	11	24	3	3,22	1,08	Neutral	9
10	The IT department's performance meets the organization's requirements	0	16	14	32	17	2,37	1,03	Disagree	10
Overall axis average	Arithmetic mean		Standard Deviation				Sample trend			
	3.70		1.23				Agree			

The general trend of the sample, as indicated in the above dimension, shows agreement, placing Ooredoo at a high level in the Wasserman matrix concerning the digital leadership criterion. Most statements related to

the characteristics of digital leaders received top marks, reflecting a clear vision regarding the requirements for digital transformation and staying updated with advancements in this field. This vision is shared at higher levels with middle management, responsible for operational execution, allowing them to express their opinions and ideas as part of the organization's communication and cultural framework. This approach helps mitigate resistance to change by sharing knowledge and ideas on attracting various skilled talents in digital technologies. Ooredoo is keen to recruit talents in information technology, demonstrating the organization's understanding of the importance of having competent human resources to operate and manage information systems, which is significantly more critical than merely possessing physical resources, as supported by several studies, including (Ouman, 2016).

This is also explained by the organization’s forward-looking perspective on the global requirements of the modern economy amid rapid technological advancement and increasing competition in information and technology, leading to a shift towards a digital economy. The organization has established conditions and standards for attracting these competencies, primarily focusing on proficiency in information technology, with about 60% of the required specialties being in computer science and information systems, as confirmed by the institution’s recruitment officials.

The high average score (4.27) and relatively low standard deviation (1) indicate strong agreement that the organization invests adequately in digital skills and competencies. This can be attributed to Ooredoo’s adoption of the strategic vigilance concept, which emphasizes the importance of competencies in information technology, focusing on activities related to information management to leverage it for competitive advantage and to cultivate future digital leaders.

This underscores that the organization invests in competencies to build a competent human resource base in technology that aligns with its operational and marketing needs, which is one of the most significant competitive advantages in our current era. Ooredoo trains these competencies and organizes training courses both internally and externally under the supervision of local and global experts, scheduling at least one training course every six months in modern technologies to overcome professional obstacles and ensure proficient handling of devices and equipment. Additionally, the organization follows an incentivizing policy, promoting talents who participate in the highest number of training and development courses. This reflects Ooredoo's commitment to nurturing and developing its talents through training programs that meet global standards, as well as developing new policies that encourage the use of digital tools by urging employees to engage in the digital transformation process through fostering values of innovation, flexibility, and continuous learning.

The average (4.09) and standard deviation (0.66) confirm a general consensus on the good coordination between different departments in implementing digital initiatives, reflecting employees' awareness of the importance of internal collaboration. This helps avoid work duplication and maximizes the use of available technological resources, despite the challenges faced by managers in defining tasks related to digital initiatives. The results indicated moderate agreement among the study sample with an average of (3.58) and a high standard deviation (1.24), suggesting some differences in opinions regarding the clarity of responsibilities for implementing new technological projects. This can be attributed to unclear or overlapping roles due to rapid changes in the digital environment, especially since respondents expressed a neutral stance with an average of (3.29) and a standard deviation of (1.01) regarding the clarity of the metrics used to evaluate digital initiatives. This indicates that these metrics are either not clearly defined or not sufficiently utilized to assess performance. The organization may need to develop and clarify key performance indicators (KPIs) that can be easily measured and analyzed to provide accurate reports on progress towards desired goals.

The results also highlighted a general feeling of dissatisfaction with the performance of the IT department in meeting the organization's requirements, with an average of (2.37). The findings point to significant challenges in this department, whether related to infrastructure, skills, or organizational support, which necessitates a reassessment of the currently adopted strategies, provision of necessary training, and increased investment in advanced technologies to ensure it meets both current and future requirements of the organization and its clients.

These results can be interpreted through the relative neutrality expressed by respondents, with an average of (3.22), regarding the effectiveness of cooperation between the IT department manager and the general manager. This may indicate some communication barriers between them or differences in priorities between the two departments, significantly impacting the overall performance of the organization under study and its digital transformation plans.

6. Discussion of the Study Hypotheses.

Based on the results and analysis of the tables, the study hypotheses can be discussed with consideration of the Westrman Digital Maturity Matrix, which is based on the extent to which institutions adopt digital technologies and their impact on operations and performance.

Hypothesis One: The application of information technology at Ooredoo enhances its ability to achieve digital maturity.

The results from the first table show a variance in the level of digital capabilities within the institution. For example, there is a strong agreement on the use of digital technology for communication with customers and marketing through digital channels (Items 1 and 2), indicating an enhancement in the institution's capabilities in this regard. However, there is a clear weakness in digital sales processes (Item 3) and a lack of clarity in using technology to improve performance and increase revenues (Item 9).

Results from the second table indicate that investing in digital skills and competencies is a priority for the institution (Item 5) and that there are clear efforts to enhance the work culture in line with digital transformation (Item 4). However, there is a weakness in collaboration between the IT department and the general management (Item 9) and a general dissatisfaction with the IT department's performance in meeting employee and customer expectations (Item 10).

Considering the standards defined by the Westrman Matrix, which classifies institutions based on their level of digital maturity according to criteria such as digital capabilities and digital leadership, the results from both tables show that Ooredoo is making progress in applying information technology to enhance digital maturity, but it still faces challenges in some core areas.

Based on this, the hypothesis can be partially accepted, as it shows that Ooredoo has high digital capabilities and utilizes modern information technology in all its operational and organizational processes. It possesses advanced technological infrastructure, including hardware and software, and employs advanced digital technologies in various aspects of its operations, such as marketing and customer services. This intensive use of technology has significantly contributed to enhancing the institution's digital maturity; however, there is a need to enhance technology integration and improve digital performance in many core aspects, such as the weak performance in providing services through digital channels, as well as gaps related to coordination between departments, particularly those concerning the IT department. This can be addressed by establishing clear standards and metrics to measure the progress and success of digital initiatives, enabling it to reach a full level of digital maturity that ensures competitiveness in the Algerian market.

Hypothesis Two: "The level of digital maturity of Ooredoo aligns with the Westrman Matrix."

The Westrman Matrix assesses the digital maturity of institutions based on their ability to integrate digital technology into their strategies, organizational culture, and daily operations comprehensively and coherently. This means it focuses on the comprehensive integration of digital technology across all aspects of the institution, including core operations, innovation in business models, and customer interaction. However, the first table shows a weakness in technology integration within some core processes, such as selling services through digital channels (where the average was low at 2.08) and personal communication with customers through new digital platforms (2.28). These points weaken the level of digital maturity and show that the institution has not yet achieved complete and effective integration of technology across all its aspects.

The Westrman Matrix also places digital leadership at the heart of digital transformation, emphasizing the importance of close collaboration between senior leadership and technology departments to achieve digital goals. However, the second table showed negative results regarding collaboration between the IT department manager and the general manager (average of 3.22), as well as a lack of clarity in the tasks and responsibilities related to implementing digital projects (3.58). These factors indicate that digital leadership is not as integrated as required, which undermines Ooredoo's ability to achieve full digital maturity according to Westrman’s standards.

Moreover, the Westrman Matrix emphasizes the necessity of an organizational culture that supports digital innovation and utilizes clear metrics to assess the success of digital initiatives. However, there is a lack of clear metrics for evaluating digital initiatives within the institution (3.29), along with a general dissatisfaction with the performance of the IT department (2.37). These results indicate a deficiency in internal digital organization and the capacity for innovation, which is supported by precise measurement of digital progress.

Given the standards defined by the Westrman Matrix, the hypothesis can be rejected. Although the institution has made progress in some areas, its level of digital maturity has not yet reached the level that aligns with the Westrman Matrix.

Hypothesis Three: "Digital leadership at Ooredoo effectively contributes to enhancing digital maturity and achieving digital transformation goals."

The first table shows significant agreement that the institution invests in digital technology and promotes a culture change that aligns with digital transformation, indicating that digital leadership recognizes the importance of technology and works to integrate it into the structure and culture of the institution, which is a positive step toward achieving the institution's digital objectives.

However, despite these positives, there is a lack of clarity regarding responsibilities (Item 7) related to digital projects. This lack of clarity can lead to confusion and overlapping roles, hindering operational effectiveness and delaying digital transformation. Successful digital leadership requires precise definition of roles and responsibilities to ensure efficient project implementation, and the absence of this clarity indicates gaps in the structure of digital leadership that may negatively affect the overall digital transformation of Ooredoo.

The second table indicates that there is consensus at the senior management level regarding the digital vision, which is a good sign of informed digital leadership about the importance of digital transformation. However, the collaboration between the IT department and general management has not reached the level of effective partnership (Item 9) according to the Westrman Matrix.

Effective partnership between IT management and general management is essential to ensure that the digital vision is successfully implemented throughout the institution. The absence of this partnership can lead to a lack of coordination and hinder digital transformation.

Considering the results, the hypothesis can be partially accepted. Digital leadership at Ooredoo clearly contributes to enhancing digital maturity, but there is a need to improve integration between the institution's departments to achieve digital transformation goals more effectively.

7. Study Results.

The study we conducted on the role of digital leadership in achieving digital maturity at Ooredoo, aided by the Westrman test and semi-structured interviews, revealed several results that contributed to answering the research questions outlined in the problem statement, which can be summarized as follows:

- Ooredoo is characterized by high transformative digital leadership capabilities that enable it to optimally exploit available technology to develop work methods, create distinction, and add value, thereby enhancing its digital maturity. This is achieved through the support of digital leadership for values of participation and collaboration with employees to create an organizational environment that fosters digital transformation and encourages acceptance of change as part of the institution's culture by adopting modern technologies and striving for mastery over them. Additionally, there is an effort to improve collaboration between different departments, especially those related to the IT department and senior management.
- Ooredoo has specialized human resources in the field of information and communication technology, and the institution is committed to providing regular and ongoing training for this group, recognizing the rapid developments occurring in this field.
- Ooredoo possesses adequate numbers of information and communication technology devices, including computers, printers, scanners, digital phones, fax machines, and other technological means. The institution continually updates this equipment according to its operational and production needs to achieve its future goals.
- Ooredoo has a significant infrastructure in the field of information and communication technology, represented by a collection of modern software applications for its operations, as well as the use of advanced networks that connect all its offices and branches, facilitating business operations and reporting errors quickly and accurately.
- Ooredoo is keen to utilize information and communication technology through its modern applications on the internet, such as the My Ooredoo Algeria app, which can be easily downloaded from Google Play, App Store, and App Gallery, allowing direct interaction with the institution.
- Ooredoo maintains detailed digital databases about its employees, customers, suppliers, and competitors, which aids in making informed decisions, using the latest software such as Oracle.
- Ooredoo employs various modern technologies in all its organizational and operational dealings, such as using electronic contracts identified by special QR codes that are scanned to verify document authenticity.
- The institution attempts to leverage modern communication technology to promote and market its offers through social media, where it has a large audience, with Facebook ranking first with 13.8 million subscribers, followed by YouTube with 178,000 subscribers, and Instagram in third place with 163,000 subscribers. Despite the large number of subscribers, there is a shortcoming in the integration of core digital operations, such as selling services directly through its digital platforms.

- Ooredoo raises awareness among its various employees about the applications of information technology and the importance of leveraging them to gain new market shares, allowing it to remain competitive in a highly competitive market.
- Ooredoo uses information technology to enhance the efficiency of its operations at both internal and external levels through the following:
- The institution continuously conducts accurate and effective diagnostics of changes in its internal work environment using the "SAP HR" program to identify its strengths and how to capitalize on them, as well as its weaknesses, with the program offering a range of suggestions for addressing them.
- The institution analyzes its external environment using statistical programs for market shares and points of sale and distribution for competing institutions to identify positive opportunities that could strengthen its competitive position, as well as prepare the necessary scenarios to respond to environmental risks.
- Information and communication technology has contributed to reducing operational and organizational processes within the institution by eliminating unnecessary operations, using advanced technology, investing in its human resources, and providing them with all the means to adopt these technologies, such as providing a professional SIM card and a smartphone for every employee to develop programs that simplify and facilitate work procedures and provide information to customers to gain their loyalty and increase their numbers through social networks.
- There is a lack of clarity regarding the roles and responsibilities assigned to employees for implementing digital projects, which could hinder the institution's ability to achieve full digital maturity, as digital maturity requires the integration of all digital activities across various aspects of the business.
- The results indicated a lack of clear metrics to evaluate the success of digital initiatives. This type of metric is an essential part of the digital transformation process, as it helps track progress and identify areas that need improvement and development.

8. Conclusions.

Based on the above, it can be said that Ooredoo has indeed begun its journey toward digital maturity according to the Westrman matrix and its colleagues, through significant investments in digital technology and various attempts to change its work culture. However, to achieve complete digital maturity, there is a need to improve the integration of digital processes, enhance internal collaboration, and ensure greater clarity in roles and responsibilities. The current digital leadership demonstrates an awareness of the importance of digital transformation, but it needs to reinforce these efforts to fully and effectively achieve digital goals through.

Technological Integration and Achieving Digital Maturity:

According to the Westrman matrix, digital maturity requires comprehensive integration of technology across all processes and activities within the institution. The study results showed that Ooredoo has invested heavily in digital technology and sought to change its work culture to align with digital transformation. However, the weak integration of some digital processes, such as online sales channels and the clarity of roles in implementing digital projects, indicates that the institution has not yet reached the necessary level of technological integration required for complete digital maturity.

Clarity of Vision and Digital Leadership:

The Westrman matrix emphasizes the importance of having a clear digital vision agreed upon by all management levels, as well as the role of digital leadership in guiding and implementing this vision. The study results indicate a consensus among senior management at Ooredoo regarding the digital vision, reflecting a positive direction toward digital maturity. However, the weak collaboration between the IT department and general management, along with unclear roles and responsibilities in some cases, may hinder the effective implementation of this vision, suggesting that digital leadership needs to be strengthened to achieve full integration.

Internal Collaboration and Coordination of Digital Efforts:

One of the criteria for digital maturity in the Westrman matrix is the ability to coordinate digital efforts among various departments within the institution. Despite efforts to change the work culture at Ooredoo, the study showed gaps in coordination between departments, especially between the IT department and senior management. To achieve digital maturity, the institution needs to enhance internal collaboration and ensure that all departments are aware of their roles in achieving digital goals.

Digital Success Metrics:

The Westrman matrix places significant importance on having clear metrics to assess the success of digital transformation. The study results revealed that Ooredoo lacks clear metrics to evaluate digital initiatives,

which hinders tracking progress and identifying areas for improvement. This lack of assessment means that the institution may struggle to determine its progress toward digital maturity.

According to the principles of the Westrman matrix, Ooredoo can be considered to have made a good start on its journey toward digital maturity through investment in technology and efforts to change its work culture. However, to achieve complete digital maturity, the institution must:

- Improve the integration of digital processes across all organizational and operational activities.
- Enhance internal collaboration and better clarify roles and responsibilities.
- Develop clear metrics to assess the success of digital transformation.

On this basis, we can affirm that Ooredoo has made progress toward digital maturity, but additional improvements are needed to ensure the complete achievement of digital transformation.

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