

Digitalization and Its Impact on Organizational Effectiveness

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Abstract

This study investigates the impact of digitalization on organizational effectiveness within the Directorate of University Services in El Oued, Algeria. Employing a descriptive methodology with a quantitative focus, the research explores four dimensions: the role of devices and tools, the influence of digital data, the effectiveness of utilized programs, and the proficiency in digital technology. Data collection involved questionnaires and exploratory interviews targeting a purposive sample of 36 employees from various departments affected by digital transformation initiatives.

Findings indicate that while digitalization has improved task completion times and enhanced communication clarity in some areas, gaps in training, uneven implementation of digital systems, and limited participation in decision-making hinder its full potential. Additionally, the study highlights the critical role of advanced training and technological competence in achieving higher levels of organizational effectiveness. The results emphasize the need for systemic updates in infrastructure, targeted training programs, and a shift toward inclusive management practices to maximize the benefits of digital transformation.

Introduction

In the past two decades, the world has witnessed an unprecedented wave of change and development across various fields, particularly in information and communication technologies. These advancements have impacted all aspects and facets of social, economic, cultural, educational, and organizational life. Digital technology and advanced communication technologies have introduced a transformative reality, resulting in a qualitative intellectual shift in social practices in general, which now bear little resemblance to what they were in the recent past.

Organizations of all types have sought to embrace digital technology to harness its immense potential, enabling them to transition to a phase of greater productivity and improved effectiveness in addressing internal and external challenges. This has led to the emergence of organizational digitalization as a modern administrative approach for managing institutions with greater precision, speed, and quality. Digitalization is defined as the process of transitioning from manually or paper-based information processing and storage to digital methods, involving the automated handling of data and tasks through electronic tools and devices such as computers, scanners, barcode readers, and more.

Like other countries, Algeria has, in recent years, attempted to keep pace with technological advancements, particularly in the administrative and management sectors, by digitizing public services. The higher education sector is among those targeted for comprehensive digital transformation, with the state adopting the motto “Paperless” to enhance transparency in the operations of university service institutions and improve the quality of services provided to students.

Numerous studies have demonstrated the transformations brought about by digitalization in organizations of various types, as well as its role in influencing different organizational phenomena associated with administrative processes. Among these phenomena is “organizational effectiveness,” which serves as a metric for evaluating the extent to which organizations succeed in performing their technical and administrative tasks and achieving their objectives. It is a measure of an organization's success, progress, and ability to achieve its goals through the implementation of planned strategies and policies. From its inception, organizational effectiveness has been recognized as critical; management relies on understanding it to improve planning and operations for achieving the desired organizational development and sustainability. Similarly, employees value studying effectiveness within their organizations to ensure their career stability and fulfill their sense of belonging.

Based on the above, we pose the following question:

Does digitalization affect organizational effectiveness in the Directorate of University Services in El Oued?

The following primary question branches into four sub-questions that define the scope of the problem:

- Does the use of devices and tools affect organizational effectiveness in the Directorate of University Services in El Oued?
- Does the use of digital data impact organizational effectiveness in the Directorate of University Services in El Oued?
- Do the programs utilized influence organizational effectiveness in the Directorate of University Services in El Oued?
- Does proficiency in digital technology affect organizational effectiveness in the Directorate of University Services in El Oued?

Second: Study Hypotheses

A. General Hypothesis:

To answer the study's questions, we propose the following general hypothesis:

- Digitalization affects organizational effectiveness in the Directorate of University Services in El Oued.

B. Sub-Hypotheses:

- Devices and tools influence organizational effectiveness in the Directorate of University Services in El Oued.
- The use of digital data impacts organizational effectiveness in the Directorate of University Services in El Oued.
- Programs utilized affect organizational effectiveness in the Directorate of University Services in El Oued.
- Proficiency in digital technology influences organizational effectiveness in the Directorate of University Services in El Oued.

Third: Importance and Objectives of the Study

1. Importance of the Study:

This study derives its importance from the subject matter itself, as it addresses a contemporary issue involving the constant developments in digital technology. These developments have

prompted researchers and employers alike to explore the implications of technology use in the world of organizations and business.

The significance of this study lies in:

- The growing interest of researchers, sociologists, and administrators in the phenomenon of digital technology within organizations and its relationship to other organizational phenomena, especially concerning human resources and organizational processes.
- Providing insights into resolving some organizational issues accompanying the digitalization process through empirical research aimed at improving its effectiveness.
- Aligning with knowledge and economic development priorities, fostering integration of social and technological aspects, and enabling adaptability to global, regional, and local realities.

2. Objectives of the Study:

- To provide answers to the study's questions regarding the impact of digitalizing university services on organizational effectiveness.
- To inform those responsible for university services about the challenges posed by digitalization, including its effects on sector effectiveness and cyber threats faced by the institution. This includes emphasizing the necessity of accompanying digitalization with effective cybersecurity measures to prevent disruptions in operations.
- To assess the responsiveness of the sector's human resources to digitalization, including their training and awareness of technology's importance as a driving force for organizational processes in the 21st century.
- To explore the sociological impacts of digitalization on the university services sector, focusing on social relations within the organization, whether between management and employees or among employees themselves.

Fourth: Definition of Concepts

1. The Concept of Digitalization:

The term "digitalization" is a modern concept associated with information and communication technology. Despite its widespread use across industries, commerce, services, and daily life, it refers to:

- "The changes and transformations in the world due to information and communication technology. It is the process of converting information into a digital format using digital technologies to enhance activities and operations across the organization. It also signifies

a shift from an industrial era characterized by analog technologies to an age of knowledge and innovation driven by digital technologies, wherein all service and production sectors use automated machines and software instead of manual labor."(1)

- Digitalization is also defined as the process of converting data into a digital format to be processed electronically using computers. In information systems, it often refers to converting printed text or images into binary signals using scanners to display the information on a computer screen.(2)
- Additionally, digitalization is described as "the process of converting traditional information resources into digital forms, undertaken by information institutions to provide maximum access to information resources for beneficiaries."(3)

1.1. Operational Definition of Digitalization

The process of transforming traditional paper-based administrative operations in the Directorate of University Services into automated digital processes using computers and other electronic devices such as magnetic card readers, facial scanners, fingerprint recognition devices, etc.

2. Concepts Related to Digitalization

A. Digital Administration:

A modern administrative approach based on the extensive and conscious use of information and communication technologies to perform the core functions of management and deliver services in organizations operating in the era of globalization and continuous change (4).

B. Digital Technology:

All electronic devices, both hardware and software, that process data by encoding it into binary signals (0, 1), often involving computers. Some also view digital technology as not only the transmission, processing, storage, and management of information accessible to a broad audience of individuals and institutions (5), but also as a continuous distinction between those who innovate and generate information with the skills to exploit it, and those who consume it with limited skills (8).

3. Concept of Organizational Effectiveness

The concept of organizational effectiveness has evolved over time, taking on various dimensions. Initially, it was linked to "an organization's ability to achieve the objectives for which it was established." This simple definition became widespread in the 1950s when an organization's ability to survive was considered a sufficient indicator of effectiveness (7).

Definitions of Organizational Effectiveness:

- According to the **Encyclopedic Dictionary**, it is: "The extent to which actions and behaviors achieve their goals and the ability to produce something (8)."
- **Etzioni** defined it as: "The extent to which an organization achieves its objectives (9)."
- It also refers to: "An organization's ability to achieve its goals, with the criteria for this ability depending on the model used to study organizations (10)."
- **Alvar** described it as: "The ability of an organization to survive, adapt, and grow, regardless of achieving specific objectives (11)."
- **Mohammed Qasim Al-Qaryouti** defined it as: "The ability of an organization to achieve both long- and short-term goals, reflecting the balance of power among influential parties, the interests of those evaluating it, and the stage of growth or development the organization is experiencing (12)."
- Many experts agree that organizational effectiveness represents "the degrees and levels of goal achievement."(13)
- According to **Drucker**, organizational effectiveness is "doing the right things," which he considers the key to success (14).
- A prominent definition states: "Organizational effectiveness is the extent to which organizational goals are achieved. In other words, 'Where am I?' and 'Where should I be?' These questions define organizational goals. Achieving a high level of organizational effectiveness is seen as the ultimate goal of any organization. Organizational effectiveness also encompasses people's perceptions of how effectively an organization pursues its goals."(15)

Views on Organizational Effectiveness:

- **Camron** described it as an organization's efficiency in acquiring essential resources (16).
- **Al-Mulhim** traditionally viewed it as "the ability of an organization to achieve its pre-determined objectives." In modern terms, it represents an organization's overall performance and its ability to secure a minimum level of satisfaction for strategic beneficiaries and stakeholders (17).

From the preceding definitions, it is evident that researchers have varying and differing perspectives on defining the concept of organizational effectiveness. Some adopt the principle of achieving the objectives that the organization strives to accomplish as a framework for defining organizational effectiveness. This principle encompasses achieving survival, adaptability, growth, long- and short-term goals, as well as fulfilling the interests of stakeholders involved in evaluation, which align with the stage of growth and development the organization is

experiencing. This principle assumes that an organization has a set of objectives it seeks to achieve and fulfill. Consequently, effectiveness is linked to the extent of success in achieving planned objectives.

Others view the principle of efficiency as the determinant of an organization's effectiveness. This perspective emphasizes comparing the organization's inputs to its outputs, meaning the volume and quantity of actual production relative to the resources available. Additionally, the organization's overall performance reflects the level of interaction between its components and its ability to adapt to the external environment (18).

1.3. Operational Definition of Organizational Effectiveness

The extent to which the Directorate of University Services is able to achieve its specified goals and effectively utilize its allocated resources, both internal and external (human and material), while leveraging its past experiences to accomplish these objectives.

Concepts Related to Organizational Effectiveness

A. Concept of Efficiency

Some researchers in the field of management have confused the concepts of **efficiency** and **effectiveness**. However, there is a near consensus among management scholars to distinguish between the two. While effectiveness focuses on how organizational goals are achieved, efficiency measures the relationship between inputs and outputs (the cost of achieving these outputs) (19).

Philippe Lorino defines efficiency as: "Anything that contributes to maximizing value and reducing costs. Efficiency is not achieved by merely reducing costs or increasing value but by accomplishing both objectives simultaneously." (20)

Efficiency has also been defined as "choosing the approach that achieves the best results using available resources," or "the ability to do things correctly (doing things right) (21)." Efficiency involves "the optimal use of available production resources in the organization," linking it closely to cost and the relationship between inputs and outputs. As such, efficiency is considered an element of effectiveness and can be measured using the formula:

$$\text{Efficiency} = (\text{Outputs} / \text{Inputs}) \text{ (22)}$$

B. Concept of Performance

There is considerable variation among scholars and researchers regarding the definition of performance. This variation stems from differing perspectives and the objectives for which the concept is applied. Some scholars focus on quantitative aspects in defining performance, while others view it as encompassing organizational, social, and economic dimensions (23).

The Al-Waseet Dictionary defines "to perform" as: "to carry out or execute something; to fulfill a debt, a prayer, or a responsibility at its proper time." Similarly, Ibn Manzur explains that to perform means "to deliver or execute," with "performance" as the corresponding noun (24).

In a technical sense, the Dictionary of Administrative Terms defines performance or achievement as: "Carrying out job responsibilities and duties in accordance with the required standards by a skilled and trained employee."

According to Bromiley and Miller, performance reflects "how an organization uses its financial and human resources and exploits them in a way that enables it to achieve its objectives (25)." This definition highlights that performance is the result of the interaction between two key elements: the method of resource utilization (efficiency) and the results achieved from that utilization (effectiveness) (26).

Peter Drucker defines performance as an organization's ability to sustain itself and remain viable by balancing the satisfaction of both stakeholders and employees. He argues that performance is a metric to evaluate an organization's success in achieving its primary goal—maintaining its market presence and sustaining its operations in a competitive environment. By doing so, the organization ensures balance in rewarding both its shareholders and employees (27).

Fifth: Previous Studies

Study 1:

Title: "Human Resource Development in the Context of the Digital Environment"

Type: Doctoral dissertation in Sociology, specialization in Human Resource Development

Researcher: Mohamed Tawfiq Waman

Institution: Faculty of Social and Human Sciences, Mohamed Khider University, Biskra, 2016

This study addressed the following problem:

What are the socio-technical requirements imposed by the digital environment in the context of contemporary institutional societies that contribute to the development and growth of human resources?

The study employed the descriptive-analytical method and arrived at the following findings:

- Operating systems for computers and network communication are adequate.
- The level of application or use of automated digital technologies is moderate to weak, including:

- The Internet
- Electronic archiving systems
- Microfilm systems used in training processes
- Voice mail systems
- Audio-visual meeting systems
- Television conferencing systems

Study 2:

Title: "The Role of Local Administration Digitalization in Promoting and Enhancing Transparency in Algeria"

Type: Published article in *Law Voice Journal*, Volume 07, Issue 03, 2021

Author: Dr. Mahmoud Sharqi

This study explored the following problem:

How can digitalizing local administration contribute to enhancing and elevating transparency in Algeria?

Using the descriptive method, the study reached the following conclusions:

- Adopting digital methods through integrating modern technologies into local administration management has become a necessity due to rapid advancements in communication and technology.
- Digitalizing local administration represents a qualitative leap in administrative management by increasing the speed and efficiency of service delivery, reducing negative phenomena such as bureaucracy, favoritism, and lack of transparency, as well as addressing corruption prevalent in traditional administrative practices.
- Digitalization contributes to rationalizing expenditures, combating digital illiteracy, and raising citizens' awareness of its importance in enhancing transparency and reducing corruption in all its forms.
- The effective implementation of local administration digitalization alters citizens' negative perceptions of administration at both national and local levels.

Study 3:

Title: "The Impact of Social Media on the Organizational Effectiveness of Public Institutions: An Applied Study on the Egyptian Ministry of Communications"

Type: Article by Dr. Iman Mohamed Ahmed El-Wakeel, published in *Administrative Research Journal* by the Academy of Administrative Sciences, Volume 38, Issue 01, January 2020

The study examined the following problem:

What is the impact of social media on the organizational effectiveness of the Egyptian Ministry of Communications?

Using the descriptive-analytical method, the study concluded:

- There is a strong correlation between social media platforms and organizational effectiveness, indicating that these platforms enhance organizational effectiveness by providing knowledge and facts to followers of the ministry.
- Social media content improves organizational effectiveness by attracting beneficiaries and followers to engage with the ministry's services and activities, contributing to achieving its goals.
- Social media content influences organizational effectiveness by encouraging interaction with its content, increasing views, engagement, comments, and participation in ministry activities, thus enhancing dimensions of organizational effectiveness.

Study 4:

Title: "The Impact of Digital Administration on Improving the Quality of Public Services: A Case Study on Biometric Passport Services in Béchar"

Type: Article published in *Economic Development Studies Journal*, Volume 02, Issue 01, 2019

Authors: Dr. Abdeljalil Mouqadam and Dr. Faiza Belabed

This study investigated the following question:

To what extent can digital administration contribute to improving and optimizing the quality of public services?

It also explored related concepts such as digital administration, public services, and total quality management.

Objectives:

- Clarify the concept of digital administration and its impact on public services.
- Assess the effectiveness of digital administration as a mechanism for improving public services.

- Explore strategies for digital public services and how they contribute to effective public service delivery, with a focus on Algeria's experience as a developing country.

Findings:

- Digital administration is a modern approach based on information and communication technology, offering unique features compared to traditional methods.
- The use of digital administration significantly enhances the quality of public services in Béchar.
- Digital administration overcomes many obstacles that hinder operations, such as time constraints, information security, and spatial and temporal barriers.
- Its application increases the effectiveness and efficiency of employees by improving productivity, saving time and effort, and reducing costs.

Sixth: Study Methodology

In line with the objectives and nature of the study, the descriptive method was employed. This approach is defined as "a description of tangible or intangible phenomena, as well as anything with observable effects." It is worth noting that scientific description differs from non-scientific description; scientific description relies on analysis and is not considered scientific unless preceded by analysis (encompassing all elements of the described phenomenon, classifying them, and organizing these classifications systematically based on the research problem).

The descriptive method is typically used in studies describing the past or existing realities, such as individuals, associations, states, etc., as well as intellectual and scientific activities of individuals, groups, or institutions, their effects, records, or related studies (28). Descriptive methods may adopt a qualitative (subjective) or quantitative (numerical) approach, or a combination of both, within a single study (29).

Given the nature and objectives of this study, a quantitative approach was chosen, aiming primarily to measure the phenomenon under investigation (30). This approach was adopted to answer the study's questions and validate its hypotheses.

Seventh: Study Scope

- **Spatial Scope:** The study was conducted at the Directorate of University Services in El Oued.
- **Temporal Scope:** The study was carried out between June and July 2024.

- **Human Scope:** The study targeted employees of the Directorate of University Services in El Oued.

Eighth: Study Population and Sample

The study population consisted of employees at the Directorate of University Services, whose departments were impacted by the digitalization initiative implemented by the Ministry of Higher Education and Scientific Research. These departments include:

- Monitoring and Coordination Department
- Finance and Contracts Department
- Scholarships Department
- Human Resources Department
- Digitalization Unit

The study was conducted on a purposive sample of 36 individuals from these various departments.

Ninth: Data Collection Tools

The primary tool for data collection in this study was a questionnaire. Additionally, an exploratory interview was conducted to assist in analyzing results and designing the questionnaire.

Ninth: Study Results

A. Discussion of the First Hypothesis:

"The devices and tools used affect organizational effectiveness in the Directorate of University Services in El Oued."

Table 1

The organization regularly develops and updates devices	Instructions and orders from management to employees are transferred in a manner	Total
Clear and smooth	Unclear	Complicated

The organization regularly develops and updates devices	Instructions and orders from management to employees are transferred in a manner	Total
Yes	3 (100.0%)	0 (0.0%)
No	5 (29.4%)	11 (64.7%)
Sometimes	12 (75.0%)	4 (25.0%)
Total	20 (55.6%)	15 (41.7%)

Discussion:

From the general trend in the table above, we observe the following:

- **55.6%** of the sample perceive that orders and instructions from management to employees are transmitted in a clear and smooth manner. This is supported by the **100.0%** who confirmed that the organization regularly develops and updates its devices.
- **41.7%** stated that orders and instructions are transmitted in an unclear manner. This is corroborated by **64.7%** who denied that the organization regularly updates its devices.
- **2.8%** felt that instructions are transmitted in a complicated manner, supported by **5.9%** who also denied the regular updating of devices.

The quantitative evidence in the table suggests that most respondents agree that instructions and orders are transmitted clearly and smoothly, supported by **100.0%** who confirmed that the administration regularly updates its devices.

The smooth transmission of orders and instructions reflects strong communication between upper and lower levels of the organizational structure. Communication is defined as "a process encompassing the conveyance, reception, acceptance, and rejection of information." Thus, interaction within the organization primarily depends on communication.

The results indicate that the transmission of orders and instructions is significantly influenced by the development and updating of devices at the Directorate of University Services. This underscores that despite the bureaucratic management style, which relies on documents for issuing orders, the shift toward digitalization has made communications between upper management and different organizational levels fully digital via email. Instructions from the General Directorate and the Ministry are also electronically transferred to relevant departments through email.(31)(32)

However, percentages like **41.7%**, who perceive instructions as unclear (supported by **64.7%** who deny regular device updates), and **2.8%**, who find instructions complicated (supported by **5.9%**), highlight the impact of digitalization on communication processes. This, in turn, affects organizational effectiveness. The table shows that as the Directorate ensures regular updates of

its devices, information transfer becomes clearer and smoother, and the opposite is true when updates are lacking.

Table 2

Computers Used	Instructions and orders from management to employees are transferred in a manner	Total
Clear and smooth	Unclear	Complicated
Fast and accurate	4 (80.0%)	1 (20.0%)
Slow	11 (57.9%)	7 (36.8%)
Inefficient	5 (41.7%)	7 (58.3%)
Total	20 (55.6%)	15 (41.7%)

Based on the statistics presented in the table above:

- **55.6%** of the sample agree that the transfer of information between management and employees occurs in a smooth and clear manner. This is justified by the **80.0%** who believe that the computers used are fast and accurate.
- **41.7%** of the sample stated that the transfer of information between management and employees is unclear, supported by **58.3%** who perceive the computers used as incapable of performing efficiently.
- **2.8%** of the respondents believe that the transfer of orders and instructions between management and employees occurs in a complicated manner. This is supported by **5.3%** who described the computers as heavy and slow.

Table 3

The Organization's Use of Computers vs. Leveraging Employee Potential

The Organization Utilizes Computers	The Organization Leverages Employee Potential	Total
Effectively	Well	Less than Needed
Well	8 (44.4%)	8 (44.4%)
Ineffectively	2 (14.3%)	8 (57.1%)
Not at All	0 (0.0%)	3 (75.0%)
Total	10 (27.8%)	19 (52.8%)

Based on the statistics presented in the table above:

- **52.8%** of the sample believe that the organization leverages its employees' potential less than necessary. This is supported by **75.0%** who feel that the organization does not pay sufficient attention to effectively utilizing computers.
- **27.8%** of respondents stated that the organization leverages employee potential effectively. This is supported by **44.4%** who believe that the organization uses computers efficiently.
- **19.4%** of respondents believe the organization does not prioritize leveraging its employees' potential, which is supported by **28.6%** who think that the organization uses computers inappropriately.

From the data above, the majority of respondents (**52.8%**) feel that the organization does not sufficiently utilize its employees' potential, supported by **75.0%** who think that the organization fails to make optimal use of its computers.

The lack of attention to effectively utilizing computers at the service management offices of the Directorate of University Services often implies issues such as lack of maintenance, failure to upgrade systems, or absence of internet connectivity. These issues create significant organizational challenges for employees. The organization's sudden shift to digitalization and its almost complete reliance on computers, internet networks, and digital platforms to manage its services require high-performance, efficient computers. Failure to optimize the use of these computers negatively affects the quality of service (33).

One respondent explained:

"Digitalization is a positive initiative that enhances service speed, quality, and reduces effort and time. However, we often waste significant amounts of time and effort resolving sudden technical

issues with computers, which leads to service disruptions as these services cannot be performed without computers. This results in student gatherings, inquiries, and sometimes protests."

In contrast:

- **27.8%** of respondents believe that the organization makes good use of its employees' potential, supported by **44.4%** who think that computers are used effectively.
- **19.4%** believe the organization neglects leveraging employee potential, corroborated by **28.6%** who feel that computers are not used appropriately.

These statistics indicate that **better utilization of computers leads to improved leveraging of employee potential, and vice versa**. This correlation underscores the impact of computer performance and usage on organizational effectiveness.

Table 4: Regular Development and Updating of Devices vs. Services Offered by the Organization

The organization regularly updates devices	Quality of services provided	Total
Good	Poor	Better than before
Yes	3 (100.0%)	0 (0.0%)
No	2 (11.8%)	1 (5.9%)
Sometimes	1 (6.3%)	0 (0.0%)
Total	6 (16.7%)	1 (2.8%)

Discussion of Results for Table 4

- **80.6%** of the sample believe that the services provided by the organization have improved compared to before. This is supported by **93.8%** of respondents who noted that the organization updates and develops devices only occasionally.
- **16.7%** of the sample stated that the services have become good, justified by the **100.0%** of respondents who confirmed that the organization regularly updates its devices.

- **2.8%** of respondents believe that the services provided by the organization are poor, which correlates with the **5.9%** who denied that the organization regularly updates its devices.

The data indicate that the majority of respondents agree that the services provided have improved, supported by **93.8%** who note occasional updates of devices.

Although the shift to digitalization has progressed significantly in recent years, it is still constrained by the availability of necessary technical tools, such as the maintenance and updating of devices like computers and printers. Comprehensive digitalization remains incomplete. This finding aligns with the results of Mohamed Tawfiq Waman's study, which concluded that the degree of digital technology application is moderate to weak.

Additionally, the **16.7%** who stated that services have become good, supported by **100.0%** who believe in regular device updates, highlight the clear connection between device condition, technological advancement, and the quality and effectiveness of services provided. Researcher Hafthari Samir refers to this as "technological obsolescence," which is a significant challenge in implementing digitalization due to the rapid pace of technological advancements that institutions struggle to keep up with.(34)

The results in the table clearly show the impact of digital device updates on the quality of services provided by the organization, emphasizing the role of device quality in influencing organizational effectiveness.

Discussion of the Second Hypothesis:

"The use of digital data affects organizational effectiveness in the Directorate of University Services in El Oued."

Table 5: Has Digitalization Made Access to Work-Related Information Easier vs. Perceptions of Task Completion Time

Has digitalization made access to work-related information easier?	Perception of task completion time	Total
Shorter	Longer than before	Unchanged
Yes	10 (71.4%)	1 (7.1%)

Has digitalization made access to work-related information easier?	Perception of task completion time	Total
No	5 (38.5%)	1 (7.7%)
Sometimes	6 (66.7%)	0 (0.0%)
Total	21 (58.3%)	2 (5.6%)

Based on the statistics and quantitative evidence from the table above:

- **58.3%** of respondents believe that task completion time has become shorter, supported by **71.4%** who confirmed that digitalization has facilitated access to work-related information.
- **36.1%** indicated that task completion time has not changed, corroborated by **53.8%** who denied that digitalization has improved access to work-related information.
- **5.6%** stated that task completion time has increased, supported by **7.7%** who also denied that digitalization has made information access easier.

These results highlight that the majority of respondents agree that digitalization has reduced task completion time and improved access to work-related information.

Shortening the time required to complete tasks is a key indicator of success in modern organizations characterized by high levels of organizational effectiveness. Dr. Boufelja Ghiat emphasizes this, noting that:

"One of the characteristics of effective organizations is the presence of advanced technology and high-quality designs. Contemporary industrial civilizations rely on advanced technology, enabling competitiveness imposed by globalization. For technology to be effective, the design of machines, devices, and workplaces must align with the physical and social characteristics of employees within the organization."(35)

The findings in the table clearly demonstrate the significant impact of digitalization on reducing task completion time. However, the remaining responses, such as the **36.1%** who stated that task completion time has not changed and the **53.8%** who denied improvements in information accessibility, as well as the **5.6%** who claimed task completion time has increased (supported by **7.7%**), reflect the link between task completion time and digitalization's role in facilitating access to information. This suggests that as digitalization improves information accessibility, task completion time decreases, and vice versa.

This relationship underscores the impact of digital data and databases on organizational effectiveness in the Directorate of University Services in El Oued.

Table 6: Digitalization of Human Resources Data vs. Leveraging Employee Potential

Digitalization of human resources data	The organization leverages employee potential	Total
Effectively	Less than needed	Not at all
Fully digitalized	4 (66.7%)	2 (33.3%)
Partially digitalized	6 (21.4%)	16 (57.1%)
Not digitalized at all	0 (0.0%)	1 (50.0%)
Total	10 (27.8%)	19 (52.8%)

Analysis of Table 6

From the digital data presented in the table above:

- **52.8%** of the sample believe the organization leverages employee potential less than necessary, supported by **57.1%** who indicate that human resources data is only partially digitalized.
- **27.8%** of respondents feel the organization utilizes employee potential effectively, supported by **66.7%** who confirm that human resources data is fully digitalized.
- **19.4%** of respondents believe the organization does not focus on leveraging employee potential, supported by **50.0%** who report that human resources data is not digitalized at all.

The data clearly show that the majority of respondents believe the organization is underutilizing employee potential, correlating with the observation that human resources data is only partially digitalized.(36)

Focusing on human resource management functions in a digital environment is critical for modern organizations. Digital technology significantly impacts administrative activities such as training, recruitment, supervision, and communication, and it also affects employee performance. The **Tavistock Institute** has emphasized the importance of aligning social and technical systems while considering influencing variables before implementing technological changes. **Herbert Simon** identified seven dimensions of technology’s impact on society, including:

- Enhancing human capabilities for achieving collective goals.

- Providing information on harmful side effects to mitigate risks.
- Offering new alternatives for decision-making.
- Providing tools for analyzing complex systems.
- Identifying new needs driven by future changes.
- Assessing human ambition and its influence on behavior.
- Developing strategies to mitigate the negative effects of technology on both human resources and organizations.

The results highlight a clear relationship between the degree of leveraging employee potential and the extent of human resources digitalization. A respondent commented:

"For example, obtaining a work certificate requires submitting a request to the HR department and then being informed when it is ready for collection, which takes at least two days."

Such procedural inefficiencies, despite the presence of a digital environment, underscore the incomplete implementation of digitalization across administrative processes. This is compounded by weak communication regarding training on digital technologies, which hinders employees from fully engaging in these activities.

The remaining results, such as the **27.8%** who believe the organization effectively utilizes employee potential, supported by **66.7%** reporting fully digitalized HR data, contrast with the **19.4%** who feel the organization neglects employee potential, supported by **50.0%** reporting non-digitalized HR data. These results reflect the direct impact of digital data levels on organizational effectiveness.

Analysis of Table 7: Challenges in Dealing with Digitalization vs. Employee Expertise

Do you face challenges in dealing with digitalization updates?	Employees with expertise in their field	Total
Sufficient	Few	Nonexistent
Yes	1 (7.1%)	12 (85.7%)
No	3 (25.0%)	9 (75.0%)
Sometimes	3 (30.0%)	7 (70.0%)
Total	7 (19.4%)	28 (77.8%)

From the table:

- **77.8%** of respondents stated that employees with expertise in their field are few, supported by **85.7%** who confirmed facing challenges in dealing with digitalization updates.
- **19.4%** believe that the number of skilled employees is sufficient, supported by **30.0%** who reported occasionally facing challenges with digitalization updates.
- **2.8%** indicated that skilled employees are nonexistent, supported by **7.1%** who also face challenges in dealing with digitalization.

The scarcity of employees with expertise in their field creates performance and operational challenges in the face of rapid digital transformation. This emphasizes the need for comprehensive training on technologies such as computers, scanners, facial recognition devices, and magnetic cards to prepare employees for these changes.

The structural and technological changes in Algerian institutions, particularly in higher education and university services, necessitate organizational restructuring to adapt to internal and external developments. This concept aligns with what is termed **organizational change**.(37)

Joan Woodward (1916–1971) found in her studies on 100 British institutions that:

"There is a relationship between the technology used by organizations and their structure. There isn't a single best way to organize work; instead, each technological context requires a specific organizational structure."

Digital technology demands new roles and changes in organizational structures. This has led the Directorate General of the National Office for University Services to establish new departments, such as a Digitalization Department and a Means Department, to address internal changes. However, the new structure remains under review and consultation.

Traditional bureaucratic structures hinder technological advancements, whereas **organic structures**, characterized by flexibility, are more suited to innovation and adaptability. **Robert Merton** criticized bureaucracy in favor of organic structures, noting:

"In organic organizations, all members possess accurate and legitimate knowledge of their roles. Decision-making is not exclusive to top management, allowing these organizations to better respond to dynamic market demands, rapid innovation, and evolving industries such as communications and software."

Analysis of Table 8

Has Digitalization Made Access to Work-Related Information Easier vs. Does the Organization Allow Participation in Decision-Making

Has Digitalization Made Access to Work-Related Information Easier?	Does the Organization Allow Participation in Decision-Making?	Total
Always	Never	Sometimes
Yes	4 (28.6%)	3 (21.4%)
No	0 (0.0%)	5 (38.5%)
Sometimes	1 (11.1%)	1 (11.1%)
Total	5 (13.9%)	9 (25.0%)

Discussion of Table 8

From the table above:

- **61.1%** of respondents stated that the organization "sometimes" allows participation in decision-making. This is supported by **77.8%** who noted that digitalization "sometimes" facilitates access to work-related information.
- **25.0%** of respondents denied being allowed to participate in decision-making. This aligns with **38.5%** who also stated that digitalization does not facilitate access to information.
- **13.9%** indicated that they are "always" allowed to participate in decision-making, supported by **28.6%** who confirmed that digitalization consistently improves access to work-related information.

The data indicate that the majority of respondents believe participation in decision-making is limited, reflecting the organization's reliance on digitalization that only partially facilitates access to information.(38)

Simon highlights that decision-making within an organization cannot be completely rational, as it is constrained by three factors:

1. **Information availability**
2. **The decision-maker's capabilities**
3. **The decision-maker's motivations**

According to Simon, decision-makers cannot have full knowledge of all relevant information, limiting their ability to make entirely rational choices among alternatives.

The lack of involvement of users in decision-making and the absence of consultation during the decision-making process can negatively affect the quality of decisions and create organizational inefficiencies. This issue is exacerbated in bureaucratic models where decisions are made top-down, which does not align with the needs of modern, fast-digitizing organizations.

The findings are consistent with **Faiza Belabed's** research, which concluded that:

"Digital administration represents a modern approach based on information and communication technology, characterized by features and advantages distinct from traditional methods."

Japanese organizations have shifted away from Weberian bureaucratic models that centralize authority, instead consulting mid- and lower-level employees on policies. This participatory approach enhances organizational flexibility and adaptability.

The remaining percentages demonstrate the link between ease of access to information and participation in decision-making, highlighting its impact on organizational effectiveness.

Analysis of Table 9

Programs Used vs. Clarity of Instructions and Orders

Programs Used	Clarity of Instructions and Orders Total	
	Unclear	Complicated
Help define employee roles	8 (88.9%)	1 (11.1%)
Complicate work procedures	1 (16.7%)	4 (66.7%)
Facilitate work procedures	11 (52.4%)	10 (47.6%)
Total	20 (55.6%)	15 (41.7%)

Discussion of Table 9

From the table above:

- **55.6%** of respondents stated that instructions and orders are transmitted clearly and smoothly, supported by **88.9%** who reported that the programs used help define employee roles.

- **41.7%** indicated that instructions are unclear, supported by **66.7%** who stated that the programs complicate work procedures.
- **2.8%** reported that instructions are transmitted in a complicated manner, supported by **16.7%** who also noted that the programs complicate work procedures.

The clarity of instructions highlights the effectiveness of communication within the organization. The majority of respondents agreed that programs designed to define employee roles contribute significantly to clear communication.(39)

Defining roles and task specialization, as emphasized by classical management schools, is a fundamental principle of efficient production processes. Émile Durkheim also recognized the importance of role specialization in fostering social solidarity, where individuals depend on one another for their interlinked contributions to production and distribution.

Field observations reveal the impact of digitalization on role definition and task delegation. One department head explained:

"Previously, requests for goods in the university dining hall were sent to us from various campuses, consolidated, and forwarded to the supplier. Distribution and inventory management were handled separately. Information about stock usage and meal numbers often arrived weeks later through daily consumption reports. However, with new programs and devices, each employee now uses a tablet with applications tailored to their tasks, enabling real-time reporting of consumption data accessible to supervisors and directors simultaneously."

These findings underscore the impact of digitalization on defining roles and responsibilities, improving communication, and enhancing organizational efficiency.

Analysis of Table 10

Do the Programs Used Enhance Organizational Effectiveness vs. Perception of Task Completion Time

Do the programs used enhance organizational effectiveness?	Task completion time	Total
Shorter	Longer than before	Unchanged
Yes	18 (75.0%)	1 (4.2%)
No	0 (0.0%)	1 (50.0%)
Partially	3 (30.0%)	0 (0.0%)
Total	21 (58.3%)	2 (5.6%)

Discussion of Table 10

From the table:

- **58.3%** of respondents noted that task completion time has become shorter. This is supported by **75.0%** who agreed that the programs used enhance organizational effectiveness.
- **36.1%** indicated that task completion time has not changed, supported by **70.0%** who believe the programs only partially enhance effectiveness.
- **5.6%** reported that task completion time has become longer, corroborated by **50.0%** who believe the programs do not enhance effectiveness.

Time efficiency in task completion is a key indicator of organizational success and productivity, as emphasized by classical management schools such as Taylorism and Fordism. Over decades, organizations have adopted modern methods, including digitalization and advanced programs, to minimize task completion time.

The majority of respondents believe that the programs used significantly contribute to organizational effectiveness and efficiency. This aligns with the findings of Dr. Mohamed Sharqi, who concluded that:

"Digitalization in administration increases the speed and effectiveness of service delivery while reducing negative phenomena such as favoritism and lack of transparency."

The remaining data reflect the impact of program functionality and quality on task completion time, which directly influences organizational effectiveness.

Analysis of Table 11

Do the Programs Used Enhance Organizational Effectiveness vs. Clarity of Instructions and Orders

Do the programs used enhance organizational effectiveness?	Clarity of instructions and orders	Total
Clear and Smooth	Unclear	Complicated
Yes	19 (79.2%)	5 (20.8%)
No	0 (0.0%)	2 (100.0%)

Do the programs used enhance organizational effectiveness?	Clarity of instructions and orders	Total
Partially	1 (10.0%)	8 (80.0%)
Total	20 (55.6%)	15 (41.7%)

Discussion of Table 11

From the table:

- **55.6%** of respondents reported that instructions and orders are transmitted clearly and smoothly. This is supported by **79.2%** who confirmed that the programs used enhance organizational effectiveness.
- **41.7%** stated that instructions are unclear, supported by **100.0%** who denied that the programs enhance effectiveness.
- **2.8%** reported that instructions are transmitted in a complicated manner, supported by **10.0%** who stated that the programs only partially enhance effectiveness.

Clear communication within an organization is critical for operational efficiency. Most respondents agree that programs designed to enhance effectiveness contribute significantly to smooth and clear communication.

The results emphasize the importance of advanced programs in improving communication processes and their role in supporting organizational effectiveness.

Discussion of the Fourth Hypothesis: Does Digital Technology Proficiency Impact Organizational Effectiveness in the Directorate of University Services in El Oued?

Analysis of Table 12

Does the Organization Train Employees on Information Technology vs. Task Completion Time

Does the organization train employees on IT?	Task completion time	Total
Shorter	Longer than before	Unchanged
Regularly	5 (71.4%)	1 (14.3%)

Does the organization train employees on IT? Task completion time Total		
Irregularly	15 (65.2%)	0 (0.0%)
No Training	1 (16.7%)	1 (16.7%)
Total	21 (58.3%)	2 (5.6%)

Table 12: Does the Organization Train Employees on IT vs. Task Completion Time

From the general trend in the table:

- **58.3%** of respondents indicated that task completion time has become shorter, supported by **71.4%** who reported that the organization trains employees on IT regularly.
- **36.1%** stated that task completion time has not changed, corroborated by **66.7%** who noted that the organization does not provide IT training.
- **5.6%** of respondents reported that task completion time has increased, supported by **16.7%** who also confirmed that the organization does not train employees on IT.

Timely task completion is critical in modern organizations and requires a high level of training for human resources. The majority of respondents emphasized that task completion time has decreased due to regular training provided by the organization.

Dr. Boufelja Ghiat highlights the importance of professional training:

"Professional training aims to equip individuals with skills, knowledge, and modern technology, enabling them to adapt to new circumstances. Training is also effective for career advancement and plays a critical role in efficient organizational management, helping achieve goals quickly and cost-effectively."

The data suggests that the level of technical skills and competence among employees significantly influences task completion time, organizational effectiveness, and adaptation to technological advancements.

Table 13: Can Employees Adapt to Emergencies vs. Participation in Decision-Making

Can employees adapt to emergencies?	Does the organization allow participation in decision-making?	Total
Always	Never	Sometimes
Always	1 (33.3%)	0 (0.0%)

Can employees adapt to emergencies?	Does the organization allow participation in decision-making?	Total
No	0 (0.0%)	2 (50.0%)
Sometimes	4 (13.8%)	7 (24.1%)
Total	5 (13.9%)	9 (25.0%)

Discussion of Table 13

From the table:

- **61.1%** of respondents stated that the organization only occasionally allows them to participate in decision-making. This is supported by **66.7%** who reported that employees are able to adapt to emergencies.
- **25.0%** indicated that the organization does not allow them to participate in decision-making, supported by **50.0%** who stated that employees are not capable of adapting to emergencies.
- **13.9%** reported that they are always allowed to participate in decision-making, supported by **33.3%** who confirmed that employees can always adapt to emergencies.

The hierarchical, bureaucratic management style at the Directorate of University Services concentrates authority at the top levels of the organization, limiting employee participation in decision-making. This approach contrasts with modern management practices, particularly in countries like Japan, where decision-making often originates from the bottom up.

Simon advocates for a similar model, arguing that decisions should flow from the lower levels upward, ensuring more comprehensive information and better organizational outcomes.

The results suggest that the organization's reliance on bureaucratic decision-making limits its ability to leverage employee expertise, which could enhance organizational responsiveness and effectiveness.

Table 14: Can Employees Adapt to Emergencies vs. Do They Provide Suggestions to Improve Services

Can employees adapt to emergencies?	Do employees provide suggestions to improve services?	Total
Always	Sometimes	Never
Always	2 (66.7%)	1 (33.3%)
No	1 (25.0%)	2 (50.0%)
Sometimes	9 (31.0%)	16 (55.2%)
Total	12 (33.3%)	19 (52.8%)

Discussion of Table 14

From the table:

- **52.8%** of respondents indicated that they only occasionally provide suggestions to improve services, supported by **55.2%** who reported that employees can only sometimes adapt to emergencies.
- **33.3%** stated that they always provide suggestions to improve services, corroborated by **66.7%** who reported that employees can always adapt to emergencies.
- **13.9%** stated that they do not provide suggestions to improve services, supported by **25.0%** who also indicated that employees cannot adapt to emergencies.

Effective management requires encouraging employee participation in decision-making, innovation, and problem-solving. Dr. Boufelja Ghat argues:

"Employees are no longer mere executors; their increasing educational and technical expertise necessitates involving them in decision-making processes. Research has shown that involving subordinates in setting organizational goals and voicing their opinions significantly enhances job satisfaction and organizational effectiveness."(46)

However, the bureaucratic nature of the organization limits such participation, negatively impacting service improvement and responsiveness to emergencies.

The data highlights that employees' technical skills and their ability to adapt to technological changes directly affect their capacity to contribute to service improvements and overall organizational effectiveness.

Table Summary (Gender Distribution)

	Gender	Frequency	Percentage
Male	24	24	66.7%
Female	12	12	33.3%
Total	36	36	100.0%

The gender distribution shows that the sample consists of **66.7% males** and **33.3% females**, reflecting a male-dominated workforce in the organization.

Conclusion

The study concludes that digitalization significantly influences organizational effectiveness in the Directorate of University Services in El Oued. Key findings reveal that regular device updates and well-designed digital programs enhance communication and task efficiency, while gaps in training and uneven implementation create challenges. The bureaucratic management style limits employee engagement in decision-making, reducing the potential impact of digital transformation initiatives.

To optimize organizational effectiveness, the study recommends:

1. **Enhanced Training:** Regular and comprehensive training programs tailored to new technologies.
2. **Systematic Digitalization:** Ensuring consistency in the digitalization process across all departments.
3. **Inclusive Management Practices:** Encouraging employee participation in decision-making processes.
4. **Infrastructure Upgrades:** Regularly updating devices and addressing technological obsolescence.

By addressing these areas, organizations can better leverage digital technology to achieve strategic goals and improve overall performance. The findings provide valuable insights for policymakers and administrators in higher education and public services seeking to enhance organizational effectiveness through digital transformation.

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