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Digital-traditional organizational tensions in algerian public service institutions: A DTOT perspective.

ABSTRACT

This study examines how the interaction between digital systems and traditional organizational structures shapes digital transformation outcomes in Algerian public service and social institutions. The research adopts a theory-driven qualitative design, complemented by selective quantitative observations, to analyze organizational dynamics beyond purely technological perspectives. Data were collected through semi-structured interviews with 55 participants across seven institutions and direct observation of administrative practices. A directed thematic coding approach, guided by the Digital-Traditional Organizational Tension (DTOT) framework, was used to identify patterns of structural tension, decision-making ambiguity, workflow redundancy, and role ambiguity. The findings reveal that digital transformation does not inherently improve efficiency. Instead, digital systems coexist with traditional bureaucratic processes, generating duplication of workflows, expansion of procedural steps, and overlapping authority structures. These dynamics create persistent organizational tensions that complicate decision-making and increase administrative burden. At the same time, traditional structures play a stabilizing role by maintaining continuity, accountability, and operational coherence. The study concludes that digital transformation in public institutions should be understood as a tension-driven process rather than a linear transition. The DTOT framework provides a novel theoretical contribution by explaining how digital and traditional logics interact to shape institutional outcomes. Effective transformation depends on the ability to manage the balance between innovation and organizational stability.

Keywords: Digital transformation; public administration; organizational tension; bureaucracy

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Tensiones organizacionales digital-tradicional en instituciones de servicios públicos de Argelia: Una perspectiva DTOT

RESUMEN

Tensiones organizativas digitales-tradicionales en las instituciones públicas argelinas: Una perspectiva DTOT. RESUMEN Este estudio examina cómo la interacción entre los sistemas digitales y las estructuras organizativas tradicionales influye en los resultados de la transformación digital en las instituciones públicas y sociales de Argelia. La investigación adopta un diseño cualitativo basado en la teoría, complementado con observaciones cuantitativas selectivas, para analizar la dinámica organizativa más allá de las perspectivas

puramente tecnológicas. Los datos se recopilaron mediante entrevistas semiestructuradas con 55 participantes de siete instituciones y la observación directa de las prácticas administrativas. Se utilizó un enfoque de codificación temática dirigida, guiado por el marco de Tensión Organizativa Digital-Tradicional (DTOT), para identificar patrones de tensión estructural, ambigüedad en la toma de decisiones, redundancia en los flujos de trabajo y ambigüedad de roles. Los hallazgos revelan que la transformación digital no mejora inherentemente la eficiencia. Por el contrario, los sistemas digitales coexisten con los procesos burocráticos tradicionales, generando duplicación de flujos de trabajo, expansión de pasos procedimentales y superposición de estructuras de autoridad. Esta dinámica crea tensiones organizativas persistentes que complican la toma de decisiones y aumentan la carga administrativa. Al mismo tiempo, las estructuras tradicionales desempeñan un papel estabilizador al mantener la continuidad, la rendición de cuentas y la coherencia operativa. El estudio concluye que la transformación digital en las instituciones públicas debe entenderse como un proceso impulsado por tensiones, más que como una transición lineal. El marco DTOT aporta una contribución teórica novedosa al explicar cómo interactúan las lógicas digitales y tradicionales para configurar los resultados institucionales. Una transformación eficaz depende de la capacidad de gestionar el equilibrio entre innovación y estabilidad organizacional.

Palabras clave: Transformación digital; administración pública; tensión organizacional; burocracia

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Tensões organizacionais digitais-tradicionais nas instituições públicas argelinas: uma perspetiva da teoria das tensões organizacionais digitais-tradicionais

RESUMO

Este estudo examina como a interação entre os sistemas digitais e as estruturas organizacionais tradicionais influencia os resultados da transformação digital nas instituições públicas e sociais argelinas. A investigação adota uma abordagem qualitativa baseada na teoria, complementada por observações quantitativas seletivas, para analisar a dinâmica organizacional para além das perspetivas puramente tecnológicas. Os dados foram recolhidos através de entrevistas semiestructuradas a 55 participantes de sete instituições e observação direta de práticas administrativas. Uma abordagem de codificação temática dirigida, orientada pela estrutura da Teoria das Tensões Organizacionais Digitais-Tradicionais (TODT), foi utilizada para identificar padrões de tensão estrutural, ambiguidade na tomada de decisões, redundância de fluxos de trabalho e ambiguidade de papéis. Os resultados revelam que a transformação digital não melhora inerentemente a eficiência. Pelo contrário, os sistemas digitais coexistem com os processos burocráticos tradicionais, levando à duplicação de fluxos de trabalho, à expansão de etapas processuais e à sobreposição de estruturas de autoridade. Esta dinâmica cria tensões organizacionais persistentes que complicam a tomada de decisões e aumentam a carga administrativa. Ao mesmo tempo, as estruturas tradicionais desempenham um papel estabilizador, mantendo a continuidade, a responsabilidade e a coerência operacional. O estudo conclui que a transformação digital nas instituições públicas deve ser entendida como um processo de tensão, e não como uma transição linear. O modelo DTOT (Transformação Digital e Tensão Organizacional) oferece uma contribuição teórica inovadora ao explicar como as lógicas digitais e tradicionais interagem para moldar os resultados institucionais. A eficácia da transformação depende da capacidade de gerir o equilíbrio entre a inovação e a estabilidade organizacional.

Palavras-chave: Transformação digital; administração pública; tensão organizacional; burocracia

INTRODUCTION

Digitalization as a Global Institutional Agenda

Over the past two decades, digitalization has evolved from a mere technological advancement into a central component of the global institutional agenda, shaping public sector reforms across diverse national contexts. Public administrations increasingly incorporate digital tools as part of modernization strategies aimed at improving service delivery, enhancing transparency, and reducing bureaucratic inefficiencies. According to Petrov (2025), digitalization represents both a challenge and an opportunity for contemporary governance systems, particularly in democratic settings. Similarly, Kirton and Warren (2018) emphasize the role of international governance frameworks, such as the G20, in promoting coordinated digital policies. These transformations are further reinforced by global dynamics linking digitalization with economic and institutional integration (Autio et al., 2021).

In this framework, digital transformation is not limited to technological adoption but entails a profound restructuring of organizational routines, administrative practices, and institutional relationships. Schildt (2022) argues that digitalization operates under specific institutional logics that redefine how organizations function and interact. Governments are thus encouraged to redesign operational models to better respond to citizen demands and evolving governance standards. However, recent studies suggest that the outcomes of digitalization depend significantly on contextual factors such as organizational culture and institutional arrangements rather than on technology alone (Aguerre et al., 2026). Consequently, digital transformation must be understood as a socio-institutional process rather than a purely technical shift.

The Paradox of Failed Modernization

Despite the optimistic expectations surrounding digital transformation, empirical evidence reveals a persistent paradox: modernization initiatives often fail to achieve the anticipated improvements in organizational performance. As Munck (2018) notes, modernization theories have historically struggled to translate into effective practical outcomes, raising concerns about their applicability. Similarly, Byekwaso (2016) criticizes dominant development approaches for oversimplifying complex socio-political realities. In the context of public sector digitalization, this paradox becomes evident when technological systems designed to enhance efficiency instead generate additional layers of complexity.

Rather than replacing traditional administrative practices, digital tools frequently coexist with them, producing hybrid organizational configurations. Daniels (2000) and Clarke (2007) illustrate how modernization processes can generate contradictions within institutional structures, leading to fragmentation and inefficiencies. This coexistence often results in duplicated workflows, ambiguous authority structures, and unclear decision-making responsibilities. Münch (2015) further explains that modernity itself is characterized by inherent paradoxes, particularly when rationalization processes produce unintended irrational outcomes. These dynamics highlight a critical issue: digital innovation may inadvertently reinforce bureaucratic complexity instead of reducing it.

The Challenge in Algerian Public Institutions

The situation of public social service institutions in Algeria exemplifies this paradox in a particularly illustrative manner. In recent years, the Algerian government has accelerated efforts to digitalize administrative processes, focusing on electronic records, online services, and workflow automation systems. However, as Chabani (2020) points out, the implementation of information systems in public organizations often encounters structural and managerial challenges. Despite these initiatives, daily administrative practices continue to reflect deeply rooted bureaucratic traditions characterized by hierarchical coordination and centralized decision-making (Bouchikhi & Barka, 2017).

In many cases, digital systems have been introduced without a comprehensive redesign of organizational processes, leading to the coexistence of digital and manual systems. This duality increases workloads and generates inefficiencies rather than improving performance. Azizi and Ketfi (2024) highlight that governance reforms in Algerian institutions frequently face obstacles related to institutional inertia and structural rigidity. Furthermore, Schoelen (2024) emphasizes that broader systemic challenges in Algerian public institutions affect the success of modernization efforts. These conditions demonstrate that digital transformation in Algeria is not merely a technological issue but a deeply organizational and institutional challenge.

Literature Limitations

Existing literature on digital transformation has provided significant insights into technological innovation, adoption strategies, and digital governance models. However, several important limitations remain. First, many studies prioritize technological performance indicators while neglecting the organizational dynamics that shape implementation outcomes. Wong (2007) highlights that research often overlooks contextual and structural factors that influence the effectiveness of digital systems. Additionally, Ioannidis (2007) argues that limitations in scientific research are frequently underreported, which restricts critical understanding and theoretical development.

Moreover, much of the literature assumes that traditional bureaucratic structures are inherently obstacles to innovation, ignoring their potential stabilizing role during periods of organizational change. Empirical research focusing on public institutions in North Africa and the Arab world remains limited, creating a significant regional knowledge gap. Importantly, current studies rarely offer a comprehensive theoretical framework to explain how digital systems coexist with traditional administrative structures within the same organization. This gap limits our ability to understand why digital transformation simultaneously generates innovation and organizational tension.

Research Question

In response to these theoretical and empirical limitations, this study seeks to address the following central research question: ¿How does the interaction between digital systems and traditional organizational structures affect digital transformation outcomes in Algerian public social service institutions? This question shifts the analytical focus from technology itself to the organizational processes that mediate transformation. As Bryman (2007) emphasizes, a well-formulated research question is essential for guiding systematic inquiry in social research.

Furthermore, Ratan et al. (2019) and Thabane et al. (2009) underline that research questions must be clearly defined to ensure methodological coherence and analytical precision. By focusing on the interaction between digital and traditional systems, this study aims to uncover the underlying mechanisms that shape transformation outcomes. This approach allows for a more nuanced understanding of digitalization processes, particularly in complex institutional environments such as public sector organizations.

Contribution Statement

By adopting an organizational perspective, this study moves beyond purely technological explanations of digital transformation and provides a more comprehensive analysis of institutional change. It examines how bureaucratic stability, hierarchical coordination, and procedural continuity interact with digital innovation to produce complex and often contradictory outcomes. Stewart Jr and Hahne (2023) highlight the importance of clearly articulating scholarly contributions, particularly in interdisciplinary research contexts.

The main contribution of this article lies in the development of the concept of Digital-Traditional Organizational Tension (DTOT), a theoretical framework that explains how digital initiatives interact with existing bureaucratic structures. This framework contributes to a

deeper understanding of the coexistence of innovation and institutional rigidity within public organizations. Additionally, it offers analytical tools for interpreting digital transformation processes in contexts similar to Algerian public institutions, thereby expanding the scope of current literature. Recent interdisciplinary studies also stress the importance of integrative approaches in addressing complex institutional challenges (Heidecker et al., 2025).

LITERATURE REVIEW

Digital Transformation in the Public Sector

Digital transformation has become a central theme in contemporary public administration, as governments worldwide increasingly adopt digital platforms, automation systems, and data-driven tools to enhance service delivery and administrative efficiency. According to Hardianto et al. (2025), digitalization initiatives are often framed as mechanisms to overcome bureaucratic inefficiencies and improve governance outcomes. Similarly, Ouboumlik and Ouazzani Touhami (2024) argue that digital technologies are strategically deployed to increase transparency and reduce operational costs. Foundational contributions also highlight that digital transformation is not merely technical but deeply embedded in institutional reform processes (Mergel et al., 2018; Carter et al., 2024).

However, recent research emphasizes that digital transformation extends beyond technology adoption and requires alignment between technological systems, organizational strategies, and institutional capabilities. Liu et al. (2025) note that successful digitalization depends on the integration of these elements within a coherent governance framework. Despite this, empirical findings reveal uneven outcomes, where digital initiatives often fail to produce the expected improvements in performance. Hardianto et al. (2025) stress that organizational culture and structural conditions significantly shape how digital tools are implemented and experienced in practice.

Furthermore, a critical limitation in the literature lies in its predominant focus on technological indicators such as adoption rates and system accessibility. Ouboumlik and Ouazzani Touhami (2024) point out that such approaches neglect internal organizational dynamics, including power relations, workflow structures, and decision-making processes. As a result, the organizational consequences of digital transformation remain insufficiently theorized, creating the need for frameworks that integrate both technological and institutional perspectives (Lips, 2024; Otia & Bracci, 2022).

Bureaucracy and Organizational Stability

Bureaucratic organization has historically been associated with stability, predictability, and institutional continuity, forming the backbone of public administration systems. Classical theory, particularly Weber (1947/2021), emphasizes the importance of hierarchical authority, formal rules, and standardized procedures in ensuring coordination and control within large organizations. Although bureaucracy has often been criticized for rigidity and inefficiency, contemporary research highlights its stabilizing role, especially in complex and uncertain environments (Grøn & Møller, 2024).

In public institutions, bureaucratic structures provide clear role definitions and procedural safeguards that reduce ambiguity in decision-making processes. Grøn and Møller (2024) argue that such features contribute to institutional resilience by ensuring continuity in service delivery and organizational coherence. Consequently, efforts to introduce digital reforms may generate tensions when new systems disrupt established administrative routines. Hardianto et al. (2025) suggest that these tensions arise not because bureaucracy is inherently resistant to change, but because it operates according to deeply embedded institutional logics.

Rather than viewing bureaucracy solely as an obstacle, recent studies propose a more nuanced perspective in which traditional structures act as mediating mechanisms that shape the trajectory of innovation. This perspective underscores the need to analyze how stability and change coexist within organizations, particularly during periods of transformation. In this

sense, bureaucracy can both constrain and enable digitalization processes, depending on how it interacts with emerging technological systems.

Hybrid Organizational Structures

The coexistence of digital innovation and traditional bureaucracy has led to the emergence of hybrid organizational structures in contemporary institutions. These structures arise when new digital systems are introduced without fully replacing existing administrative frameworks, resulting in the simultaneous operation of multiple organizational logics. Bagni et al. (2025) highlight that hybrid structures are often designed to balance flexibility and efficiency with stability and control. Similarly, Claver-Cortés et al. (2012) emphasize that such configurations can support competitive and adaptive organizational strategies.

Despite their potential advantages, hybrid structures frequently generate ambiguity and complexity within organizations. Lentz (1996) notes that the coexistence of different structural elements can lead to overlapping responsibilities and coordination challenges. Ahmady et al. (2016) further argue that unclear organizational boundaries may affect performance and decision-making processes. In practice, employees often navigate parallel systems—digital and manual—which can result in duplicated workflows and increased administrative burden.

In the public sector, hybridization is particularly pronounced due to the need to maintain institutional continuity while implementing reforms. Digital systems are typically introduced incrementally to mitigate risks, reinforcing the coexistence of traditional and modern organizational elements. This gradual approach, while pragmatic, often prevents deep structural transformation, thereby sustaining organizational tensions rather than resolving them.

Organizational Tension Theory

Organizational tension theory offers a valuable framework for understanding the coexistence of competing institutional logics within organizations. Smith and Lewis (2011/2018) conceptualize tension as a persistent and inherent condition arising from the simultaneous pursuit of contradictory objectives, such as stability versus change or control versus flexibility. Rather than viewing tension as a dysfunction, this perspective considers it a normal and potentially productive feature of organizational life.

Empirical research demonstrates that the way organizations manage tensions significantly influences their outcomes. Dieste et al. (2022) show that poorly managed tensions in technological transformations can lead to inefficiencies and resistance, whereas effective management can foster learning and adaptation. Similarly, Ghiringhelli and Virili (2021) argue that organizational change processes can be understood as mechanisms for negotiating and stabilizing tensions over time. These insights highlight the importance of governance and coordination in transformation processes.

However, existing applications of organizational tension theory rarely address the specific interaction between digital systems and bureaucratic structures in public institutions. Most studies focus on broader dichotomies, such as innovation versus efficiency, without explicitly analyzing digital–traditional coexistence. This gap suggests the need for a more context-specific theoretical approach capable of capturing the unique dynamics of public sector digital transformation (Crossan et al., 1995).

Research Gap Summary

The literature reviewed reveals several critical gaps that justify further theoretical and empirical investigation. First, existing studies tend to prioritize technological adoption while underestimating the role of organizational structures in shaping implementation outcomes. As Daigle (2010) suggests, literature reviews often identify gaps related to contextual and structural dimensions that remain insufficiently explored. Second, traditional bureaucracy is

frequently treated as a static constraint rather than as an active component influencing digital transformation processes.

Additionally, while the concept of hybrid organizational structures has gained recognition, there is limited theoretical development explaining how digital and traditional logics interact over time. Wexler et al. (2018) emphasize the importance of identifying research gaps to advance knowledge in complex fields, a point reinforced by Orta Martínez et al. (2007) in their analysis of institutional impacts. Most importantly, current literature lacks a comprehensive framework capable of explaining how digital systems coexist with traditional structures and how this interaction shapes organizational outcomes.

THEORETICAL FRAMEWORK

Definition of the Concept: Digital-Traditional Organizational Tension (DTOT)

In response to the identified limitations, this study introduces the concept of Digital-Traditional Organizational Tension (DTOT) as an analytical framework for examining digital transformation in public institutions. DTOT refers to the persistent tension that emerges when digital systems are implemented within environments characterized by established bureaucratic structures and traditional administrative practices. Aparicio et al. (2016) highlight the importance of theoretical frameworks in structuring complex phenomena, while Varpio et al. (2020) distinguish between conceptual clarity and analytical application in theory building.

Unlike linear models of technological change, the DTOT framework assumes coexistence rather than replacement. Digital systems interact with pre-existing institutional arrangements shaped by hierarchy, procedural formalism, and administrative continuity. Romeo and Sangiovanni-Vincentelli (1991) emphasize that theoretical frameworks must capture dynamic interactions rather than static relationships, an idea that aligns with the DTOT perspective. Consequently, digital transformation is conceptualized as a process of interaction between competing organizational logics.

The central premise of DTOT is that transformation outcomes depend not only on technological capacity but also on how institutions manage the tension between digital flexibility and bureaucratic stability. Ajitabh and Momaya (2004) argue that organizational competitiveness depends on the alignment of multiple internal factors, while Pacherie (2008) underscores the importance of understanding underlying structures in complex systems. In this sense, tension is not viewed as an anomaly but as an inherent structural condition of organizational change.

Dimensions of DTOT

To operationalize the concept, DTOT is structured around four interrelated dimensions observable in organizational practice. First, structural tension refers to the friction generated when digital infrastructures intersect with hierarchical authority systems, often creating contradictions in coordination mechanisms. Second, decision-making tension emerges when overlapping digital and traditional processes generate ambiguity regarding authority and responsibility.

Third, workflow redundancy captures the duplication of procedures across digital and manual systems, which increases workload and reduces efficiency gains expected from digitalization. Finally, role ambiguity arises when organizational roles are not clearly redefined during digital transformation, leading to confusion and weakened accountability. Together, these dimensions illustrate that organizational tension is a multidimensional phenomenon shaped by structural, procedural, and behavioral factors.

Conceptual Model

To synthesize these theoretical assumptions, this study proposes a conceptual model that explains the interaction between digital systems and traditional organizational structures. The

model conceptualizes digital transformation as an interactive process rather than a linear transition, where digital systems introduce innovation, flexibility, and data-driven capabilities, while traditional structures provide stability, coordination, and institutional continuity (Ouboumlik & Ouazzani Touhami, 2024; Liu et al., 2025).

The interaction between these two organizational logics generates tension, which in turn shapes institutional outcomes such as efficiency, clarity in decision-making, and overall performance. Importantly, the model does not assume that tension is inherently negative. Instead, outcomes depend on how effectively organizations manage the coexistence of digital and traditional elements. When managed appropriately, tension can lead to adaptive balance; when neglected, it may intensify organizational complexity and inefficiency.

METHODOLOGY

Research Design

This study adopts a theory-driven qualitative research design, complemented by selective quantitative observations, to examine the organizational dynamics underlying digital transformation in Algerian public service and social institutions. This approach aligns with the need to analyze complex socio-organizational phenomena that cannot be fully captured through purely quantitative indicators. As Espinoza Freire (2020a) argues, qualitative research enables an in-depth understanding of social realities by focusing on meanings, interactions, and contextual conditions. In this sense, the study prioritizes interpretative analysis to uncover the mechanisms of Digital-Traditional Organizational Tension (DTOT) as an emergent organizational phenomenon.

Furthermore, the integration of limited quantitative observations serves to strengthen analytical robustness through methodological complementarity. According to Espinoza-Freire (2025a), combining qualitative depth with selective empirical observations enhances the explanatory power of research, particularly in institutional contexts. The design is therefore oriented toward theory building, allowing the identification of patterns, relationships, and tensions arising from real organizational practices rather than relying exclusively on predefined variables. This approach ensures alignment between the research question, the theoretical framework, and the empirical strategy.

Research Context

The study is situated within Algerian public service and social institutions, which operate under a highly centralized administrative system characterized by hierarchical authority, procedural formalism, and strong bureaucratic traditions. These institutional features provide a relevant context for analyzing the interaction between digital systems and traditional organizational structures. As Espinoza-Freire (2025b) notes, contextual analysis is essential in qualitative research to understand how institutional environments shape social and organizational behavior.

In recent years, digital transformation in Algeria has been accelerated through national modernization initiatives aimed at improving public service delivery and administrative efficiency. However, these initiatives have often been implemented without comprehensive organizational restructuring, leading to the coexistence of digital and manual systems. This context creates an ideal empirical setting to explore DTOT, as it reveals how digital innovation interacts with entrenched bureaucratic practices. Consequently, the study emphasizes the importance of institutional context in shaping the outcomes of digital transformation processes.

Data Collection

Data collection was conducted using a triangulated qualitative approach, ensuring depth, validity, and analytical richness. Triangulation allows the integration of multiple data sources to capture different dimensions of the phenomenon under study, thereby enhancing credibility (Espinoza Freire, 2020b). Two primary techniques were employed: semi-structured interviews

and direct observation, both aligned with the study's interpretative and theory-building orientation.

Semi-structured interviews were conducted with 20 department heads and 35 staff members across selected institutions. The interview protocol focused on participants' experiences with digitalization, perceptions of organizational change, decision-making processes, and manifestations of organizational tension. This method enabled the collection of nuanced insights into both formal procedures and informal practices. As highlighted by Espinoza-Freire (2025a), interviews are particularly valuable for exploring subjective experiences and uncovering hidden organizational dynamics.

In addition, direct observation was carried out within institutional settings to examine administrative practices in real time. Observations focused on document management, workflow execution, and interactions between digital and traditional systems, with particular attention to redundancy, authority overlaps, and role ambiguity. This technique provided empirical evidence of how DTOT manifests in daily organizational routines. The combination of interviews and observation ensures a comprehensive understanding of both perceived and actual practices within institutions.

Sample

The study employed a purposive sampling strategy to ensure the inclusion of relevant and information-rich cases. The sample consisted of seven public service and social institutions located across three municipalities, involving a total of 55 participants, including both department heads and staff members. This sampling approach is consistent with qualitative research principles, where selection is based on the potential contribution of participants to the research objectives rather than statistical representativeness (Espinoza Freire, 2020a).

The selection criteria considered institutional diversity in terms of size, level of digital system implementation, and scope of services provided. This diversity allowed for comparative analysis across different organizational contexts, enhancing the analytical depth of the study. According to Espinoza-Freire (2025b), purposive sampling facilitates the exploration of complex phenomena by capturing variability and contextual differences. As a result, the sample supports a nuanced understanding of how DTOT operates across different institutional environments.

Data Analysis

Data analysis followed a thematic and interpretative approach, guided by the principles of qualitative content analysis. The process involved coding interview transcripts and observational notes to identify recurring patterns, categories, and relationships associated with DTOT. As Espinoza-Freire (2025a) suggests, systematic coding is essential for transforming qualitative data into meaningful analytical insights. The analysis progressed from open coding to axial coding, allowing the identification of core dimensions of organizational tension.

The DTOT framework served as a sensitizing concept, guiding the interpretation of empirical findings while allowing for the emergence of new categories. This iterative process ensured a balance between theoretical guidance and empirical discovery. Additionally, selective quantitative observations were used to support qualitative interpretations, particularly in identifying the frequency of workflow duplication and decision-making delays. This integrative approach strengthens the validity and explanatory depth of the findings.

Validity and Reliability

To ensure methodological rigor, the study incorporated multiple strategies aimed at enhancing validity and reliability. Triangulation of data sources and methods was employed to corroborate findings and reduce potential biases (Espinoza Freire, 2020b). Furthermore, prolonged engagement in the field allowed for a deeper understanding of institutional dynamics and increased the credibility of the analysis.

The study also applied analytical transparency, clearly documenting data collection and analysis procedures to ensure replicability. According to Espinoza-Freire (2022), ethical and methodological rigor are fundamental components of scientific research. In addition, participant validation was used selectively to confirm the accuracy of interpretations, strengthening internal validity. These measures collectively ensure that the findings are robust, credible, and grounded in empirical evidence.

Ethical Considerations

Ethical considerations were central to the research process, particularly given the institutional nature of the study. Participation was voluntary, and all respondents were informed about the purpose of the research, ensuring informed consent. Confidentiality and anonymity were strictly maintained to protect participants and institutional identities. As emphasized by Espinoza-Freire (2022), ethical principles are essential in maintaining the integrity and credibility of scientific research.

Additionally, the study adhered to principles of responsible data management, ensuring that collected information was used exclusively for academic purposes. The researcher maintained neutrality and reflexivity throughout the process, minimizing potential biases in data interpretation. These ethical safeguards reinforce the trustworthiness and legitimacy of the study.

FINDINGS

This section presents the empirical findings organized according to the four dimensions of Digital-Traditional Organizational Tension (DTOT). The results combine evidence from interviews and direct observations, allowing for a comprehensive understanding of how digital systems interact with traditional bureaucratic structures in Algerian public service and social institutions.

Structural Tension: Workflow Redundancy

One of the most consistent findings is the persistence of **workflow redundancy**, where digital systems coexist with manual procedures rather than replacing them. Although digitalization is expected to streamline administrative processes, empirical evidence indicates that institutions maintain parallel systems, generating duplication and inefficiency. This phenomenon reflects a structural tension between new digital infrastructures and existing bureaucratic routines, which continue to shape organizational practices despite technological change.

Table 1.

Structural Redundancy Before and After Digitalization

Process	Before Digitalization	After Digitalization	Observed Effect
Client Registration	Manual forms	Manual forms + Digital	Increased processing time, record duplication
Aid Distribution	Paper approval	Paper approval + Digital	Entry overlap and delays
Reporting	Monthly reports	Monthly reports + Digital	Increased administrative burden

The findings demonstrate that digitalization does not automatically reduce bureaucratic layers; instead, it often reproduces them in parallel formats. This supports the argument that digital transformation in the public sector tends to generate hybrid organizational configurations rather than full structural replacement (Mergel et al., 2018; Bjerke-Busch &

Aspelund, 2021). From a DTOT perspective, workflow redundancy emerges as a structural manifestation of unresolved tension between digital efficiency and institutional continuity.

Decision-Making Tension: Authority Overlap

Another significant finding is the emergence of authority overlap, where decision-making responsibilities become ambiguous due to the interaction between hierarchical authority and digital systems. Employees frequently reported uncertainty regarding whether to follow traditional administrative directives or system-generated instructions, particularly in cases involving automated workflows. This ambiguity highlights the coexistence of competing organizational logics that redefine authority structures within institutions.

Table 2.

Authority Overlap in Decision-Making

Task	Authority Before Digitalization	Digital Authority	Observed Tension
Social approval aid	Office Head	Digital workflow algorithm	Unclear decision final
Document verification	Supervisor	Digital verification	Role ambiguity
Customer complaint escalation	Department Head	Automated ticketing system	Response delays due to unclear authority

The overlap between human and digital authority structures generates decision-making delays and reduces organizational clarity. Rather than simplifying governance processes, digital systems introduce additional layers of coordination that must be negotiated in practice. This finding aligns with organizational tension theory, which suggests that competing logics—such as control versus automation—create persistent ambiguity within organizations (Smith & Lewis, 2011/2018; Dieste et al., 2022). Consequently, decision-making tension becomes a central dimension shaping digital transformation outcomes.

Workflow Redundancy: Process Expansion

In addition to duplication, the study identified a clear pattern of workflow expansion, where the number of procedural steps increases following digitalization. This expansion results from the integration of digital processes into existing bureaucratic routines without eliminating prior steps, leading to more complex administrative sequences. Observations indicate that digital tools often add verification layers, data entry requirements, and approval stages, thereby intensifying procedural density.

Table 3.

Workflow Inflation

Procedure	Steps Before Digitalization	Steps After Digitalization	Percentage Increase
Registration	5	8	+60%
Aid Review	6	10	+67%
Document Approval	4	7	+75%

The data reveal a significant increase in the number of procedural steps, confirming that digitalization may expand rather than streamline workflows. This finding reinforces previous research indicating that digital transformation often produces unintended complexity due to partial integration with existing structures (Carter et al., 2024; Hardianto et al., 2025). Within

the DTOT framework, workflow expansion reflects the persistence of organizational tension, where efficiency-oriented technologies interact with control-oriented bureaucratic systems.

Role Ambiguity and the Stabilizing Role of Traditional Structures

The findings also reveal the presence of **role ambiguity**, particularly in contexts where digital transformation alters responsibilities without corresponding organizational adjustments. Employees frequently experience uncertainty regarding their roles, especially when digital tasks overlap with existing administrative duties. This ambiguity affects coordination, accountability, and overall organizational performance, highlighting the human dimension of DTOT.

At the same time, traditional bureaucratic structures continue to play a crucial stabilizing role, particularly in partially digitalized environments. These structures provide continuity, reduce uncertainty, and compensate for limitations in digital systems, demonstrating that institutional stability remains a critical component of organizational functioning.

Table 4.

Mechanisms of Stability

Mechanism	Example	Observed Effect
Role Clarity	Tasks defined by supervisor	Maintains accountability
Process Continuity	Paper backups	Reduces service interruptions
Hierarchical Oversight	Managerial review	Mitigates system errors
Informal Coordination	Peer consultations	Balances system rigidity

These findings suggest that traditional organizational arrangements should not be viewed solely as barriers to innovation but also as mechanisms that sustain institutional coherence. This perspective aligns with recent studies emphasizing the stabilizing function of bureaucracy in complex environments (Grøn & Møller, 2024). From a DTOT standpoint, organizational effectiveness depends on how institutions balance digital innovation with structural stability.

Visual Mapping of DTOT

Figure 2.

Digital-Traditional Organizational Tension Map



The visual mapping synthesizes the four dimensions of DTOT and identifies key zones of organizational tension within public service and social institutions. Structural tension is reflected in workflow redundancy and duplication, while decision-making tension emerges through authority overlap between digital systems and hierarchical structures. Workflow expansion highlights increasing procedural complexity, and role ambiguity captures the human impact of transformation processes.

This integrated representation illustrates that digital transformation is not a linear process but a multidimensional interaction between competing organizational logics. The mapping provides a diagnostic tool for identifying critical areas requiring managerial intervention, particularly in contexts where digital systems and traditional structures coexist.

Analytical Synthesis

Overall, the findings demonstrate that digitalization in Algerian public service and social institutions does not inherently lead to improved efficiency or simplification of processes. Instead, it produces a complex interplay between digital innovation and traditional bureaucratic structures, resulting in redundancy, ambiguity, and increased organizational complexity. These outcomes confirm the central premise of the DTOT framework: digital transformation is shaped by the interaction between competing organizational logics rather than by technology alone.

At the same time, the persistence of traditional structures highlights their critical role in maintaining stability and continuity during periods of change. This dual dynamic suggests that effective digital transformation requires not the elimination of bureaucracy, but its strategic integration with digital systems. Consequently, organizational performance depends on the ability to manage tension as an inherent feature of institutional transformation processes.

DISCUSSION

The findings of this study provide strong empirical support for the central premise of the Digital–Traditional Organizational Tension (DTOT) framework: digital transformation in public institutions is not a linear or substitutional process, but rather an interactive and tension-driven dynamic between digital systems and pre-existing bureaucratic structures. Contrary to dominant narratives that frame digitalization as inherently efficiency-enhancing, the results demonstrate that its outcomes are contingent upon how organizations manage the coexistence of competing institutional logics.

Rethinking Digital Transformation: From Efficiency to Organizational Complexity

One of the most significant contributions of this study is the challenge it poses to the prevailing assumption that digital transformation leads to administrative simplification. The evidence of workflow redundancy and process expansion indicates that digitalization may, in fact, increase organizational complexity when implemented without structural redesign. This finding aligns with previous research suggesting that digital transformation often produces hybrid configurations rather than replacing traditional systems (Mergel et al., 2018; Carter et al., 2024).

However, this study goes further by demonstrating that such hybridization is not merely a transitional phase but a persistent organizational condition. The coexistence of digital and manual systems reflects what Smith and Lewis (2011/2018) conceptualize as enduring organizational tensions, where competing demands cannot be fully resolved but must be continuously managed. In this sense, digital transformation should be reconceptualized not as a process of optimization, but as a reconfiguration of complexity, where efficiency gains are neither automatic nor guaranteed.

The Persistence of Bureaucracy: Constraint or Enabler?

The findings also contribute to the ongoing debate regarding the role of bureaucracy in contemporary public administration. While traditional perspectives often portray bureaucracy as an obstacle to innovation, this study reveals a more nuanced reality. The stabilizing mechanisms identified—such as hierarchical oversight, procedural continuity, and role clarity—demonstrate that bureaucratic structures play a critical role in sustaining organizational functionality during digital transformation.

This perspective is consistent with Grøn and Møller (2024), who emphasize the importance of bureaucratic stability in complex institutional environments. Rather than being eliminated,

bureaucratic elements persist and interact with digital systems, shaping transformation outcomes. The DTOT framework thus reframes bureaucracy as both a source of tension and a mechanism of stability, highlighting its dual role in organizational change processes.

Decision-Making in Hybrid Systems: The Problem of Distributed Authority

The emergence of authority overlap and decision-making ambiguity represents a critical organizational challenge identified in this study. Digital systems, particularly those incorporating automated workflows, introduce new forms of distributed authority that coexist with traditional hierarchical structures. This coexistence creates uncertainty regarding accountability and decision ownership, often leading to delays and inefficiencies.

These findings extend organizational tension theory by demonstrating how digitalization transforms authority structures within public institutions. While prior studies have examined tensions between innovation and control (Dieste et al., 2022), this research highlights a more specific dynamic: the interaction between algorithmic and hierarchical authority. This interaction generates what can be described as decision-making hybridity, a condition in which authority is neither fully centralized nor fully automated, but negotiated across systems and actors.

DTOT as a Theoretical Contribution

A key theoretical contribution of this study lies in the operationalization and empirical validation of the DTOT framework. Unlike existing approaches that treat digital transformation as a technological or managerial issue, DTOT conceptualizes it as a structurally embedded tension between competing organizational logics. The identification of four dimensions—structural tension, decision-making tension, workflow redundancy, and role ambiguity—provides a multidimensional lens for analyzing transformation processes.

This framework extends existing literature in three important ways. First, it integrates insights from digital transformation studies with organizational tension theory, offering a more comprehensive analytical model. Second, it shifts the focus from outcomes to processes, emphasizing how interactions between systems shape organizational realities. Third, it provides a context-sensitive perspective, particularly relevant for public institutions operating within strong bureaucratic traditions.

By framing tension as an inherent condition rather than a failure, DTOT challenges linear models of innovation and offers a more realistic understanding of organizational change. This contribution is particularly valuable in under-researched contexts such as North African public institutions, where digital transformation unfolds within complex institutional environments.

Practical Implications for Public Sector Reform

The findings of this study have significant implications for policymakers and public administrators. First, digital transformation strategies should move beyond technology-centered approaches and incorporate organizational redesign as a central component. The persistence of workflow redundancy and process inflation indicates that implementing digital systems without restructuring administrative processes is unlikely to yield efficiency gains.

Second, there is a need to clarify decision-making authority within hybrid systems. Organizations should establish clear governance mechanisms that define the relationship between digital tools and hierarchical structures, reducing ambiguity and improving accountability. Third, training programs should be designed to address role ambiguity, ensuring that employees can effectively navigate evolving organizational environments.

Importantly, policymakers should recognize that bureaucratic structures are not inherently incompatible with digital innovation. Instead, the challenge lies in managing the interaction between stability and change, leveraging the strengths of both systems. This perspective calls for a balanced approach to reform, where digitalization is integrated into existing institutional frameworks rather than imposed as a disruptive force.

Implications for Future Research

This study opens several avenues for future research. First, further empirical studies are needed to test the DTOT framework in different national and institutional contexts, allowing for comparative analysis and theoretical refinement. Second, quantitative approaches could be employed to measure the intensity and impact of organizational tensions, complementing the qualitative insights presented here.

Additionally, future research could explore the role of leadership and governance in managing DTOT, particularly in relation to decision-making processes and organizational adaptation. Finally, longitudinal studies would be valuable in examining how digital-traditional tensions evolve over time, providing deeper insights into the dynamics of institutional transformation.

Closing Insight

In sum, this study demonstrates that digital transformation in public institutions is fundamentally a process of managing organizational tension rather than eliminating it. The interaction between digital systems and traditional bureaucratic structures produces complex outcomes that cannot be understood through purely technological or managerial perspectives. By introducing and empirically grounding the DTOT framework, this research contributes to a more nuanced and realistic understanding of digital transformation, with both theoretical and practical relevance.

CONCLUSION

This study set out to examine how the interaction between digital systems and traditional organizational structures shapes digital transformation outcomes in Algerian public service and social institutions. The findings demonstrate that digitalization does not operate as a linear process of technological substitution but as a complex and tension-driven interaction between competing organizational logics. Rather than eliminating bureaucratic inefficiencies, digital transformation frequently reproduces and, in some cases, intensifies them through workflow redundancy, decision-making ambiguity, and procedural expansion.

A central conclusion of this research is that organizational tension is not a failure of digital transformation but a structural condition inherent to it. The coexistence of digital systems and traditional bureaucratic arrangements generates persistent dynamics that simultaneously enable and constrain institutional performance. In this sense, efficiency is not an automatic outcome of digitalization; it depends on the organization's capacity to manage the interaction between flexibility and stability. This insight challenges dominant narratives that frame digital transformation as inherently beneficial and instead calls for a more critical and context-sensitive understanding.

From a theoretical perspective, the study makes a significant contribution through the development and empirical validation of the Digital-Traditional Organizational Tension (DTOT) framework. By conceptualizing digital transformation as an interaction between technological innovation and institutional continuity, DTOT provides a multidimensional analytical lens that captures the complexity of organizational change. The identification of four core dimensions—structural tension, decision-making tension, workflow redundancy, and role ambiguity—offers a robust framework for analyzing transformation processes in public sector contexts. This contribution extends existing literature by integrating digital transformation studies with organizational tension theory, moving beyond reductionist and technology-centered approaches.

At the practical level, the findings underscore the need for a paradigm shift in public sector reform strategies. Policymakers and institutional leaders should move beyond viewing digitalization as a purely technical solution and instead recognize it as an organizational process requiring structural alignment. Effective transformation requires not only the implementation of digital systems but also the redesign of workflows, clarification of decision-making authority, and adaptation of organizational roles. Importantly, traditional bureaucratic

structures should not be treated as obstacles to be eliminated, but as stabilizing elements that can support transformation when appropriately integrated.

Furthermore, the study highlights that the success of digital transformation lies in achieving a dynamic balance between innovation and institutional stability. Organizations that fail to manage this balance are likely to experience increased complexity, inefficiency, and ambiguity. Conversely, those that recognize and strategically manage organizational tension can leverage it as a source of adaptation, learning, and long-term institutional resilience.

Finally, this research contributes to the broader understanding of digital transformation in underexplored contexts, particularly within North African public institutions. By providing empirical evidence grounded in real organizational practices, the study addresses a significant gap in the literature and opens new avenues for comparative and longitudinal research. Future studies should further examine how DTOT evolves across different institutional environments and explore mechanisms through which organizations can effectively govern digital-traditional interactions.

In conclusion, digital transformation should not be understood as the replacement of bureaucracy by technology, but as a reconfiguration of organizational systems in which tension plays a central and unavoidable role. Recognizing, analyzing, and managing this tension is essential for achieving meaningful and sustainable transformation in public institutions.

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