

# Digital Transformation and Strategic Planning in Sudanese Institutions: A Comparative Case Study of Sudatel Telecom Group and the Sudan Taxation Chamber

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## Abstract

This paper investigates the intersection between digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery and strategic planning in Sudanese institutions through a comparative case study of Sudatel Telecom Group (private sector) and the Sudan Taxation Chamber (public sector). It explores how digital initiatives are aligned with institutional strategies and what organizational, structural, and cultural conditions support or hinder this alignment. Drawing on semi-structured interviews, document analysis, and thematic comparison, the study reveals that while private institutions like Sudatel demonstrate strong digital leadership, resource allocation, and cultural adaptability, public entities face bureaucratic rigidity, limited ICT infrastructure, and fragmented planning. The findings highlight the critical role of strategic coherence, regulatory flexibility, and cross-sector collaboration in achieving sustainable digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery. The paper concludes with policy recommendations to enhance institutional readiness and digital governance in emerging economy contexts like Sudan.

## Keywords

Digital Transformation, Strategic Planning, Sudan, Public Sector, Private Sector, Institutional Capacity, Organizational Change, ICT Development, Policy Reform

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## 1. Introduction

Digital transformation (DT) has emerged as a pivotal strategic priority for organizations around the world. Beyond the simple digitization of services, DT represents a comprehensive restructuring of processes, cultures and institutional capabilities through the integration of advanced digital technologies (Vial, 2019). In emerging economies like Sudan, the digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) agenda is a critical necessity and a formidable challenge. It offers the potential to modernize public administration, enhance the quality and efficiency of service delivery, and stimulate inclusive economic growth. However, its implementation is often hampered by infrastructure deficits, regulatory constraints and institutional rigidity (Heeks, 2018; World Bank, 2020).

In this study, strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994) indicates, in this context, the degree to which an organization's digital initiatives are coherently integrated into its overall strategic objectives and planning processes (Venkatraman, 1994). At the same time, institutional capacity (the ability of organizations to plan, implement, and adapt strategically based on available resources and governance) (Andrews et al., 2017) refers to an organization's ability—its leadership, human resources, and governance structures—to plan, execute, and adapt to strategic changes (Andrews et al., 2017).

Despite national policy commitments, there is still a dearth of empirical research on how Sudanese institutions conceive, implement, and manage digital strategies. Questions remain about the alignment of these strategies with long-term regulatory goals, especially under the country's fragile circumstances. As such, the relationship between digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) and strategic planning is not laid down and not adequately examined.

This paper adopts a comparative case study approach to analyze how digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) is integrated into the strategic planning frameworks of two distinct Sudanese institutions: Sudatel Telecommunications Group (Sudani), a private sector telecommunications company operating in a liberalized market. The Sudanese Taxation Chamber, a public sector administrative authority operating under centralized governance. These cases were selected to provide insight into sectoral differences in digital capabilities, leadership vision, policy alignment, and organizational adaptive capacity.

By investigating these contradictory institutions, the study contributes to a growing body of literature exploring digital governance in fragile and resource-constrained environments. It identifies key enablers and barriers that determine

the effectiveness of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) and explores how strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994) can be achieved in contexts characterized by limited institutional uncertainty and flexibility, while revealing the strategic gaps, leadership dynamics and regulatory challenges shaping digital governance in the Sudanese context.

### 1.1. Objectives of the Study

- Critically examine how digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) is integrated into strategic planning processes within Sudanese institutions.
- Compare the implementation and alignment of digital initiatives in the public and private sectors using case studies of Sudatel Telecom Group (Sudani) and the Sudan Taxation Chamber.
- Identify the organizational, leadership, and policy factors that enable or constrain effective digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) in fragile-state contexts.

### 1.2. Research Hypotheses

1) H1: Institutions with adaptive leadership, decentralized decision-making, and investment in digital infrastructure are more likely to successfully integrate digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) into their strategic plans.

2) H2: Public institutions in Sudan face greater challenges in aligning digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) with strategy compared to private institutions due to structural and regulatory constraints.

3) H3: The presence of a supportive regulatory and policy environment positively moderates the relationship between strategic planning and digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) success.

## 2. Literature Review

### 2.1. Digital Transformation in Emerging Economies

While digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) (DT) has been rapidly embraced in developed econo-

mies as a central driver of innovation and competitiveness, its trajectory in emerging economies has been markedly uneven. Many developing and transitional states face systemic barriers to digital adoption, including inadequate infrastructure, political volatility, limited institutional capacity (the ability of organizations to plan, implement, and adapt strategically based on available resources and governance) (Andrews et al., 2017), and restrictive regulatory environments. Vial (2019) conceptualizes digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) as a strategic process through which organizations redefine their value propositions and operating models by leveraging digital technologies. However, Kraus et al. (2021) argue that this process as constrained by infrastructure and human capital constraints especially in emerging markets. In fragile contexts such as Sudan—where governance systems are often weak, technological ecosystems underdeveloped, and digital skills are scarce—translating this conceptual model into practice remains a formidable challenge.

Heeks (2018) argues that in developing countries, digital initiatives often fail not due to lack of intention but because they are ill-suited to the local context. A successful digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) in emerging economies therefore requires not just technological investment but also localized frameworks that account for socio-political instability, informal institutional norms, and sectoral maturity. Adaptive leadership, participatory planning, and resilience-based digital policies are critical to transforming conceptual strategies into real-world results.

Rather than being a linear or purely technical endeavor, DT in these settings often unfolds amid socio-political disruptions and budgetary constraints, requiring adaptive leadership and context-sensitive strategies. This highlights the need for localized frameworks that consider institutional maturity, sectoral dynamics, and the broader political economy of digital development in low-resource environments.

## 2.2. Strategic Planning and Digital Alignment

Strategic planning is usually defined as a deliberate and structured process by which organizations define their long-term goals, serving as a guide for dealing with uncertainty and achieving long-term goals, as described by Bryson (2018) as a systematic approach through which organizations analyze both internal capabilities and external opportunities or threats, and allocate resources in a way that supports sustainable development. In the context of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019), the effectiveness of digital initiatives depends heavily on their alignment with these overarching strategic frameworks.

Venkatraman (1994) emphasizes that true digital transformation (DT), defined

as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) requires more than incremental technological upgrades and automation of existing processes; it must be integrated into a broader strategic vision that encompasses business process reengineering, organizational restructuring, and cultural change. However, in many low-income and fragile countries, this consensus remains elusive. Factors such as fragmented governance, inconsistent policy frameworks, and limited strategic planning expertise often result in disjointed digital initiatives that fail to deliver long-term value. Digital tools may be adopted in isolation from institutional goals, leading to inefficiencies and misuse of resources. This misalignment underscores the urgent need for capacity building in strategic management and the formulation of adaptive planning models tailored to the constraints and complexities of developing country environments.

In fragile and low-income countries, however, this alignment is frequently undermined by fragmented governance, short-term budgeting cycles, and insufficient planning capabilities. Peppard & Ward (2016) emphasize the importance of integrating IT strategy into organizational strategy to avoid isolated technology implementations. When strategic goals are disconnected from digital initiatives, organizations risk deploying underused or misaligned tools that do not enhance productivity or service delivery.

### 2.3. Sectoral Differences: Public vs. Private

Empirical evidence consistently highlights the divergent trajectories that public and private institutions follow in the pursuit of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019). In the private sector, digital strategies are typically driven by market incentives such as customer satisfaction, innovation cycles, operational efficiency, and competitive advantage. As a result, private firms often exhibit greater agility, a stronger appetite for technological experimentation, and faster implementation timelines.

Conversely, public sector institutions operate within regulatory frameworks that prioritize accountability, procedural compliance, and risk aversion (Alsaad et al., 2022). These governance imperatives shape a more conservative institutional culture that tends to delay or fragment the adoption of digital tools. In Sudan, this contrast is particularly pronounced. The telecommunications industry, led by companies like Sudatel, has embraced mobile-based innovations, digital customer engagement, and platform integration as core components of their business strategy. In contrast, public agencies such as the Sudan Taxation Chamber continue to grapple with legacy systems, bureaucratic inertia, and limited fiscal autonomy—factors that constrain the scale and sustainability of digital reform.

These structural and cultural differences not only affect the pace of digital adoption but also influence the institutional capacity (the ability of organizations to plan, implement, and adapt strategically based on available resources and govern-

ance) (Andrews et al., 2017) to align technology with broader strategic outcomes.

## 2.4. Sudanese Context

Sudan's digital reform efforts have accelerated in recent years, but this acceleration is driven by widespread administrative inefficiencies and increased public attention to improved service delivery. The Ministry of Communications has led several national strategies aimed at expanding e-government platforms. However, Sudan's digital landscape has been severely affected by the country's protracted social and political instability, economic sanctions, and chronic institutional fragility. These factors have hindered the development of a coherent digital infrastructure and limited the ability of public institutions to implement integrated technological solutions. Although recent reform initiatives—driven in part by donor support and internal demand for modernization—have sought to digitize basic public services, their progress has been slow and uneven.

Public agencies continue to operate within siloed systems characterized by outdated technologies, limited interoperability, and bureaucratic rigidity. The lack of coordination across ministries and the absence of a unified national digital strategy further exacerbates inefficiencies. Nonetheless, examples from the private sector offer a more promising outlook. Companies like Sudatel have managed to incorporate digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) into their strategic agendas, demonstrating that institutional autonomy, leadership commitment, and targeted investment can create enabling conditions for technological advancement, even within fragile state environments.

This contrast underscores the importance of organizational context in determining digital outcomes and highlights the potential for scalable models of transformation when governance and resource structures are aligned with innovation goals.

## 3. Methodology and Analytical Framework

### 3.1. Methodology

This study employs a qualitative comparative case study approach to explore the integration of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) (DT) within strategic planning processes in Sudanese institutions. The selection of this methodology (please clarify participant selection criteria, number rationale, and ethical considerations) is grounded in its suitability for examining complex organizational phenomena within real-life contexts. Two purposefully selected institutions representing divergent sectors were analyzed: Sudatel Telecom Group (Sudani), a market-oriented private telecommunications provider, and the Sudan Taxation Chamber, a hierarchical public fiscal authority. These institutions were chosen to reflect the contrast in governance structures, strategic priorities, and operational environments between the

private and public sectors in Sudan.

Primary data collection involved twelve semi-structured interviews with key informants, including IT professionals, strategic planners, and mid-level managers from both institutions. These interviews provided nuanced insights into organizational strategies, leadership orientations, digital capacities, and implementation challenges. The interviews were complemented by document analysis of strategic plans, digital policy frameworks, internal reports, and national ICT directives to contextualize and triangulate the findings.

Data analysis was conducted using thematic coding (justify the use of five dimensions and their relevance to research questions using references such as [Peppard & Ward, 2016](#)) in NVivo software. A predefined coding framework was developed based on the literature and refined through inductive insights from the data. Five core analytical dimensions guided the coding process: leadership vision, technological infrastructure, organizational digital culture, regulatory environment, and human capital development. These dimensions facilitated a systematic comparison of how each institution approaches digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery ([Vial, 2019](#)) and strategic alignment (i.e., the coherence between digital goals and organizational strategy) ([Venkatraman, 1994](#)).

To ensure the reliability and validity of the results, the study employed data triangulation, combining interview insights with documentary evidence. This approach enhanced the credibility of interpretations and allowed for a richer understanding of the organizational dynamics influencing digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery ([Vial, 2019](#)).

## **3.2. Analytical Framework**

The analytical framework underpinning this study is structured around five inter-related dimensions that influence the alignment between digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery ([Vial, 2019](#)) and strategic planning. This framework was informed by existing literature on digital governance and organizational strategy and refined based on empirical observations from the two case studies.

### **3.2.1. Leadership Vision**

This dimension assesses the extent to which top and middle management articulate a clear digital vision, set transformation priorities, and translate strategic objectives into actionable initiatives. Effective leadership is essential for driving digital change, aligning teams, and fostering accountability.

### **3.2.2. Technological Infrastructure**

This refers to the availability, scalability, and interoperability of digital tools, plat-

forms, and systems within the organization. Institutions with modern ICT infrastructure are better positioned to implement and scale digital initiatives in alignment with strategic goals.

### 3.2.3. Organizational Culture

Organizational culture encompasses attitudes towards innovation, tolerance for risk, and openness to change. Institutions that cultivate a culture supportive of digital experimentation and learning are more likely to succeed in their transformation efforts.

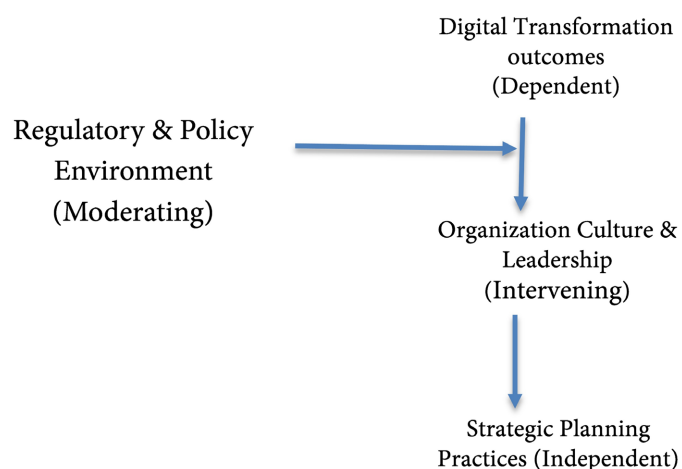
### 3.2.4. Regulatory Environment

The regulatory dimension considers the flexibility and responsiveness of legal and policy frameworks governing digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019). A supportive regulatory environment facilitates innovation, reduces bureaucratic inertia, and enables timely adaptation to emerging technologies.

### 3.2.5. Human Capital

This dimension evaluates the availability of digital skills, professional development programs, and workforce readiness. Strategic investment in human capital is essential for ensuring that digital strategies are not only conceived but also effectively implemented and sustained.

Together, these five dimensions form a comprehensive lens for assessing digital-strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994). By applying this framework to both the private and public sectors in Sudan, the study identifies sector-specific enablers and constraints, offering context-sensitive insights into the pathways toward effective digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) in fragile and resource-limited environments (Figure 1).



**Figure 1.** Digital transformation & strategic planning framework.

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## 4. Findings and Analysis

### 4.1. Case Study: Sudatel Telecom Group (Sudani)

Sudatel Telecom Group, operating under the brand name Sudani, is one of Sudan's largest private sector telecom providers. The organization has undertaken multiple strategic initiatives aimed at integrating digital services across its operational model. This includes investment in cloud-based infrastructure, mobile money platforms, and customer-facing applications designed to improve user experience and data-driven decision-making.

Interviews with company executives revealed a high degree of commitment to digital innovation, often spearheaded by cross-functional leadership teams and supported by international partners. One notable success is the deployment of a real-time customer analytics system that links front-end mobile application usage with backend CRM (Customer Relationship Management) systems, allowing for more responsive service offerings.

Sudani's digital roadmap is embedded within its broader corporate strategy and is reinforced by periodic training programs for staff, digital KPIs, and a clear governance framework. The company's culture fosters experimentation and continuous improvement, supported by strategic partnerships and investment in emerging technologies.

### 4.2. Case Study: Sudan Taxation Chamber

In contrast, the Sudan Taxation Chamber, a central public authority responsible for tax administration, illustrates the challenges faced by government institutions in embracing digital change. While the Chamber has launched digital filing systems and attempted to automate internal workflows, progress has been hindered by outdated infrastructure, budgetary constraints, and internal resistance.

Interviews highlighted that although top-level leadership supports the digital agenda, mid-level bureaucrats often lack clarity on implementation priorities. For example, a digitized tax registration platform launched in 2021 remains underutilized due to inadequate public awareness campaigns and limited integration with national ID databases. Unlike Sudani, the Chamber's digital initiatives are often implemented in silos, with minimal cross-departmental coordination. The absence of a central digital strategy and measurable performance indicators further complicates monitoring and evaluation efforts.

### 4.3. Comparative Discussion and Thematic Insights

Building upon the two institutional case studies, a comparative analysis reveals fundamental differences in how digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) is perceived, structured, and operationalized across sectors. These divergences are not merely reflective of institutional mandates but rather highlight deeper contrasts in governance structures, leadership behaviors, and resource environments.

The comparative findings of this study underscore significant institutional disparities in the planning, execution, and evaluation of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) initiatives. Within Sudani, digital strategy is deeply embedded in corporate planning processes and operationalized through decentralized business units. Digital key performance indicators (KPIs) are monitored systematically, and collaboration across departments is facilitated through real-time data platforms. The company's leadership actively nurtures a culture of innovation and long-term thinking, supported by sustained investment in advanced ICT infrastructure, including cloud technologies, mobile platforms, and AI-driven services.

By contrast, the Sudan Taxation Chamber exhibits a fragmented and reactive approach. Despite high-level policy directives promoting e-government transformation, internal digital initiatives often lack cohesion, sufficient funding, and effective horizontal coordination. While senior leadership may express rhetorical support for digital reform, implementation at the middle-management level remains inconsistent. Many operational units work in silos, without shared objectives or systems for performance measurement.

Thematic analysis highlights five critical dimensions that shape digital-strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994):

1) Leadership Clarity: Sudani demonstrates effective translation of digital vision into departmental action, while the Chamber suffers from unclear delegation and weak managerial ownership.

2) Technological Readiness: Sudani benefits from cloud infrastructure and integrated platforms, whereas the Chamber remains reliant on outdated legacy systems.

3) Institutional Culture: A performance-oriented, innovation-friendly culture distinguishes Sudani, whereas public institutions are hindered by risk aversion and rigid hierarchy.

4) Regulatory Adaptability: As a private firm, Sudani has more flexibility in adopting emerging technologies, while public institutions face inflexible procurement and compliance protocols.

5) Human Capital Capacity: Sudani invests in staff upskilling and digital literacy; in the Chamber, limited training and skill mismatches hinder digital scale-up—especially in rural offices.

#### **4.4. Digital Transformation Challenges and Opportunities in Sudan**

Sudan's digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) landscape is shaped by a unique mix of political volatility, economic fragility, and growing citizen demand for more responsive governance. Nationally, the digital ecosystem faces deep structural challenges: incon-

sistent internet coverage, high service costs, low cybersecurity preparedness, limited participation of the private sector in policy design, and a fragmented digital governance architecture.

Public sector efforts often suffer from duplication, lack of interoperability, and insufficient monitoring and evaluation systems. Furthermore, the absence of a unified national digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) strategy has resulted in siloed initiatives across ministries and agencies, reducing the potential for integration and impact.

Despite these constraints, notable opportunities exist. Sudan's youthful population represents a latent digital workforce, particularly if equipped with relevant skills in programming, data analytics, and cybersecurity. The rapid expansion of mobile services, fintech platforms, and private-sector-led innovation—as seen with Sudani—demonstrates the country's latent potential for inclusive digital growth. Moreover, international development agencies are increasingly willing to fund digital public infrastructure, governance platforms, and institutional reform.

To capitalize on these opportunities, Sudan must pursue not only technical upgrades but also bold institutional reforms. This includes modernizing legal frameworks, empowering decentralized digital leadership, and strengthening collaboration between government, the private sector, and civil society (Table 1).

**Table 1.** Comparative assessment of digital transformation readiness.

Category	Sudani (Private Sector)	Taxation Chamber (Public Sector)
<b>Leadership Commitment</b>	Strong-proactive digital vision	Moderate-bureaucratic support
<b>Infrastructure</b>	Modern, scalable systems	Legacy systems, limited upgrades
<b>Digital Culture</b>	Market-driven, innovative	Risk-averse, compliance-oriented
<b>Policy &amp; Regulation</b>	Flexible, competitive	Rigid, slow policy cycles
<b>Skills &amp; Capacity</b>	High-frequent training	Medium-limited development programs

**Figure 2** presents the conceptual framework underpinning the analysis of digital-strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994). It visualizes the dynamic interaction between internal organizational enablers—such as leadership, infrastructure, and digital culture—and external constraints, including regulatory environments and market conditions. This framework serves as an analytical lens to examine how these variables collectively influence the formulation, execution, and sustainability of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) initiatives within different institutional contexts.

**Figure 3** illustrates the research framework depicting digital-strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Ven-

katraman, 1994) factors.

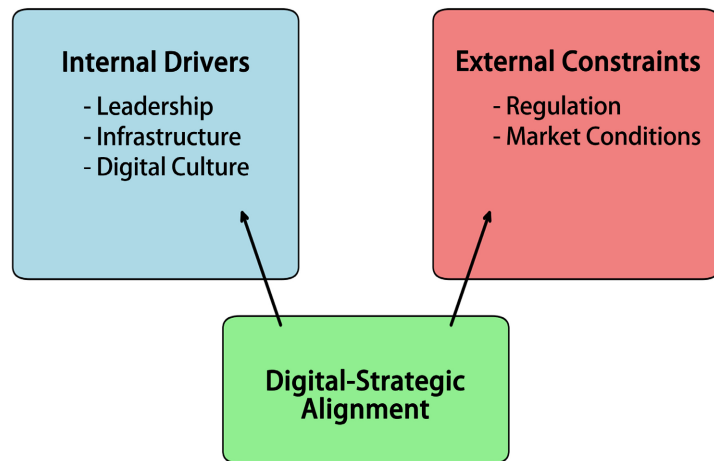


Figure 2. Conceptual framework for strategic digital alignment analysis.

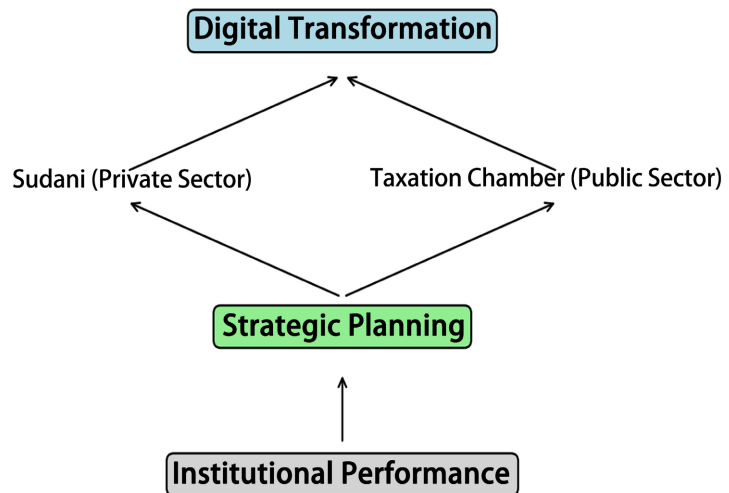


Figure 3. Research framework depicting digital alignment factors.

## 5. Discussion

This study aimed to critically examine the integration of digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) within the strategic planning frameworks of two contrasting Sudanese institutions: the private-sector Sudatel Telecom Group (Sudani) and the public-sector Sudan Taxation Chamber. By employing a comparative qualitative case study approach, the research highlighted key institutional disparities in how digital initiatives are conceived, operationalized, and evaluated within divergent governance models.

Sudani demonstrates a high degree of strategic alignment (i.e., the coherence between digital goals and organizational strategy) (Venkatraman, 1994), characterized by well-resourced digital infrastructure, adaptive leadership, and an inno-

vation-oriented organizational culture. Its transformation journey is embedded within its corporate strategy, supported by decentralized governance and empowered cross-functional teams. Digital Key Performance Indicators (KPIs) are regularly monitored, and technology is leveraged to enhance both customer engagement and internal efficiency. This model illustrates how market-driven imperatives can catalyze holistic digital integration when enabled by autonomy and strategic coherence.

In contrast, the Sudan Taxation Chamber reflects structural challenges prevalent in many public-sector organizations in fragile states. Although national mandates advocate for e-government initiatives, the Chamber's implementation remains fragmented, hindered by outdated legacy systems, limited technical capacity, and hierarchical rigidity. Strategic ambiguity and low institutional agility further constrain the scalability of its digital reforms.

These findings affirm that digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) is not merely a technological undertaking—it is a multidimensional organizational change process. It requires a coherent strategy, mature infrastructure, institutional autonomy, and a culture conducive to innovation and risk-taking. Effective integration of digital technologies depends heavily on organizational flexibility, visionary leadership, and a policy environment that incentivizes experimentation and inter-agency collaboration.

Crucially, without these enabling conditions, digital initiatives risk becoming superficial detached from core organizational functions and lacking long-term sustainability. This research contributes to the growing body of literature exploring how fragile and resource-constrained states, such as Sudan, can forge viable pathways toward digital governance. It emphasizes the role of institutional context in mediating digital outcomes and challenges the assumption that technological solutions alone can drive systemic change.

From a policy perspective, the findings underscore the importance of decentralized digital governance models. Building leadership capacity across all levels—not just at the top—is critical for embedding digital strategy into operational realities. Lessons from peer nations such as Rwanda and Egypt demonstrate that alignment between national ICT policy and broader institutional reform is vital for achieving sustainable and scalable digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019).

## 6. Recommendations

To bridge the persistent gap between strategic aspiration and effective implementation in Sudan's digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) landscape, several key measures are proposed:

**1) Enhance Public-Private Cooperation:**

Establish structured mechanisms to facilitate collaboration between public institutions and private-sector actors, particularly in telecommunications and fintech. These partnerships can foster knowledge exchange, co-innovation, and joint capacity-building, thereby accelerating the expansion of digital infrastructure and inclusive service delivery.

**2) Invest in Human Capital Development:**

Launch nationwide digital literacy programs and support academic institutions in designing technology-focused curricula. This should be complemented by integrating digital skills training and strategic workforce development into national development plans to build long-term institutional resilience and agility.

**3) Cultivate Adaptive Leadership:**

Develop leadership capabilities across all organizational levels—from mid-level managers to senior executives—to ensure strategic objectives are effectively translated into actionable digital initiatives. In the public sector, this includes equipping leaders with the tools to navigate digital change and manage transformation initiatives with clarity and accountability.

**4) Modernize the Regulatory Framework:**

Reform regulatory environments to support rapid adoption of digital technologies. This includes updating procurement policies, data governance standards, and ICT legislation to promote flexibility, interoperability, and organizational responsiveness in a dynamic technological context.

**5) Expand ICT Infrastructure Investment:**

Prioritize sustainable financing for the development of robust digital infrastructure across government bodies. This investment should enable scalable, interoperable, and secure digital platforms that meet the evolving demands of service users and institutional operations.

**6) Implement Digital Performance Metrics:**

Embed digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) indicators into organizational performance management systems. Doing so will enhance accountability, support evidence-based planning, and drive continuous learning and institutional improvement.

**7) Develop a Unified National Digital Strategy:**

Institutionalize a national digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) agenda that provides a coherent policy framework for both public and private sector stakeholders. Such a strategy should ensure alignment across ministries and agencies, prevent redundancy, and promote coordinated implementation across sectors.

## **7. Conclusion**

Digital transformation, when embedded within a coherent strategic framework

and supported by appropriate institutional mechanisms, has the potential to significantly enhance organizational performance, service delivery, and public value. This study has shown that in the Sudanese context, the private sector—exemplified by Sudatel—is demonstrating substantial progress in aligning digital initiatives with strategic objectives, largely due to greater operational flexibility, investment in infrastructure, and a culture that incentivizes innovation.

By contrast, public sector entities such as the Sudan Taxation Chamber continue to confront persistent barriers, including hierarchical rigidity, limited fiscal autonomy, and fragmented planning. These structural and cultural impediments restrict the integration of digital tools into long-term institutional strategies. As such, the development of a unified national digital transformation (DT), defined as the integration of digital technology into all areas of business, resulting in fundamental changes to operations and value delivery (Vial, 2019) framework—one that accounts for sectoral disparities and institutional maturity—is critical.

The future of digital governance in Sudan will depend not only on the availability of technology but also on the capacity of institutions to lead and manage transformation. Success will require visionary leadership, investment in human capital, regulatory modernization, and sustained cross-sector collaboration. Without addressing these foundational elements, digital reform efforts are unlikely to produce lasting or equitable impact.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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