

## Navigating digital transformation in accounting system: Challenges and opportunities

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### CHRONICLE

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### ABSTRACT

The primary objective of this study was to assess the challenges associated with the digital transformation process in the accounting systems of companies listed on the Khartoum Stock Exchange, focusing on the perspectives of senior management, financial management, and technology management. These departments were considered integral due to their profound understanding of digital transformation processes, requirements, and existing as well as anticipated challenges. Employing a descriptive-analytical approach, the study utilized a questionnaire to gather data from 315 individuals within the study population. The results revealed a favorable inclination among Khartoum Stock Exchange-listed companies towards digital transformation, manifested through a notable automation of accounting procedures, the cultivation of a digital culture, and the adoption of strategic approaches for digital transformation. However, the study identified several challenges, including insufficient technological infrastructure at the national level, the absence of a clear national strategic plan for digital transformation, and limited financial resources allocated to digital transformation in accounting systems. The study also proposed a set of solutions to address these challenges, categorized into national and corporate levels.

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## 1. Introduction

Digital transformation in recent years is becoming a key strategic initiative for numerous organisations around the globe encompassing capabilities for performance measurement, information management, decisions making, etc., relating to corporate responsibility (Alghadi et al., 2024; Almaiah et al., 2022; Alrfai et al., 2023). For instance, as noted by Mendhurwar and Rajhans (2021), industry specialists and professionals think that digital transformation must remain integral and perpetual in any broad scheme. This implies creating new digital departments as well as recruiting digital professionals in different departments that would lead the digital transformation plan (Schallmo & William, 2018). Digital transformation is done through technology and communications across every facet of governance to optimize quality (Liu, 2011; Sharma, 2016). However, due to a dynamic market that is related to digital transformation, these old accounting systems are not able to satisfy instant changes in the business world in a digital age (Idris, & Mohamad, 2016; Idris, & Mohamad, 2017; Khassawneh, 2014). Modern businesses utilise integrated computing systems and interconnectedness with the external environment (Krokhchieva et al., 2021). Therefore, the sector of accounting is one of the most affected areas about digital transformation through the usage of new technologies, which significantly impacts practices within the individual, corporate, national, and global spheres (Begum, 2019). Accountants may lag in financial operation despite many technological and technical advancements (Lutfi et al., 2022a). Hence, it should be possible to reshape the accounting profession in relation to disruptive trends like digitalisation, artificial intelligence and the needs of the fourth industrial revolution (Rabbani et al., 2023). This implies equipping the accountants with the ability to adopt new technology trends as well as understanding how they should be incorporated into the company (Lutfi et al., 2023b,c). In addition, such accountants should have excellent communication skills in processing the information to make a good decision (Lutfi, 2022). The Smart Africa Council meeting, held on the sidelines of the 32<sup>nd</sup> African

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Union Summit in Addis Ababa in February 2019, emphasized the need for the Information and Communication Technology (ICT) sector to lead the digital transformation. The African Union Commission pledged to develop a comprehensive digital transformation strategy in collaboration with the United Nations Economic Commission for Africa, Smart Africa, the African Development Agency, the African Telecommunications Union, the Capacity Building Foundation in Africa, the International Telecommunication Union, and the World Bank. The Digital Transformation Strategy for Africa (2020-2030) aims to "leverage digital technology and innovation to transform societies and economies in Africa, promote integration, generate comprehensive economic growth, encourage employment opportunities, eliminate the digital divide, and eradicate poverty to secure the benefits of the digital revolution for economic and social development" (African Union, 2019). Therefore, Sudan, being part of the African Union, is not an exception. Its aim is to develop a regional digital market in Africa before 2030. It thereby requires capacity building on technical and professional aspects of accounting fields for effective digital transformation leadership. Conducting SWOT analysis (strengths, weaknesses, opportunities, threats and anticipated threats).

Spearheading the issue is the digital transformation in accounting, which involves transitioning from conventional accounting systems to digitized and computer-aided ones (Lutfi, 2023). As such, Sudanese business must have its way of developing strategies and plan as far as the digital transformation in accountancy is concerned. Taking into consideration the challenges as well as opportunities in the transformation process open for Sudanese firms. Hence, this study seeks to establish the status of digitalisation in accounting in Sudanese firms cited on the Khartoum Exchange. As well as explore the associated problems in these accounting systems for transformation.

This study will systematically address several key inquiries pertaining to the digital transformation landscape in companies listed on the Khartoum Stock Exchange. Firstly, the investigation aims to discern the level of advancement in the automation of accounting procedures and operations, along with the adoption of a digital culture within these organizations. Additionally, the research will scrutinize the statistically significant impact, at a significance level of 0.05, of digital transformation challenges on the automation of accounting procedures and operations. Furthermore, it will assess whether there is a statistically significant impact, at the same significance level, of these challenges on the construction of a digital culture and the adoption of strategic methods for digital transformation. Lastly, the study will explore potential statistically significant differences based on sector type in the automation of accounting procedures and operations, the building of digital culture, the adoption of strategic methods for digital transformation, and the challenges faced in the digital transformation journey. Through the meticulous application of an appropriate research methodology and precise data analysis, this research endeavor aims to offer valuable insights into the current state of digital transformation among companies listed on the Khartoum Stock Exchange.

## **2. Literature Review**

### *2.1 Digital Transformation*

Digital transformation is the rapid evolution of business activities, operations, competencies, and models to fully leverage the changes and opportunities brought about by digital technology (Demirkan et al., 2017; Tekbas & Nonwoven, 2018; Shishakly et al., 2023). Consequently, it involves the adaptation or modification of business models resulting from the dynamic pace of technological progress and innovation, leading to changes in consumer behaviour and social conduct (Kotarba, 2018; Lutfi, & Alqudah, 2023). The changes imposed by information technologies are described to automate tasks and operations (Legner et al., 2017). Researchers like Clohessy et al. (2017) and Verhoef et al. (2021) affirm that digital transformation encompasses changes that digital technologies can induce in a company, resulting in alterations to products, organizational structures, process automation, and the creation of greater value for the company. Therefore, digital transformation requires extensive use of advanced information technologies such as analytics, mobile computing, social media, smart devices, and optimized use of traditional technology to enable key improvements in business operations (Chaniyas, 2017). As clarified by Paavola et al. (2017), digital transformation focuses on using digital technologies to enable significant business improvements in operations and markets, such as enhancing the customer experience, streamlining operations, or creating new business models. This perspective is reinforced by Verhoef et al. (2020), who explain that digital transformation is the process of using digital technologies to create new businesses or modify existing operations, cultures, and customer experiences to meet the changing requirements of businesses and markets. Additionally, Phornlaphatrachakorn and Kalasindhu (2021) highlight that digital transformation is the process of using digital technologies to create or modify existing business operations and cultures, as well as customer experiences, to meet the evolving requirements of business and the market.

In summary, digital transformation is the impact of information technology on business organizations in a way that leads to changes in products or organizational structures and shifts operations towards automation through new technological solutions and trends. These changes enable unique alterations in business operations, creating added value for the organization and customers.

### *2.2 The Need for Digital Transformation*

There are several key external factors that have contributed to the need for digital transformation. According to Statista (2019), the increasing use of technology in the context of the internet, such as broadband internet, smartphones, cloud computing, online payment systems, and cryptocurrencies, has collectively contributed to the enhancement of e-commerce. Verhoef et al. (2021) added another factor, emphasizing the intensification of competition resulting from these new digital technologies, leading to a significant shift from local to global competition. Kannan & Li (2017) highlighted another aspect related to

changes in consumer behaviour in line with the digital revolution. Consumers are shifting towards online e-commerce stores, sometimes enabling them to participate in designing products according to their needs and assisting other customers by sharing product reviews.

It is evident from the above that digital transformation and the use of new digital technologies have become an urgent necessity to align with the rapid changes in the business environment (Saad et al., 2022). There is now a wide and promising opportunity for businesses to benefit from these new digital technologies in managing their various activities and enhancing their competitive advantage.

### *2.3 Elements of Digital Transformation*

Digital transformation encompasses various key elements that collectively contribute to reshaping and enhancing organizational processes and strategies. These elements are crucial in navigating the dynamic landscape of the digital era. Thip-wiatpotjana (2021) clarified that digital transformation comprises four elements as follows:

**Digital Mindset:** This involves developing digital thinking within business operations by altering the mindset of employees at various levels. It also includes supporting budgets and developing infrastructure that will facilitate digital evolution.

**Digital Processes:** It entails changing internal processes to allow the adoption of digital technologies, ensuring a seamless flow of information, and executing operations that aid in planning and decision-making related to new systems.

**Digital Knowledge and Skills:** This element focuses on developing digital knowledge and skills for employees, equipping them with proficiency in using various computer programs and digital skills for extracting and utilizing data in report preparation.

**Digital Culture:** It involves cultivating a digital culture to encourage organizational collaboration among employees. This ensures that they are prepared to deal with emerging technologies and innovative changes to increase organizational productivity while reducing problems and obstacles that may hinder digital transformation.

### *2.4 Requirements for Digital Transformation*

Digital transformation entails a set of essential requirements that organizations must address to successfully navigate the challenges and capitalize on the opportunities presented by the digital era. These requirements are multifaceted and encompass various aspects of an organization's structure, processes, and culture. Achieving successful digital transformation necessitates the implementation of a comprehensive organizational change strategy coupled with instilling a culture that supports such transformation. According to Varina and Titko (2019), it is imperative to cultivate a digital culture, and this requires active endorsement and support from executive management. Organizations must embark on the redesign of their strategies and organizational structures, initiating an innovative process related to new leadership approaches to adapt to the requirements of digital transformation (Schuchmann, Daniela, & Sabine, 2015). This inevitably calls for a shift in operational patterns and the need for both leaders and employees to adapt (Antonopoulou et al., 2021). The nature of digital transformation is intricately linked to strategic changes in the business model (Sebastian et al., 2017). In a related context, Verhoef et al. (2021), Gregory (2019), and Varina & Titko (2019) highlighted strategic necessities for digital transformation, encompassing the following:

### *2.5 Digital Resources*

These are resources owned and controlled by the organization, including tangible and intellectual assets. Assets comprise both material and intellectual components, while capabilities involve human, informational, or organizational capital; Organizational Structure (Organizational changes must align with the adoption of digital transformation, fostering organizational flexibility capable of accommodating digital developments. This should consider a shift in organizational culture), Digital Growth Strategies (Various strategies exist for growth through the stages of digital transformation, with one of the prominent approaches being the utilization of digital platforms), Metrics and Objectives (Realizing the full potential of digital transformation requires measuring performance improvements using Key Performance Indicators (KPIs). This facilitates the learning process and adjusts the business model accordingly).

### *2.6 Advantages of Digital Transformation in Accounting*

Digital transformation, in general, enables organizations to keep pace with emerging and evolving customer demands, offering better opportunities for competition and increased competitiveness by creating new value that ensures sustainability in the future (Kozarkiewicz, 2020). It provides valuable opportunities for core business functions by moving away from manual processes and automating operations, increasing the speed, accuracy, and cost-effectiveness of performance (Hilali et al., 2020). Utilizing digital technology significantly reduces the costs of producing accounting information, making it continuously available. It allows the storage, analysis, and processing of vast amounts of data for decision-making (Maciejewski, 2017; Rippa & Secundo, 2019; Sheng et al., 2020). In the realm of digital accounting, all transactions are conducted in an electronic environment, enhancing the efficiency and accuracy of tasks, interpretation, and reporting of data and information (Phornlaphatrachakorn & Kalasindhu, 2021). Digital transformation facilitates real-time automated accounting, providing opportunities for organizations to verify processes efficiently and address shortcomings in the short term. Moreover, it reduces

forecasting errors, laying the foundation for streamlined managerial decisions and enhancing an organization's ability to exchange and process massive data flexibly and efficiently in real time. Digital transformation also opens broader avenues for cloud computing, enabling organizations to utilize the latest infrastructure and accounting software (Demiro & Heupel, 2017). Additionally, researchers such as Phornlaphatrachakorn and Na Kalasindhu (2021) and Al-Htaybat et al. (2017) emphasize that digital transformation significantly impacts the quality of financial reports, the utility of accounting information, and the effectiveness of strategic decision-making. It improves the relevance of accounting information, making it available in real-time without delays. Begum (2019) points out that digital capabilities increase the automation, speed, accuracy, and reliability of accounting transactions, especially in handling large-volume transactions. The use of blockchain technology through a decentralized digital ledger ensures the immutability of shared records.

In conclusion, the digital transformation is a catalyst for efficiency, accuracy, and innovation in accounting. It enhances the role of accountants, allowing them to focus on more creative, non-routine tasks. For auditors, it contributes to precise planning, analytical review procedures, relative importance assessments, internal control evaluations, and continuity decisions (Herbert et al., 2016; Gulin et al., 2019). The adoption of digital technologies is not only beneficial for organizations but also revolutionizes the roles and responsibilities of accountants and auditors in the ever-evolving digital landscape.

### *2.7 Challenges of Digital Transformation in Accounting Systems*

Several obstacles impede the digital transformation process, such as companies lacking the necessary information technology for digital transformation, especially in small and medium-sized enterprises and traditional sectors. Digital transformation requires a robust, secure, and flexible digital network infrastructure, incurring high costs and burdens that some may not be able to bear. Additionally, cybersecurity incidents pose a significant threat to the digital transformation environment, potentially harming sustainability and public services (Negrwiro & Madiaga, 2019). Furthermore, leaders and employees often lack digital thinking, knowledge, and skills necessary for working in digital environments (Hi, et al., 2021). Another challenge is the lack of a proper strategy for the successful implementation of new technologies (Fintech Vietnam, 2020). There is also a resistance to change, resulting in conflicts between current practices and new digital transformation approaches (Christensen et al., 2016). In the context of developing countries, low levels of technology and innovation hinder companies from embracing digital transformation in their operations (Hai, et al., 2021).

### *2.8 Digital Culture*

Digital culture refers to a set of values, knowledge, and skills aimed at enhancing individuals' capabilities to participate in the digital world and technological development fully and securely (Gilster & Glister, 1997; Al-Najjar, 2013). It involves the ability to use digital devices and access information through them (Ali, 2018). Individuals with digital culture possess behaviours and cognitive patterns that enable interaction with the digital age (Kamel, 2022). This enables society to confidently use digital applications, computers, and electronic services to keep pace with modern community life (Abdelkader, 2019). Therefore, it represents a form of the new culture emerging with digitization, influencing attitudes, behaviours, and habits related to digital technology, especially the application of the latest digital technologies (Lohapan, 2021). In the digital revolution, the best way to deal with continuous change is to change the culture and adopt a digital culture that helps in planning and continuously testing and committing to new things (Rowles & Brown, 2017). Changing the digital culture within the organization requires adopting various methods and approaches to activate the digital culture (Al-Subeai, 2017; Rabahi & Karish, 2021), including:

**Building Transparency:** Ensuring that every individual within the organization is aware of the impact expected from digital technologies, allowing free flow, and sharing of information, disclosure, and easy access.

**Encouraging Collaborative Spirit:** Building a shared vision for collective work, sharing knowledge and ideas, and making collaborative decisions.

**Providing Digital Training:** Empowering employees to use modern technologies by developing continuous training plans in emerging technology areas to acquire the necessary knowledge and skills to keep up with digital advancements.

**Building a Culture of Innovation and Experimentation:** Creating creative capabilities, finding sophisticated solutions, and innovative and new processing methods to address technological challenges. Encouraging and developing digital talents.

## **3. Related works**

The study conducted by Thipwiwatpotjana (2021) aimed to investigate the digital transformation of accounting in Thai companies and identify influencing factors. The study surveyed 260 employees from 162 companies, concluding that the success of digital accounting transformation relies on adopting digital processes, possessing a digital mindset, developing digital culture, and acquiring digital knowledge and skills. Four factors, namely executive leadership, business model and organizational structure, access to resources, and external support, constituted 84% of the digital transformation capacity.

Meraghni et al.'s study (2021) focused on presenting the conceptual and practical framework of digital transformation and its impact on accounting information systems. The study highlighted digital transformation requirements, such as digital strategy, human element awareness, and the effects and obstacles facing the digitization of accounting information systems. The

research involved 237 individuals from approximately 120 Algerian companies, revealing a weak awareness of the importance of digital transformation. Challenges significantly impacted attempts to develop accounting information systems in line with digital transformation requirements.

Othman & Al-Dweikat's study (2021) aimed to identify the impact of digital transformation risk management on the reliability of accounting information. The field study, conducted in Jordanian commercial banks with a sample of 74 risk management professionals, found that risk management collectively impacted the reliability of accounting information, covering data, operational, output, and internal and external environmental risk management.

Kornchai & Khajit's study (2021) investigated the effects of digital accounting on the quality of financial reporting, the utility of accounting information, and the effectiveness of strategic decision-making in Thai listed companies. The study, with a sample of 313 companies, revealed significant impacts of digital accounting on financial report quality, accounting information utility, and strategic decision-making effectiveness.

Cicchello's study (2020) addressed digital transformation in South Africa during the COVID-19 pandemic. It emphasized the necessity of accelerating and removing obstacles to digital transformation, especially in key industries like financial services. The study underscored that digital transformation is no longer a strategic choice but a necessary requirement for the survival of vital industries.

Parlak's study (2020) highlighted the tangible impact of digital transformation on accounting information systems. The study emphasized the shift from preservation, classification, and summarization of financial data to analysis and discussion. It emphasized the need for accounting professionals to use advanced systems effectively.

The study by Rashwan & Abu Rahma (2020) focused on understanding digital transformation and its reflections on the practice of accounting and auditing in Palestine. Results indicated that digital transformation provides the necessary technological skills, enhancing the effectiveness and accuracy of accounting services, leading to increased satisfaction among accounting service beneficiaries.

Begum's study (2019) aimed to study digital transformation in accounting in India, evaluating the current situation and future ambitions. The study, based on a random sample of finance professionals from various organizations, identified a knowledge gap regarding digital transformation in accounting and finance. The current situation was found to be at a moderate level, and the study emphasized the need for technological development to support digital accounting throughout the country.

Rehm's study (2017) shed light on preparing accounting information systems for digital transformation. It outlined key steps in administrative documentation, preparing accounting document guides, determining principles and guidelines, and documenting operational procedures.

A review of previous studies reveals several commonalities with the current study. Thipwivatpotjana's study (2021), Meraghni et al.'s study (2021), and Rehm's study (2017) share similarities in addressing digital transformation requirements. Meraghni et al. (2021) and Cicchiello's study (2020), Begum's study (2019), Othman & Al-Dweikat's study (2021) focus on the obstacles facing digital transformation in accounting. This study differs from previous ones by concentrating on Sudanese business environments, exploring the relationship between process automation, digital culture, strategic methods, and digital transformation in accounting systems. The study proposes suitable solutions at both the national and company levels within the Khartoum Stock Exchange.

#### **4. Research Method**

The study community consists of companies listed on the Khartoum Stock Exchange, totaling 67 companies distributed across eight main sectors (www.kse.com.sd, 2022). A simple random sample of 270 individuals was selected, representing three main departments in each company under study. These departments include senior management, financial management, and technology management, considering that these three departments are the most knowledgeable and closely connected to the digital transformation process in accounting systems, along with its current and future requirements and challenges.

A questionnaire was designed using a five-point Likert scale (Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1)). The phrasing of the questions was based on the model of governmental digital transformation measurement (eighth dimension) in the Kingdom of Saudi Arabia issued by the Yesser e-Government Program. The statements were reformulated and adapted to align with the nature and requirements of the study.

#### **5. Data Analysis and Results**

##### *5.1 Validity and reliability*

To evaluate the robustness of the model constructs, we employed the criterion outlined in to gauge the extent of shared variance among the latent variables. In line with this criterion, both the Average Variance Extracted (AVE) and Composite Reliability (CR) were utilized to assess the convergent validity of the measurement model. AVE quantifies the proportion of variance captured by a construct relative to that attributable to measurement error, with values exceeding 0.70 considered

excellent, and a threshold of 0.50 deemed acceptable. CR, serving as a less biased measure of reliability than Cronbach's alpha, is considered satisfactory when equal to or above 0.70. The outcomes presented in Table 1 indicate that the CR values for all constructs surpass the 0.70 benchmark.

**Table 1**  
Validity and reliability

	AVE	Cronbach's A	CR
Automating Accounting Processes (AAP)	0.514	0.891	0.893
Digital Culture (DC)	0.509	0.948	0.949
Strategic Methods (SM)	0.505	0.904	0.907
Digital Transformation Challenges (DTC)	0.541	0.809	0.811

Table 2 indicates values for the most commonly used fit indices. These included four indices, i.e., CMIN/DF (Chi Square-to-Degree of Freedom ratio), GFI (Goodness of fit index), CFI (Comparative fit index) and RMSEA (Root mean squared error approach). As per Porcel-Gálvez et al. (2018), CMIN/DF should be less than three, GFI and CFI should both be higher than 0.90 (Haney et al., 2019) and RMSEA.

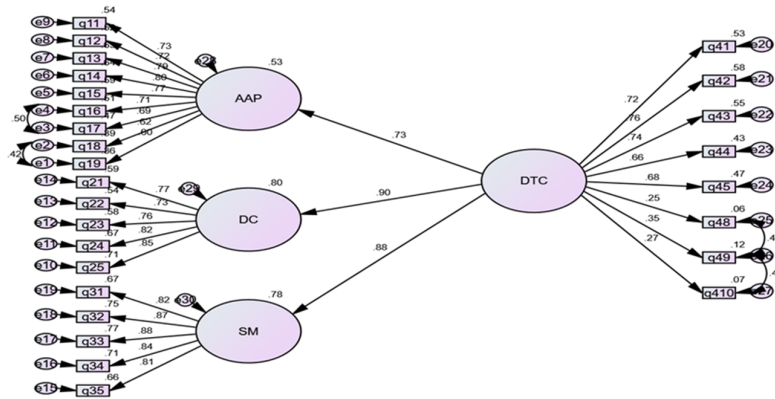
**Table 2**  
The Fitness Indexes assessment for the measurement model

Model Fit Indices	Recommended value	Comments
$X^2$ /df	< 5.00	The required level is achieved
Comparative fit index (CFI)	> 0.900	The required level is achieved
Root Mean Squared Error of Approximation (RMSEA)	< 0.080	The required level is achieved
Goodness-of-Fit (GFI)	> 0.900	The required level is achieved

The CFI value was 0.917, and the GFI value was 0.908, indicating a good fit of the data to the model. Additionally, the RMSEA value was 0.068, suggesting a good fit for the data. Therefore, it can be relied upon that the above model provides reliable and trustworthy results. As shown in Table 3, the data found a good fit with the measurement and structural models

**Table 3**  
The Fitness Indexes assessment for the measurement model

Model	$X^2$ /df	RMSEA	GFI	CFI
Conceptual Model	0.056	0.068	0.908	0.917



**Fig. 1.** Structural Equation Model

*5.2 Hypotheses testing*

For analysing the role of mediation in the association between the independent and dependent variables, a few needs should be addressed. This includes direct relation, which is direct relation between dependent variable, and independent variables, as well as indirect relation, which occur via mediator variable. It is only relevant when the direct effect is significant at a statistical level. The mediator has an intervening role between the independent and dependent variables if the direct relationship between the former and latter weakens while indirect effects through the mediator are strong. The empirical results supported the existence of a statistical significance of the direct effect between AAP and DTC, as the results were (Estimate = 0.813, p = 0.000); also the direct effect between DC and DTC as the results were (Estimate = 1.037, p = 0.000); other effects between SM and DTC as the results were (Estimate = 1.108, p = 0.000). Table 4 shows the Results of hypotheses testing.

**Table 4**  
Results of hypotheses testing

H				Estimate	S.E.	C.R.	P
H1	AAP	←	DTC	.813	.093	-8.793	***
H2	DC	←	DTC	1.037	.078	-13.297	***
H3	SM	←	DTC	1.108	.087	-12.776	***

Table 5 shows the results of the statistical analysis using the Analysis of Moment Structures (AMOS) software for the regression of digital transformation challenges on both the automation of accounting procedures and operations, building digital culture, and adopting strategic methods for digital transformation. The results indicate a significant impact of challenges on the automation of accounting procedures and operations, building digital culture, and adopting strategic methods for digital transformation, with a significant P-value of 0.000. Additionally, all statements are significantly related to their respective axes, with a significance value of 0.000.

**Table 5**  
Regression Weights for the Impact of DTC

			Estimate	Standardized Estimate	S.E.	C.R.	P
F1	←	F4	-0.813	-0.728	0.093	-8.793	***
F2	←	F4	-1.037	-0.896	0.078	-13.297	***
F3	←	F4	-1.108	-0.882	0.087	-12.776	***
q19	←	F1	1	0.6			
q18	←	F1	1.018	0.621	0.084	12.054	***
q17	←	F1	0.988	0.688	0.1	9.855	***
q16	←	F1	1.057	0.713	0.104	10.115	***
q15	←	F1	1.066	0.768	0.1	10.651	***
q14	←	F1	1.195	0.799	0.109	10.928	***
q13	←	F1	1.233	0.793	0.113	10.877	***
q12	←	F1	1.227	0.72	0.12	10.197	***
q11	←	F1	1.026	0.733	0.099	10.319	***
q25	←	F2	1	0.845			
q24	←	F2	1.047	0.816	0.06	17.382	***
q23	←	F2	1.19	0.759	0.076	15.613	***
q22	←	F2	0.945	0.735	0.063	14.895	***
q21	←	F2	0.983	0.77	0.062	15.941	***
q35	←	F3	1	0.812			
q34	←	F3	1.065	0.84	0.061	17.568	***
q33	←	F3	1.209	0.88	0.064	18.797	***
q32	←	F3	1.128	0.866	0.061	18.362	***
q31	←	F3	1.052	0.821	0.062	16.971	***
q41n	←	F4	1	0.725			
q42n	←	F4	1.105	0.764	0.083	13.232	***
q43n	←	F4	1.001	0.743	0.078	12.859	***
q44n	←	F4	1.031	0.658	0.091	11.342	***
q45n	←	F4	0.923	0.682	0.078	11.768	***
q48n	←	F4	0.579	0.249	0.136	4.244	***
q49n	←	F4	0.643	0.352	0.107	6.018	***
q410n	←	F4	0.632	0.268	0.138	4.574	***

## 6. Discussion

First Question:

Is there a high level of automation of accounting procedures and operations, along with the adoption of digital culture in the companies listed on the Khartoum Stock Exchange?

The results concluded that the study sample individuals strongly agreed that there is a high level of automation of accounting procedures and operations, as well as the establishment of digital culture. The mean values were 3.97 and 4.28, respectively, indicating a high level of automation of accounting procedures and operations and the adoption of digital culture in the companies listed on the Khartoum Stock Exchange. This aligns with the findings of the study by Thipwivatpotjana (2021), which concluded that the success of digital accounting transformation is attributed to the adoption of digital processes.

For the discussion and interpretation of the second, third, and fourth questions, linear regression model was utilized, as presented in the following table:

Second Question:

Is there a statistically significant impact, with a significance level of (0.000), of the challenges of digital transformation on automating accounting procedures and operations in the companies listed on the Khartoum Stock Exchange?

From Table 4, the regression coefficient of digital transformation challenges (H1) on the automation of accounting procedures and operations (F1) was -0.813. This indicates that digital transformation challenges have a negative effect on the automation of accounting procedures and operations (meaning, as the challenges increase, the processes of digital transformation decrease and vice versa). The significance value was 0.000, indicating a strong impact with high statistical significance, suggesting that digital transformation challenges have a significant impact at a significance level of (0.05) on automating accounting procedures and operations in the companies listed on the Khartoum Stock Exchange.

Third Question:

Is there a statistically significant impact, with a significance level of (0.000), of the challenges of digital transformation on building digital culture in the companies listed on the Khartoum Stock Exchange?

From Table 5, the regression coefficient of digital transformation challenges (H2) on building digital culture (F2) was -1.037. This indicates that digital transformation challenges have a negative effect on building digital culture (meaning, as the challenges increase, the process of building digital culture decreases and vice versa). The significance value was 0.000, indicating a strong impact with high statistical significance, suggesting that there is a statistically significant impact at a significance level of (0.05) for digital transformation challenges on building digital culture in the companies listed on the Khartoum Stock Exchange.

Fourth Question:

Is there a statistically significant impact, with a significance level of (0.000), of the challenges of digital transformation on adopting strategic methods for digital transformation in the companies listed on the Khartoum Stock Exchange?

From Table 5, the regression coefficient of digital transformation challenges (H3) on adopting strategic methods for digital transformation (F3) was -1.108. This indicates that digital transformation challenges have a negative effect on adopting strategic methods for digital transformation (meaning, as the challenges increase, the adoption of strategic methods for digital transformation decreases and vice versa). The significance value was 0.000, indicating a strong impact with high statistical significance, suggesting that there is a statistically significant impact at a significance level of (0.05) for digital transformation challenges on adopting strategic methods for digital transformation in the companies listed on the Khartoum Stock Exchange.

Fifth Question:

Is there a statistically significant difference, with a significance level of (0.000), in automating accounting procedures and operations, building digital culture, adopting strategic methods for digital transformation, and attributing challenges of digital transformation to the sector type?

From Table 5, the statistical significance value for the relationship between building digital culture and the sector type was 0.025, indicating a significant difference at a level of 0.05, attributed to the sector type. However, the significance values for automating accounting procedures, adopting strategic methods for digital transformation, and attributing challenges of digital transformation were all greater than 0.000, indicating no significant difference attributed to the sector type. Therefore, there is no difference in automating accounting procedures and operations, adopting strategic methods for digital transformation, and attributing challenges of digital transformation to the sector type in the Khartoum Stock Exchange.

In response to the challenges encountered in the digital transformation of accounting systems for publicly listed companies, researchers propose a comprehensive set of recommendations at both the national and organizational levels. At the national level, these recommendations include the development of a robust digital transformation plan aligned with the Digital Transformation Strategy for Africa (2020-2030), the establishment of regulatory frameworks and standards, enhancement of technological infrastructure, collaboration with regional and international entities, and the creation of incentives for companies investing in information technology. Standardized national indicators, governance measures, and the promotion of digital culture across societal segments are also emphasized. At the organizational level, companies listed on the Khartoum Stock Exchange are advised to formulate a vision promoting innovation and learning in information technology, assess their digital capabilities, analyze constraints and benefits of digital transformation, and provide necessary resources for the transformation process. Creating dedicated units for digital transformation, fostering a culture of continuous learning, attracting digital talent, and integrating accounting applications are among the proposed strategies. Additionally, effective communication plans, continuous training programs, and feedback mechanisms from user experiences are suggested to ensure successful digital transformation journeys for these companies.

## 7. Conclusion and Recommendations

In conclusion, there is a notable positive trajectory among companies listed on the Khartoum Stock Exchange towards digital transformation, characterized by a substantial level of automation in accounting procedures, the cultivation of digital culture,



and the adoption of strategic approaches to digital transformation. However, these endeavors encounter several challenges, including weak national technological infrastructure, the absence of a clear national strategic plan for digital transformation, and limited financial resources allocated to digital transformation in accounting systems. Furthermore, variations in the level of building digital culture exist among these companies, linked to the respective sectors to which they belong. Importantly, no significant differences were observed in the levels of automation, adoption of strategic methods, and challenges faced in digital transformation among companies based on their sectors. The study also indicates that digital transformation challenges exert a counteractive influence on the automation of accounting procedures, digital culture development, and the adoption of strategic methods. Moving forward, the researchers recommend the implementation of plans for the continuous development and preparation of leaders in the digital transformation process. They advocate for the formulation of an accredited plan to attract digital competencies in the accounting systems field, emphasizing the importance of continuous digital training for employees. Additionally, a gradual shift from computer-based automation to cloud computing is suggested to reduce expenses related to the digital transformation infrastructure. Lastly, an ongoing commitment to enhancing digital culture is emphasized to align with the evolving landscape of technologies and advancements.

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