

Impact of Digital Transformation on Organizational Governance to Improve Performance

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ABSTRACT

This study aims to evaluate the potential and impact of digital transformation on Sudan Customs, and to determine the most significant factors that affect the organizational governance, performance, and acceleration.

This study employed a mixed-method approach, utilizing a questionnaire and interviews to collect quantitative data. Based on the conceptual model structure and a review of the literature on digital transformation, organizational governance, and organizational performance, an online survey was completed by Sudan Customs officers and a number of officers participated in online interviews.

According to the data analysis, the respondents demonstrated that digital transformation can transform the officers' professional practice. Furthermore, the findings revealed that (i) financial leverage is the most significant factor in terms of improving organizational performance; (ii) support from decision-makers, budgetary support from top management, and transparency are the most crucial factors in accelerating digital transformation; and (iii) transparency is the most vital factor in enhancing organizational governance.

The results indicate that digital transformation impacts Sudan Customs' performance. On this basis, it is recommended that the Sudan Customs leadership prioritize and provide robust support for the adoption of digital transformation as a critical factor in improving organizational governance and performance.

Keywords:- Digital Transformation, Organizational Governance, Organizational Performance.

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CHAPTER ONE INTRODUCTION

A. Introduction

Digital transformation has become a new approach for many organizations to gain a competitive advantage in the prevailing intense and dynamic market competition. Many organizations have applied digital transformation, which has positively impacted business performance (Sundaram et al., 2020). Digital technology applications provide innovators and entrepreneurs with broader boundaries for value creation and capture (Nambisam et al., 2019). Moreover, the unique focus on technology has recently become balanced by the recognition that transformation processes are introduced to organizations, starting with information processes through business processes (Jedynak et al., 2020; Machado et al., 2019).

Luna-Reyes et al. (2014) showed that digital transformation is a potential engine to transform how the government works by transforming (i) the internal operational processes to improve organizational effectiveness, and (ii) the interactions with external individuals and organizations via e-government.

In the modern era, technological advancement and globalization have led to economic growth and social development in many parts of the world. Governments are also increasingly adopting new technology to ensure public safety and protect citizens. In particular, customs administrations have adopted digital customs to promote free trade and travel, while preventing the cross-border transportation of dangerous goods and unauthorized individuals. (Kim et al., 2020).

B. Current Situation of Digital Transformation in Sudan

According to a UN report on the e-government development index and global e-government development ranking for the years 2020 and 2022, Sudan's development index was 0.3154 and 0.2972, while the world ranking was 170 and 176, respectively. According to these statistics, Sudan has slowly regressed. In contrast, most countries in Africa have increased their digital transformation or e-government value; for example, South Africa and Tunisia. The adaptive challenges of digital transformation extend beyond technology; they call for organizational structures and skills, a new form of leadership, and the transformation of public-private partnerships (United Nations E-Government Knowledgebase, 2022).

➤ Digital Transformation Challenges in Sudan

The implementation of digital transformation requires robust technology and infrastructure. Sudan faces numerous challenges in terms of the implementation of digital transformation. In this study, three of these challenges are addressed. Firstly, digital transformation governance needs to be designed and implemented in Sudan. However, greater infrastructure, human capacity, financial resources, and attendant political and regulatory support are required. Secondly, transparency represents a significant challenge in Sudan due to the need for enhanced information collection and the difficulties of using electronic information systems and sharing knowledge. Thirdly, information and communication technology (ICT) has been recognized as one of the main challenges for implementing digital transformation in Sudan (Abdalla, 2012).

C. Problem Statement

Rapid technological advancement and digital transformation have emerged as essential components of success. The Sudan Customs is responsible for implementing a broad range of government policies in diverse areas such as revenue collection, trade and traveler compliance, and the protection of society including anti-terrorism, cultural heritage, intellectual property, the collection of statistics, and environmental protection. Therefore, Sudan Customs faces many challenges in adopting digital transformation to meet these requirements, such as a lack of integration and standardization with relevant agencies, a lack of infrastructure and workplace capabilities, an increased need for technical skills, and more ICT usage among the officers.

Moreover, greater awareness is required of the digital transformation culture in Sudan Customs, as well as officers' resistance to change, fear of replacement with ICT, and redundancies. Furthermore, more cargo inspection equipment and ground handling tools are necessary in Sudan Customs facilities affecting the speed of procedures and increasing the time for cargo clearance and release.

D. Purpose of the Study

This research aims to assess the impact of digital transformation by determining the factors that affect organizational performance and governance, and the factors that affect the acceleration of digital transformation in Sudan Customs.

E. Research Questions

- What are the impacts and potential benefits of digital transformation in Sudan Customs?
- What are the most significant factors that affect organizational performance?
- What are the most significant factors that affect organizational governance?
- What are the most significant factors that affect the acceleration of digital transformation?

F. Significant of the Study

The significance of this study stems from the rapid international development of ICT. Sudan Customs, as a government agency, is entrusted with carrying out many duties and tasks requiring modern technologies that enable the organization to improve its performance effectively and efficiently. Moreover, Sudan Customs seeks to achieve its mission and vision of simplifying and accelerating customs procedures and capacity building through the adoption of digital transformation. Hence, there is great importance in accelerating the digital transformation process, which will enable Sudan Customs to improve its performance and enhance the organizational governance.

This study will supplement the literature on digital transformation, and will offer valuable material for students and researchers exploring such transformation in Sudan.

G. Justification for the Study

Despite the development and progress, Sudan Customs has unsatisfactory digital transformation, with particular areas for improvement including inspection, ground handling equipment, and continuous system upgrades. Moreover, increased coordination among agencies is necessary to keep pace with modern technology. Thus, these challenges have negatively affected the performance of Sudan Customs, and the acceleration of digital transformation in the organization. It is believed that this study can function as a reference and a guide for Sudan Customs, while assisting the organization toward achieving the desired objectives of protecting and preserving the economy and society, as well as achieving the World Customs Organization (WCO) recommendation, which calls for making data a vernacular language among customs administrations to facilitate and harness trade.

H. Research Outline

This study is divided into five chapters. Chapter One presents an introduction and the background of the study, as well as the current situation of digital transformation in Sudan, digital transformation challenges, the problem statement, the research purpose, the research questions, the significance of the study, and a justification for the research. Chapter Two concerned reviewing previous studies on digital transformation and its impact on organizational governance and performance. Chapter Three describes the study's research methodology and design, the conceptual framework, the data source determination, the data-collection tools and procedures, and the presentation of the data analysis. Chapter Four presents the findings resulting from the data analysis, and then a discussion of said findings. Finally, in Chapter Five the conclusion and recommendations, limitations, and suggestions for further study can be found.

CHAPTER TWO LITERATURE REVIEW

A. Introduction

This chapter presents definitions of the terminologies surrounding digital transformation, a brief history of digital transformation, and an exploration of the environmental factors that affect the acceleration of digital transformation. In addition, the relationship between digital transformation and improved organizational performance is considered. Moreover, the chapter reviews the literature related to the impact of digital transformation on improved organizational performance and its ability to enhance governance

B. Definition of Terminologies

➤ Digital Transformation

Schwertner (2017) asserted that digital transformation employs technology to create new business models, processes, software, and systems that lead to increased profitability, competitive advantage, and efficiency. Businesses achieve this digital transformation by transforming their processes and business models, empowering workforce efficiency and innovation, and personalizing customer experiences. Kutnjak et al. (2019) emphasized that digital transformation is a complex and demanding process that requires the commitment of the entire company to use resources—human, technological, physical, organizational, and financial—with digitalization involving the implementation of digital tools throughout the organization, focusing primarily on people and business processes, based on changes to the business model.

➤ Digitization

Digitization involves the conversion of something to a digital form (Schwertner, 2017). At a basic level, digitization refers to converting physical or analog documents into an electronic or digital format. It organizes information to enhance acquisition, recording, retrieval, dissemination, and storage. In most cases, digitization helps to lay the foundation for more complex and sophisticated approaches to transform the organization. As a result of digitization, organizations generally become more efficient.

➤ Digitalization

Digitalization refers to the optimization of an organization's operating model using digital technologies (Wetering, 2021), whereby the operating model represents how the organization structures its core business processes to deliver value to its customers and stakeholders. Thus, digitalization could mean changing current processes to provide new capabilities or to enhance customer experience through technology. A useful example is automation and business process management to improve productivity and customer interaction. The digitalization of core business processes and operations typically results in increased revenue produced or a reduction in cost from the existing lines of business.

C. A Brief History of Digital Transformation

Heavin (2018) claimed that digitization and digital transformation have occurred in organizations since the 1950s. By the mid-1970s, the computer revolution had begun, with the adoption of computing technology accelerating through the 1980s. According to Baker (2014), in the late 20th century digital transformation in the form of e-commerce, customer relationship management, and improved communications gave companies access to new markets and a competitive edge. Schallmo and Williams (2018) showed that between 2000 and 2015, the emergence of smart devices and social media platforms introduced a significant shift in how customers interacted with businesses and their expectations for reaction times and availability across many channels. Matt et al. (2015) reported that companies in almost all industries conducted several initiatives to explore new digital technologies and exploit their benefits. Chen et al. (2015) affirmed that these developments turned data into a vital strategic asset, while Faraj and Pachidi (2018) pointed out that many compare digital transformation with earlier industrial transformations propelled by general-purpose technologies such as steam or electricity. Regardless of whether digital transformation represents the Second Machine Age, the Third Wave, or Industry 4.0, significant shifts are underway in the respective economy and society.

D. Environmental Factors Affecting the Acceleration of Digital Transformation

Maroye et al. (2017) claimed that the reason for the poor implementation of digital transformation include a decreasing public-sector budget restricting organizational investment in high-quality technology and entrenched resistance to change. Moreover, the inevitable intra-organizational relations between public management administrations, the political uncertainty arising from a rapidly changing digital environment, and the political autonomy in the decision-making process of the different public entities affect the overall implementation and aim of digital transformation.

E. Impact of Digital Transformation on Improving Performance

Peng and Tao (2022) showed that digital transformation has dramatically improved the performance of enterprises. Furthermore, it can stimulate the momentum of organizational innovation with cost reduction, increased revenue, improved efficiency, and the promotion of innovation representing the main paths for digital transformation to enable the development of an organization, among which the policy effect on organization innovation is the most significant. Zhai et al. (2022) emphasized that digital transformation enhances an organization's performance, which can result in lower costs, enhanced operating efficiency, and innovation success, leading to superior performance. On the other hand, standard digital transformation helps an organization's performance in the long term (Zhai et al., 2022).

In contrast, condensed digital transformation can boost an organization's performance in the first two years. Chouibi et al. (2022) found that a growing interest in digital transformation can assist organizations to achieve higher performance, primarily at the organizational level, with the authors also providing a global overview of the associated risks. For instance, according to Setia et al. (2013), companies such as Best Buy and Starbucks leverage digital technologies to improve performance by transforming customer-side business operations and synchronizing data, information, and ideas. In addition, Brynjolfsson and Yang (1997) demonstrated that firms employing more digitally embedded business processes obtain higher performance from their ICT capabilities. Imran et al. (2021) emphasized that leadership, structures, and culture are the key enablers of digital transformation that facilitate industrial organizations to achieve performance outcomes such as collaboration, customer-centricity, and agility.

F. Impact of Digital Transformation on Organizational Governance

According to Westerman et al. (2014), digital transformation in organizational governance involves steering the company's digital activities in the optimum direction by synchronizing employees' diverse energy throughout the organization into a coherent system that drives the digital transformation forward. Furthermore, Nielsen and Jordanoski (2020) argued that the digital transformation of the public sector largely depends on the focus, governance, and intergovernmental coordination and cooperation, specifically in terms of guiding the use of ICT toward building an efficient and user-oriented whole-of-government ecosystem for public service production and delivery. The authors also underscored that a robust governance model with clear roles and responsibilities for all institutions complements formal cross-sectoral bodies for decision-making and asserted that intergovernmental coordination and cooperation are essential for successful digital transformation.

Spremic (2017) claimed that due to disrupting capacities and unique features, digital technology has transformed many business models and how people communicate, learn, live, and work.

G. Relationship between Digital Transformation and Improved Organizational Performance

Weill and Woerner (2018) reported that digital transformation as a disruption has both the potential to create new business opportunities and the capacity to destroy well-established, successful business models. Bughim and Zeebroeck (2017) investigated the relationship between digital transformation and organizational performance, finding that those organizations that improve their digital intelligence successfully execute digital transformation, with the digital intelligence score therefore being statistically significant and positively correlated with subsequent financial indicators collected from audited sources such as revenue and company growth, while controlling for factors such as industry mix, organizational size, or location. Nwankpa and Roumani (2016) examined the mediating effect of digital transformation on the relationship between information technology (IT) capability and organizational performance, finding that IT capability positively affects performance, mediated by digital transformation. In addition, Verhoef et al. (2021) argued that in terms of their digital transformation processes, organizations require digital assets and to acquire or develop capabilities related to digital agility, digital networking, and big data analytics. Consequently, digital transformation requires specific organizational structures and metrics to calibrate performance.

H. Chapter Summary

From reviewing of previous studies related to digital transformation found that there is a strong relationship between digital transformation and improving organizational governance and performance. Furthermore, literature review of digital transformation revealed other environmental factor affect digital transformation such as budget constraint, resistance to change, and lack of infrastructure have an impact on digital transformation process. In the next chapter, the methodology applied to the research is explored.

CHAPTER THREE METHODOLOGY

A. Introduction

This chapter outlines the research methodology for this study. Furthermore, it provides data on the sample, including the criteria for inclusion in the study, who the participants were how the participants were selected. Furthermore, the research design chosen for this study is presented, along with the justification for this choice, and the conceptual model. Finally, the instruments utilized for data collection (i.e., questionnaire and interviews) and the procedures followed in this study are described.

B. Research Design

According to Gray (2009), the research design is the overarching plan for collecting, measuring, and analyzing data. Typically, a research design will describe the purpose of the study and address the research questions, the data-collection techniques, approaches to selecting a sample, and how the data will be analyzed. This study employed mixed methods to answer the research questions. The study utilized a survey to gather rich data, since it involved respondents providing qualitative and quantitative responses to the study related to digital transformation in Sudan Customs. Chawla and Sodhi (2011) emphasized that additional qualitative data might be needed to define the problem, to be collected through expert interviews, secondary data, and organizational information. In these cases, an exploratory investigation requires a qualitative approach to gain insight into the behavioral or perceptual aspects of the problem.

The quantitative and qualitative study data were collected through online survey questionnaires completed by Sudan Customs officers. Meanwhile, additional qualitative data were collected through interviews with customs officers.

C. Conceptual Model of the Research

This study utilized the cause-and-effect model as the conceptual model of the research (see Figure 3-1). This model has two main categories, namely, the causes and the effects. The causes are divided into major causes, with one of the significant causes being the deceleration of digital transformation. Figures 3-2–3.4 below illustrate the structure of the models in terms of the cause-and-effect factors impacting the deceleration of digital transformation, organizational governance, and organizational performance at Sudan Customs.

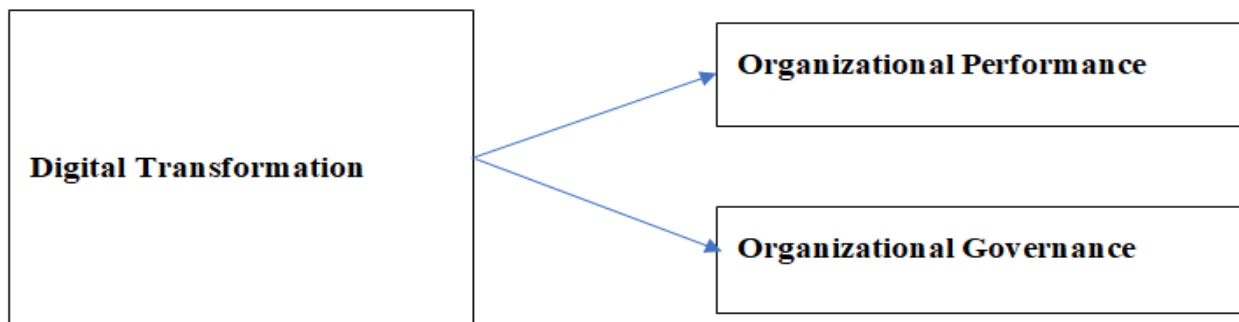


Fig 1 Conceptual Model

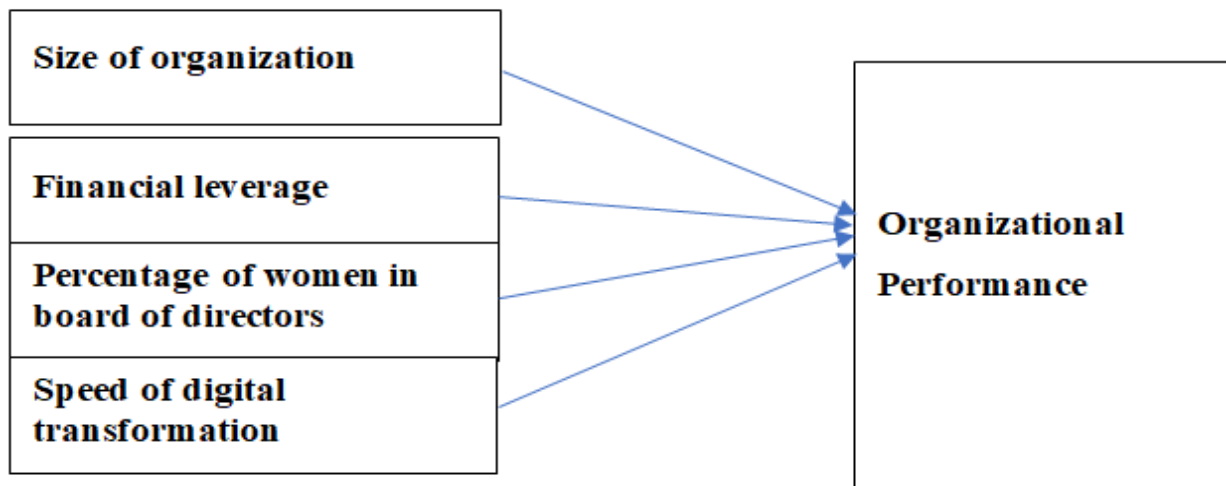


Fig 02 Factors Affecting Organizational Performance

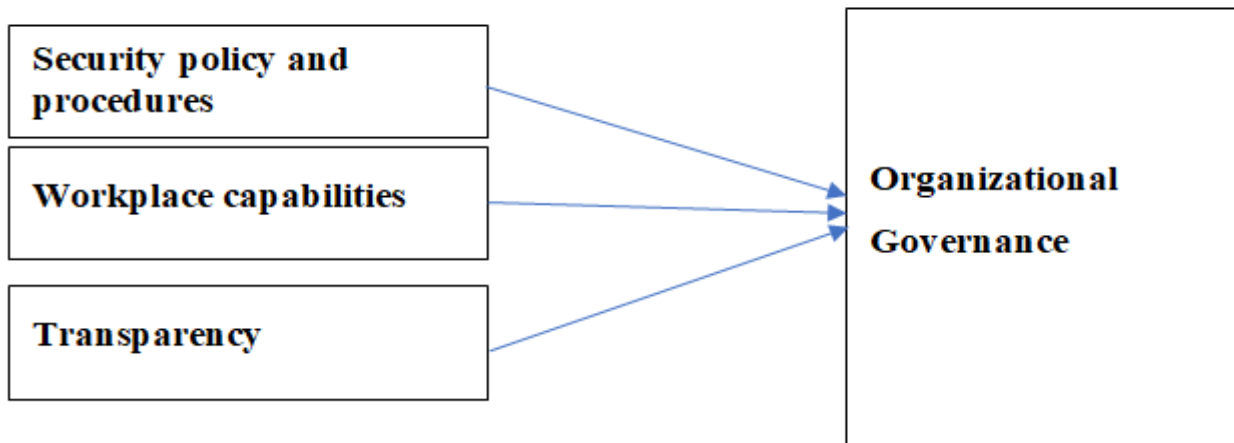


Fig 3 Factors Affecting Organizational Governance

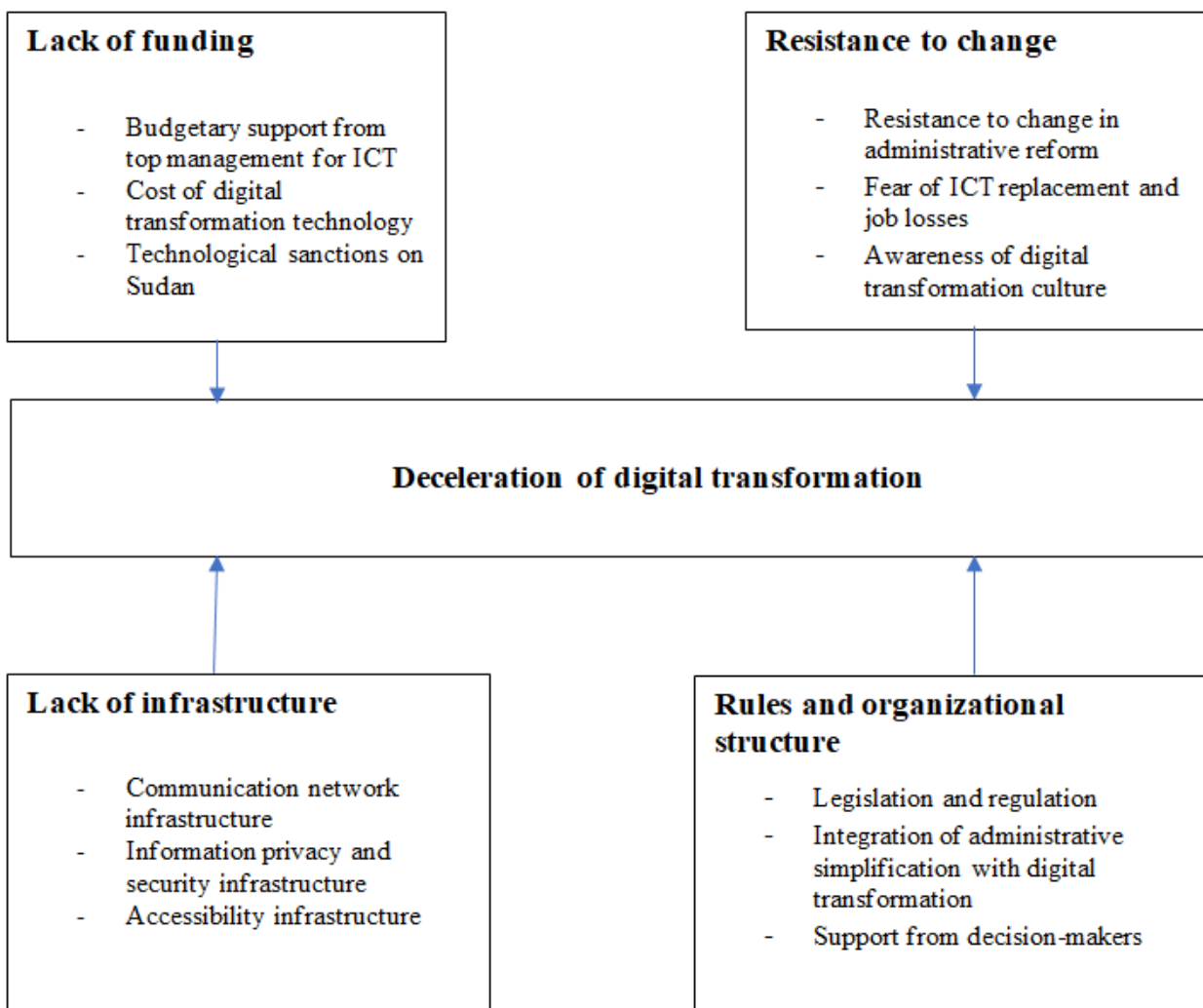


Fig 4 Factors affecting the deceleration of digital transformation

D. Sample Size

Burns and Grove (2003) referred to sampling as the selection of a group of people, events, or behaviors to conduct research. This study selected a sample of 126 customs officers from four customs offices in Sudan. The target population considered for this study were officers working in the technical administrations of Sudan Customs. The sample was selected randomly from a list of all the Sudan Customs officers, and links to the online questionnaire were sent to them. Moreover, a group interview was conducted with officers selected from four administrations.

E. Data-Collection Procedures

The data collected for this study were from both primary and secondary sources. The primary data were collected using questionnaires and interviews. In contrast, the secondary data sources were gathered from academic journal articles, publications, the Internet, and other literature based on digital transformation. Most of the data were collected in August and September 2022, when the questionnaires were completed by the participants. A cover letter attached to each questionnaire requested the participants to complete the instrument (see Appendix J). The questionnaire had thirty questions, including ranking questions, open-end questions, Likert scale questions, and closed-end questions with different options (see appendices A–D). A preliminary pilot test was conducted with two participants to obtain feedback on the time taken to answer the questionnaire, the general understanding of the questions, and the ease of accessing and using the online survey technique through Google Forms. Invitations to complete the survey questionnaire were sent to the participants on August 5, and the survey was closed on September 5, 2022.

The interviews were based on semi-structured questions and conducted on November 20, 2022, via Zoom. The process lasted 35 minutes. The interviews covered the purpose of the study and presented the research questions for a response.

F. Data Analysis

There are two forms of data in this study: qualitative and quantitative data. The qualitative data were obtained from the interviews, while quantitative and qualitative data were obtained from the questionnaire. The collected data were coded and analyzed using SPSS and Excel, with the quantitative results presented in tables, bar charts, pie graphs, and spider charts. The data obtained from the interviews were analyzed by categorizing the content provided by the interviewees and identifying information relevant to achieving the purpose of the study and responding to the research questions.

G. Chapter Summary

This chapter explained how the data was obtained, and clarified the study's conceptual framework, while describing the methods and procedures employed to collect the data. Finally, this chapter illustrated the techniques utilized for the data analysis and presentation in chapter three. The next chapter presents the collected data and its analysis.

CHAPTER FOUR DATA ANALYSIS AND DISCUSSION

A. Introduction

This chapter presents the data and discusses the findings to improve organizational performance. The questionnaire employed in this study was carefully analyzed to ensure that the data gathered would be clearly presented through percentages and graphs.

The questionnaire utilized for this study comprised nine sections with a total of 30 questions, ranging from ranking questions, Likert-scale questions, and open-ended questions, to closed-ended questions, which were all developed to ensure the rigor and objectivity of the collected data.

B. Background Information

➤ Gender Distribution

Figure 5 presents the distribution of gender of the participants. According to the data, 92.1% of the respondents to the questionnaire were males, indicating that the overwhelming majority of the respondents were male. On the other hand, 7.9% of the respondents to the questionnaire were females, indicating that the minority of the officer respondents were female.

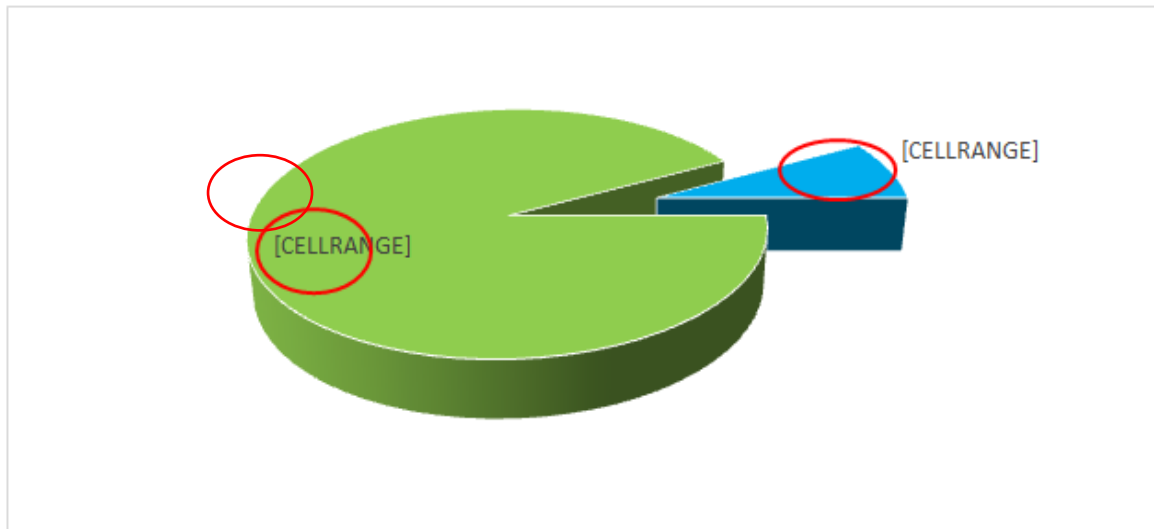


Fig 5 Distribution of Participants by Gender

➤ Duration of Employment

Figure 6 shows the respondents' duration of employment at Sudan Customs. The majority of respondents at 61.1% were in the 5–10 years group, followed by 27.0% in the less than 5 years group, 7.9% in the 21 and above years group, 3.2% in the 11–15 years group, and 0.8% in the 16–20 years group.

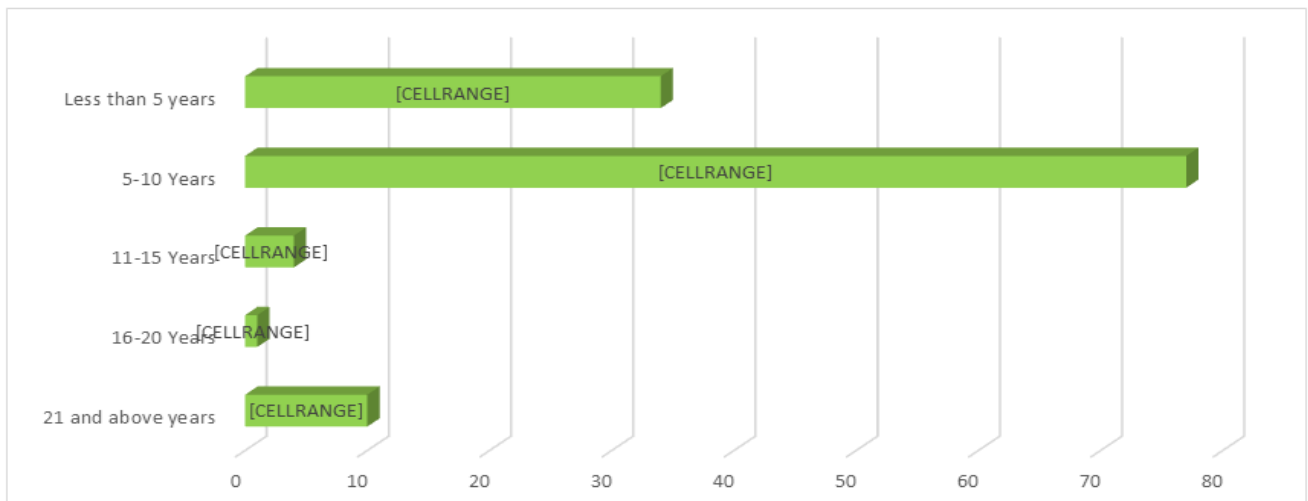


Fig 6 Respondents' Duration of Employment

➤ *The Rank of Respondents at Sudan Customs*

Figure 7 presents the rank of the respondents at Sudan Customs. The majority of respondents were junior officers at 65.9%, followed by supervisor officers at 23.8%, middle management officers at 7.1%, and senior management officers 3.2%.

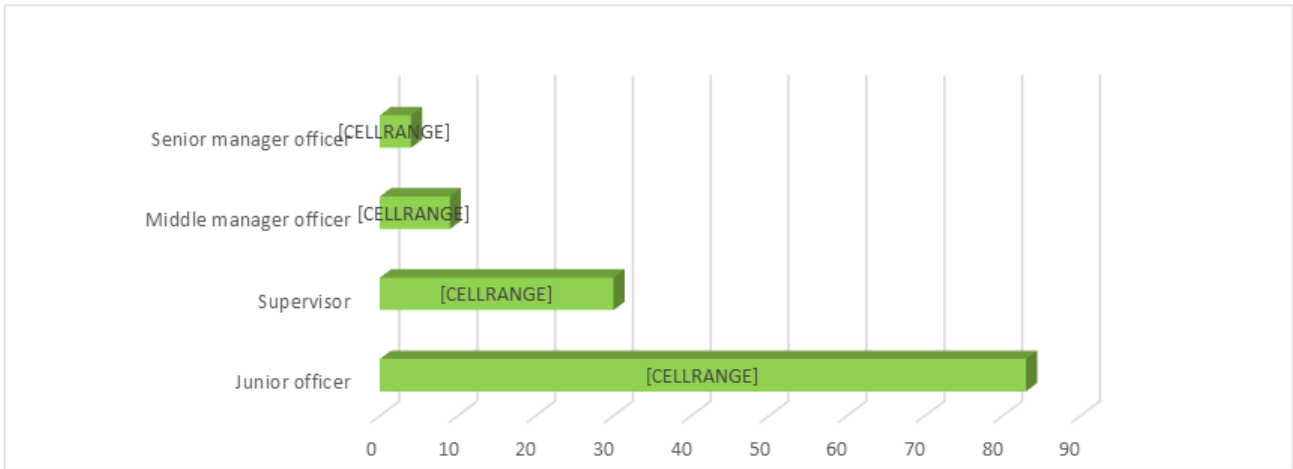


Fig 7 Rank of Respondents in Sudan Customs

➤ *Current Administration of Respondents*

Figure 8 shows the administrations in which the respondents were based. The majority of the survey respondents were from the General Administration of Customs Operations at 50%, followed by the General Administration for Compliance and Facilitation at 23%, the General Administration of Smuggling Combat at 15.1%, and the General Administration of Public Affairs at 11.9%.

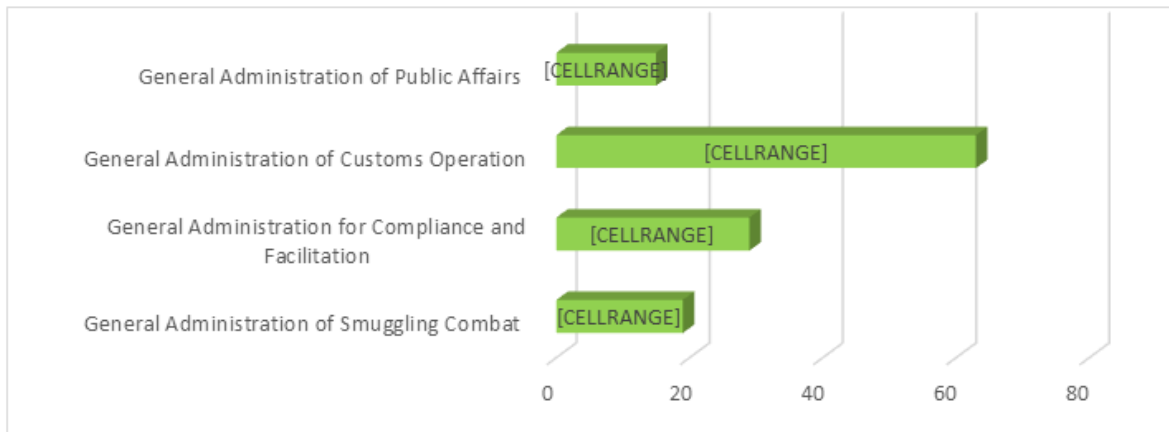


Fig 8 Current Administration of Respondents

➤ *Respondents' Training History*

Figure 9 presents the training history of the respondents, where they were asked to indicate how many times they had received training based on the following options: none, once, twice, or several times. According to the results, 54.8% of the respondents had yet to receive any training, followed by 20.6% of the respondents who had received training once, 11.9% of the respondents who had received training twice, and 12.7% of the respondents who had received training several times.

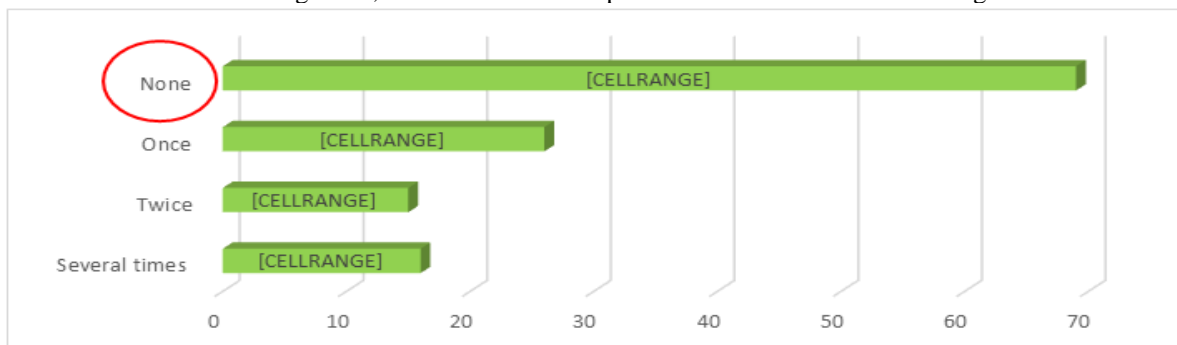


Fig 9 Respondents' Training History

C. The Current Impact and Potential of Digital Transformation in Sudan Customs

This section presents the participants' responses to questions regarding four factors that affect the digital transformation in Sudan Customs, as presented in Figure 10.

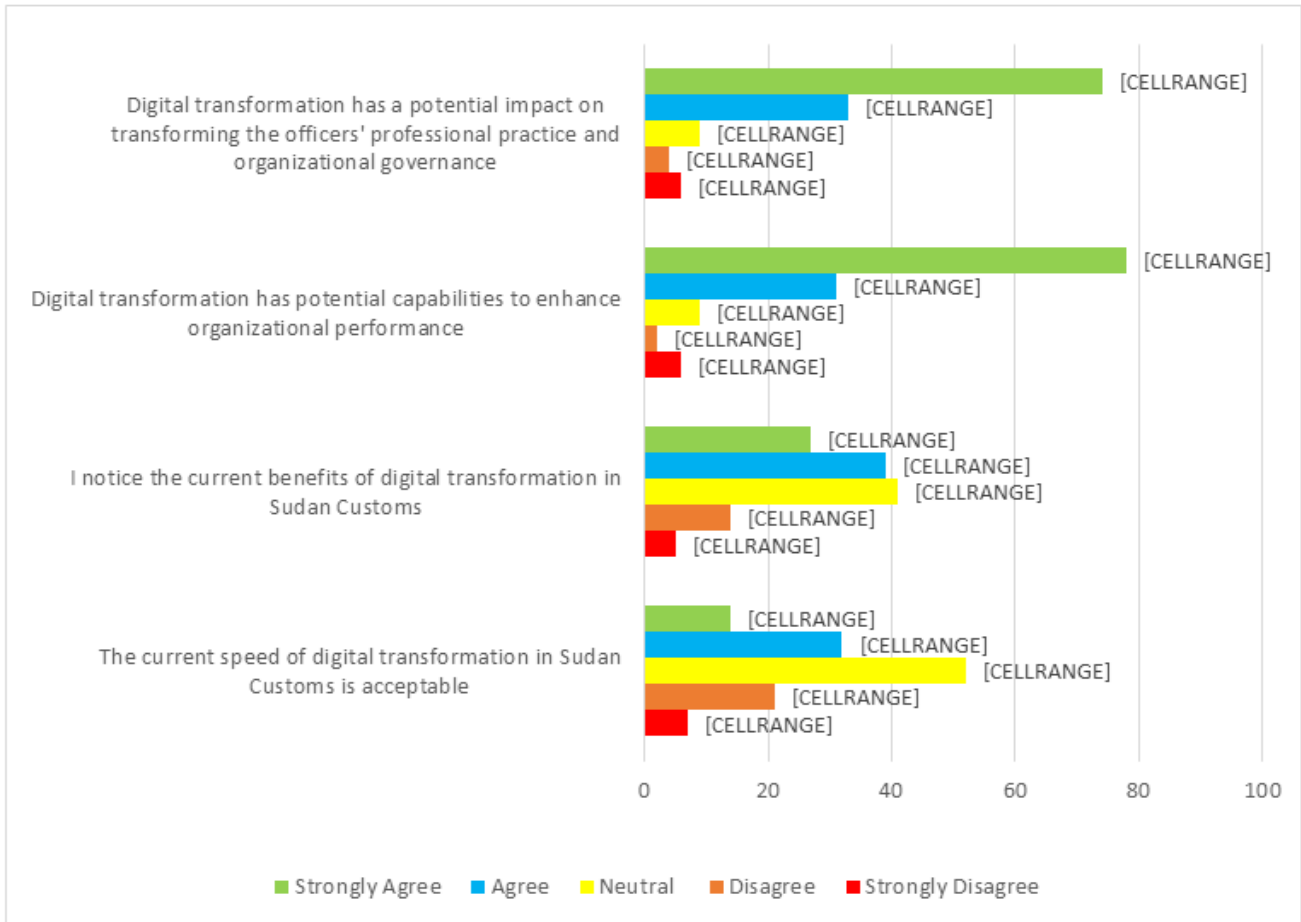


Fig 10 Current Impact and Potential of Digital Transformation in Sudan Customs

➤ *Digital Transformation has a Potential Impact on Transforming the Officers' Professional Practice and Organizational Governance*

Figure 10 shows the participants' responses regarding digital transformation's current impact and potential in Sudan Customs. Based on the data shown in the figure, 74 respondents, equal to 58.7% of the survey population, strongly agreed that digital transformation could potentially transform the officer's professional practice and organizational governance. Furthermore, 33 respondents (26.2%) agreed. Meanwhile, 7.1% of the respondents are responding, and merely expressing a neutral position. On the other hand, 3.2% of the respondents disagreed, and 4.8% strongly disagreed.

➤ *Digital Transformation has Potential Capabilities to Enhance Organizational Performance*

Figure 10 presents the responses regarding the potential capabilities of digital transformation to enhance organizational performance. Based on the data received, 78 respondents, equal to 61.9% of the survey population, strongly agreed that digital transformation could potentially enhance organizational performance. Furthermore, 31 respondents (24.6%) agreed. Meanwhile, 7.1% of the respondents had a neutral stance. On the other hand, 1.6% of the respondents disagreed, and 4.8% strongly disagreed.

➤ *I Notice the Current Benefits of Digital Transformation at Sudan Customs*

Figure 10 shows the responses regarding the participants' evaluation of the current benefits of digital transformation in Sudan Customs. Based on the collected data it was found that 27 respondents, equal to 21.4% of the survey population, strongly agreed, while 39 respondents (31%) agreed. Meanwhile, 32.5% of the respondents held a neutral view. On the other hand, 11.1% of the respondents disagreed, and 4% strongly disagreed.

➤ *The Current Speed of Digital Transformation in Sudan Customs is Acceptable*

Figure 10 presents the responses regarding the current speed of digital transformation in Sudan Customs. Based on the data received, 14 respondents strongly agreed, equal to 11.1% of the survey population, while 32 respondents (25.4%) agreed. Meanwhile, 41.3% of the respondents held a neutral perspective. On the other hand, 16.7% of the respondents disagreed, and 5.6% strongly disagreed.

The findings of these four factors reveal that digital transformation can transform the officers' professional practice and improve performance. This finding is significant among four factors and needs to be sustained and improved upon.

D. Factors Affecting Organizational Performance

This section presents the participants' responses regarding four factors that affect organizational performance in Sudan Customs, as seen in Figure 11.

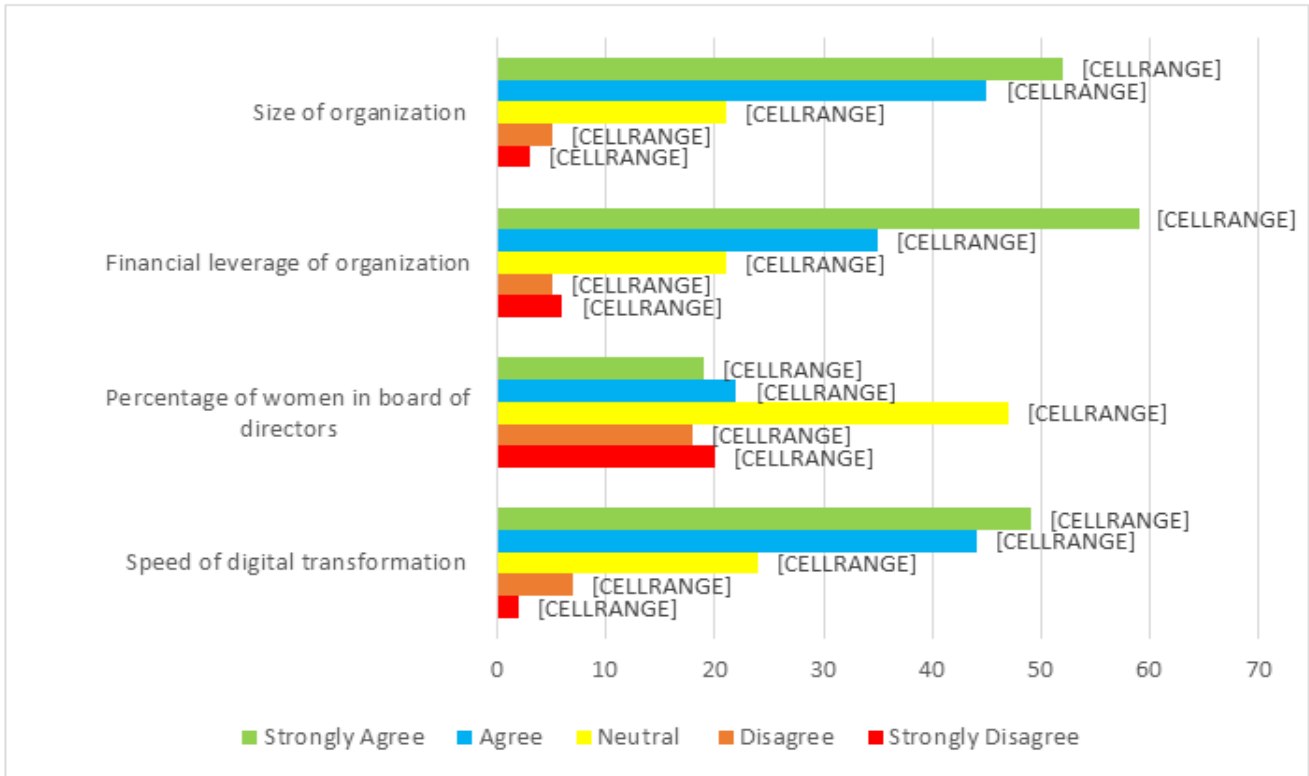


Fig 11 Factors Affecting Organizational Performance

➤ *The Size of the Organization*

Figure 11 shows the responses regarding the effect of the organization's size on organizational performance. According to the findings 52 respondents, equal to 41.3% of the survey population, strongly agreed that the organization's size affects organizational performance, while 35.7% of the respondents agreed. Meanwhile, 16.7% of the respondents expressed a neutral position. On the other hand, 4% of the respondents disagreed, and only 2.4% strongly disagreed.

➤ *Financial Leverage of the Organization*

Figure 11 presents the responses regarding the effect of the financial leverage of an organization on organizational performance. According to the findings 59 respondents, equal to 46.8% of the survey population, strongly agreed that financial leverage affects organizational performance, while 27.8% of the respondents agreed. Meanwhile, 16.7% of the respondents had a neutral stance. However, 4.0% of the respondents disagreed, and 4.8% strongly disagreed.

➤ *The Percentage of Women on the Board of Directors*

Figure 11 shows the responses regarding the effect of the percentage of females on the board of directors (BOD) in the organization. According to the findings 47 respondents, equal to 37.3% of the survey population, had a neutral perspective. In addition, 17.5% of the respondents agreed and 15.1% strongly agreed. On the other hand, 14.3% of the respondents disagreed, and 15.9% strongly disagreed.

➤ *The Speed of Digital Transformation*

Figure 11 presents the responses regarding the effect of the speed of digital transformation in the organization. Based on the data gathered, 49 respondents, equal to 38.9% of the survey population, strongly agreed that the speed of digital transformation affects organizational performance, while 34.9% agreed. Meanwhile, 19% of the survey population expressed a neutral stance. However, 5.6% of the survey population disagreed, and only 1.6% strongly disagreed.

According to the analysis, the summary of four factors revealed financial leverage to be the most critical factor. This finding is positive and needs to be sustained and improved to enhance organizational performance.

E. Factors Affecting Organizational Governance

This section presents the participants' responses regarding three factors that affect organizational governance in Sudan Customs, as seen in Figure 12.

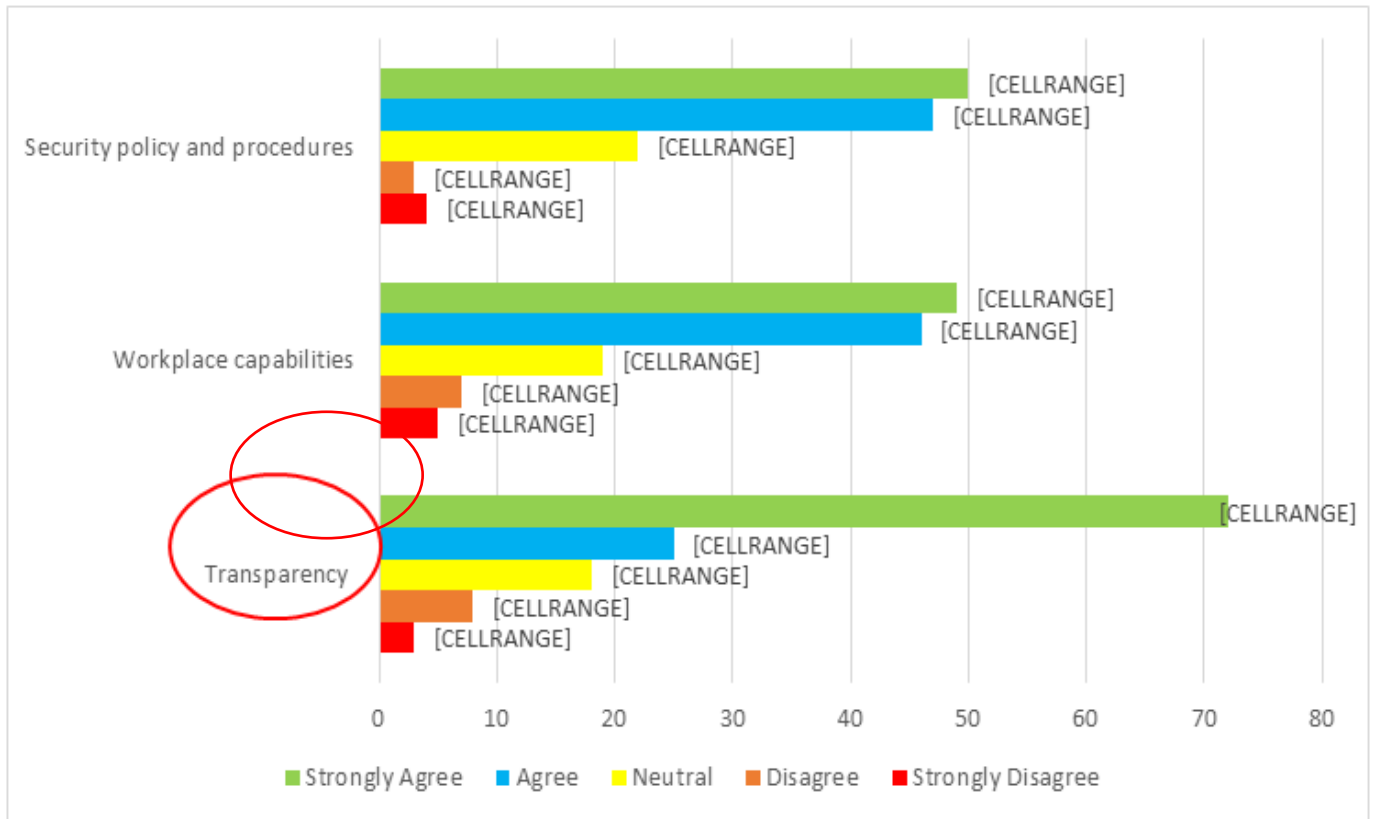


Fig 12 Factors Affecting Organizational Governance

➤ *Security Policy and Procedures*

Figure 12 shows the respondents' views regarding the effect of the security policy and procedures on organizational governance. Based on the received data 50 respondents, equal to 39.7% of the survey population, strongly agreed that the security policy and procedures affect organizational governance, while 37.3% agreed. Meanwhile, 17.5% of the respondents expressed a neutral position. However, 2.4% of the respondents disagreed, and 3.2% strongly disagreed.

➤ *Workplace Capabilities*

Figure 12 presents the respondents' perceptions regarding the effect of workplace capabilities on organizational governance. Based on the gathered data 49 respondents, equal to 38.9% of the survey population, strongly agreed that workplace capabilities affect organizational governance, while 36.5% agreed. Meanwhile, 15.1% of the respondents conveyed a neutral opinion. On the other hand, 5.6% of the survey population disagreed, and 4% strongly disagreed.

➤ *Transparency*

Figure 12 shows the respondents' views regarding the effect of transparency on organizational governance. According to the data 72 respondents, equal to 57.1% of the survey population, strongly agreed that transparency affects organizational governance, while 19.8% agreed. Meanwhile, 14.3% of the survey population expressed a neutral position. However, 6.3% of the survey population disagreed, and 2.4% strongly disagreed. This result indicates that transparency has a high priority among the three factors of organizational governance.

The results of the three factors revealed that transparency is the most critical. This result is significant, and needs to be sustained and improved to enhance organizational governance.

F. Funding Affecting Digital Transformation in Sudan Customs

This section presents the participants' responses regarding three factors that affect the funding of digital transformation in Sudan Customs, as seen in Figure 13.

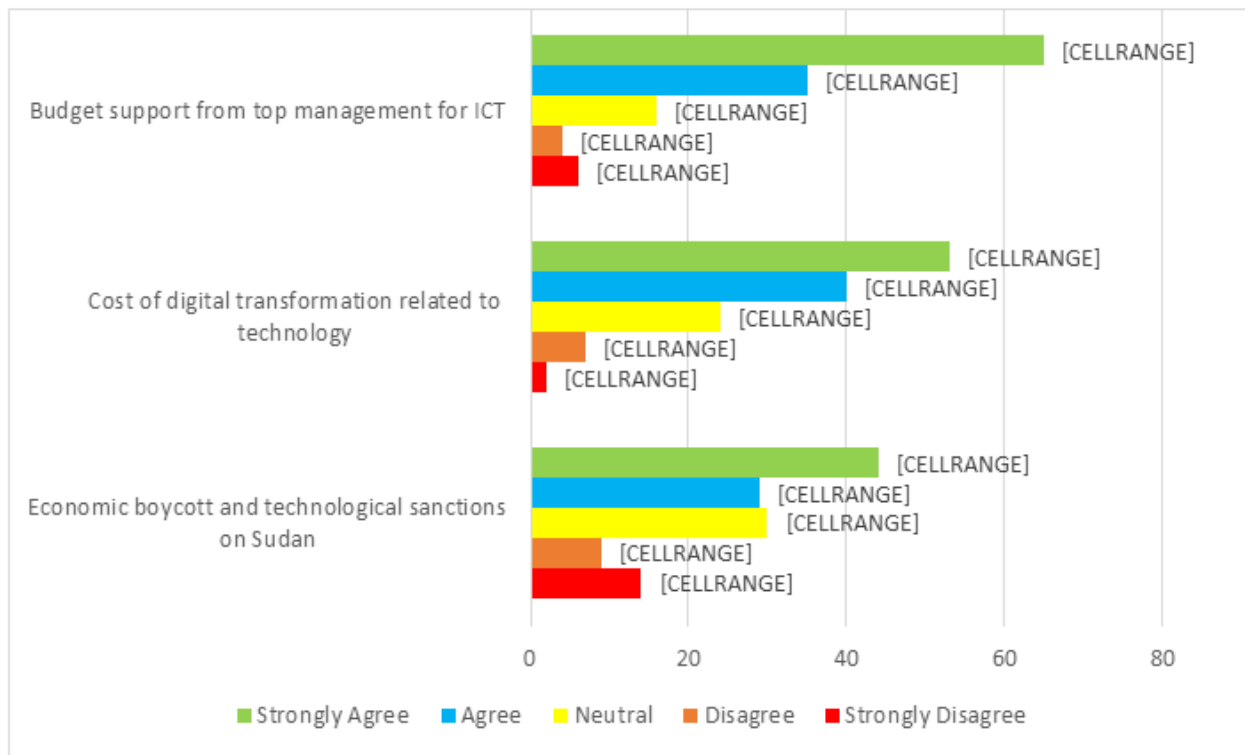


Fig 13 Funding Factors Affecting Digital Transformation

➤ *Budgetary Support from Top Management for ICT*

Figure 13 shows the respondents' perceptions regarding the effect of budgetary support from top management for ICT on digital transformation. Based on the data received 65 respondents, equal to 51.6% of the survey population, strongly agreed that budgetary support from top management for ICT affects the acceleration of digital transformation in Sudan Customs, while 27.8% agreed. Meanwhile, 12.7% of the respondents expressed a neutral position. Conversely, 3.2% of the respondents disagreed, and 4.8% strongly disagreed.

➤ *Cost of Digital Transformation Related to Technology*

Figure 13 shows the respondents' views regarding the effect of the cost of digital technology related to digital transformation in Sudan Customs. Based on the data gathered 53 respondents, equal to 42.1% of the survey population, strongly agreed that the cost of digital technology related to digital transformation affected the digital transformation in Sudan Customs, while 31.7% of the survey population agreed. Meanwhile, 19% of the respondents conveyed a neutral opinion. Conversely, 5.6% of the respondents disagreed, and 1.6% strongly disagreed.

➤ *Economic Boycott and Technological Sanctions on Sudan*

Figure 13 presents the respondents' perceptions regarding the effect of the economic boycott and technological sanctions on Sudan. Based on the collected data 44 respondents, equal to 43.9% of the survey population, strongly agreed that the economic boycott and technological sanctions affected the acceleration of digital transformation in Sudan Customs, while 23% of the survey population agreed. Meanwhile, 23.8% of the respondents conveyed a neutral opinion. Conversely, 7.1% of the respondents disagreed, and 11.1% strongly disagreed.

According to the analysis, the summary of the three factors showed that budgetary support from top management represents the most critical of the three factors explored. This finding is thus significant among the three considered and needs to be sustained and improved to enhance digital transformation in Sudan Customs.

G. Infrastructure Affecting Digital Transformation in Sudan Customs

This section shows the participants' responses regarding three factors that affect digital transformation infrastructure in Sudan Customs, as seen in Figure 14.

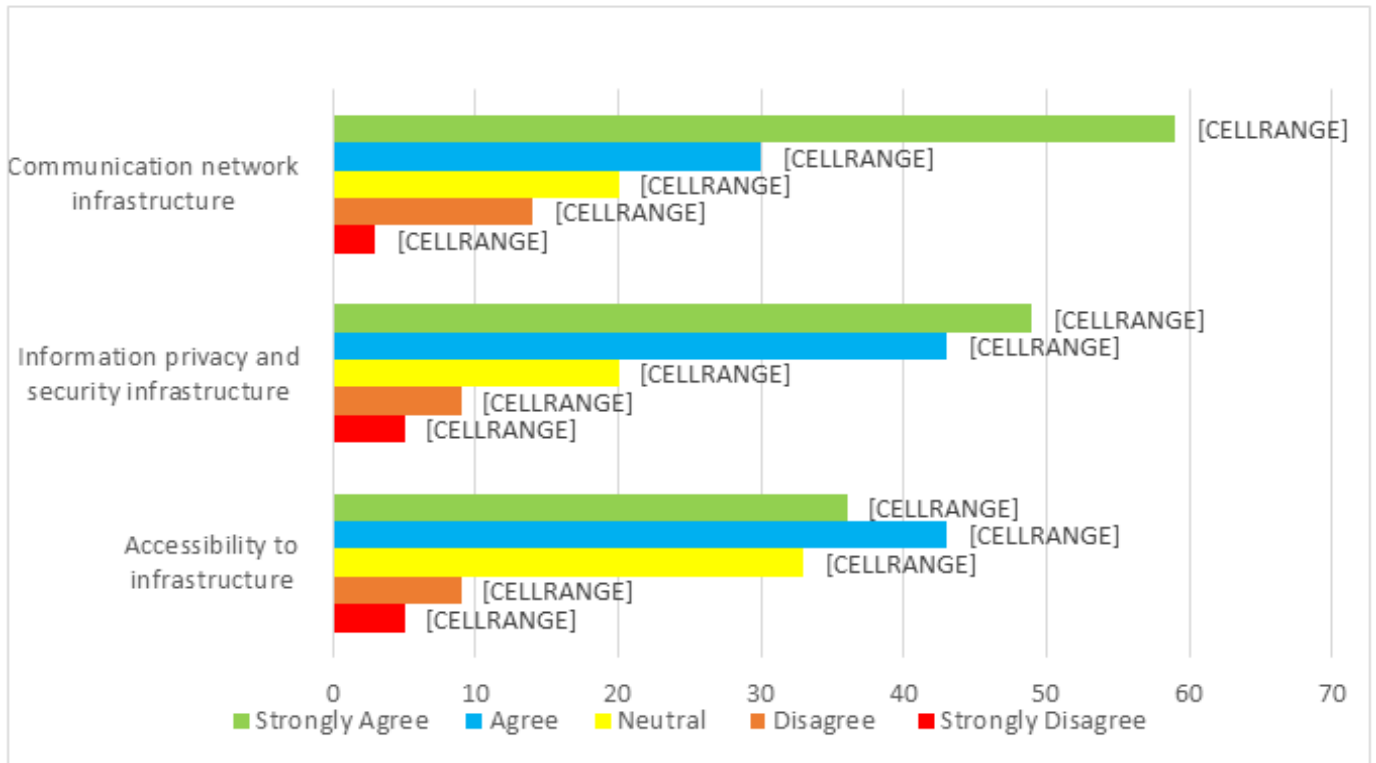


Fig 14 Infrastructure Factors Affecting Digital Transformation

➤ *Communication Network Infrastructure*

Figure 14 shows the respondents' views regarding the effect of communication network infrastructure on digital transformation at Sudan Customs. According to the findings 59 respondents, equal to 46.8% of the survey population, strongly agreed that the communication network infrastructure affects digital transformation in Sudan Customs, while 23.8% agreed. Meanwhile, 15.9% of the survey population expressed a neutral position. On the other hand, 11.1% of the respondents disagreed, and 2.4% strongly disagreed.

➤ *Information Privacy and Security Infrastructure*

Figure 14 presents the respondents' perceptions regarding the effect of information privacy and security infrastructure on digital transformation at Sudan Customs. According to the findings 49 respondents, equal to 38.9% of the survey population, strongly agreed that information privacy and security infrastructure affected the digital transformation in Sudan Customs, while 34.1% of the survey population agreed. Meanwhile, 15.9% of the respondents expressed a neutral position. On the other hand, 7.1% of the respondents disagreed, and 4% strongly disagreed.

➤ *Accessibility of Infrastructure*

Figure 14 shows the respondents' views regarding the effect of the accessibility of infrastructure on digital transformation in Sudan Customs. According to the findings 43 respondents, equal to 34.1% of the survey population, agreed that the accessibility of infrastructure affected the digital transformation in Sudan Customs, while 28.6% strongly agreed. Meanwhile, 26.2% of the respondents expressed a neutral position. However, 7.1% of the respondents disagreed, and 4% strongly disagreed.

According to the results, the summary of three factors shows that communication network infrastructure is the most critical of the three factors explored. This finding is thus significant and the communication network infrastructure needs to be sustained and improved to enhance digital transformation in Sudan Customs.

H. Resistance to Change Affecting Digital Transformation in Sudan Customs

This section shows the participants' perceptions regarding three factors that affect the resistance to change in terms of digital transformation in Sudan Customs, as seen in Figure 15.

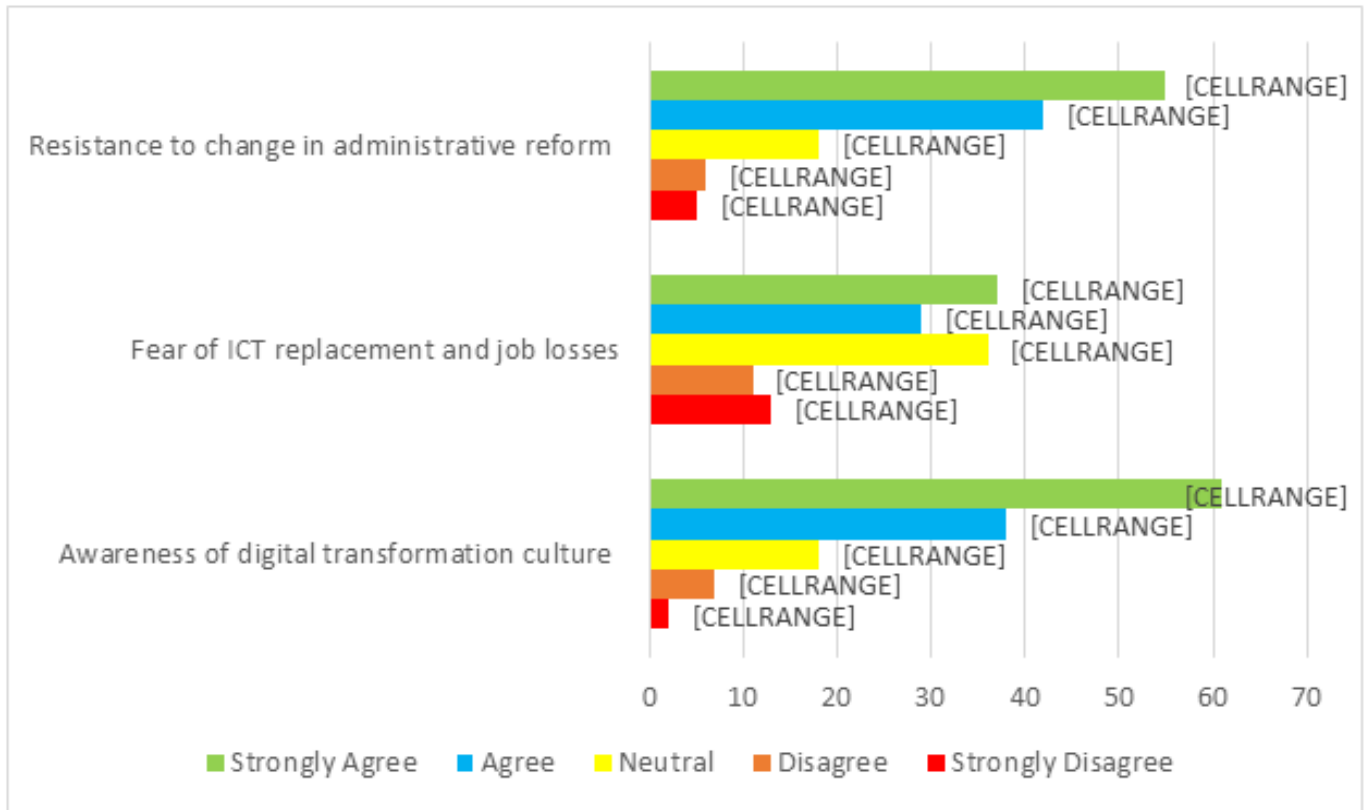


Fig 15 Resistance-to-Change Factors Affecting Digital Transformation

➤ *Resistance to Change in the Administrative Reform*

Figure 15 presents the respondents' perceptions regarding the effect of resistance to change in administrative reform. According to the findings 55 respondents, equal to 43.7% of the survey population, strongly agreed that resistance to change in administrative reform affected the acceleration of digital transformation in Sudan Customs, while 33.3% of the survey population agreed. Meanwhile, 14.3% of the respondents conveyed a neutral opinion. However, 4.8% of the respondents disagreed, and 4% strongly disagreed.

➤ *Fear of ICT Replacement and Job Losses*

Figure 15 shows the respondents' perceptions regarding the effect of the fear of ICT replacement and job losses. According to the findings 37 respondents, equal to 29.4% of the survey population, strongly agreed that fear of ICT replacement and job losses affected the acceleration of digital transformation in Sudan Customs, while 23% of the survey population agreed. Meanwhile, 28.6% of the respondents conveyed a neutral opinion. However, 28.6% of the respondents disagreed, and 10.3% strongly disagreed.

➤ *Awareness of Digital Transformation Culture*

Figure 15 presents the respondents' perceptions regarding the effect of the awareness of a digital transformation culture. According to the findings 61 respondents, equal to 48.4% of the survey population, strongly agreed that awareness of digital transformation culture affected the acceleration of a digital transformation culture in Sudan Customs, while 30.2% of the survey population agreed. Meanwhile, 14.3% of the respondents conveyed a neutral opinion. On the other hand, 5.6% of the respondents disagreed, and 1.6% strongly disagreed.

Based on the analysis, the summary of the three factors demonstrates that awareness of a digital transformation culture is significant among the three factors. This finding is crucial in the study, and needs to be sustained and improved to increase awareness of the digital transformation culture.

I. Rules and Organizational Structure Affecting Digital Transformation in Sudan Customs

This section shows the participants' perceptions regarding three factors that affect the resistance to change of digital transformation in Sudan Customs, as seen in Figure 16.

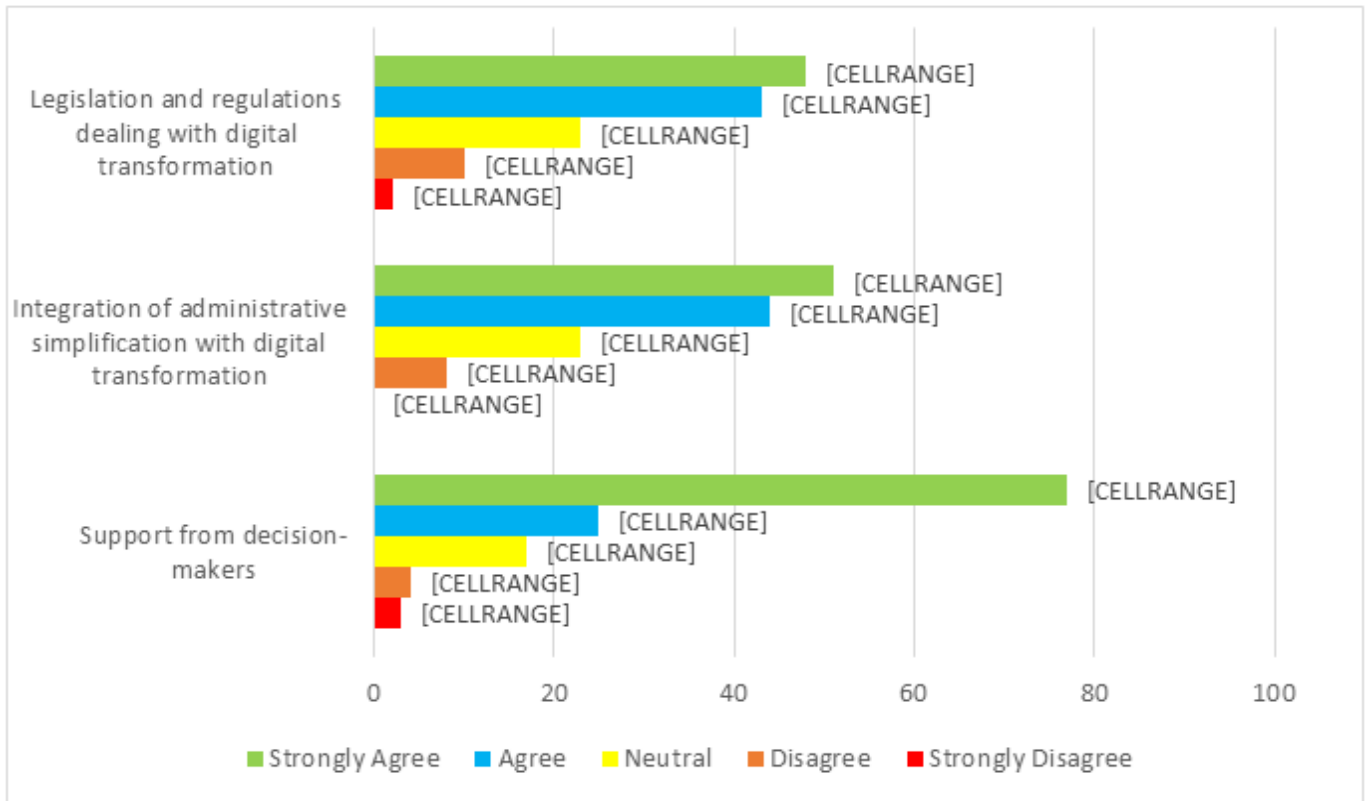


Fig 16 Rules and Organizational Structure Factors Affecting Digital Transformation'

➤ *Legislation and Regulations Dealing with Digital Transformation*

Figure 4-12 presents the respondents' perceptions regarding the effect of legislation and regulations on digital transformation. Based on the results 48 respondents, equal to 38.1% of the survey population, strongly agreed that legislation and regulation dealing with digital transformation affected the acceleration of digital transformation in Sudan Customs, while 34.1% of the survey population agreed. Meanwhile, 18.3% of the respondents conveyed a neutral opinion. In contrast, 7.9% of the respondents disagreed, and 1.6% strongly disagreed.

➤ *Integration of Administrative Simplification with Digital Transformation*

Figure 4-12 shows the respondents' views regarding the effect of the integration of administrative simplification with digital transformation. Based on the results 51 respondents, equal to 40.5% of the survey population, strongly agreed that integration and administrative simplification with digital transformation affected the acceleration of digital transformation in Sudan Customs, while 34.9% of the survey population agreed. Meanwhile, 18.3% of the respondents conveyed a neutral opinion. However, 6.3% of the survey population disagreed, and none strongly disagreed.

➤ *Support from Decision-Makers*

Figure 4-12 shows the respondents' perceptions regarding the effect of support from decision-makers. Based on the collected data 77 respondents, equal to 61.1% of the survey population, strongly agreed that support from decision-makers affected the acceleration of digital transformation in Sudan Customs, while 19.8% of the survey population agreed. Meanwhile, 13.5% of the respondents conveyed a neutral opinion. In contrast, 3.2% of the respondents disagreed, and 2.4% strongly disagreed.

According to the analysis, the summary of the three factors shows that decision-makers' support is the most critical. This finding is significant in the study and needs to be sustained and improved to mobilize decision-makers to support digital transformation projects.

J. Qualitative Data Analysis: Interviews

The researcher sent an email to seven participants in the form of an invitation letter, describing what the study entailed and seeking pertinent data, their availability for the interview, and their informed consent. Their completed informed consent form and invitation was delivered back via email to the researcher. The seven participants who agreed to the interview then received a confirmation email from the researcher. The online interviews took place in November 2022. Zoom sessions were employed to conduct the interviews, as this method was considered more cost-effective and convenient. Five minutes were allotted to each participant during the approximately 35-minute interview. The discussion also focused on the study's purpose and research questions. Table 4-1 below presents the respondents who participated in the interview and their respective administrations.

Table 1 The Interview Respondents

Respondent	Administration
Respondent A	General Administration of Public Affairs
Respondent B	General Administration of Customs Operation
Respondent C	General Administration for Compliance and Facilitation
Respondent D	General Administration for Compliance and Facilitation
Respondent E	General Administration of Smuggling Combat
Respondent F	General Administration for Compliance and Facilitation
Respondent G	General Administration of Public Affairs

➤ **Research question one:** *What are the impacts and potential benefits of digital transformation in Sudan Customs?*

The participants were asked their opinion of digital transformation's current impact and potential benefits in Sudan Customs, with all agreeing that digital transformation could transform officers' professional practice and improve performance in the organization. However, there were a range of responses when asked in a follow-up question why most of the respondents to the questionnaire survey conveyed a neutral opinion to the current benefits of digital transformation in Sudan Customs: "because only a few people have skills and knowledge regarding digital technology" (Respondent A); "due to a lack of ICT in the workplace" (Respondent B); "I think due to a lack of trust in the functionality of digital transformation and difficulty" (Respondent C); "because the basic infrastructure needs to be put in place and IT officers have to be trained to handle necessary tasks of day-to-day operation" (Respondent D); "Sudan Customs provided the workplace with modern technology that assists officers in their tasks, but some officers are not ready to start and respond" (Respondent E); and "due to absence of awareness and limited resources of knowledge regarding digital transformation dissemination" (Respondent F). However, all of the respondents acknowledged the potential impact of digital transformation on officers' professional practice and improving performance.

➤ **Research question two:** *What are the most significant factors that affect organizational performance?*

All of the participants A, B, C, D, E, G, and F acknowledged that for organizational performance to be enhanced, major factors regarding financial leverage, organizational size, speed of digital transformation, and the percentage of women on the board of directors must be addressed.

➤ **Research question three:** *What are the most significant factors that affect organizational governance?*

All of the participants A, B, C, D, E, F, and G acknowledged that in order to enhance organizational governance, transparency is a vital factor and the most critical among all other factors.

➤ **Research Question Four:** *What are the most significant factors that affect the acceleration of digital transformation?*

Most of the respondents cited weak awareness of digital transformation as the most significant factor affecting the acceleration of digital transformation in Sudan Customs. Respondent A stated that "awareness is the basis for digital transformation", Respondent B reported that it is "mainly ignorance of adopting technology", and Respondent C asserted that "the primary factor is knowledge of digital technology. If there is no knowledge of it, then it cannot be accelerated by digital transformation".

Furthermore, basic infrastructure was reported as a significant factor affecting the acceleration of digital transformation, with Respondent D observing, "we still have power outages, and it is quite expensive to host a digital transformation 24/7". The majority of the respondents highlighted awareness and inadequate infrastructure, while only a few of the respondents regarded information privacy and security as the most significant factor affecting the acceleration of digital transformation in Sudan Customs. Respondent E claimed "that the most critical factor is support from decision-makers"; Respondent F asserted that "due to a lack of digital transformation knowledge, some officers, even those who use devices, equipment, and tools that support advanced technologies, use the technology without being fully competent in its operation"; and Respondent G said that "legislation, regulations, and resistance to change could affect the acceleration of digital transformation in Sudan Customs".

K. Discussion of the Findings

Based on the summary of the data results from the questionnaire and interviews, the findings of the study highlighted seven factors as the most significant. The following discussion explores these significant factors.

➤ *Digital Transformation's Current Impact and Potential Benefits to Transform Officers' Professional Practice and Organizational Performance*

According to the results of this study, most the respondents affirmed that digital transformation could transform officers' professional practice and organizational performance. In addition, the majority of the respondents believed that digital transformation would introduce additional opportunities for Sudan Customs, while having a positive impact on organizational performance. Moreover, it was found that digital transformation can encourage Sudan Customs to integrate its business processes and routines through digital technology to achieve enhanced performance.

This study revealed that many of the respondents expressed a neutral perspective. This neutral stance may be due to a number of factors present in Sudan Customs, such as a lack of trust in the functionality of digital transformation, and difficulty in evaluating its current benefits. Therefore, there needs to be greater dissemination of information regarding digital technology and a broader learning channel. Furthermore, this issue may be due to a need for Sudan Customs to encourage their officers to use ICT at work. Moreover, due to the lack of officer training, there is weak alignment with the current technologies necessary to fulfil their duties and tasks. In addition, officers' weak engagement was noted at all functional levels in terms of implementing new projects. This finding highlights the inability of officers to determine the current benefits of digital transformation in Sudan Customs.

➤ *Infrastructure that Affects the Speed of Digital Transformation in Sudan Customs*

Based on the findings of this study, the majority of the respondents affirmed that communication network infrastructure is a priority in order to accelerate the digital transformation. Furthermore, this study revealed a positive association between the communication network infrastructure and the speed of digital transformation.

In addition, a high level of communication network infrastructure represents a critical factor in achieving a high speed of digital transformation. Therefore, this strong relationship will enable Sudan Customs to enhance its capabilities and accelerate digital transformation.

➤ *Necessary Funding that Affects the Acceleration of Digital Transformation in Sudan Customs*

According to the results of this study, the majority of the respondents affirmed that budgetary support from top management for ICT is a significant priority among all factors in accelerating digital transformation. This finding indicates that monetary funds are critical in implementing digital transformation. Therefore, this study reveals the significance of top management's budgetary support toward ICT projects in terms of encouraging and providing the necessary resources for their implantation.

➤ *Awareness of Digital Transformation Culture*

Based on the findings of this study, most of the respondents affirmed the importance of the awareness of a digital transformation culture for Sudan Customs. This result indicates that digital transformation could accompany digital culture adoption among customs officers through establishing education channels and integrating departments to increase and consolidate digital transformation awareness and culture in Sudan Customs. This finding is consistent with previous study by Dilber (2019), emphasizing that consolidating digital culture requires the analysis of the current situation in order to identify challenges. Moreover, adopting a digital learning culture, collaborating with innovation laboratories and research institutions to realize the digital transformation, and supporting organizations with requirements and needs' analyses will help to implement the organizational objectives.

➤ *Rules and Organizational Structure Affecting Digital Transformation in Sudan Customs*

According to the results of the study, the majority of the respondents emphasized that support from decision-makers is crucial to accelerating digital transformation in Sudan Customs. Furthermore, the study revealed that most of the respondents believed that decision-makers support and encourage officers to work on ICT projects. This result of the study is consistent with previous study by Raed (2021), emphasizing that support from decision-makers is considered a core factor in adopting new technology and innovations in an organization. Furthermore, decision-makers play a crucial role in adopting and implementing new technologies by sponsoring the initiatives and diffusion within an organization. Thus, decision-makers play an essential role and influence the acceleration of digital transformation at Sudan Customs.

➤ *Organizational Performance*

Based on the findings of this study, the majority of the respondents acknowledged that the organization's performance would improve when financial leverage is employed, indicating that Sudan Customs should adopt increased financial leverage to improve the organizational performance.

➤ *Organizational Governance*

According to the results of the study, the majority of the respondents strongly agreed that transparency plays an important role in organizational governance. Furthermore, the findings revealed a close relationship between transparency and organizational governance. This result indicates that transparency represents the most significant among the three indices within this study.

L. Chapter Summary

The data analysis and findings resulted in robust data to answer the study's research questions, with a strong relationship found between digital transformation, organizational performance, and governance revealed. The study's findings show that digital transformation, financial leverage, transparency, budgetary support for ICT, communication network infrastructure, awareness of digital transformation culture, and support from decision-makers are the most significant factors to adopt in terms of accelerating digital transformation at Sudan Customs. The next and final chapter presents the conclusion and recommendations.

CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

A. Introduction

This study seeks to evaluate the impact of digital transformation and determine the factors that affect organizational performance and governance, while determining those factors that affect the acceleration of digital transformation in Sudan Customs. This study was achieved quantitatively and qualitatively by the use of a survey, and qualitatively through the use of interviews. This chapter will conclude the findings obtained from the previous data analysis and discussion chapter, and present recommendations and opportunities for further study.

B. Conclusion

This section aims to respond to the research questions established in section 1.5 by focusing on the most important findings emerging from the data analysis that affect organizational performance, organizational governance, and the acceleration of digital transformation.

➤ *Research Question 1:*

This study finds that digital transformation has the potential capability and benefits to enhance officers' professional practice and improve their performance at Sudan Customs. Furthermore, the results reveal that digital transformation assists the organization in improving statistic data collection and the ease of analysis. Moreover, the findings highlight that digital transformation can strengthen human resources management by increasing customs officers' professional agility and flexibility.

➤ *Research Question 2:*

According to the results, the financial leverage of Sudan Customs is a significant factor in improving organizational performance. The findings also show that financial leverage is critical in enhancing the organizational performance. Therefore, organizations with more financial leverage have more effective and higher quality organizational performance.

➤ *Research Question 3:*

Based on the findings, transparency is the most critical factor in enhancing organizational governance at Sudan Customs. Furthermore, transparency was found to enable Sudan Customs to build trust among its officers and involve them in decision-making processes, thus leading to improved organizational governance. Therefore, transparency encourages officers to be coherent and integrated by sharing their thoughts and opinions, while facilitating availability and easy access to information that enhances the value of the organization.

➤ *Research Question 4:*

This study reveals three factors that have a significant impact on accelerating digital transformation in Sudan Customs:

- Decision-makers' support is a critical factor that affects the acceleration of digital transformation in Sudan Customs, with their support and encouragement deemed essential to accelerating digital transformation projects. Therefore, endorsement and approval from decision-makers are crucial to accelerate digital transformation.
- Budgetary support from the top management for ICT projects is a fundamental pillar of establishment projects. Therefore, financial support and allocating sufficient resources for ICT projects represents a strong catalyst imposing a positive impact on accelerating digital transformation in Sudan Customs.
- Awareness of digital transformation culture plays a vital role in accelerating digital transformation. Therefore, enhancing the digital transformation awareness culture in Sudan Customs is necessary by increasing the knowledgebase through educating the customs officers personnel.

C. Recommendations

This section presents three recommendations that have emerged from the study based on the findings drawn from the data analysis.

➤ *The Role of Executives in Coordinating and Implementing Activities*

The role of executives is to implement the policies and strategies of Sudan Customs. Furthermore, executives should focus on the departments concerned with planning and training, such as the Directorate of Planning and Training, and coordinating with them to develop strategic plans to take advantage of ICT and the benefits of digital transformation to improve performance. Moreover, the executives in Sudan Customs must provide the support, resources, and assistance necessary to implement digital transformation. In addition, the significant role of executives is to highlight the importance of digital transformation by explaining the benefits and opportunities that could be realized by adopting digital transformation. Furthermore, the executives in Sudan Customs should utilize the potential impact of digital transformation by involving all departments and units through an evaluation of the current situation of departments via workshops and seminars, and presenting the evaluation outcomes to top management and leadership for decision-making.

➤ *Budgetary Support from Top Management for ICT Projects and Decision-Makers' Support*

The role of top management in the process of implementing projects related to ICT is to provide and facilitate adequate resources. Since the digital transformation process is rather cost-intensive and requires resources, and where the national budget is unable to provide the necessary funding, a vital role of top management is to mobilize the support of donors in financing organizational reforms. As top management can play an active role in awareness-raising through their involvement in ministry-level decision-making processes, Sudan Customs can be more prominently featured when donors request information from political leadership.

The role of top management in implementing ICT projects is critical. Therefore, to win the support of decision-makers, managers of the General Administration of Compliance and Facilitation should clearly explain the positive impact and benefits that can be achieved by accelerating the digital transformation process in Sudan Customs. Hence, it is the responsibility of top management to bring this to the attention of the higher-level decision-makers at the policy level, including senior ministry officials and politicians.

➤ *Transparency Enhancement*

Policy-makers should take note of the fact that the development and implementation of digital transformation in Sudan Customs are vital to ensure a successful transformation of the organization. This transformation requires fundamental changes to the structure, functions, and core processes of Sudan Customs. Faster response and commitment of policy-makers is necessary in order to ensure the adoption of digital transformation by enhancing transparency and practicing accountability at all levels of Sudan Customs. In practice, policy-makers must accept novel ideas for implementing changes that will lead to digital transformation. However, senior management in Sudan Customs should be eager to implement transparency and be flexible in adopting changing procedures to meet new conditions and solve problems as they arise. Policy-makers must also be willing to practice transparency in all functions and activities of Sudan Customs.

Furthermore, transparency creates accountability and makes it more difficult to claim ignorance of the rules. In addition, it is crucial to develop a climate of trust that fosters integrity between customs officers in order to enhance transparency. Establishing a help desk is also essential to support the administration in serving its customs officers. In addition, transparency enables and enhances organizational governance through the availability of information and ready access to published information for all interested parties. Thus, transparency offers secondary benefits for Sudan Customs through increased trade flows and revenue.

D. Study Limitations

This study has a number of limitations regarding the data and methods, and therefore this section presents the limitations encountered by the researcher during the research.

Digital transformation is a broad topic, and understanding of the concept might vary from administration to administration where different opinions and perceptions may exist regarding digital transformation. Therefore, it would be helpful to study digital transformation by focusing on certain digital transformation drivers in order to better understand the phenomenon.

This study does not comprise all of the critical factors related to digital transformation. Therefore, the factors presented in this study might not provide a clear and precise picture of the conceptual framework, as the reader might prefer to know, for example, the most and least significant factors.

The study results are based on Sudan Customs officers' perspectives, and this investigation does not include other viewpoints such as those from the Sudanese business community or non-governmental organizations.

The paucity of previous studies related to the subject of the study in Sudan influenced the analysis of the current situation of digital transformation by limiting the ability to compare the results with the literature. Furthermore, the use of English-only electronic databases excluded those works published in other languages such as Arabic, which might have been pertinent to this study.

E. Further Research

This study only included certain factors that affect organizational governance, organizational performance, and the acceleration of digital transformation, while other factors such as cloud computing, big data, and blockchain were excluded. Therefore, future studies may investigate these additional factors' influence on digital transformation and officers' professional practice, as they may prove important to accelerating digital transformation. The conceptual model could thus be expanded to include cloud computing, big data, and blockchain, and then link these to the existing factors as appropriate.

Future work could be conducted in other African customs administrations or other customs administrations in different parts of the world. Furthermore, since all customs administrations share the same essential goals and objectives, conducting a comparative analysis related to the same phenomenon would be of interest.

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