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The impact of digital transformation on the accounting system effectiveness

Khaleed Omair Alotaibi *

Applied College, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

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ABSTRACT

In today's rapidly changing digital landscape, most businesses in various industries have embraced digital transformation to improve their operations and efficiency. The accounting industry also has opportunities to enhance the effectiveness of its systems with new technologies. This study introduces a new framework called the Digital Transformation Framework for Accounting System Effectiveness (DTFASE), developed using design science research. The framework consists of five main stages: assessment and planning, implementation and integration, operationalization and monitoring, continuous improvement, and evaluation and reporting. Its purpose is to guide organizations in systematically transforming their accounting systems to boost overall effectiveness. By using this framework, organizations can fully leverage digital technologies to optimize their accounting processes.

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1. Introduction

Technology plays a vital role in the contemporary business environment and has created a new era of efficiency and accuracy in almost all functional areas (Peppard and Ward, 2004). Among the critical functional areas experiencing a transformative shift are accounting, auditing, and business reporting procedures (Liguori and Steccolini, 2011). The emergence of digitalization, backed by information technology, has significantly modified the traditional patterns of accounting, auditing, reporting, and regulatory compliance (Bonsu et al., 2023). Digitization refers to inculcating digital technologies into various aspects of business processes and functions (Knudsen et al., 2021). The adoption and implementation of these technological innovations not only streamline routine tasks but also enhance the overall efficiency of these functions (Jans et al., 2023).

This transformation has many potential benefits to organizations and factors such as real-time data insights, accuracy of reported data, and firms' compliance with regulatory requirements (Hadi et al., 2023). If an organization adapts to this digital revolution, it will find itself equipped with potential and powerful tools that not only speed up routine accounting functions but also make it more competitive by offering more profound insights into financial performance, risk management, and regulatory compliance (Coglianese and Ben Dor, 2020). Furthermore, the adoption of digital technologies for accounting and auditing and other allied functions poses some challenges, such as adaptation to change, additional cost of adaption and implementation, security issues, and skills gap among professionals (Gulin et al., 2019).

According to Tuan et al. (2021), digital transformation is aimed at helping businesses compete in a globalized economy where the Industrial Revolution 4.0 is flourishing. For companies to successfully implement digital transformation, three critical factors must be considered: cost, profitability, and convenience. Digital transformation in an enterprise takes place in two stages or processes (Fig. 1): digitalizing the records and documents and performing the digital transformation. Digitalization is the process of converting physical records into digital formats, while documentation is the process of creating and maintaining records of information. Both digitalization and documentation play a crucial role in the digital transformation of an organization.

Therefore, this study aims to develop a novel framework, called the digital transformation framework for accounting system effectiveness (DTFASE), using design science research. The framework aims to provide organizations with a systematic method for transforming their accounting

* Corresponding Author.
Email Address: komalotaibi@imamu.edu.sa
https://doi.org/10.21833/ijaas.2024.11.021
Corresponding author's ORCID profile:
https://orcid.org/0009-0007-2540-4983
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systems to enhance their overall efficiency. By adopting this framework, organizations can take full advantage of digital technologies and leverage them to optimize the accounting processes.

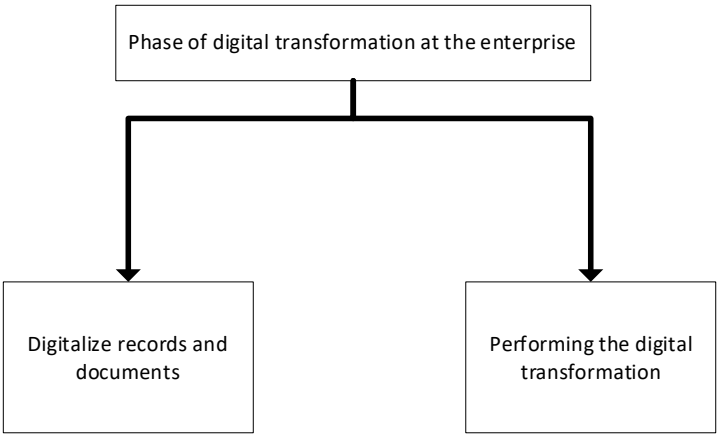

Fig. 1: Stages of digital transformation in an enterprise (Tuan et al., 2021)

This study contributes to the body of knowledge by providing a comprehensive framework capable of optimizing accounting processes by harnessing the full potential of digital technologies. This helps accountants enhance their productivity, improve their accuracy, and gain valuable insights into financial performance. The proposed framework serves as a roadmap for organizations seeking to leverage digital technologies in their accounting processes. The rest of the paper is organized as follows: Section 2 discusses related work and introduces the problem statement and objectives of the study. Afterward, Section 3 presents the methodology adopted for the current research. Section 4 presents the results and discussion. Next, Section 5 explains the limitations, and finally, Section 6 concludes the paper and recommends future work.

2. Literature survey

Various tools have been employed by researchers to investigate the relationships between digital transformation and accounting information systems. For example, Bhimani and Willcocks (2014) pointed out that digitization creates potential transformation for accountants to move from data entry tasks to analytical and strategic roles and to use their intellectual skills to the maximum extent. Despite many opportunities resulting from the digitization of accounting, there are many issues to be considered before moving forward, such as organizations and accountants' issues regarding resistance to change, additional training needed to fill skill gaps, and cybersecurity threats.

According to Vasarhelyi et al. (2015), modern accounting practices have been revolutionized by integrating emerging technologies such as artificial intelligence (AI), blockchain, cloud computing, and data analytics. Advancements in technology have simplified the collection and analysis of financial data, facilitating real-time reporting and predictive analytics.

According to Bucko (2017), the widespread use of smartphones has led experts to propose a new version of banking services called smart banking services, and they have proven that these services are suitable for many people, from young adults to older adults. Security is of utmost importance in banking applications owing to the sensitivity of information on smartphones. These applications influence customer-bank relationships more deeply than their services because they determine what they do.

Alalwan et al. (2017) indicated that banks tend to enhance their efficiency and effectiveness by adopting the latest technologies in the relevant market. The adoption of technology depends on its acceptance by individuals working in the organization and how easily it can be handled. The researchers additionally noted that there are few studies on how people intend to use banking applications through smartphones in Jordan, in addition to the low use rate of banking technology. Therefore, the researchers investigated factors that affect customers' behavior in using smartphones for banking within Jordanian banks. A questionnaire was used to survey a sample of 343 participants quantitatively. The results showed that among the factors affecting behavioral intention are expected benefit, motivation, comfort, confidence, and safety.

According to Barth et al. (2017), financial reporting is a cornerstone of transparent and reliable communication between entities and stakeholders. The goal of disseminating financial data and insights is to allow investors, regulators, and management to make informed decisions. Accurate, timely, and relevant finance reports are crucial to fostering trust, facilitating capital allocation, and ensuring corporate accountability.

Based on the results of Iansiti and Lakhani (2017), blockchain technology has been integrated into accounting practices to enhance trust and transparency. With the use of its decentralized ledger system, transactions are guaranteed immutable, reducing the risk of fraud and increasing the reliability of financial records.

Rehm (2017) presented the main steps to follow to prepare an accounting information system for

digital transformation. The preparation of accounting information systems for digital transformation necessitates establishing principles and directions, defining measures to be taken in exceptional cases, and documenting operating procedures.

According to Demiröz and Heupel (2017), there is a lack of awareness about the overall advantages of digital transformation among business organizations, as many are simply beginning their digital transformation activities.

Gepp et al. (2018) argued that applying AI tools in auditing assists auditors in detecting risks more efficiently and enhances the overall effectiveness of the audit function.

Many authors in their study (for example, Fernandez and Aman (2018) and Kaya et al. (2019)) have argued that the automation of accounting not only accelerates data processing but also minimizes the risk of human errors and enhances overall efficiency. They have also highlighted the need for evidential investigation before the implementation of technology.

Kokina and Blanchette (2019) indicated that development has affected every aspect of life, and it has reached financial management and accounting, too. As electronic commerce became widespread, the need to automate accounting processes became more apparent because of the enormous technological advances in smart mobile banking services dominating the world and the spread of the concept of electronic commerce.

According to Khasawneh and Alqurran (2019), banking life is also increasingly reliant on technology because of the use of information technology in every aspect. As a result, they surveyed Jordanians to determine their intentions to use banking applications in all situations.

The results of the study conducted by Lazarova (2019) showed that the formation of digital transformation happens not only at the highest levels of administrative offices but also at all levels and functions of institutions, including accounting and finance.

According to Minkkinen et al. (2022), the application of digital tools in the auditing process enables auditors to verify all the transactions, which is more effective than traditional sample checks. Furthermore, they pointed out that an accurate and fair view of accounts can be drawn appropriately and certified per the regulatory requirements.

In the period between 2006 and 2019, Rejman Petrovic et al. (2024) measured the efficiency of information and communication technologies in business in the Republic of Serbia. They found out that the digital business transformation process in Serbia was intensive, expansive, and relatively efficient. As a result, companies need to use software packages more efficiently, while e-commerce has been efficient for most years. The results of their study are limited to Serbia, so they cannot be generalized.

Decman et al. (2019), Coglianese and Ben Dor (2020), and El-Manaseer et al. (2023) highlighted that the digitization of accounting benefits both organizations and regulatory authorities in compliance management.

According to Kruskopf et al. (2020), digital accounting is a significant tool that can allow accountants to offer various services that they previously had to spend a lot of time providing. For example, they can solve accounting problems for decision-making, prepare budgets, design accounting systems, calculate taxes, prepare financial statements, and present information clearly and concisely.

Saed (2020) proposed a method for estimating the level of data-driven technologies used by accounting organizations to make more informed decisions. According to the authors, fuzzy logic is a useful tool in assessing whether the accounting system is adequately prepared for digital transformation. This approach aids in estimating the impact of digital transformation on an enterprise accounting system.

Mohammad et al. (2020) highlighted that the digitization of accounting transforms routine accounting tasks, maintains high accuracy in accounting, and transforms the clerical functions of accountants into analytical functions. Furthermore, using AI tools and agile methodologies in the accounting process gives more flexibility to accountants to exercise their intellectual expertise in the recognition, measurement, and disclosure of financial affairs.

Msweli and Mawela (2021) attempted to explore the factors influencing elderly consumers' use of banking services through smartphones. To collect data, the researchers interviewed elderly residents of KwaZulu-Natal in South Africa. According to their findings, the number of elderly people using smartphones for banking services has decreased, and the reasons for this decline include a lack of information and understanding about how these applications are used, language, change resistance, security and trust issues, as well as another demographic factor.

According to Tuan et al. (2021), managers can use accounting work effort and error in digital transformation to locate customers. The organization can then focus on improving product quality and raising its competitiveness.

In another research, Othman and AL-Dweikat (2021) maintained that managing risks during digital transformation has tangible impacts on making appropriate information. This aims to benefit both the makers and users of accounting data. However, the compressive framework for risk management is missing in digital transformation.

Thipwiwatpotjana (2021) examined the factors affecting the digital transformation of accounting firms. Data were collected from 260 employees of 162 quality accounting firms in Thailand using a questionnaire. The data was analyzed using descriptive statistics, Pearson's correlation analysis,

and MIMIC analysis to test hypotheses. According to the results, successful digital transformation depends on adopting digital processes, having a digital mindset, developing a digital culture, and learning digital skills.

A study conducted by Phornlaphatrachakorn and Kalasindhu (2021) examined the effect of digital accounting on financial reporting quality, accounting information usefulness, and strategic decision effectiveness among listed companies in Thailand. According to their findings, digital accounting significantly impacts the quality of financial reporting, the usefulness of accounting information, and the effectiveness of strategic decision-making.

Potryvaieva et al. (2022) highlighted that digital transformation in accounting leads to increased efficiency, accuracy, and overall effectiveness of accounting functions; however, it still needs to be investigated empirically.

According to Tawiah and Borgi (2022), the overall quality of accounting and financial reporting can be maximized through digitization. By leveraging digital tools and software, organizations can enhance their efficiency, accuracy, and transparency in their financial reporting processes. However, it is important to acknowledge and address the challenges associated with digitization, such as cybersecurity risks and the need for continuous professional education.

In another study, Fotoh and Lorentzon (2023) noted the pivotal role of digitization in streamlining routine clerical tasks, eliminating errors, and enhancing transparency and accessibility of financial and non-financial data.

Furthermore, Mardawi et al. (2023) and Tian et al. (2024) pointed out that emerging aspects of accounting, such as environmental, social, and governance (ESG) reporting and triple-bottom-line accounting, can also be accommodated efficiently through digitization and automation of accounting functions.

Asikpo (2024) studied the way technological advancements such as big data analytics, artificial intelligence, blockchain, and cloud computing have reshaped the financial reporting landscape. The research also examined how digitalization enhances financial reporting accuracy, transparency, and efficiency. It showed that there are challenges associated with the digital transformation of financial reporting. The study identified and analyzed several potential risks, including cybersecurity threats, data privacy concerns, and the requirement for skilled personnel capable of configuring and utilizing these advanced technologies.

Wang and Shao (2024) examined the data of Chinese manufacturing enterprises listed on the A-share market between 2011 and 2021. They conducted both empirical studies and measurements about how digital transformation impacts the efficiency of industries. Their findings indicated that digital transformation has a significant impact on the production efficiency of manufacturing enterprises by promoting the efficiency of the manufacturing process. The positive effect is greater for high-tech firms and non-state-owned firms than for non-high-tech firms and state-owned firms.

The literature review revealed a lack of a comprehensive digital transformation framework for accounting systems. The present accounting systems are facing several challenges that make it difficult for them to adapt and keep pace with the rapidly evolving digital landscape. A major problem faced by accounting companies is that their systems do not integrate with each other. Table 1 summarizes key contributions from the literature on digital transformation in accounting, highlighting the focus areas and types of transformation factors studied.

Based on the review of the literature presented in the previous section, adopting a digital transformation framework is necessary to enhance the effectiveness of accounting systems in the modern business environment. The current accounting systems face several challenges that hinder their ability to adapt to the rapidly evolving digital landscape. One of the main problems is the lack of integration between accounting and other systems. Accounting data are often stored in silos, making it difficult to share and collaborate with other departments or external stakeholders. Integration is needed to improve financial reporting and analysis efficiency and accuracy. It is necessary to adopt a digital transformation framework to resolve these challenges and improve the performance of accounting systems. This framework should encompass integrating accounting and other systems, automating manual processes, implementing modern data analytics capabilities, enhancing visibility and control over financial data, and compliance with the latest regulations and standards.

The main objective of this study is to develop a new framework called the DTFASE. This framework helps organizations systematically transform their accounting systems to improve their efficiency and effectiveness.

3. Methodology

This study used the design science research method to develop DTFASE. To collect information about digital transformation and accounting systems from 2015 to 2024, the authors used six online databases: Google Scholar, IEEE Xplorer, Science Direct, Scopus, Springer, and Web of Science (WoS). Next, the authors selected some of the best articles related entirely to digital transformation and accounting systems and arranged them by relevance. "Digital transformation" and "accounting systems" are two keywords used when searching for articles in the databases. As Fig. 2 shows, a total of 8475 articles were extracted, among which 2900 articles were found in Google Scholar, 21 articles in Scopus, 365 articles in IEEE Xplore, 6 articles in WoS, and 5183 in Springer.

Table 1: Summary of the existing literature on digital transformation and accounting systems

References	Focus area	Key technology/contribution	Digital transformation factors
Bhimani and Willcocks (2014)	Big data in management accounting	Big data	Assessment and reporting
Vasarhelyi et al. 2015)	Integration of emerging technologies in accounting	AI, Blockchain, Cloud computing, Data analytics	Assessment and reporting
Bucko (2017)	Security of smart banking (Slovakia)	Smart banking	Evaluation and developing, Assessment and reporting
Alalwan et al. (2017)	Adoption of mobile banking (Jordan)	Smart banking	Evaluation and developing, Assessment and reporting
Barth et al. (2017)	Transparency in financial reporting	Information technology	Assessment and reporting
Iansiti and Lakhani (2017)	Blockchain for reliability in accounting	Blockchain	Execution and combination, Permanent improvement, Assessment and reporting
Rehm (2017)	Digital-ready accounting systems	Cloud computing	Assessment and reporting
Gepp et al. (2018)	AI tools in auditing	AI	Assessment and reporting
Kokina and Blanchette (2019)	Automation in accounting processes	Robotic process automation	Assessment and reporting
Saed (2020)	Decision-making using digital tools	Fuzzy logic	Assessment and reporting
Tuan et al. (2021)	Competitiveness via digital transformation	Digital transformation strategy	Evaluation and developing, Permanent improvement, Assessment and reporting
Othman and AL-Dweikat (2021)	Risk management in digital transitions	Risk management	Assessment and reporting
Thipwiwatpotjana (2021)	Factors in digital transformation for accounting firms	Digital transformation factors	Assessment and reporting
Phornlaphatrachakorn and Kalasindhu (2021)	Quality improvements in financial reporting	Digital transformation	Assessment and reporting
Potryvaieva et al. (2022)	Effectiveness of accounting digitization	Digitization of accounting	Assessment and reporting
Minkkinen et al. (2022)	AI-driven compliance and reporting	AI	Evaluation and developing, Assessment and reporting
Tawiah and Borgi (2022)	Maximized financial reporting quality via AI tools	AI tools	Permanent improvement, Assessment and reporting
Fotoh and Lorentzon (2023)	Digitization and improved reporting	AI tools	Assessment and reporting
Asikpo (2024)	Reshaped reporting with AI and blockchain	Big data analytics, AI, Blockchain	Execution and combination, Permanent improvement, Assessment and reporting
Wang and Shao (2024)	Efficiency in manufacturing via transformation	AI	Execution and combination, Assessment and reporting

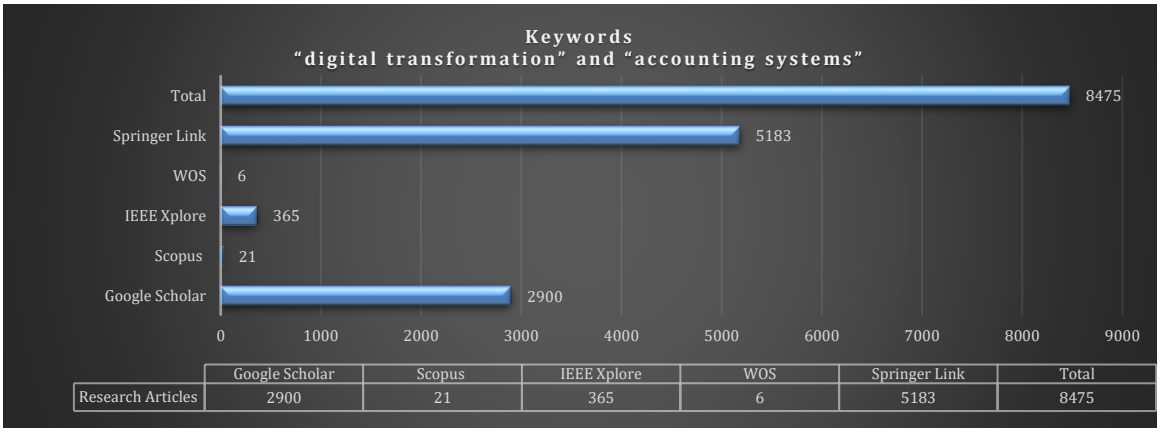

Fig. 2: Articles collected from common online databases

This study followed the inclusion and exclusion criteria displayed in Fig. 2 to filter the articles collected for this study. After identifying 8475 articles, the author removed 3200 duplicated articles and excluded 1300 from the screening process. In the excluding process, the author reviewed the full text of the remaining articles, and 601 articles were removed for these reasons: 370 were out of scope, and 22 were missing the results. Finally, in the inclusion process, only 338 articles were selected for this study. Fig. 3 displays the distribution of articles based on the filtration criteria.

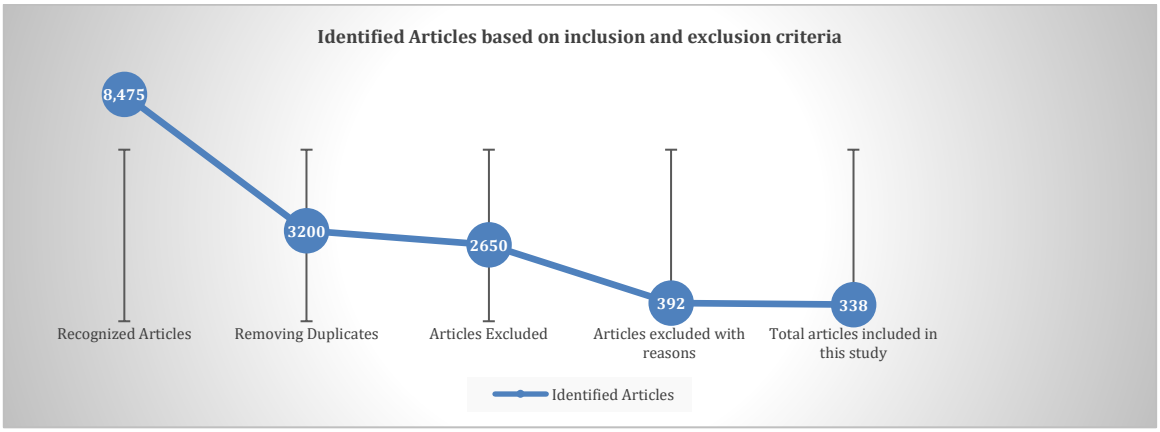

Fig. 3: Identification process based on the inclusion and exclusion criteria

The integration of standard processes and practices of digital transformation and accounting systems in this study resulted in the development of a comprehensive and harmonized framework known as DTFASE. It aims to enhance the effectiveness of accounting systems in a digital transformation environment. The DTFASE offers a comprehensive approach to managing and optimizing accounting processes in digital transformation. The framework encompasses various aspects of accounting and digital technology, ensuring that organizations can fully leverage the benefits offered by both. The developed DTFASE consists of five main stages (Fig. 4): assessment and planning, implementation and integration, operationalization and monitoring, continuous improvement, and evaluation and reporting. In the following, all the stages are explained.

- Assessment and planning: This stage was designed to assess the company's current accounting system and identify areas for improvement. The stage involves identifying existing processes, systems, and technologies and considering future needs and trends. Once identified, a comprehensive plan is developed to guide accounting firms through their digital transformation journey of the company. Initially, the current accounting system is assessed. This involves analyzing various aspects of the system, including its processes, systems, and technologies. The assessment aims to identify areas for improvement and areas for potential transformation. To assess the existing processes, evaluating their effectiveness and efficiency is essential. This involves examining how tasks are performed, identifying bottlenecks, and determining opportunities for improvement. By understanding the strengths and weaknesses of the current processes, organizations can make informed choices about their future transformation directions. The assessment should also include evaluating the current systems and technologies used in the accounting system. This includes the evaluation of their compatibility, scalability, and potential for integration with other systems. The objective is to identify outdated or incompatible systems hindering the digital transformation journey.
- Implementation and integration: DTFASE is implemented in this stage, and the digital

transformation process begins. New technologies, systems, and workflows are integrated into the existing accounting framework. One of the critical aspects of this stage is training and educating employees on new systems and practices. This ensures they have the knowledge and skills to use new digital tools and workflows effectively. Organizations can minimize disruption and ensure a smooth transition by providing comprehensive training.

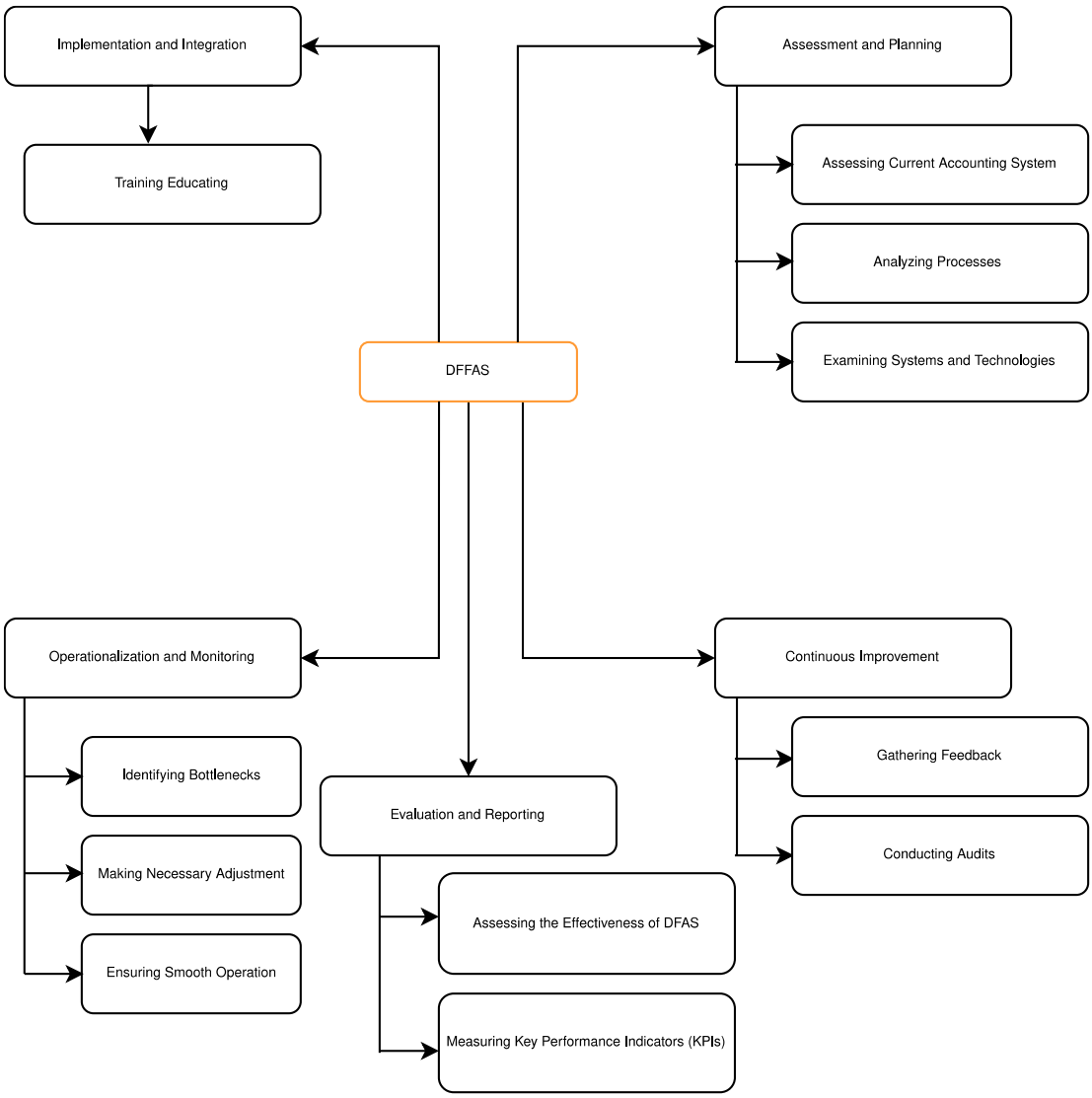

Fig. 4: The structure of DTFASE

- Operationalization and monitoring: Once the DTFASE is implemented, it becomes operationalized within the organization. This involves the ongoing monitoring and evaluation of the effectiveness of the framework. This stage focuses on identifying bottlenecks, making necessary adjustments, and ensuring the smooth operation of DTFASE. The first step in operationalizing DTFASE is identifying potential bottlenecks hindering its smooth operation. This involves thoroughly analyzing the framework's features, components, and functionalities. By identifying such bottlenecks, the organization can proactively address them and ensure optimal system performance. As the organization uses DTFASE, there may be areas where adjustments or refinements are necessary to enhance its effectiveness. This may involve modifying the algorithms of the system, enhancing user interfaces, or integrating additional data sources. The organization can continuously review and update DTFASE to optimize its performance and address evolving fraud threats. To ensure the smooth operation of DTFASE, the organization must establish a robust monitoring and maintenance plan. This plan should include regular system check-ups, updates, and backups. In addition, the organization should establish protocols for reporting any issues, incidents, or anomalies that may arise during the DTFASE operation. By proactively monitoring and maintaining the system, the organization can resolve issues promptly and minimize disruption to its operations.
- Continuous improvement: The DTFASE was designed to be agile and adaptable to changing business needs. This stage focuses on continuous improvement and optimization of the framework to ensure that it continues to support digital transformation initiatives effectively. It involves

gathering feedback, conducting audits, and identifying areas for improvement. By continuously refining DTFASE, organizations can stay at the forefront of digital transformation. It includes gathering feedback and conducting audits. One of the critical aspects of continuous improvement is gathering input from stakeholders and users of DTFASE. This feedback can be gathered through surveys, interviews, and focus groups, and it helps organizations identify areas of improvement and tailor DTFASE to align with their goals. Regular audits play a vital role in ensuring the effectiveness and efficiency of the framework. These audits can be conducted internally by the organization's teams or by independent consultants. Auditors can identify potential issues or shortcomings by examining the framework's processes, procedures, and tools. This feedback can then be used to refine and improve DTFASE.

- Evaluation and reporting: The final stage of DTFASE involves evaluating and reporting the progress made in the organization. This involves assessing the framework's effectiveness, measuring key performance indicators, and communicating the results to stakeholders. This stage helps the organization demonstrate the value of digital transformation and make informed decisions about future initiatives. This stage comprises two steps: assessing the effectiveness of DTFASE and measuring Key Performance Indicators (KPIs). To evaluate the effectiveness of the framework, organizations need to assess the extent to which they have achieved their intended goals. This involves evaluating KPIs that align with the organization's objectives and measuring the impact and outcomes of the digital transformation initiatives. By tracking and analyzing these indicators, the organization can identify areas for improvement and make informed decisions about future initiatives. KPIs are measurable values that indicate the success or progress of an organization's digital transformation efforts. Organizations should select relevant KPIs that align with their strategic objectives and are meaningful to their stakeholders.

4. Results and discussions

Digital transformation has become essential for organizations to stay competitive in today's rapidly changing business landscape. The accounting system plays a significant role in driving this transformation, as it plays a vital role in managing financial information, providing insights, and supporting decision-making processes. This study developed a robust digital transformation framework called DTFASE to help organizations effectively transform their accounting systems. It comprises five stages: assessment and planning, implementation and integration, operationalization and monitoring, continuous improvement, and evaluation and reporting. By adopting this framework, organizations can harness the full potential of digital technologies and leverage them to optimize their accounting processes. The following are the benefits organizations can receive by using the framework:

- Increased efficiency: Digital transformation enables organizations to automate repetitive tasks, streamline processes, and reduce manual errors. This leads to improved efficiency, cost savings, and increased productivity.
- Enhanced data accuracy: Digital technologies enable organizations to accurately capture, store, and process large volumes of data. This enhances data integrity, allowing organizations to make more informed decision-making.
- Streamlined reporting: Digital transformation enables organizations to generate real-time financial reports and dashboards, providing valuable insights into their financial performance. This facilitates streamlined reporting processes, enabling faster decision-making processes.
- Compliance and regulatory compliance: Digital technologies help organizations comply with regulatory requirements such as financial reporting standards. This reduces the organization's compliance risks and enhances its reputation.
- Efficient collaboration*:* Digital transformation facilitates collaboration among employees, stakeholders, and customers. This improves communication, enhances teamwork, and enables real-time collaboration on accounting tasks.

Table 2 contrasts the developed DTFASE with existing digital transformation frameworks and models. For example, the assessment and planning process is covered only by Alalwan et al. (2017), Tuan et al. (2021), and Minkkinen et al. (2022), whereas the implementation and integration process is discussed by Iansiti and Lakhani (2017), Asikpo (2024), and Wang and Shao (2024). However, the operationalization and monitoring process has not been covered by any previous studies, which makes it a unique process for the developed DTFASE. The continuous improvement process was covered by Iansiti and Lakhani (2017), Tuan et al. (2021), and Asikpo (2024). Finally, the evaluation and reporting process is covered generally by all previous studies, as shown in Table 2. Therefore, the developed DTFASE provides a comprehensive and systematic approach to transforming accounting systems. By adopting this framework, organizations can leverage the full potential of digital technologies to optimize their accounting processes, drive efficiency, enhance data accuracy, streamline reporting, and ensure compliance with regulatory requirements.

5. Limitations

The development of a digital transformation framework can have several limitations that can affect the effectiveness of an accounting system. These limitations can arise because of various factors, including the following:

Table 2: Comparison between the developed DTFASE and the existing digital transformation frameworks

Proposed DTFASE stages	Existing works																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Assessment and Planning			√	√								√							√		
Implementation and integration						√														√	√
Operationalization and monitoring																					
Continuous improvement						√						√					√			√	
Evaluation and reporting	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

1: Bhimani and Willcocks (2014); 2: Vasarhelyi et al. (2015); 3: Bucko (2017); 4: Alalwan et al. (2017); 5: Barth et al. (2017); 6: Iansiti and Lakhani (2017); 7: Rehm (2017); 8: Gepp et al. (2018); 9: Kokina and Blanchette (2019); 10: Khasawneh and Alqurran (2019); 11: Saed (2020); 12: Tuan et al. (2021); 13: Othman and AL-Dweikat (2021); 14: Thipwiwatpotjana (2021); 15: Phornlaphatrachakorn and Kalasindhu (2021); 16: Potryvaieva et al. (2022); 17: Tawiah and Borgi (2022); 18: Fotoh and Lorentzon (2023); 19: Minkkinen et al. (2022); 20: Asikpo (2024); 21: Wang and Shao (2024)

- Complexity of the DTFASE: One of the main limitations of a developed DTFASE is the complexity it introduces into the accounting system. Implementing a comprehensive framework involves integrating various digital technologies, such as AI, machine learning, and big data analytics, into the existing accounting system. This integration can be challenging as it involves understanding the capabilities and limitations of these technologies and ensuring seamless communication between them and the accounting system.
- Lack of integration: Another limitation of the developed DTFASE is the potential for lack of integration. When developing DTFASE, it is crucial to integrate seamlessly with the existing accounting system. However, if the DTFASE fails to do that, it can lead to data discrepancies, duplication of effort, and increased complexity. This can hinder the effectiveness of the accounting system, as it becomes more difficult to extract valuable insights and make informed decisions.
- Absence of change management: The implementation of a DTFASE often requires significant changes to existing business processes and workflows. However, the absence of a change management program can significantly lower the effectiveness of an accounting system. Change management involves educating employees about the new framework, training them on how to use its features, and addressing any change-induced concerns or resistance to change. Without a robust change management program, employees may struggle to adapt to the new framework, leading to reduced productivity and increased errors.
- Security concerns: The digital nature of a DTFASE introduces security concerns that can impact the effectiveness of an accounting system. Cyber threats and data breaches have become more prevalent in recent years, and without proper security measures in place, a digital transformation framework can be vulnerable to attacks. This can result in unauthorized access to sensitive data, financial losses, and reputational damage. A comprehensive security strategy should be implemented to mitigate these security concerns, including robust authentication measures, encryption, and regular vulnerability assessments.
- Data quality and accuracy: Data reliability is crucial to the effectiveness of an accounting system, and implementing a digital transformation framework can introduce data quality issues. Digital technologies like AI and ML rely on high-quality data for accurate analysis and decision-making. However, inaccurate or incomplete data can lead to flawed analysis, incorrect financial reporting, and difficulty in making informed decisions. Regular data cleansing, validation, and verification processes should be implemented within the digital transformation framework to ensure data quality.

6. Conclusion

The digital landscape has been evolving rapidly over the past few years, and businesses across all industries are taking advantage of it to streamline operations and improve their efficiency and productivity. The accounting industry, among all, attempts to use technology to enhance the efficiency of accounting systems. To ease this path, this study developed a digital transformation framework (DTFASE) using design science research to enhance the effectiveness of accounting systems. It comprises five main stages: assessment and planning, implementation and integration, operationalization and monitoring, continuous improvement, and evaluation and reporting. Using this framework, organizations are guided to improve the overall effectiveness of their accounting systems through a systematic process of transforming their accounts. Through the adoption of this framework, organizations can harness the full potential of digital technologies and leverage them for cost-effectively optimizing their accounting processes. As part of the future work on this project, the authors intend to implement the developed framework in a real-life scenario to demonstrate its effectiveness.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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