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Organizational Routines and Digital Transformation: An Analysis of How Organizational Routines Impact Digital Transformation Transition in a Saudi University

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Abstract: This study was undertaken in response to the current lack of research identifying organizational routine influences that are exerted on organizations, including in relation to digital transition. Digital transformation refers to the integration of digital technologies, such as data analytics and automation, into an organization, engendering changes in its work routines, processes, structure, and culture. However, digital transition is a strategic process involving significant structural and procedural changes in the shift from one technology to another. Therefore, understanding the effect of organizational routines is essential for understanding how digital transformation impacts an organization, and how best to manage this transition. This study explores the impact of organizational routines on digital transition, in order to understand how they can facilitate a successful digital transformation. It employs a single case study of a university that recently implemented digital technologies, including big data analytics and automation, in some of its managerial services for its employees. It marked a significant technological shift for this public university, and the study specifically explores how the organizational routines affected this digital transition, particularly in terms of managerial and administrative issues. In modern times, many universities worldwide have undergone significant changes, and it is therefore essential to document the impact of organizational routines on digital transition, especially in developing countries where universities play a crucial societal role. The complexity of universities as organizations, and the interaction between organizational routines and digital transition highlight the importance of a case study approach for understanding this complexity. The university with which this study is concerned is a leading public university that holds considerable influence and a leadership role within the higher education sector, and which has adopted various technologies and information systems. The success of the digital transformation at this university may have a significant impact on other universities in the region and encourage them to adopt similar approaches to digital transition and digital transformation in the future, if they understand the impact of organizational routines in such transitions. The results show that organizational routines play a leading role in digital transformation transition; moreover, some aspects can explain the ways in which these routines influence digital transformation transition, such as inherited status, the adaptation of technology and changes to current organizational settings, and power. This study can contribute toward the successful implementation of digital transformation and influence the strategies adopted for the transitions required by digital technologies.

Keywords: information systems; organizational routines; digital transformation; influence; case study

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1. Introduction

Research shows that organizational routines such as habits and repetitive forms of action play a role in organizational life. However, research on how this influences the significant change caused by the adoption of technological systems in organizations is lacking in

the current literature on information systems (ISs) and organizations. Researchers have employed a qualitative interpretive case study, undertaking semi-structured interviews with IS analysts, developers, implementers, and managers involved in digital transformation transition within a single university in Saudi Arabia. This study examined the influence of organizational routines in the course of digital transformation transition by applying a theoretical framework to guide data collection and analysis based on the behavioral theory of economic change, organizational adaptation and change theories, and a theory of power. Thus, this research employed a specific case study that investigated how the organizational routines of a university can influence the process of digital transition. By comprehending the effects of organizational routines on digital transition through this case study, universities can gain insights into how to digitally transform their own organization, and better understand the significance of organizational routines. Specifically, this study explores how the organizational routines of managerial and administrative functions at a university in Saudi Arabia impacted its digital transition. This study conducted interviews with a number of technology experts and users among the managerial staff in order to understand this impact.

The existing routines in an organization may not be compatible with the new digital environment, causing difficulties in integrating the new technology with the existing systems and processes. This can cause delays, errors, and other problems that can compromise the effectiveness of the new digital system. If an organization lacks the appropriate attitude to change, suitable digital routines, and appropriate structural changes, their efforts towards digital transformation will not be successful [1]. Moreover, some organizations may face difficulties in implementing sufficient organizational changes in their practices and work methods (routines) that enable them to fully reap the benefits of their digital initiatives [2]. Previous research indicates that failure rates associated with digital transformation range from 66% to 84% [3], hence understanding how to successfully manage the digital transition by dealing with the associated routines is crucial for preventing the failure of a digital transformation. Prior research reveals that unwritten cultural norms and formal organizational procedures have historically prevented organizational development, especially in the case of technological innovation that affects employees' routines within an organization [4]. It has been demonstrated that developing a digital strategy, identifying enterprise boundaries, breaking down digital transformation processes into specific projects, and developing a unified digital infrastructure are crucial to the success of any digital transformation. However, due to engrained cultural norms, businesses frequently prefer to adhere to established routines, rejecting attempts to implement digital transformation [5]. This highlights the importance of understanding the impact played by organizational routines on digital transition, ensuring that a digital transformation is appropriately targeted.

Understanding the influences involved in the digital transformation transition can help identify aspects that must be avoided. Familiarity with such influence can improve the creation of strategies to deal with routines and enhance the understanding of both issues experienced by decision makers and how they may be addressed. Research (e.g., [6–9]) has shown that organizational routines influence the performance and behavior of employees, clarify power relationships, and enhance participation as well as managerial influence. The implementation of technology and digital transition can have an impact on existing routines, including the flexibility and the actors' orientation. This study focuses on these influences, particularly with respect to organizational routines in the process of digital transformation transition. Therefore, the primary goals set out in this study are to:

1. Determine how organizational routines impact organizations.
2. Assist in interpreting how organizational practices in the university affect digital transformation transition.
3. Offer suggestions for how universities might limit the extent to which organizational complexity has a detrimental effect on the university's digital transformation transition.

Digital transformation can be undertaken to support service innovations [10] or to cut the costs of running and operating an organization [11]. It can also improve and increase organizational competitiveness [12], productivity [13], efficiency [14], and effectiveness [15]; therefore, understanding digital transition—and the role of organizational routines in it—is the first step in ensuring a successful digital transformation. This study contributes to the literature by identifying the influence and impact of organizational routines on the digital transformation transition of a university in a developing nation in order to facilitate the success of future digital transformation in other universities in the region and similar environments. This study's key contribution is to develop a theoretical framework outlining how organizational routines can influence digital transformation transition in a university based on empirical evidence from a case study. Universities implement distinct routines, and understanding the effects of this transition can assist universities in avoiding disruption as a result of the digital transformation transition process. To avoid the delays and disruptions that routines can impose upon digital transformation transition activities, it is vital to understand the ramifications of such routines. Insights into this will be provided in this study to aid university executives and administrators in making crucial decisions to prepare shifts.

The rest of this paper is divided as follows. First, the topic is introduced. Second, the literature on organizational routines and digital transformation is reviewed. Third, a theoretical framework to examine the ways in which organizational routines influence digital transformation is drawn up. Fourth, the research methods and results are outlined. Fifth, the findings are discussed. Finally, concluding remarks are offered.

2. Literature Review

2.1. Understanding Organizational Routines in Organizations

In our everyday life, we all have our own established routines that enables us to go through a busy day and help us minimize our efforts in jobs that we often repeat. Thus, a routine comprises a form of repetitive behavior that can, however, change in response to circumstances [16]. From an organizational perspective, organizational routines are seen as critical methods that enable organizations to achieve their tasks [17] as well as generative systems that represent how a required action can normalize incompatible organizational goals [18]. In the digital transformation area, Laumer et al. [19] found that work routines have a strong influence on the implementation of digital technologies, while they play a major role in user resistance.

Researchers such as Becker et al. [20] considered organizational routines central to the understanding of organizational change; however, thirty years ago, Freeman and Hannan [21] considered them a basis for inertia. Organizations can implement behaviors that form actions that can be performed mindlessly [22] and that can be used by managers and employees to prevent an organizational actor from being held personally accountable for any failure [23]. Such routines can serve as a source of reliability and speed [24] and play a role in managerial control and increase the legitimacy of a firm [25]. A number of additional results have shown that the routinization of organizational tasks tends to increase security [25] and reduce anxiety, which leads to stability [23]. Although organizational routines can produce some complexity, Wurm et al. [26] showed that they can be transformed and made effective.

Polites and Karahanna [27] facilitated a basic understanding of the development of routines in an organizational context, particularly as a result of IS. Such routines, in conjunction with new digital systems, can enhance the understanding of change in an organization during the implementation process and the future use of the new technologies [28]. Polites and Karahanna [27] further argued that current routines can inhibit the additional use of new systems in the course of their initial implementation, which can result in resistance to the new technology. They showed that most work undertaken in an organizational context comprises a routine that is "performed automatically, outside awareness, and occasionally not subject to conscious control . . . habit plays both a positive and negative role in IS use"

(p. 243). This indicates that routines can prevent users accepting new technologies or exploring an unexploited system that has the potential to offer assistance [27]; in other words, they can hinder innovation and creativity. Thus, it is essential for researchers and practitioners to have a clear understanding of how organizational routines can have an impact on the implementation and adoption of technologies.

Chen et al. [29] identified routine reformation as the main challenge for organizational plans toward IT transformation, whereas systems like integrated systems (i.e., enterprise resource planning (ERP)) can provide an opportunity to standardize business routines [30]. Integrated systems embedded as part of the current business processes can both limit and impose organizational routines while such routines may require change on a periodic basis [31]. Scapens and Jazayeri's [32] study of management accountants and ERP implementation examined alterations made to the roles of management accountants, including the elimination of certain routine jobs. Systems such as ERP and knowledge management systems only effectively work when organizations pay attention to adjusting their routines in order to align with extant systems [33]. Thus, a change in business routines may offer opportunities for the successful implementation of ERP [34], which shows that digital transformation technologies may help organizations develop automated, repeatable, and routine tasks [35], and support the reformation of organizational routines.

This understanding of the implementation of digital technologies demanding changes in organizational routines and alliteration is important. There are many possible reasons for digital failure, but we know that organizational routines are one of the main factors [5]. Therefore, developing a good understanding of the potential for organizational routines within organizations and considering how the effects of the digital transformation transition can help organizations introduce digital technologies becomes a vital aspect of any technological adoption process.

Business processes are developed from organizational routines that are permitted by digital infrastructures [36]. However, digital innovation currently involves reengineering, re-inventing, and in some instances, demolishing entire segments of organizations [37]. Such routines encompass two equally constitutive dimensions: first, ostensive characteristics (i.e., an abstract structure of the performance) and second, performative elements (i.e., an enactment of a routine). Both dimensions are influenced by technology [38]. There may also be an overlap between human and material agency, with the potential to form new routines and change an organization's digital systems in order to facilitate productivity [39].

Organizations frequently create and use technologies with the aim of transforming their routines. However, the dynamics that influence routines remain unclear, whereas a re-design of performance models in response to technology focuses on modifying routines [40]. Berente et al. [41] showed that routines can improve implementation and enhance the potential for system integration and control. This may help groups and networks comprising interdependent routines influence organizational stability, change, and innovation [42].

Former research into digital transformation and organizational routines [38,43] has focused on outcomes from a number of different perspectives, including in relation to change and/or performance. However, such studies tend to lack insight into how digital transformation transition may influence organizational routines (and vice versa) in specific contexts. Thus, it is important to develop a fresh perspective to advance our understanding of the reasons behind the successes and failures associated with digital transformation transition in the context of Saudi Arabian universities. Undoubtedly, universities in developing countries have unique organizational characteristics and routines that can play a role during the process of digital transformation transition. For example, some researchers have shown that digital transformation initiatives may be resisted due to the complexities of pre-existing organizational routines [19]. Therefore, focusing on organizational routines and the requirements for digital transformation may help clarify the challenges faced by universities in developing countries.

To date, there is a limited information concerning the ways in which digital transformation is influenced by and in turn influences organizational routines from the perspectives of: first, evolutionary theory of economic change; second, organizational adaptation and stability; third, organizational change; and fourth, power. These theories can improve our understanding of how an organization's day-to-day operations influence and are affected by digital transformation transition. Each theory contributes a different perspective, informing understanding about what we are aiming to achieve. The evolutionary theory of economic change described status, its inheritance, and its role in forming new routines and maintaining routines during digital transformation transition. The organizational adaptation and stability theory can explain how routines are adopted or eradicated to maintain stability as organizations transition towards digital transformation. The dynamics of organizational change, as a consequence of the routine influence of an organization on digital transformation, is another perspective brought about by organizational change theory and finally power theory, thereby enabling and focusing on the role of authorities in overcoming resistance. All four of those theories can assist in interpreting an organizational routine when navigating digital transformation. Thus, there is an urgent need to understand and realize the implications of such processes, especially since their capacity to highlight the ways in which specific problems that arise when adopting IS and digital solutions may be avoided. There is also a need for deeper exploration to broaden the perspectives of organizations and ISs, and thus, this will be the focus of this research.

2.2. Organizational Routines and How They Can Influence Organizations

The literature on IS and organizational sciences sets out the main influences that organizational routines exercise over the performance of employees, including: (1) how they act; (2) the clarification of power relationships; (3) employee behavior; (4) participation; (5) managerial influence and change; (6) the influence of technologies on routines and vice versa; (7) flexibility; and (8) an actor's orientation. These influences will guide the data collection and analysis process undertaken within the theoretical framework for analyzing and interpreting the data presented herein. The influences on organizations will be tested in the context of organizational transformation transition in the university environment.

Organizational routines can influence a firm's performance (e.g., [19,24,29,44,45]). They tend to impact the innovation performance [46] when many processes exist in different areas since these can both slow down the process of running an organization as well as represent its lack of innovation, resulting in creating obstacles to digital transformation transition. Organizational routines influence the behavior of individuals in different situations and scenarios (e.g., [9,20,39,47–49]) and reveal the procedures whereby work is conducted. Therefore, a higher number of daily routines tends to exert greater control on the actions of employees in the course of digital transformation transition, that is, when the usual routine for completing workers' tasks is slow, and decision-making rules are complex. Therefore, a higher number of routines within a company can influence how the individual, the group, and the organization may behave in the course of digital transformation transition, while also highlighting any potential for resistance.

The dynamics of organizational powers is another aspect that can be greatly influenced by organizational routines (e.g., [9,50,51]) because of their capacity to concentrate power in the hands of specific actors. This is also evident during digital transformation transition, which can influence the decisions taken in favor of, or against, such routines. In particular, routines tend to influence participation (e.g., [9,23,52]) in relation to administration as well as the task of balancing conflicting organizational goals [18]. Thus, with repetition, routines tend to facilitate such tasks, and help employees acquire appropriate skills and balance organizational conflicts.

Similarly, organizational routines influence stability and adaptability (e.g., [9,53,54]) in relation to practices and rules that exist in organizations. Certain actors involved in digital transformation such as a project management office (PMO) can co-transform and adopt new ways of carrying out tasks [55]. Thus, routines that have existed over a long period of

time can encourage stability in the performance of work, thus facilitating adaptability in the course of digital transformation.

During their initiation, organizational routines influence different actors' orientations (e.g., [54]) while digital transformation can determine actors' views and future directions within the organization, indicating that actor orientations are vital for clarifying inter-organizational direction [56]. Additionally, routines can influence managerial decisions and help with organizational change (e.g., [20,51,57]). This shows that digital transformation can initiate new ways of obtaining information and knowledge, thus influencing decisions and changes in aspects such as structure and/or behavior. On the other hand, organizational routines can halt change [58], thus influencing the result of organizational transformation led by digital technologies. Organizational routines influence the use of technology (e.g., [59]), and so digital transformation alters how technologies influence routines, which may alter its potential. Understanding how organizational routines affect the technologies utilized and implemented during processes of digital transformation is vital, since it can assist in preventing failure and ensuring the success of such programs. This research analyzes how organizational routines affect digital transformation by revealing how technology and organizational routines interact.

The main gap in the literature that this research addresses is that of how organizational routines influence digital transformation. Another gap addressed herein relates to the lack of studies available that have adopted an interpretive case study to realize the processes that show how such impacts arise.

2.3. Organizational Routines in the University Context

Universities have unique characteristics that distinguish them from other organizations, and the various models that influence their development and progress play a significant role in their status [60]. However, there is a tension between the nature of universities and the technological systems designed for the private sector [61]. Calls for universities to change and to transform their organizational characteristics have recently emerged [62]. However, managing the regular routines of universities can represent a risk to this, reduce coordination and mutual comprehension, and add to the time and mental effort required by those involved in a transition [63]. Universities must therefore prioritize the ongoing improvement of their use of information technology and adopt a democratic leadership style that empowers their staff [64] in order for their organizational structure and decision-making processes to have an impact on digital transition. Universities can differ in terms of their governance, and depending on their location, can assign varying degrees of emphasis on either authoritative leadership or a democratic governance style [65]. Moreover, universities tend to have a distinct organizational culture [66]; some, for example, have an internationalization culture [67]. Therefore, the governance style and organizational culture of universities can have an impact on their digital transformation transition. Saudi universities are unique due to their level of legislation and government support, and this influences the type of digital transformation required, as well as the way it is managed. There is currently a gap in the literature regarding how universities' unique routines impact digital transformation transition, including in the context of Saudi universities. The case study university in the present research automated some of its managerial services within its e-service systems and developed a system that enabled it to use its data in the form of analytics, in order to support its decision making. This study explored the organizational routines that impacted on this organizational transformation transition. Thus, Saudi Arabian universities share similarities with both American and European universities, as they all have similar aims in terms of conducting research and providing higher education. However, universities can vary significantly in terms of culture, society, and politics, as well as in their management style. Additionally, the adoption of digital technologies can also differ, with some universities heavily embracing them while others do not. Therefore, conducting more case studies in developed and developing

countries is essential to increase our understanding of how digital technologies can be successfully implemented.

2.4. Digital Transformation Transition

The primary challenge for organizations undergoing digital transformation is effectively managing the digital transformation transition process [68]. "Transformation" refers to a significant change within an organization that influences both structure and strategy [69] and the distribution of power [70]. It concerns the implementation of technologies to increase productivity, value creation, and social welfare [71]. This results in change within the different aspects of an organization (including the use of technologies) and is capable of advancing processes and changing business models [72], including digitization processes, with a focus on efficiency [73].

There is increased awareness of the value of digital technology for firms, including to help them align their business and use of IT as part of a shared digital business strategy [74]. This shows that digital innovation can form a collection of digital technologies and their physical constituents with the aim of developing new digital products. This can lead to major changes in strategies and processes, while also prompting companies to reconsider their organizational logic [73]. Thus, digital innovation concentrates on improving current physical products through digital capabilities [73]. However, organizations can fail to increase their value because of an interruption between the design and implementation of strategies [75].

Very little research has focused on the organization of digital configuration [76]. Few studies have examined how organizational routines influence digital transformation, including the potential difficulties (see [77]). The absence of existing evidence can impact the development of appropriate strategies, resulting in various risks for the business involved, primarily because of the failure to consider all influences exerted on routines, including successful digital transformation. Strategizing for digital transformation plans should include a clear vision, along with planning and implementation [78]. In the implementation stage, a company should consider routines and how to best establish an appropriate strategy [79].

Digital technologies have culminated in considerable organizational transformation over several decades [73]. They have enabled major improvements [80] and have combined digital technologies and business processes [80]. However, research has shown that organizational routines are essential for establishing appropriate strategies [81].

The digitization process must recognize the needs of the entire firm instead of merely focusing on digitization alone, because of the ability to transform relationships, and the presence of a bureaucratic and organizational culture [82]. However, for digital transformation to succeed, it is important to recognize how and when to apply technologies, including taking into consideration the new IT identified by Andal-Ancion et al. [83], that is, information intensity, customizability, electronic deliverability, aggregation effect, search costs, real-time interface, contracting risk, the network effect, the benefits of standardization, and missing competencies. It is important to understand the ways in which change tends to take place in different organizations, and the successes of transformation [84]. Organizations must understand how different organizational concepts (i.e., routines) influence the success of digital transformation to ensure that implementation goes as planned, so as to realize the benefits of digitization within the organization.

The present study employs this understanding of digital transformation, namely the influence of information technology on various aspects of an organization, such as its structure, processes, routines, and ability to adapt to technological changes. This study places considerable emphasis on the technological aspects of IT, and the need for alignment between IT and organizational routines. Specifically, it highlights how IT can impact an organization's routines, and the ways in which new technology can be integrated [85]. Since digital transformation plays a role in improving business models, and process optimization is part of this process [86]. This study focuses on processes and procedures in order to understand the influence and impact of routines on digital transformation transition.

The digitization of processes mainly focuses on improvement through the use of technologies by reducing the number of steps required to perform a task [87]. In the case study, automation was developed for some services related to management in order to assist in performing the processes concerned without the involvement of administrative staff [88]. This study addresses digital transformation transition from the perspective of the previous understanding of technological terms, such as the automation of processes at a university, and the use of big data in how organizational routines can impact and enable organizational transformation.

3. Theoretical Framework

Multiple theories are referenced in information systems research, but few theorize digital transformation and its organizational aspects such as organizational routines. This necessitates the consideration of available theories that exist in the fields of organizational and information systems, with the potential to explain the nature of organizational routines and changes to these routines, or their process of adaptation during moments of digital transformation. For the purpose of this study, the following theories were reviewed: the evolutionary theory of economic change, organizational change theory, organizational adaptation, several studies of power, resource-based view, institutional theory, and the dynamic capabilities view.

According to the perspective of the resource-based view, organizations own various resources, some of which afford them a competitive edge, and others that result in exceptional long-term results [89]. This theory explains routines as a resource with the potential to influence digital transformation by either supporting the use or adaptation of digital transformation. However, this theory has limitations, as it mainly focuses on internal substantial resources and capabilities, and is limited in its potential to explain the insubstantial resources and changes to organizational routines that can be caused by the process of digital transformation in organizations.

Institutional theories suggest that organizations are compelled to comply with commonly accepted standards and appropriate forms and behaviors. Failure to do so could cast doubt over the legitimacy of the organization, which may then negatively impact its ability to acquire resources and garner social support [90]. This theory has limitations with regard to explaining changes in the dynamic nature of organizational routines and the digital transformation of organizations, as it focuses on the stable nature of organizations and commonly accepted issues present within organizations.

The basic premise of the dynamic capabilities view is a firm's capacity to integrate, build, and reconfigure organizational resources using key processes to respond to environmental change and uncertainty and to design novel value-creating strategies [91]. However, this theory has limitations in terms of explaining how organizational routines can facilitate or impede digital transformation. For example, the theory typically focuses on the development of new capabilities rather than benefiting from existing ones such as organizational routines that could be adopted to augment the digital transition.

Consequently, the evolutionary theory of economic change, organizational change theory, organizational adaptation, and several studies of power were selected according to the following criteria:

1. The requirement to understand how organizational routines change in times of digital transformation transition.
2. The role of previous routines, their nature, and their impact on digital transformation transition.
3. How routines influence performance and behavior during periods of digital transformation.
4. How routines are adapted and decisions are made with regard to the role of organizational routines during digital transformation transition.

To comprehend the impact of the above, it is important to examine how previous routines and practices have contributed to the development of a new reality during periods

of digital transformation transition (and how the concept of practices inherited from the evolutionary theory of economics can assist with interpreting this impact). Organizational change theory can be a helpful tool to analyze how routines change and how they influence performance and behavior in organizations as they move towards and beyond digital transformation. How organizational routines are adapted and become flexible during periods of digital transformation can be illustrated by employing organizational adaptation and flexibility theory. How power assists in stabilizing or changing organizational routines is valuable when influencing digital transformation processes and can be interpreted and analyzed with the assistance of power theory.

3.1. The Evolutionary Theory of Economic Change

The evolutionary theory of economic change is helpful in examining organizational routines. It was first developed by Nelson and Winter [45]. It concentrates on technological issues pertaining to production, highlights the cognitive nature of organizational structure, and views a firm as comprising an entity that produces, processes, and stores knowledge. This theory has not been defined, but it is generally understood that it emphasizes expertise and information as the main components in the study of evolutionary economics. It is significant that economic experience is considered an established routine replicated by practice which is focused on the concept of a form of inheritance at play in the behavioral routines, technologies, and characteristics of the economic system [92–96]. Thus, this theory was primarily chosen to help explain how the routines of the university (the case study) adapt and change in response to digital transformation transition. The evolutionary theory of economic change focuses on issues pertaining to the economy and change. One of its central concepts is routines being discussed in relation to the economy and theory, with practice being a unit of analysis that results in familiarity with the workings of both organizations and the economy [16]. The theory connects routines to genetic material, that is, they are seen as following a mechanism identical to that used by genes in the human body, that is, influencing behavior while ensuring that genealogical information remains untouched [23]. Thus, organizations and societies affect organizational digital transformation as they inherit their infrastructure and practices which affect their development [92–96]. Therefore, this theory can be used by researchers to understand how organizational routines shift and adapt to changes, emphasizing the importance of inherited practices during periods of change. Organizational routines, according to this theory, also play a role in shaping whether systems and technologies succeed or fail during digital technology transitions.

3.2. Organizational Change Theory

A company's routine offers various opportunities for empirical research to study organizational change [20]. A number of studies (e.g., [16,45,97,98]) have shown that routines form one of the fundamental components of organizational behavior, thus representing the mechanism of how organizations complete work while also serving as a potential tool for achieving change [20]. Feldman [17] demonstrated the existence of an internal dynamic within routines that are capable of encouraging organizational change. These dynamics pertain to participants acting as agents. Thus, the need to detach others from existing routines is removed and change is seen as taking place through the response of workers. Routines can facilitate change in organizations if they lead to an improvement in performance, the development of new routines, and the provision of a foundation for positive change. This means that routines follow a cause-and-effect pattern—new routines emerge from old routines. This shows that highlighting a routine can help a researcher observe the internal dynamics that facilitate change [20]. Thus, this theory was chosen because it demonstrates how organizational routines can become barriers, especially when they hinder a university's ability to fully integrate digital technologies. Alternatively, organizational routines can also drive change within the university by facilitating the adoption and adaptation of new digital systems. Organizational change theory is therefore useful for assessing how organizational routines impact digital transformation, allowing researchers to recognize

what issues may drive change during the implementation of digital technologies. More specifically, it can reveal how routines facilitate changes in terms of the performance and behavior of users when dealing with technological systems.

3.3. Organizational Adapatation Theory

Organizational routines have become central to both adaptability and stability. This means that routines are adaptable and are imbued with sufficient flexibility. For example, routines influence performance by remaining adaptable to different situations. When organizational members become involved, they learn to recognize the actions that they must take in order to effectively work towards achieving their business goals [9]. The adoption of new technologies and innovation by such businesses generally differs because of the difference in their selection of reference groups [99]. However, routines may cause inertia, obstruct adaptation, and delay organizational change [100]. This theory provides researchers with a unique lens through which to examine and understand how universities deal with and respond to change, while also identifying issues that drive organizational routines to adapt to digital systems. Organizational adaptation theory helps recognize what and how changes in organizational routines can occur when adapting new digital systems at the university.

3.4. Power

During a routine performance, an interaction takes place between agency and context, demonstrating that actions have the potential to change routines. The performance of routines is grounded in agency, whereas the power of interactors emphasizes the purpose of agency and context and can verify the place of individuals in an organization [54]. The symbolic capital and positions of actors can create new routines and reactions in opposition to corporate plans for change [50], thus disrupting the workings of the organization's power/knowledge base [51]. This theory help examine how decisions related to change are taken in relation to organizational routines positioning in times of digital transformation. Understanding who has the potential to influence routines at a university is one way of grasping the impact of organizational routines during the implementation of digital systems. Power theory provides a lens through which to understand why and how the influence of organizational routines affects the decisions made by a leader or users. This can lead to an improved understanding of the issues that drive digital transition from the perspective of power dynamics.

3.5. Development of the Theoretical Framework

Each theory was selected to analyze and interpret the impact of organizational routines on digital transformation and transition from multiple perspectives. Different concepts were borrowed using different lenses and theories to achieve an almost full impression of their impact. The ideas associated with previous routines and their impact on the evolution of routines (e.g., the idea of practices inherited from the evolutionary theory of economic change) and future settings can inform the process of digital transformation and determine the generated results. Thus, during a process of digital transformation, routines can clarify how infrastructure and practices have the potential to impact development. However, the processes whereby digital transformation informs organizational change cannot be fully understood unless we comprehend its impact on organizational performance, behavior, and change. Moreover, based on our understanding of former practices, their influence on development, and how this guides routines can only be interpreted and analyzed according to organizational change theory. How such routines in organizations can be adapted and rendered flexible during times of digital transformation assists us in realizing the extent to which digital transformation is impacted through the lens of the theory of organizational adaptation and flexibility. Lastly, power is an important concept that can be addressed to understand how actions and decisions are made with regard to digital transformation, as impacted by organizational routines.

4. Methods

4.1. Study Design

This study adopted an ontological view of social constructivism [101], emphasizing that the acceptance of how organizational routines influence digital transformation transition requires an understanding of the culture and context in which such change takes place. Interpretivism supports the researcher in understanding the problem examined [101]. The influence of organizational routines on digital transformation transition can be understood through interpretation [102]. The current study assumes that interpretivism would produce a reconstructive understanding of the social and historical context of how organizational routines influence digital transformation. Klein and Myers [103] indicated that in order to understand how a situation under investigation unfolds, research should focus on the historical context for the ways in which organizational routines influence digital transformation [102].

This study implemented a qualitative methodology that offers a systematic means of appreciating the influence of organizational routines on digital transformation transition from the perspective of participants. This included interviews that produced rich data to analyze and interpret the social and institutional context [104]. Qualitative methodology is wide-ranging and focuses on producing a theory from the data and methods employed, that is, interviews. The study of organizational routines influencing digital transformation requires the generation of a theory that is completely grounded in data; quantitative methodologies are unable to derive sufficiently rich information compared to qualitative approaches [105].

This study therefore used a qualitative case study strategy, which is considered the most appropriate for the examination of a particular phenomenon while also delivering meaning collected in equal measure from supporters and opponents [106]. It examines organizational routines along with their influence on digital transformation transition in the context of a specific university in Saudi Arabia. It concentrates on one group in a single setting and produces complex data [104,105]. Case studies are the most effective means of examining "how" organizational routines influence the digital transformation transition [107,108].

The preparations for this study began three months before data collection (May 2020). After receiving authorization from the university administration, the researcher interviewed the university's IT manager for an hour and a half. The researcher requested the names of IT specialists, system analysts, and university managers that had engaged in the digital transformation process and therefore had knowledge and experience of digital transformation and organizational routines. The researcher employed the snowball sampling method in each interview, wherein each interviewee was asked to recommend additional individuals with relevant knowledge so that they could also be interviewed. This provided additional insights into how organizational routines influence digital transformation [109].

The reason for choosing this university as a case study was that it enabled a detailed exploration of how university management and administrative routines can affect the digital transformation transition in a developing country, as the university employed forms of automation in some of its services and used big data analytics to support its managerial decision making. Choosing an appropriate case study facilitated our understanding of certain issues related to routines and digital transformation transition that were difficult to capture via other methods. It also provided a unique understanding of a particular kind of organization that differed from other sectors that employ emerging technologies. Moreover, the case study illustrated the practical implications of digital transformation transition for other organizations in the same sector.

4.2. Participants

Data were collected through semi-structured interviews [110] with 30 individuals, each lasting approximately one hour and a half. The individuals interviewed comprised a project manager, five organizational managers, seven IS implementers, seven employees in

different departments within the organization, five systems analysts, and five developers (See Table 1 for more information about the participants). The interviewees were chosen in order to collect a variety of perspectives on the research question. The interviews clarified the complexities involved in digital transformation transition by revealing how organizational routines added either to success or failure [111]. The data collected for this study were gathered using interviews with members of the managerial and technological staff who participated in developing and implementing the digital systems at the university. There was no need to interview individuals from, for example, the academic staff or the student body, as the focus of the study was concerned with managerial operations and how the university's organizational routines influenced its digital transformation transition.

Table 1. Research sampling.

Participant Number	Participant Role	Department	Code Name
P1	Project manager (consultant)	IS	PM1
P2	Department manager	Human resources	DM1
P3	Department manager	Finance	DM2
P4	Department manager	Administrative Communication	DM3
P5	Department manager	IS	DM4
P6	IS implementer	IS	IS1
P7	IS implementer	IS	IS2
P8	IS implementer	IS	IS3
P9	IS implementer	IS	IS4
P10	IS implementer	IS	IS5
P11	IS implementer	IS	IS6
P12	IS implementer	IS	IS7
P13	Department manager	Purchases	DM5
P14	Employee (user)	Human resources	E1
P15	Employee (user)	Human resources	E2
P16	Employee (user)	Finance	E3
P17	Employee (user)	Finance	E4
P18	Employee (user)	Administrative Communication	E5
P19	Employee (user)	Administrative Communication	E6
P20	Employee (user)	Purchases	E7
P21	Developer	IS	D1
P22	Developer	IS	D2
P23	Developer	IS	D3
P24	Developer	IS	D4
P25	Developer	IS	D5
P26	Analyst	IS	A1
P27	Analyst	IS	A2
P27	Analyst	IS	A3
P28	Analyst	IS	A4
P29	Analyst	IS	A5
P30	Analyst	IS	A6

4.3. Development of Interview Questions

The interview questions were developed in order to understand how organizational routines affect the university's digital transformation transition. The questions were developed from the literature by first identifying the organizational routines that influence organizations and information systems, and second, developing a theoretical framework to help formulate questions that would reveal their various impacts on digital transformation transition. This aimed to gather general information on the interviewees and asked for their views on the university's digital transformation. The questions gathered information on the impact of organizational routines on digital transformation. A theoretical framework

(see Figure 1) that developed leading questions following those listed was used. Some examples of these questions are as follows:

- How inherited routines affected digital transformations was a follow-up question to how organizational routines influenced digital transformation.
- How the university managed change in the course of digital transformation and the influence of routines in managing that change were two other follow-up questions.
- How adaptation, stability, and power influenced organizational routines and had an impact on digital transformation were asked in order to obtain a full picture of the interviewees' views.

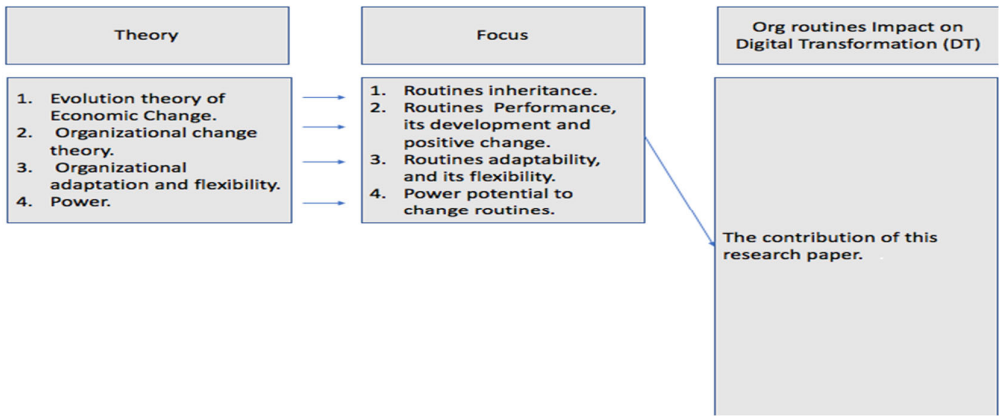

Figure 1. The theoretical framework developed.

The questions concerned the influence and impact of organizational routines on digital transformation transition, and focused on the influences identified in the literature: namely (1) how actors act (in response to the decision to change and move towards digital transformation at the university); (2) the clarification of power relationships (how power relationships impacted the digital transformation, which means how power was used to help or the opposite in the university's digital transformation); (3) employee behavior (how employees behave during the implementation process); (4) participation (how employees participate in the digital transformation in both helpful and unhelpful ways); (5) managerial influence and change (the impact of management and leadership on the university's digital transformation); and (6) the influence of technologies on routines and vice versa; (7) flexibility (how far the university and its employees were flexible and open to change); and (8) actor orientation (how the employees' orientation toward the planned digital transformation impacted its adoption). The interviews sought to gather background information on the interviewees and the organization, as well as details on how the interviewee described the digital transformation initiative in their organization and how they believed organizational routines influenced digital transformation.

4.4. Data Processing and Analysis

Eisenhardt [112] highlighted the role of theory as a guide in developing and executing a data collection instrument as an iterative process of both collection and analysis, and as a final product of research [113]. This study relied on the behavioral theory of economic change, organizational change and adaptation, and power theories to shape the theoretical framework guiding the data collection and analysis. This helped locate the research in the correct organizational context and understand how organizational routines can influence digital transformation transition. Data were analyzed through a six-step method developed from Cresswell's [114] systematic technique. First, the researcher transcribes the interviews as well as organizes and prepares the data. Second, the researcher reads the collected data in order to understand it. Third, the researcher codes the data. Creswell [114] defined coding as a process of organizing data into sections of text before clarifying their

meaning. The researcher assembled the resulting information into categories. Fourth, the researcher identified the themes in the data for analysis, including the specific details of how organizational routines influence digital transformation transition. Finally, the data were interpreted by comparing the findings with the relevant literature. This method was considered appropriate because the procedure for its application was clear (Please see Table 2 for how analysis and interpretation performed).

Table 2. Examples from interviews indicating how analysis and interpretation performed.

Theme	Evidence (Example from Interviews)	Support from Literature
The influence of inherited routines on performance	Users tend to perform well when routines are transparent once adopted and injected into the heart of the organization. (IT manager (DM4))	Supported and used the lens of evolutionary theory for economic change to intercept it.
Organizational routines lead to flexibility in the digital transformation project.	Organizational routines can influence, lead to, and generate flexibility during digital transformation, which, by its very nature, requires change in all organizational work and processes . . . (Information Systems implementer (IS3). . . . However, automation results in less flexibility . . . (Information System implementer (IS2)	Supported and used the lens of organizational change theory to interpret this.

Specifically, the process of the analysis and interpretation was as follows:

1. The interview transcripts were organized into themes and key concepts, and the relevant elements from the interviews were sorted under each theme in the first step of the coding process;
2. The theme schemes were developed and informed by the research aims and questions using the theoretical framework to organize the data;
3. The theme schemes were applied to the data, by reading the data and commencing the coding by assigning codes to the relevant text. This was repeated multiple times;
4. The patterns present in the text were recognized following the coding, which identified the phrases related to the research aims and questions, and by considering the ways in which they were informed by the theoretical framework;
5. Once the coding was completed and the themes and patterns present in the data were identified, these were interpreted by linking the theoretical framework to the findings;
6. To ensure the validity and accuracy of the interpretation, the study applied the data triangulation of participants by meeting different people with varying descriptions and their involvement in digital transformation. This technique was used to validate the results obtained from the interviews. Therefore, the data triangulation of participants was applied to ensure the accuracy of the results.

5. Results

The development and implementation of digital technologies has been a goal for many organizations as they strive to provide more and better information to help them compete in an increasingly global business environment. In some cases, digital systems are implemented according to technical specifications with little regard given to organizational and end-user considerations [115]. Pliskin et al. [116] argued that the same IS may have different meanings for different people, such as analysts and users, as their views of these systems may differ. More recently, digital transformation has produced different meanings for people inside the organization itself [117].

More specifically, many businesses experience failure with digital technologies, particularly when implementation does not align with established organizational environments and particular routines [1]. The term "organizational routines" relates to a number of

aspects. Primarily, it denotes the repetition of straightforward actions and the methods required to accomplish organizational tasks [23,118].

This section presents the findings from the interviews. The participants' views of the influence of organizational routines were examined and interpreted. The findings were then compared with those of the extant literature. The university examined in this study is a major public university that was established in the middle of the previous century and is now one of the largest ones in Saudi Arabia. It is managed by a rector and four vice rectors, along with the deans of colleges. Over the years, the university has relied on various IS and digital solutions. The digital environment has been managed by deans and specific departments.

5.1. Saudi Arabia Context

The objectives of Saudi Vision 2030 include the establishment of a digital government, improving the Saudi economy, and forming a dynamic digital society by moving and positioning countries as an internationally competitive information and communications technology center [119]. Many services, including those related to commerce, are earmarked to benefit from this shift.

Until recently, in Saudi Arabia, organizations have been largely centralized in terms of management and operations, including decision making, and automation has become the norm in many organizations. The Ministry of the Interior has presented excellent examples of how digital technologies, such as the web-based system and application "Absher," changed existing routines and supported the automation of several services provided to citizens in a public organization. Services such as issuing passports, driving licenses, IDs, as well as visas for foreign workers, were automated by Absher [120]. Absher represents a strategic change in the Saudi government's focus on advancing e-governance in the country [121]. As a large-scale project, it shows that digital technologies can improve services and contribute to organizational transformation. Information systems and technologies have similarly been introduced to higher education institutions to improve management, research, and teaching. As universities have unique routines, the current study aimed to document changes in routines attributed to digital transformation in a Saudi higher education institution. It does so by presenting a successful case study from the sector, which can support research in other sectors. Today, in Saudi Arabia, there is a growing trend towards the automation of many services, including higher education. Universities have a history of implementing digital technology to support academic and managerial functions. The country established a commission for artificial intelligence and data, reflecting the government's plans to support the public sector with digital technology, which is expected to transform the way in which the government provides services to its citizens. This ambition is also reflected in public universities.

5.2. Inheritance of Infrastructure and Practices during Digital Transformation

Inherited routines constitute an aspect of workforce interactions with new technologies, because they operate in a manner comparable to that of genes in the human body. The behavioral theory of economic change reflects this. For example, the literature states that only knowledgeable actors can influence routines, either by creating new aspects or changing existing ones [23,122,123]. While implementing new technology, actors tend to transfer their previous practices (i.e., the experience of other technologies) to the performance of new routines [39,124]. Thus, their evolution can be observed by considering the influence of technology on user performance in the course of digital transformation. For example, an IT manager (DM4) stated:

> "*During the implementation of ERP, which took place years ago, it was clear that organizational routines had several influences, with one having a beneficial impact on users' performance. Therefore, users tend to perform well when routines are transparent once adopted and are injected into the heart of the organization. This is because the*

knowledge of routines can make digital transformation a reality and more rapid process attainable as it directs users toward improved participation".

Meanwhile, an analyst (A2) explained:

"*Digital transformation is affected by previous systems implementations, as these practices, routines, and infrastructure move with us, and are used in arguments and [in the] efforts to adopt the new processes of digital transformation. These routines can impact the performance of the employees during the process in two ways, either positively or negatively*".

This can be interpreted and explained by the behavioral theory of economic change, as a main issue in the theory is the idea of the inheritance of routines, which plays a role in the development of such routines in the organization affected by technological systems. These inherited routines play a role in the change and in the move from one situation to another situation during the process of digital transformation.

However, routines can inhibit performance in the course of digital transformation, potentially because new routines tend to influence users' ability to complete work, as a result of changing processes. This may be the case because individuals tend to avoid change, which can be tiring for organizational actors. For example, a systems analyst (A1) stated:

"*In our efforts to implement an information system for a public organization, we put in tremendous effort to maintain our previous processes and work in the face of the benefits that digital transformation can bring to the organization, which can influence performance. We found that employees feared the prospect of change and that despite the new trends in technology, some preferred to continue working as they had done previously, rather than to learn new methods and skills. All this can restrict performance and digital transformation*".

Thus, organizational routines can influence the emergence of new processes in the course of digital transformation. The literature agrees that business processes form emergent organizational routines that are characterized, permitted, and forced by IT artifacts that are established in the course of functional-hierarchical decomposition and social design [125]. An information systems analyst (A1) stated:

"*Organizational routines can be influenced by new processes that emerge as a result of digital transformation, thus changing routines accordingly*".

Organizational routines lead to flexibility in the course of digital transformation. The literature shows that companies that are stable and inflexible require organizational routines in order to evolve [59]. However, routines that promote flexibility ensure that new information systems follow certain rules and processes; however, they can potentially result in digital transformation leading to less organizational flexibility in turn. This shows that the evolution of routines is not always possible. One information system implementer, (IS2), stated:

"*Previously, the traffic department experienced minor errors that the manager was able to address with the routine and rules. So yes, before this there were high levels of flexibility, but now the [Absher] system requires citizens to upload all the necessary papers, meaning that they have to provide exactly what is needed in order to complete their requests. However, automation results in less flexibility*".

As a developer (D2) noted:

"*This issue of organizational flexibility tends to be true before the automation of some processes at the university, as there is a need to have the correct data in the systems. Without this it's impossible to provide the service needed. So this kind of inflexibility of digital systems ensures the correctness of the data, and aims to reduce errors as much as possible*".

Behavioral theory posits that routines usually change and influence new practices and routines. However, regarding digital transformation and organizational routines, flexibility or inflexibility can be understood in the following way, as explained by project manager (PM1):

> "*I can answer this issue from two angles: one, organizational routines affect the participation in the digital transformation transitions by influencing, for example, decision-making regarding how to proceed and improve processes, and [how to] deal with managing change; second, it can be the case that if the organizational leadership improves processes, it enables the achievement of the potential of automation, for example at the university*".

5.3. Organizational Routines Impact on Performance and Change during Digital Transformation

Routines for completing organizational tasks can continue throughout the course of digital transformation transition, and may result in a change or confirmation, as an aspect of future transformation. This is contingent on the actors' acceptance of how digital transformation should progress in order to confirm improvements in the operating atmosphere of the organization. This shows that the provision of incentives for workers and other personnel during digital transformation may cause routines to become constant with specific aims and goals. The literature supports the previous understanding of these factors. For example, Laumer et al. [19] study of the implementation of IS systems identified routines as having clear benefits, including the ability to exert strong influence on user resistance. It also demonstrated that the ease of adoption and use can also mediate user resistance. A systems developer (D2) stated:

> "*Organizational routines may influence and change user behavior either positively (supporting digital transformation), or negatively, depending on the nature of routines and the organization. We learned that once systems are implemented, we must understand their nature, especially processes that have been in place for a long time that expect certain behaviors from users. However, you encounter tremendous resistance to change, including attempting to convince you that new systems do not align with the existing rules. Still, in reality, this does not fit existing organizational routines*".

An IS implementer (IS3) explained:

> "*This can be relevant to digital transformation transition, where the behavior of the employees is impacted by the digital transformation. Some employees preferred the previous routines and were more relaxed, [but] if a practice they were familiar with [was affected], they might be threatened by the new systems, and raised a kind of resistance*".

A developer (D3) agreed regarding the fact that routines can influence behavior:

> "*Routines have the potential to change . . . the university [supported this by] influencing behavior and encouraging [staff] using various methods, such as providing incentives, which the university policy supported to encourage acceptance behavior*".

Organizational routines can be influenced by managerial actions in the course of digital transformation transition with the literature confirming that routines can facilitate change [45]. Additionally, existing routines (i.e., managerial actions) tend to influence digital transformation, which can, in turn, influence managerial actions, that is, to follow decisions and the benefits of automation on future change. According to a systems developer (D5):

> "*This question of how routines influence managerial action and change can be answered by identifying the relations between routines and managers, including whether it is one of power, productivity, competency, or strategy. Second, what changes can digital transformation bring to routines? Is the change related to automation or increased responsibilities? For example, if you see the relationship between the manager and the routine as one of power and find that the digital transformation will reduce his responsibilities and transfer them to higher managers, then the manager in danger of*

losing his authority will resist digital transformation. In contrast, if the manager sees routines and needs to get rid of them, then he can focus on strategic targets, which will result in a positive relationship with respect to digital transformation".

Managerial actions and decisions regarding organizational routines play a role in digital transformation transition. For example, the support of such a project by leadership plays a role in modifying or accepting routines, and engenders understanding of how organizational change can be achieved, as demonstrated in the extant literature concerning organizational change [20].

This study concluded that organizational routines influence actors' orientation in the course of digital transformation, as confirmed by the literature, including Howard-Grenville [54], who showed that individuals and groups deal with routines using diverse intentions and orientations, proposing that an agency forms specific routine performances. A systems analyst (A5) stated:

"*Organizational routines can influence an actor's orientation in the course of digital transformation. This may be possible when routines are developed and improved based on an actor's orientation within the organization as actors tend to keep or develop routines, particularly during a period of digital transformation*".

Routines both influence and have the potential to change actors' orientation when there is a clear benefit for employees as a result of digital transformation. A user (E5) explained:

"*There is a high possibility that organizational employees can have positive relationships with routines and may find them comforting. Thus, they have a positive influence on employees' orientation. This means that digital transformation influences routines when it has a clear and useful result and can be beneficial to users' interests. In such cases, a new routine can have a positive influence on actors' orientation during digital transformation*".

Meanwhile, an implementer (IS4) observed:

"*Support for digital transformation was demonstrated when the employees had a previous understanding of what technology can bring to a change, in the way they conducted their work, such as their normal routines. When their view [of the change] was positive, this supported the process of digital transformation*".

5.4. Organizational Routines Have the Potential to Be Adoptable during Digital Transformation

In the course of digital transformation transition, the performance of employees and actors enables the analysis of the influence of organizational routines. The adaptation of new approaches can serve as the principal reason for the acceptance of subsequent change. This may be the result of the possible influence of routines on organizational adaptation theories. This study found that organizational routines influence stability and the adaptation to new technologies in the course of digital transformation transition, as supported by the literature. Feldman and Pentland [23] argued that routines can be a source of both change and stability and identified two relevant aspects: the ostensive (which represents the structure) and the performative (which represents the precise actions undertaken at specific times and places). They believed that the former allows actors to guide, explain, and suggest the exact performance of a routine, whereas the latter makes, preserves, and adapts the former. They also argued that the association of the ostensive and performative aspects confirms an extensive variety of consequences that range from stability to substantial change. A systems consultant and project manager (PM1) stated:

"*Organizational routines can influence stability and the adaptation of change in the course of digital transformation. I remember, during the implementation of a major ERP in a public organization, routines tended to stabilize old processes. However, working and improving these processes and reflecting them in the ERP systems along with their use*

in the organization, implies that routines have the potential to adapt to changes during digital transformation".

Meanwhile, a system implementer (IS3) explained:

"*The adopting of technological systems by the university involved some of the processes and routines being adapted and stabilized with the new technology. An automation for the service of a disclaimer from the university, which used to be through a written application, signed by a huge group of people, . . . changed to make the service totally automated, which meant that the process was changed using technology, . . . [and] adapted. The means of adaptation to new routines depends on the nature of technological change, and how useful it is*".

This study found that organizational routines tend to be influenced by new technologies in the course of digital transformation, as supported by the literature. Labatut et al. [126] showed that the development and implementation of a technology over an extended period of time, including placing greater emphasis on its disciplinary impact, has a relationship with any changes to organizational routines and players' competences, which can result in novel actions. An information systems implementer (IS4) stated:

"*Organizational routines may be influenced by new technologies that can create new processes and rules that will eventually improve or remove routines. New technologies impact organizational routines, which we can say mostly improve and adapt to new organizational routines*".

However, this study also found that routines influence the process of digital transformation by altering automation and the distribution of responsibilities, thus potentially exerting considerable influence on adaptation. A systems developer (D3) explained:

"*Technology generally leads to automation in an organization, and to decreased and increased responsibilities in particular jobs. It may also create new jobs with new responsibilities. For example, issuing a new or renewing an existing driving license in Saudi Arabia involved several processes. With digital upgrades and a web-based system called Absher, they have changed the process and reduced many managers' responsibilities and decreased the need for some jobs, while also increasing the requirements for programmers. Many managers felt that their work had become easier because of the Absher system, and that the pressure of and time taken to finish work had also reduced*".

Developer (D2) noted:

"*At the university, the new technologies, such as big data analytics, have changed the way [we] take decisions, which are now supported by real data. This means the routines concerning the ways the leadership take decisions are based on evidence. [This] changed the routines used for collecting data and information from the university departments, regarding, for example, quality matters. Now it is available any time and [it is] easier to get through the technological systems, which helps the university plan its management routines*".

5.5. Through the Role of Power, Actions That Play a Potential Role in the Success of Digital Transformation Can Be Understood

The engagement of players in organizations along with their power in the course of digital transformation can lead to change by incorporating their control over beneficial information and knowledge concerning routines and over how work should be completed. This influences the methods through which digital transformation can help an organization develop its routines. This study found that organizational routines influence power relations in the course of digital transformation. The literature has concluded that ostensive and performative routines can shape power relations within organizations [127]. The arena in which routines function, along with the actors' symbolic capital and position-taking throughout implementation can help routines influence initiatives for organizational change [54]. A systems consultant and project manager (PM1) stated:

> "*Organizational routines have an evident influence on power relations in the course of digital transformation. Those with greater familiarity can be in a powerful position to either support such digital transformation or create obstacles. This can be, for example, knowing certain technicalities (i.e., know-how) that are necessary for undertaking specific jobs or processes and understanding an organization's hidden rules. This knowledge makes these actors very powerful and ensures that they play a key role in successful digital transformation*".

Organizational routines can influence power relations, particularly because of fears arising from the need for employees to increase their skills as a result of digital implementation. The respondents felt that some university managers tend to fear a possible loss of authority with employees because of the loss of power as a consequence of digital implementation. A systems developer (D3) noted:

> "*While implementing IS in a public organization once, I remember that a manager said that employees now do not need to receive instructions . . . as all work processes were automated, which meant that his authority and guidance and the need to order employees to carry out work had decreased, because the new systems took care of all processes and the manager only had to approve them*".

Organizational routines tend to influence user participation, which can increase their power in the course of digital transformation. This aspect has not been directly discussed in the literature, but it can be concluded that this can take place in response to the participants' reflections on and reactions to several consequences of the preceding repetitions of the routine [17]. Systems developer (D2) stated:

> "*Organizational routines can influence and increase participants' power in the course of digital transformation. It is obvious that when users agree that digital transformation can improve their work processes and make their work easier and more productive, they tend to participate more in digital transformation initiatives, which, in turn, can increase their power*".

The interview data showed that digital transformation and solutions within organizations tend to encourage participation because those that are promoted to senior positions will, in the future, comprise employees who will support digital transformation and implement appropriate processes. This is because such initiatives attract support from both the government and private organizations. A systems analyst (A4) supported this finding and said:

> "*In the course of digital transformation, we tend to notice that employees normally support our efforts and make sure that they are successful. In a country that has an e-government policy, the employees know that we are the future and so ensuring the current and future success in an organization means supporting us in our efforts*".

5.6. The Development of the Theoretical Framework

The main conclusions that informed the development of the theoretical framework are as follows:

1. Organizational routines can inhibit performance during digital transformation because they can influence users' capacity to complete tasks which are integral to the process of change.
2. Organizational routines have an impact on organizational processes in times of digital transition.
3. Organizational routines tend to be flexible throughout a digital transformation.
4. Organizational routines can be impacted by managerial actions during a period of digital transformation and transition.
5. This study found that organizational routines are typically influenced by new technologies in the course of a digital transformation.

6. During a transition to digital transformation, the performance of employees and actors enables an analysis of the influence of organizational routines. The adaptation of new approaches can serve as the principal reason for the acceptance of subsequent change.
7. The engagement of key players in organizations, in conjunction with their power over the course of a digital transformation, can effect change as they exert their control over beneficial information and incorporate their knowledge concerning routines to determine how work should be completed.

This framework was developed to highlight the main issues and themes regarding the means of theoretically understanding how organizational routines impact the digital transformation transition according to the relevant theories cited in the extant literature. For example, the evolutionary theory of economic change assigns greater emphasis and importance to the idea of practice inheritance, which can be related to routines in changing environments. This concept was further investigated in order to consider the impact of organizational routines on the digital transformation transition in interviews with the university staff. The analysis of the results identified the fact that inherited infrastructure practices as routines played a role in the transition, demonstrating a strong impact of organizational routines on digital transformation transition. This was supported by a number of the interviewees, who explained that the routines concerned moved from a previous situation to a new situation, and that a certain amount of effort was required to understand how to develop them and improve them using digital technologies. The existing organizational change literature and theory highlighted how routines impact performance, and how performance is developed or changed. This can be very important for understanding how organizational routines impact digital transformation transitions, and this was evident in the university involved in this research, since it sought to improve the performance of its managerial functions and its services to its stakeholders by understanding how organizational routines can change while comprehending how performance is developed. This is because digital transformation transition is influenced by the effect of its performance. Additionally, digital transformation engenders general improvements in performance. In addition, organizational change theory highlights how performance changes. This informed the current study's focus and the analysis of the interviews which was conducted through the lens of organizational change theory. The lens of organizational adaptation and flexibility also assisted in interpreting the findings regarding how routines are adapted and how flexible they are. Understanding the role of power in the impact of organizational routines on digital transformation aided the interpretation of how the decisions which are taken can play a role in the success of a digital transformation transition. The theoretical framework developed as a result of applying this lens to the university in our study and it was used to interpret the findings of the interviews.

This study contributes to the current body of literature in the field by exploring how organizational routines impacted a particular digital transformation transition. Understanding this impact via the theoretical framework employed has the potential to increase the success rate of digital transformations in the future. For example, underscoring the role of routines in a transition and those inherited at the time of change is important for avoiding the potentially disruptive effect of introducing new digital products in an organization, and may influence the organization's performance in the transition period, along with the operation of its managerial functions.

This theoretical framework can be used by universities in different contexts, as well as by other organizations, as it enables an understanding of important issues concerning routines and their impact on digital transformation. Moreover, it highlights the importance of both managers and technological staff at a time of change and transition must be aware of the issues that can impact the success or failure of the transformation. For example, engendering better decision making by enhancing understanding of the ways in which power is relevant to a digital transformation transition, since a power relationship can impact the change of routines during a transition.

6. Discussion

6.1. Linking the Findings to the Prior Literature

The literature concerning the impact of organizational routines on digital transformation that this study aimed to explore is limited. The literature regarding organizational sciences has long discussed organizational routines. However, the influence of digital transformation on organizations remains an area in need of special attention. Organizational routines play a major role in the successful implementation and use of digital technologies. Thus, developing a clear understanding of their impact can help organizations and developers or implementers develop a clear set of ideas to assist them in being cautious during the implementation and use phases. This study provides a response regarding how organizational routines have an impact on digital transformation.

It is important to consider the influence of technology on user performance in the course of a digital transformation transition. By understanding the inherited infrastructure practices that were previously employed in conducting managerial functions, it is possible to gain understanding of future performance expectations following a digital transformation transition. Indeed, there are few studies concerning how organizational routines influence performance during digital transformation processes. This study showed that, at a time of digital transformation, actors have typically transferred their previous practices and knowledge of the technology when performing new organizational routines in times of digital transformation. Singh et al. [128] and Zahi et al. [129] indicated that digital transformation improves performance within organizations. The organizational sciences literature pointed out the extent to which organizational routines play a role in the speed of organizational performance [24], although Gardner et al. [130] observed that organizational performance arises as a result of the use of both technologies and routines. This means that understanding the nature of previous experience and habits for organizational actors can determine the support afforded by digital transformation for successful technology projects.

Additionally, there is a need for organizations to realize that flexibility in routines and processes affects the success of digital transformation, as proven in this case study. This means that organizations have to move towards being more flexible if they are to maximize the benefits of their huge investment in technology and avoid failure. For example, Leonardi [39] described the case of introducing computer simulation technology into automotive design, developing a framework that showed the contradictions and challenges of working in an environment where technology and organizational routines are not flexible.

This study demonstrates that organizational routines have an impact on organizational actors' behavior during a digital transformation transition. This is because these actors tend to employ certain long-standing behaviors for conducting routines, and can be resistant to changing them, which can play a role in the success of a digital transformation transition. Because digital transformation transitions are impacted either positively or negatively, the nature of the behavior, understanding the behavior, and providing initiatives to encourage the actors concerned by the digital transformation transition are important. As reported in the existing literature (e.g., [131]), it is also important to encourage organizational actors to behave in a manner that is supportive of change, including a digital transformation, and to participate in the change.

Organizational routines are influenced by managerial actions during a digital transformation process, and vice versa; therefore, the capabilities and style of the managers involved influence the success or failure of a digital transformation transition. Digital transformations often do not fail due to problems with strategy or business models but rather fail for reasons related to leadership [70]. Hence, managerial actions play a central role in accepting the changes to the extant routines that are necessary to reap the benefits of automation and digital transition.

Moreover, the attitude of the actors concerned can be connected to the outcome of a transition; a positive attitude towards certain familiar organizational routines can influence

the kind of support that the actors provide to a digital transformation transition, and vice versa. Encouraging the appropriate kind of attitude to technology that engenders trust in the technology by the actors will generally support the advanced technology implementation [132]. Therefore, actors' attitudes towards routines and existing processes, particularly in terms of their degree of support for these routines, can shape the form of their support for a digital transformation transition, which ultimately determines the fate of the transition.

Organizational routines can influence the stability of the organization and the adaptation to the change caused by a digital transformation transition. Routines can either be stabilized or adapted in the process, and existing organizational routines as well as the attitude of the organizational leadership can determine the fate of these routines. By its nature, digital transformation requires changes and adaptations to new routines in order to benefit from the full potential of the new technologies. It is sometimes the case that, due to pressure from other organizational actors, the leadership must stabilize the routines concerned during the digital transformation transition. It is therefore important that the leadership understands the needs of the organization and is able to see the benefits of improving its processes. Digital transformation requires ongoing adaptation on the behalf of an organization, which must be malleable to this [133].

During organizational change, organizational routines are impacted by improving or changing the processes involved [1]. In addition, the way in which managerial functions are conducted is also impacted by the new technologies present in digital transformation initiatives. While new technologies have the potential to improve organizational routines, the changes to organizational routines involved can often affect user participation, as evidenced by the present study, and their knowledge, experience, and attitude to the change can play a role in the success of a digital transformation transition. Users therefore have power to determine the success of adopting new technologies via their support of, or resistance to, a transition. Moreover, they also have the power to influence others' views of new technology, and the energy required to support a change [134].

Therefore, organizational routines in times of digital transformation require leaders to understand the nature of organizational change mechanisms to avoid and prevent user resistance and assure the best performance as digital transformation transition becomes a reality. As Robey et al. [135] explained, while embedded IT artifacts may impose specific behavioral patterns, human agents have a variety of options available when appropriating such artifacts. Thus, habits may result in particular organizational changes, or serve to reinforce ingrained habits over time. To make digital transformation adaptation successful within an organization, it was proven in this study that stabilizing organizational routines can be enhanced or altered according to the nature of the routines and how organizational leaders wish such routines to be managed during the process of digital transformation.

In addition, this study proved that digital transformation could play a role in change and have an impact on organizational routines, as demonstrated at the university. It was previously found that organizational adaptation, as a result of the adoption of technological innovations, played a role in transformation within organizations in competitive environments [99]. Power was also an important element in this case, showing that power struggles could arise during digital transformation, inhibiting efforts towards digital transformation. Thus, understanding where power exists and having a leadership strategy in place to deal with it would also be expected to have an impact.

6.2. Novel Conclusions

This study developed a theoretical framework (as can be seen in Figure 2) to explore and empirically interpret a case study at a university recently involved in digital transformation. This was performed through the use of a theoretical framework predicated on the behavioral theory of economic change, organizational adaptation, and change theories, and a theory of power also helped when interpreting the impact of organizational routines on digital transformation.

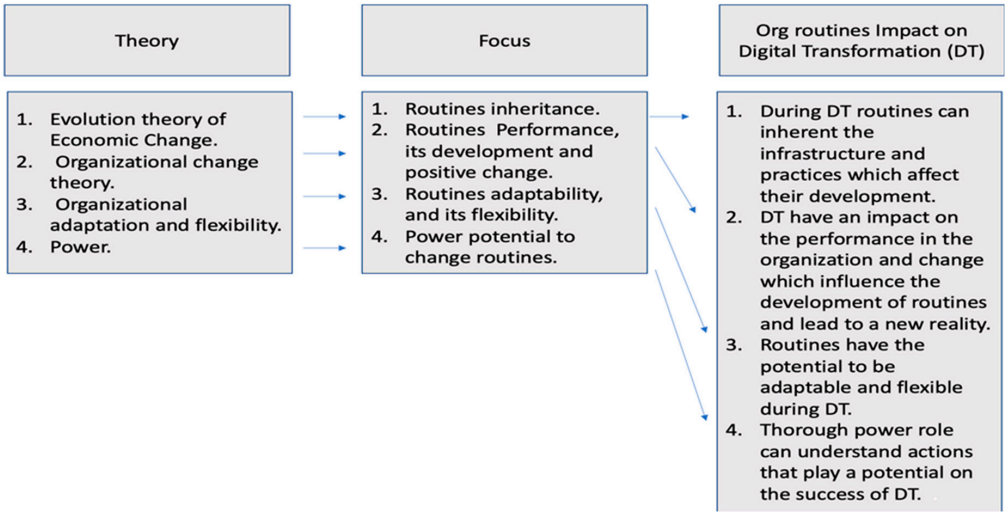

Figure 2. The contribution of the theoretical framework of this study.

This study further contributes to and brings new insights to digital transformation's impact on organizational routines. It can be used in the analysis and guide studies exploring how routines impact digital transformation in different contexts. Thus, bridging the different perspectives in the study enriched and strengthened the interpretation of the data and the results. For example, the behavioral theory of economic change helped advance an understanding of how previous routines are moved or adapted as a result of digital transformation.

Additionally, the lack of digital transformation influences organizational routines in general, particularly in developing countries. This case study and the interpretation of the information collected based on theoretical frameworks that consider organizational routines contributes to the literature by enhancing an understanding of the processes that facilitate and complicate digital transformation. Saudi Arabia has a unique culture that can enrich the IS literature, especially by elucidating what happens when implementing technologies in an organization. Furthermore, as Walsham [113] explained, case studies can be generalizable, making them beneficial to both researchers and practitioners.

Some limitations were associated with sampling in this study, as we sought out employees with technological backgrounds and managers at an organization in Saudi Arabia. The analysis was based on a single theoretical framework developed in relation to the data collection process, although other theories could have explained the findings from different perspectives.

Nevertheless, the data did show that decision makers should also consider the impact of organizational routines on the success or failure of digital transformation. A clear understanding is needed before and during the implementation process so as to also benefit the technological staff involved in the implementation process during a digital transformation.

7. Conclusions

This paper contributes to the field by identifying the influence of organizational routines on digital transformation, including their impact on the process of digital transformation, as the field of digitization currently lacks studies concerning theory, and those that introduce new concepts [38]. By recognizing this influence, organizations can ensure that organizational routines do not form an obstacle to digital transformation transition. The theoretical implications and framework (see Figures 1 and 2) developed for the analysis of the data collected for this study enhanced our understanding of digital transformation and the impact on the organizational routines involved, by providing an analytical tool for evaluating the mechanisms of organizational change by focusing on the issues of inherited routines and practices [136] and their impact on digital transformation transition.

The framework emphasized the concept of change, in order to explore the importance of understanding how and why routines change [137] as a consequence of a digital transformation transition. The examination of the elements of organizational adaptation and flexibility in terms of the routines involved and their impact on a digital transformation was important for determining how such adaptations and the degree of flexibility of the organization concerned play a role in supporting organizational routines during a period of technology transition. The adaptability and flexibility required from an organization can be redesigned over time as appropriate [130]. The theoretical framework employed by this study highlighted the issue of power, and how power relations play a role in modifying and retaining the routines involved in a digital transformation transition, the understanding of which is important for comprehending their impact on the processes and successes of a new IS implementation [138].

This paper determined the requirement to establish the influence of technology during a period of change in the following manner: first, how organizational routines influence the performance of employees; second, the ways in which individuals act; third, the impact of power relations; fourth, the behavior of employees; fifth, the issue of participation; sixth, the factor of managerial influence; seventh, change; and finally, flexibility and actors' orientation. These factors have all been linked to digital transformation transition and it is necessary to determine their independent and collective impacts.

Universities can use the theoretical framework proposed herein to develop a clear plan of action for strategizing a digital transformation, the need for which was identified by the existing literature [139], including identifying how organizational practices inform digital transformation procedures, a matter that the present study contributed to, adding to the findings of previous research (e.g., [140].) This study will also help advance an understanding of how a university's managerial and administrative routines in a developing nation can affect a digital transformation transition that promotes improvements to the governance and data management of the organization involved [141]. The findings of this study can help managers understand the influence of organizational routines on the process of digital transformation and facilitate the success of such initiatives through their understanding that allowing employees to participate in developing new modes of working can influence or improve new routines. Additionally, they might consider that it is sometimes important to design their organizational routines so that they correlate with the university's goals and aims during the time of digital transition.

One area of potential future research would be to consider how organizational routines relate to digital transformation so as to develop a theoretical framework to describe the impact of emerging technologies and digital transformation in multiple cultures and contexts.

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