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Organizational readiness for digital financial innovation and financial resilience

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ABSTRACT

The use of digital financial innovations (DFIs) in firms is widespread for supply or demand reasons. Successful realization of DFIs requires a digital transformation of the organizations. To date, there is hardly any study that discusses the organizational or strategic antecedents of DFIs in organizations. This study uses the organizational readiness and strategic alignment theories to understand how various dimensions of organizational readiness (change valence, change efficacy, and contextual factors) influence DFIs. The study also informs about the moderation effect of digital technology – business strategy alignment on the relationship between organizational readiness and DFIs. We find that the organization's change efficacy (comprising of resource readiness, IT readiness, and cognitive readiness) and contextual factors (comprising of culture readiness, strategic readiness, and partnership readiness) positively influence DFIs. However, no support is found for the moderation effect of digital technology – business strategy. We also find that DFIs positively impact the firms' financial performance and resilience (robustness and adaptability). The results are informative for practitioners and theoreticians. For practitioners, the study informs that realizing DFIs in organizations requires reconfigurability and flexibility of resources, IT, strategy, collaborations, and organization culture. Moreover, DFIs offer financial resilience to the firms to absorb financial shocks. For theoreticians, one crucial finding is that in a developing economy context, digital technology – business strategy alignment does not play a moderation role in realizing DFIs, which may not be the case in the developed economies and merits further research.

1. Introduction

Digital financial innovations (DFI) make use of digital technologies to realize financial solutions that support businesses in executing their operations (Khin and Ho, 2019). The DFI encompasses various essential and emerging technologies and concepts such as block chains, big data analytics, social networks, near field communications, peer to peer technologies, crowdfunding, the internet, and artificial intelligence (Dozier and Montgomery, 2019; Du et al., 2020; Gomber et al., 2017; Hua et al., 2019) to name a few. The conceptualization of DFI utilized in this study relates to how well the DFIs of a firm are compared to its competitors in terms of quality, features, distinctness, application, or novelty. The use of DFI promises several benefits to firms including, better customer experience and profitability (Mbama and Ezepue, 2018; Nasiri et al., 2020; Wang et al., 2021), supply chain financial performance (Du et al., 2020), market value (Lam et al., 2019); financial inclusion of stakeholders in the value chains (Aisaiti et al., 2019); crowdfunding for social venturing (Mollick, 2014); and managing risk under natural disasters (Barnes, 2020) such as COVID-19. While DFI provides various cost and efficiency benefits, it also nurtures risks to all stakeholders (Longworth, 2020). The requisite digital transformation of firms for adopting digital technologies, with the changing nature of the technologies and the competitive landscape, makes firms particularly vulnerable, and organizations must be ready to adapt to these changes. Besides the growing recognition that DFI enables the organization's digital transformation, the empirical work in this domain is still scant, and there is a strong need for practical investigation (Khin and Ho, 2019).

The theory of organizational readiness is entrenched in change management and offers the all-embarrassing theoretical support for assessing organizations' readiness for DFI (Lokuge et al., 2019). It is evident that organizational readiness is an imperative prerequisite to capture the full benefits of the DFI (Jun et al., 2021). Similarly, Williams (2011) and Lokuge et al. (2019) also confirmed that despite the

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proliferation, deployment, and ease of use of DFI, organizations are yet unable to achieve the full advantages because of a lack of organizational readiness. Although DFI is a game-changer towards sustainable growth, the state of affairs is susceptible in developing countries (Bongomin et al., 2019), where organizations are not well equipped for digital transformation. Besides the growing recognition of DFI that enables the organization's digital transformation, the empirical work in this domain is still scant, and there is a strong need for practical investigation (Khin and Ho, 2019). Further to the above research gaps, our motivation to focus on DFI and organizational readiness is also triggered by several practical reasons, (1) because of the COVID-19 pandemic, many businesses (in a developing country like the United Arab Emirates (UAE) have reported a high level of volatility in their financial flows which has threatened the viability (or has resulted into closure) of many firms owing to lack of readiness, (2) the service sector (which is one of the biggest sectors of the economy in the UAE) is mainly enabled by secure, trustworthy, convenient financial transactions and customer experience and a lack of it results into loss of business especially in the post-COVID world.

A review of the extant literature on the antecedents and consequences of DFIs does not show a very healthy picture (Appendix A). Appendix A shows that the most studied concepts related to DFI include the attitudes or intentions to adopt financial technologies (Hu et al., 2019; Kamble et al., 2019; Senyo and Osabutey, 2020; Wong et al., 2020). Moreover, there are a few studies that focus on digital-related capabilities (Nasiri et al., 2020), customer perceptions of digital banking (Mbama and Ezepue, 2018), and the development of Fintech (Wang et al., 2021). The extant literature also informs about the antecedents of DFIs, such as motivational factors for the adoption of DFIs, behavioral factors such as perceived ease of use, perceived usefulness of the digital technologies, and the trust and risk of using digital technologies. Similarly, the consequences of DFIs such as customer experience, market value, and financial performance (profitability, cost, and return on assets) have been studied. The review of the literature reveals a need to (1) investigating digital transformation-related factors that influence DFIs in organizations and (2) understanding how would DFIs influence the financial performance of firms in a volatile market environment.

We thoroughly reviewed the literature to understand the organizational factors (specifically organizational readiness) that may influence technology adoption or DFI (Appendix B). We find that different aspects of organizational readiness (e.g., employee motivation (Kankanhalli et al., 2015), employee self-efficacy (Mancha and Shankaranarayanan, 2020; van de Weerd et al., 2016), organization structure, processes, values, and capabilities (Gillani et al., 2020; Khin and Ho, 2019; Wiesböck et al., 2020), organization climate/culture (Fuller et al., 2007; Uzkurt et al., 2013), and strategic factors (Leidner et al., 2010; Yen et al., 2012)) have been investigated in the literature but none of these studies commenced a holistic view of the organizational readiness factors. We intend to cover this research gap by focusing on the novel three dimensions (change valence, change efficacy, and contextual factors) of the theory of organizational readiness proposed by Weiner (2020) and Lokuge et al. (2019) as an antecedent of DFI.

We also realize from the extant literature that DFI has been shown to influence the financial performance of the firms (in terms of return on assets, cost reduction, or profit increase) (Giudice et al., 2020; Nasiri et al., 2020) positively. On the other hand, Likewise, Liu et al. (2013) pointed out that the operations management literature lacks empirical evidence as to whether the adoption of digital technologies could improve performance. Besides, due to the COVID-19 pandemic, many firms are experiencing financial shocks, delays in payments resulting in a change in financial plans, and uncertainties in offering services to customers. Thus, the firms have to exhibit financial resilience to cope with such financial shocks (Ali et al., 2018; Nkundabanyanga et al., 2019). We argue that the organizational readiness concept provides a rich set of aspects (belonging to employee, organization, and strategic factors) that will help in realizing DFIs in firms. However, this will also require from the outset an alignment between the business strategy and the DFIs. We also argue that the DFIs will be instrumental in providing robust and accurate information to decision-makers in the firm on which bases they can make responsive decisions. This will, in turn, improve not only the financial performance but also the financial resilience of the firm. Our main research question is;

RQ-What is the impact of organizational readiness on DFIs of the firms?

This overarching research question is followed by two sub-questions.

RQa- What is the relationship between the business strategy of a firm and the adoption of DFIs?

RQb-What is the impact of DFI on the financial resilience of the firms?

The rest of the paper is organized as follows. Section 2 provides theoretical support for the overall research model being investigated in this study, following by the hypotheses development in Section 3. Section 4 offers methodological details, and Section 5 presents analyses and results. Section 6 discusses the results and concludes the paper.

2. Theoretical underpinning

To realize their objectives, organizations need to be ready for a change that might be challenging in many cases, and literature proposes various theories in this regard. To summarize the structural and psychological nature-related ambiguities of realizing change in organizations, Weiner (2020) presents a multi-level and multi-faceted Readiness Theory for change, which states, 'A shared psychological state in which organizational members feel committed to implementing an organizational change and confidence in their collective abilities to do so.' The empirical testing of the organizational readiness theory in the field of operations/innovation management is still limited (Vaishnavi et al., 2019) and predominantly across service organizations (Yen et al., 2012).

The three main dimensions of the organizational readiness theory for change proposed by Weiner (2020) and Lokuge et al. (2019) are, i.e., change valence (employee change commitment), change efficacy, and contextual factors. Concerning change valence, the more members of the organization appraise the change, the more they would like to introduce it or put it differently, the more determined efforts they will put into implementing the change (Fishbein and Ajzen, 1977; Meyer and Herscovitch, 2001). However, several factors can affect an employee's dedication to change, and change valence states that an organization's stakeholders collectively support the changes during execution. Being a key measure, change efficacy is a 'detailed and in-depth description or evaluation of the professed capability to execute a task' (Gist and Mitchell, 1992). It emphasizes the adequacy of the financial, human, material, and knowledge resources required to execute and instrument the change. It further helps the organizations to gauge the potential strengths of readiness to innovate and transform. Contextual factors offer a broader concept that derives innovation attitude.

Most importantly, an organizational culture that promotes innovation and learning is argued to be more equipped for change (Jones et al., 2005; Weeks et al., 2004). Some scholars also emphasize that versatile organizational methods, i.e., good working relations and organizational procedures, are essential in fostering readiness for change (Benitez et al., 2018; Rafferty and Simons, 2006). Hence, the theory of readiness provides the basis for designing suitable frameworks for organizational readiness for innovation and is being used in this research.

In digital innovation, almost 90% of proposed concepts never transform into new products or services because of the lack of organizational readiness to innovate (Lokuge et al., 2019). Readiness is a condition that is achieved concerning the organizations' psychological, interactive, and structural readiness before the beginning of a particular activity (Helfrich et al., 2011; Klein and Sorra, 1996). In comparison, innovation deals with the development or acceptance of new technologies such as digital, blockchain, IoT, big data analytics, artificial intelligence, cloud computing, and expansion of goods, services, and

markets (Crossan and Apaydin, 2010; Khin and Ho, 2019). The development or adoption of digital technologies requires the willingness of organizations to adapt to these changes. Although digital technologies are accessible, scalable, proliferating, and easy to use, firms are yet struggling to acquire the full potential of digital innovations because of a lack of organizational readiness (Kelly et al., 2017; Lokuge et al., 2019; Rafferty and Simons, 2006; Vakola, 2013; Williams, 2011). Thus, organizational readiness, a prerequisite for change, indicates the behavioral and psychological preparedness of the firms (Weiner, 2020) for the change. This preparedness renders flexibility in the organization to reconfigure its tangible and intangible resources. It can be inferred that organizational readiness theory offers a unifying theoretical framework for explaining organizational readiness to digitally innovate, and hence is being utilized in this study.

The development or adoption of digital technologies does not happen in a void. These technologies provide specific value to the firms' stakeholders (Gudergan and Mugge, 2017). To adopt such technologies, organizations need to develop a shared understanding with stakeholders and make innovative decisions (Chen et al., 2010). This emphasizes the importance of the digital business strategy (DBS) concept (Bharadwaj et al., 2013a). Mithas and Lucas (2010) inform that digital resources create a differential value for the firm. Thus, adopting digital technology for business improvement requires a transformation strategy from traditional means to digital innovations that can upset the financial and operational performance of the firms. Today, though organizations are getting ready for digital change, digital transformation is still at an early stage (Daidj, 2019). A strategic fit, where business strategy is aligned with the operational activities, perhaps can increase the pace of change (Gudergan and Mugge, 2017).

3. Research model and hypothesis

The theory of organizational readiness offers a comprehensive framework to assess the readiness of organizations for digital innovation. Though the literature has explicitly stated the potential benefits of digital innovation, organizations have yet to realize the full potential of embracing digital innovations (Lokuge et al., 2019). Besides, the intricacy of digital business strategy (DBS) also prohibits the impending possibilities, and we aim to cover these concepts in this work, as shown in Fig. 1.

3.1. Change valence and digital financial innovation

Change valence is an organization's commitment to adopt positive changes for improved performance (Meyer and Herscovitch, 2001). The change valence in this study is taken in the sense of innovation valence, which is measured by attitude, motivation, and empowerment of the employees to adopt or deliver innovations (Lokuge et al., 2019). In the case of digital transformation, employee motivation and empowerment is necessary to facilitate digital change. This change may pertain to employee role transition, acceptance of new technology, collaborative working, and coordination with other organization members. A strong commitment to these changes will make the transition successful. Literature has also urged creating employees' commitment by managerial support, information sharing regarding organizational resources, and providing tools directly related to adopting digital transformations (Armenakis et al., 1993). Thus, employee commitment to change is driven by organizational commitment to change, and an absence of organizational commitment may result in undelivered ideas and project failures (Lokuge et al., 2019). Thus, we hypothesize and investigate the positive impact of change valence on digital financial innovation.

H1. Change valence has a positive effect on the digital financial innovation of the firm.

3.2. Change efficacy and digital financial innovation

Change efficacy refers to the perceived capability of an organization to realize change. Thus, it covers an understanding of the type of financial, technical, human, and information resources and how those resources will be reconfigured to realize the change in a timely and successful manner. Specifically, the change efficacy includes resource readiness, IT readiness, and cognitive readiness (Lokuge et al., 2019).

Resource readiness is the flexibility of all resources, i.e., human, financial, physical, and technology, to accept change. In the context of digital change, it shows that organizations should reconfigure their resources to acquire and sustain the potential benefits of digital innovations. Fuller et al. (2007) talk about institutional resources, including the adequacy of institutional resources to support change, such as employee training, office space, computer access. Similarly, IT readiness requires a comprehensive structure for the transformation, including the capabilities of the employees. Castelo-Branco et al. (2019) highlighted this infrastructure requirement and associated analytical capabilities to adopt digital transformation. The stability and flexibility

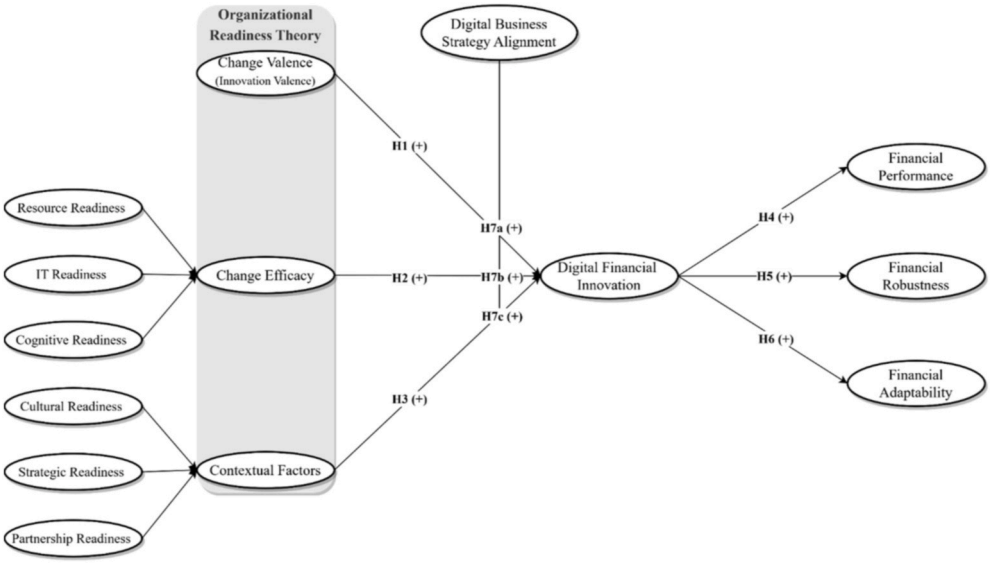

Fig. 1. Research model and hypotheses.

of this structure are other factors in the domain of IT readiness. Sedera et al. (2016) and Chen et al. (2017) find that IT readiness in terms of infrastructure availability, stability, and flexibility produces positive outcomes for the organizations.

Furthermore, cognitive readiness emphasizes the importance of know-what and know-how of organizational change. It shows that an adaptive organizational culture, employee training to enhance the knowledge for the required technology, and collaboration and coordination among employees produce the confidence to manage such change. It also predicts team performance in dynamic and complex environments (Crameri et al., 2019). Halpern et al. (2021) found that communication clarity, known specific goals, and collaboration among employees result in effective transformation. Mancha and Shankaranarayanan (2020) also commented on the importance of change efficacy as the antecedent of digital transformation. So, we hypothesize a positive relation of change efficacy with digital financial innovation.

H2. Change efficacy has a positive effect on the digital financial innovation of the firm.

3.3. Contextual factors and digital financial innovation

Contextual readiness deals with the core values to adopt innovation and consists of three sub-constructs: cultural readiness, strategic readiness, and partnership readiness (Jones et al., 2005). Contextual factors are among the most crucial elements for organizations to show conducive behaviors and support innovation. For example, whether organizational culture is rigid and resistive or flexible and adaptive (Deshpandé et al., 1993) while pursuing (digital) transformation. Uzkurt et al. (2013) informed through a content analysis that organizational culture, management style, and organizational support are essential factors for realizing innovations in organizations. Developing a conducive organizational culture for innovation would require the proper organizational structure, policies, and value system as a pre-requisite (Hameed et al., 2012; Snyder-Halpern, 2001).

Other dimensions include strategic readiness and partnership readiness for the transformation process. Strategic readiness deals with clear strategies for the digital transformation process and the resulting benefits. Bharadwaj et al. (2013b) and Nylén (2015) commented on the requirement of information clarity, refinement, communication of strategic goals. Similarly, partnership readiness deals with transparent information among the partners, including upper and lower tiers of the supply chain (Abrell et al., 2016). Information transparency creates trust and honesty among partners. It can be anticipated that cultural, strategic, and partnership readiness are prerequisites for digital transformation (Frame et al., 2018; Khin and Ho, 2019). Thus, we hypothesize:

H3. Contextual factors have a positive effect on the digital financial innovation of the firm.

3.4. Digital financial innovation and financial performance

The extant literature (Appendix A) informs the effect of digital technologies on the firms' financial performance (in terms of profitability, cost, and return on assets). Setyawati et al. (2017) find the financial system's improved efficiency by the Fintech start-up enterprises. Alimirruchi and Kiswara (2017) studied digital financial innovation and associated operational (availability, security, and effectiveness) and financial performance (profitability, inventory turnover). They found a significantly improved financial performance of Samsung as a result of using digital technologies. Casolaro and Gobbi (2007) examined Italian banks for cost and profit functions and found that information and communication technologies can significantly boost productivity. Similarly, Ho & Mallick (2010) confirm a positive relation of information technologies with banking performance. As a result, these studies indicate that digital technologies can affect firms' organizational, operational, and financial performance. So, we hypothesize:

H4. Digital financial innovation has a positive effect on the financial performance of the firm.

3.5. Digital financial innovation and financial robustness

Organizational resilience is the capability to survive in critical circumstances (Acquaah et al., 2011), and the importance of organizational resilience has significantly increased during COVID-19 crisis (Huang et al., 2020). On the other hand, financial resilience is the capability of the firms to forestall, prepare for, respond and adapt to incremental change and sudden unforeseen disruptions to survive and prosper by formulating suitable economic policies aimed at reducing budget deficits (Acquaah et al., 2011). Digital innovations play a vital role in upgrading firms' competitive advantage and enabling them to survive the competitive business landscape (Hua et al., 2019). This capability to manage risks enhances the financial robustness and adaptability of a firm, which have been considered integral elements of financial resilience (Gibb et al., 2016; Nkundabanyanga et al., 2019; Taylor, 2013).

Financial robustness refers to the propensity of the financial systems of firms to rapidly cope with changing market dynamics (Zhan and Zeng, 2012). Consequently, for a financial system, robustness can assess its tolerance during financial uncertainty and risk. Nkundabanyanga et al. (2019) studied financial robustness in firms and evaluated the relationship between technology intensity, R&D, and financial resilience. They found a predictive force based on firm size, age, innovation, and financial resilience on the survival of public interests. The relationship between DFI and financial robustness is not highlighted in the literature, so we hypothesize:

H5. Digital financial innovation has a positive effect on the financial robustness of the firm.

3.6. Digital financial innovation and adaptability

Digital innovation enables it to cope with risks by making changes in its operations and adapting to unforeseen circumstances (Francalanza et al., 2017). The firm's adaptability can be conceptualized as an organization's capability to remain comparatively intact through its life cycle (Hannan and Freeman, 1977). Uncertainties, disruptions, and risks during COVID-19 have created distinct challenges for the survival of the firms, and organizations are forced to adapt to new operational and strategic channels rapidly; for instance, an upright example of adaptability to quote is that of the educational institutions during COVID-19 (Huang et al., 2020). Similarly, firms that utilize digital means for their financial dealings are more adept in cutting costs and keeping the financial flow intact. Digital financial technologies create a virtual copy of the financial flow through electronic means, enabling seamless and uninterrupted information flow and transactions. The real-time nature of these technologies reduces information asymmetries and hence enhances the efficiency of the financial system. Moreover, digital technologies are known to provide flexibility and adaptability, which makes it easier for firms to make changes quickly, increasing the firm's responsiveness. These evolving capabilities of a firm act as dynamic capabilities and provide them with a competitive edge (Karimi and Walter, 2015). Therefore, we hypothesize:

H6. Digital financial innovation has a positive effect on the financial adaptability of the firm.

3.7. Digital business strategy, organizational readiness, and digital financial innovation

The DBS concept guides digital technology implementation for business strategies (Setia et al., 2013). It helps organizations to deal with the evolving business environment by acquiring insights from business strategy (Kane et al., 2015), customer preferences (Plummer et al., 2014), and market attitudes (Mainardi and Vollmer, 2015). DBS

configuration necessitates IT experts and business managers to align (Feeny and Willcocks, 1998; Li et al., 2021; Ross et al., 1996). The effective use of digital technologies requires an appropriate complementary infrastructure for leveraging value. This infrastructure is formed by the suitable organization structure, skilled workforce, lean processes, flexible work practices, flexible IT infrastructure, and open communication (Agrifoglio et al., 2017; Dewett and Jones, 2001; Liao et al., 2017; Liu et al., 2013). These infrastructural components cumulatively develop and enhance the organizational readiness for digital technology usage and innovation (Gürdür et al., 2019).

The alignment of DBS and IT is considered essential for organizational performance and competitiveness (Kahre et al., 2017). Similarly, Akter et al. (2016) studied the big data analytics capability for improved organizational performance. They found a substantial moderating effect of analytics capability - business strategy alignment on the relationship between big data analytics capability and organizational performance. The positive relationship between business competency and digital strategy has also been emphasized in the literature (Fitzgerald et al., 2014; Nambisan et al., 2017). However, the presence of relevant organizational resources will influence the successful implementation of digital technologies. Their proper orchestration in a directed manner will yield a value that enhances the performance of the firm. Organizational readiness is shaped by the appropriate use of the tangible and intangible resources of the firm, which is guided by the DBS of the firm (Sambamurthy et al., 2003). The orchestration of these resources is highly dependent on the business-IT alignment of the organization as the alignment not only provides direction but also serves as underlying support for the adoption and use of digital technologies (de Sousa Jabbour et al., 2018; Frishammar et al., 2018; Prince et al., 2014). This business-IT alignment in the context of organizational readiness for digital financial innovation can further enhance the performance of the firms. Hence, we hypothesize:

H7 (a, b, c). Digital technology – business strategy alignment positively moderates the relationship between organizational readiness (change valence, change efficacy, and contextual factors) and digital financial innovation of the firm.

4. Research methodology

4.1. Measurement instrument

The items for the various constructs were adopted from the literature, as shown in Appendix C. The organizational readiness construct was exhibited as formative, whereas all other constructs were reflective. Five-point Likert scale was used to measure the items of the questionnaire.

An online questionnaire consisting of seven sections was established. The first section covered general information questions (e.g., type of organizations, management position, department, years of experience, etc.). The Part B of the questionnaire dealt with seven formative components of the theory of organizational readiness, which were clustered into three groups (Change valence, Change efficacy, and Contextual factors), as suggested by (Lokuge et al., 2019). Section C of the questionnaire covered four questions of Digital technology-business strategic alignment, which were adapted from Li et al. (2021), and Section D covered seven items of Digital financial innovation adapted from Khin & Ho, (2019) and Paladino (2007). Sections E, F, and G subsequently dealt with the questions of Financial performance (four items adopted from Ali et al. (2018)) and Financial robustness (five items adopted from Nkundabanyanga et al. (2019), and Financial adaptability (four items adopted from Nkundabanyanga et al. (2019)).

4.2. Sample selection

A purposive sampling technique was used for the selection of respondents. This would ensure that the respondents had enough knowledge and experience about strategies, utilization, and scarcity of resources (Maspaitella et al., 2018). The respondents were primarily employed in service organizations, whereas they would be experts in IT, Finance, Strategy, or other related departments. Three major sources were used to identify the appropriate respondents. The list of IT experts working in the *Centre of Digital Innovation* (CoDI) of UAE was established. CoDI performs numerous research and development activities in the area of ICT and has launched an ecosystem of various stakeholders from various sectors (https://u.ae/en/information-and-services/g2g-services/codi). This is worth mentioning that digital transformation is an integral strategic pillar of the wider national economic development and diversification transformation, and UAE is leading the way in adopting digitalization among neighboring Gulf countries.

The second source was the managers and senior managers on LinkedIn, who were employed in IT, Finance, Strategy, or other related departments of different service organizations, including Hotel, Healthcare, Airline, Education, Banking, Telecom, Financial, and Logistics industries. The third source was the list of the pioneers and mature companies in digital innovation and transformation from the *Federal Competitiveness & Statistics Authority* and the *National Bureau of Statistics*. A list of managers and senior managers employed in the IT, Finance, Strategy, and Operations departments of these companies was developed.

A comprehensive list of potential respondents from all three sources was developed with 1130, during the next stage. An attempt was made to present an equal representation of the departments mentioned above. Shortlisted respondents were contacted and briefed through phone calls and emails. 680 respondents decided to participate, and a questionnaire was directed through survey monkey during April–May 2020. The sample size for this study was determined by using G*Power software, following the settings recommended by Faul et al. (2009), Hair et al. (2017), and Cohen (1988). Subsequently, the minimum sample based on the power of 95%, an alpha level of 0.05, and effect size $f^2 = 0.15$ should be 242. Finally, 440 useable responses were retained after removing 11 incomplete responses, representing a response rate of 64.7%.

4.3. Demography of the sample

Senior and mid-level managers from IT, Finance, Strategy, and other related departments were approached in this survey, as they are believed to know about the strategic position of an organization regarding digital innovation and performance. Table 1 depicts the profile of the respondents. An attempt was made to cover the significant service industry sectors of the UAE. Table 1 shows that approximately two-thirds of the responses were received from mid-level managers. The other category in the department section presents operations since part of the questionnaire is related to resilience. Two-third of respondents had prior experience of 5–15 years in the relevant field. The sales volume of most of the organizations was above $5 Million.

4.4. Analysis method

Statistical analysis was conducted using a partial least squares structural equation modeling (PLS-SEM) approach (Ringle et al., 2015) for the reason that composite-based SEM (PLS-SEM) provides numerous technical advantages over the popular factor-based SEM methods (e.g., AMOS) (Hair and Sarstedt, 2019) and, for this purpose, has been adopted by recent studies in supply chain and operations management (Akter et al., 2017; El Baz and Ruel, 2020; Saghiri and Mirzabeiki, 2020; Wong et al., 2020). More specifically, PLS-SEM is more suitable in estimating complex relationships, models, and formatively-measured constructs (Akter et al., 2017; J. Hair et al., 2017; Sarstedt et al., 2016). Given the predictive nature of this study, PLS-SEM is preferred because of its predictive relevance (Hair et al., 2012; Sharma et al., 2018). Additionally, PLS-SEM shows higher robustness in the absence of distributional assumptions, such as multivariate normality (Hair et al.,

Table 1
Respondents' Demographic profile.

Industry type	Frequency	Percent
- Hotel/Tourism service	84	19%
- Business service (e.g., advertising, computing, engineering)	53	12%
- Health care service	79	18%
- Education service	51	12%
- Airline service	62	14%
- Financial service	67	15%
- Logistics/warehousing/transportation services	44	10%
Management level		
- Middle	280	64%
- Senior	160	36%
Department		
- IT	187	42%
- Finance	123	28%
- Strategy	88	20%
- Others	42	10%
Years of experience		
- Less than 5 years	46	10%
- Between 5 and 10 years	159	36%
- Between 10 and 15 years	121	28%
- Between 15 and 20 years	75	17%
- More than 20 years	39	0.9%
Number of employees		
- Less than 500	161	37%
- Between 500 and 1000	198	45%
- More than 1000	81	18%
Sales volume(Million $)		
- 0.5–1 Million ($)	45	0.10%
- 1–5 Million ($)	137	31%
- 5–10 Million ($)	143	32%
- More than 10 Million ($)	115	26%

2017, 2019). Another important reason for employing PLS-SEM analysis is its superiority in estimating mediating effects (Nitzl et al., 2016) by overcoming the limitations of factor-based SEM and regression analysis (e.g., PROCESS macro). Specifically, PROCESS-based analysis does not consider the measurement error and assess the model structure in isolation. At the same time "PLS-SEM account for measurement error and consider the entire model structure in the parameter estimation and also offer more flexibility in terms of model specification compared with the factor-based SEM methods" (Sarstedt et al., 2020).

In the light of the above, and given the complexity of our proposed model (formative-formative hierarchical component model with moderated mediation effects), its predictive purpose and the absence of distributional assumptions fully justify our decision to use PLS-SEM for our data analysis. To examine the first and second-order formative constructs (change valence, change efficacy, and contextual factors) of organizational readiness for digital innovation (Lokuge et al., 2019), the two-stage approach was applied (Hair et al., 2018). Finally, following Hair and Sarstedt (2019), a two-step process was adopted, first the assessment of the formative and reflective measurement models, then the evaluation of the structural model.

5. Analysis of results

5.1. Normality test

As shown in Appendix C, the Shapiro-Wilk test revealed a violation of the univariate normality assumption for all items except CV1 and FR1 (Hanusz and Tarasińska, 2015). Similarly, all the four multivariate normality tests (i.e., Mardia's multivariate kurtosis and skewness tests, Henze-Zirkler's consistent test, and Doornik-Hansen omnibus test) indicated a significant departure of the observed data from multivariate normality (Doornik and Hansen, 2008; Henze and Zirkler, 1990; Mardia, 1970).

5.2. Formative and reflective measurement model assessment

For the assessment of the first and second-order formative measurement model, a three-step procedure was adopted as recommended by (Sarstedt et al., 2019). In the first step, the convergent validity of the formative higher and lower-order latent variables was assessed by using redundancy analysis and a global single item to measure the criterion construct (Cheah et al., 2018). As shown in Table 2 (Panels A and B), the path coefficients are well above the threshold value of 0.7, indicating that convergent validity is fulfilled (Cheah et al., 2018; Hair et al., 2017). Next, potential collinearity issues between formative predictors were examined using the variance inflation factor (VIF). As recommended by (Hair et al., 2019), VIF values must be below 5 and, ideally, below 3.3 (Diamantopoulos and Siguaw, 2006). The inner VIFs for the first and second-order measurement models indicate that multicollinearity is not a concern in this study. Finally, Bias Corrected and Accelerated (BCa) bootstrapping method was applied to test the significance of outer weights and loadings with 10,000 bootstrap samples by using estimation Mode B following the recommendations of Streukens and Leroi-Werelds (2016) and Sarstedt et al. (2019). All outer weights are significant except CV1, CV2, and RR2. It should be noted that the weights of the nonsignificant indicators are not necessarily a sign of poor measurement model quality unless the loadings are nonsignificant, too (Hair et al., 2017). Hence, we retained the CV1, CV2, and RR2 as their loadings are statistically significant.

After assessing the first and second-order formative measurement model, we proceed to the evaluation of the reflective measurement model. Internal consistency, convergent, and discriminant validity criteria were deployed to assess the quality of the measurement model (Hair et al., 2019). First, convergent validity was examined using outer loadings and average variance extracted (AVE). As recommended by Hair et al. (2017, p. 113), outer loading must be above 0.708, but "items with loading between 0.40 and 0.70 should be considered for removal only when deleting them leads to an increase in the AVE or composite reliability (CR) above the suggested threshold value". Therefore, items DFI1, DFI4, DFI7, and DSA3 were dropped, while the remaining items with loadings below 0.708 were retained because their deletion had no substantive change on the AVE and CR of the construct. Also, item FP2 was dropped to meet the discriminant validity threshold. After removing the non-complying items, we regenerated the measurement model. As shown in Table 3 (Panel A), internal consistency reliability and convergent validity were confirmed as AVE, CR, and Cronbach's alpha (α) values are above the required threshold of 0.5 (AVE) and 0.7 (CR and α) (Bagozzi and Yi, 2012; Hair et al., 2019). Finally, discriminant validity was established (see Table 3, Panel B) as the square root of AVE for each construct is higher than all the correlation coefficients (Fornell and Larcker, 1981). Furthermore, the heterotrait-monotrait (HTMT) values are below the threshold of 0.90, and the bootstrapped confidence intervals do not contain the value one, corroborating the distinctiveness of the constructs (Henseler et al., 2015).

5.2.1. Non-response bias and common method bias

Literature has demonstrated that common method biases (CMB) can seriously affect the validity of research findings since data are obtained from the same source at the same point in time (Lindell and Whitney, 2001; Malhotra et al., 2006). Different a priori and post-hoc actions were adopted to mitigate the common method variance (Podsakoff et al., 2003). First, the questionnaire was pretested by 34 participants who did not participate in the final sample, to detect ambiguities and misunderstandings because of syntax or vocabulary and the use of positive and negative item wording (Perneger et al., 2015). Second, the anonymity and confidentiality of respondents were preserved by not collecting any personal details for the respondents. After the data collection, post-hoc marker variable and full collinearity approaches were used to examine the possibility of common method bias. The first approach indicates that a marker variable can be identified in a post-hoc

Table 2
Evaluation of the formative measurement model.

Panel A: First-order formative measurement model assessment[a]

Items	Convergent validity	VIF	Outer weights	*t*-Value	95% BCa CI[b]	Outer loadings	*t*-Value	95% BCa CI[b]	Item decision
CV1	β between CV_F and CV_G = 0.860	1.860	0.240	1.610	[-0.077; 0.514]	0.585	5.391	[0.338; 0.751]	Retained
CV2		1.809	−0.292	1.853	[-0.616; −0.005]	0.372	3.027	[0.099; 0.577]	Retained
CV3		1.506	0.995	11.903	[0.826; 1.144]	0.973	30.324	[0.914; 0.999]	Retained
RR1	β between RR_F and RR_G = 0.821	1.424	0.422	5.811	[0.280; 0.566]	0.680	12.913	[0.569; 0.775]	Retained
RR2		1.311	0.087	1.153	[-0.061; 0.234]	0.300	3.576	[0.124; 0.454]	Retained
RR3		1.106	0.771	15.984	[0.668; 0.86]	0.891	26.366	[0.811; 0.944]	Retained
IT1	β between IT_F and IT_G = 0.853	1.782	0.233	2.030	[0.001; 0.446]	0.761	13.089	[0.634; 0.857]	Retained
IT2		1.563	0.286	2.993	[0.093; 0.469]	0.715	11.447	[0.581; 0.823]	Retained
IT3		1.457	0.671	8.878	[0.528; 0.823]	0.922	32.617	[0.864; 0.97]	Retained
CG1	β between CG_F and CG_G = 0.766	1.093	−0.323	2.121	[-0.610; −0.012]	−0.047	0.286	[-0.363; 0.291]	Retained
CG2		1.171	0.519	2.935	[0.17; 0.863]	0.662	4.652	[0.364; 0.904]	Retained
CG3		1.116	0.751	5.112	[0.411; 0.963]	0.854	8.391	[0.616; 0.975]	Retained
CR1	β between CR_F and CR_G = 0.843	1.717	0.270	5.829	[0.173; 0.359]	0.787	28.756	[0.73; 0.837]	Retained
CR2		1.546	0.364	8.362	[0.273; 0.445]	0.804	26.417	[0.739; 0.856]	Retained
CR3		1.916	0.540	10.516	[0.439; 0.639]	0.915	57.889	[0.882; 0.944]	Retained
SR1	β between SR_F and SR_G = 0.875	1.564	0.244	4.685	[0.142; 0.343]	0.733	19.992	[0.651; 0.798]	Retained
SR2		1.438	0.580	13.331	[0.491; 0.662]	0.885	47.212	[0.846; 0.918]	Retained
SR3		1.585	0.384	9.356	[0.305; 0.461]	0.802	29.127	[0.743; 0.851]	Retained
PR1	β between PR_F and PR_G = 0.856	1.574	0.392	7.304	[0.289; 0.499]	0.819	29.298	[0.76; 0.869]	Retained
PR2		1.697	0.507	10.850	[0.415; 0.599]	0.885	43.395	[0.841; 0.921]	Retained
PR3		1.719	0.288	5.337	[0.183; 0.393]	0.799	26.405	[0.733; 0.853]	Retained

Panel B: Second-order formative measurement model assessment[a]

HOC	LOC	Convergent validity	VIF	Outer weights	*t*-Value	95% BCa CI[b]	LOC decision
CE	RR	β between CE_F and CE_G = 0.782	1.298	0.586	22.875	[0.542; 0.644]	Retained
	IT		1.259	0.469	20.286	[0.428; 0.519]	Retained
	CG		1.065	0.268	7.835	[0.194; 0.330]	Retained
CF	CR	β between CF_F and CF_G = 0.945	3.190	0.323	18.228	[0.288; 0.357]	Retained
	SR		3.078	0.377	23.133	[0.347; 0.410]	Retained
	PR		2.641	0.391	23.593	[0.358; 0.422]	Retained

Notes: β = Path coefficient; F = Formative; G = Global; VIF = variance inflation factor; BCa CI = Bias Corrected and Accelerated Bootstrap; CI = Confidence Interval; HOC = higher-order component; LOC = lower-order component.

[a] Estimation: Mode B (Sarstedt et al., 2019).

[b] BCa bootstrapping method applied to test the significance of skewed indicator weights with 10,000 bootstrap samples (Streukens and Leroi-Werelds, 2016).

fashion (Lindell and Brandt, 2000), using the smallest correlations between the manifest variables as a proxy for common method variance (Lindell and Whitney, 2001; Malhotra et al., 2006; Papastathopoulos et al., 2020). As shown in Table 4, the path coefficients before and after correcting for common method bias have not changed significantly. We also conducted the full collinearity test by estimating the variance inflation factors (VIFs) for all the constructs as an alternative procedure for the identification of CMB (Kock, 2015). All VIFs were below the cut-off point of 5, even the more conservative threshold of 3.3, ranging from 1.074 to 3.307. As such, both tests demonstrate that the CMB is not a potential concern for our model.

Nonresponse bias was tested by comparing the responses received for all measured items from early and late respondents (i.e., pre- and after-deadline) (Rogelberg and Stanton, 2007). Applying a Mann-Whitney *U* test, 312 pre-deadline and 128 after-deadline questionnaires were compared, yielding no significant differences between the means of the two groups (α = 0.05). Hence, the study is free from systematic nonresponse bias.

5.3. Structural model assessment

Before hypothesis testing, we check the collinearity of exogenous latent variables. All inner VIF values are below the cut-off value of 3.3 (Diamantopoulos and Siguaw, 2006), ranged from 1.297 (Change Valence) and 3.162 (Contextual Factors*Digital Strategy Alignment). Thus, collinearity does not affect the structural model results. The examination of the model's predictive power was estimated using the coefficient of determination (R^2). Results of 0.25, 0.50, and 0.75 can be interpreted as weak, moderate, and substantial, respectively (Hair et al., 2011). The R^2 values show that financial performance, robustness, adaptability, and digital financial innovation explain 48.2%, 43.0%, 49.9%, and 64.2% of the variance, respectively (see Table 5). Analogously, the effect sizes (f^2) for the structural model relationships show that DFI has a strong effect on FP, FR and FA while CF, CE, and CV account for medium and no effect on DFI (Cohen, 1988). Finally, we examined the model's predictive relevance (Q^2) by using the blindfolding procedure. As shown in Table 5, the values for the four endogenous constructs are well above zero, verifying the path model's predictive power (Evermann and Tate, 2016; Hair et al., 2017).

Moving to structural model, the results support the research hypotheses of a significant positive effect of change efficacy ($\beta = 0.118$, p = 0.034) and contextual factors ($\beta = 0.334$, p < 0.001) on digital financial innovation. Additionally, digital financial innovation exerts a significant positive effect on financial performance, robustness, and adaptability ($\beta = 0.694$, $\beta = 0.656$, $\beta = 0.707$ all p-values below 0.001, respectively). However, change valence ($\beta = 0.048$, p = 0.181) does not have significant effect on digital business strategy alignment. Surprisingly, none of the three moderation are significant, implying that a higher digital business strategy alignment will not lead to higher digital financial information. Another interesting finding is the ***total effect*** of organizational readiness for digital innovation formative constructs on firm's financial performance, financial robustness, and financial adaptability via digital financial innovation. Specifically, change efficacy and contextual factors have a significant positive ***total effects*** on financial performance ($\beta_{CE} = 0.082$, p = 0.032; $\beta_{CF} = 0.239$, p < 0.001), robustness ($\beta_{CE} = 0.077$, p = 0.035; $\beta_{CF} = 0.225$, p < 0.001), and adaptability ($\beta_{CE} = 0.083$, p = 0.035; $\beta_{CF} = 0.243$, p < 0.001). On the contrary, the total effects of change valence and the moderators reveal a nonsignificant effect on the financial status of the company.

Table 3
Evaluation of the reflective measurement model.

Panel A: Indicators' reliability and validity						
Items	Internal consistency reliability		Convergent validity			Item decision
	CR	α	FL	IR	AVE	
DFI1	0.853	0.769	0.548	0.300	0.592	Deleted
DFI2			0.722	0.521		Retained
DFI3			0.756	0.572		Retained
DFI4			0.562	0.316		Deleted
DFI5			0.819	0.671		Retained
DFI6			0.776	0.602		Retained
DFI7			0.559	0.312		Deleted
DSA1	0.939	0.902	0.870	0.757	0.837	Retained
DSA2			0.898	0.806		Retained
DSA3			0.662	0.438		Deleted
DSA4			0.974	0.949		Retained
FA1	0.838	0.758	0.678	0.460	0.567	Retained
FA2			0.688	0.473		Retained
FA3			0.847	0.717		Retained
FA4			0.785	0.616		Retained
FP1	0.851	0.738	0.848	0.719	0.655	Retained
FP2			0.653	0.426		Deleted
FP3			0.792	0.627		Retained
FP4			0.788	0.621		Retained
FR1	0.847	0.775	0.622	0.387	0.527	Retained
FR2			0.769	0.591		Retained
FR3			0.636	0.404		Retained
FR4			0.793	0.629		Retained
FR5			0.791	0.626		Retained

Panel B: discriminant validity						
	DFI	DSA	FA	FP	FR	HTMT CI does not include 1
DFI	**0.769**[b]	0.862[c]	0.826	0.843	0.856	Yes
DSA	0.750[a]	**0.915**	0.676	0.822	0.695	
FA	0.676	0.602	**0.753**	0.846	0.765	
FP	0.674	0.683	0.628	**0.810**	0.705	
FR	0.672	0.596	0.624	0.558	**0.726**	

Notes: CR = Composite reliability; α = Cronbach's alpha; FL = Factor Loadings; IR = Item reliability; AVE = Average variance extracted; CI = Confidence Intervals.
[a] The lower triangle indicates the correlations between the constructs.
[b] The bold values indicate the square root of AVE.
[c] The upper triangle indicates the HTMT values.

Table 4
Path coefficient values obtained before and after correcting for Common Method Variance.

Hypothesized paths	Estimates before correcting for CMB	Estimates after correcting for CMB (r_{mv} = 0.107)
H1: CV → DFI	0.048	0.054
H2: CE → DFI	0.118*	0.104*
H3: CF → DFI	0.344***	0.302***
H4: DFI → FP	0.694***	0.589***
H5: DFI → FR	0.656***	0.625***
H6: DFI → FA	0.707***	0.697***
H7i: CV*DSA → DFI	0.043	0.044
H7ii: CE*DSA → DFI	0.009	0.013
H7iii: CF*DSA → DFI	−0.038	−0.025

Notes: r_{mv} = shared correlation resulting from CMB using post hoc market variable correlation between FR1 and FA2.
*p < 0.05; **p < 0.01; ***p < 0.001.

Table 5
Evaluation of the structural model.

Hypotheses and paths	β	t-Value	95% BCa CI	Status
H1 (+): CV → DFI	0.048	1.338	[-0.024; 0.118]	Not supported
H2 (+): CE → DFI	0.118*	2.120	[0.005; 0.225]	Supported
H3 (+): CF → DFI	0.344***	5.533	[0.219; 0.464]	Supported
H4 (+): DFI → FP	0.694***	21.968	[0.625; 0.752]	Supported
H5 (+): DFI → FR	0.656***	19.948	[0.583; 0.713]	Supported
H6 (+): DFI → FA	0.707***	24.025	[0.643; 0.758]	Supported
H7i (+): CV*DSA → DFI	0.043	0.965	[-0.043; 0.133]	Not supported
H7ii (+): CE*DSA → DFI	0.009	0.144	[-0.105; 0.129]	Not supported
H7iii (+): CF*DSA → DFI	−0.038	0.613	[-0.173; 0.072]	Not supported
Coefficient of determination				
$R^2_{DFI} = 0.642$; $R^2_{FA} = 0.499$; $R^2_{FP} = 0.482$; $R^2_{FR} = 0.430$				
Effect sizes				
$f^2_{CV\ on\ DFI} = 0.005$; $f^2_{CE\ on\ DFI} = 0.014$; $f^2_{CF\ on\ DFI} = 0.100$; $f^2_{DFI\ on\ FP} = 0.930$; $f^2_{DFI\ on\ FR} = 0.753$; $f^2_{DFI\ on\ FA} = 0.997$;				
Predictive relevance				
$Q^2_{DFI} = 0.340$; $Q^2_{FA} = 0.274$; $Q^2_{FP} = 0.312$; $Q^2_{FR} = 0.221$				

Notes: BCa bootstrapping method was applied to test the significance of skewed indicator weights with 10,000 bootstrap samples (Streukens and Leroi-Werelds, 2016).
The two-stage approach and Mode B were used for specifying and estimating the higher-order constructs (Sarstedt et al., 2019).
*p < 0.05; **p < 0.01; ***p < 0.001.

6. Discussion and conclusion

6.1. Association between organizational readiness and digital financial innovation

In today's time, DFIs provide responsiveness, accuracy, convenience, and risk management that are valuable for their stakeholders (Lam et al., 2019; Mbama and Ezepue, 2018; Wang et al., 2021) but also result in profitability for the firms. We posited that successful realization of DFIs in firms might require a digital transformation of the firms, which in turn may raise a need of reviewing business models, business strategy, organization design, operations, and processes, or even the values of the firms (Balakrishnan and Das, 2020; Saarikko et al., 2020; Schallmo et al., 2020; Wang et al., 2020). We find positive support for the effect of change efficacy and contextual factors on DFI, which is in accordance with the findings of Lokuge et al. (2019). Change efficacy refers to the knowledge and confidence of the organization (and its members) to execute change activities in timelines, understand the challenges and intricacies that they may face on the way, and their ability to address those challenges for a successful change. Since we tested the hypothesis for service industry firms in a developing country like UAE, we find organizations are flexible and reconfigurable to accept DFIs in terms of their resource competencies, IT infrastructure, and mindsets. This is evident since the service industry in the UAE makes significant investments in deploying the latest information and communications technologies to stay ahead of the other Middle Eastern countries (Hatem, 2020).

This study also finds empirical support for a positive effect of contextual factors on the DFI, and this result confers the previous findings of (Mikalef and Krogstie, 2020). Given that the industry in the UAE shows the highest level of ICT indicators among the region (Hatem, 2020), the firms, in general, have strong linkages with (ICT) technology providers/developers. Firms are generally ready to deploy new technologies to provide the best service to their customers. And this is true across the sectors within the service industry, whether that be telecom firms such as Etisalat and Du, healthcare organizations such as Aster and Mediclinic, or online retailers such as Noon and Souq. Thus, technology adoption is also part of the organizations' strategic thinking, and they

are ready to make investments for this purpose. Deshpandé et al. (1993) call this "external orientation" of the organizational culture since it brings about differentiation for the firm in a competitive landscape.

We do not find a positive effect of change valence on DFI in this study, contrary to our hypothesis H1. Since change valence is measured in terms of employee motivation and empowerment to realize a change task such as DFI, the results seem counter-intuitive. Perhaps, one of the reasons for this could be that employees are committed to carrying out change tasks but do not feel empowered enough to make decisions regarding innovations on their own. That industry may explain this lack of empowerment in a developing economy like UAE still lacks but is on a fast learning trajectory in developing the right organizational systems. From a theoretical perspective, Deshpandé et al. (1993) refer to this as the "mechanistic processes" (vs. the organic processes), which mark a higher level of control, order, and stability in the organization—combining this with the external orientation that is discussed above results in an organizational culture that may be termed as the market culture. So from this perspective, the firms in the service sector may perhaps exhibit the market culture. However, a determination of the cultural types exhibited by firms in the service sector requires further research studies.

6.2. Moderating effect of digital technology – business strategy on the relationship between organization readiness and digital financial innovation

This study does not find a moderation effect of digital technology – business strategy on the relationship between organizational readiness and DFIs. Many studies affirm positive relationships between strategy and technological innovations (Berman and Hagan, 2006; Ritter and Gemünden, 2004). However, in recent times the strategy – IT alignment concept itself has been argued. The alignment of strategy and IT has long been explored in the literature, and the recent advancements in digital technologies are opening new areas of exploration rather than concluding the debate for various reasons (Coltman et al., 2015), (1) the IT and strategy are both in "perpetuity," and the changes in IT and business strategy produce avenue of misalignment between the two, (2) the strategy – IT alignment has become very institutionalized, to the extent that IT does not necessarily provide a differentiating factor to firms since all progressive firms would have IT systems implemented, and (3) the digitalization is a business strategy itself, so the alignment between IT is strategy does not make sense. These theoretical arguments may help us explain the insignificant moderation effect of digital technology – business strategy that this study finds. Firstly, in the UAE, the firms are always at the forefront of adopting new IT, thus making IT the strategy of the businesses, thus making the concept of alignment between IT and strategy meaningless in managers' minds. Secondly, since IT and strategy are constantly changing, continuous alignment between the two would mean a futile effort, and the firms may be following them as two separate strategies alongside. Together these arguments may result in a scenario where an organization follows an IT strategy in a focused manner irrespective of the business strategy.

6.3. Association between digital financial innovation, financial performance, and financial resilience

Our study confers the previous findings (Nasiri et al., 2020; Wang et al., 2021) of the relationship between DFI and financial performance. Since digital financial solutions facilitate seamless interactions with external stakeholders and provide accurate and timely information, they enhance the firm's operational performance in terms of inventory turnover, availability, and efficiency. This, in turn, improves the financial performance of the firms (Alimirruchi and Kiswara, 2017). This study finds that DFIs positively affect sales growth, pre-tax profit, cash flow, and stakeholder value. This makes sense because seamless, accurate, and timely information provided by DFIs would result in sales growth and cash flow, which would result in higher pre-tax profit and higher stakeholder value.

This study also finds a positive effect of DFIs on financial resilience (financial robustness and financial adaptability). Robustness is the propensity of a firm to rapidly cope with changing market dynamics (Zhan and Zeng, 2012). Since DFIs provide accurate and timely information of the financial and operational interactions with external stakeholders, managers can closely monitor uncertainty and changing market dynamics promptly. This allows them to make quick decisions to hedge against or avert those uncertainties. These decisions may relate to changing operational plans such as scaling down operations or intermittent services to customers. The change in operational plans may result in significantly reduced costs versus the revenues and better profits. These decisions could also relate to absorbing financial shocks and ensuring yearly financial goals. Similarly, financial adaptability refers to the capability of a firm to adapt to changes in the market environment. In the presence of seamless, accurate, and timely information, the firm can visualize trends and proactively take actions to adapt to the changes that might come in the future. Thus, DFIs provide financial adaptability to the firms.

6.4. Implications for theory

Empirical research is scarce in the domain of DFIs. One primary reason for this scarcity of digital finance-related constructs. Since digital technologies are being deployed in various sub-domains of management, this research motivates operational/organizational researchers to develop new constructs and study digitalization phenomena in multiple sub-domains of management. This study explores the relationship of organizational readiness with DFIs and finds that change efficacy and contextual factors of organizational readiness determine DFIs. The results are novel since organizational readiness has not been studied in the context of DFIs. This study does not find empirical support for the relationship between change valence and DFIs. It is inferred that firms in the developing economy like the UAE practice high external orientation and high control (lack of flexibility). This provides avenues for future research to explore the true nature of culture organizations practice concerning digitalization in developing economies.

This study finds no empirical support of the moderation effect of digital technology – business strategy construct on the relationship between organizational readiness and DFIs. This could be because of the inconclusiveness of the debate between IT and business strategy alignment. Although there exist three decades of research exploring the relationship between IT and business strategy, and the general understanding is that an alignment between the two should improve business performance, the debate is not settled in the literature (Coltman et al., 2015). Our findings also suggest the same that both concepts can co-exist and do not have to be aligned. The extant literature talks about this inclusiveness owing to the overlaps between and the changing nature of the two concepts. One more reason for this could be the lack of business strategy in developing economy firms. However, these reasons are open questions that require further research and investigations.

6.5. Implications for practice

This research work generates several findings that are useful for practitioners. First, DFIs enhance firms' financial performance and financial resilience (in terms of robustness and adaptability). Both concepts are of significant importance for business and finance managers, and DFIs can act as a means to produce early information and data for responsive and proactive decision-making. The research also informs that the successful realization of DFIs requires an organizational readiness to change, reconfigure, and retool its resources, IT, strategic thinking, collaborations, culture, and cognition. The practicing managers need to establish appropriate policies and practices in the organization to facilitate these.

6.6. Limitations and future research

This research has some limitations. Firstly, the empirical support is based on the data collected from a developing economy like the UAE and even the service industry. Further generalizations of the findings of this study require theory testing in other industries and economies (both the developing and the developed). It may be argued that the implementation of digital technologies and production of financial results require some timeframe, and the cross-sectional nature of the data on which this study is based may not surrogate the longitudinal data.

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Declaration of competing interest

None.

Appendix A. Antecedents and consequences of Digital Financial Innovations (DFIs)

Authors and year	Journal	Method	Constructs related to DFI	Antecedents	Consequences	Findings ("→" = lead(s) to)
Zavolokina et al. (2016)	FI	Literature Review	FinTech	Motivating factors for FinTech	None	A combination of regulatory, economic, and technological factors drive financial innovations
Hu et al. (2019)	Symmetry	Survey	Attitude, and intentions toward adoption of Fintech services	Perceived risk, brand image, government support, user innovativeness, perceived ease of use, perceived usefulness, users' trust	None	• Brand image, government support, user innovativeness, perceived ease of use, perceived usefulness, users' trust positively → attitude toward adoption of Fintech services • Attitude toward adoption of Fintech services positively → intention toward adoption of Fintech services
Kamble et al. (2019)	IJPR	Survey	Attitude, and intentions toward adoption of Blockchain technology	Perceived usefulness, perceived ease of use, subjective norms, behavioral control	None	• Perceived usefulness positively → attitude toward adoption of Blockchain technology • Perceived usefulness, and perceived ease of use positively → intention toward adoption of Blockchain technology • Perceived behavioral control positively → intention toward adoption of Blockchain technology
Senyo and Osabutey (2020)	Technovation	Survey	Mobile money services use	Behavioral intentions, perceived risk, service trust, agent trust	None	Behavioral intentions of users positively → mobile money services use
Mbama and Ezepue (2018)	IJBM	Survey	Customer perceptions of digital banking	None	Customer experience	• Perceived value, functional quality, digital banking service quality, employee customer engagement, perceived usability positively → customer experience • Perceived risk negatively → customer experience
Lam et al. (2019)	IJPE	Event study	Supply chain finance initiatives (with firm characteristics, collaborative mechanisms and service type)	None	Market value	• SCF initiatives announced by non-bank investors positively → significantly higher market value • SCF initiatives announced when service providers collaborate, or when service providers upgrade services positively → significantly higher market value
Nasiri et al. (2020)	TASM	Survey	Digital related capabilities	None	Performance measurement system, financial performance	• Human and collaborative capabilities positively → Performance measurement system • Performance measurement system mediates the relationship between human and collaborative capabilities and financial performance
Wang et al. (2021)	RIBF	Survey (Big Data Analysis)	Development of Fintech	None	Performance measures (profitability, financial innovation, improved control of risk)	The development of Fintech in the commercial banks positively → Profitability, financial innovation, and improved control of risk
Del Gaudio et al. (2020)	EMJ	Survey	Adoption of ICTs (in banking transactions)	Information and communication technologies (ICTs)	Several financial performance parameters	Studied the role of ICTs on the profits and risks of financial distress and found a positive relation between ICTs and performance.

Notes: FI: Financial Innovation; EMJ: European Management Journal; IJBM: International Journal of Bank Marketing; TASM: Technology Analysis and Strategic Management; IJPR: International Journal of Production Research; IJPE: International Journal of Production Economics; IJIM: International Journal of Information Management; RIBF: Research in International Business and Finance

Appendix B. Selective Studies on the relationship between organizational factors and technology related innovations

Distinct Organizational factors (among others)	Authors & Year	Journal	Method	Constructs/Concepts	Findings ("→" = lead(s) to)
Motivation related factors	Fuller et al. (2007)	JSAT	Survey	Organizational readiness (motivation, institutional resources, staff attributes, organizational climate) for change, evidence-based practices, practices with less empirical support	Organizational readiness for change positively → evidence-based treatments (manualized treatments, medication, integrated mental health services, and motivational incentives) more compared to less evidence-based practices (confrontation and noncompliance discharge)
	Kankanhalli et al. (2015)	MISQ	Survey	Trend leadership, Employee motivational factors (enjoyment, extrinsic rewards, recognition), Intention to innovate	Employee benefits such as extrinsic rewards and recognition positively → intention to innovate
Self-efficacy	McDonald and Siegall (1996)	JMP	Conceptual	Employee self-efficacy, technological change	Evaluates the employee's self-efficacy for technological changes and introduces multiple factors to enhance self-efficacy
	Mancha and Shankaranarayanan (2020)	ITP	Survey	Entrepreneurial orientation and self-efficacy, and digital literacy and digital technology self-efficacy	Entrepreneurial self-efficacy and digital technology self-efficacy positively → digital innovativeness
Organization structure, processes, values and capabilities	Snyder-Halpern (2001)	IJMI	Delphi Study	Organizational factors (resource attributes, processes, values), Management support, IT system innovation	The organizational factors were found to support IT system innovation in healthcare organizations.
	Hameed et al. (2012)	INFMAN	Meta-analysis	Organizational characteristics (formalization, centralization, readiness and other organizational factors) and IT innovation adoption	Investigates the organizational factors for IT adoption and finds a significant relationship for organizational readiness, moderate relation for department size, weak for infrastructure, top management support, IT expertise, and organizational size.
	Aboelmaged (2014)	IJIM	Survey	Technological, organizational and environmental contexts and e-readiness	Technological and organizational determinants involving technological infrastructure and organizational competence positively → e-maintenance readiness of the firm
	van de Weerd et al. (2016)	INFMAN	Case Study	Organizational readiness (resources), organizational size	• Top management support enables Software as a Service (SaaS) for small firms • Organizational readiness does not enable SaaS for small firms
	Gillani et al. (2020)	IJPE	Survey	Technological, organizational (worker attributes, organizational practices related to centralization, coordination, improvements), and environmental contexts and digital technologies implementation	Organizational context of a firm positively → technological context, which in turn positively → digital technologies implementation
	Khin and Ho (2019)	IJIS	Survey	Digital orientation, digital capability and digital innovation	Digital capabilities positively → digital innovation
	Wiesböck et al. (2020)	INFMAN	Survey	IT capabilities of the organization (infrastructure, business spanning, proactive stance, digital technologies and solutions), digital products and services	Organizational IT capabilities positively → digital product/service solutions
Organizational climate/ culture	Fuller et al. (2007)	JSAT	Survey	Organizational readiness (motivation, institutional resources, staff attributes, organizational climate) for change, evidence-based practices, practices with less empirical support	Organizational readiness for change positively → evidence-based treatments (manualized treatments, medication, integrated mental health services, and motivational incentives) more compared to less evidence-based practices (confrontation and noncompliance discharge)
	Uzkurt et al. (2013)	IJITM	Content Analysis	Organizational culture and support, management style, learning orientation, human capital and innovation	• Innovation culture, structure and climate are the most cited factors for innovation • Management style, organizational support, creative human capital, and learning orientation are the second most important factors for organizational innovation
	Herath et al. (2020)	DBAIS	Survey	Organizational factors, institutional factors, adoption of information security solutions	Organizational and environmental factors contribute to information security solution adoption.
Strategic factors	Leidner et al. (2010)	JSIS	Survey	CIO strategic leadership, TMT attitude, hospital climate, hospital IT innovation	CIO strategic leadership and TMT attitude positively → hospital IT innovation
	Yen et al. (2012)	DSS	Survey	Strategic orientation for service innovation, Enabling mechanisms (champions, experience, inter-organizational collaborations), and innovation performance	• Strategic orientation towards service innovation positively → service innovation performance • Enabling mechanisms positively → service innovation performance
Several factors (motivation, resource sufficiency and attributes, and strategic)	Halpern et al. (2021)	JATM	Survey	Organizational contextual factors and resources readiness, innovation, digital transformation	Explores the relationship of digital change with organizational readiness, innovation, airport size, and ownership and reveals that organizational readiness has a direct effect on digital change.

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Distinct Organizational factors (among others)	Authors & Year	Journal	Method	Constructs/Concepts	Findings ("→" = lead(s) to)

Note: INFMAN: Information & Management; IJIM: International Journal of Innovation Management; JSAT: Journal of Substance Abuse Treatment; IJPE: International Journal of Production Economics; JATM: Journal of Air Transport Management; JMP: Journal of Managerial Psychology; IJMI: International Journal of Medical Informatics; IJITM: International Journal of Innovation and Technology Management; DSS: Decision Support Systems; DBAIS: Database of Advances in Information Systems; MISQ: MIS Quarterly; ITP: Information Technology and People; JSIS: Journal of Strategic Information Systems; IJIS: International Journal of Innovation Science.

Appendix C. Construct measurement, descriptive analysis and normality tests

Constructs	Items	Description	M	SD	W
Organizational readiness (Lokuge et al., 2019): includes Change Valence, Change Efficacy (Resource Readiness, IT Readiness, Cognitive Readiness), and Contextual Factors (Cultural Readiness, Strategic Readiness, Partnership Readiness)					
Change Valence	CV1	Our staff members have the right attitudes that facilitate innovations.	3.214	1.036	0.996
	CV2	Our staff members are motivated to facilitate innovations.	3.107	1.204	0.984***
	CV3	Our staff members are empowered to make decisions that facilitate innovations.	3.368	0.994	0.986***
Global Item CV	CV_G	Overall, our staff members make decisions that facilitate innovations.	3.730	0.830	0.985***
Resource Readiness	RR1	My organization is flexible in allocating adequate financial resources necessary to innovate with the IT portfolio.	3.361	0.965	0.991**
	RR2	My organization is flexible in allocating adequate human resources necessary to innovate with the IT portfolio.	3.091	1.260	0.980***
	RR3	My organization is flexible in allocating adequate IT infrastructure resources necessary to innovate with the IT portfolio.	3.832	0.986	0.979***
Global Item RR	RR_G	Overall, my organization is flexible in allocating adequate resources necessary to innovate with the IT	4.125	0.823	0.953***
IT Readiness	IT1	Enterprise system/s in my organization is stable, up-to-date, and reliable.	3.580	0.992	0.990**
	IT2	I have access to a range of new technologies like cloud, mobile, social media, and big data analytics available to facilitate innovations.	3.730	0.952	0.983***
	IT3	Our IT infrastructure is stable, up-to-date, and reliable to facilitate innovations.	3.507	0.968	0.992*
Global Item IT	IT_G	Overall, IT and IS in my organization are stable, up-to-date, available, and reliable to facilitate innovations.	4.025	0.824	0.967***
Cognitive Readiness	CG1	Our staff members have the appropriate knowledge (i.e., technical, business process, and organizational) to facilitate innovations.	3.802	0.924	0.984***
	CG2	Our staff members have the appropriate skills to facilitate innovations.	3.800	1.129	0.983***
	CG3	Our staff members have the appropriate adaptability to facilitate innovation.	3.764	1.013	0.986***
Global Item CG	CG_G	Overall, our staff members have the appropriate skills to facilitate innovation.	4.450	0.718	0.941***
Global Item Change Efficacy	CE_G	Overall, my organization has the necessary resources, technologies, and staff capabilities to facilitate innovations	3.607	0.530	0.980***
Cultural Readiness	CR1	My organization has a well-established way of sharing ideas and thoughts to engage with the IT portfolio for innovations.	3.620	1.122	0.975***
	CR2	My organization has a decentralized decision-making process that facilitates the engagement of all business areas to use the IT portfolio for innovations.	3.659	1.069	0.990**
	CR3	My organization takes reasonable risk assessment of engaging IT to facilitate innovations.	3.580	0.990	0.988**
Global Item CR	CR_G	Overall, my organization has a well-developed culture to engage with the IT portfolio for innovations.	4.057	0.833	0.967***
Strategic Readiness	SR1	Our organizational strategic goals are clear to me when engaging the IT portfolio to facilitate innovations.	3.691	1.007	0.990**
	SR2	Our organizational strategic goals are relevant to me when using the IT portfolio to facilitate innovations.	3.668	1.037	0.992*
	SR3	I am well-aware of our organizational strategic goals communicated to me for using the IT portfolio to facilitate innovations.	3.845	1.006	0.980***
Global Item SR	SR_G	Overall, our organizational strategic goals are clear, relevant, and well-communicated to me when engaging the IT portfolio to facilitate innovations.	4.155	0.863	0.963***
Partnership Readiness	PR1	My organization has a good relationship with the software vendors to facilitate innovations.	3.700	0.949	0.984***
	PR2	My organization has a good relationship with the management consultants to facilitate innovations.	3.845	1.048	0.985***
	PR3	My organization has a good relationship with our suppliers and vendors to facilitate innovations.	3.693	0.960	0.984***
Global Item PR	PR_G	Overall, my organization has a good relationship with its partners to facilitate innovations.	4.175	0.849	0.956***
Global Item Contextual Factors	CF_G	Overall, my organization has a well-established culture, strategy, and partnerships to facilitate innovations	3.690	0.832	0.987**
Digital Business Strategy Alignment (Li et al., 2020)	DSA1	Integrate digital technology and business strategy to attain strategic alignment	3.757	0.933	0.982***
	DSA2	Create a shared vision of the role of digital technology in the business strategy	3.686	1.010	0.980***
	DSA3	Jointly plan how digital technology will enable the business strategy	3.961	1.036	0.974***
	DSA4	Confer with each other before making strategic decisions	3.689	0.963	0.982***
Digital Financial Innovation (Khin and Ho, 2019; Paladino, 2007)	DFI1	The quality of our digital financial solutions is superior compared to our competitors	3.598	1.064	0.980***
	DFI2	The features of our digital financial solutions are superior compared to our competitors'	3.698	1.039	0.980***
	DFI3	The applications of our digital financial solutions are totally different from our competitors'	3.793	1.027	0.987**
	DFI4	Our digital financial solutions are different from our competitors' in terms of product platform	3.645	1.084	0.986***
	DFI5	Our new digital financial solutions are minor improvements of existing products	3.686	1.058	0.984***
	DFI6	Some of our digital financial solutions are new to the market at the time of launching	3.707	1.035	0.982***

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Constructs	Items	Description	M	SD	W
	DFI7	The applications of our digital solutions are totally different from the applications of our main competitors' solutions	3.814	0.900	0.975***
Financial Performance (Ali et al., 2018)	FP1	Sales growth	3.609	1.001	0.982***
	FP2	Pre-tax profit	3.864	1.004	0.981***
	FP3	Cash flow	3.434	1.038	0.990**
	FP4	Stakeholders value	3.616	1.047	0.987**
Financial Robustness (Nkundabanyanga et al., 2019)	FR1	Management is planning to scale down the number of operational branches in the nearby future	3.523	1.148	0.996
	FR2	We are compliant to applicable laws and regulations	3.839	1.078	0.979***
	FR3	We sometimes experience intermittent delivery of services to our customers	3.530	1.020	0.992**
	FR4	All our plans in a given financial year are implemented without postponing to other financial periods	3.745	1.068	0.989**
	FR5	We deal with financial shocks well	3.600	1.078	0.989**
Financial Adaptability (Nkundabanyanga et al., 2019)	FA1	Most of our operations are insured against shocks and uncertainties	3.502	1.053	0.983***
	FA2	We easily adjust our operating procedures in case of need	3.448	1.058	0.974***
	FA3	We consistently follow similar priorities from year to year	3.634	0.942	0.988**
	FA4	We are capable of spotting opportunities in our operating environment with ease	3.666	1.044	0.988**
Tests for multivariate normality					
Mardia mSkewness = 885.638 chi2(24804) = 65406.395					Prob > chi2 = 0.000
Mardia mKurtosis = 3598.47 chi2(1) = 12238.733					Prob > chi2 = 0.000
Henze-Zirkler = 1.176429 chi2(1) = 1.51e+13					Prob > chi2 = 0.000
Doornik-Hansen chi2(104) = 2127.021					Prob > chi2 = 0.000

Notes: M = Mean; SD = Standard deviation; W = Shapiro Wilk test statistic; *p < 0.05; **p < 0.01; ***p < 0.001.

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