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Investigating the dynamics between change readiness, digital business strategies, and digital innovation in the banking sector

Rizki Fahriza[1,*], Donard Games[2], Hendra Lukito[3]
Universitas Andalas, Indonesia[1,2,3]
Corresponding e-mail: andthereallbegin@gmail.com[*]

ABSTRACT

Purpose — *The objective of this research is to investigate the relationship between change readiness and digital innovation within the banking industry. Furthermore, the study aims to examine how this relationship is influenced and moderated by the alignment of digital business strategies.*

Method — *This research employed quantitative methods and utilized a saturated sampling technique to gather data. The sample consisted of 95 respondents and was conducted at all branch offices of PT. Nagari Bank Sumatera Barat. To ensure the validity of the data, convergent validity and discriminant validity tests were performed using the SmartPLS 4.0 program. Hypothesis testing was carried out by conducting t-statistical assessments for each variable in order to address the research hypotheses.*

Result — *We found that there is a positive and significant influence between valence changes and digital innovation. Similarly, we observed a positive and significant impact between contextual factors and digital innovation according to our test results. Additionally, our study revealed a positive and significant association between changes in efficacy and digital innovation. However, our hypothesis which posits that the alignment of digital business strategy (including valence changes, efficacy changes, and contextual factors) moderates the relationship between change readiness and digital innovation was not supported. This suggests that the alignment between business strategy and digital strategy does not strengthen or weaken change readiness for digital innovation.*

Contribution — *This study adds to the body of knowledge by providing new insights into the relationship between change readiness and digital innovation within the banking industry.*

Keywords: *valence changes, changes in efficacy, contextual factors, digital innovation, digital business strategy alignment*

INTRODUCTION

In recent times, there has been significant and rapid development in the field of information technology, leading to a paradigm shift in how human needs are met. The emergence of digital technology, facilitated by information technology advancements, has spurred a widespread digitization phenomenon across various domains (Schueren et al., 2020). Research findings indicate that digital transformation plays a pivotal role in driving digital innovation, with studies emphasizing its importance as a catalyst for organizational growth and adaptation to the digital landscape (Hadjielias, Christofi, & Tarba, 2022). Digital innovation encompasses the enhancement of existing digital products and services through technologies such as artificial intelligence, big data, cloud computing, among others, which are products of this transformative era (Xie et al., 2022). Scholars define digital innovation as the utilization of digital technology to support and improve operational processes within companies (Faldetta et al., 2021). Moreover, it is also described as innovation driven by digital technology itself (Agostini et al., 2020).

Organizational change readiness, derived from change management principles, plays a crucial role in the successful implementation of digital innovation initiatives (Jun et al., 2021). According to Lokuge et al. (2019), change readiness exists at multiple levels within an organization, ranging from individuals to groups, units, and the entire organization itself. Moreover, Hussain & Papastathopoulos (2022) and Alkhamery et al. (2020) highlight that changes in valence significantly influence commitment to change. Therefore, the theory of readiness for change comprises three main dimensions: changes in valence, changes in efficacy, and contextual factors.

Change valence represents the organizational and individual commitment to change (Xie et al., 2022). Change efficacy refers to the belief in one's own ability, whether at an individual or organizational level, to effectively navigate and manage change (Haqq & Natsir, 2019). Contextual factors encompass broader conditions within the company that can influence readiness for change, such as organizational culture, partnerships, and implementation strategies (Wang et al., 2020).

To facilitate the successful implementation of digital innovation, it is essential to align the business strategy with the digital strategy. This alignment ensures that the strategies implemented are conducive to promoting and fostering digital innovation within an organization. The alignment of digital business strategy encompasses the integration of both the business strategy and the digital strategy, forming the foundation for this concept (Uhlig & Remane, 2022).

By aligning the business strategy and the digital strategy, companies can effectively navigate the dynamic business landscape by leveraging insights derived from customer preferences and market conditions. This alignment becomes crucial in driving strategic change, gaining a competitive advantage, and enhancing overall organizational performance (Kahre et al., 2017). It enables companies to adapt to the evolving business environment, capitalize on digital technologies, and seize opportunities for growth and success.

Previous research has revealed that a lack of readiness within companies results in approximately 90% of ideas and innovations failing to meet customer needs (Lokuge et al., 2019). Therefore, it is crucial for companies to ensure their readiness for change in order to fully harness the potential of digital innovation. The alignment between business strategy and digital strategy plays a pivotal role in facilitating more effective implementation of digital innovation. Research by Hussain & Papastathopoulos (2022) confirms that changes in efficacy significantly and positively influence digital innovation. This means that when companies exhibit readiness in terms of resources, information technology, and cognitive factors, their readiness for change in digital innovation increases. Haqq & Natsir (2019) also support these findings, highlighting the positive and significant impact of efficacy changes on digital innovation. Furthermore, Vanny et al. (2022) discovered a positive and significant relationship between changes in efficacy and organizational commitment to digital innovation.

In this study, we examined the impact of various factors related to change readiness at a banking institution that had not previously been investigated in terms of adopting digital innovation, specifically in the realm of digital banking services. The aim was to understand the variables that influence readiness for change and how these variables relate to the implementation of digital innovation at the bank. Our research expands upon previous studies by examining the readiness for change scores across three dimensions: changes in valence, changes in efficacy, and contextual factors. Additionally, we investigated the role of digital business strategy alignment in moderating the relationship between these dimensions of change readiness and the adoption of digital innovation at the bank.

METHOD

This research utilizes quantitative methods and employs a saturated sampling technique. The target population for this study includes all active employees in the Assistant Vice President and Vice President office of PT. Nagari Bank, with a total of 95 individuals. The employees in this office hold managerial positions

and senior managerial roles, representing various departments such as finance, information technology, legal, planning, marketing, general, and others. They possess knowledge and experience in strategy, resource utilization, and resource management. Data collection was conducted through the distribution of questionnaires to the respondents. The questionnaire employed a Likert scale with five levels for measuring the data. Based on the collected questionnaire responses, further analysis can be conducted.

Table 1. Definition of operational variables

Variable	Definition	Indicator	Question	Scale	Source
Digital Innovation (Y)	Development of new products, services or solutions using digital technology	Quality	7	Likert (1-5)	Khin & Ho, (2019)
		Feature			
		Uniqueness			
		Application			
		Novelty			
Valence Change (X1)	A form of support and commitment owned by employees to change	Perceived need	10	Likert (1-5)	Shea et al., (2014)
		Perceived benefits			
		Perceived timeliness			
		Perceived compatibility			
Efficacy Change (X2)	Change which refers to the perceived ability of the organization to bring about change	Resource Readiness	9	Likert (1-5)	Hussain & Papastathopoulos (2022)
		Information Technology Readiness			
		Cognitive Readiness			
Contextual Factors (X3)	Matters related to core values to adopt innovation	Cultural Readiness	9	Likert (1-5)	Helfrich et al., (2018)
		Strategic Readiness			
		Partnership Readiness			
Alignment of Digital Business Strategy (Z)	organizational strategy that is formulated and executed by utilizing digital resources to create added value	Shared Vision	9	Likert (1-5)	Almajali et al., (2022); Bi, (2020)
		Integration of information technology and business			
		Synergy and partnership between information technology and business			
		open discussion			

Source: Authors' compilation (2023)

The validity tests conducted in this research utilized the SmartPLS 4.0 program. Convergent validity and discriminant validity were assessed. In terms of reliability, the variables were considered reliable if they met the rule of thumb criterion of Cronbach's alpha and composite reliability being greater than 0.7; otherwise, they were deemed unreliable (Ghozali, 2015).

Hypothesis testing involved the use of t-statistical assessment for each variable to examine the research hypotheses. A hypothesis was considered supported if the t-statistic value exceeded 1.96 (two-tailed test), and it was deemed unsupported if the t-statistic value fell below this threshold. Additionally, the significance level (p-value) played a crucial role: a value less than 0.05 indicated a significant effect, while a value greater than 0.05 indicated no significant effect (Hair Jr., Gabriel, and Patel 2014).

To assess the moderation effect, the significance value of the moderation test was examined. If this value was less than 5.00%, the variable under scrutiny could be categorized as a moderating variable within the tested model.

Hypotheses development

Valence change and digital innovation

The valence change, rooted in motivation theory, encompasses the support and commitment exhibited by employees towards change. Research by Akunyumu et al. (2021) suggests that a higher appreciation for change within an organization leads to employees being more motivated to implement and actively participate in change initiatives. Additionally, Shea et al. (2014) identified four indicators of changes in valence: perceived need, perceived benefits, perceived timeliness, and perceived compatibility.

In a study conducted by Harrison et al. (2022) focusing on the change readiness of nurses to adopt innovations in health services during the Covid-19 pandemic in Australia, it was found that commitment to change, which represents changes in valence, had a moderate to strong influence on the readiness to implement innovations in health services related to the pandemic. This implies that the organizational commitment of nurses plays a pivotal role in their willingness to accept and embrace changes when dealing with various innovations related to health services.

H1: Changes in valence have a positive and significant effect on digital innovation

Efficacy change and digital innovation

Efficacy change refers to the perceived ability of an organization to bring about change (Haqq & Natsir, 2019). Budhiraja (2021) explains that it involves assessing one's perceived capability to perform a task, considering both the required knowledge and the suitability of available resources (Deja et al., 2021). Effective transformation is facilitated by clear communication, shared goals, and collaboration among employees (Halpern et al., 2021). Assessing change efficacy includes understanding various resources such as financial, human, and information resources, and utilizing them appropriately and efficiently to drive successful changes (Helfrich et al., 2018). Specifically, Lokuge et al. (2019) identify three indicators that influence changes in efficacy: human resource readiness, information technology readiness, and cognitive readiness.

In a study conducted by Hussain & Papastathopoulos (2022) involving 680 respondents who possessed knowledge and experience in strategy, resource utilization, and resource scarcity within companies, including managers and senior managers in finance, strategy, information technology, and other equivalent fields, it was found that changes in efficacy significantly and positively influenced digital innovation undertaken by organizations.

H2: Changes in efficacy have a positive and significant effect on digital innovation

Contextual factors and digital innovation

Contextual factors play a crucial role in organizations' readiness for change and their ability to adopt innovations. According to Alolabi et al. (2021), contextual factors are associated with core values that support the adoption of innovations. These factors, particularly organizational culture and partnerships, provide a broader understanding of change readiness within organizations (Xie et al., 2022). Helfrich et al. (2018) identify three indicators that influence contextual factors: cultural readiness, strategic readiness, and partnership readiness.

In a study by Mikalef & Krogstie (2020), which involved 202 Chief Information Officers and information technology managers working in various companies in Norway, it was found that contextual factors, including culture, strategy (vision and mission), and partnerships (external environment), significantly influenced digital innovation. This research highlights the importance of considering these contextual factors when assessing organizations' readiness for change and their ability to drive digital innovation.

H3: Contextual factors have a positive and significant effect on digital innovation

Alignment of digital business strategy

To generate business value and thrive in competitive marketplaces, companies need to connect their digital business strategies with their overall business strategies (Wunderlich & Beckin, 2018). This alignment requires a flexible and dynamic organization. Li et al. (2021) emphasize that aligning business strategy with digital technology enables organizations to achieve the best strategic alignment and ensures that digital technology contributes effectively to the organizational strategic framework. Collaboration and mutual understanding between the technology department and the business component are essential for making informed decisions and sharing business responsibilities.

For digital technology to add value to a company, it is crucial to establish strategic alignment between enterprise information technology professionals and business management. Almajali et al. (2022) propose four key indicators for achieving alignment of the digital business plan: shared vision, integration of information technology and business, synergy and cooperation between information technology and business, and open dialogue.

Research by Berman & Hagan (2006) suggests a positive relationship between strategy and technological innovation. Organizational readiness for change is influenced by the use of relevant company resources and guided by the appropriate business strategy. When there is alignment between business strategy and information technology, coupled with organizational readiness for change, the potential for successful digital innovation increases, leading to enhanced organizational success and performance.

H4: Alignment of digital business strategy moderates the relationship between change readiness with digital innovation

RESULT AND DISCUSSION

Convergent validity test

The Convergent Validity Test examines the validity of the relationship between each indicator and its underlying construct. This test assesses the correlation between the indicator and the construct, represented by the loading value. The Convergent Validity Test is considered strong when the outer loading value is greater than 0.7. However, values ranging from 0.6 to 0.69 can still be acceptable if the Average Variance Extracted (AVE) score exceeds 0.5. If the outer loading value falls below 0.6, it is necessary to remove the indicator from consideration (Ghozali, 2015).

Tabel 2. Convergent validity test result

	FK (X3)	ID (Y)	KSBD (M)	PE (X2)	PV (X1)
FK1	0,808				
FK2	0,705				
FK3	0,787				
FK4	0,789				
FK5	0,837				
FK6	0,769				
FK7	0,810				
FK8	0,862				
FK9	0,842				
ID1		0,835			
ID2		0,820			
ID3		0,681			
ID4		0,712			
ID6		0,725			
ID7		0,742			
KSBD1			0,870		
KSBD2			0,870		
KSBD3			0,887		
KSBD4			0,834		
KSBD5			0,879		
KSBD6			0,893		
KSBD7			0,831		
KSBD8			0,834		
KSBD9			0,840		
PE1				0,810	
PE2				0,628	
PE3				0,843	
PE4				0,881	
PE5				0,743	
PE6				0,783	
PE7				0,844	
PE8				0,807	
PE9				0,761	
PV2					0,742
PV3					0,700
PV4					0,771
PV5					0,751
PV6					0,686
PV7					0,724
PV8					0,752
PV9					0,819
PV10					0,758

Source: Processed data (2023)

After conducting the initial test, it was observed that certain indicators of each variable were not valid due to their convergent validity value being below 0.60. These invalid indicators were identified in the digital innovation variable, specifically in question number 5 (pertaining to new digital products and

services being small improvements to existing ones), and in the valence change variable, specifically in question number 1 (related to perceiving digital innovation as aligned with company values).

To address this issue, the next step involves removing these invalid indicator questions and reprocessing the data until the desired conditions are met: achieving an outer loading value between 0.6 and 0.69, and ensuring the AVE score remains above 0.5. This iterative process will help improve the validity of the measurement instrument and ensure a more accurate assessment of the variables under study.

Discriminant validity test

The Discriminant Validity Test involves comparing the discriminant validity with the Average Variance Extracted (AVE), which is the square root of the average variance extracted. This assessment is done by examining the cross-loading values presented in accordance with the Fornell-Larcker table. To establish good discriminant validity, the square root value of AVE should be higher than the correlation value between constructs, with a recommended AVE value of greater than 0.5 (Ghozali, 2015). In this study, the discriminant validity test result is as follows:

Table 3. Discriminant validity test

	Average Variance Extracted (AVE)
FK (X3)	0.643
ID(Y)	0.569
PE(X2)	0.627
PVs (X1)	0.556

Source: Processed data (2023)

According to the table above, it indicates that each latent variable can be deemed valid as the AVE value exceeds 0.50.

Table 4. Fornell-Larcker

	FK (X3)	ID(Y)	PE(X2)	PVs (X1)
FK (X3)	**0.802**			
ID(Y)	0.619	**0.755**		
PE(X2)	0.627	0.568	**0.792**	
PVs (X1)	0.473	0.552	0.443	**0.746**

Source: Processed data (2023)

Based on the table above, it is evident that each latent variable can be considered valid since the Fornell-Lacker test value exceeds 0.50.

Reliability test

This test is performed to evaluate the dependability and trustworthiness of an instrument. If the Cronbach's alpha and composite reliability values are greater than 0.7, the variable is considered reliable according to the general guideline. Conversely, if the values fall below this threshold, the variable is deemed unreliable (Ghozali, 2015).

Table 5. Composite reliability

	Cronbach's alpha
FK (X3)	0.930
ID(Y)	0.850
PE(X2)	0.925
PVs (X1)	0.900

Source: Processed data (2023)

The coefficient of determination (R^2) and hypotheses test

Based on the research findings, the R-square value of the digital innovation variable is 0.507. This indicates that approximately 50.70% of the variation in the digital innovation variable can be explained by three dimensions of readiness to change: changes in valence, changes in efficacy, and contextual factors. The remaining 49.30% of the variation is attributed to other variables that were not included in this study.

The hypothesis can be considered supported if the t-statistic value exceeds 1.96 (for a two-tailed test), and conversely, it is not supported if the t-statistic value is less than that threshold. Additionally, the P-value is deemed to have a significant effect if it is less than 0.05, while it is considered to have no significant effect if it exceeds this value (Hair et al., 2010). In this study, the hypothesis test is conducted as follows:

Table 6. T-statistics and P-values

	Path Coefficient	**t-statistics**	**P-values**
PV (X1) -> ID (Y)	0.327	2,898	**0.004**
PE (X2) -> ID (Y)	0.239	2,051	**0.040**
FK (X3) -> ID (Y)	0.340	2,369	**0.018**

Source: Processed data (2023)

The coefficient for the path Valence Change → Digital Innovation is 0.327. The T-statistic value (2.898) is greater than the critical value from the T-Table (1.96), and the P-value (0.004) is less than 0.05. Consequently, the hypothesis H1, which

suggests that changes in valence have a positive and significant impact on digital innovation, is supported.

The path coefficient for Efficacy Change → Digital Innovation is 0.239. The T-statistic value (2.051) is greater than the critical value from the T-Table (1.96), and the P-value (0.040) is less than 0.05. Thus, the hypothesis H2, which posits that changes in efficacy have a positive and significant impact on digital innovation, is supported.

The coefficient for the path Contextual Factors → Digital Innovation is 0.340. The T-statistic value (2.369) is greater than the critical value from the T-Table (1.96), and the P-value (0.018) is less than 0.05. Consequently, the hypothesis H3, which suggests that contextual factors have a positive and significant impact on digital innovation, is supported.

Moderation effect test

The moderation test's significance value serves as a reference to determine whether the variable being investigated can be considered a moderating variable. If the significance value is below 0.05, it indicates that the variable can be classified as a moderating variable in the tested model. Here are the results of the moderation test conducted in this study:

Table 7. Moderation effect test

	Path Coefficient	T statistics	P values
KSBD (Z) x PV (X1) -> ID (Y)	0.022	0.218	0.827
KSBD (Z) x PE (X2) -> ID (Y)	-0.078	0.649	0.516
KSBD (Z) x FK (X3) -> ID (Y)	-0.014	0.123	0.902

Source: Processed data (2023)

Based on the provided table, it can be concluded that there is no significant moderating effect observed in the relationship between PV→ID with KSBD as a moderating variable (P value = 0.827 > 0.05). Similarly, the relationship between PE→ID with KSBD as a moderating variable also does not exhibit a significant moderating effect (P value = 0.516 > 0.05). Additionally, the FC Relations→ID with KSBD as a moderating variable also does not show a significant moderating effect (P value = 0.902 > 0.05).

In summary, based on the results of the three-dimensional moderation analysis of the digital business strategy alignment variable with digital innovation, hypothesis H4, which suggests that digital business strategy alignment

moderates the relationship between change readiness and digital innovation, is not supported.

Discussion

The effect of valence changes on digital innovation

Based on the results of the study, it was found that changes in valence have a positive and significant impact on digital innovation. These valence changes directly increase readiness for change towards digital innovation. Recognizing the importance and benefits of innovation enhances employee motivation to embrace change. The support from managers or leaders within the organization strengthens employee determination and commitment to digital innovation. High employee motivation contributes to a stronger organizational commitment to change and implement digital innovations. This finding is consistent with previous research conducted by Harrison et al. (2021), Doukani et al. (2021), and Lokuge (2019), which also found a positive and significant relationship between valence changes and digital innovation.

These findings suggest that individual determination and commitment to change facilitate the successful implementation of digital innovation. The study included participants in senior positions, indicating that management support through various directions and policies reinforces organizational commitment. This organizational commitment further promotes individual commitment to embrace change.

The effect of efficacy changes on digital innovation

Based on the study's findings, there is a significant and positive relationship between changes in efficacy and digital innovation. This aligns with previous research conducted by Hussain & Papastathopoulos (2022) and Haqq & Natsir (2019), which also found that efficacy changes have a positive and significant influence on digital innovation. The readiness for change in digital innovation is enhanced by the readiness of resources, information technology, and cognitive factors within the organization. Additionally, Vanny et al. (2022) discovered a positive and significant association between efficacy changes and organizational commitment to digital innovation.

The efficacy changes directly impact the readiness for change towards digital innovation. When an organization and its members perceive their ability to effect change, it increases their confidence and belief in making those changes. The

organization's capabilities, including necessary resources, knowledge, time requirements, and activities, are closely linked to efficacy changes.

These findings suggest that high individual and organizational beliefs in their ability to handle change facilitate the successful implementation of digital innovation. This also indicates that the top management, such as vice presidents and assistant vice presidents, at the organization already possess the necessary skills to manage these changes effectively.

The influence of contextual factors on digital innovation

Based on the research findings, it is evident that contextual factors have a positive and significant influence on digital innovation. This is consistent with prior research conducted by Mikalef & Krogstie (2020), which highlighted the impact of contextual factors, including strategic readiness and organizational culture, on digital innovation. Strategic readiness involves clear communication and shared understanding of goals within the organization, leading to increased readiness for change towards digital innovation. Similarly, studies by Helfrich et al. (2020) and Xing et al. (2021) also found that cultural contextual factors, such as organizational values, play a crucial role in facilitating change readiness and driving digital innovation.

These findings indicate that strong support for contextual factors enhances a company's ability to navigate change and successfully implement digital innovation. It suggests the presence of an organizational culture that fosters openness to new ideas, a well-defined strategy that supports digital innovation, effective communication of this strategy to all employees, and positive relationships with partners involved in the development of digital products and services.

The influence of change readiness and digital innovation with the alignment of digital business strategies as the moderating variable

Based on the study's findings, Hypothesis 4, which suggests that the alignment of digital business strategy moderates the relationship between change readiness and digital innovation, is not supported. This indicates that the alignment of the digital business strategy does not strengthen or weaken the relationship between readiness to change and digital innovation.

These findings align with the research conducted by Hussain & Papastathopoulos (2022), who also found that the alignment of digital business

strategy did not moderate the relationship between readiness to change and digital innovation in the companies they observed.

The reason for the lack of moderation effect between the alignment of business strategy and readiness to change towards digital innovation could be attributed to the fact that PT Nagari Bank has been actively involved in digital product development since 2015. By 2020, it already had a comprehensive range of digital products, surpassing some other regional banks. Consequently, the alignment of business strategy with digital strategy has been extensively carried out to support and facilitate the development of digital products. For PT Nagari Bank, digitalization itself is considered a business strategy, rendering the concept of aligning digital business strategy redundant.

Considering the profile of the respondents, who hold high-level positions such as vice presidents and assistant vice presidents at PT Nagari Bank, it can be inferred that the managers and senior executives of the organization have recognized the importance of alignment and have already aligned the business and digital strategies. Therefore, the current focus of the vice presidents and assistant vice presidents is no longer on implementing readiness for digital innovation, but rather on measuring the effectiveness of its implementation.

CONCLUSION

Based on the analysis and discussion, it can be inferred that readiness to change, encompassing changes in valence, efficacy, and contextual factors, has a significant and positive impact on digital innovation. When an organization and its employees exhibit strong commitment and confidence in their ability to change, supported by relevant contextual factors, they are better positioned to implement digital innovation successfully.

However, it was found that the alignment of the digital business strategy does not moderate the relationship between readiness to change and digital innovation. This implies that the alignment between the business strategy and digital strategy does not strengthen or weaken the readiness for change in digital innovation.

To enhance readiness for change towards digital innovation, it is important to pay attention to digital products and services, particularly regarding their level of novelty, quality, and features. This is reflected in statements that have received low scores, such as "The use of digital products and services in my company differs from competitors," "In terms of product platforms, our digital products and services differ from competitors," and "New digital products and

services in our company are minor improvements to existing ones." By launching products and services that have good quality and unique features, offering something new and different from competitors, it will increase the company's readiness for change in embracing digital innovation.

In future research, there are various effective approaches to evaluate the implementation of digital innovations in banks. For instance, utilizing a balanced scorecard approach can provide valuable insights. Additionally, researchers can explore alternative theories or models, such as Lewin's or Lehman's models, to measure readiness for change. Furthermore, examining other variables like performance, leadership style, organizational support, capabilities, and more can contribute to a comprehensive understanding of digital innovation. It is also recommended for future studies to expand beyond the banking sector and include larger sample sizes to enhance the generalizability of findings.

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