

The Linkage Relationship between Knowledge Creation and Business Sustainability in Cross-Sectional Banking Services: The Key Mediating Role of Technological Innovation Capability

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Abstract

Understanding and leveraging the reciprocity between knowledge creation, technological capability, and business sustainability is essential for businesses aiming to thrive in today's evolving marketplace. The study investigated the impact of technological innovation capability on knowledge creation and business sustainability in Cambodia's banking service industries. It emphasized the need for banking institutions to develop their technological capabilities to foster a culture of knowledge creation, thereby enhancing their competitiveness in the financial landscape. Data were collected from 208 middle-line banking service employees in Cambodia's banking service industries. The results of SEM indicated that technological innovation capability plays an important role in both direct and indirect relationships between knowledge creation and business sustainability. The relationship between knowledge creation, technological innovation capability, and business sustainability is crucial in today's dynamic and competitive business environment. The study reveals that technological innovation enhances knowledge creation processes, enabling banks to adapt to market demands and regulatory environments. Therefore, enhancing technological innovation capability can improve operational efficiencies, customer satisfaction, and long-term sustainability, thereby boosting organizations' resilience and competitiveness.

Keywords

Knowledge Creation, Technological Innovation Capability, Business

1. Introduction

Banking service practitioners are experiencing significant technological advancements, enhancing convenience for users in the new era of Banking 5.0 (Nicoletti, 2021). Industry 5.0 envisions modern banking, requiring managers to understand technological trends for strategic decisions and future success (Maddikunta et al., 2022). In October 2020, Cambodia became one of the first two countries to adopt a retail central bank digital currency (CBDC) (Ugur & Vivarelli, 2021). In the era of Banking 5.0, providing electronic banking services is crucial for customer satisfaction and retention. Technological advancements have significantly increased organizational efficiency, transforming business development processes since the beginning of industrialization. This shift is crucial for banking managers to capitalize on existing opportunities (Mehdiabadi et al., 2022).

Hence, banking service industrial revolutions introduce these effects, as organizations leverage innovation to meet customer needs and gather valuable information (Nethravathi et al., 2020). Implementing technological innovations to improve customer service quality is a critical component of business success, encompassing the delivery of accurate information and high-performance interactions to meet consumer needs (Kim & Yeo, 2024). Following the COVID-19 pandemic, Cambodia experienced a 5.4% average economic growth rate, resuming business operations across sectors like SMEs (World_Bank, 2024). Banks have played a pivotal role in this resurgence, providing essential services like e-banking, loans, and various card services (Time_Khmer, 2023). Delivering exemplary customer service quality is critical for banks to differentiate themselves in intensifying competition. Failure to meet customer expectations may jeopardize satisfaction and trust, impede customer retention, and hinder growth (Kim & Yeo, 2024). Therefore, banks must understand the factors influencing customer service quality to maintain their competitive strength and foster sustainable growth (Kim & Jindabot, 2023).

Cambodia's banking sector has experienced rapid growth and modernization, but service issues persist, impacting customer satisfaction and economic stability. With widespread usage of e-banking services like internet banking and microchip-sensor cards, banks must continue to develop technological innovations and promote their value to customers (Kim, 2022). This requires constant evolution and updating of their current e-banking services. Customer dissatisfaction remains a major concern, characterized by long wait times, lack of personalized service, and insufficient communication (Kim & Jindabot, 2022). The rapid adoption of digital banking has complicated the banking landscape, introducing cybersecurity threats, inadequate infrastructure, and insufficient technological adaptation (Yoeung et al., 2023).

To enhance the effectiveness of banking services, Cambodia needs to address limited financial literacy, inadequate customer service, regulatory challenges, access to banking services, and technological hurdles (Morgan & Trinh, 2019). Stakeholders, including government agencies, financial institutions, and educational organizations, should collaborate to improve financial education, enhance regulatory frameworks, and expand access to banking services. By overcoming these barriers, Cambodia can progress towards a more inclusive and sustainable banking environment.

Innovation failure is influenced by a firm's innovation capability and organizational learning, which impact its growth (Del Monte & Papagni, 2003). Firm failure risks are significant; internal and external innovation mechanisms (Mackelprang et al., 2015), such as efficiency and trade spillover effects, affect survival (Zhang et al., 2018). Emerging-economy firms often fail in domestic and global markets due to inadequate technological development (Karabag, 2019). Banking service firms are more likely to fail in technological innovation when they have low or high levels of product R&D intensity or face financial constraints (Kim, 2022). Reflecting on past failures is crucial for enhancing learning and supporting innovation (Danneels & Vestal, 2020).

Technological innovation literature explores the impacts of technological innovation on firm survival and growth (Ugur & Vivarelli, 2021). Most importantly, technological innovation allows companies to maximize their knowledge, improve investment planning, and generate positive returns (Gunjal, 2005). The rapidly changing business environment has increased reliance on Information and Communication Technologies (ICTs) to maintain competitiveness, improve profitability (Bresciani et al., 2018; Intezari & Gressel, 2017), and succeed in dynamic markets (Stanimirovic, 2015). Technology innovation capability activities aim to enhance efficiency and performance (Ferreira et al., 2015), making ICTs and innovation strategic resources for business competitive advantage (Yunis et al., 2018). The adoption of technological solutions for new product research and development increases the technological innovation capacity of companies, enabling them to meet the needs of a continually changing market (Gil-Gomez et al., 2020).

Most empirical studies show that knowledge management literature recognizes the impact of new digital technologies on business performance. These technologies improve the quality and efficiency of knowledge in strategic and organizational processes, demonstrating that the combined use of people and technology promote the success of businesses (Di Vaio et al., 2021; Lee et al., 2020). Organizations conceptualize innovation as the acceptance of a new idea or conduct (Chege et al., 2020). Innovation enhances product value, business sustainability, and economic growth (Huang et al., 2020). It is considered a key driver for firms' long-term success in today's competitive markets (YuSheng & Ibrahim, 2020). A firm's ability to innovate has become essential for its success and competitive advantage (Mendoza-Silva, 2021). Enhancing technological innovation capability is crucial for improving firms' survival and sustainable growth (Lam et al., 2021). In

today's business environment, with rapidly advancing communication and information technologies, knowledge creation capabilities are valuable for implementing technological innovation, leading to business model innovation (Hock-Doepgen et al., 2021). Technological innovation, environmental concerns, and sustainable growth are becoming norms in the business world. SMEs and the banking service industries are adopting environmentally friendly technological practices, and countries are increasingly addressing environmental issues to meet customer needs and expectations (Chanveasna et al., 2024). Based on this research gap and argument, this study extends the dynamic capabilities theory to examine the relationship between knowledge creation, technological innovation capability, and business sustainability in Cambodian banking service industries.

2. Theoretical Background and Hypothesis Development

2.1. The Dynamic Capabilities Theory

The dynamic capabilities theory refers to a firm's ability to rapidly integrate, build, and reconfigure internal and external core business competencies related to technological innovation to address changing business environments (Teece et al., 1997). It explains that industries requiring high technological innovation capabilities, such as semiconductors, information services, and software companies, need an expanded paradigm to understand how competitive advantage is achieved (Teece et al., 1997). This theory arises from a resource-based view (RBV), which sees the firm as owning stocks of valuable technology or other firm-specific resources (Teece, 2002).

From this perspective, dynamic capabilities refer to the ability to maintain congruence with changes in the core business environment, involving innovative responses when time-to-market and timing are critical, and the rate of technological change is rapid. The theory deepens our understanding of how firms can develop capabilities for enabling major technological innovations (O'Connor, 2008). Key aspects of dynamic capabilities in knowledge management explain why some organizations are more successful than others in building competitive advantage within dynamic markets (Easterby-Smith & Prieto, 2008).

The dynamic capability perspective extends the resource-based view by addressing how valuable, rare, and difficult-to-imitate resources enable a firm to achieve sustained competitive advantage (Ambrosini & Bowman, 2009). Firms with strong dynamic capabilities adopt technological innovations faster, achieving high business performance in competitive, dynamic market environments (Teece & Leih, 2016). Researchers have only limitedly explored key concepts of dynamic, innovative, and entrepreneurial capabilities (Vu, 2020).

Dynamic capabilities theory explains that firms can innovate their business models for sustainability by implementing new technological innovations (Bocken & Geradts, 2020), successful circular economy business cases (Khan et al., 2020), entrepreneurial orientation and performance (Abu-Rumman et al., 2021), and deploying to innovate business models (Randhawa et al., 2021). An

extensive literature review of dynamic capabilities highlights their role in achieving firm performance through environmental changes in technological innovation capability (Arun & Yildirim Ozmutlu, 2022) and improving business competitive posture in dynamic markets (Singh et al., 2022).

Based on these arguments, this study asserts that dynamic capability theory can be explained to firms that build human resources and capital to create new knowledge, enhancing technological innovation capability and leading to high business performance in dynamic market environments. This theory is applied to explain the conceptual framework proposed in **Figure 1**.

2.2. Hypothesis Development

2.2.1. Knowledge Creation and Technological Innovation Capability

Major innovation requires knowledge creation and application in novel contexts (O'Connor, 2008). Knowledge creation is central to technological innovation (Lichtenthaler, 2016). This process fosters the development of technological innovation capabilities for products or services (Yu & Yu, 2017). Knowledge is generally considered a key strategic asset to enhance innovation and improve a firm's operations (Elrehail et al., 2018). A firm adept at developing knowledge can continually generate the reserves needed to advance its products, improve processes, enhance productivity, cut costs, upgrade products, and develop innovative practices, products, and services (Alshanty & Emeagwali, 2019).

Within the framework of the resource-based view (RBV), this study explores the role of knowledge, technological innovation capabilities, and a manager's educational background as determinants of a firm's development as a technology-based and high-innovation service firm (Camisón-Haba et al., 2019). Knowledge creation positively affects firms' technological innovation capability (Alshanty & Emeagwali, 2019). Firms that develop knowledge resource capabilities gain enhanced technological innovation for green product development (Awan et al., 2021). Knowledge creation is a critical success factor for adopting new technological innovations, considered an extension of the RBV (Heenkenda et al., 2022). In supply chain companies, knowledge creation drives the adoption of new technological innovations to create value and achieve competitive advantages (Chiu & Lin, 2022). Global subsidiaries' knowledge-creating capabilities drive MNCs' success in improving technological innovation and change (Rhee et al., 2023).

Based on the above research arguments, the following hypothesis is proposed:

Hypothesis 1: Knowledge creation positively influences technological innovation capability.

2.2.2. Technological Innovation Capability and Business Sustainability

Technological innovation is not only crucial for economic survival but also drives growth, productivity, and competitiveness (Pittaway et al., 2004). This study asserts that firms engaging in more collaborative technological innovation activities exhibit higher business sustainability. Research and development (R&D) in technological innovation ensures the development and growth of business

performance and sustainability (Jin & Choi, 2019). Knowledge-based technological innovation capability is essential for enhancing sustainable business performance (Fernando et al., 2019). Empirical findings show that firm-level technological innovation capability positively relates to firm performance (Wu et al., 2020). Technological innovation capability can maintain and improve long-term business performance (Wang & Hu, 2020). Entrepreneurs develop technologically innovative strategies to enhance firm performance and achieve business sustainability. Technological innovation provides a competitive edge to firms (Chege et al., 2020). Evidence indicates that innovation positively affects firm survival and productivity (Ugur & Vivarelli, 2021).

This study shows that innovation types associated with market power, such as product innovation and marketing innovation of intellectual property assets, have a stronger positive influence on firm survival and productivity. Technological innovation capability has garnered interest among scholars, practitioners, and policymakers as a critical tool for sustainable development (Omri, 2020). Schumpeter and Swedberg (2021) identified technological innovation as key to corporate performance and sustainability. Technological innovation capability is significantly associated with sustainability perspectives (Dhliwayo & Chebo, 2022). Most firms focus on improving their technological innovation capabilities to build competitive strengths and achieve business sustainability (Hanaysha et al., 2022). The technological innovation capability of firms is a vital resource for promoting business growth (Heenkenda et al., 2022). Firms involving technological innovation capability and sustainability have been gaining prominence (Fitz-Oliveira & Wasgen, 2023). This logic permeates firms, which need to adapt their technological innovation capabilities to enhance business sustainability performance. Thus, the following hypothesis is proposed:

Hypothesis H2: Technological innovation capability positively influences business sustainability.

2.2.3. Knowledge Creation and Business Sustainability

A knowledge-creating environment enables organizations to exploit and develop resources more efficiently than rivals and sustain business operations (Sharkie, 2003). New knowledge creation and R&D innovation maintain a firm's sustainability (Lai et al., 2015). The value of knowledge creation drives sustainable growth strategies for firms (Iazzolino & Laise, 2016). Knowledge creation enhances firm performance and success (Su et al., 2016). It is essential for maintaining competitiveness and sustainable growth. Developing knowledge resources is central to business competitiveness (Yu et al., 2017). Empirical studies highlight the importance of timely access to reliable information in increasing firm performance (Yunis et al., 2018). According to knowledge creation theory, it significantly influences business sustainability (Sales de Aguiar & Paterson, 2018). It plays a critical role in positively affecting business performance and sustainability in the hospitality sector (Martinez-Martinez et al., 2019). Knowledge creation is crucial for

increasing core value for sustainability (Chaurasia et al., 2020). It has gained importance in knowledge management literature and research for its potential to advance business sustainability (Chopra et al., 2021). Knowledge creation enhances business development and sustainability in dynamic environments (Tajpour et al., 2022) and influences e-business sustainability (Perdana & Syah, 2023). It involves generating new ideas, insights, and expertise, forming the foundation for technological capability. Technological capability involves an organization's ability to develop, adopt, and utilize technology to enhance products, services, and processes. Based on these arguments, this study proposes the following research hypothesis:

Hypothesis 3: Knowledge creation positively influences business sustainability.

2.2.4. The Mediating Effects of Technology Innovation Capability

Innovation is crucial for national growth and well-being, benefiting consumers, businesses, and the economy. It enables firms to improve performance, implement new products, services, and procedures, deliver business value, and secure competitive advantages (Cornell_University, 2017). Technology innovation capability is the ability of an organization to efficiently use resources and create value through mastering existing technologies and crafting new ones. This capability is crucial for superior innovation performance, encompassing product, managerial, and process innovations (Mendoza-Silva, 2021). Process technology innovation capability enhances operational efficiency, leading to cost reductions and higher profitability. Technical and management innovations improve operational efficiency and managerial functions, contributing to overall performance (Battistella et al., 2023).

Innovation involves the creation, acceptance, and implementation of new products, markets, supply sources, production technologies, and organizational forms (Ghasemaghahi & Calic, 2019). It includes the ability to create and transform new knowledge to meet changing market, technology, and competition requirements (Lanzolla et al., 2021). For firms moving towards product customization, innovation involves developing and implementing new products, services, and processes based on customized demands (Yang & Yee, 2022). The development of innovation depends on key resources such as strategic decisions, operational routines, skills, knowledge development, and management. Sharing knowledge, implementing new technology, learning, and collaboration contribute to developing routines, skills, and organizations that enhance innovation capability (Chen et al., 2024).

Digital enablement is a crucial tool for accelerating knowledge creation for innovation (Wang, 2021). It involves using digital connections, such as the Internet, interactive platforms, and smart products, to mitigate spatial limits and increase the capacity of accessible network resources (Bouncken & Barwinski, 2021). This allows firms to co-create and coordinate new knowledge, develop customized products and services, and enhance their innovation capability. Digital enablement also

enhances organizational creativity by mitigating information processing constraints and improving understanding of context and complex variables (Johnson et al., 2022). By leveraging digital technologies, firms can improve their responsiveness to environmental changes and focus on creativity development.

Technological innovation capability in community enterprises in Phuket, Thailand, mediates the relationship between entrepreneurial capability and sustainable organizational performance (Somwethee et al., 2023). In SMEs, technological innovation mediates the relationship between technology orientation and green innovation performance (Khan et al., 2024a). Another study suggests that technology innovation capability in SMEs mediates the impact of digital technology on product customization (Chen et al., 2024). Based on the previously discussed research arguments, this study proposes the following research hypothesis:

Hypothesis 4: Technology innovation capability mediates the relationship between knowledge creation and business sustainability

2.3. Conceptual Framework

According to stakeholder theory (Freeman, 2010), an organization's performance is measured by its efforts to operate and adjust strategies for success. These efforts are evaluated using key performance indicators derived from strategic objectives and can be benchmarked against similar organizations to assess competitive position (Tang et al., 2015). Sustainability emphasizes key indicators for measuring sustained organizational performance (Garske et al., 2020). The theory of sustainable performance suggests that organizations should benchmark against competitors and rival strategies to gain a higher market share (Frempong et al., 2021). Business sustainability supports competitive advantage and innovation in services, products, and processes (Somwethee et al., 2023). Entrepreneurial capability theory guides organizations in navigating volatility, uncertainty, complexity, and ambiguity (VUCA) (Murugan et al., 2020), enhancing competitiveness through effective management and performance (Yi et al., 2018).

The Resource-Based View (RBV) strategy focuses on achieving sustained competitive advantage by emphasizing resource utilization and integration in response to changing environments (Barney, 1991). The RBV, which considers firm-specific resources such as valuable technology (Teece, 2002), leads to the dynamic capabilities theory. This theory explains that firms that build human resources and capital to create new knowledge enhance their technological innovation capability, resulting in high business performance in dynamic market environments.

Figure 1 incorporates comprehensive literature and theories to investigate Cambodia's banking service industry, which is rapidly evolving due to globalization, technological advancements, and the need for innovative financial services. Prioritizing knowledge creation and technological innovation can enhance competitiveness, meet customer expectations, and drive sustainable growth.

In various research settings, technological innovation capability has been used

as a mediating variable to explain the relationship between independent and dependent variables. For example, Aydin (2021) used technological innovation capability to explain the relationship between market orientation and production innovation in Turkey’s manufacturing firms. Khan et al. (2024b) examined the relationship between technological innovation capability, technology orientation, and green innovation performance in small and medium-sized enterprises (SMEs) in Pakistan. Additionally, AlTaweel and Al-Hawary (2021) found that innovation capability mediates the relationship between strategic agility and organizational performance in stock exchange contexts. Technological innovation capability also mediates the relationship between entrepreneurial resources and microbusiness performance among Malaysian women entrepreneurs (Taleb et al., 2023). It mediates the relationship between intellectual capital and firm performance in Malaysian manufacturing SMEs (Aljuboori et al., 2022). According to Yu and Yu (2017), technological innovation capabilities play a crucial role in the knowledge creation process and are sustainable. However, scholars have shown limited interest in the specific mediating effect of technological innovation capability on the relationship between knowledge creation and business performance. This research manuscript has designed a conceptual framework to address these research gaps by exploring both the direct and indirect effects of technological innovation capability in the banking service industries in Cambodia.

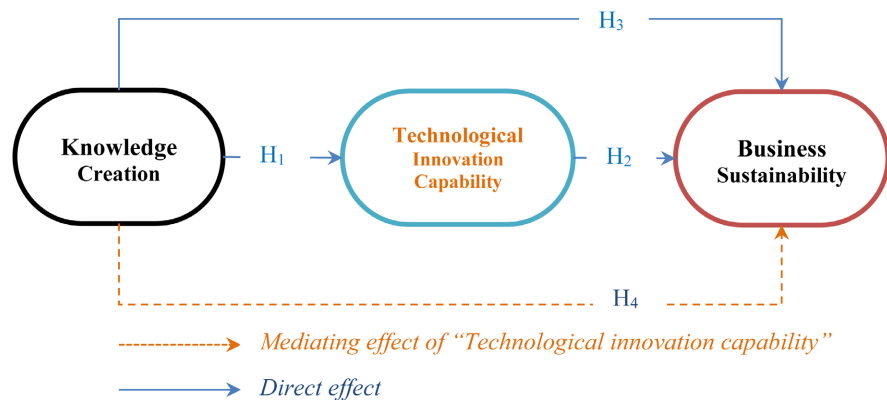


Figure 1. Conceptual model of technological innovation capability

3. Methodology

3.1. Sampling Procedures

A total of 58 commercial banks and nine specialized banks were targeted for the sample, as listed on December 31, 2022 (NBC, 2022). Each bank was invited to select four middle managers: one credit manager, one HR manager, one IT manager, and one marketing manager to complete the survey. A purposive sampling technique was used to invite their participation. Forty-nine commercial banks and three specialized banks agreed to send their middle managers. The valid sample size was 208 (52 banks x 4 middle managers) for data analysis. For quantitative data analysis (e.g., SEM), the sample must include at least 196 respondents

(Veasna et al., 2013: p. 515).

3.2. Questionnaire Design and Measurement Scales

“Knowledge Creation” consists of seven items adopted from Papa et al. (2018). Technology Innovation Capability consists of five items adopted from Aydin (2021). Business Sustainability consists of seven operationalized items from Yunis et al. (2018). The 19 items adapted from previous studies were measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was validated through double-back translation from English to Khmer and Khmer to English, as shown in Appendix 1.

3.3. Data Analysis Tools

To address a research gap in data analysis, most previous researchers conducted regression analyses to examine their hypotheses in innovation research contexts (e.g., Chen et al., 2021). This study uses SPSS 29 and AMOS 29 to test the relationships among the research variables, as proposed in Figure 1. The following data analysis techniques and steps are adopted to test the reliability and validity of the research constructs: 1) Factor analysis and reliability test, 2) Confirmatory factor analysis (CFA), and 3) Structural equation modeling (SEM). The research findings section explains each data analysis test in more detail.

4. Results

4.1. Reliability Test by Confirmatory Factor Analysis (CFA)

The construct reliability and convergent validity were assessed using the threshold guidelines of Anderson and Gerbing (1988). First, exploratory factor analysis and reliability tests validated the reliability of all research items, with Cronbach’s Alpha coefficients for each factor exceeding 0.70. Second, a confirmatory factor analysis (CFA) was performed using AMOS 29 to evaluate the distinctiveness of the measures. The first-order factor model was adopted to examine each research construct, and results indicated that standardized loadings for all items exceeded 0.70 and t-values were higher than 1.96 ($p < 0.001$). The fitness indices of each research construct were acceptable: Chi-square/degree of freedom ($\chi^2/d.f$) < 2 , Goodness-of-fit (GFI) > 0.90 , Adjusted Goodness-of-fit (AGFI) > 0.90 , and Root Mean Square Residual (RMR) < 0.05 . Thus, the thresholds recommended by Hair et al. (2020) and Kline (2023) were satisfied.

Second-order and hierarchical models were then conducted to examine the fitness of each research construct. The results satisfied the thresholds (see Figure 2 and Table 1). The overall goodness-of-fit assessment (Figure 2) showed that the model met the thresholds: $\chi^2/d.f$ (146.208/78) = 1.874, GFI = 0.953, AGFI = 0.927, NFI = 0.962, CFI = 0.982, and RMSEA = 0.047. This indicates that the research model for this study is a good fit with strong convergent validity and construct reliability (Anderson & Gerbing, 1988; Hair et al., 2020).

Table 1. The result of overall model CFA.

Indicators	Variables	λ	t-value	AVE	CR	Alpha ^o
KCR7	←	0.864***	A			
KCR5	←	0.829***	13.93			
KCR4	← Knowledge creation	0.887***	14.76	0.651	0.902	0.879
KCR3	←	0.732***	12.56			
KCR2	←	0.706***	12.17			
TICA5	←	0.756***	A			
TICA4	← Technological	0.843***	16.69	0.589	0.851	0.854
TICA3	← innovation capability	0.761***	15.08			
TICA2	←	0.702***	13.85			
BUS2	←	0.730***	A			
BUS3	←	0.769***	16.7			
BUS4	← Business sustainability	0.781***	15.15	0.563	0.885	0.891
BUS5	←	0.740***	14.37			
BUS6	←	0.697***	13.47			
BUS7	←	0.780***	15.19			

Note: λ = Standardized Estimates; AVE = Average variance extracted and CR (Composite Reliability) was calculated by Hair et al. (2014). *** $p < 0.001$, which is significant level at t-value > 1.96 . A = parameter regression weight was fixed at 1. Alpha^o was calculated from factor analysis and reliability test.

4.2. Correlation Matrix

A correlation matrix is a statistical technique used to examine the relationship between variables in a data set. The results in **Table 2** indicate that knowledge creation has a positive correlation with technological innovation capability ($\gamma = 0.563$ or 56.3%, $p < 0.001$). Technological innovation capability has a positive correlation with business sustainability ($\gamma = 0.703$ or 70.3%, $p < 0.001$). Knowledge creation has a positive correlation with business sustainability ($\gamma = 0.734$ or 73.4%, $p < 0.001$). Therefore, these three research variables are significantly correlated.

4.3. Mediating Test—Sobel's Test

There are many statistical methods to test mediation effects, such as hierarchical regression (Baron & Kenny, 1986) and SEM (Veasna et al., 2013). For this study, the Sobel test was adopted. The Sobel test involves two phases. First, there is a significant mediated effect if the z-test exceeds a t-value of 1.96 for 2-tailed tests with $\alpha = 0.05$ (Iacobucci, 2012; Zhao et al., 2010). According to Hair et al. (2014) and MacKinnon et al. (1995), the indirect effect is calculated using the formula: indirect effect = $a \times b$ (where a is the path coefficient of the relationship between the independent and mediator variables, and b is the path coefficient of the

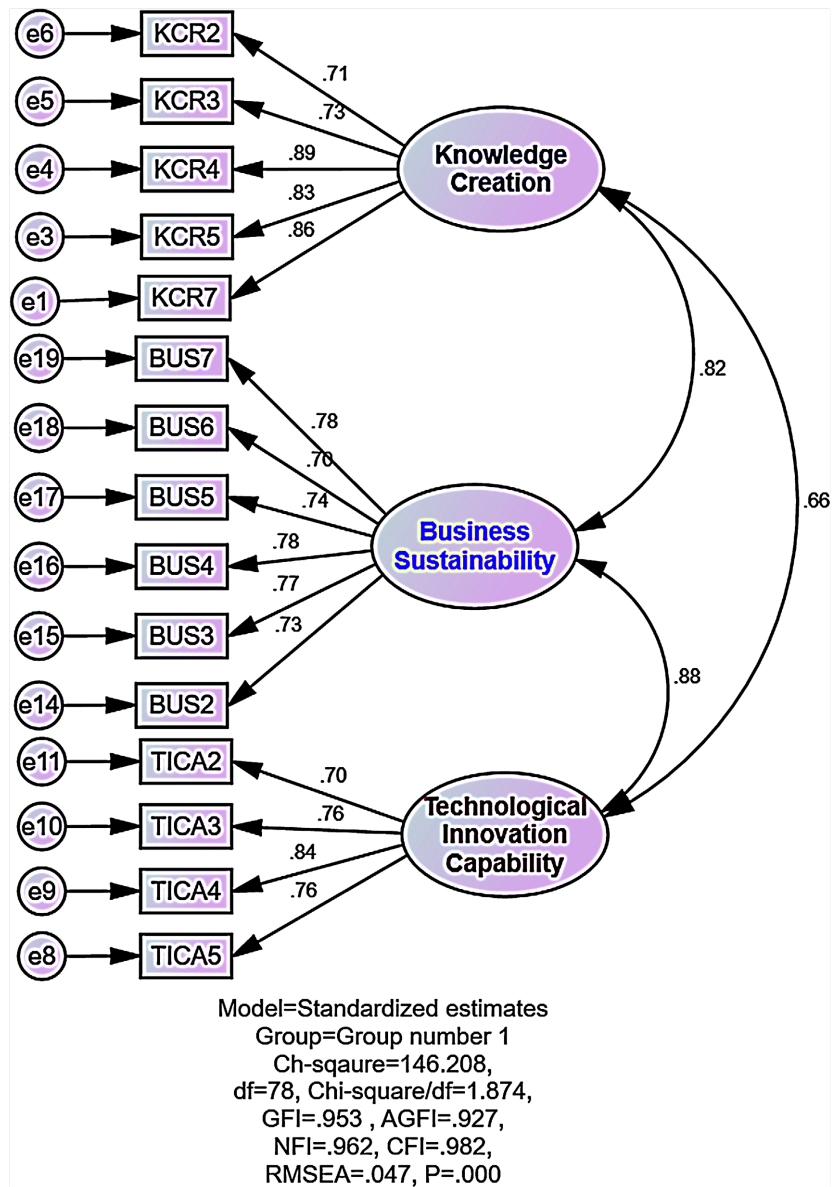


Figure 2. The result of overall model CFA.

Table 2. The result of correlation matrix (n = 208)

Variables	Mean	Std.D	KC	TIC	BUS	Gen	JOE	Ed
KC	2.745	0.887	1.00					
TIC	2.625	0.981	0.563**	1.00				
BUS	2.954	0.973	0.734**	0.703**	1.00			
Gen	0.317	0.467	-0.124	-0.108	-0.039	1.00		
JOE	1.596	0.851	-0.054	-0.114	-0.057	-0.004	1.00	
Ed	1.457	0.537	-0.053	-0.077	-0.055	0.036	0.363**	1.00

Note:**. Correlation is significant at the 0.01 level (2-tailed). KC = Knowledge creation; TIC = Technological innovation capability; BUS = Business sustainability; Gen = Gender; JOE = Job Experience; Ed = Education.

Table 3. The result of structural equation modeling (SEM).

Indicators		Research constructs	λ	t-value	p-value
KCR7	←	Knowledge Creation	0.657***	A	0.000
KCR5	←		0.829***	13.844	0.000
KCR4	←		0.887***	14.431	0.000
KCR3	←		0.732***	12.513	0.000
KCR2	←		0.706***	12.138	0.000
TICA5	←		Technological Innovation Capability	0.756***	A
TICA4	←	0.843***		16.695	0.000
TICA3	←	0.761***		15.07	0.000
TICA2	←	0.701***		13.805	0.000
BUS2	←	Business Sustainability		0.73***	A
BUS3	←		0.769***	16.703	0.000
BUS4	←		0.781***	15.152	0.000
BUS5	←		0.74***	14.374	0.000
BUS6	←		0.697***	13.48	0.000
BUS7	←		0.78***	15.2	0.000
Path relationships (Direct effects)					
H1: KC → TIC			0.670***	11.007	0.000
H2: TIC → BUS			0.411***	7.537	0.000
H3: KC → BUS			0.609***	9.712	0.000

$\chi^2/d.f = 1.897$; GFI = 0.953; AGFI = 0.927; CFI = 0.981; NFI = 0.962; RMSEA = 0.048

Note: KC = Knowledge Creation; TIC = Technological Innovation Capability; BUS = Business Sustainability; ***p < 0.001, which is significant level at t-value > 1.96. A = parameter regression weight was fixed at 1.

Table 4. The result of mediating effect.

Mediating effects	Standardized Coefficient*	Sobel's test						Results
		a	S _a	b	S _b	z-test**	p-value	
KC → TIC → BUS		0.670	0.07	0.609	0.06	6.963	0.000	Confirmed

Noted: *Standardized Coefficient for mediating effect = $a \times b$; **z-test = $\frac{ab}{\sqrt{b^2 SE_a^2 + a^2 SE_b^2}}$. KC = Knowledge creation; TIC = Tech-

nological innovation capability; BUS = Business sustainability. a is the path coefficient of the relationship between the independent and the mediator variables; b is the path coefficient of the relationship between the mediator and the dependent variables; SE_a is the standard error (SE) of the relationship between the independent and the mediator variables; SE_b is the standard error (SE) of the relationship between the mediator and the dependent variables; The significance level for Sobel's test is $z > 1.96$ and $p < 0.05$. An online calculation tool for Sobel's test can be found on the following webpage and in Appendix 2:

<https://quantpsy.org/sobel/sobel.htm>.

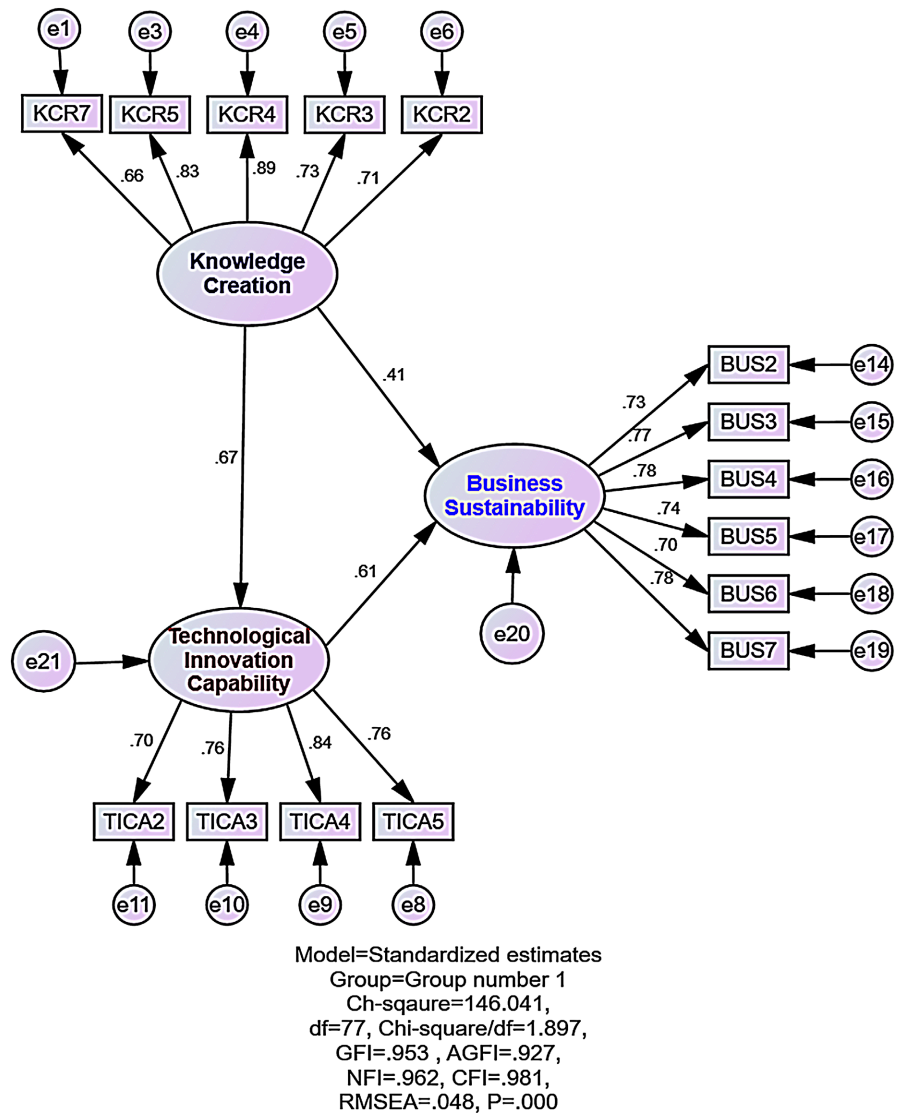


Figure 3. The result of SEM.

relationship between the mediator and dependent variables). Second, the significance level of the z-test is computed using the Sobel test, as follows: $Z\text{-test} = \frac{ab}{\sqrt{b^2 SE_a^2 + a^2 SE_b^2}}$, where SE_a is the standard error (SE) of the relationship between the independent and mediator variables, and SE_b is the standard error of the relationship between the mediator and dependent variables (Iacobucci, 2012). The results of mediating effects in this study are shown in Table 4 (the results of mediating effects by Sobel’s test), which suggests a model for the mediating effect procedure (Kong et al., 2012).

5. Discussion

The study surveys the dynamic capability literature to understand how employee knowledge promotes sustainable business models by optimizing technological

innovation capability. It analyzes knowledge creation and technological innovation capabilities and their effect on a firm's sustainable competitive advantage using a knowledge-based theoretical framework (Yu et al., 2017). The findings provide crucial implications for manufacturing firms to enhance sustainable business practices through knowledge creation. Managers should transform their firms into learning organizations to improve the acquisition, integration, and creation of knowledge (Yu et al., 2017). The study also examines the impact of innovation capability, disruptive technology, and knowledge creation on SME sustainability (Heenkenda et al., 2022).

As shown in **Table 4** and **Figure 3**, **Hypothesis 1**: Knowledge creation and technological innovation capability ($\beta = 0.67^{***}$, t-value = 11.007, p-value = 0.000) is confirmed by the research findings. Knowledge management practices show that knowledge creation enhances firm innovation capability (Lam et al., 2021). Understanding knowledge management as a process can help managers make decisions about knowledge creation and technological innovation activities (Spanellis et al., 2021). Knowledge creation capabilities are a valuable source for enhancing technological innovation in SMEs (Hock-Doepgen et al., 2021). The results of this study indicate that technological innovation capability significantly enhances business performance and sustainability. Technological innovation capability, product innovation, and R&D cooperation are important for increasing sustainable business performance (Jin & Choi, 2019).

Hypothesis 2: Technological innovation capability and business sustainability ($\beta = 0.609^{***}$, t-value = 9.712, p-value = 0.000) are confirmed by this research finding. High technological innovation capability enables firms to generate fundamental values and beliefs that guide employees to create new knowledge, transforming it into intellectual assets, which in turn secure the organizations' long-term survival and sustainable development (Yusr, 2016). According to this research, improving technological innovation capability positively impacts business performance in both large companies and SMEs (Jin & Choi, 2019). It is widely acknowledged that enhancing technological innovation capability is essential for firms' survival and sustainable growth (Lam et al., 2021). Knowledge creation is vital for firms to maintain the growth of new markets and ensure sustainability (Abbas et al., 2020).

Hypothesis 3: Knowledge creation and business sustainability ($\beta = 0.411^{***}$, t-value = 7.537, p-value = 0.000) are confirmed by this study. Knowledge creation does not significantly impact firms' sustainable competitive advantage (Yu et al., 2017). The knowledge creation process does not significantly directly affect sustainable business competitive advantage (Ordóñez de Pablos & Lytras, 2018), consistent with findings by Heenkenda et al. (2022). Employee knowledge creation helps managers improve firm performance (Bag et al., 2021). Indeed, in the literature review of knowledge management practices, knowledge creation, acquisition, and sharing are essential to driving business performance and sustainability (Abbas & Kumari, 2021). According to existing literature on knowledge management,

knowledge creation plays an important role in improving technological innovation quality and firm performance (Chaithanapat et al., 2022). Therefore, considering that knowledge is a critical resource for companies (Friedrich et al., 2020), it is interesting to understand how knowledge creation, driven by digital technological innovation, can accelerate the process of creating long-term value and guide corporate strategy towards new and innovative business models (Di Vaio et al., 2021).

Hypothesis 4 explores the role of technological innovation as a bridge between knowledge sharing and banking service performance in Cambodia. This study supports this idea (Sobel z-test = 6.963***, p-value < 0.001). The findings align with previous research, which has examined the direct relationship between knowledge creation and business performance in various contexts, including SMEs (Aisjah et al., 2023), digital platform-based multinational enterprises (Chatterjee et al., 2023), and the hotel service industry (Alzyoud et al., 2023; Hameed et al., 2021). The knowledge-based view suggests that knowledge creation is a strategic resource that drives innovation, competitive advantage, and value creation (Ambrosini & Bowman, 2009; Grant, 1996; Spender & Grant, 1996). Companies enhance their knowledge management methods to improve stakeholder interactions and create flexible learning and application processes, directly affecting knowledge-related performance (Han et al., 2024; Mciver et al., 2013).

Based on previous research, this study concludes that “technology innovation capability” is crucial, serving as both a direct and indirect link between knowledge sharing (independent variable) and business performance (dependent variable). When bank employees create knowledge collaboratively, it enhances banking service performance. A high level of technological innovation capability in the banking system is essential to meet customer needs and expectations. Similar concepts include the impact of knowledge creation on sustainable performance through green technological innovation (Shahzad et al., 2020). Knowledge, learning, and innovation are crucial for organizational strategy. Bank managers and leaders must actively manage knowledge resources for long-term competitiveness, assessing management and employee performance based on knowledge creation and transfer (North & Kumta, 2018).

6. Conclusion and Future Research

6.1. Conclusion

According to the research findings, technological innovation capability plays an important role in both the indirect (Table 4, z-test = 6.963***, $p < 0.001$) and direct relationship between knowledge creation and business sustainability (Table 3). Knowledge creation contributes to the banking service industry’s need to implement new technological innovation capabilities by 67% to meet customer needs and expectations with high service and environmental competitive advantages. Additionally, banking service industries implementing updated technological innovation capabilities can enhance business sustainability by 61%.

Conversely, knowledge creation improves business sustainability in banking service industries by only 41%. This study suggests that the relationship between knowledge creation and business sustainability may be moderated by service market orientation and the level of middle-line managers through training and development related to HRM activities, leading to a weaker relationship with low regression weight.

The banking service industry in Cambodia is undergoing significant transformation due to digital advancements and changing consumer demands. Financial institutions must leverage knowledge creation, technological innovation, and business performance to enhance operational effectiveness and service quality. As digital technologies become more prevalent, Cambodian banks must invest in advanced tools like mobile banking, data analytics, and cybersecurity measures to remain competitive. These technologies streamline operational processes, reduce costs, and enhance customer experience. Research shows that banks with strong technological innovation capabilities can respond quickly to market changes and customer demands, significantly boosting their business performance. The relationship between knowledge creation and technological innovation capability is synergistic, creating a robust framework for driving business performance. Knowledge creation insights guide the pursuit of technological innovations, aligning investments with customer expectations and organizational goals. Technological advancements facilitate knowledge sharing across the organization, enhancing collaborative efforts and driving collective intelligence. In conclusion, the relationship between knowledge creation and technological innovation capability is vital for improving business performance in Cambodia's banking service industry. Financial institutions that actively engage in knowledge management and embrace technological advancements can enhance operational efficiencies and elevate their competitive positioning. Prioritizing these interrelated elements is crucial for achieving sustainable success and delivering value to customers in an ever-changing financial landscape.

6.2. Future Research

The findings of this study focus on the banking service industry by applying key research variables as proposed in **Figure 1**. To achieve business sustainability, the banking sector must enhance its technological innovation capabilities through employee knowledge creation. **Adams and Lamont (2003)** noted that knowledge creation and sharing are vital for continuous innovation, leading to competitive and sustainable benefits. Effective knowledge creation can improve workforce productivity, increase service value, and enhance competitive advantages through creativity, thus ensuring sustainability (**Kale & Karaman, 2012**).

Consistent with this argument, our study indicates that knowledge creation and technological innovation are crucial for maintaining a competitive advantage in dynamic business environments. This study focuses on the banking service industry and middle managers' perceptions of knowledge creation, technological

innovation capability, and business sustainability in Cambodia.

Future research should extend this study by exploring multiple contexts, such as cross-sectional and longitudinal studies of high-tech industries. It should also expand the conceptual framework by including key research variables from existing literature, such as environmentally friendly technology (Yu et al., 2017), national technology policies (Karabag, 2019), environmental innovation capability (Tseng et al., 2019), socio-economic and environmental sustainability (Omri, 2020), and green innovations (Polas et al., 2023). Additionally, absorptive capacity, employee personality traits (Shahzad et al., 2020), institutional cultures, and leadership styles should be considered as important moderating factors in the relationship between knowledge creation, technological innovation capability, and business sustainability.

7. Research Implication and Recommendation

In knowledge management literature, creating new knowledge and technological innovation capabilities are integral to an organization's progress and survival (Abbas et al., 2020). The developed knowledge creation model proposes a decision-aid tool for innovative technology companies, encouraging them to view knowledge creation as a long-term project for sustainable competitive advantages (Spanellis et al., 2021). Knowledge creation in enterprise development strategies is crucial as a management center for experience and technological innovation (Zhao et al., 2022). Therefore, the study recommended that owners and managers in the banking service industries should fully commit to ensuring knowledge creation for organizational learning. They should also motivate their employees to learn and improve their skills, abilities, and competencies to acquire and generate knowledge, thereby enhancing the connection between knowledge management practices and sustainable organizational innovation. Key concepts of knowledge creation and knowledge sharing among employees impacted firms' financial performance (Muhammed & Zaim, 2020) and technological innovation performance (Jarmooka et al., 2021).

The banking service industry in Cambodia can enhance its sustainability by promoting a culture of learning and knowledge sharing. This can be achieved through creating knowledge management systems, investing in advanced technology infrastructure, providing ongoing training programs, building partnerships with tech firms and educational institutions, and prioritizing customer-centric innovations. The study reveals that innovative service banking models depend more on networking and managerial capabilities than on expertise breadth. Banking managers need to approach technology innovation differently in the current turbulent and uncertain environment. To innovate business models, managers should renew, refresh, and reorient their connections to expose themselves to new ideas, technology, and knowledge management systems. Active service leadership practices are crucial for achieving strategic vision and knowledge creation, thereby increasing business performance in Cambodia's banking service industry.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1: Questionnaire Design

Knowledge creation (Papa et al., 2018) (AVE = 0.651, CR = 0.902, α = 0.879)

1. [KC1]-The importance of gathering information from sales and production sites
2. [KC2]-The importance of sharing experience with suppliers and customers
3. [KC3]-The importance of finding new strategies and market opportunities by wandering inside the firm
4. [KC4]-The importance of creative and essential dialogue
5. [KC5]-The importance of transmitting newly created concepts
6. [KC6]-The importance of forming teams as a model, and of conducting experiments and sharing results with entire departments
7. [KC7]-The importance of searching for and sharing new values and thoughts

Technological Innovation Capability Aydin (2021) (AVE = 0.589, CR = 0.851, α = 0.854). Compared to your major competitors, how would you evaluate your firm’s capabilities in the following areas:

1. [TIC1]-Acquiring important technology information
2. [TIC2]-Identifying new technology opportunities
3. [TIC3]-Responding to technology changes
4. [TIC4]-Mastering the state-of-art technologies
5. [TIC5]-Developing a series of innovations constantly

Business Sustainability Yunis et al. (2018) (AVE = 0.563, CR = 0.885, α = 0.891)

1. [BUS1]-The company’s profitability is better
2. [BUS2]-High efficiency levels in operations
3. [BUS3]-Productivity is high
4. [BUS4]-Organization’s market constantly growing
5. [BUS5]-Employee satisfaction level is high in our organization
6. [BUS6]-Customers are satisfied
7. [BUS7]-Overall, company performance is high and improving

Appendix 2: The Sobel’s Test

The calculation of this Figure was adopted the results from **Table 4**. The result of mediating effect.

CALCULATION FOR THE SOBEL TEST
quantpsy.org

An interactive calculation tool for mediation tests

Curriculum vitae

Selected publications

Supplemental material for publications

Online utilities

Mediation & moderation material

PSY-GS-9879 / PSY-PC-3743: Factor Analysis

PSY-GS-8882: Multilevel Modeling

Vanderbilt Psychological Sciences

Vanderbilt Quantitative Methods

Organizations

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based methods by which mediation may be formally assessed.

An illustration of mediation

a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients.

Description of numbers needed

a = raw (unstandardized) regression coefficient for the association between IV and mediator.

s_a = standard error of a .

b = raw coefficient for the association between the mediator and the DV (when the IV is also a predictor of the DV).

s_b = standard error of b .

To get numbers

1. Run a regression analysis with the IV predicting the mediator. This will give a and s_a .
2. Run a regression analysis with the IV and mediator predicting the DV. This will give b and s_b . Note that s_a and s_b should never be negative.

To conduct the Sobel test

Details can be found in Baron and Kenny (1986), Sobel (1982), Goodman (1960), and MacKinnon, Warsi, and Dwyer (1995). Insert the a , b , s_a , and s_b into the cells below and this program will calculate the critical ratio as a test of whether the indirect effect of the IV on the DV via the mediator is significantly different from zero.

Input:	Test statistic:	Std. Error:	p-value:
a 0.670	Sobel test: 6.96358081	0.05859485	0.000
b 0.609	Aroian test: 6.94576061	0.05874519	0.000
s_a 0.07	Goodman test: 6.98153888	0.05844413	0.000
s_b 0.06	Reset all	Calculate	

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