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Measuring the influence of technological innovation and social sustainability via the mediating role of organizational innovation and digital entrepreneurship

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Abstract: This research aims to investigate how technological innovation influences social sustainability via the mediating role of organizational innovation and digital entrepreneurship. This investigation employed a quantitative research approach and used data from survey questionnaires based on a set of suppositions evaluated using structural equation modeling. A total of 320 respondent companies from digital provider companies in Thailand. The findings of the research expose that technological innovation has a positive effect on organizational innovation and digital entrepreneurship. Both serve as mediators in the correlation between technology innovation and social sustainability. Moreover, this research will be beneficial for businesses that are implementing new technologies and innovation, considering their role in attaining both environmental and social sustainability.

Keywords: technological innovation (TI); organizational innovation (OI); digital entrepreneurship (DE); social sustainability(SS)

1. Introduction

The current digital technology and innovation have reconfigured competitive dynamics in the economy and society, forming new markets and changing existing ones. Moreover, society's most significant obstacles are the increasing levels of risk and vulnerability that affect the economy, individuals, and the environment (Rey-Martí et al., 2021). This presents a multifaceted challenge for businesses and policymakers. The analysis of sustainable development has mostly intensive on the economic and environmental elements, neglecting the social component of sustainability. With the growing number of firms embracing sustainability, there is a rising need to integrate social sustainability into all business operations (Ajmal et al., 2018).

The emergence of the sustainability idea directly reacted to the worldwide ecological problems, caused mainly by the extensive industrial use of natural resources and ongoing environmental deterioration (Maier et al., 2020a). Therefore, its primary objective was to protect and maintain the integrity of the ecosystem. Starting from its primary purpose, the notion gradually extended its impact to include the whole quality of life from an economic and social perspective.

The sustainability of an organization may be determined by its capacity to produce sufficient income to cover production costs, replace used assets, and make investments necessary for ongoing competitiveness and social movement (Barbieri et

al., 2010). An essential element of embracing a social movement is substituting outdated methods and customs with alternative ones that effectively embody the new movement's ideals, objectives, and directives. When a corporation commits to sustainable development, it must inevitably alter its operational practices to minimize adverse social and environmental effects. This necessitates adopting a novel approach towards innovation, specifically focusing on sustainable innovation, which refers to a type of innovation that directly contributes to sustainable development (Schot and Geels, 2008). Indeed, since the inception of the sustainable development movement, significant critiques have been made about particular innovations that have succeeded. Based on the foundations of sustainability within this movement, innovations should simultaneously provide favorable economic, social, and environmental outcomes (Barbieri et al., 2010). Therefore, the encouragement of sustainable organization, the many methods of establishing it internationally, and the advancement of sustainable technology, Considering this potential and addressing it appropriately is a significant barrier for organizations attempting to align with sustainable, innovative organizations.

Innovations may be seen as a metasystem where entrepreneurial activity is the main driving factor for using digital potential (Satalkina and Steiner, 2020a). Digital technologies offer entrepreneurs new business development and improvement opportunities, leading to economic, environmental, and social sustainability (Fernandes et al., 2022). These technologies facilitate the processes of digitization, and transformation, which include departing from traditional methods and adopting new, sustainable business models for development (Gavrila Gavrila and De Lucas Ancillo, 2022). Therefore, digital entrepreneurs play a significant role in advancing sustainability by generating economic value, optimizing resources, and fostering social inclusion and deficiency alleviation over digital technologies (Manea et al., 2021). Integrating digital technology with the circular economy, known as Digital entrepreneurs, may effectively work towards the sustainable development objective of responsible consumption and production. This involves optimizing resources by minimizing the usage of new resources (Manea et al., 2021). Digital entrepreneurs have the potential to contribute to the goal of making entrepreneurship more accessible. Specific characteristics of digital technology for company formation and expansion, such as the internet's ability to provide expanded access to global markets, may be particularly advantageous for underserved social sectors (McAdam et al., 2020; Tim et al., 2021). Digital entrepreneurship is a component of the innovation system that involves the creation of new ventures or the revolution of current businesses (Commission, 2015). Innovative methods of value creation characterize it and serves as a catalyst for innovation development (Pagani, 2013; Vendrell-Herrero et al., 2017). Therefore, it is essential to consider the role of digital entrepreneurship in the innovation to comprehend its potential effects on the changes and sustainable shifts of these systems. Moreover, incorporating digitization into company operations entails not just internal modifications about novel organizational management methods and entrepreneurial procedures. External factors such as institutional influence, emerging market trends, changes in competitive advantages, and societal attitudes like digital trust and technology adoption have a substantial impact. It is essential to have a comprehensive considerate of the whole process of digital entrepreneurship and its function in the innovation, namely its changes and sustainable

transitions (Satalkina and Steiner, 2020b).

Sustainable development links short-term and long-term objectives and economic and environmental challenges. It requires finding a robust theoretical framework to handle human-environment situations. Answers to questions about transitioning to this perspective are needed for any changes in the existing situation. Sustainable innovation appears to be an excellent way to approach sustainability. This combination creates notions like sustainability-driven innovation (Maier et al., 2020b).

Innovation requires systemic alignment of products/services, strategies, and business models with long-term sustainability goals. Recent research on sustainability in innovation is promising, but current methodologies, tools, and processes are not enough to drive organizations into digital entrepreneurs (Barbieri et al., 2010). This research offered a scenario strategy that corporations may utilize to establish technical and innovation strategies that contribute to social sustainability. To contemplate the role of technological innovation, organizational innovation, and digital entrepreneurship. Although it has evident importance for social sustainability, its possible has not concerned sufficient research attention. In this study, we highlight the innovation that considers the impact of technological innovation on organizational innovation and digital entrepreneurship with consequences for social sustainability.

2. Literature review

2.1. The influence of technological innovation on organizational innovation

In a comprehensive conception, Innovation involves creating and executing an idea, product, process, or behavior in an organization (Damanpour, 1996). Innovative activities include product and process creation, administrative and management procedures, and organizational structures (Damanpour and Aravind, 2012). Innovation is “the implementation of a new or significantly improved product, process, marketing method, or organizational method in business practices, workplace organization external relations” (OECD, 2005). Accordingly, innovation literature describes innovation using three typologies: product-process innovation, radical-incremental innovation, and technological-organizational innovation. Research on the correlation between technical innovation, organizational innovation, and internationalization has gained popularity (Donbesuur et al., 2020). According to Damanpour and Evan (1984), technological innovation is “the implementation of an idea for a new product or service or the introduction of new elements in an organization’s production process or service operation”. Organizational innovation involves new or significant improvements in operative management, marketing, database management, and external relationship management. Unlike technological innovation, which directly presents new items and processes to clients or consumers, organizational innovation involves the implementation of novel or enhanced concepts and procedures inside a company’s work environment, including management and marketing systems. Its purpose is to decrease expenses and generate value for the company and its stakeholders (Donbesuur et al., 2020).

Comprehending the creation and execution of technological and organizational innovations is essential, considering the significance of these breakthroughs in

enhancing labor and work processes inside businesses. The advancement and implementation of novel information technologies are closely linked to alterations in corporate strategy, the transmission of information, and the configuration of business procedures. Technological advancement also brings about the possibility of new options in the organization of employment as well as the improvement of the overall quality of working conditions (Boonstra and Vink, 1996). Therefore, alternative hypothesis H1 below is recommended based on the given literature review:

H1: Technological innovation has a positive influence on organizational innovation.

2.2. The influence of technological innovation on digital entrepreneurship

Digital entrepreneurship is an innovative and emerging idea. The objective is to establish a profitable enterprise, adapting to the modern landscape of the digital age. As a result, digital entrepreneurs have more access to broader and more diverse markets than conventional entrepreneurs, because of the extensive reach and scope of the Internet (Ladeira et al., 2019). The emergence of new technical platforms such as Google, Instagram, and YouTube has led to a proliferation of digital entrepreneurs who are creating self-employment opportunities and stimulating economic growth (Redondo-Rodríguez et al., 2023).

Technological innovation has facilitated the emergence of digital entrepreneurs by providing them with opportunities that include reduced costs in relation to investment, effort, and possible outcomes. These occurrences, driven by technological innovation, have been extensively examined and researched from several viewpoints in the last few decades. Researchers observe technology as a facilitator that encourages entrepreneurs by closing the divide between innovation and establishing a new company endeavor (Steininger, 2018). Furthermore, digital entrepreneurship contributes to reducing entry barriers, reducing company risks, decreasing the cost of starting a new firm, and exhibiting greater sustainability (AKHTER et al., 2022).

Innovation technology revolutionizes and reshapes social and commercial systems, reducing obstacles and creating limitless economic prospects. Technological innovation fosters an ecosystem in which goods, processes, and services circulate, propelling digital entrepreneurship exemplified by companies like Uber, eBay, and YouTube. Internet-based organizations have seen exponential growth compared to conventional businesses (Ulhøi, 2021). Several previous researches have been undertaken to examine the correlation between technological innovation and digital entrepreneurship. Therefore, alternative hypothesis H2 below is recommended based on the previously mentioned literature review:

H2: Technological innovation has a positive influence on digital entrepreneurship.

2.3. The influence of organizational innovation on social sustainability

Organizational innovation refers to introducing new ideas, methods, or practices into an organization to improve its overall performance and effectiveness. In the current era of globalization and rapid technological advancement, the significance of organizational innovation in establishing sustainable competitive advantages has become crucial for the survival and long-term success of firms in developed (Kising'u et al., 2016). Organizational innovation primarily encompasses four activities closely

tied to economic factors: new product creation, innovative manufacturing techniques, creative strategy, and economic organization (Baregheh et al., 2009). An organization demonstrates innovation by embracing novel concepts or initiatives, which may manifest as fresh offerings or goods, novel frameworks, innovative manufacturing methods, or inventive administrative systems (Bilgihan et al., 2011).

Organizational innovation aims to decrease executive and administrative expenses, increase satisfaction, and improve sustainability performance (Niu et al., 2022). A firm with a high degree of innovation may easily accomplish the aforementioned goal by gaining the necessary competencies to enhance performance and establish a lasting competitive advantage (García-Morales et al., 2014). Innovation has a substantial and favorable influence on organizations' economic, social, and environmental sustainability. In addition, firms might gain advantages using innovation-focused strategies that enhance their sustainability performance (Kuzma et al., 2020). Several studies have shown that organizational innovation significantly impacts environmental and social sustainability.

Therefore, the alternative hypothesis H3 below is recommended based on the given literature review:

H3: Organizational innovation has a positive effect on social sustainability.

2.4. The influence of digital entrepreneurship on social sustainability

Digital entrepreneurship is a multifaceted spectacle (Abubakre et al., 2021; Beliaeva et al., 2019a), and theoretical and empirical methods have gone beyond digital entrepreneurs and enterprises to societies as an ecosystem (Song, 2019). Studies have indicated that a digital startup's success relies on its founders, operations, and community (Autio et al., 2018a). External organization conditions such as institutional role, digital infrastructure, digital marketplace tendencies, and social attitudes as digital skills, digital trust, and technology adoption also affect the integration of digital technologies into business processes (Satalkina and Steiner, 2020c). The digital entrepreneurship ecosystem also encompasses a multidimensional view and includes interactions between entrepreneurs, stakeholders, and institutions (Sahut et al., 2021). In the digital age, an entrepreneurial ecosystem is a digital economy that uses digital technologies and infrastructures to help new ventures get started by rethinking the business model (Autio et al., 2018b).

Multiple research studies highlight the significant relationship between digitalization and sustainability. The interconnections between digital entrepreneurship, sustainability, and business model innovation areas. The suggested concept of digital sustainable value clarifies the complicated structure of the collaborative network, highlighting its essential social, environmental, and economic implications and their interconnected link within the digital business ecosystem (Herman, 2022). Hence, it may be regarded as a pioneering foundation for future investigations into digital entrepreneurship, sustainability innovation, and business model innovation within the integrated study field (Baranauskas and Raišienė, 2022).

Therefore, the alternative hypothesis H4 is recommended based on the provided literature review.

H4: Digital entrepreneurship has a positive influence on social sustainability.

H5: Organizational innovation mediates the relationship between technological

innovation and social sustainability.

H6: Digital entrepreneurship mediates the relationship between technological innovation and social sustainability.

The innovation that considers the impact of technological innovation on organizational innovation and digital entrepreneurship with consequences for social sustainability. **Figure 1** shows the theoretical framework.

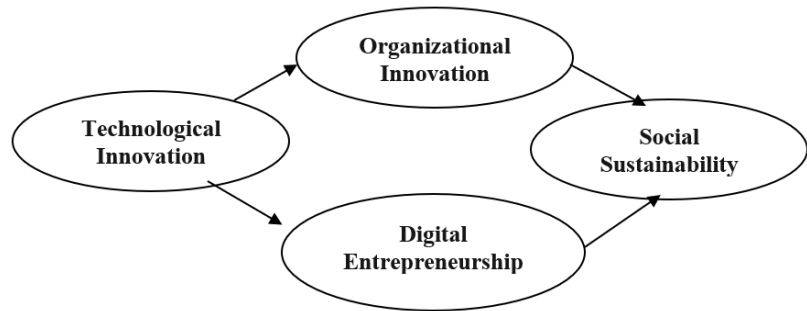


Figure 1. Theoretical framework.

3. Methodology and measurement

3.1. Data collection of the sample

In this research, quantitative research was designed with a questionnaire to gather data to evaluate the research model. The research respondents were managers or business owners in Thailand's digital industry (Digital Provider), which is a digital economy promotion agency. Further, the control variables were firm age and firm size. As in earlier studies, the natural logarithm of staff numbers indicates business size (Cardinal, 2001). The research also controls for firm age. For this research, structural equation modeling was used to examine the hypothesis. In the following research, the targeted population by which the data was gathered involved managers or business owners in Thailand's digital industry (Digital Provider) of the digital economy promotion agency. At first, we disseminated 368 survey questionnaires via various channels, including but not limited to emails. Finally, we received a reply to 320 completed questionnaires, indicating a response rate of 88.88 %. Those questionnaire data are analyzed to test the relationship between the research hypotheses.

3.2. Measurement of variables

This research assessed technological innovation, organizational innovation, and digital entrepreneurship on social sustainability. The questionnaire is drawn on the five-point Likert scale. Based on (Subramani, 2004), technological innovation can be defined as the adoption of a new idea to build a new product or service and a new way of building an organization's production process or service operation. The idea must be implemented through an adoption process. Adoption is the decision to use the innovation as a whole as the best way of action (Higa et al., 1997). The organizational innovation scale captures the extent of the firm's product, managerial, and marketing innovations. This definition reflects the importance of a broader conceptualization of innovation that incorporates both technological and non-technological innovation (Damanpour, 1991; Hyvärinen, 1990). High scores on the innovation intensity scale

indicate that the firm has introduced radical innovations in its product, managerial, and marketing systems. Our measures incorporate both the degree and types of innovation. Further, the success of digital entrepreneurship was measured using a nine-item construct adopted from the work of Zahra (1996), social sustainability is more concerned with social development, user satisfaction, comfort, health and safety, accessibility, and equality. It is about constructing physical, cultural, and social places to support human well-being and encourage a sense of community (Palich and Edmonds, 2013).

3.3. Data analysis

We evaluated the data using AMOS for multivariate data analysis, and for mediation, SPSS software for Windows Process 25.00 examined independent factors' effects on dependent variables (Hair Jr et al., 2023). Before final data collection and analysis, survey validation was confirmed via pilot research. This study used confirmatory factor analysis to examine the validity of many components inside the conceptual model, which were created as scales. All factor loadings are more significant than the rule-of-thumb 0.40 cut-off (Nunnally and Bernstein, 1994). Moreover, Cronbach's alpha coefficient, which is higher than 0.70, was used to assess the reliability measurement (Nunnally and Bernstein, 1994). Therefore, the value of all measures of validity and reliability is consistency. The result shows factor loadings and the Cronbach's alpha coefficient for several item scales used in this study in **Table 1**. Results of measure validation.

Table 1. Results of measure validation.

Items	Factor Loadings	Cronbach's Alpha
Technological Innovation (TI)	0.719–0.899	0.898
Organizational Innovation (OI)	0.775–0.903	0.926
Digital Entrepreneurship (DE)	0.892–0.928	0.961
Social Sustainability (SS)	0.712–0.889	0.903

Table 1 presents factor loading scores between 0.712 and 0.928. Additionally, Cronbach's alpha was between 0.898 and 0.961 during the pilot study. Therefore, all constructs of the validity and reliability of measurement are applicable to further analysis.

3.4. Common method variance

Pilot research was carried out to enhance and perfect the question statement and item wordings. The survey's measuring questions for each construct were also separated into separate sections of the questionnaire, and participants were also notified that their responses would remain anonymous. In an exploratory factor analysis, seven distinct components were found, none of which could explain the majority of the variance. In this study, cross-sectional data on independent mediating, moderating, and dependent components were collected from the same respondents. Harman's single-factor test is used to determine the extent of irrespective variance. A principal component analysis (PCA) of all the measurement instrument items revealed

five factors with eigenvalues > 1 , which reported 59.61% of the total variance. In contrast, the first unrotated factor maintained just 43.29% of the variation. A single element accounts for less than half of the variation, indicating that common procedure bias does not affect the data.

3.5. Analysis method

In compliance with the proposal by Hair et al. (2014), CB-SEM was employed for data analysis. Initially, CFA was used to validate the measurement model. A structural model was developed to confirm the idea and determine causal pathway coefficients. Combining measurement and structural models into a single research, SEM offers an improved approach for empirically assessing theoretical models (Hair Jr et al., 2021).

3.6. Constructs validity and reliability

To validate the measurement model, the constructs' unidimensionality, validity, and reliability were assessed using CFA. To guarantee unidimensionality, each measured variable must be explained by a single construct, and items about latent constructs must have sufficient factor loading (above 0.60) for the corresponding constructs. The dependability of the measurement model was assessed using composite reliability (CR). To verify convergent validity, average variance extract (AVE), which displays the average percentage of variance among latent constructs explained by items in the measurement model, was computed. Construct validity was established when every construct's fitness index met the required requirements. The results of this investigation indicate that the dataset exhibits a strong alignment with the theoretical components shown in **Table 2**. Statistics from fitting evaluation.

Table 2. Statistics from fitting evaluation.

Goodness-of-Fit Measure	Recommended Value	Structural Model (Result)
CMIN/DF	2.0–5.0 (Diamantopoulos and Siguaw, 2000)	2.367
CFI	≥ 0.900 (Kelloway, 2015)	0.973
NFI	≥ 0.900 (Schumacker and Lomax, 2010)	0.967
RMSEA	≤ 0.080 (Schumacker and Lomax, 2010)	0.047
TLI	≥ 0.900 (Schumacker and Lomax, 2010)	0.971

In this research, values for ChiSq/df, RMSEA, CFI, TLI, and NFI were gathered to assess model fitness. Two DE items (DE1 and DE2) and one TI item (TI3) were dropped because factor loading was not achieved; nevertheless, model fit problems prevented these items from being dropped. All factor loadings are more significant than 0.60, the AVE is greater than 0.50, and the CR is more significant than 0.60. The square root of the AVE values was utilized to calculate discriminant validity. In order to obtain discriminant validity, the degree of correlation between the constructs should not be greater than 0.85 (Kline, 2023)—**Table 3** Convergent validity.

Table 3. Convergent validity.

Construct	FL	AVE	CR	α
Technological Innovation				
TI1: The organization has access to new marketing channels by using marketing communications as a tool for presenting to customers using modern technology.	0.88			
TI2 The organization has developed new marketing channels by designing an electric commerce management system to expand channels and reach more customers.	0.91	0.795	0.939	0.898
TI3 The organization has both internal and external information database systems that provide a space for employees to exchange knowledge and information.	0.89			
TI4 The organization is seeking innovative approaches to work that can be implemented by staff.	0.87			
Organizational Innovation				
OI1 The organization exhibits adaptable leadership and embraces shifts in emerging work structures.	0.87			
OI2 The organization designs user-friendly products with innovative applications to satisfy consumer demands.	0.84			
OI3 The organization has consistently designed product styles that seem contemporary.	0.89	0.769	0.943	0.926
OI4 The organization is searching for creativity that finds new ways to work that personnel can be set into practice.	0.86			
OI5 The organization delivers services to consumers with precision and efficiency, according to the specified timeframe.	0.82			
Digital Entrepreneurship				
DE1 The organization has the potential to generate more profits than in previous periods.	0.85			
DE2 The organization is able to sustain a steady market share and consistently see an increase in market share.	0.88			
DE3 The organization consistently experiences an increase in revenues compared to previous periods.	0.86	0.715	0.911	0.903
DE4 The organization may cultivate trust and foster enduring customer relationships.	0.88			
Social Sustainability				
SS1 The organization can optimize the use of accessible natural resources while minimizing their impact on the environment.	0.92			
SS2 The organization has risk projection may enhance economic prospects for sustainable development in the present and future.	0.89			
SS3 The organization is secure And capable of addressing the personnel's demands while prioritizing their health.	0.87	0.787	0.941	0.903
SS4 The organization is capable of effectively formulating plans for diverse activities in alignment with its well- defined objective.	0.88			
SS5 The organization has the capacity to sustainably operate while achieving a harmonious equilibrium among society, economics, and environment for long-term growth.	0.89			

Table 4. Descriptive statistics and discriminant validity refers to discriminant validity values that are less than 0.85 and more than the construct correlation, indicating that there is no redundancy among the measuring model's elements.

Table 4. Descriptive statistics and discriminant validity.

Variables	Mean	SD	VIF	TI	OI	DE	SS
TI	4.004	0.660	1.123	0.860			
OI	3.991	0.701	1.112	0.710**	0.851		
DE	4.009	0.759	1.789	0.207**	0.140*	0.851	
SS	4.043	0.671	1.431	0.112*	0.158**	0.136*	0.870

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

3.7. Path analysis via CB-SEM

As shown in **Table 4**, Descriptive statistics and discriminant validity all of the evaluated variance inflation factor (VIF) values range from 1.112 to 1.789, below the minimum threshold level of 3.0. This indicates that multicollinearity was not an effect model. The structural model analysis found an appropriate range of model fit indices. After analysis, the suggested hypotheses (H1-H4) are shown in **Table 5**, Path analysis and path coefficients. The results showed that technological innovation has a significant positive effect on organizational innovation ($\beta = 0.395$, $p < 0.001$). Thus, hypothesis 1 is supported. Secondly, The results showed that technological innovation also has a significant positive impact on digital entrepreneurship ($\beta = 0.534$, $p < 0.002$). Thus, hypothesis 2 is supported. Thirdly, The results showed that organizational innovation has a significant positive effect on social sustainability ($\beta = 0.519$, $p < 0.000$). Thus, hypothesis 3 is supported. Lastly, The results showed that digital entrepreneurship significantly influences social sustainability ($\beta = 0.342$, $p < 0.000$). Thus, hypothesis 4 is supported.

Table 5. Path analysis and path coefficients.

Hypothesis	Estimation	S.E.	C.R.	p -value	Decision
Technological Innovation → Organizational Innovation	0.395	0.098	5.431	***	Supported
Technological Innovation → Digital Entrepreneurship	0.534	0.233	8.234	***	Supported
Organizational Innovation → Social Sustainability	0.519	0.299	11.571	***	Supported
Digital Entrepreneurship → Social Sustainability	0.342	0.095	5.665	***	Supported

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, a Bata coefficient with standard errors.

3.8. Mediation analysis

The mediational effect was investigated using the bootstrapping Maximum Likelihood Estimation (MLE) approach with 1000 bootstrap samples and a 95% confidence interval. This result demonstrates that organizational innovation mediates the relationship between technological innovation and social sustainability ($\beta = 0.395 \times 0.391 = 0.154$, $p < 0.005$). Hence, hypothesis 5 is supported. Moreover, digital entrepreneurship mediates the relationship between technological innovation and social sustainability ($\beta = 0.534 \times 0.342 = 0.182$, $p < 0.005$). Hence, hypothesis 6 is supported.

4. Conclusions and discussions

This research conducted in the realm of technological innovation offers a very advantageous foundation for those engaged in digital entrepreneurship in Thailand.

Also, it provides valuable perspectives on organizational actions for global digital enterprises to attain social and environmental sustainability objectives. This research was divided into four assessment parts. The first part analyzed technological innovations that were positively related to organizational innovation. Technological and organizational innovation are significant factors in implementing technologies inside innovative enterprises.

The first hypothesis concerns technological innovation and its positive relation to organizational innovation, which is significant. Business organizations can use novel technologies and methodologies in their product development procedures, fostering a drive to generate innovative goods. These findings align with the outcomes of other studies (Barge-Gil and López, 2014; Heij et al., 2020). In other words, technological innovation and organizational innovation are driving factors in the generation of scientific and technical knowledge, as well as the conversion of this information into functional objects like goods, systems, processes, and services, and the response to organizational innovation, which is consistent with most researchers, as discussed in the literature review (Tariq et al., 2019; Yuan and Guangpei, 2021). The findings show the significance of technological innovation efforts in enhancing corporate performance, which is acknowledged by stakeholders, including investors. The impact of technological innovation on the national economy is substantial and mutually reinforcing (Satakina and Steiner, 2020d). Technological innovation is pivotal in driving firms to augment their productivity, profitability, and market share (Damanpour and Aravind, 2012). These might assert that organizations acquire an advantage in the market by capitalizing on technology breakthroughs, which enable them to launch novel goods, enhance manufacturing processes, and optimize supply chain management.

The second hypothesis suggests that technological innovation is positively related to digital entrepreneurship. Digital entrepreneurship is important as a new business model in the global market, and it is significantly influenced by technological advancement. Implementing effective digital technologies and the ability to react to shifting business circumstances have led to an increased focus on digital entrepreneurship (Damanpour and Aravind, 2012). Through the application of various digital technologies, digital entrepreneurship establishes the necessary circumstances to enable effective digital transitions. A fundamental and crucial attribute of digital entrepreneurship is the ability to promptly respond to environmental changes and adjust the firm to market possibilities and challenges. This facilitates a wide range of choices for consumers regarding goods and services while simultaneously fostering a competitive landscape for sellers to promote superior quality offerings via a competitive procedure. There has been a growing encouragement for digital entrepreneurs to embrace digital applications and strategic approaches in order to market and distribute their products and services to customers efficiently. Moreover, it encompasses the use of digital technology and platforms to find and capitalize on business prospects for providing products, services, education, training, health, and commerce. The findings demonstrated the substantial impact of technical advancement on digital entrepreneurship inside entrepreneurs' social networks, using digital methods that eventually strengthen social capital (Davidson and Vaast, 2010; Zhao and Collier, 2016).

The third hypothesis is that organizational innovation is positively related to social sustainability. This may be the essence of organizational innovation since it offers sustainable strategies for attaining sustainability in companies such as digital entrepreneurs. Organizational innovation has been shown to positively impact business productivity, leading to enhanced competitive advantages and increased profitability for enterprises. These mechanisms thus support the firm innovative activity for social sustainability. The findings indicate that previous sources' views have a significant and favorable impact on organizations' capacity to bring innovation in both products and processes consistently (Raymond et al., 2010).

The fourth hypothesis concerned digital entrepreneurship being positively related to social sustainability. Digital entrepreneurship utilizes innovative digital technology to transform established firms and influence emerging ones (Beliaeva et al., 2019b). Digital Entrepreneurship stimulates economic expansion and facilitates the creation of employment opportunities, promoting the development of quality work and stimulating innovation. Regarding the social aspect of sustainability, it is widely acknowledged that entrepreneurship may have a good impact on eliminating inequities, promoting social cohesion, and expanding possibilities for everyone (Herman, 2022). Furthermore, digital entrepreneurship may address environmental concerns by encouraging the adoption of eco-friendly purchasing habits and sustainable practices. Additionally, it can support the adoption of innovative digital technologies and resilience strategies (Herman, 2022). Digital entrepreneurship encompasses the integration of social, environmental, and financial objectives and their effect into a comprehensive and integrated concept of creating sustainable value creation digital products, platforms, or the the ecosystem (Baranauskas and Raišienė, 2022).

The mediating effect of organizational innovation and digital entrepreneurship is a full mediation between technology innovation and social sustainability. These results indicated that the combinative effect of both organizational innovation and digital entrepreneurship improves technological innovation to achieve social sustainability.

5. Suggestions and contributions

This research presents the business's required innovation strategy for achieving social sustainability, which includes technological innovation, organizational innovation, and digital entrepreneurship. Based on the principles of sustainability embraced by innovations, digital entrepreneurship should concurrently provide favorable economic, social, and environmental outcomes (Barbieri et al., 2010). This research contributes to the theoretical understanding of how innovation strategy and digital entrepreneurship achieve social sustainability through technological innovation as a determinant of organization innovation and digital entrepreneurship by a few researchers emphasizing technological innovation in aspects such as driven organization, individuality, and resources. Through its implications, this study contributes to businesses achieving social sustainability by innovation related to the creation, adoption, or utilization of a new product, production process, service, or management or business method by an organization. This innovation should lead to a decrease in environmental risk, pollution, and other negative impacts of resource use, including energy consumption, throughout the entire life cycle of the innovation.

Digital entrepreneurship has the potential to stimulate economic development, enhance labor productivity and income, increase competitiveness, promote resource efficiency, create jobs, and improve health, education, and well-being.

The research suggests that it would benefit administrative leaders within academic institutions to enhance the training provided to volunteers on adopting creative and digital entrepreneurial practices involved in implementing new technologies, considering their organizations' role in accomplishing overall environmentally friendly practices and social sustainability. Moreover, The researcher suggests more investigation into several aspects, including training, environment, information technology, leadership, and others, to comprehend the influence of these factors on digital entrepreneurship.

6. Limitations and future directions

Although the study is relatively new, certain constraints shaped the investigation. Initially, the demographic samples consisted of managers or company owners in Thailand's digital industry (Digital Providers) who are affiliated with digital economy promotion organizations.

However, it is essential to develop the scope of this study by considering the perspectives of workers inside firms to get impartial and unbiased comments about the issues under investigation. Furthermore, assessing individuals' attitudes toward technological innovation is a novel notion since previous studies have been inclined to see this as a potential overlap. Therefore, more validation is necessary in the future if these processes are commonly exclusive, as shown by the current study. Future research should investigate if the predicted factors included in this study also impact economic sustainability. In addition, the absence of consideration for the effects of organizational environment, brand equity, work satisfaction, and self-efficacy necessitates more investigation in future studies.

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