INTERNATIONAL JOURNAL OF eBUSINESS AND eGOVERNMENT STUDIES
Vol: 15 **No:** 2 **Year:** 2023 **ISSN:** 2146-0744 (Online) (**pp.** 300-321) **Doi:** 10.34109/ijebeg.2023150216
Received: 07.08.2023| **Accepted:** 27.10.2023 | **Published Online:** 20.11.2023

-RESEARCH ARTICLE-

COMPETENCY DEVELOPMENT FOR THAILAND-BASED DIGITAL ENTREPRENEURS: REGISTERED WITH THE DEPARTMENT OF BUSINESS DEVELOPMENT (DBD)

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─Abstract─

The study sought to discover and evaluate the skills and components of entrepreneurial talents in digital enterprises in Thailand through the application of third-order confirmatory factor analysis. Data was collected by distributing an online questionnaire to 900 digital entrepreneurs located in Thailand. Analysed data utilising descriptive statistics, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). Empirical data that supported the proposed model confirmed the presence of sixteen minor components in addition to four primary constituents. The factors encompassed a wide range of aspects, such as: 1) Digital learning and development encompasses various activities, including content creation, content marketing, promoting creative thinking, quickly acquiring information and skills, designing digital media, and visualising digital media. 2) Data analysis involves various duties, including developing a vision, strategic planning, using digital business analytics, analysing, and interpreting marketing data, and resolving digital-related difficulties. 3) Utilising digital communication channels to establish networks and boost cooperation. 4) Proficiency in data analysis, tool utilisation, problem-solving in digital environments, and adaptability to dynamic situations. In order to excel in the digital industry, digital entrepreneurs must boost their self-improvement abilities and cultivate the capabilities of their team.

Keywords: Digital Competencies, Digital Communication, Digital Learning and Development, Digital Entrepreneurship, and Digital Knowledge.

Citation (APA): Meedach, T., Lekcharoen, S. (2023). Competency Development for Thailand-Based Digital Entrepreneurs: Registered with The Department of Business Development (DBD). *International Journal of eBusiness and eGovernment Studies, 15*(2), 300-321. doi: 10.34109/ijebeg.2023150216

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INTRODUCTION

In recent years, technology and the internet have become increasingly indispensable for worldwide company transactions and operations. The COVID-19 pandemic has precipitated a substantial alteration in consumer behaviour, with a predilection for e-commerce (online shopping) over traditional in-store shopping. This transition has resulted in a significant surge in electronic transactions, surpassing the use of cash for payments. The worldwide internet sector had significant growth from 2020 to 2021, with its value increasing from $3.351 trillion to $4.213 trillion, reflecting a growth rate of 25.7%. The industry's expansion remains evident, with a further rise of $4.921 trillion in 2021 (Abrams, 2021). The Thai government predicts that the online businesses in the country will achieve a turnover of $10.947 million and a market value of $15.626 million by 2025, with a growth rate of 9.30%. Companies that endorse, foster, and facilitate internet-based firms are experiencing a 9.30% expansion due to the swift and irreversible growth of online enterprises. This category encompasses services such as logistics and distribution, mobile device applications, online transactions for digital marketing, and food delivery. In the post-COVID era, entrepreneurs must utilise technology and innovations to effectively respond to evolving client behaviour and optimise their operations.

According to Dave (2015), a digital business is characterised by its online or online-based nature, with a strong emphasis on innovation and a minimal need for physical resources. The study identified four main components: 1) utilising technology to enhance cognitive abilities; 2) the significance of efficiency in providing services and adapting to changing situations; 3) employing tools to foster intellectual growth; and 4) the value of prompt service delivery and flexibility in response to new circumstances (Skog et al., 2018). The authors assert that the rapid advancement of digital technologies has enabled numerous digital enterprises to outperform traditional businesses. In 2019, Thailand's small and medium-sized companies faced challenges due to a lack of liquidity and innovative ideas, resulting in a 5% decline (Department of Business Development, 2021). Many organisations face a significant challenge when it comes to embracing digital transformation and adopting digital practices. This challenge primarily stems from a lack of digital awareness and understanding within these organisations. The rapid growth of the digital industry has presented a significant challenge for SMEs, as they may struggle to compete with larger companies in terms of salary offerings due to a shortage of digital labour.

The convergence of the "Thailand 4.0" national strategy and the 20-year national strategy in 2016 has underscored the significance of digital competencies in Thailand. The COVID-19 pandemic has underscored the importance of digital skills in addressing the challenges posed by lockdowns and limited transportation options. To tackle this issue, the Thai government set up the Office of SMEs Promotion (OSMEP) with the aim of improving the

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skills and digital capacities of entrepreneurs (Ariya et al., 2021). Insufficient proficiency in these abilities can result in the downfall of a business (Rachapaettayakom & Jutimongkonkul, 2022), particularly during the pandemic era when numerous businesses endured the effects of lockdown measures (Haider et al., 2023; Ministry of Information and Communication Technology, 2016; Srichan & Kosolkittiamporn, 2023).

The COVID-19 pandemic has affected global health and economies. As people use digital channels to avoid social contact during the COVID-19 pandemic, digital commerce has increased. Due to this change in customer behaviour, internet transactions have increased while in-person purchases have decreased. The epidemic boosted Thai consumer goods sales from 2019 to 2021. However, it is important to note that well-known digital businesses and platforms like Shopee, Lazada, Makro, and 7-Eleven were primarily responsible for the significant profits. In contrast, small and medium-sized enterprises (SMEs) were only able to secure a modest portion of the market utilising platforms like Facebook, Instagram, and TikTok. The government has implemented strategies to assist entrepreneurs by encouraging research and development, cultivating innovation, and integrating AI in different sectors to address the gap between major and minor participants. The Thai government's objective is to train current entrepreneurs to become "New Generation Entrepreneurs" who can adapt to technology and innovation and thrive in the global market. As per the Department of Business Development's latest report (2021), it is essential for aspiring entrepreneurs to have the necessary knowledge, skills, and attitudes to succeed in an ever-evolving technological environment. The purpose of this study is to improve the skills of Thai entrepreneurs who are establishing digital companies.

LITERATURE REVIEW

The Use of Digital Technologies for Learning and Development

A digital learning and development programme encompasses the utilisation of digital-based learning methods to enhance the growth and skills of employees within an organisation or entity. There are various methods available to achieve this goal, including blogs, videos, online courses, webinars, online collaboration, and experiential learning. These avenues can enhance individuals' skills, improve their productivity, and propel their professional growth (Dave, 2015).

According to a source from Bryn Mawr College (2016), the process of generating new content and knowledge involves the improvement and integration of information into pre-existing knowledge. Accurately predicting the success of fresh concepts is crucial, as it involves the ability to forecast the outcomes of new ideas. Learning agility and development are approaches that help individuals rapidly learn and enhance their skills, both cognitively and behaviorally. Visual representation of quantitative information can

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be effectively achieved through digital design and data visualisation. In their study, Ataei et al. (2020) utilised various graphical formats to effectively present data based on its characteristics.

DATA ANALYSIS

Examining data requires the application of logical or statistical techniques to assess, condense, and assess it (Shamoo & Resnik, 2003). According to Bryn Mawr College (2016), some statistical and logical techniques that can be used are Excel, MySQL, SPSS, ArcGIS, and R Studio. Business operations data are analysed alongside statistical analyses. An essential aspect of strategic foresight and planning involves examining trends and environmental factors, including political, economic, social, technological, and legal aspects, to predict future developments (Satalkina & Steiner, 2020). Examining data with the aid of information technology facilitates a range of business operations by means of digital business analysis (Crittenden et al., 2019). An essential aspect of strategic foresight and planning involves examining trends and environmental factors, including political, economic, social, technological, and legal aspects, to predict future developments (Satalkina & Steiner, 2020). Examining data with the aid of information technology facilitates a range of business operations by means of digital business analysis.

When conducting a market analysis, various factors are considered, including market size (both in terms of volume and value), customer segments, purchasing patterns, and economic circumstances (Zdolšek Draksler & Širec, 2018).

Digital Communication

Utilising digital communication channels enables the cultivation of entrepreneurs at present and in the long run by facilitating interaction with individuals, institutions, and organisations. Utilising social networks and digital technologies is crucial for information development, experience sharing, mental skill enhancement, and fostering a sense of opportunity. The key components of digital communication skills are as follows: 1) Networking necessitates the exchange of information and ideas among individuals who possess similar interests, with the aim of establishing enduring and mutually advantageous relationships (Ataei et al., 2020). (2) Collaborative communication, as described by Kurmanov et al. (2020), emphasises the importance of considering perspectives and input from all stakeholders. File sharing systems, collaborative editing software, blogging, forums, and online chat tools are all components of a digital collaboration method (Bryn Mawr College, 2016). Effective communication is essential for active engagement and participation in collaborative situations. 3) Persuasion entails the use of effective techniques and relevant topics to alter individuals' behaviour, attitudes, ideas, or values (Zdolšek Draksler & Širec, 2018).

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Digital Knowledge

In their study, Law et al. (2018) examine the systematic utilisation of digital tools and technology, referring to it as digital knowledge. There are four distinct categories in which this type of knowledge can be further classified. First, individuals who possess knowledge of data and information can analyse data, interpret its meaning, and communicate it effectively to relevant stakeholders (Wall et al., 2007). Secondly, proficiency in information and communication technologies entails adeptly utilising software and leveraging technology for effective communication. Additionally, problem solving in the digital realm entails the utilisation of innovative tools and technologies to identify and resolve issues. According to Zdolšek Draksler and Širec (2018), dealing with unexpected circumstances is a crucial quality. This capacity is characterised by the aptitude to adapt to unexpected circumstances.

Conceptual Framework

The proposed research integrates several important concepts from different sources. These encompass the notion of "digital competency" as outlined by Bryn Mawr College (2016) and the examination of the "potential of SMEs" as deliberated by Ataei et al. (2020). In addition, it includes Dave's (2015) examination of entrepreneurial skills and attributes, as well as Satalkina and Steiner's (2020) identification of indicators for digital competencies in entrepreneurs. Figure 1 depicts the research framework for enhancing digital entrepreneurship, focusing on strategies to foster its growth:

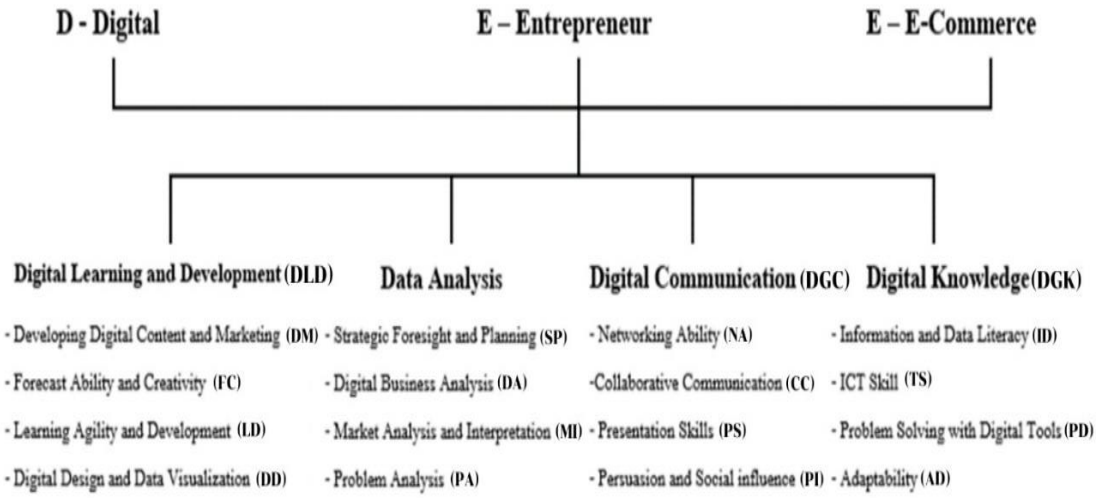

Figure 1: 4DEE Model.

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RESEARCH METHOD

The data for this research were collected and analysed using a mixed methodology approach.

Qualitative Research

The research sample included 21 experts in the field of online business entrepreneurship. The participants in the study consisted of a group of nine university professors who specialise in online business entrepreneurship, six government personnel, and six experienced online business entrepreneurs who have been registered with the Department of Business Development for at least two years. The study employed focus group questions and online surveys as research tools. Data was collected using focus groups and online questionnaires. There were two rounds in the data collection process. An analysis of the content was conducted, resulting in the development of a questionnaire using an electronic focus group (E-FOCUS GROUP). An analysis was performed using factor and indicator analysis methods on the collected responses. Based on the analysis of initial responses, a closed-end questionnaire was created for the second round. The Fuzzy Set Theory was employed to identify elements and indicators that satisfied the acceptance criterion of 0.75.

The research findings were derived from the perspectives of 21 experts, as documented in the questionnaire. Relevant elements and indicators were identified and analysed to draw conclusions.

Quantitative Research

The Department of Business Development focused a study on 16,136 online business owners in Thailand in 2021. Hoelter (1983a) suggests that a causal link model should have enough latent variables in relation to observed variables, typically around 10–20 times more (in this case, 80 variables), to align with empirical data. A sample of 900 online entrepreneurs who have been in operation for at least two years and have registered capital with the Department of Business Development (DBD) was selected (Kline, 2011). A survey was conducted with 21 experts using an online questionnaire that was developed based on textbook analysis and input from relevant research textbooks. The questionnaire consisted of two parts: the first part gathered general information from respondents in a checklist format, while the second part collected comments on the competencies required by digital business entrepreneurs. The questionnaire consisted of seven rating levels, with an overall confidence value of 0.981. Data was collected through an online questionnaire.

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The collected data was analysed using a range of statistical techniques, including descriptive statistics, exploratory factor analysis (EFA), correlation coefficient analysis, and confirmatory factor analysis (CFA) with maximum likelihood estimation (ML). An analysis was performed to assess the structural validity of the research model by comparing the theoretical structural equation model with empirical data. Consistency was assessed by calculating the relative chi-square value (CMIN/df) using a criterion of less than three. In addition, various goodness-of-fit indices were considered, such as GFI, AGFI, CFI, and TLI. Each of these indices needed to have a value higher than 0.90 to match the empirical data (Schumacker & Lomax, 2010). The evaluation also included RMR and RMSEA (Hu & Bentler, 1995), which were considered acceptable if they were below 0.8 (Byrne, 2001; Hair et al., 2010).

The Human Research Ethics Committee at Rangsit University granted approval for this study (DPE. RSUERB2022-029). Prior to their participation, all individuals were required to give informed consent, and they were presented with a statement outlining the objectives of the study. Individually completing the questionnaire was a requirement of the Jonjoubsong and Thammabunwarit (2019) study participants.

Data Analysis and Statistics

Data were analysed using descriptive statistics, EFA, CFA, and correlation coefficient analysis.

RESULTS

General Sample Information

Male respondents accounted for the majority (61.1%) of the 900 samples analysed. The population was comprised of individuals in the age category of 30-39, which constituted 30–39% of the total population. Approximately 50.44% of the participants said that they possessed a bachelor's degree as their greatest educational attainment. The most prominent factor was determined to be marital status. In addition, 52.44% of firms have a tenure of one to five years and possess a registered capital ranging from one to five million baht.

Competencies of Digital Business Entrepreneurs: An Exploratory Factor Analysis

The competencies of digital entrepreneurs in Thailand were found to consist of four main components: digital learning and development, digital analysis, digital communication, and digital knowledge. The primary constituents are further subdivided into four subordinate constituents, and the specifics are enumerated below:

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(1) Digital learning and development component:

1. Developing and marketing digital content: There are three indicators with factor loadings that range from 0.668 to 0.848.
2. Creativity and forecasting: Three indicators have factor loadings ranging from 0.679 to 0.798.
3. The factor loading falls within the range of 0.667 to 0.784, suggesting a significant level of progress and improvement in learning.
4. Three indicators, with factor loadings ranging from 0.612 to 0.819, are associated with data visualisation and digital media design (Table 1).

(2) Component of data analysis:

1. Within the realm of Vision and Strategic Planning, three indicators have been identified, each with factor loadings that range from 0.646 to 0.745.
2. The Digital Business Analysis includes a total of 4 indicators, with factor loadings ranging from 0.613 to 0.803.
3. When examining marketing data, it is worth noting that two indicators display factor loadings of 0.735 and 0.759, respectively.
4. The problem analysis includes three indicators with factor loadings ranging from 0.720 to 0.7322 (Table 3).

There are four components that make up digital communication:

1. There are three indicators that measure networking capability, with factor loadings ranging from 0.737 to 0.877.
2. The collaborative communication indicators range from 0.7288 to 0.7666.
3. There are two indicators that measure presentation skill, each with a factor loading ranging from 0.813 to 0.841.
4. Social influence and persuasion were assessed using two indicators, which had factor loadings ranging from 0.747 to 0.810 (Table 5).

There are four sub-components of digital knowledge, and those components are listed below:

1. Reading proficiency (three indicators with a factor loading of 0.747-0.763)
2. Proficiency in using digital tools (three indicators with a factor loading ranging from 0.717-0.724)
3. Digital tool problem-solving abilities (two indicators with factor loading range from 0.703-0.815)
4. Knowledge and flexibility (two indicators with a factor loading ranging from 0.717-0.767) (Table 7).

Discriminant validity assessment for the latent variables helps prevent multi-

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collinearity. The researcher found that the HTMT ratio of correlation, which was suggested by Henseler et al. (2015), had better specificity (between 97% and 99%) and sensitivity (20.82%) than the Fornell and Lacker method (1981). The results of the HTMT calculation are presented in Table 2.

Table 1: Demonstrates the Digital and Principal Element Analysis Factor Loading.

Variable	Items	Element			
		DM	FC	LD	DD
DM11	The company has employees who can efficiently plan for digital marketing strategies for its business.	0.801			
DM13	Data management and access within and outside the organization based on cloud computing.	0.848			
DM15	Data management experience in the cloud, including both internal and external access levels to data.	0.668			
FC12	Identify and develop new digital businesses.		0.679		
FC14	Risks generated both internally and externally can be managed.		0.798		
FC16	Predicts how their own businesses will perform.		0.718		
LD11	Acquires knowledge of digital business quickly.			0.758	
LD13	Ability to introduce new technologies and digital business solutions to employees quickly.			0.784	
LD17	Access digital business information about the client's products and services on a timely basis.			0.667	
DD12	Experienced in selecting media agencies that create catchy media to attract customers.				0.612
DD14	Using information effectively to tell digital business stories.				0.819
DD16	A proven ability to select and develop trending digital images and videos through the right agency.				0.726

Table 2: Digital and Development Discriminant Validity Results for the HTMT.

Construct	CR	AVE	HTMT			
			DM	FC	LD	DD
DM	0.83	0.58	-	-	-	-
FC	0.76	0.55	0.83	-	-	-
LD	0.79	0.53	0.77	0.73	-	-
DD	0.80	0.57	0.79	0.80	0.83	-

In their study, Hair et al. (2019) presented a criterion of 0.75 for all constructions, which is detailed in Table 2. The outcome was a significant level of reliability for all structures.

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Based on research conducted by Fornell & Larcker (Ab Hamid et al., 2017), an Average Variance Extracted (AVE) value ranging from 0.5 to 0.7 is considered indicative of convergent validity. All the constructions were successful, indicating successful convergent validity. According to the criteria set by Henseler et al. (2015) and Raza and Hanif (2013), all HTMT values are below 0.85.

Table 3: An Analysis of The Principal Element of Data Based on Factor Loading.

Variable	Items	Element			
		SP	DA	MI	PA
SP21	Develop expertise in agency selection for emerging digital enterprises requiring images or videos.	0.716			
SP23	Visionary leadership and inspiring their employees.	0.845			
SP27	Marketing promotion strategies can be based on digital businesses.	0.746			
DA21	Be able to fully comprehend fundamental analytical data, such as revenue, expenditures, and performance metrics.		0.759		
DA23	Analysing digital business data with Tableau and SPSS is a skill that employees should possess.		0.613		
DA25	Understanding and solving digital business problems.		0.709		
DA27	Knowledgeable and proficient in SWOT analysis (strengths, weaknesses, opportunities, and threats).		0.803		
MI23	Identify customer behaviour and analyse it within the context of digital businesses.			0.759	
MI25	Analysing digital customer segments with understanding and knowledge.			0.735	
PA21	A proficient analyst who is adept at analysing customer behaviour and categorizing digital business problems.				0.727
PA23	Prioritization skills				0.728
PA25	Able to develop corrective strategies for digital businesses as well as solve problems.				0.732

It is necessary to conduct discriminant validity testing on the latent variables to avoid multicollinearity. The study's results showed that the HTMT ratio of correlation, as explained by Henseler et al. (2015), was more specific (97% to 99%) and more sensitive (20.82%) than the Fornell and Lacker method (1981). The HTMT result analysis is available in Table 4.

Table 4: Analyses of Discriminant Validity for HTMT.

Construct	CR	AVE	HTMT			
			SP	DA	MI	PA
SP	0.83	0.57	-	-	-	-
DA	0.80	0.53	0.74	-	-	-
MI	0.73	0.57	0.71	0.75	-	-
PA	0.79	0.55	0.72	0.79	0.83	-

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The reliability among all constructions was found to be high, surpassing Hair's criterion of 0.7, as indicated in Table 4. All the AVE values, which are used to evaluate convergent validity, exceeded the recommended threshold of 0.5 (Raza & Hanif, 2013). It is evident that convergent validity has been established. In addition, the HTMT values were found to be below 0.85, which aligns with the standards set by Henseler et al. (2015).

Table 5: An Analysis of Digital Communications Based on Factor Loading.

Variable	Items	Element			
		NA	CC	PS	PI
NA31	Efficiently cooperating with entrepreneurs in the digital sector.	0.753			
NA33	Cooperates with government agencies.	0.789			
NA35	Developing digital business partnerships.	0.768			
CC31	Incorporating a digital teamwork system.		0.771		
CC35	Digital business plans presented by employees.		0.732		
PS33	Data on digital business performance can be presented by employees.			0.843	
PS35	Business plans should be presented digitally by employees.			0.818	
PI31	The ability to motivate customers.				0.811
PI33	By offering bonuses to employees, digital businesses can incentivize their performance.				0.752

To avoid the multicollinearity issue, it is crucial that latent variables possess discriminant validity. The study results show that Henseler's formula's heterotrait-monotrait (HTMT) correlation had much higher specificity and sensitivity (between 97% and 99%) than Fornell and Lacker's (1981) ratio (20.82%). The HTMT values for NA, CC, PS, and PI have been calculated, as indicated in Table 6. McClelland (1973) conducted a study.

Table 6: Results of the Discriminant Validity Test for the HTMT.

Construct	CR	AVE	Discriminant Validity			
			NA	CC	PS	PI
NA	0.83	0.59	-	-	-	-
CC	0.74	0.57	0.83	-	-	-
PS	0.83	0.67	0.84	0.72	-	-
PI	0.79	0.63	0.80	0.77	0.73	-

Based on the recommendations by Hair et al. (2019), the CR of all constructs exceeded the recommended threshold of 0.7. The findings indicated that all structures exhibited a high level of reliability. Fornell and Larcker (Ab Hamid et al., 2017) propose that an Average Variance Extracted (AVE) value

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exceeding 0.5 is necessary for assessing the convergence validity of constructs. All the constructions demonstrated convergent validity, indicating their effectiveness. None of the studies included in the analysis reported HTMT values higher than 0.85, which satisfies the criteria set by Henseler et al. (2015) and Raza and Hanif (2013).

Table 7: Analysing Digital Knowledge Based on Factor Loading.

Variable	Items	Element			
		ID	TS	PD	AD
ID41	Engages in talks and Q&A sessions to research information and identify fake news.	0.748			
ID43	Expert at evaluating digital business data.	0.755			
ID45	Data-driven approach to evaluating digital businesses.	0.764			
TS41	Developing a data-driven approach to digital business evaluation.		0.723		
TS43	Capable of selecting and using digital tools to communicate with employees.		0.718		
TS45	Planning out digital skills training for employees includes setting up topics, times, and frequency of annual training.		0.711		
PD43	Provides solutions to customers using digital tools.			0.705	
PD45	Uses digital tools effectively in digital businesses to solve problems and make decisions.			0.818	
AD41	Ability to adapt to domestic and international laws and regulations regarding digital business.				0.769
AD43	Capable of effectively adapting strategies to the rapidly changing digital business environment.				0.718

To prevent multi-collinearity, it is essential to perform discriminant validity testing on the latent variables. Based on Henseler's formula (Henseler et al., 2015), the Heterotrait-Monotrait (HTMT) ratio of correlation has demonstrated superior specificity and sensitivity rates (97% to 99%) compared to Fornell and Larcker (1981) (20.82%). You can find the HTMT values for CC, PS, PI, and NA in Table 8.

Table 8: A Comparison of The Discriminant Validity of the HTMT with Knowledge Derived from Digital Sources.

Construct	CR	AVE	HTMT			
			ID	TS	PD	AD
ID	0.78	0.55	-	-	-	-
TS	0.75	0.50	0.71	-	-	-
PD	0.72	0.54	0.77	0.74	-	-
AD	0.70	0.53	0.80	0.78	0.80	-

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All constructions in Table 8 showed high dependability, with CRs surpassing the suggested criteria of 0.7 by Hair. The commonly used AVE, which evaluates convergent validity, exceeded the Fornell and Larcker-recommended threshold of 0.5. This indicates that the objective of achieving convergent validity has been successfully accomplished. In addition, all HTMT values were below 0.85, meeting the criteria set by Henseler et al. (2015).

Test for Model Fit

Structural equation modelling (SEM) employs multivariate statistical analysis to identify the factors that impact competency development. Specialised software packages are employed to analyse the data collected and interpret the results of the hypothesis tested. An analysis of the latent variables in the model is necessary, ensuring that each latent variable aligns with the empirical data. The study should then conclude by evaluating the fit between the data and the model. The criteria were satisfied by adjusting the latent variable to align with the empirical data, meeting all requirements. This provides an explanation for the change of seven levels in the observed variable, which was a survey variable resembling a rating scale, during the process of data collection. An investigation was conducted to analyse the connection between the observable and latent variables through confirmatory factor analysis (CFA), with the aim of identifying any potential associations between them. Reporting factor loading and the variance of the explainable component is essential for a comprehensive analysis and interpretation. Based on the research conducted by Hair et al. (2006), it is recommended that components should, on average, explain a minimum of 50% of the variation.

The researcher enhanced the model by integrating Modification Indices (M.I.) based on Ullman's criteria. It was necessary to carefully evaluate the programme's desired outcomes and theoretical principles to exclude any irrelevant observational variables. The researcher systematically processed the new model, ensuring that each step was completed thoroughly. This process was repeated until all the empirical data aligned perfectly with the structural equation model. Ullman (2001) states that the evaluation criteria should be widely recognised and applied, as demonstrated in Table 9. Ullman further proposed that incorporating model assessment criteria is essential for ensuring the consistency of model building with empirical data.

An Investigation of The Competencies of Thailand-Based Digital Entrepreneurs Using a Third-Order Confirmatory Factor Analysis

The CFA test evaluated the proficiency of digital business entrepreneurs in four key domains: digital learning, digital analysis, digital communication, and digital comprehension. The model was modified using the criteria of Model Modification Indices (MI), which led to the inclusion of four elements, sub-elements (16), and observation variables (51). Figure 2 illustrates the findings of the analysis.

The goodness of fit values show that the model is in excellent agreement with the empirical data. The Chi-Square test was conducted with 1093 degrees of freedom and yielded a Chi-

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Square value of 2026.264. The resulting Chi-Square/DF index value was 1.85. The value is notably different from the recommended 2.00. Three GFI measures, namely AGFI, TLI, and CFI, surpass the standard of 0.90. Their respective scores are 0.90, 0.90, and 0.92. In addition, the criteria for the conditions have been satisfied by the RMSEA value of 0.03, the SRMR value of 0.03, and the Hoelter's value of 520. The findings confirm the compatibility of the competency model for digital entrepreneurs that was developed in Thailand.

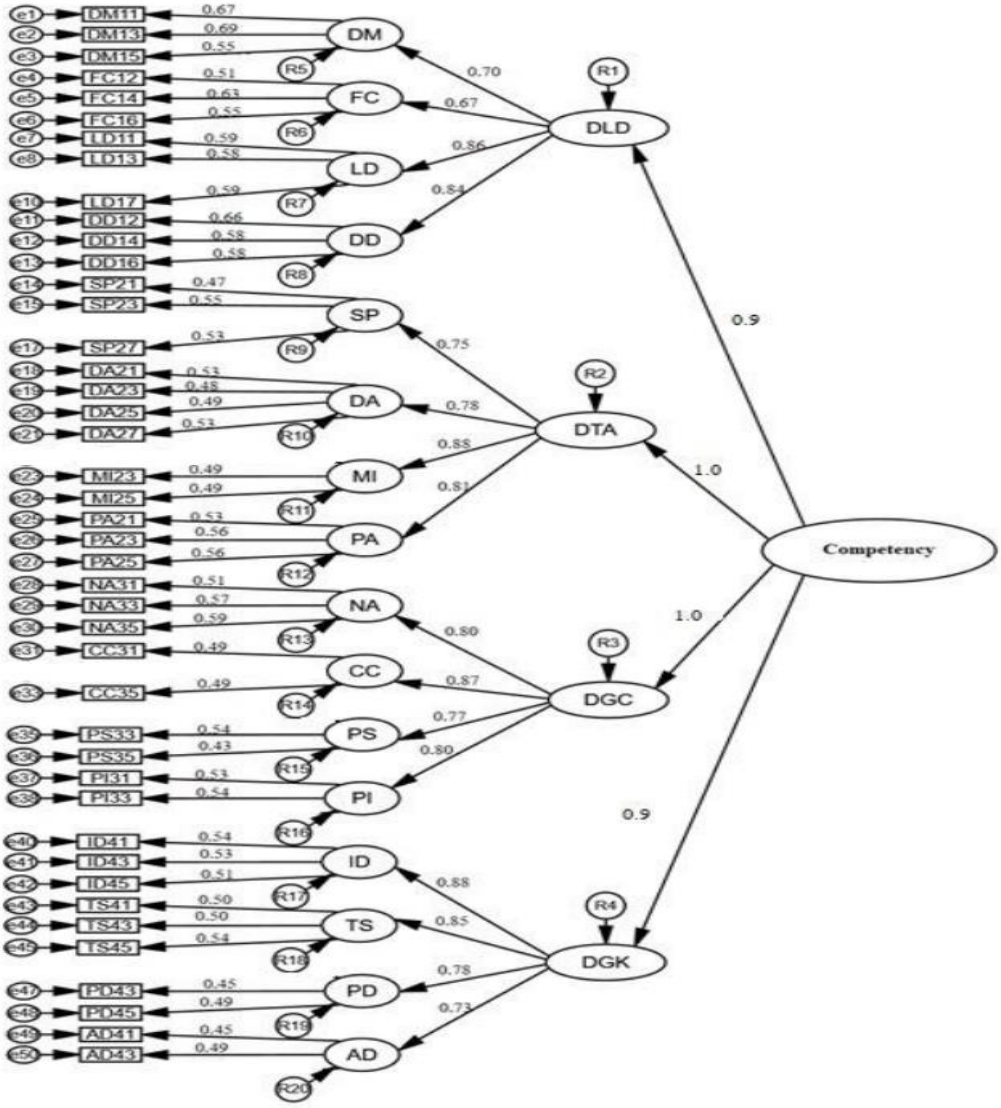

Figure 2: Illustrates The Competencies of Thai Digital Entrepreneurs.

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Table 9: Demonstrates the results of Fitting Analysis.

Index	Value Criteria	Structural Model	Outcome	Reference
Chi-Square /df	< 2.00	1.85	SUCCESSFUL	Tabachnick and Fidell (2007); Ullman (2001)
GFI	≥ 0.90	0.92	SUCCESSFUL	Joreskog and Sorbom (1984)
AGFI	≥ 0.90	0.90	SUCCESSFUL	Schumacker and Lomax (2004); Tanaka and Huba (1985)
CFI	≥ 0.90	0.92	SUCCESSFUL	Hu and Bentler (1999)
RMSEA	< 0.08	0.03	SUCCESSFUL	Schreiber et al. (2006)
SRMR	< 0.08	0.03	SUCCESSFUL	Thompson (2004)
Hoelter	> 200	520	SUCCESSFUL	Hoelter (1983b)

Table 10: Convergent Validity Analysis Results for Digital Entrepreneurs' Competencies.

3rd order	Std. Loading	2nd order	Std. Loading	CR	AVE	1st order	Std. Loading
DLD	0.9***	DM	0.71***	0.83	0.63	DM11	0.68***
						DM13	0.69***
						DM15	0.57***
		FC	0.68***	0.80	0.5	FC12	0.52***
						FC14	0.64***
						FC16	0.57***
		LD	0.83***	0.75	0.53	LD11	0.59***
						LD13	0.57***
						LD17	0.58***
		DD	0.84***	0.77	0.58	DD12	0.67***
						DD14	0.59***
						DD16	0.58***
DTA	1.0***	SP	0.77***	0.82	0.57	SP21	0.48***
						SP23	0.54***
						SP27	0.52***
		DA	0.79***	0.73	0.54	DA21	0.54***
						DA23	0.47***
						DA25	0.50***
						DA27	0.52***
		MI	0.89***	0.79	0.57	MI23	0.50***
						MI25	0.48***
		PA	0.82***	0.73	0.55	PA21	0.52***
						PA23	0.55***
						PA25	0.55***
DGC	1.0***	NA	0.81***	0.76	0.59	NA31	0.58***
						NA33	0.52***
						NA35	0.58***
		CC	0.89***	0.73	0.61	CC31	0.48***
						CC35	0.47***
		PS	0.78***	0.72	0.62	PS33	0.42***
						PS35	0.45***
		PI	0.81***	0.78	0.59	PI31	0.52***

						PI33	0.51***
DGK	0.9***	ID	0.89***	0.80	0.63	ID41	0.53***
						ID43	0.52***
						ID45	0.53***
		TS	0.88***	0.82	0.63	TS41	0.51***
						TS43	0.49***
						TS45	0.53***
		PD	0.79***	0.73	0.57	PD43	0.47***
						PD45	0.48***
		AD	0.73***	0.74	0.59	AD41	0.47***
						AD43	0.48***

All the latent variables in Table 10 were found to be statistically significant at a level of.001. This includes the third latent variable in the competency model for entrepreneurs based in Thailand. DGC and DTA had the highest weights among all factors, with respective weights of 1.00. Close behind were Digital Learning and Development (DLD) and Digital Knowledge (DGK).

The second order of the competence model showed a statistical significance of .001 for all latent variables among Thailand-based entrepreneurs.

1) Out of all the categories, market analysis and interpretation (MI) earned the greatest weight, 0.88. The weight of data analysis (DTA) ranged from 0.75 to 0.88.
2) Collaboration (CC) had the highest weight (0.87), followed by digital communication (DGC) with 0.77.
3) A weight of 0.88 was assigned to reading knowledge (ID), with a weight between 0.73 and 0.88 for digital knowledge (DGK).
4) Among all the other categories, digital learning and development had the highest weight of 0.86, followed by fast learning and development (LD).

The measurement model for all observed variables (1st order) was validated through confirmatory factor analysis (CFA) at a statistically significant level of 0.001. For variables to be considered as indicators of latent learning, digital development, and communication, they must have a weight of 0.30 or higher (Hair et al., 2010).

DISCUSSION

There is strong empirical evidence supporting the third criteria that validates the skills of digital entrepreneurs in Thailand. The four main components are digital communication, digital knowledge, data analytics, and digital learning and development. The examination of these elements follows a prioritised order.

Data analytics plays a crucial role in shaping the entrepreneurial competency of Thai digital companies. Included in this study are the analysis of data, the interpretation of

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the market, and the identification of problems. Effective decision-making requires a methodical approach. Keeping up with technological advancements allows business owners to create efficient and innovative strategies. A study conducted by Ataei et al. (2020) highlights the importance of strategic competency in effective business management, particularly for small and medium-sized enterprises (SMEs). A study by Bryn Mawr College (2016) emphasizes the significance of data management and analytics in promoting entrepreneurship in Mexico. In their study, Suwanroj et al. (2019) highlighted the importance of digital media, data generation, management, and evaluation in developing digital proficiency. It is recommended that businesses in Thailand offer data analytics training in marketing, operations, and finance to improve their digital business capabilities (Thanachawengsakul, 2020).

Efficiently collaborating with employees, both within and outside of organisations, to achieve organisational goals has positioned digital communication as a highly prized capability among digital entrepreneurs in Thailand. Hence, it is crucial for business owners to have a comprehensive understanding of the digital communication module, which can greatly benefit their company. This finding aligns with a recent study conducted by Prendes-Espinosa et al. (2021) on the topic of "Digital Entrepreneurship": Supporting the organisation's activities is crucial for start-ups and spin-offs, as success relies on effective teamwork, interdisciplinary collaboration, and clear communication. To enhance their online business capabilities, it is crucial for the company to broaden their digital communication channels. This will enable customers to reach out to the company easily and freely. In addition, it is crucial for the company to have a comprehensive understanding of working with different types of chatbots.

Thailand's digital entrepreneurs' competency is ranked third due to the rapid evolution and change of technology. Insufficient digital literacy among entrepreneurs could pose challenges for their companies in staying competitive in the technology-driven era. As a result, businesses may need to shut down. Hence, it is imperative for entrepreneurs to possess a strong command of digital technology to effectively apply their recently acquired knowledge and adapt to the prevailing business landscape. The findings are consistent with a study by Bryn Mawr College (2016) Bryn Mawr College looking at the influence of digital competency-related knowledge, abilities, and attitudes on entrepreneurship in Mexico. Companies must continue to navigate the digital landscape, conduct business in a digitally native manner, and adapt their operations. Education and training can equip them with the necessary digital knowledge.

The DLD component assesses the capabilities of digital entrepreneurs in Thailand. The fourth position is attributed to the combination of critical thinking and mastery of digital skills. As stated by Kurmanov et al. (2020), companies that actively pursue knowledge in the contemporary era are more likely to achieve long-term success and growth. The study suggests that entrepreneurs must possess digital competencies to achieve success.

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CONCLUSION

The study's findings on the evolution of digital entrepreneurs' competencies in Thailand indicate that the proposed model aligns with existing information. The model consists of 51 variables, divided into 16 sub-components and 4 main components. These essential and auxiliary components consist of:

1) Digital learning and development encompass various aspects such as digital media design, creativity stimulation, content creation and promotion, and rapid education and development.
2) Data analysis encompasses problem identification, strategic planning, vision planning, analysis of digital business operations, and the interpretation and analysis of marketing data.
3) Effective digital communication necessitates collaboration, networking, the ability to persuade, and strong presentation skills.
4) Data analysis, digital tool expertise, problem-solving, and adaptability is all part of digital literacy.

Therefore, digital entrepreneurs and their employees can leverage these insights to gain the essential skills, abilities, and knowledge required for achieving success. Government organisations are also urging digital business owners to embrace this strategy and create initiatives that boost revenue generation for both businesses and the economy. Finally, given the global nature of digital commerce, businesses need to understand how to engage in international trade.

RECOMMENDATION

Here are some recommendations to help digital businesses in Thailand improve their competitiveness:

1) Digital learning and development: A training programme is required to assist digital business owners in enhancing their skills in forecasting, content-based marketing, content production, creativity development, and effective teaching and learning methods.
2) Data Analysis: Given the critical importance of these analyses for organisational success, it is imperative that digital entrepreneurs possess comprehensive training in strategic planning, problem analysis, digital business analytics, and marketing interpretation. To enhance their operations and gain a competitive edge, it is imperative for them to possess the capability to utilise and analyse the data repository.
3) Digital Communication: To promote effective communication, it is essential for digital entrepreneurs to make a commitment to investing in dependable and high-quality networking solutions. To communicate effectively, individuals must also have motivation, persuasiveness, and presentation skills.

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4) Digital Knowledge: To effectively prepare for digital business operations, entrepreneurs need to have a solid grasp of data analysis, proficiency in using various tools, strong problem-solving abilities, and the capacity to adapt to changing circumstances.

LIMITATION AND FURTHER STUDY

The advancement of skills for digital business entrepreneurs reflects the current state of their abilities. Further research should prioritise the development of employee skills in digital businesses, as this could yield valuable insights for enhancing human resource management. Adjustments to the variables used in this study are necessary to meet the criteria for employee performance.

Authors' Contributions

The study was designed by the first author, who also obtained ethics committee approval, conducted the survey, analysed the data, drew conclusions, and authored the report with assistance from the second author. The final manuscript was reviewed and approved by both authors.

Conflict of Interest

The authors declare no conflict of interest in this research work.

Ethics Statement

The Ethics Committee of Rangsit University approved this study with exemption.

Funding Statement

The first author of this study bears the research expenses.

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