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Key Indicators for the Growth of Logistics and Distribution Tech Startups in Thailand

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Abstract

Purpose: As Thailand seeks to become a regional startup hub, Thai startups have been acquiring growth and scalability in the last ten years. Hence, this paper examines influential factors in Thailand's growth of logistics tech startups. The conceptual framework incorporates sensing user needs, sensing technological options, conceptualizing, scaling, and stretching, co-producing, and orchestrating, business strategy, strategic flexibility, and startup growth. **Research design, data, and methodology:** The quantitative method was applied to distribute the questionnaire to 500 managers and above in logistics tech startups in Thailand. The sampling techniques involve judgmental, convenience, and snowball samplings. Before the data collection, The Item Objective Congruence (IOC) Index and pilot test (n=45) were employed for content validity and reliability. The data were mainly analyzed by Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM). **Results:** The findings revealed that sensing technological options, scaling, and stretching, co-producing, and orchestrating, and business strategy significantly influence the growth of startups in Thailand. Nevertheless, sensing user needs, conceptualizing, and strategic flexibility have no significant relationship with startup growth. **Conclusions:** For Thailand to accelerate its digital economy driven by tech startups, firms must emphasize influential factors to accelerate growth by providing the right tech solutions for people's lives.

Keywords : Logistics, Distribution, Supply Chain Management, Business Growth, Tech Startups

JEL Classification Code : M10, M31, L61, L62, O30

1. Introduction

Startups are described as innovative, young, and fast-growing entrepreneurial firms. Tech startups in supply chains and supply chain management (SCM) involve the predominant goal of entrepreneurial ventures is to find customers, build a customer value proposition and serve products and/or services as customer's solutions (Wagner, 2021). Logistics and distribution tech startups usually provide warehousing, fulfillment, and distribution services. The Thailand startup ecosystem is one of a regional leader in innovation, ranked for startups at number 53rd in the world and ranked number 4 in Southeast Asia in 2021. Four cities are ranked in the top 1,000 in Thailand, and the top city in Thailand is Bangkok at 99 globally, followed by Phuket at 547 and Chiang Mai at 567. The most popular startup industries in the country are eCommerce and retail, marketing and sales, and software and data. Startup ecosystem sectors in Thailand comprise Thai startups, foreign startups, VCs and CVCs, universities and incubators,

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and government and partners. Thailand's startup ecosystem began and accelerated its potential in 2016 as Thailand 4.0 policy seeks to drive the economy through innovation by increasing the support to create new startups and their economic value (Khong-khai & Wu, 2018).

It has been found that the value of an investment in Thai startups is not in innovation-driven industries, with 80% of the investment going to Logistic & Distribution Tech, FinTech, AdTech, Fashion, and InsurTech. In contrast, businesses like BioTech, AgriTech, HealthTech, FoodTech, TravelTech, and EdTech in innovation-driven industries only account for 10% of their funding. However, while the COVID-19 pandemic has had a negative impact on the country's economy, tech startups have strived in e-commerce, food delivery, remote working, and other pandemic trends to accelerate growth and increase funding (Kumkrua et al., 2021). The country has emerged three unicorns during the pandemic, which are Flash Group (e-commerce logistics & distribution firm), Ascend Money (fintech), and Bitkub (cryptocurrencies).

Startups in Thailand face various obstacles regarding ease of doing business and the digital workforce. Thailand's education system is also a fundamental struggle to keep up with its neighbors. Based on the IMD world digital competitiveness ranking and Digital Council of Thailand in 2022, Thailand ranks 40th in global and 3rd in ASEAN in knowledge, technology, and future readiness. In addition, external challenges for startup firms; lack of R&D infrastructure, English proficiency, and experience, and internal challenges; lack of internal balance, market research, and a financial mindset (Tomy & Pardede, 2018).

Furthermore, limited empirical research explored the startup economy in Thailand, and yet no adequate analysis of external factors affecting business growth. Due to the fragmented literature and data, the researcher studied previous empirical literatures in other countries to identify influential internal factors of startup growth in Thailand, incorporating sensing user needs, sensing technological options, conceptualizing, scaling, and stretching, co-producing, and orchestrating, business strategy, and strategic flexibility.

2. Literature Review

2.1. Sensing User Needs (SUN)

The study of Teixeira et al. (2021) implied sensing user needs as the embodiment of dynamic capabilities. Janssen et al. (2018) signified as sensing user needs "firms' capacity to understand the demands of existing or potential clients." A firm can gain its competitive advantage through the high degree of a customer-oriented perspective by providing products or services as solutions to their customers (Salunke et al., 2019). Consequently, sensing user needs should be strategized to efficiently serve existing markets and create new products and services (Barbero et al., 2011). Teixeira et al. (2021) further extended in the survey that sensing user needs is how a firm systematically observes and evaluates the needs of its customers, analyzes the actual use of services, and distinguishes the different groups of users and market segments. Based on this discussion, a hypothesis is indicated:

H1: Sensing user needs has a significant influence on startup growth.

2.2. Sensing Technological Options (STO)

According Khaksar et al. (2017), the sensing technological options empowers a service provider to identify new technological opportunities to improve and/or create services. Numerous researchers pointed out the support of technological options and capabilities on business growth (Dibrell et al., 2008; Khaksar et al., 2017; Parida & Örtqvist, 2015; Teixeira et al., 2021). The exploitation of new technologies endorses a firm's innovation capability (product, service, and process) which positively impacts firm performance. Teixeira et al. (2021) studied the linkage between the sensing technological options and the growth of startups based on pioneering and innovative products or services as dynamic capabilities. Sensing technological options involves how the firm stays up to date with promising new services and technologies, identifying possibilities for new services, and keeping up with competitors' technologies. Hence, this study hypothesizes as follows:

H2: Sensing technological options has a significant influence on startup growth.

2.3. Conceptualizing (CON)

Conceptualizing is "the essence of service innovation, which is to provide a new value proposition for a specific customer or group of customers through combining new and existing resources" (Janssen et al., 2016). Love et al. (2011) referred to conceptualization as "detailing and visualizing service offerings, as well as aligning this new offering with a firm's organizational structure, resources, partners, delivery systems, markets, and other business propositions, to develop the service, pricing, and revenue model" Den Hertog (2014) encapsulated conceptualization is how a firm expedite central to service innovation with the experimentation, prototyping and "thinking out of the box." Innovative ideas for new service concepts and offerings can

significantly drive business growth (Teixeira et al., 2021). Based on previous studies, the third hypothesis is as follows:

H3: Conceptualizing has a significant influence on startup growth.

2.4. Scaling and Stretching (SCS)

Monteiro (2019) noted that a "business model can be scaled when a firm's activities and transactions can be replicated so that the company can increase its revenue at a much higher rate than its costs." Teixeira et al. (2021) studied the scaling and stretching as dynamic capabilities of a firm that can expedite "large-scale (semi-)standardized service operations." Therefore, the company's ability to scale is to replicate the business model and provide similar or close solutions across all channels. On the other hand, stretching is related to communication and brand power, whereas current brand and reputation can generate new market opportunities and business growth (Den Hertog, 2014). Khaksar et al. (2017) pointed out that scaling and stretching engage "the diffusion of service innovation in other businesses and industries where business partners perform to extend the advantages of innovation." Therefore, a hypothesis is proposed:

H4: Scaling and stretching have a significant influence on startup growth.

2.5. Co-Producing and Orchestrating (COP)

Co-producing and orchestrating is "a company's ability to manage service innovation across the organization and engage in networking" (Teixeira et al., 2021). These dynamic capabilities require service innovation to co-produce new and different service solutions for customers (Den Hertog, 2014). Limited access to knowledge, financial, human, and vice versa challenges startups. These firms must constantly adapt and integrate external resources to survive market pressures and expand their businesses (McGrath et al., 2019). In addition, business networking offers young companies access to resources to overcome the liability of newness and smallness (Baum et al., 2000). Teixeira et al. (2021) measured the effect of co-producing and orchestrating on startup growth by the level of a firm that can initiate and maintain partnerships, collaborate with other organizations to introduce, and improve new services, and strongly coordinate with several parties for service innovation. Based on the above discussions, a hypothesis is stated:

H5: Co-producing and orchestrating have a significant influence on startup growth.

2.6. Business Strategy (BS)

Meekaewkunchorn et al. (2021) terms business strategies as "innovation, marketing, differentiation and low-cost, which have a positive influence on organizational performances." In a business context, the innovative strategy of a firm is crucial for developing new products and services (Bhaskaran, 2006). Business strategies can dictate a firm's competitive advantage and sustainable development (Georgellis et al., 2000). Knight (2000) posited that business strategies could determine the firm's performance in specialization and differentiation, quality, and marketing. In the context of startups, strategic opportunities for new ventures can be categorized along two dimensions: collaboration or competition and attitude toward the innovation as the venture's decisions regarding customers, technologies, identity, and competitive space (Gans et al., 2018). Tuan and Yoshi (2009) discovered the linkage strategy of new product introduction as an internal factor significantly associated with the firm's growth. Hence, the researcher proposes the following hypothesis:

H6: Business strategy has a significant influence on startup growth.

2.7. Strategic Flexibility (SF)

The strategic flexibility of a firm relates to new market creation, the quality of management, interaction in niche markets, and cooperation and networks (Matalamäki & Joensuu-Salo, 2022). Bock et al. (2012) implied that strategic flexibility is "the firm's capability to quickly redeploy and relocate resource and production process making the response to environmental turbulence, the threats of other entrants and technical changes." Strategic flexibility is "an ability to handle change by exploiting new opportunities" (Zhou & Wu, 2010). Flexibility can be strategized in the system, transitional periods, scalability of products, business chains, organizational capabilities, and information technology (Oke, 2005). Therefore, strategic flexibility is reported to influence firms' growth (Matalamäki & Joensuu-Salo, 2022). Meng et al. (2020) conceptualized that strategic flexibility can be measured by a larger range of alternative uses, costs, the difficulty of switching, time required to switch to alternative resource use, environmental changes, and organizational structures that support the firm's product strategies. Subsequently, the following hypothesis is proposed:

H7: Strategic flexibility has a significant influence on startup growth.

2.8. Startup Growth (GRO)

Seo and Lee (2019) acknowledged that startups are categorized as "new technology-based firms (NTBFs), which strive to build scalable, repeatable and profitable business models." The service innovation aims to drive business growth among NTBFs differences are expected in startups (Teixeira et al., 2021). Business model innovation greatly influences business growth and overall firm performance (Bruton et al., 2018). Matalamäki and Joensuu-Salo (2022) referred to a firm's growth strategies: market penetration, market development, product development, and diversification. Tuan and Yoshi (2009) studied the growth of SMEs measured by technological sophistication, market positioning, and new product introduction. Janssen et al. (2016) indicated that startup growth is the process' capability to respond to customer needs while pursuing a scalable business model.

3. Research Methods and Materials

3.1. Research Framework and Hypotheses

The conceptual framework is based on three previous literatures (Matalamäki & Joensuu-Salo, 2022; Teixeira et al., 2021; Tuan & Yoshi, 2009), as shown in Figure 1. There are seven dependent variables which are sensing user needs (SUN), sensing technological options (STO), conceptualizing (CON), scaling and stretching (SCS), co-producing and orchestrating (COP), business strategy (BR), and strategic flexibility (SF). An independent variable is startup growth (GRO).

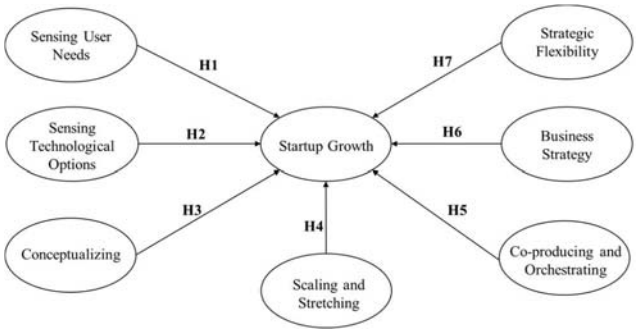

Figure 1: Conceptual Framework

H1: Sensing user needs has a significant influence on startup growth.
H2: Sensing technological options has a significant influence on startup growth.
H3: Conceptualizing has a significant influence on startup growth.
H4: Scaling and stretching have a significant influence on startup growth.
H5: Co-producing and orchestrating have a significant influence on startup growth.
H6: Business strategy has a significant influence on startup growth.
H7: Strategic flexibility has a significant influence on startup growth.

3.2. Methodology

This study applied a quantitative method by online distribution from May to August 2022. The questionnaire consists of 3 parts, which are screening questions (2), measuring items with a five-point Likert scale, ranging from 1 strongly disagree to 5 strongly agree (31), and demographic questions (4). Before the data collection, the content validity was proven by the item-objective congruence (IOC) index at a score above 0.5. Cronbach's alpha coefficient values assured the reliability test of the pilot test (n=45) were acceptable at above 0.7 (Nunnally & Bernstein, 1994). The data were analyzed by confirmatory factor analysis (CFA) and structural equation modeling (SEM) to test the goodness of fit and hypotheses, using SPSS and SPSS AMOS statistical tools.

3.3. Population and Sample Size

The target population is managers and above level in logistics and distribution tech startups in Thailand. The job requirement for manager level and up is at least Bachelor's degree and mostly at the age of 21 years old and above. The sample size of the structural equation model is recommended to be at least 200 respondents (Kline, 2011). In this study, the online survey was distributed to around 600 participants. Consequently, 500 responses were valid to proceed with the data analysis.

3.4. Sampling Technique

The sampling techniques in this research involve judgmental, convenience, and snowball samplings. First, the research chose the group of manager level in the logistics and distribution tech startup firms as they are involved in the strategic level and are the main person to operate to achieve the business growth. Next, convenience sampling was conducted through the online survey in google form. The researcher contacted the target group via direct emails through CEOs and human resources. LinkedIn and Line chat application are another two main communication channels to recruit qualified participants. Last, the researcher used snowball sampling to request the participants to share the online survey link with their qualified peers and colleagues.

4. Results and Discussion

4.1. Demographic Profile

The demographic results of 500 respondents are summarized in Table 2. Most respondents are males for 56 percent (280 respondents), whereas females are 44 percent (220 respondents). In terms of age, most of the respondents are between 31 and 40 years old, accounting for 39.6 percent (198 respondents), followed by between 21 and 30 years old, accounting for 28.6 percent (143 respondents), between 41 and 50 years old for 21.8 percent (109 respondents), and over 50 years old for 10 percent (50 respondents). Respondents are Bachelor's (61.6 percent), Master's (28.4 percent), and Doctorate degrees (10 percent), respectively. For job roles, the majority is product development, with 22 percent (110 respondents).

Table 1: Demographic Profile

Demographic Information		Frequency	%
Gender	Male	280	56.0%
	Female	220	44.0%
Age	21-30 years old	143	28.6%
	31-40 years old	198	39.6%
	41-50 years old	109	21.8%
	Over 50 years old	50	10.0%
Educational Level	Bachelor's degree	308	61.6%
	Master's degree	142	28.4%
	Doctorate degree	50	10.0%
Job Role	Founder/Co-Founder/C-level	19	3.7%
	Product Development	110	22.0%
	Business Development	75	14.9%
	Marketing	95	18.9%
	Finance and Accounting	70	14.0%
	Human Resources	60	12.0%
	Legal	34	6.9%
	Administration	24	4.9%
	Others	13	2.7%

4.2. Confirmatory Factor Analysis (CFA)

In CFA, the data were analyzed by the evaluation of convergence validity and discriminant validity. Table 2 shows an internal consistency coefficient under the rule that Cronbach's Alpha value must be 0.70 or above (Nunnally & Bernstein, 1994). The values were acceptable when the t-value >1.98, the p-value <0.5, and the factor loadings were higher than 0.5 (Hair et al., 2010). Furthermore, the composite reliability (CR) of all constructs was significant at 0.7 and over, and the average variance extracted (AVE) was higher than 0.5 (Fornell & Larcker, 1981). Thus, all estimates are significant and confirm convergence validity and discriminant validity.

Fornell and Larcker (1981) indicated that the evaluation of discriminant validity is calculated by each variable's square root of AVE. Based on this study, the discriminant validity is supportive because the value of discriminant validity is larger than all inter-construct/factor correlations. Additionally, multicollinearity's problem can be assessed through the correlation coefficient. As a result, the problem of multicollinearity is not issued as the factor correlations in Table 3 did not surpass 0.80 (Studenmund, 1992).

Table 2: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
Sensing User Needs (SUN)	Teixeira et al. (2021)	3	0.882	0.823-0.884	0.882	0.713
Sensing Technological Options (STO)	Teixeira et al. (2021)	3	0.884	0.818-0.882	0.884	0.717
Conceptualizing (CON)	Teixeira et al. (2021)	4	0.879	0.766-0.846	0.881	0.651
Scaling and Stretching (SCS)	Teixeira et al. (2021)	5	0.841	0.647-0.785	0.842	0.517
Co-Producing and Orchestrating (COP)	Teixeira et al. (2021)	3	0.747	0.650-0.755	0.749	0.500
Business Strategy (BS)	Den Hertog (2014)	4	0.826	0.705-0.767	0.827	0.544
Strategic Flexibility (SF)	Meng et al. (2020)	5	0.807	0.591-0.749	0.810	0.463
Startup Growth (GRO)	Teixeira et al. (2021)	4	0.800	0.668-0.727	0.801	0.503

Note: CR = Composite Reliability, AVE = Average Variance Extracted

Table 3: Discriminant Validity

	SF	SUN	STO	CON	SCS	COP	BS	GRO
SF	**0.680**							
SUN	0.676	**0.844**						
STO	0.646	0.844	**0.847**					
CON	0.257	0.287	0.256	**0.807**				
SCS	0.628	0.508	0.479	0.221	**0.719**			
COP	0.603	0.582	0.515	0.138	0.621	**0.707**		
BS	0.453	0.306	0.370	0.150	0.376	0.314	**0.738**	
GRO	0.528	0.537	0.567	0.217	0.555	0.521	0.179	**0.709**

Note: The diagonally listed value is the AVE square roots of the variables

The goodness of fit was applied to test the measurement model in the CFA. This study uses the criteria of CMIN/DF, GFI, AGFI, NFI, CFI, TLI, RMSEA, and RMR, as illustrated in Table 4. Consequently, all values were acceptable fit according to the acceptance criteria without an adjustment. Accordingly, convergent and discriminant validities of this study were approved.

Table 4: Goodness of Fit of Measurement Model

Index	Acceptable Values	Measurement Model
		Statistical Values
CMIN/DF	< 3.00 (Hair et al., 2006)	586.777/406 = 1.445
GFI	≥ 0.90 (Hair et al., 2006)	0.931
AGFI	≥ 0.90 (Hair et al., 2006)	0.916
NFI	≥ 0.90 (Arbuckle, 1995)	0.926
CFI	≥ 0.90 (Hair et al., 2006)	0.976
TLI	≥ 0.90 (Hair et al., 2006)	0.972
RMSEA	< 0.05 (Browne & Cudeck, 1993)	0.030
RMR	< 0.05 (Hair et al., 2006)	0.014
Model summary		**Acceptable Model Fit**

Remark: CMIN/DF = Ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normalized fit index, TLI = Tucker-Lewis index, CFI = comparative fit index, RMSEA = root mean square error of approximation, and RMR = root mean square residual

4.3. Structural Equation Model (SEM)

The structural equation model is a statistical method to measure the correlation of structural equations (Byrne, 2010). SEM measurement mainly includes two aspects: the model's goodness of fit and the correlation between variables. In terms of the adaptability of the model, the SEM statistical index values in this study, as shown in Table 5, are compared with acceptable standard values. The indices and values of the goodness of fit were CMIN/DF = 1.713, GFI = 0.919, AGFI = 0.903, NFI =0.910, CFI = 0.960, TLI = 0.955, RMSEA = 0.038, and RMR = 0.043 respectively. The values of each index are all within acceptable standards, so the fitness of the model in this study is acceptable.

Table 5: Goodness of Fit of Structural Model

Index	Acceptable Values	Structural Model	
		Statistical Values Before Adjustment	Statistical Values After Adjustment
CMIN/DF	< 3.00 (Hair et al., 2006)	1750.454/427 = 4.099	710.964/415 = 1.713
GFI	≥ 0.90 (Hair et al., 2006)	0.776	0.919
AGFI	≥ 0.90 (Hair et al., 2006)	0.740	0.903
NFI	≥ 0.90 (Arbuckle, 1995)	0.778	0.910
CFI	≥ 0.90 (Hair et al., 2006)	0.822	0.960
TLI	≥ 0.90 (Hair et al., 2006)	0.806	0.955
RMSEA	< 0.05 (Browne & Cudeck, 1993)	0.079	0.038
RMR	< 0.05 (Hair et al., 2006)	0.093	0.043
Model summary		**Unacceptable Model Fit**	**Acceptable Model Fit**

Remark: CMIN/DF = Ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI = normalized fit index, TLI = Tucker-Lewis index, CFI = comparative fit index, RMSEA = root mean square error of approximation, and RMR = root mean square residual

4.4. Research Hypothesis Testing Result

Table 6 shows the results of hypothesis testing, which are measured from the regression weights and R2 variances. The significance level is supported at p = 0.05. Sensing technological options strongly impacts startup growth (β = 0.337). In addition, startup growth is significantly influenced by scaling and stretching (β = 0.271), followed by co-producing and orchestrating (β = 0.159), and business strategy (β = 0.116). In contrast, sensing user needs, conceptualizing, and strategic flexibility have no significant relationship with startup growth, reflecting β = -0.035, 0.054, and 0.087, respectively.

Table 6: Hypothesis Result of the Structural Model

H	Paths	(β)	S.E.	t-Value	Tests Result
H1	SUN --> GRO	-0.035	0.095	-0.320	Not Supported
H2	STO --> GRO	0.337	0.084	3.340*	Supported
H3	CON --> GRO	0.054	0.036	1.228	Not Supported
H4	SCS --> GRO	0.271	0.080	3.791*	Supported
H5	COP --> GRO	0.159	0.076	2.103*	Supported
H6	BS --> GRO	0.116	0.042	2.624*	Supported
H7	SF --> GRO	0.087	0.087	1.094	Not Supported

Note: *p<0.05

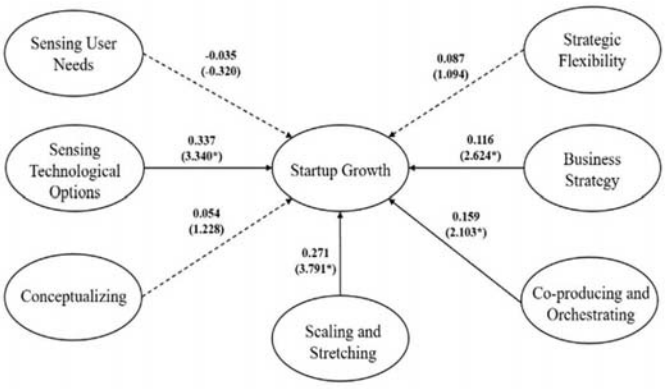

Figure 2: The Results of Structural Model

Remark: Dashed lines, not significant; solid lines, significant. *p<0.05

The hypothesis testing results in Figure 2 can be explicated that:

H1 fails to verify the significant relationship between sensing user needs and startup growth, resulting in the standardized path coefficient value of -0.035 (t-value = 0.320). The results contradict previous studies that "firms' capacity to understand the customers' needs can enhance their competitive advantage and the high degree of business growth (Barbero et al., 2011; Salunke et al., 2019; Teixeira et al., 2021).

H2 confirms the significant influence of Sensing technological options on the growth of logistics and distribution tech startups, represented in the standardized path coefficient value of 0.337 (t-value = 3.340*). The findings align with many scholars that technological options empower a startup to identify new technological opportunities to endorse business growth (Dibrell et al., 2008; Khaksar et al., 2017; Parida & Örtqvist, 2015; Teixeira et al., 2021).

H3 indicates the insignificant support between conceptualizing and startup growth, with a standardized path coefficient of 0.054 (t-value = 1.228). The outcome contradicts the earlier discussions that the capability of startups to provide a new value proposition cannot determine business growth (Den Hertog, 2014; Janssen et al., 2016; Love et al., 2011; Teixeira et al., 2021).

H4 validates that scaling and stretching significantly influence startup growth, reflected in a standardized path coefficient value of 0.271 (t-value = 3.791*). Accordingly, startups' business models can be scaled and expedited to accelerate firms' growth (Den Hertog, 2014; Khaksar et al., 2017; Monteiro, 2019; Teixeira et al., 2021).

H5 approves that co-producing and orchestrating significantly influence startup growth with a standardized path coefficient value of 0.159 (t-value = 2.103*). The results associated with empirical studies show that startups can manage innovation across the organization and its network to accelerate growth (Baum et al., 2000; Den Hertog, 2014; McGrath et al., 2019; Teixeira et al., 2021).

H6 presents the standardized path coefficient value of 0.116 (t-value = 2.624*), which confirms a relationship between business strategy and startup growth. The hypothesis testing results show that terms business strategies of tech startups as innovation, marketing, differentiation, and low cost, can gear toward firm growth (Bhaskaran, 2006; Georgellis et al., 2000; Meekaewkunchorn et al., 2021).

Last, H7 disapproves that strategic flexibility significantly influences startup growth, resulting in the standardized path coefficient value of 0.087 (t-value = 1.094). Many studies opposed these results and stated that strategic flexibility relates to the capability to enhance business growth (Bock et al., 2012; Matalamäki & Joensuu-Salo, 2022; Zhou & Wu, 2010).

5. Conclusions and Recommendation

5.1. Conclusion and Discussion

This research achieves to identify key indicators of the growth of logistics and distribution tech startups through the influential factors of sensing user needs, sensing technological options, conceptualizing, scaling, and stretching, co-producing and orchestrating business strategy, and strategic flexibility in Thailand. Five hundred managers and above in logistics and distribution tech startups in Thailand were surveyed to achieve the research objectives. The results led to partial confirmation of the assumptions from previous studies. After the CFA and SEM data analysis, the findings revealed that sensing technological options, scaling and stretching, co-producing and orchestrating, and business strategy significantly influence the growth of startups in Thailand. Nevertheless, sensing user needs, conceptualizing, and strategic flexibility has no significant relationship with startup growth.

The study sheds light on the significant factors as key indicators influencing startup growth, with a specific focus on the logistics and distribution tech sector in Thailand. The findings can be implied that sensing technological options, scaling, and stretching, co-producing and orchestrating, and business strategy must be mobilized. Following the evidence from previous literature, the exploitation of new technologies endorses a firm's product, service, and process innovation which positively impacts firm performance. Den Hertog (2014) added that the company's ability to scale and stretch could generate new market opportunities and business growth. Teixeira et al. (2021) studied the effect of co-producing and orchestrating on startup growth can be done by the firm's ability to initiate and maintain partnerships. Additionally, business strategy is a key to driving the firm performance and growth, as confirmed by Tuan and Yoshi (2009)

On the other hand, due to startups' innovative nature and newness, sensing user needs, conceptualizing, and strategic flexibility are insignificant for growth. This finding opposes most earlier studies (Barbero et al., 2011; Salunke et al., 2019; Teixeira et al., 2021). Teixeira et al. (2021) posited that "the growth phenomenon seems to be more closely related to the capacity to identify market demands and develop an appropriate business model." It highlights the business stages of the startups to determine whether growth is not relevant to the identification of customers' needs. Conceptualization is also at the seed stage, not the growth stage. Furthermore, strategic flexibility can be recognized but not as important to overcome barriers related to the newness and smallness of startups.

5.2. Recommendation

This research suggests that managers should invest actively in upkeeping the new technologies even if they have a well-established business model and product and service innovation. As business environments are becoming increasingly competitive, it is necessary to constantly review and adapt the business model to be scaled and stretched. Moreover, the results also signal the utilization of collaboration and networking. A startup must engage with investors and other tech stakeholders. The startup growth is more linked to business strategies than technology. Hence, clear objectives and road-to-market may accelerate business growth.

Even though sensing user needs, conceptualizing, and strategic flexibility has no significant relationship with startup growth. These indicators cannot be dismissed. At the beginning stage of a startup, it is important to know that receiving feedback is important if we can recognize and resolve customer objections. Then, the firm can develop products or services to meet the market's needs, leading to long-term success. Companies such as Dropbox, Hotmail, Eventbrite, Mailbox, and Snapchat have more than a million users by getting the needs of customers before commercializing.

Conceptualizing a startup requires a creative idea and nourishment to facilitate leanness and growth. Therefore, it is undeniable to strengthen the value proposition of the tech solutions responding to the most-update market needs. Strategic flexibility can partially influence growth, but it is mandatory for survival and sustainability. Many companies sprint their product and service innovation, aiming to fail fast and speed up what works. Thus, the strategies can be changed and adopted according to the market situation. For Example, logistics and distribution tech startups shifted the focus from traditional to medical care service delivery and warehousing during COVID-19 to response to the enormous market and customers demand during the pandemic. In conclusion, for Thailand to accelerate its digital economy driven by tech startups, firms must emphasize influential factors to accelerate growth by providing the right tech solutions for people's lives.

5.3. Limitation and Further Study

This research has three major limitations. First, significant factors have focused on the role played by the internal context in the relationship between capacities and startup growth. Future studies could measure the influence of external factors such as public policies, tax incentives, government support, market competition, funding, and other institutional variables. Second, this study mainly focuses on logistics and distribution tech startups and has yet to cover other sample groups in different industries, such as FinTech, AdTech, Fashion, and InsurTech. Finally, the researcher merely applied the quantitative method. The qualitative or mixed method should be considered for further study to provide insights, in-depth interpretation, and implications.

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