

THE EFFECTS OF NETWORK AND INNOVATION CAPABILITIES ON PERFORMANCE OF STARTUP BUSINESSES IN THAILAND

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ABSTRACT

This research aimed to examine the effects of network and innovation capabilities on performance of startup businesses in Thailand and to examine the mediator affecting the relationship between network capability and performance of startup businesses in Thailand. The researcher collected information from 171 executives of startup businesses and used questionnaire as a research tool. The statistics used for data analysis included basic statistics, and the Structural Equation Modeling (SEM) with the program LISREL. The research findings revealed that the hypothesis model was congruent with the empirical data at high level and that the network capability had direct effects on innovation capability and indirect effects on performance. Innovation capability had direct effects on performance and innovation capability was the mediator between network capability and performance.

Keywords: Network Capability, Innovation Capability, Performance, Startup Businesses.

INTRODUCTION

Startup businesses had limited choice in development and growth. The only path to growth was access to external resources by joining business network. Some executives of startup businesses knew very well from past investment on the use of relationship of business network. At the same time, other executives would develop business using instinct within the group of social and economic relationship (Drakopoulou Dodd & Anderson, 2007). Business relationship and network embedding to start business changed all the time. They were not new (Coviello, 2006, Hoang & Yi, 2015, Lechner et al., 2006). However, literature review forged understanding of the strategic network capability which was used by executives in cooperation with business partners to create ability of access, commencement of operation, and determination of resource models with other companies to develop and/or change business network.

Literature review put forward basic hypothesis that network capability took place naturally in companies (Eisenhardt & Martin, 2000). However, network capability was developed rather than existent by itself (Möller & Svahn, 2003) as companies needed to create internal capability (Teece et al., 1997). But it was argued that the importance of development of network capability was to develop the understanding of management on the potential of business relationship with network. Similarly, Thornton et al. (2014) argued that a company's network behavior was important for business relationship (Thornton et al., 2015). But the executives of other companies must participate. The development of network capability required recognition and operation with other companies. Therefore, it was more than internal expertise of a company

that focused on other companies. The involvement of other companies also meant that enforcement of network capability was a process that was relatively specific for each context.

Network capability was a competitive tool that was crucial to the success of business entrepreneurs. It also filled the country's expectation as the role of major mechanism to enhance the national economic progress. The major factor of the innovation indicator of startup businesses was considered from the capability of an organization in limited situations. The innovation also affected the production of new products, enhances on the existing products, increases speed and quality of goods, increases efficiency of work process, opening of new markets, and model or method of delivery of value to customers. The innovation affecting the results was divided into 3 types namely product innovation, process innovation, and organization innovation (Kotler & Keller, 2012). In terms of education, startup businesses could use various systems to improve or change operation and could efficiently develop and compete with different institutions as well as other organizations (Hareebin et al., 2016).

National Startup Committee was established from the vision of General Prayut Chan-ocha, Prime Minister, with the intention to restructure the economic system of the country by developing "*Startup Company*" as New Economic Warrior (NEW) and identify Thailand as the open space for ASEAN growth. The guideline was charted for the promotion of Thailand's startup companies as follows: 1. Open for Talent from around the world: To enhance competitiveness of startup companies in Thailand to be able to grow in the world market 2. Open for Business Growth: Development of startup businesses was the development of products or services in parallel with the development of the model of innovation-based business 3. Open for Investment: For startup companies to develop innovative products and services as well as expand market abroad and 4. Open for Ecosystem: To develop the systematic and sustainable ecosystem of startup companies (Startup Thailand, 2020).

Startup was a newly established business, a new company established to accommodate the IT technology-based business, including growth of business operation in leaps and bounds, generating high income. It was the business established to mostly solve problems in daily life such as various applications. One only had to look at Google, Facebook to have the clearer picture of this type of business. These brands started as startup businesses. Startup business was first established in US as what was called Silicon Valley, the congregation of the world's IT leading companies, as well as entrepreneurs and investors. At present, SMEs, as well as newly established startups, constituted the key to drive the economy and solve the social problems of unemployment, create innovation and sustainability to the country's economic system (Baard & Van Den Berg, 2004). The generated employment was a challenge to the newly established SME entrepreneurs due to the linkage with the business turnover. If business faced with the problems of decreased sales or profits, it would impact business turnover, employment, as well as trade and investment. Therefore, small and medium startup businesses needed to manage resources for the maximum benefit to ensure business competitiveness.

Most startup companies started from the outside of the main business network. Executives needed to find out which relationship was crucial to success. Moreover, the lack of reputation and legitimacy of startup businesses meant that other companies must spend time to know and recognize the new business. Network capability related in the long term with performance of startup businesses (Zacca et al., 2015), which business executives still had little knowledge on the development of network capability (Gulati, 1998; Kale et al., 2000). Moreover, Autio et al. (2011); Zahra et al. (2006) argued that there had hardly been any empirical study on the development of capability of startup businesses.

Based on the above reasons, the researcher was interested in conducting the research study on network and innovation capabilities affecting performance of startup businesses in Thailand. The objective was to examine how network and innovation capabilities affect performance. The information was collected on startup businesses in Thailand. The research findings would be used as executives' planning guideline that focused on more business performance from the creation of value-added using business network. Innovation capability and technology were major factors that drove the "Thailand 4.0" policy with the tendency to drive entrepreneurs to conduct new business model or startup businesses in order to be able to compete in the global market.

Objectives

1. Examine the effects of network capability on innovation capability and performance of startup businesses in Thailand
2. Examine the effects of innovation capability on performance of startup businesses in Thailand

LITERATURE REVIEW

Network Capability

Network was a group of business organizations, experts, or people coordinated through the marketing mechanism rather than the traditional chain of command (Miles & Snow, 1992). It was the voluntary formation of groups of individuals or organizations through exchange of news and information or common activities. At the same time, each organization performed full management by itself. That is, the network did not affect autonomy and interdependence of its members.

In the past, there was no theory to explain the network development both in the specific context and the challenges faced by novice entrepreneurs. The research model was constructed by the integration and the lessons learned from the existing theory of relationship building process (Nebus, 2006), organization network management (Möller & Halinen, 1999) and social capability (Baron & Markman, 2003). Theories generally focused on face-to-face relationship enhancement. These theories made the observation that relationship happened from personal preference (Farh et al., 2010, Nebus, 2006). Moreover, motivation was also a major factor that influenced the intention to be a part of specific behavior (Vroom, 1964). People would use online social network to search for information when they had positive belief or recognized the value of the role of network in entrepreneurs' activities.

Network capability was additionally explained from the perspective of the theory of Resource-Based View (Barney, 1986, Wernerfelt, 1984), including external capability (Dyer & Singh, 1998, Lorenzoni & Lipparini, 1999). The perspective of the external-focused network was management of business relationships (Ritter, 1999). Moreover, Ritter et al. (2002) additionally discussed about the external interesting issues by adding the portfolio of the relationships. Therefore, network management was considered a sub-dimension of network capability. But for startup businesses, there were still many obstacles to develop network capability as relationships and positions of the network relied on other businesses (McGrath & O'Toole, 2013).

According to the past research study, network capability was studied mainly as mediator. The use of network capability as a 'cause variable' affecting on innovation capability and

performance was rarely observed. Moreover, in Thailand's context, there is no such a study that focuses on the effects of network capability on innovation capability and performance of startup businesses in Thailand using population in the study. Therefore, based on the above supporting factors, the research hypothesis could be presented as follows:

H₁: Network capability had positive impacts on innovation capability

H₂: Network capability had positive impacts on performance

Innovation Capability

Generally, innovation was derived from the use of open technology and high-quality resources, and it relied on the differences of knowledge and types of IT system. Knowledge management was the most important part of innovation especially the knowledge-based industry such as startup businesses. Knowledge constituted competitive advantage for the development of goods and services (Plescan & Gavriletea, 2008). Companies' capability to innovate was the most important factor of competitive advantage in the situations of highly volatile and changing markets. Innovation capability would assist organizations to move towards the continuous development of innovation to respond to the changing business environment (Slater et al., 2010), embedded in the entire strategies, system, and structure that supported innovation in the organization (Gloet & Samson, 2016).

Literature on innovation argued that innovation was the basic source of a company's success and survival (Abbing, 2010; Cho & Pucik, 2005). Amidst such complicated competition and intellectual surroundings, the research on qualifications and specific problems of startup businesses required development in leaps and bounds, compared to other business models. Startup businesses were unique. No similar strategy could be used to develop new products or services or business models, for example, the ability to see the difference in the nature of services or actions and the level of interactions between organizations providing services to customers (Johne & Storey, 1998), and new dimension of business thinking that entailed the transformation of new, original, and flexible operation (Kuo et al., 2014).

Innovation could take place only when companies had the ability to create innovation (Laforet, 2011). Innovation capability was therefore considered valuable asset for the companies to maintain competitiveness and implement all strategies (Lawson & Samson, 2001). It could not be isolated from other practical guidelines, and could not be solved, and had close relationship with the experience-based testing (Guan & Ma, 2003). Innovation capability assisted companies in timely launching new products and adopting new systems. Importantly, continuous competition input factor should be taken into account. Therefore, based on the above supporting factors, the research hypothesis could be presented as follows:

H₃: Innovation capability had positive impacts on performance

Based on the above hypothesis, the research conceptual framework shown in (Figure 1).

Sample

The sample used in the research included 431 executives of startup businesses in Thailand (National Innovation Agency (Public Organization), 2020: website) covering 69 days of the period for collecting data, 171 collected questionnaires or 39.67% of the sample. This was in line with Aaker et al. (2001) who suggested that there must be responses of 20% of the

questionnaires to be considered acceptable as they had sufficient and reliable size that could be tested.

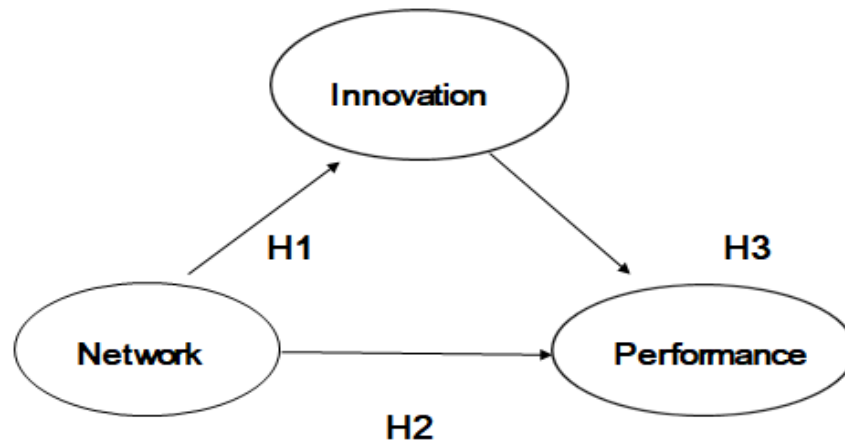


FIGURE 1
RESEARCH CONCEPTUAL FRAMEWORK

METHODOLOGY

A Tool Used for Data Collection

Questionnaire was used as a tool for the data collection which was in line with the determined objective and conceptual framework, divided into 4 parts and 35 questions as follows: Part 1: General information of the executives of startup up business in Thailand, with the checklist of 10 questions, covering the information on gender, age, marital status, education, work experience, models of business, types of business, average annual income of business, and period of research. Parts 2-4: The questionnaire was characterized by the rating scale as follows: 12 questions on network capability of business, 8 questions on innovation capability of business, and 6 questions on performance of business.

Quality of the Tool Used for Data Collection

As for the reliability of the tool, Alpha Coefficient was used according to the Cronbach method with the following details: network capability had the Alpha Coefficient equaled .904, innovation capability had the Alpha Coefficient equaled 0.920 and performance had the Alpha Coefficient equaled 0.907. This was consistent with Streiner and Norman (1995) who recommended that the Reliability value must be higher than 0.80.

Data Analysis

This research conducted data analysis with descriptive statistics to describe the characteristics of the variables including network capability, innovation capability, and performance. The analysis of the “Construct Validity” through the “Confirm Factor Analysis” was used to test the “Construct Validity” of the observed variable. The analysis of the ‘Structure

Equation Modeling' was used to develop and test the validity of the constructed model with the empirical data through the consideration of the goodness of fit indices with the empirical data.

Research Findings

The presentation of the research findings was divided into 3 parts as follows:

Analysis of the Mean and Standard Deviation of Observed Variables

The analysis revealed that the mean of the observed variables ranged from 3.833 to 4.096 which were at fair to high levels. The network capability (NET) had the highest mean of 4.096. The innovation capability (INO) had the mean of 4.085, and the performance (PER) had the mean of 4.085.

Findings of the analysis of Correlation Coefficient of Observed Variables

The analysis of this part aimed to study the relationships between all observed variables if they had relationships and the direction and size of the relationships using the Pearson's Product Moment Correlation as statistics in the analysis. The results of the analysis revealed the following:

The Correlation Coefficient between 25 observed variables were all in relationships totaled 300 pairs. The difference from zero with statistical significance at the level of .01 totaled 193 pairs. The difference from zero with statistical significance at the level of .05 totaled 34 pairs. The relationships without statistical significance totaled 73 pairs. The sizes of relationship ranged between 0.000 and 0.719. The relationships between variables with the highest value included network capability (n4) and network capability (n3) ($r_{XY}=0.737$), followed by network capability (n3) and network capability (n2) ($r_{XY}=0.722$). As for the relationships between variables with the lowest value included network capability (n10) and performance (p6) ($r_{XY}=0.001$) and network capability (n2) and innovation capability (i8) ($r_{XY}=0.006$) (Table 1).

Considering the Kaiser-Meyer-Olkin (KMO) test which indicated that the appropriate sample size should be higher than 0.50, it was found that the $KMO=0.865$ which indicated the appropriate sample size. The results of Bartlett's test of Sphericity which was the statistics to test the hypothesis if the Correlation Matrix was Identity Matrix, it was found that the value equaled 2383.512 ($p<.01$, sig 0.00). It indicated that the Correlation Matrix was different from the Identity Matrix with the statistical significance at the level of .01. It meant that each variable was related and suitable to be used to develop and test the validation of the model with the empirical data.

Findings of the Analysis of the Model Affecting Network Capability on Innovation Capability and Performance of Startup Businesses in Thailand

Figure 2 indicated the results of the analysis of Structural Equation Modeling based on the hypothesis to examine the effects of network capability on innovation capability and performance of startup businesses in Thailand with the empirical data through the model's Goodness of fit indices. It was found that the model was congruent with the empirical data. The Goodness of fit indices between models according to the conceptual framework and the empirical data was at good level (Chi Square=332.45, $df=295$, $df=1.127$, $p\text{-value}=0.065$,

GFI=0.868, RMSEA=0.027, NFI=0.938, NNFI=0.984, AGFI =0.843, PGFI=0.729, CFI=0.985). It indicated that the organization’s success fit the determined theoretical model at the acceptable level.

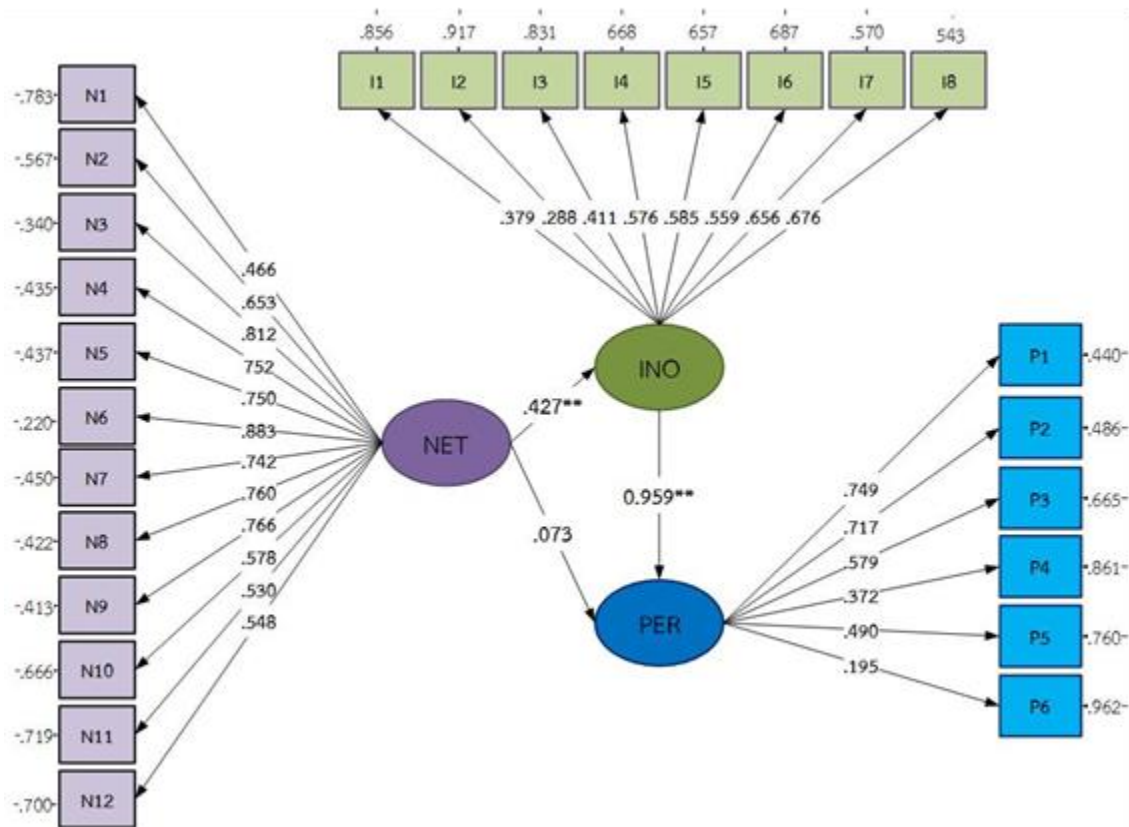


FIGURE 2
MODEL OF EFFECTS OF NETWORK CAPABILITY ON INNOVATION CAPABILITY AND PERFORMANCE OF STARTUP BUSINESSES IN THAILAND

Based on Table 1, the research findings revealed that the results of the analysis presented the Correlation Coefficient between Variables and Influence Coefficient of the measurement of the latent variables to inspect the Construct Validity of the observed variables used in the model to study “*network capability and innovation capability on performance of startup businesses in Thailand*” according to the hypothesis of the empirical data. The dependent variable was performance (PER). The independent variable included network capability (NET) and innovation capability (INO). In considering the statistics used to inspect the congruence between the measurement of the latent variables to inspect the Construct Validity of the observed variables used in the model to study “*network capability and innovation capability on performance of startup up businesses in Thailand*” by searching for the Goodness of fit indices of the model, it revealed that there was congruence between the model and the empirical data.

Considering the variable of performance (PER) as dependent variable, it revealed that the variable with direct influence on the dependent variable included network capability (NET) with the size of influence equaled -0.145. The variable with direct and indirect impacts on the

dependent variable included innovation capability (INO) with the size of direct influence equaled 1.740 and the size of indirect influence equaled .816. The two variables could both explain the variance of the variable of performance (PER) at 86.50 percent.

Dependent variables	INO (E1)			PER (E2)								
	TE	IE	DE	TE	IE			DE				
Independent variables												
NET (K1)	0.469** -0.154 3.045		0.469** -0.154 3.045	0.672** -0.204 3.297	0.816** -0.236 3.465			-0.145 -0.172 -0.839				
INO (E1)				1.740** -0.384 4.532				1.740** -0.384 4.532				
Variables	I1	I2		I3	I4	I5	I6	I7	I8			
Reliability	0.441	0.83		0.619	0.322	0.343	0.313	0.43	0.457			
Variables	P1	P2		P3	P4	P5	P6					
Reliability	0.56	0.514		0.335	0.319	0.42	0.38					
Variables	N1	N2		N3	N4	N5	N6	N7	N8	N9	N10	
Reliability	0.217	0.433		0.66	0.565	0.563	0.78	0.55	0.578	0.587	0.334	
Variables	N11	N12										
Reliability	0.281	0.3										
Structural equation INO PER												
R SQUARE					0.183			0.865				
Correlation matrix between latent variables: INO PER NET												
INO 1.000												
PER							0.928**	1				
NET			0.427**			0.337**			1			

Considering the Correlation Coefficient matrix between latent variables, it revealed that the Correlation Coefficient of the latent variables were all positive. The variable of performance (PER) and the variable of innovation capability (INO) had equally the highest level of relationship equaled .928. The variable with the lowest level of relationship was the variable of performance (PER) and network capability (NET) equaled 0.337.

DISCUSSION

Network capability (NET) influenced innovation capability because the context of data collection for the research coincided with the period when Thailand has been facing the crisis from COVID-19 pandemic situation since the end of 2019 and the outbreak became critical starting in February 2020. As a result, the government implemented the stringent measures to curb the spread through the lockdown nationwide since March 26, 2020, suspending the country's economic activities. Although the lockdown was later revoked, businesses faced the problems of marketing, orders, production process, etc. so that work efficiency and performance did not achieve the goals. Some businesses must temporarily suspend their operation. The lockdown measures, enforced for 2 months, affected Thailand the most among ASEAN

countries, abruptly both domestic and international production chains. Some companies found themselves in fragile and sensitive situations, faced to the serious changes of liquidity. Therefore, startup businesses must adapt the form of organizational management in line with the urgently changing situations with creation of business network which was adaptation of new techniques and strategies. It would power-up the business operation to have diverse business networks which could link markets, prices, and sources of production of goods to increase potentials in driving the organization. This was consistent with Walter et al. (2006) who argued that each organization must seek new methods to maintain the level of competitiveness and prevent business failure. The creation of business networking was one method which constituted cooperation between relevant people or various businesses in different forms, as well as forged relationship and business partnership. Cenamora et al. (2019) argued that network capability was the mediator of the relationship between digital platform capability and entrepreneurs' efficiency.

Innovation capability (INO) influenced performance (PER) because the establishment had innovation capability to continuously develop new products and services in response to the needs of customers, allocate resources for research of new innovations to perform task efficiently, continuously use new technologies to develop work efficiency, and regularly adapt management in accordance with changes, leading to the organization's high performance and competitiveness. This was consistent with the research of Luangsakdapich (2020) which argued that innovation capability on services influenced performance on services. It was in line with Kaleka (2011), and Silvia, Rajshekhar & Luciano (2018) who argued that the characteristics of services with superior quality than competitors could respond to the needs and meet the acceptance of customers which had direct positive impact on performance achievement.

Research Limitations

This research faced a limitation of accessing to the information of startup businesses in Thailand. The researcher spent time collecting data during the COVID-19 pandemic in Thailand. Therefore, business did not fully operate and employees worked from home. Moreover, many businesses were closed temporarily or permanently. There were only 431 establishments of startup businesses still operational. The researcher collected data by sending 431 questionnaires by post. The 171 questionnaires were responded or 39.67 percent of the sample. The duration of data collection totaled 69 days according to the basic agreement of the analysis using Structure Equation Modeling. It meant that the size of population per the Observed Variable must not be lower than 10-12: 1 or the relationship between variables must be based on the Hair theory (Hair et al. 2010) to obtain the sufficiently large Sampling Size to be able to be analyzed with the LISREL (Linear Structural Relationship) program. The number of the collected questionnaires was lower than as determined.

RECOMMENDATIONS

Recommendations on the Application of Research Findings

The executives of startup businesses in Thailand should focus on network capability (NET) especially during the time when business atmosphere faces fluctuations and crises so that business cannot perform organizational management as in normal situations. It can be achieved through exchange of knowledge and share of experience with other agencies to serve as the practical guideline, opportunity provided for the establishment's trading partners to introduce

their business partners to the establishment, assistance and support from other agencies, and confidence and clarity to forge cooperation with trading partners to ensure that all will achieve their goals, etc. The activities that business strives to create and maintain business network will affect innovation capability (INO) and greatly contribute to the success of the business.

The research findings revealed that the innovation capability (INO) had direct influence on performance (PER) of startup businesses at high level. The size of the influence equaled 1.740 with the statistical significance at the level of .01. Therefore, executives of startup businesses should modify their operations by continuously developing new products and services in line with the demand of customers, allocate resources in research of new innovations, offer speed in presenting new products or services to customers, and apply new technologies to continuously develop work efficiency which will ensure business flexibility, with ability to speedily adapt and change management, in accordance with the highly volatile situations at present. The measures will affect the success of the business both in the short and long terms.

Recommendations on Future Research

The analysis of the research data revealed that the model acquired from the research study with the empirical data was highly congruent with the theoretical model. The influence lines between variables illustrated the relationship with statistical significance ($p < 0.05$) which showed that the model from this research study was well-founded and appropriate to testing at high level. However, this study revealed that the variables of the network capability (NET) had no statistical significance and were not congruent with the research hypothesis. Therefore, the researcher recommended other methodologies or programs to conduct the comparative analysis. The analysis of the study findings used the LISREL (Linear Structural Relationship) program to analyze the results to create comparison. In terms of Model fit, other programs should be used for further analysis. Other statistics should also be used in the analysis to confirm the results of the analysis such as Multiple Regression, etc.

CONCLUSION

For this research, as the period of data collection from startup businesses coincided with the unusual situations during COVID-19 pandemic, the researcher recommended that data should be collected again once the situation resumes to normal, the comparative analysis should also be conducted again to inspect the research model and the influences of the variables from empirical data.

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