

THAILAND 4.0’S INNOVATION AND STARTUP PERFORMANCE: ANALYZING THE INDICATOR LEVEL

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The objective of this research is to study the level of startups’ creative innovations and business performance under the national programme Thailand 4.0. The research is using mixed methods, and the population of this study consists of entrepreneurs and executives, including those who are directly participating in the development of creative innovations in Thailand. The research findings indicate that there are three main variables of creative innovation, namely: (1) Learning Innovation, (2) Communication Innovation, and (3) Operational Support Innovation. The Communication Innovation was ranked No. 1 as it has the highest mean ($\bar{x} = 4.29$, $S.D. = 0.51$) while the 2nd rank was assigned to Learning Innovation with the highest mean ($\bar{x} = 4.25$, $S.D. = 0.51$), the 3rd rank got Operational Support Innovation with the highest mean ($\bar{x} = 4.22$, $S.D. = 0.55$), all variables were found to be statistically significant.

Keywords: creative innovations; startups; Thailand 4.0; information technologies.

Introduction

Under the conditions of the world being without borders, all businesses must be alert to follow the trends of borderless era facing intense competition at the same time. Economic, social and political environments in today's world are rapidly changing, thus resulting in different levels of business operations in each country, depending on the existing fundamentals and the ability to conduct governmental policies and adapt them to the changing business situation. Technological advancements have resulted in rapid and continuous development of innovations. The main objective of any innovation is to respond to changes in consumers’ needs and tastes. Competition through taking advantage of the use of production resources is limited, thus, all businesses are forced to turn to new strategies and new approaches so that to create new competitive advantages.

In Thailand, small and medium enterprises (SMEs) are regulated in accordance with the Notification of the Ministerial Regulation under the Ministry of Industry on “Indicating the Number of Employees and Value of Business” (Chittithaworn et al., 2011), published in the Royal Gazette on 20 September 2002. In this document, employment and fixed assets are



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used as standard criteria, and according to these criteria, approximately 99% of all businesses in the country belong to this business category. This clearly demonstrates vital importance of SMEs for Thai economy. SMEs are playing an important role in sustainable development and they also serve as the main mechanism for recovering the economy and strengthening economic progress as well as a mechanism for solving poverty-related problems. SMEs in Thailand are generating employment for over 70% of the country's total working age population, thus creating an average added value of approximately 40% of GDP while their export value is accounted for more than 25% of the total export value.

Although SMEs are very important to the business system overall, 90% of them around the world, including those in Thailand, are failing to operate their businesses properly due to lack of prudence and expertise. It is obvious that during the economic slowdown in 1997 or in 2008, many businesses could not survive due to their failure to overcome obstacles. Such businesses were eventually shut down; in Thailand this especially concerned the original equipment manufacturing (OEM) businesses. When the global economy is fluctuating, affecting all businesses within it, on average, only 10% of SMEs could achieve success.

In this context, innovation is a relatively new issue for small and medium enterprises in Thailand, as previously it was seen as not very important, thus, many businesses still have little knowledge on how to adjust their businesses to be truly innovative or how business may solely focus on innovation and technology (Limthongchai & Speece, 2003). Economic innovation brings new ideas or utilizes the existing ideas in new ways for economic benefits, or through doing things differently from others by using changes around us as opportunities and conveying them to the concept that creates benefits for business itself and for the society. Innovation can also be understood as the introduction of new concepts or the use of existing things in a new way for economic benefits. The success of innovation must start from a mutual agreement among people involved in innovations, with their intentions to develop better products and brands. Development of any innovation starts with understanding what customers want and how related technological advancements can be combined with new ideas to go beyond competitors. This would require deep understanding of both innovation and strategy, and only then products will be developed to be innovative. Innovative business is always based on a new business model supported by outstanding technologies with high potential at the global market, good corporate management, intellectual property protection and creation of awareness about innovations (National Innovation Agency, 2006). All businesses in Thailand could be able to develop themselves to become innovative business, provided their business executives are truly committed to promote the idea of innovative business. Highly innovative business consists of the following elements: Leadership, Planning, Information, People, Processes and Results (Lertwongsatien & Wongpinunwatana, 2003).

This context demonstrates the importance of studying creative innovations by startups under Thailand 4.0. Review of the relevant literature demonstrates that creative innovations have enough power to affect business operations and even predetermine business survival (De Groote & Backmann, 2019).

This research aims to analyze and find out whether creative innovations influence the level of startups' performance or not, how and what factors are affecting organizations' creative innovations. The objective of this research is to study the level of startups' creative innovations and business performance in the context of the national program known as Thailand 4.0.

Literature review

Our review of relevant literature review has helped us find a range of research and academic articles on creative innovations, for example (De Jong et al., 2019). These authors state that creative innovation means invention, creativity, improvement and/or offering new products or services for the commercial market for the first time, and this may include new processes and management concepts. This is in sync with (Dif et al., 2018) who also stated that creative innovation is application of knowledge to create new things and offer them to the commercial market in the form of new products, new services and new production processes. Creative innovation is always based on the idea that has never been presented to the market before, thus, benefits from it are also achieved in a brand new and creative way. Allmendinger & Berger (2019) categorized innovations into the following groups:

1. Product Innovation. It means improving products that are already being commercially manufactured or offering brand new products to the market. Such innovation may be new to the whole world, to a specific country or even only to organization itself. Product innovations can be also divided into tangible products (new car models, high-definition TV, DVD) and intangible product that are mostly services, actually (natural conservation tours, telephone banking etc.).

2. Process Innovation. It means changing the way or the method of manufacturing products or providing services in a different, newer form. Process innovation always depends on the ability to change organization in any part of its production and supply chains so that to make it more efficient and effective and thus gain a competitive advantage. To this category belong, for example, Just In Time (JIT), Total Quality Management (TQM) and Lean Production. Process can be considered in its 5 dimensions or stages: 1) proactive intention; 2) definition of a new idea; 3) integrating this idea into the existing process; 4) adjustment of the new idea; and 5) innovation itself. All five stages allow employees and other partners get engaged in the design process of the new product development, as this would contribute to having innovative projects and innovative practices help with achievement of better business outcomes.

3. Managerial Innovation. This means the process of inventing and applying new concepts to become more consistent with specific characteristics of each organization and thus increase both efficiency and effectiveness of that organization. Managerial innovation also means organizational change and improvement in basic concepts and methods of conducting business within the changing environments with the main objectives being as follows: strategic benefits (maintaining customer base, expanding own market share, implementing a strategic plan in the most specific way, penetrating new markets and expanding onto new customer groups); marketing benefits (pricing products and services so that to offer prices lower than competitors, improving customer satisfaction level, making a difference for customers, building relationships with them, increasing flexibility); and operational benefits (cost reduction, increase of speed and accuracy in work, adding value to products and maximizing values and benefits from the use of the same amount of resources).

Casals (2011) stated that creative innovations in the SMEs context specifically are usually more intense when it comes to business competition at both national and international levels. Thanks to creative innovations in products and services including management processes, it becomes possible to manufacture products and provide services that can respond to consumers with greater diversity and differences. Therefore, creative innovation is an

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essential factor for survival of SMEs and startup businesses in the first place. (Nanda & Rhodes-Kropf, 2013) mentioned that creative innovation is an important factor in formation of a competitive advantage as it can build relationships and strengthen loyalty among customers, thus empowering the whole business brand in the long run.

This corresponds to Ries (2011) who studied the relationship between innovative potential and the performance of the export business in electronics, electrical appliances and equipment. This author found that:

1) innovation potential of a strategy is related and has a positive impact on overall business performance including sales growth rate, gross margin and growth rate of market shares;

2) innovation potential in part of resource use has a negative impact on overall business performance and the sales growth rate in particular; and

3) innovation potential in marketing tends to have a negative impact on overall business performance, gross margin and growth rate of market shares.

This was followed by (Neyens et al., 2010) who conducted their empirical research on marketing innovation models and their effect on operations of export businesses in Thailand. Their study showed that marketing innovations of an exporting company consists of main factors including new product innovation, new operational innovation, and innovation in finding new markets. Performance of such an export company consists of the following factors: business performance, marketing innovations (consisting of new products, new operational processes, and new markets), company's resources consisting of executives' marketing knowledge and the size of the company.

Success of Thailand's export businesses is directly related to the use of marketing innovations and it depends on many factors. Introduction of a new product should be proceeded with brand building, while development of new operational processes must focus on the use of information systems and introduction of newer technologies. At the same time, the search for new markets should be narrowed down to specific markets. Implementation of innovative strategies must be collaborated by many parties, including government agencies, commercial organizations and educational institutions. In addition, having a vision of international marketing knowledge and having good relationships with customers and agencies is also directly related to business success of export companies. All of the above is considered as valuable resources for creation of marketing innovations in Thailand.

Müller & Thoring (2012) studied innovative potential and export performance of Chinese companies. Their research showed that export growth is related to innovation potential, learning innovation, research and development, marketing, corporate management, the use of human resources and strategies but it is not related to production and output growth rate.

Dempwolf, Auer & D'Ippolito (2014) also studied production strategies and implementation of innovations in newly industrial countries. Their study showed that technology management affects product and process innovations in Thailand only. Interestingly, three key areas of production strategies (leadership, human resource management and R&D) are the same for both product and process innovations. Lastly, in innovations of technologies and products in Thailand tend to be more advanced than in Vietnam.

Davis & Schaefer (2003) studied whether innovations bring operational results or not. Their empirical research on small and medium enterprises in Taiwan found that 80% of the

companies that participated in the telephone surveys managed some innovations. Key innovations to be managed included technological innovations and marketing innovations. Innovations are associated with sales to the least extent, while management innovation turned out to be the most important factor in describing the relationship with sales as compared to technological innovation.

Carlson & Usher (2016) also studied the impact of innovation potential on research and development in company's performance. This study showed that innovation potential is related to business performance the most. When assessing the rate of assets return, strengths and potential of human resources, the research and development affects company's performance. Companies with multiple value creations have innovative potential manifested in different forms. Research and development impacts were found to be at moderate and low levels, thus indicating to positive mid-level capability in the relationship between innovation potential and business performance.

Finally, Chien (2013) studied whether the results of moving to innovations is good or bad. It was found that positive results of moving to innovations include:

1) Innovations are related to results, such as type, speed, amount and quantity of results;

2) Market advantages in relation to both competitors and customers;

3) Excellent operations.

At the same time, negative results of moving to innovations include:

1) Organization is extremely changing in terms of core competencies and innovations that do not generate revenues;

2) Market risks involved;

3) Customer attitude might change; and

4) Increase of organizational costs.

Research Methodology

Here we present the mixed-method research consisting of qualitative research and quantitative research, according to Creswell (2009). The key objective of this research is that it results could be beneficial to the society as a whole, in both academic and professional aspects in relation to creative innovations by startups in the lights of Thailand 4.0.

The researcher conducted the in-depth interview to confirm the conceptual framework and collected data from the key informants who were startups' executives or those responsible for regulating creative innovations in Thailand. The core applied method has been purposive sampling, as in Tongco (2007).

After that, the researcher has applied data obtained from the in-depth interviews in Part 1 to create questions for a quantitative questionnaire. The researcher has conducted the literature review to analyze the key concepts in the related theories and to define the operational definition and structure of the variables to be then applied. Then, the researcher presented the developed questions to the experts in creative innovations to verify the accuracy in contents of the questions, and also to test the validity and reliability of the questionnaire.

The quality inspection results of the questionnaire in terms of content validity, coverage, properness and clarity in using language obtained from 5 experts confirmed that the content validity of the questionnaire has been ranging from 70% or more, or has the

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consistency values between 0.70–1.00. This has shown that all the questions in the questionnaire are consistent and are also in line with the objective of the research.

Sampling Techniques and Sample Size

The representative samples used in this research were randomly taken by the researcher using cluster random sampling to the distributed populations, as this is the case when we might have difficulties with establish the framework of populations or what is natural aggregated populations, as in Snijders (2014). Despite its overall similarity, complete differences or diversity can be observed within each group to enable decrease in errors in the course of estimating the parameter value of populations under probability sampling.

Table 1 - Startups classified by regions
(Source: Office of Small and Medium Enterprises Promotion (OSMEP), 2018)

| Regions | No. of Population | No. of Representative Samples | Percentage |
|--------------|-------------------|-------------------------------|------------|
| 1. Central | 3,895 | 60 | 15.18 |
| 1. South | 6,338 | 83 | 21.01 |
| 3. North | 6,020 | 79 | 20.25 |
| 4. East | 1,684 | 22 | 5.04 |
| 5. Northeast | 12,240 | 160 | 40.50 |
| Total | 30,177 | 404 | 100 |

After that, calculation based on the formula from (Yamane, 1973: 1088) was applied to determine the size of the representative sample group with exact number of populations. The author ended up with 404 representative samples, divided into 5 regions (see Tab. 1 for all numbers). The data has been collected by means of questionnaires delivered together with the request letter, self-introduction letter and also explanation on how to fill in the questionnaire. An envelope with the returning address and postal stamp was also attached, as recommended in Dillman (2000).

Analysis of Descriptive Statistics

Descriptive statistics method was applied to explain and describe the properties or characteristics of the distribution of variables according to the characteristics of the group. The measurements were set as Percentage, Mean and Standard Deviation, and 15 observed variables of the basic statistics were analysed to explain and describe the distribution of the observed variables. All the means were interpreted following the principles of class interval and applying the assessment criteria as follows:

| | | |
|--------------|-----------|------------------|
| Mean between | 4.21-5.00 | Agree the Most |
| Mean between | 3.41-4.20 | Very Much Agree |
| Mean between | 2.61-3.40 | Moderately Agree |
| Mean between | 1.81-2.60 | Less Agreement |
| Mean between | 1.00-1.80 | Least Agreement |

Analysis of the Study Results

It was found that there are 3 areas of creative innovations to be studied such as Learning innovation, Communication Innovation and Operational Support Innovation. According to the data analysis on the rating scale for creative innovation, it was found that the rating scale for Communication Innovation was ranked No. 1 with the highest mean ($\bar{x} = 4.29$ S.D. = 0.51) and the rating scale for Communication Innovation can be sorted as follows (see Tab. 2).

Table 2 - Results for Startups' Creative Innovations Divided into Categories
(Source: made by the author)

| Creative Innovation | Rating Scale | | | Ranking |
|---|--------------|-------------|----------------|----------|
| | \bar{x} | S.D | Interpretation | |
| Communication Innovation | 4.29 | 0.51 | Highest | 1 |
| 1. Your business supports the use of social media to listen to customers' opinions and criticisms. | 4.30 | 0.74 | Highest | |
| 2. Your business is trading via electronic systems (using e-Commerce). | 4.34 | 0.81 | Highest | |
| 3. Your business has been using smartphones and/or tablets to expand at the market. | 4.40 | 0.74 | Highest | |
| Learning Innovation | 4.29 | 0.51 | Highest | 2 |
| 4. Your business has always used technology to study new work processes, such as searching for information on the Internet. | 4.42 | 0.71 | Highest | |
| 5. Your business uses digital media to promote learning about new working styles. | 4.28 | 0.68 | Highest | |
| 6. Your business uses technology to help in training on systematic thinking with the focus on problem-solving. | 4.22 | 0.70 | Highest | |
| Operational Support Innovation | 4.22 | 0.55 | Highest | 3 |
| 7. Your business has adopted a computer system to store information for more effective servicing and better corporate management. | 4.35 | 0.74 | Highest | |
| 8. Your business is using computer programs in managerial decision-making and/or in production planning. | 4.26 | 0.75 | Highest | |
| 9. Your business applies technologies to store inventory data for continuous trading transactions. | 4.19 | 0.74 | High | |

Discussion

From the data analysis above, on the rating scale for Creative Innovation Communication category was ranked the highest ($\bar{x} = 4.29$, S.D. = 0.51) and thus become No.1. It means that businesses in Thailand have been intensively applying communication technologies and devices, including smartphones and tablets, with the aim to expand to the markets and to trade via electronic systems, and also to support the use of social media while listening to customers' comments and criticisms.

Thai businesses have also supported the use of technology to communicate information both internally and externally, such as for in-office communication, for training programs and when delivering company's news to customers. Also, technology is used to convey and exchange information required in jointly developing business together with business partners.

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This corresponds to the results once obtained by Davis & Schaefer (2003). Innovation in the use of information technologies always responds to changes in the outside environment. Thus, organizations are trying to apply information technologies for value adding or getting new competitive advantage.

Innovative technologies are also frequently applied to support both internal and external data communication so that to make production processes much quicker. Businesses create new competitive advantage by focusing on differentiation in the product life cycle and by applying innovations in the field of information technology while creating new knowledge for personnel. Granting personnel access to such advanced information technologies would be encouraging creativity at all stages of the product life cycle, be it the stage of introduction, stage of growth or stage of saturation, all of them has the need and the ability to use advanced technologies.

This is in line with the research results of Chien (2013) who explained that many businesses are applying innovations and information technologies to participate in both external and internal communication such as via email, company's website as well as for doing business via the internet or E-commerce systems. In this context, competitive advantage makes the difference between the company and its competitors in the same industry as it originated from company's ability to use sophisticated technologies for learning, communication and business operations, for example, for doing business in the Internet.

Conclusions

Since the category of creative communication technologies got the highest mean, we can logically assume it can create the most competitive advantage for businesses. Therefore, executives or those involved in development and implementation of creative innovations by emerging businesses (startups) should emphasize on the activities such as training for employees involved in the use of information technologies. Introduction of creative innovations will add value to the company as well as contribute to sustainable growth in sales, thus increasing the competitiveness from differentiation. In such a way, startup business would be able to go beyond competitors within the same industry.

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