GUIDELINES FOR BUSINESS ADVANTAGE MANAGEMENT FOR EXPORT OF THAI INDUSTRIAL PRODUCTS

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Abstract

Industrial products are one of the biggest money-generating exports of Thailand. Nowadays global trade has become challenging and competitive, reducing the competitiveness of Thai exports of industrial goods due to various disadvantages. As a result, this research study aimed to investigate and develop a structural equation model, to provide guidelines for business advantage management for the export of Thai industrial products to enhance its competitiveness in the global market. The research used a mixed methods approach, including both qualitative and quantitative study; in-depth interview, questionnaires, and focus group techniques were used to collect data. The samples used in this study were obtained from 9 experts in the field of international trade, 7 professionals in international trade, and 500 executives at the managerial level and higher who all worked in corporate businesses which received the Prime Minister's Export Award between the year 1992 and 2017. The results revealed that guidelines for business advantage management consisted of 5 components including information and information technology, marketing, resources, innovation, and production. The results on the Structural Equations modelling passed the evaluation criteria and fit with the empirical data, with a Chi-square probability level of 0.051, relative chi-square (CMIN/DF) of 1.177, Goodness of Fit Index (GFI) of 0.961, and Root Mean Square Error of Approximation (RMSEA) of 0.019. Ultimately, the findings in this study can be generally used as a guideline to improve the business advantage for all industrial-product related businesses and can also be applied in the design of graduate programs in the management field related to industrial business or of short-term courses offered by government agencies to promote the competitiveness of industrial business for export.

Keywords: Management model, business advantages, export business, structural equation model

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1. INTRODUCTION

International trade has become an important factor in driving national economies around the globe. Thailand, as a developing country, relies heavily on international trade and the export of goods, especially the export of industrial products that have for a long time, continuously brought a top rank income to the country each year. The GDP report of Thailand, quarter 4/2017 (Office of the National Economic and Social Development Board, 2018) revealed that in 2017 Thailand's export of goods and services accounted for as much as 74% of the country's GDP, valuing 10,533,101 million baht, in which the export of goods amounted to 7,968,616 million baht (52% of the GDP), and 80.1% of the goods export value was contributed by the export of industrial products. Looking back, in 1997 the growth rate of industrial product exports was 28.82% (YoY), while just 20 years later in 2017, the growth rate had drastically plummeted to 5.57% (YoY). More importantly, when closely considering the growth rate of industrial product exports over the period from 1997 to 2017 (Ministry of Commerce, 2018), there was a tendency for it to continuously decline. Together with the fact that Thailand has been in a state of political instability over recent years, and the shrinkage that has been observed in both domestic and international investment, not to mention the overall global economic slowdown, it was inevitable that a lack of competitive ability among Thailand's industrial businesses and exports would emerge sooner or later.

As a consequence, this study had the primarily objective to investigate and to create a structural equation model, to provide guidelines for business advantage management for the export of industrial products from Thailand so that the Thai industrial export business can compete sustainably and find stable ground in the global market.

2. LITERATURE REVIEW

A review of literature was conducted as guidance for developing an integrated structural model of business advantage.

2.1 International Business/Trade Theory

Adam Smith (1776)'s theory of absolute advantage and David Ricardo's (Ruffin, 2002) theory of comparative advantage were based on the technological superiorities of one country or one business over others. The theory of absolute advantage helps explain what goods and services a country or business should produce, which depends primarily on a comparative cost advantage (Irvin, 2008: 28), while the principle of comparative advantage in business is beyond the comparative cost advantage, in that such advantages can be altered by resource endowments, technology, demand or marketing patterns, specialization, and business practices (Gupta, 2009). The existence of this comparative

advantage theory led to the extension of an important international trade theory called the Heckscher-Ohlin Model (Heckscher, 1991) which states that a country or business has a comparative advantage in the production of goods when using relatively abundant resources which it is in possession of, and that it can ultimately profit from exportation of such goods. When speaking of resources, one of the most important resources necessary for any kind of business operations is human skills, and it is suggested by Keesing (1966) that countries or businesses with relatively abundant human skills will have a comparative advantage as a result of enhanced productivity. However, in international trade, when products have been exposed to the market for a certain period of time, the cycle of maturity and decline will be reached as a consequence of internationalization, and, therefore, a comparative advantage alone is no longer sufficient for a business to maintain itself in the international market and the advent of innovation is needed (Vernon, 1979).

In 1985, Porter had developed and proposed the theory of competitive advantage which mainly relies on strategic competition principles; that is, a business can achieve its competitive advantage if it maintains low cost production and product differentiation through the help of innovation. In addition, a sustainable competitive advantage involving the implementation of unique value-creating strategies—in which innovations in different areas including product innovation, marketing innovation, production and technological innovation, and management innovation are needed—was introduced by Barney (1991) and Hoffman (2000). Although many past studies put "innovation" at the heart of competitive advantage, it has been found that there are other components playing important roles in achieving the competitive advantage in such businesses; namely, information technology, marketing, resources, and manufacturing.

2.2 Information Technology

Information technology is at the heart of today's business operations as it is an important tool connecting the relationships among management, production, and corporate strategies, supporting the competitiveness of the businesses (Laudon, 2016). It also helps businesses in managing resources, reducing costs, and increasing the efficiency of industrial operations, leading to an increasing competitive edge for the business to win the market (Fatemeh, 2015; Bianchi, 2017; Shasha, 2017; and Radulovich, 2018). According to McFarlane (1984) and Porter & Miller (1985), the role of information and information technology in terms of databases, which were later developed into big data, is a firm-specific factor for competitive advantage. The study of John (2017) and Radulovich (2018) revealed that information technology has effects on the resource management of an organization and the level of

information technology affects resource management efficiency in factors concerning both production and capital, leading to an ability to generate business profits.

2.3 Marketing

Market analysis is the process of collecting data on the target market and utilizing this data for marketing strategy planning; it helps entrepreneurs in decision making and developing new ideas and innovations. The concept of the Marketing Mix was introduced by Borden (1964) for industrial business, stating that such businesses must create an appropriate "Marketing Mix" in order to establish their own marketing strategies. Besides marketing strategies, businesses must also take into account the concept of 5 factors, including reaching new customers, operating the business at low cost, developing core competencies and diversifying risks in order to extend the business and allow it to compete in international markets (Gamble, 2015). More importantly, Božic (2015) and Kamboj (2017) found that systematic marketing strategies positively affect the competitiveness of businesses as they bring in new innovations in various forms that help to create products which match consumer demand, and will in turn contribute to a sustainable consumption which renders a competitive capability and efficiency of business operations. In addition, Garrido-Moreno (2015) suggested that organizational knowledge management affects customer relation management and marketing, and the usage of big data, and social media is an important channel effectively improving customer relations and marketing.

2.4 Innovation

Drucker stated that innovation is the creation of something new and different, and is not only restricted to products but can also be extended into processes, including changes and improvements in production processes which allow a business to consequently become more efficient and responsive to higher production requirements (Virawut, 2007). In other words, innovation increases productivity in the long-run, and growing productivity leads to improved competitiveness (Porter, 1985). There are 4 major areas of scope for innovation; these were proposed by Tidd in 2014, and comprise product innovation, process innovation, position innovation, and paradigm innovation, all of which lead to an increase in a business's competitive potential. Innovation in business is generally driven by marketing factors which are based on consumer needs and it relies mainly on the existing foundational scientific capability of the company, and on marketing data (Trott, 2017). Additionally, Bircan (2015), Halim (2015), Diaz-Fernandez (2017) and Woschke (2017) confirmed the positive impacts of innovation on the competitiveness of organizations as reducing business operation costs and

efficiently managing capital factors, while selecting technology that is cost-effective.

2.5 Resource

Barney (1991) developed the Resource-based View Theory (RBV) suggesting that a business must utilize its own resources, both tangible and intangible to achieve productivity. Drucker (Virawut, 2007) believed that productivity is the true origin of competitive advantages, and that enhanced productivity is derived when the human resources of an organization are well-trained. The studies of Boso (2012), Al-bahussin (2013) and Xie (2013) showed that not only capital, but also human resources, are the essential resources for business growth, and constitute sustainable competitiveness. Angulo (2014) and Lemonakis's (2013) studies also unveiled that the factor of capital directly affects the production capacity of a business and also creates customer satisfaction and loyalty leading to sustainable competitiveness, and that investment level directly affects the development of production capacity, therefore promoting the business's competitiveness.

2.6 Manufacturing

The concept of Lean Manufacturing, by Ohno (1978) and Deming (1986), is a concept of manufacturing that incorporates a collection of principles, tools, and techniques, into business processes, which can collectively improve competitiveness. The Operation Management theory consists of 5 basic factors influencing the decision making for production; including process, capacity, inventory, workforce, and quality, which were proposed by Schroeder (1981); good management of these factors helps organizations reduce their production costs, control quality, and enhance efficiency in the production processes. In addition, to improve the capability of the manufacturing processes, the theory of Six Sigma (6 M's: Man, Machine, Material, Method, Measurement and Mother Nature (Environment)) can be used as an effective production management tool (Folaron, 2003; Ishikawa, 1985). Vermaak (2014), Kafetzopoulos (2015), Singhry (2015) and Lii (2016) suggested that production capacity and productivity of a production business are positively affected by the level of development regarding technology and innovation, helping to create its advantage and competitiveness. Likewise, Artsiomchyk (2015) and Barasa (2018) revealed that investment in technology, innovation, research, and development positively affect business development, help to enhance production, and increase business effectiveness.

3. RESEARCH MODEL AND HYPOTHESES

From the theoretical concepts and literature review, it is clear that competitive advantage or the

competitiveness of a business in the context of international trade, is constituted by many influential factors and components, such that relationships exist among these factors. In this study, however, the industrial products export business was the main focus and therefore the only type of industry from which data were obtained. Five components contributing to business advantage were proposed, as shown in figure 1, which were later developed into the guidelines for business advantage management in the export of Thai Industrial Products.

The subsequent hypotheses were suggested as follows: H_1: Factors related to information and information technology directly influence resources; H_2: Factors related to information and information technology directly influence marketing; H_3: Marketing factors directly influence innovation factors; H_4: Innovation factors directly influence resource factors; H_5: Innovation factors directly influence manufacturing factors; and H_6: Resource factors directly influence manufacturing factors.

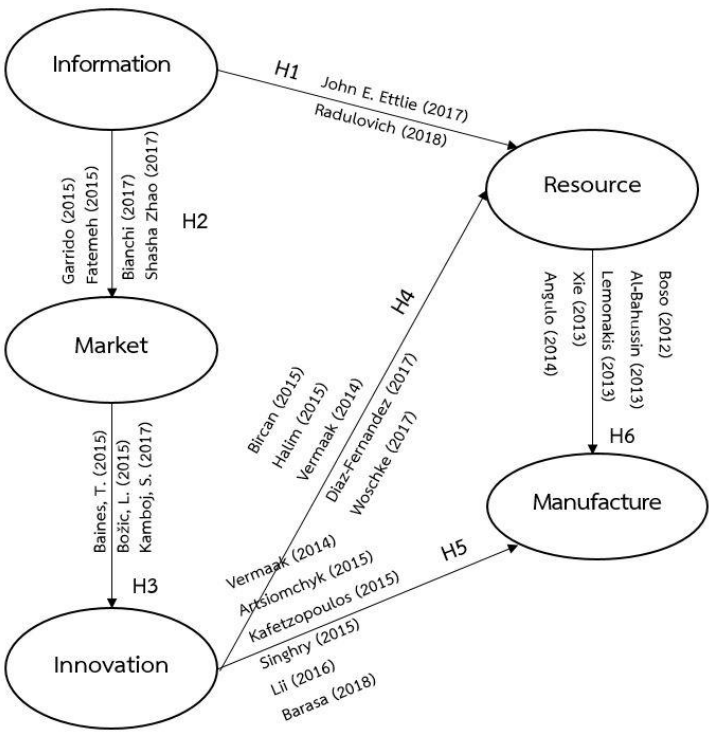

Figure 1: Research Framework

4. RESEARCH METHODOLOGY

In this research study, an inductive research method combining a mixed methodology of qualitative and quantitative data collection from both primary and secondary sources was employed according to the following methods and resources:

Study of Primary and Secondary Data

Literature relating to business advantage management and problems in the export of Thai industrial products was reviewed, and relevant information gathered and analyzed to develop a conceptual model for the variables that influence business advantage. Primary data was also collected by both qualitative and quantitative means, with 121 observed variables and 5 latent variables classified into endogenous latent variables and exogenous latent variables; the endogenous latent variables comprised those related to marketing, innovation, resources, and manufacturing, while the exogenous latent variables were factors concerning information and information technology.

Population and sample

The population used in the quantitative portion of the study consisted of executives at managerial level and higher, coming from 647 business firms, each of which had received the Prime Minister's Export Award (PM Award) during the years 1992 - 2017. The population was divided into 2 groups: those working in firms with less than 20 years of operation, and those from corporate businesses with 20 or more years of operation, as shown in Table 1. The sample size used for the analysis of the developed structural equation model in this study was 500, as suggested by Comrey and Lee (1992). In addition, the sample employed in the qualitative phase consisted of 9 experts, for use in the in-depth interview technique, and 7 professionals from related fields for the focus-group technique.

Qualitative Research Method

During the in-depth interviews, the 9 experts were divided into 3 groups of 3 respondents; these consisted of businessmen carrying out an export business, government officials in international trade, and academicians in international trade. The in-depth interviews were conducted as the first qualitative method and took place in the form of open-ended questions based on the reviewed literature. After deriving the complete interview contents, the data were then analyzed and arranged into question items for the questionnaire which was to be used as a tool in the subsequent quantitative phase. Following the quantitative phase, another qualitative approach—**the focus** group technique, which involved discussion for confirmation of the validity of the model obtained in the preceding quantitative research—was carried out on 7 professionals in related fields from government, business, and academic sectors.

Quantitative Research method

The questionnaire used in the quantitative research method was validated for content validity by 5 experts and then tested for reliability with discriminant analysis through the SPSS Program. After passing the criteria, the questionnaire was used in order to collect a sample of data from the population. The questionnaire in this study consisted of 4 parts, whereby the first two sections consisted of check-list questions involving general information and general characteristics of the business, the third part consisted of five-point rating scale questions conforming to the criteria of Likert's methodology (David, 2011) and questioning the level of importance regarding the guidelines of Business Advantage Management for the export of Thai industrial products, while the last section consisted of open-ended questions enquiring on opinions and suggestions. Upon completion of the questionnaire process, the obtained data were then used in designing the structural equation model based on the research framework (Figure 1).

Table 1: Respondent Profiles

Items		Percentage
Business operation duration	< 20 years	50
	≥ 20 years	50
Types of industrial business	Agro-industry and Agro-processing industry	25.80
	Health and beauty products manufacturing industry	8.60
	Heavy industry	26.00
	Industry in fashion and sports products	15.00
	Industry in lifestyle products	10.20
	Industry in environmental friendly and innovative products	3.20
	Industry in other products	11.20
Joint venture with foreign countries	No foreign joint venture	80.40
	Have foreign joint venture	19.60
Numbers of permanent employees in the corporate businesses	≤ 50 employees	26.80
	51 - 200 employees	31.40
	> 200 employees	41.80
Business capital	≤ 50 Million baht	56.60
	51 - 200 Million baht	22.80
	> 200 Million baht	20.60

Assessment of research tools

The analysis of content validity was conducted through the Index of Item Objective Congruence (IOC) with IOC values between 0.6 and 1.0, therefore higher than the set criteria of 0.5 (Tanin, 2017). For reliability testing, data collected from the initial questionnaire, gained from a pilot study with a sample size of 30, yielded discriminant analysis (DA) values for the checklist items between 0.410 and 0.799, higher than the set criteria of 0.300 (Tanin, 2017), while the rating scale items were analyzed through Cronbach's Alpha yielding a reliability value of 0.983, which is also higher than the set criteria of 0.800 (Jump, 1978). It was therefore concluded that the rating scale items hold an exceptional internal reliability and consistency.

Data analysis

The data were analyzed with both descriptive statistics and inferential statistics using the SPSS Program. The model of business advantage management for the export of Thai industrial products depicted in figure 2 was derived from the use of statistical methods employing confirmatory factor analysis (CFA), path analysis, and structural equation modeling (SEM) in examination, evaluation, and model development. Multivariate statistical analysis and structural equation modelling (SEM) were conducted through AMOS with the evaluation of the data model fit of 4 values (Arbuckle, 2011) as follows: (1) Chi-square Probability level with $p > 0.05$ (2) Relative Chi-square (CMIN/DF) < 2 (3) Goodness of fit Index (GFI) > 0.90, and (4) Root Mean Square Error of Approximation (RMSEA) < 0.08.

5. RESULTS

Results of general data analysis

The results of the qualitative study through in-depth interviews revealed that there were 5 significant components constituting guidelines for business advantage management for export: 1) Information and Information Technology 2) Marketing 3) Innovation 4) Resources 5) Manufacturing. The following 121 questions consisting of 23 items regarding information and information technology, 26 items regarding marketing, 23 items regarding innovation, 26 items regarding resources, and 23 items regarding manufacturing, were then created to be included in the questionnaire. Results from the samples taken from the two groups of respondents, working in corporate businesses with different durations of operation, indicated that all respondents assigned high importance to the overall guidelines for business advantage management of exports, with an average score of 4.07. When considering each aspect individually, the manufacturing component was ranked the highest with an average score of 4.29. The top 3 items under each component with the highest scores were as follows: Manufacturing component 1) producing goods to meet the standards required by the trading partner

countries ($\overline{X}$ = 4.58), 2) checking quality of the manufactured products to meet orders and export standards ($\overline{X}$ = 4.57) and 3) providing packaging to meet the needs of customers in foreign countries ($\overline{X}$ = 4.54); Marketing component 1) strictly adhering to contract and conditions given to the trading partners ($\overline{X}$ = 4.56), 2) exploring market needs and trends before developing products ($\overline{X}$ = 4.34), 3) utilizing tax and tariff benefits, such as FTA and GSP, that Thailand has with various trading partners ($\overline{X}$ = 4.31); Information and Information Technology components 1) having tax and tariff information related to goods to be exported to the trading partner countries ($\overline{X}$ = 4.4), 2) Connecting work processes in the organization with an information technology system in order for each department to work faster and more efficiently ($\overline{X}$ = 4.33), 3) obtaining commercial benefit information related to the products to be exported to the trading partner countries ($\overline{X}$ = 4.32); Resource component 1) focusing on teamwork rather than individuals ($\overline{X}$ = 4.37), 2) cultivating good governance principles for organizational personnel both at operational and management level ($\overline{X}$ = 4.33), 3) setting a clear operational schedule and controlling the effective operation as scheduled for on-time delivery ($\overline{X}$ = 4.33); and Innovation components 1) welcoming customer comments and needs for product development and improvement of the working process ($\overline{X}$ = 4.36), 2) Making an advantageous difference in the product ($\overline{X}$ = 4.30), 3) Regularly keeping track of new technologies by participating in domestic and international exhibitions of innovative products and production technology ($\overline{X}$ = 4.22).

When considered by sample groups, analysis of the sample groups working in corporate businesses with different durations of operation, revealed no significant differences in both the overall guidelines and each component, with a statistical significance level of 0.05. However, by-item investigation yielded significant differences in 7 items, with the top 3 items recognized by all observers being 1) Creating an attention-grabbing story of the products and business to be presented in international markets (p – Value = 0.01*), 2) products to be presented in the market must be of a diversity of colors, patterns, and sizes etc. to meet the needs of customers in different countries (p – Value = 0.03*), and 3) Possessing an information technology system that can connect the business to customer groups and trading partners (p – Value = 0.04*).

Table 2: Descriptive and inferential statistical analysis

Guideline for Business Advantage Management for Export	$\bar{X}$	S.D.	*t* - Value	*p* - Value
Overall	4.07	0.23	-0.66	0.51
Information Technology	4.02	0.34	0.10	0.92
Marketing	4.03	0.34	-1.18	0.24
Innovation	4.00	0.35	-0.79	0.43
Resource	4.02	0.34	-0.76	0.45
Manufacturing	4.29	0.32	0.41	0.69

Results of Hypothesis Testing

The results of the hypothesis testing depicted in Table 3 revealed that the empirical data on factors relating to information and information technology had a direct influence on the empirical data of factors relating to resources and marketing at a significance level of 0.001 and 0.01 with a factor loading of 0.37 and 0.30, respectively. The empirical data on factors relating to marketing had a direct influence on the empirical data of factors relating to innovation at a significance level of 0.001 with a factor loading of 0.36. The empirical data regarding innovation had a direct influence on the empirical data of factors relating to resources and manufacturing at a significance level of 0.01 and 0.05 respectively, both with factor loadings of 0.17. The empirical data on factors relating to resources had a direct influence on the empirical data of factors relating to manufacturing at a significance level of 0.01 with a factor loading of 0.42. All of the aforementioned results were consistent with the respective hypotheses.

Table 3: Statistical values of the constructed model after modification

Variables	Estimate	R^2	variance	C.R.	*P*
Information					
Marketing	0.30	0.09	0.07	3.10	**
Resource	0.37	0.18	0.11	4.18	***
Marketing					
Innovation	0.36	0.13	0.25	3.86	***
Innovation					
Resource	0.17	0.18	0.11	2.72	**
Manufacturing	0.17	0.23	0.01	2.21	*

Table 3 (continued)

Variables	Estimate	R^2	variance	C.R.	*P*
Resource					
Manufacturing	0.42	0.23	0.01	3.25	**

*** p < 0.001, ** p < 0.01, * p < 0.05

Results of the structural equation model

To assess the validity of the developed model, the initial model and revised model were compared. The evaluation of the goodness of fit of the SEM of guidelines for business advantage management for the export of Thai industrial products revealed that only the RMSEA value passed the set criteria, with a value of 0.053 and *p* value of 0.000, the CMIN/DF value was at 2.377 and GFI value was 0.602, both of which did not pass the set criteria. Therefore, the goodness of fit was adjusted by considering modification indices derived from the program based on statistical theory and inappropriate empirical data were deleted one by one until those four variables passed the set criteria and the model was suitable for reprocessing (Arbuckle, 2011). After all adjustments, the revised model showed a *p* value = 0.051 for CMIN/DF value = 1.177, GFI = 0.961, and RMSEA value = 0.019 , all of which passed the model evaluation criteria and were in line with the empirical data as shown in Figure 2, Table 2 and Table 3.

Table 4: Statistics after model adjustment

Evaluating the Data-Model Fit	Recommended value	Value of initial model	Value of revised model
p	≥ 0.050	0.000	0.051
CMIN/DF	≤ 2.000	2.377	1.177
GFI	≥ 0.900	0.602	0.961
RMSEA	≤ 0.080	0.053	0.019

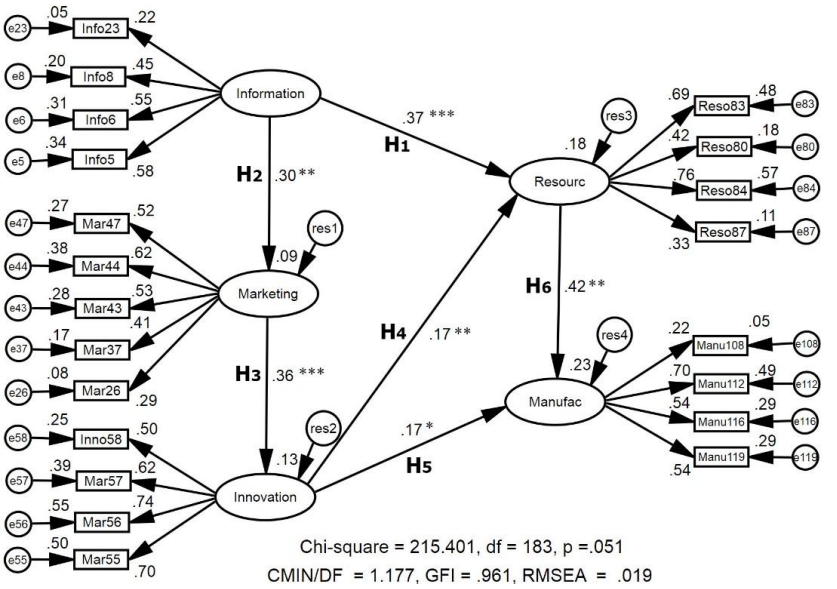

Figure 2: The structural model

Results of Focus Group Discussion

A focus group was conducted with 7 interdisciplinary experts to confirm the SEM model and discovered that the 7 experts all agreed with the consensus and confirmation that the structural equation model of guidelines for business advantage management for the export of Thai industrial products was valid.

6. DISCUSSION

The main objective of the study was to investigate a structural equation model of guidelines for business advantage management for the export of industrial products from Thailand. The findings of this study primarily supported the hypotheses and indicated that factors relating to information and information technology had the most direct influence on factors relating to resources with the highest statistical significance level compared to others. This result was consistent with those of previous works (Barney, 1991; Shasha, 2017; Radulovich, 2018) reflecting that current information technology is the key to efficient management of limited resources including raw materials, land, labor, and capital, which results in cost reduction and an increase in the competitive potential of the organization. This finding was also in accordance with the study of Bharat (2017), who found that the level of investment in information technology directly influences the profits of companies. In addition, the findings further revealed that information technology directly influences marketing, which was also in

accordance with previous studies proving that it was necessary to use information technology in searching and collecting marketing data, communicating with consumers and also helping businesses to find new marketing channels (Perloff, 2003; Panda, 2018; Rahman, 2018). Moreover, in this study, it was found that the manufacturing component was the most important among all other components and the innovation component had a direct influence on manufacturing suggesting that manufacturing businesses should pay close attention to their production by improving production activities with the use of innovation and technology to develop the products that meet customer needs, which will in turn lead to an increase in the level of competitiveness (Singhry, 2015; Lii 2016). Besides this, it was found that another essential factor for improving production efficiency was resources, conforming to the findings of Kumlu (2014) Woo (2017) and Jones (2017), who stated that in order to increase a business's competitiveness, the improvement of production technology, research and development in production, and skilled workers and experts in important fields (human resource, in other words) are necessary. Thus, it was clear that the innovation component and resource component both had direct influences on the manufacturing component, consistent with the hypotheses of this study.

In addition, the findings revealed that, overall, businesses with different durations of operation placed similar importance on all components in the guidelines of business advantage management for the export of Thai industrial products. The reason for this similarity was that every business, whether or not it had long years of operation, is concerned about its competitiveness, as it wants to survive in the environment of international trade. In order to enhance competitiveness, the business must be greatly aware of the importance of innovation, leading to differentiation for the organization and possibility of instantaneous response to diverse and rapidly changing customer needs (Porter, 1985). Moreover, it was found that businesses with different durations of operation can all improve their business advantage through innovation and information technology; this finding conforms to the research of Valmohammadi (2017), who presented that the use of information technology to systematically manage information can highly increase innovation potential, positively affects the service and management of the business, and helps in increasing the long-term competitive ability of the business, regardless of the business's duration of operation. Nevertheless, the by-item comparison of the importance level of the guidelines as recognized by businesses with different operation durations showed that the item regarding the creation and telling of an attention-grabbing story for the products and the business to be presented in international markets, was viewed differently at the highest statistical significance level,

which was similar to Clarkson's (2017) finding, stating that it was necessary for a new business to build up the value of their products and services via various channels. Creating and telling a story through various forms of corporate communication, especially social media, which now plays a significant and very important role in communication with customers, is an efficient way of making the brand known (Rahman, 2018). Businesses that had been operating for longer, on the other hand, were not greatly aware of storytelling as their brands are already well-known, thus placing more importance on maintaining their reliability and upgrading their brands.

Additionally, the study also revealed that production to meet the needs and standards of the trading partners was ranked number one as most important among all observed variables; this corresponds to the real world of international trade in that it is necessary for business entrepreneurs to realize the importance of standards required by their trading partners as many trading countries often raise issues regarding product standards and use them as a trade barrier. Thus, in order to be able to export the products and have a greater business advantage over others, it is essential that the manufacturer produce products which meet the standards required by their trading partners. More importantly, the product standards of developed countries play a very important role in the distribution of new technology in developing countries as new technology is needed to improve products to meet new standards, and this leads to innovation in production which helps to elevate the industrial business in developing countries overall (Koch, 2017)

7. CONCLUSION AND RECOMMENDATIONS

According to the findings of this study, information and information technology, innovation, and big data are essential factors to be taken into account for enhancing business advantages for the export of Thai industrial products. This is consistent with the current Thailand 4.0 industrial revolution policy, which vastly emphasizes the application of information technology which can greatly elevate production efficiency, while at the same time initiating innovation in many aspects of industrial business. Moreover, based on this research study, it is recommended that, regarding information and information technology, businesses should create immunity by placing importance on the investment of information technology and big data databases. Appropriate equipment and technology should be provided for usage, while employees are authorized to access the database and the body of knowledge, so that they can utilize them for the development and extension of new innovations, which should be based on building knowledge. Business owners should place great importance on creating a wide-open working atmosphere and

policies. Visions of the business related to innovation should be determined and transferred to every department in the organization. This may be of help in the creation of any new innovations. Marketing should be based on morality, since data and information can presently be accessed and spread very easily and quickly, businesses should be very aware of issues regarding ethical marketing which will in turn help to bring about brand reliability. In addition, the imposition of marketing strategies focusing on new innovations should take into account the patterns, processes, and management of marketing in order to create differentiation. The management of resources should be based on rationality since all factors related to production, human resources, capital, and time are crucial components that need effective management to reduce costs and increase the competitive ability of the company. Production should be based on modesty, as businesses need to create new products and production processes in order to maintain their competitiveness in international markets; with a reduction in production cost and an increase in product quality, honesty to customers, compliance with the quality standards of trading partners, and environmental impact being taken into consideration, the long-term sustainability of the business will then be achieved.

More importantly, the key idea for effective management of an export business is to truly know "oneself", "one's customers" and "one's partners". That is, businesses must know and understand what their products really are, how different they are from others, whom they are appropriate for, who their customers are, and which type of customers they are, as well as their behavior in the target markets. Not only that, but businesses must know their trading partners, how reliable they are, how well they know their customers, and how much they need the products. Additionally, in order to succeed in the export business, one should not only know his own principles but must also know their competitors and the market environment.

The findings obtained herein can be used in general as a guideline for business operations, particularly, for the export of industrial products of all kinds since the sample groups used in this research study were awarded manufacturers and exporters, randomly selected from diverse fields of industrial products. The results of the study can also be applied in the design of graduate programs in the management field, or can be used in developing short-term courses by government agencies to promote the competitiveness of industrial business for export. However, regarding further research, study into specific fields of industrial business, in order to obtain more specific results is advisable. Future researchers can use this business advantage management model and research methodology as a guideline to develop a management model that is more suitable and specific for other areas of business which may be of interest, as there may

be other factors affecting their competitive advantage. Moreover, this business advantage management model can be further used as a guideline for studying the practical steps and actual implementation of business advantage management for the industrial sector or businesses in a specific area of interest.

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