APPROACH TO THE USED OF INNOVATION IN THE THAI FOOD INDUSTRY TO ENHANCE SUSTAINABLE TO THE COMPETITIVENESS

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ABSTRACT

As food industry is the basic industry of Thailand generating the top gross domestic product income of the country, this research aims to explore the approaches to used innovations in the Thai food industry to sustainably enhance competitiveness. The mixed research methods were used. The qualitative research was conducted with the in-depth interview techniques to find factors to develop into a model. The next sequence was the quantitative research collecting data from a sample of 500 people who were entrepreneurs in Thai food industry to develop and analyze the model. Lastly, the qualitative research was conducted with group discussion techniques to verify the validity of the model. The results of the simulation analysis revealed that to be consistent with the empirical data and hypothesis testing results. It was found that the knowledge management aspect directly influenced the information management aspect. It also directly influenced the innovation management and gave direct influence on the competitiveness significantly at the 0.001 level. The innovation management directly influenced competitiveness significantly at the 0.001 level. It could be concluded that the application of innovation to enhance competitiveness should start with knowledge management because knowledge management was an important factor in creating the organizational innovation.

Keywords: Innovation, Food Industry, Competitiveness, Knowledge Management, Innovation Management, Information Management

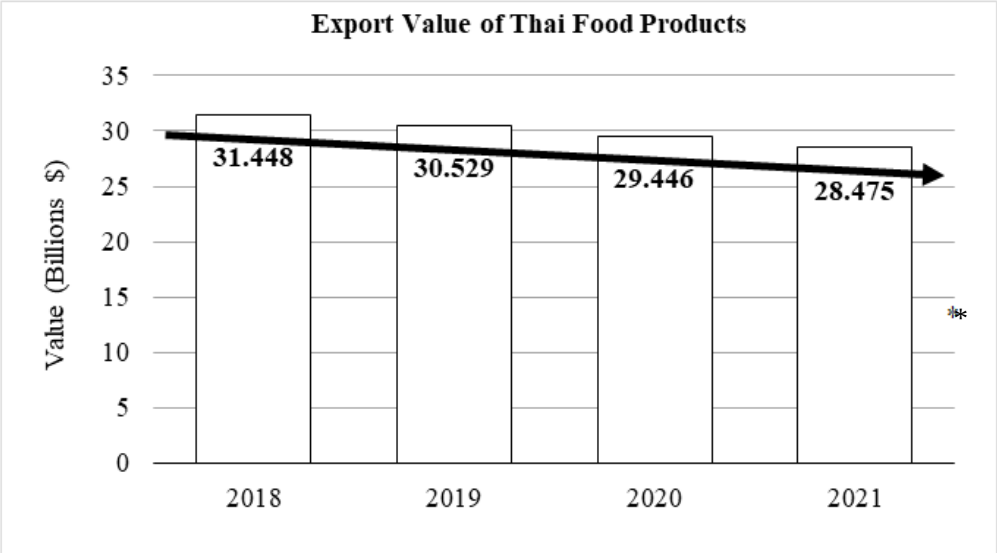
INTRODUCTION

Background and Significance of Problem

At present, the demands of food consumers around the world are diverse. The products and services have to meet the needs of consumers more comprehensively. As a result, the business has intense competition with the innovation development to build competitiveness in the global market (Prasat, 2015). The export is essential to the country's economic system, both directly and indirectly. However, the growth of exports in the Thai food industry relies on the growth of the global market. Therefore, as the world changes rapidly, Thai exporters must adapt to maintain competitiveness in order to sustainably stand in the international trade market. According to the study, the global food industry is accelerating adaptation through innovation management. As it is important to business performance, it is necessary to accelerate adaptation to keep up with global social trends (Vijak, 2017; Hamel, 2006). At the same time, the ability to appropriately use the knowledge contained within the organization is essential to the success of the organization. The organization that can manage knowledge better than competitors will have greater chance of success in building a competitive advantage (Chilton & Bloodgood, 2010).

Thailand's food industry plays an important role in the economy. It generates income, gross domestic product number 1 worth 645,152 million baht (Office of Industrial Economics, 2020). This creates the added value and spreads the prosperity to the region. Most operators are small and medium-sized enterprises. In 2019, the food sector accounted for 14.2 percent of all

enterprises (Office of Small and Medium Enterprises Promotion, 2020). The direction of the Thai food industry is likely to grow. However, Thailand's food exports tend to decline. It appears as shown in Figure 1.



(* from the forecast)

FIGURE 1
EXPORT VALUE OF THAI FOOD PRODUCTS (OFFICE OF INDUSTRIAL ECONOMICS, 2020)

From the data analysis on the competitive environment of the Thai food industry, it was found that 4 main factors were 1) inefficiency in competitiveness. June & Danupon (2015) found that the problems and obstacles of the Thai food industry which affected the ability to export, namely, raw material cost, labor cost, including drought tended to increase. 2) For the lack of efficiency in information management, Atcharat (2011) stated that the information system was inefficient, inaccurate, and did not meet the needs of the management. It would cause the management to lose faith in the quality of information without bringing information to assist in decision making (Laudon, 2015). The data was through the analysis and was summarized in a meaningful form and useful for planning and decision-making. 3) For the Innovation Management issue, Leepaitoon, et al., (2020) stated that cost reduction and increase of competitiveness is an important issue for Thailand especially for the problem of innovation management. Vittayaprapat, et al., (2021) gave further recommendations on the approaches to solve innovation management problems. The organizations should focus on the application of innovation and technology to raise operational standards. The innovation and technology will result in increased efficiency of the organization. 4) For the lack of approaches for knowledge management, Sathitiphong (2011) stated that the results of assessment on the knowledge management from the past operation of Thailand entirely had many problems and obstacles. Senge (1994) proposed the idea of creating a learning organization.

In this research, the researcher aimed to study the use of innovation in the Thai food industry to enhance sustainable competitiveness by using the mixed research methods to obtain an approach that could be applied in solving the problems caused by the obstacles and the 4 constraints as described above. This is the main reason why Thailand still encounters export problems in the Thai food industry that tends to decline until now. Although there are already efforts to promote, from seeing the statistics that tend to shrink, the sustainable competitiveness is less. Therefore, this is the question and objective of this research to develop a structural equation model for innovative use in the Thai food industry to enhance sustainable competitiveness.

LITERATURE REVIEW

From the research objectives, the study of academic papers, and the qualitative research conducted with the in-depth interview techniques in order to develop as a hypothesis and create a research conceptual framework of the Structural Equation Model, the approach to the used of innovation in the Thai food industry to enhance sustainable competitiveness was found to contain 4 important factors which could be identified as follows.

Competitiveness

Porter (1998) proposed the concept of competitive strategy for the position of an organization in the industry. This means the product or service features that can be customized to meet customer needs and in accordance with the capabilities of the organization. The competitive strategy can include several components such as a cost leadership strategy, differentiation strategy, and specific focus strategy, etc. Such strategies can lead to competitive advantages. This can be demonstrated by the organization's performance superior to other organizations over time (Somjai, Vasuvanich, Laosillapacharoen & Jermsittiparsert, 2020). Tracey, et al., (1999) stated that competitive advantage was an organization's ability to compete in the market with its competitors. In addition, the competitive advantage also refers to the extent of the position of self-defense ability under the competition that is above the opponent. It also refers to the capabilities of the organization that help it differentiate itself from competitors in the market. From the research studies of Chetthamrongchai & Jermsittiparsert (2019), it was found that the competitive advantage was what the organization was trying to have above its competitors or the same type of organization. The competitive advantage is what makes each organization different. This is also what is needed in being a market leader today.

Information Management

O' Leary (2015) described an information system as a system consisting of hardware, software, people, procedures, data and connections that worked altogether to provide the information needed to run an organization. Information is very important in the production of products and services in order to be profitable along with yielding the success of the organization. Valacich & Schneider (2015) said that information systems consisted of hardware, software and communication networks developed to collect processing and disseminate information useful to the operations of the organization. Noorit, et al., (2020) further advised that modern management processes must focus on information management for the application of information and communication technology in the organization. It can increase the efficiency of communication and collaboration.

Innovation Management

Pramanik (2018) defines innovation as an important tool for entrepreneurs to build their business competitiveness and wealth. They seek benefits and opportunities from various changes in order to create business and services that are different from competitors using available resources or from reconstruction including the development of new knowledge. Ruiz-Jimenez & Fuentes-Fuentes (2013) said that innovation also influenced organizational performance. It helps organizations achieve commercial objectives by generating higher profits. It also represents business growth. Trott (2017) noted that innovation was often viewed as a matter of management. Thus, the entrepreneurs play a role and focus on the innovation development process. In addition, the innovation plays a role in making entrepreneurial success.

Knowledge Management

Nonaka & Takeuchi (1995) discussed knowledge management as the management of creating new knowledge using prior knowledge and experience in a systematic way to develop innovations and to create competitive advantages. McAdam (2000) introduced an innovative knowledge management model that consisted of 4 knowledge management processes; knowledge building, spread of knowledge, knowledge gathering, and the use of knowledge. Each process was composed to drive innovation. Moreover, Turban, et al., (2010) described the knowledge management as a process that enabled organizations to identify, select, organize, disseminate and transfer critical information and expertise. This is part of the organizational memory that exists in an unstructured form.

Research Hypotheses

In this research study, the researchers defined the research hypotheses according to the theory in order to study the influence of components comprising entrepreneurs and executives in business organizations. The hypotheses can be used to test the results for using in planning the management and formulating the approaches to be used in the innovation of Thai food industry to enhance sustainable competitiveness. There are 5 hypotheses as follows.

H1：Knowledge management directly influences information management.

Kakhki & Gargeya (2019) studied and found that knowledge management was important for integrating information management systems with organizations such as production, operations, procurement to increase operational efficiency. It could reduce costs and improve services. Siwasilchai, et al., (2021) argued that knowledge management was a process of knowledge improvement to increase knowledge and expertise in strategic planning. It directly influenced the information technology management. This reduces the total cost of the organization and increases the competitive efficiency.

H2: Knowledge management directly influences innovation management.

Valaei, Rezaei & Emami (2017) investigated an exploratory learning strategy which was important to creativity and innovation. It was found that knowledge management and organizational knowledge development affected innovation management and innovation application of entrepreneurs. Cong, Zou & Wu (2017) found that the mechanism of innovation capability was based on knowledge management. Therefore, knowledge must be developed to be ready before developing innovations in the next sequence.

H3: Knowledge management directly influences competitiveness.

Daghfous & Zoubi (2017) studied and found that the ability to manage knowledge, knowledge creation process, knowledge transfer, knowledge exchange and knowledge sharing affected the increase of competitiveness of integrated organizations. Hsiao & Chamg (2011) who studied research on knowledge management said that innovation and technology were important to connect both leaders and organizations through knowledge management to be ready to adapt and apply innovations.

H4: Innovation management directly influences competitiveness.

Chatzoglou & Chatzoudes (2018) studied "The Role of Organizational Innovation in Creating the Competitive Advantages" and found that organizational innovation was directly important to business competitiveness. Satell (2017) said that the mechanism of choosing for the right innovation of the organization was the basis for sustainable innovation development and competitiveness.

H5: Levels of importance of innovative approaches in the Thai food industry to enhance overall sustainable competitiveness classified by business size was different.

Andrea & Mario (2008) conducted a study on the size of innovation-focused companies in Europe. Differences between large and medium-sized companies were found in the product innovation and production processes. However, some complementary properties were found. They are correlated with different inputs and innovative strategies according to the nature of the company significantly different between large and medium-sized companies. Vittayaprapat, et al., (2021) found that large industrial business and small and medium businesses focused on different innovation management approaches.

METHODOLOGY

This study was designed as an inductive research with mixed methodology. Qualitative Research using In-depth Interview technique with 9 experts including 3 experts in Thai food industry entrepreneurs, 3 experts in Thai food industry from government department and 3 independent scholars in business management academic with structured interview from as opened-end questions followed the concept of four latents which reviewed from theory and literature. The four latents comprised of 1) Competitiveness 2) Information Management 3) Innovation Management and 4) Knowledge Management. These variables were evaluated the index of the corresponding with objective or content using Item Objective Congruence; IOC analysis that showed 0.60-1.00 value (accepted at >0.5). Finally, we obtained the suitable 100 variables in 4 latents for try-out questionnaire that evaluated the reliability from Cronbach's Alpha statistic showed at 0.977 (accepted at >0.8) and discrimination both check-list and rating-scale question items (accepted at >0.3) using Standard Deviation (S.D.) analysis obtained 0.51–2.06 and Corrected Item-Total Correlation analysis obtained 0.33–0.78 respectively.

Quantitative research: Population of this research is Thai food industry entrepreneurs which are classified into large industrial business with having more than 200 employees and small and large industrial business with having less than 200 employees (Ministry of Industry, 2019). Sample size determination was carried out by using criteria of component analysis research. 500 samples were determined in very good level (Comrey and Lee, 1992 referred in Tanin, 2020). Multi-stage sampling was used and consisted of cluster sampling, quota sampling and probability sampling using simple random sampling, respectively. Multivariate Statistical Analysis employed Structural Equations Model (SEM) by AMOS with evaluating the Data-model Fit in 4 levels including (1) Chi-square Probability Level over 0.05, (2) Relative Chi-square less than 2, (3) Goodness of fit Index over 0.90, and (4) Root Mean Square Error of Approximation less than 0.08.

The model of Approach to the used of innovation in the Thai food industry to enhance sustainable to the competitiveness approved by 11 experts using focus group analysis techniques in qualitative research.

RESEARCH FINDINGS

The results from the analysis on the approach in used the innovation in the Thai food industry to enhance sustainable to the competitiveness can be described below.

Table 1
MEAN AND STANDARD DEVIATION OF THE APPROACH IN USED THE INNOVATION IN THE THAI FOOD INDUSTRY TO ENHANCE SUSTAINABLE TO THE COMPETITIVENESS

Approach in used the innovation in the Thai food industry to enhance sustainable to the competitiveness	Small and medium size			Large size		
	$\overline{X}$	S.D	Level of importance	$\overline{X}$	S.D	Level of importance
Overall	4.14	0.47	High	4.33	0.31	High
1. Competitiveness	4.25	0.50	High	4.45	0.30	High

2. Information Management	4.13	0.46	High	4.31	0.35	High
3. Knowledge Management	4.09	0.50	High	4.27	0.36	High
4. Innovation Management	4.08	0.56	High	4.31	0.36	High

The research results revealed that small and medium-sized entrepreneurs in the Thai food industry overall gave the importance at a high level. Considering each aspect, the average scores can be sorted from highest to lowest in order, namely, competitiveness, information management, knowledge management and innovation management. All aspects are of high importance.

The research results revealed that on the part of large entrepreneurs in the Thai food industry overall, they gave importance at a high level. Considering each aspect, the average scores can be sorted from highest to lowest in order, namely, competitiveness, information management, innovation management and knowledge management. All aspects are of high importance.

For the results of analysis of the developed structural equation model, the researchers improved the structural equation model by considering Modification Indices (MI) as recommended by Arbuckle (2012) to rule out some improper observational variables until the structural equation model was obtained with statistical values that passed all 4 criteria. The analysis of the developed structural equation model passed the criteria for evaluating consistency and empirical data with a Chi-square Probability Level of 0.065, Relative Chi-square of 1.182, Goodness of Fit Index of 0.965 and Root Mean Square Error of Approximation of 0.019.

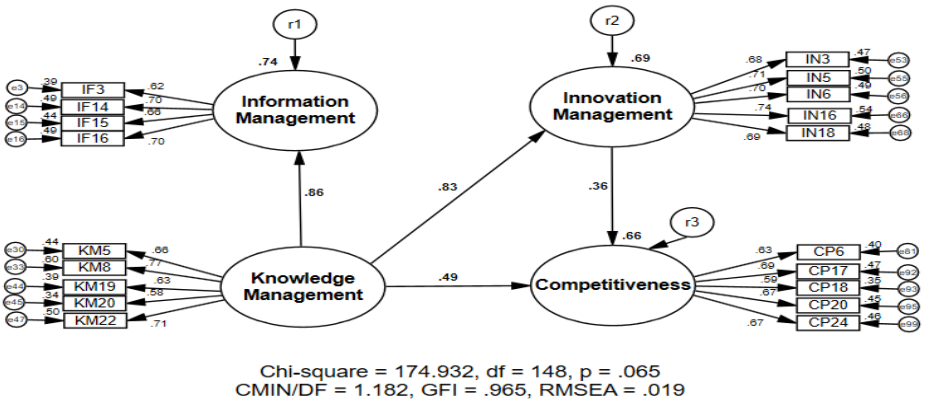


FIGURE 2
STRUCTURAL EQUATION MODEL OF THE APPROACH IN USED THE INNOVATION IN THE THAI FOOD INDUSTRY TO ENHANCE SUSTAINABLE TO THE COMPETITIVENESS

The results of the structural equation model analysis of the research could be summarized that the structural equation model created the approach in used the innovation in the Thai food industry to enhance sustainable to the competitiveness. After updating the model, it was consistent with empirical data and the results of the statistical hypothesis test were consistent with the set research hypotheses as shown in Figure 2.

Table 2
STATISTICAL ANALYSIS OF STRUCTURAL EQUATION MODEL FOR APPROACH TO THE USED OF INNOVATION IN THE THAI FOOD INDUSTRY TO ENHANCE SUSTAINABLE TO THE COMPETITIVENESS IN STANDARDIZED ESTIMATE MODE

Variable	Estimate		R^2	Variances	C.R.	p
	Standard	Unstandard				
Knowledge Management				0.18		
Information Management	0.86	0.85	0.74	0.05	11.14	***
Innovation Management	0.83	0.96	0.69	0.08	11.88	***

Competitiveness	0.49	0.48	0.66	0.06	4.83	***
Innovation Management			0.69	0.08		
Competitiveness	0.36	0.31	0.66	0.06	3.64	***
Knowledge Management				0.18		
KM5	0.66	1.00	0.44	0.24		
KM8	0.77	1.23	0.60	0.19	14.71	***
KM19	0.63	0.99	0.39	0.28	12.34	***
KM20	0.58	0.96	0.34	0.33	11.55	***
KM22	0.71	1.08	0.50	0.21	13.70	***
Information Management			0.74	0.05		
IF3	0.62	1.00	0.39	0.26		
IF14	0.70	1.06	0.49	0.21	12.20	***
IF15	0.66	1.18	0.44	0.31	11.76	***
IF16	0.70	1.20	0.49	0.27	12.17	***
Innovation Management			0.69	0.08		
IN3	0.81	1.00	0.47	0.28		
IN5	0.77	1.10	0.50	0.29	13.96	***
IN6	0.70	1.04	0.49	0.28	13.74	***
IN16	0.74	1.10	0.54	0.25	14.41	***
IN18	0.69	0.98	0.48	0.25	13.63	***
Competitiveness			0.66	0.06		
CP6	0.63	1.00	0.40	0.27		
CP17	0.69	1.11	0.47	0.24	12.29	***
CP18	0.59	0.94	0.35	0.29	10.91	***
CP20	0.67	1.07	0.45	0.26	12.02	***
CP24	0.67	1.04	0.46	0.23	12.10	***

*** With statistical significance at 0.001 level

The results of the structural equation model analysis of the research revealed that Knowledge Management found a variance of 0.18, directly affecting the information management at the Standardized Regression Weighs of 0.86 with statistical significance at the 0.001 level. The squared multiple correlations (R^2) were 0.74. The variance was 0.05 directly influencing the Innovation Management at the Standardized Regression Weighs of 0.83 with statistical significance at 0.001 levels. The multiple squared correlations (R^2) were 0.69. The Variance was 0.08 directly influencing the Competitiveness at the Standardized Regression Weighs of 0.49 with statistical significance at the 0.001 level. The squared multiple correlations (R^2) were 0.66. The variance was 0.06. In Innovation Management, the variance was 0.08 directly influencing the Competitiveness at the Standardized Regression Weighs of 0.36 with statistical significance at the 0.001 level. The squared multiple correlations (R^2) were 0.66 and the variance was 0.06.

The results of the analysis on the influence between structural equation model variables of the research could be summarized that Knowledge Management was the Exogenous Latent Variable that influenced Endogenous Latent Variable in other areas, namely, Information Management, Innovation Management, and Competitiveness with statistical significance at the 0.001 level. The sum of influence on Competitiveness got the correlation of multiples squared (R^2) equal to 0.66.

DISCUSSION ON THE RESEARCH RESULTS

The key issues discovered from research findings on the approach in used the innovation in the Thai food industry to enhance sustainable to the competitiveness were that food industry wanted to enhance the application of innovations to enhance sustainable competitiveness. The management approach should be prioritized to start from the knowledge management aspect because knowledge management was an important factor in organizational innovation. It also

resulted in the increase of sustainable competitive efficiency in other areas of management. This was consistent with the research hypotheses test results.

The knowledge management influenced the information management. It showed that the entrepreneurs in the Thai food industry prioritized knowledge management and organizational development. This would affect information management and the utilization of information technology. Lu (2017) said that the application of information technology was the combination of operational skills or relevant expertise with process and product management. This helped achieving the efficiency and smoothness of operations. It was consistent with the study of Nieves & Osorio (2018) further suggesting that the information technology was essential for innovation management in the role of knowledge resources of an organization. The context of the Thai food industry must develop and give importance to knowledge management and organizational knowledge development first. Then, it would affect the information management and utilization of information technology until it could become a driving force towards innovative application in the food industry through enterprise knowledge management.

The knowledge management also influenced innovation management. It showed that knowledge management affected the innovative application of entrepreneurs in the Thai food industry. This was in accordance with Shu, et al., (2014) who said that innovation also reflected organizational efficiency. That innovation was driven by advances in technology and rapidly changing customer needs. Pimon (2013) added that innovation would help working better, more efficiently and more effectively. It saved time and labor. When innovation was applied in combination with technology, it would yield positive effect. Because modern technology played an important role, it was a tool that made invention fast, convenient and easy to use.

The knowledge management influenced the competitiveness of entrepreneurs. It showed that knowledge management and organizational knowledge creation were essential to the ucompetitiveness and competitive advantage of entrepreneurs as well as increasing the efficiency of the organization. It was correspondent with Hitt, et al., (2016) who suggested that organizational analysis to identify organizational resources organizational capacity and core competencies of the organization could create value that met the needs of customers. It would lead to competitive advantage in the end. Ploenhad, et al., (2019) added that organizational optimization was the main goal of every organization. The focus of the organization was on optimization using various strategies and tools in business management. The limitation of this research was to study specific approaches related to the application of innovations in the Thai food industry. The researcher hope that in the future there will be research to study the business management approaches of the food industry in order to move towards the smart industry.

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