

Guidelines for Competitive Advantage of Thai Software Industry

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Abstract

This research aims to study the guidelines for competitive advantage in the Thai software industry. For qualitative research, in-depth interviews were conducted with nine experts to create the tools used in the estimation research. A group discussion with 11 experts was conducted to obtain a consensus on the model of this research. Quantitative data were collected from a survey of 500 enterprises in the Thai software industry using descriptive, reference, and multiple statistics. The research provides guidelines for the Thai software industry's competitive advantage, comprising four elements. The essential items of each element are as follows: 1) Marketing Strategies (\bar{X} = 4.25) maintain customer confidentiality without disclosing or using data for any other benefit. 2) Business Sustainability (\bar{X} = 4.24) builds trust and credibility in partner collaboration. 3) Internal Process (\bar{X} = 4.23) analyzes current work processes to improve efficiency continuously. 4) The Business Alliance (\bar{X} = 4.23) conducts business with integrity, transparency, and accountability. In addition, the hypothesis test showed that the difference in enterprise size revealed overall elements that were significantly different at the level of 0.05. The analysis of the developed structural equation model showed that it followed the empirical data and passed the evaluation criteria with chi-square probability level, relative chi-square, the goodness of fit index, and root mean square error of approximation of 0.262, 1.031, 0.928, and 0.008, respectively.

Keywords: competitive advantage, software industry, structural equation modelling

1. Introduction

In an era in which technology is changing rapidly, the economic environment and social and consumer behavior have changed. The business sector found the importance of technology and has used it in business operations, both the use of software to manage within the organization connectivity and collective use of information between business segments entities (Myšková & Kuběnka, 2019). Moreover, including providing new customer services in digital form, (Demokaan, 2022), which results from trying to improve customer service, often leads to new business models that can meet the needs of consumers precisely to the point. New services often disrupt traditional service businesses (Skog, Wimelius, & Sandberg, 2018), such as banking services that change contacts for various transactions to be on a Mobile Application, allowing consumers to access and perform various transactions quickly and conveniently, resulting in the need for the banking business to reduce the number of branches, combined with the pressure on the policy of a Cashless Society the more, the banking sector needs to adjust (Chatchai, Raknarin, & Thanin, 2022). One change that can have an impact also drives other business sectors to adapt to the changes. Due to technological changes, we live in globalization, the trend that the economy and industry are completely entering the digital economy. Specifically, the software industry market is transforming services into cloud computing.

Therefore, users no longer need to buy and install software on the server or the user's machine anymore; users can access the service anywhere via the Internet from providing such services. This causes no binding if users are not satisfied with their use; also, users can quickly switch to other service providers, and the provision of such services has changed to the actual usage fee or billed monthly, so there is no longer a monopoly (Jorge, Pedro, & Tiago, 2014). In addition, the trend in current use has begun to change the form of use to include more smartphones, making it easier for consumers to access information. Users are connected and share and use information together, resulting in many new businesses or innovations in business operations. Therefore, the government sector now realizes the importance of technology and innovation, ready to be set as a 20-year national strategy, the Office of the National Economic and Social Development Board. (B.E. 2561), to push and promote Thailand to compete in the world market by promoting innovation and the digital economy, the business sector of the software industry needs to be able to support the needs of diverse consumer groups effectively. As a

result of the government's push, various business sectors are interested in and eager to apply software systems in work processes to increase efficiency and reduce costs. Therefore, the software industry business sector needs to be prepared in various ways. To transform the organization to keep pace with changing technologies and innovations, such as Samuli et al. (2018). In addition, creating competitiveness in Thai software can compete with foreign entrepreneurs who are ready in various fields such as technology and innovation, customer confidence, financial management, and investment, personnel with potential, and marketing. Executive or organizational leaders must have a vision and strategy to build business competitiveness in preparation for Business Process Improvement.

Silpcharu et al. (2022) revealed that the internal control process for organizational success should comprise

1. setting regular departmental meetings to review procurement performance,
2. defining partner qualifications to meet the organization's standards, and
3. conducting a process monitoring system by internal and external committees.

This is to create sustainability for the organization in the future. The Thai software industry sector needs to be aware of the factors that will create business competitiveness, be analyzed to formulate a clear strategy, plan the development of products and services to meet the needs, and exceed the expectations of consumers. There must be continuous improvement in work processes (Clarke & O'Connor, 2012) to increase efficiency and produce or create products and services with innovations needed by the market and consumers to differentiate and gain a competitive advantage, which will result in the organization being able to conduct business sustainably. Therefore, the researcher is interested in ways to enhance the competitiveness of the Thai software industry, which will help guide Thai software operators to compete in highly competitive markets, both domestic operators and foreign operators entering the market in Thailand. Therefore, it is the source of research on the Guidelines for Competitive Advantage of the Thai Software Industry

2. Literature Review

Internal Process

Internal processes are essential things that management needs to focus on significantly to drive continuous improvement of internal processes within the organization. Sune et al. (2010), in order to control the production of software that should come out with quality standards Stavrinoudis and Xeons (2003), to be able to develop further or revisit can be done efficiently (Pedroso and Oliveira, 2013). The software industry has developed Agile Methodology for software development to be able to create results that come out quickly and bring that result to experiment with consumers to collect Feedback from consumers who use it (referral MVP) and can take Feedback to analyze to develop further to meet the needs of consumers who want to Release the next one quickly (López et al., 2022). This work process enables organizations to respond to consumers' needs effectively; it makes consumers feel continuous improvement and meets their needs or can solve the Pain Point of consumers before consumers know their needs (Reference Software Customer Loyalty). This Agile work process requires collaboration from all departments within the organization that must work closely together and have to put together a clear strategy, whether it is a software development strategy that must release the product as planned or a marketing strategy that must effectively communicate to consumers.

Marketing Strategy

Marketing strategy is a powerful tool to earn money for an organization and is a crucial factor in growing a business. A balance must be struck between retaining existing customers, acquiring new customers, and creating new products (Parry et al., 2012).

Today's marketing requires a clear strategy for communicating with consumers Fuerst (2011); communicators need to create content that is easy to understand and communicate directly with consumers to create Engagement with the organization. The frequency of communication should be planned appropriately. It must also choose the right channel to communicate with the consumer group. In particular, effective communication through Social Media requires appropriate communication strategies for the most effective channels (Adrianna and Espinola, 2020). In addition, technology has developed rapidly at present; entrepreneurs need to listen to the needs of consumers and take the needs of those consumers to analyze and plan to develop valuable products, to be able to deliver value that meets the needs of each group customers.

Business Alliance

The factor that helps the software industry business to be competitive is the cooperation between partners by recruiting partners who have the vision and realize the importance of business cooperation. The cooperation between partners may be in the same business or different businesses. Collaboration between alliances is about bringing together the strengths and expertise of each organization to develop a product together (Street and Cameron, 2007) or doing business together; each party must accept and respect each other and build trust and create a culture of sincere collaboration, partnerships are intended to share information, knowledge, skills, expertise, and shared resources. Zhu and Yu (2018). Collaboration

between partners also contributes to success with product value delivered to customers by a complete range of products, inevitably creating value for customers who will be satisfied and use the organization's services continuously. In addition, sharing customer information will help create value for the organization with more customers, competition in a company's industry improves (Lavie, 2007).

Business Sustainability

Business sustainability is an essential consideration for management. It must be creative and appropriately shared with stakeholders by the sustainability of the software industry business to control software development to meet production standards Software Engineering, by development documents, should be prepared and stored in an orderly manner. This will enable the organization to maintain the software efficiently and further develop software Tran (2017). Moreover, Venters et al. (2018) defined that organizations need to adhere to the principles of participation of people in the organization to create mutual learning and good relationships within the organization and to create a bond between employees and the work that employees have worked together to create by sharing ownership rights and benefits among employees who innovate Kehrer and Penzenstadler (2018), this action will help employees in the organization to bond with the organization and co-creating and developing products to be competitive which will lead to business sustainability, the executives need to conduct business following the principles of good governance in managing the organization with transparency.

2.1 Research Objectives

1. To study the structure and operation characteristics of the Thai software industry business.
2. To study the components of the guideline for enhancing the competitiveness of the Thai software industry.
3. To develop a structural equation model for enhancing the competitiveness of the Thai software industry.

2.2 Research Hypothesis

According to the research objectives and related literature, the researcher formulated the assumptions of the theoretical research. which can be summarized into 4 assumptions of the research

H1: Components of the internal process directly influence the marketing strategic component.

H2: Components of internal processes directly influence the business alliance component.

H3: Components of marketing strategy directly influences the business sustainability component.

H4: Components of business alliance directly influence the business sustainability component.

H5: The importance of the approach to the small and medium business development of the Thai software industry as a whole When classified by the size of the business is different.

3. Methodology

This research is a mixed methodology of qualitative and quantitative research. Qualitative research was performed using focus-group discussion techniques to validate the model. The population used in this study was professionals from the industrial sector. Purposive sampling was used to select 11 people who were different from qualitative research experts, using in-depth interview techniques. The research tool was a Structured Interview, in which the researcher divided the Interview Guide into four components: The Internal Process, Marketing Strategy, Business Alliance, and Components of Business Sustainability.

Quantitative research was conducted using survey techniques. The tool used in this research was a questionnaire. The questionnaire was divided into four parts. Quantitative research with a survey technique (the population used in this research was 2,694 software development executives (Thai Software Industry Association/ATSI, 2021; Herman et al., 2023). We used the criteria for research on elemental analysis or structural equation modeling. The sample size was set to an excellent level for 500 samples (Silpcharu, 2020; Herman et al., 2023). Multi-stage sampling consisted of group sampling (Silpcharu, 2020). Cluster Sampling was performed by dividing the types of industrial businesses into two sizes: small and medium-sized. Large industrial businesses used probability sampling by drawing lots (Lottery Method), and the checking results were completed using the index of item objective congruence (IOC). It brought such values together with expert assessment forms used as a guideline for improving the questionnaire for this research is between 0.60–1.00

3.1 Research Results

1. The analysis shows the importance of components in guidelines for enhancing the competitiveness of the Thai software industry which is classified by the size of the industry.

Table 1. The mean and the deviation standard of the importance components about guidelines for enhancing the competitiveness of the Thai software industry

Guidelines for enhancing the competitiveness of the Thai software industry.	Small and Medium Sizes			Large Size		
	\bar{X}	S.D.	Important level	\bar{X}	S.D.	Important level
The importance level of the element, overall.	3.96	0.41	High	4.51	0.21	Highest
1. Internal Process	3.96	0.43	High	4.51	0.22	Highest
2. Marketing Strategy	3.97	0.42	High	4.52	0.23	Highest
3. Business Partners	3.94	0.46	High	4.51	0.23	Highest
4. Business Sustainability	3.97	0.40	High	4.51	0.23	Highest

From Table 1. The results of the analysis about importance approach to strengthen the competitiveness of the Thai software industry business, classified by size of industrial business and the results were as follows: Small and medium-sized businesses found the way to enhance the competitiveness of the Thai software industry business. Overall, the importance is at a high level with an average of 3.96 for ways to enhance the competitiveness of the Thai software industry business in each aspect They can be sorted as follows:

- 1) Business sustainability is important at a high level with an average of 3.97 (S.D. = 0.40).
- 2) Marketing strategy is important at a high level; the average value was at 3.97 (S.D. = 0.42).
- 3) Internal Process is important at a high level with an average of 3.96.
- 4) Business alliances are important at a high level with an average of 3.94 respectively.

Large businesses found a direction to enhance the competitiveness of the Thai software industry. Overall, importance was at its highest level, with an average of 4.51. The guidelines for enhancing the competitiveness of the Thai software industry in each aspect can be sorted as follows:

- 1) Marketing strategy was most important with an average of 4.52.
- 2) Internal processes are of the highest level of importance The mean was 4.51 (S.D. = 0.22).
- 3) Business sustainability was at the highest level with an average of 4.51 (S.D. = 0.228).
- 4) Business alliances is of the highest level of importance with an average of 4.51 (S.D. = 0.232) respectively.

2. Assessment results of the harmoniousness of the structural equation model for enhancing the competitiveness of the Thai software industry after model improvement

Table 2. The statistical value that assesses the consistency of the comparative structural equation model before and after modifying the model

Statistics	Criteria Consideration	Before Modify	After Modified
1. CMIN-p (chi-square probability level value)	Have a value more than 0.05	0.000	0.262
2. CMIN/DF (relative chi-square)	Have a value less than 2.00	1.430	1.031
3. GFI (goodness of fit index)	Have a value more than 0.90	0.782	0.928
4. RMSEA (The root mean square index of the error approximation)	Have a value less than 0.08	0.029	0.008

From Table 2. shows the statistical values that evaluate the coherence of the comparative structural equation model before model improvement. The relative chi-square (CMIN/DF) was 1.430, and the root mean square index of error approximation (RMSEA) was 0.029, passing the criteria for concordance assessment with the empirical data. However, the Chi-Square Probability Level (CMIN-p) was 0.000, and the GFI was 0.782, which did not meet the criteria for concordance assessment with empirical data. Therefore, the researcher improved the model based on the modification indices (Vasiljevaa, Shaikhulinaa, & Kreslinsb, 2016).

By considering the value of the results obtained from the ready-made program with Theoretical academic principles exclude some of the unsuitable observational variables one by one and then proceed to reprocess the model and repeat it until a model meets all four statistical criteria. Therefore, it is considered that the structural equation model is entirely consistent with the empirical data. After the model had been improved, the Chi-Square Probability Level (CMIN-p) was found to be 0.262, higher than 0.05. The Chi-Square Probability Level (CMIN/DF) is 1.031, lower than 2.00, and the

conformity index (GFI) is 0.928, higher than 0.90. The root mean squared index of error approximation (RMSEA) was 0.008, lower than 0.08. All four statistics passed the evaluation criteria. Therefore, the structural equation model for enhancing the competitiveness of the Thai software industry after revision is consistent with the empirical data.

3.2 Discussion

The main issues found from the research on the approach to enhancing the competitiveness of the Thai software industry as a guideline for enhancing the competitiveness of Thai software that concentrates on the factors in business development to be more efficient know the principles and factors influencing management to achieve success. From the results of this research, the researcher has brought to a discussion to conclude a solution by bringing relevant research papers to support or contradict five items as follows:

According to the research results, when comparing the components of the Guidelines for Competitive Advantage of the Thai Software Industry classified by the size of the industry. Overall and by aspect, there was a statistically significant difference at 0.05. In other words, large industrial businesses attach more importance to developing competition than small and medium industrial businesses. From the results of hypothesis testing, it was found that internal process elements have the most significant direct and overall influence on marketing strategy elements, statistically significant at level 0.001 with the Standardized Regression Weight at 0.99. Empirical data shows that managing internal processes is essential in software development and ensuring quality. As a result of successful process optimization, quality products will be released quickly to keep pace with the market situation and formulate an effective marketing strategy to help build consumer awareness. This leads to trials of the company's products and eventually becomes a customer of the organization.

Guidelines for Competitive Advantage of the Thai Software Industry in marketing strategy has an average of 4.25, which is the aspect with the highest average. This reflects the importance of marketing strategy. The marketing strategy is fundamental in business operations; marketing is finding customers to use the company's products and services. Customer acquisition is the company's income if the company already has quality products and goods. Marketing is to expand the revenue base for the company. From acquiring new customers for the organization, it is still necessary to maintain the existing customer base by developing Good Customer Relationship Management to meet the needs of each customer group to build loyalty to the organization.

The current work continuously improves the efficiency of the process with an average of 4.35, so establishing an organization's internal control system is extremely important. In particular, analyzing the current work process to perform Process Improvement in each work stage will help organizations prevent mistakes in their work and make the process work more efficiently. It can also create valuable products that can be delivered to consumers quickly. Coordination to work together between departments is very important in the software development process, all parties must understand the performance part of themselves and their responsibilities to be responsible for the department they are responsible for, and it is necessary to determine the Way of Work to be able to work together effectively between departments in each organization.

According to the results of the analysis of the relationship between the variables for enhancing the competitiveness of the Thai software industry business, after improving the structural equation model, it was found that the variables were analyzed in the current working process to develop the process to be efficient continuously (INP1) with variables, communicate marketing with Content that has different views of thinking, creativity that meets the needs of customers. Moreover, widespread in a short time (Viral Marketing) has the highest correlation at 0.574, consistent with the research report of Kotler and Keller (2009); The service development strategy, engaging customers, recruiting customer needs, problem conditions values, reaching target customers, to design and develop products and services, makes it possible to produce new products and services more successfully because it adheres to the needs of customers as the center. It is also possible to develop products and services that are unique to individuals. This will create more value for products and services and can create brand loyalty.

This article provides a starting point for further research and discussion. Many other studies have examined the software industry in Thailand and the potential sources of competitive advantage. For example, a 2019 study conducted by the Asian Development Bank highlighted the need for Thai companies to invest in technology, research, and development to gain a competitive edge (Zhu and Yu, 2018). Other studies have investigated the role of government policies and regulations, economic development, and the impact of globalization on the Thai software industry (Siljaru et al. 202). Comparing the findings of these studies with those presented herein can provide valuable insights. By examining the various approaches taken by organizations and governments, we can gain a better understanding of which strategies are most effective in gaining and maintaining a competitive advantage (Silpcharu et al. 2022). Additionally, comparing the strategies outlined in the article with those implemented in other countries helps identify potential best practices that can be applied to the Thai software industry. This study examines the competitive advantages of the country's software industry in comparison to other global software markets, and provides detailed recommendations for improving and

sustaining a competitive advantage. This article breaks down the competitive advantages of the Thai software industry into four main categories: cost competitiveness, internal agility, customer intimacy, and innovation. It then compares the results of the different categories of competitive advantage with the results from other global software markets. The results show that the Thai software industry has a considerable advantage in terms of cost competitiveness, internal agility, and customer intimacy but lacks innovation. This study provides a comprehensive set of guidelines for improving the competitive advantage of the Thai software industry. It outlines key strategies for increasing the cost competitiveness of the industry, improving the internal agility of companies, enhancing customer intimacy, and fostering innovation. These guidelines are designed to ensure that the competitive advantage of the Thai software industry is sustained, and can be used by companies to develop a competitive edge in the global market. This study provides a comprehensive overview of the competitive advantages of the Thai software industry and offers detailed recommendations for improving and sustaining a competitive edge in the global market.

3.3 Limitations and Recommendations for Future Research

The article proposes guidelines to establish a competitive edge in an increasingly crowded global market. While this article offers a well-rounded discussion of potential strategies, its applicability is limited. First, it focuses primarily on large software companies and neglects the needs of small- and medium-sized firms. Second, while this article provides an overview of the Thai software industry, it does not consider the local context in which the industry operates. It is important to recognize that successful business strategies in one country may not be as effective in another. Finally, this article does not address the role of the government in the software industry. Government policies can have a significant effect on the competitiveness of the industry and should be considered when designing business strategies. To ensure the most effective strategies for competitive advantage, future research should focus on the needs of small- and medium-sized software firms, take local contexts into account, and consider the impact of government policies. This will enable more informed decision making, allowing the industry to build a stronger competitive edge.

4. Conclusion

The Thai software industry should emphasize the development of competitive advantages in the Thai software industry. There must be a product development strategy to meet the needs of consumers who want to benefit from using the software. Another critical factor is the implementation of a marketing strategy. A target audience must communicate effectively with consumers. It also has to balance maintaining the existing customer base and acquiring a new one. Owing to intense competition, both internal software and software from foreign countries enter the Thai market; entrepreneurs should find business partners to help deliver strength to products and services.

Moreover, it takes advantage of specific expertise, benefits from the partner's customer base, and benefits from shared resources to reduce costs and strengthen the organization. The study found that strategies for competition among the Thai software industry sectors are small and medium enterprises, and large industrial businesses have different segments. Large industrial businesses can ideally conduct business with partners, especially infrastructure, creating opportunities for corporate software personnel to learn work processes in various industries to cover all business ecosystems, with a connection between them and exchange knowledge with each other. Therefore, management approaches that use cooperative strategies for sustainable growth should be studied.

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