The Comparative Analysis of ASEAN Higher Education: An Outlook on Future Policy Redesign for Thailand

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Abstract

This research article aims at suggesting higher education policy redesign for Thailand. Through a documentary research approach, lessons learned were drawn from Singapore and Malaysia countries providing excellent higher education development regarding World Economic Forum. The comparative analysis revealed that Singapore and Malaysia those adopted as a important tool for enhancing national competitiveness through concrete higher education development plan and lifelong learning platforms. They have high spending and investing proportion in higher education and research sector focus on developing learners' skills by networking with stakeholders in the ecosystem. Lastly, meticulous policy executions were steadily found in Singapore and Malaysia.

Keywords: Higher education policy, Policy redesign, ASEAN, Foresight, Thailand

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การวิเคราะห์การอุดมศึกษาเชิงเปรียบเทียบของประเทศในกลุ่มอาเซียน: มุมมองเพื่อออกแบบนโยบายอุดมศึกษาใหม่สำหรับประเทศไทย

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บทคัดย่อ

บทความวิจัยนี้วัตถุประสงค์ในการนำเสนอแนวทางการออกแบบนโยบายอุดมศึกษาใหม่สำหรับประเทศไทย ผ่านการวิจัยเชิงเอกสารเพื่อถอดบทเรียนการพัฒนานโยบายการอุดมศึกษาของประเทศสิงคโปร์และมาเลเซีย ซึ่งกลุ่มประเทศตัวอย่างที่ดีในอาเซียนตามการจัดอันดับของ World Economic Forum ผลการศึกษาจากการวิเคราะห์เชิงเปรียบเทียบพบว่า กลุ่มประเทศตัวอย่างที่ดีใช้การอุดมศึกษาเป็นเครื่องมือในการสร้างทุนมนุษย์เพื่อสร้างขีดความสามารถทางการแข่งขันให้กับประเทศ ผ่านการจัดทำแผนพัฒนาอุดมศึกษาและแพลตฟอร์มการเรียนรู้ตลอดชีวิตที่เป็นรูปธรรม มีสัดส่วนของงบประมาณแผ่นดินที่เกี่ยวข้องกับการอุดมศึกษา และการลงทุนทางด้านการวิจัยของประเทศในระดับสูง ให้ความสำคัญกับการพัฒนาทักษะผู้เรียนผ่านการสร้างเครือข่ายกับผู้มีส่วนได้เสียในระบบอุดมศึกษา และมีการดำเนินนโยบายการพัฒนาการอุดมศึกษาที่มีความชัดเจนและต่อเนื่อง

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Introduction

Higher education has a significant impact and has been accepted that it is a core for human capital development. This is because it functions as the economic and social mechanisms, leading to country competitiveness (UNESCO, 2021). Moreover, knowledge asset and intellect as the main pillars of the nation are all immensely rooted and nurtured by the higher education. Especially, when the country confronts with the emerging challenges, the knowledge, intellect, and human capitals are significantly required the supports from higher education to overcome and gain the advantage from these challenges.

There are many considerable challenges occurring in many aspects. For example, the changing rate of population growth is not in accordance with the existing curriculum and the amount of the student in the education system (KPMG, 2020; Mintz, 2020; Wu et al., 2019). Also, the inconsistency of the demand and supply on workforce producing by the higher education, appropriation budget based on the university operation performance, and university ranking are the related factors affecting on the emerging challenges (Karran & Mallinson, 2018). In addition, not only the worth of investment gained from the university (Stolze & Sailer, 2021) but the unstable policies of education influenced by the political interferences (Nasruddin et al., 2012) are also the factors related the government resulting in the challenges. Apart from the mentioned factors bringing about the emerging challenges is the wide spread of COIVD-19 pandemic which is the influential issue effecting on the learners, instructors, and policy makers (Shamsir et al., 2021).

These emerging challenges lead to the research question that how Thailand should adapt the higher education policy implementation to maintain its performance competitiveness and make the higher education remains as the core pillars of country wisdom. This research paper, therefore, aims at proposing higher education policy redesign in Thailand based on the future studies. It is believed that the result Innovation tool for this research study will help creating the notion, future framework development and innovation of higher education. Also, the policy makers

and all higher education institutions will be advantageous from this study because of the fast changing of globalization and challenges.

To answer the expected research question, the documentary research approach will be employed to scrutinize the lessons learned drawn from Singapore and Malaysia which are the best practice countries providing excellent higher education policy development regarding World Economic Forum (World Bank, 2021). This research paper includes the research framework, design, methodology, data analysis and findings, and the suggested policies for Thai higher education redesign.

Review of Literature

Framework of Future Studies

A general propose of future studies framework is to create the systemic notion as a future planning which the scope of it also covers the analysis of the expected results in the future time. This framework relies on the cooperation between the stakeholders in directing the expected mission and determining the interested policy (Ratanawaraha, 2020). According to the process of foreseeing the future in policy making (Figure 1), Voros (2003) proposed the loose generic foresight process framework into 4 main steps. The first is a step of input which is the defining of the key driver and gathering the information and trends related to the interested issues. The second is the foresight step referring to an in-depth analysis of the data drawn from the first step to find out whether the main factors or trend variables that are likely to have an effect and the impact will come out in what kinds of form. The next is the output step which is about the strategic alternatives for resolving the existing problems. The final step is the strategy which is the process of codifying and systemizing the nations from the previous steps in order to formulate policies or a clearer strategic plan.

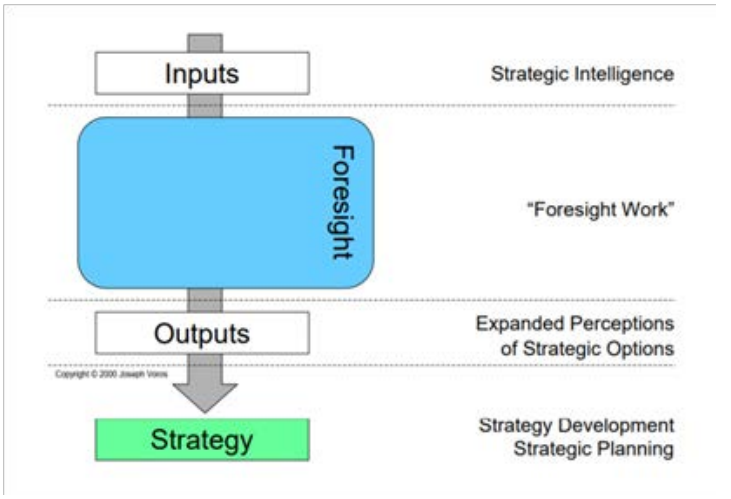

Figure 1: A process of foresight for policy making

Source: Voros (2003)

The concept of future studies has been initiatively employed as a frame of education policy development in many academic studies. For instance, in Andreescu et al.'s work (2012), it has been studied about an analysis of systematic foresight in Romania's education during 2009 to 2011 to portray the problems caused from the higher education and to suggest the guidelines of policy formulation in the higher education facet. This aspect of research interest is also found in the study of Nasruddin et al. (2012) which analyzed and depicted the foresight of Universiti Sains Malaysia into five persepctive, including the A' la Carte University, the Invisible University, the Corporate University, the State University, and the University in The Garden. Apart from these studies, Piirainen et al. (2016) brought the concept of future studies into the university's mission development to meet the requirement of stakeholders' research and innovation in the context of higher education. In 2020, Stolze & Sailer illustrated a foresight of higher education which was driven by key drivers including international level, digital transformation, and the process of creating shared values and these led to five categories of the foresight which are worldwide, transdisciplinary, adaptive, blended – learning, and Ecosystem.

A development of higher education policy from the best practice countries in ASEAN

A competitiveness performance ranking in the global stage was held by the World Economic Forum (WEF) in the consideration of higher education and training development (Pillar 5: Higher education and training) during 2007 to 2017 (World Bank, 2021). It was reported that in the performance evaluation of higher education and training development, it was indispensably considered from some significant indicators such as secondary school attendance rate, tertiary enrollment rate, quality of education system, quality of education in mathematics and science, quality of schools that teach management, internet access in schools, research. And available training services, and the scope of training. Singapore and Malaysia were found that their performances in higher education and training development were the highest ranking among other ASEAN country members (Figure 2). Although the performance of Singapore has an increasing progression, Malaysia tends to decrease significantly. These two countries are all still in the highest standard in ASEAN. It could be seen that these two countries could be plausible in employing in this research study as the best practice and guidelines for higher education policy formulation.

Apart from these two model countries, the third place had been changed alternately among Thailand, Brunai, and Indonesia during 2007 to 2017. Considering from the Figure 2, it could be found that the higher education development of Thailand could possibly degrade from the ranking during 2007 to 2013. Although it reflects a little better line during 2014 to 2015, the ranking of Thailand slightly declined in 2016. The higher education and training development of Vietnam, Myanmar, and Lao are the members of ASEN which were categorized below the world median.

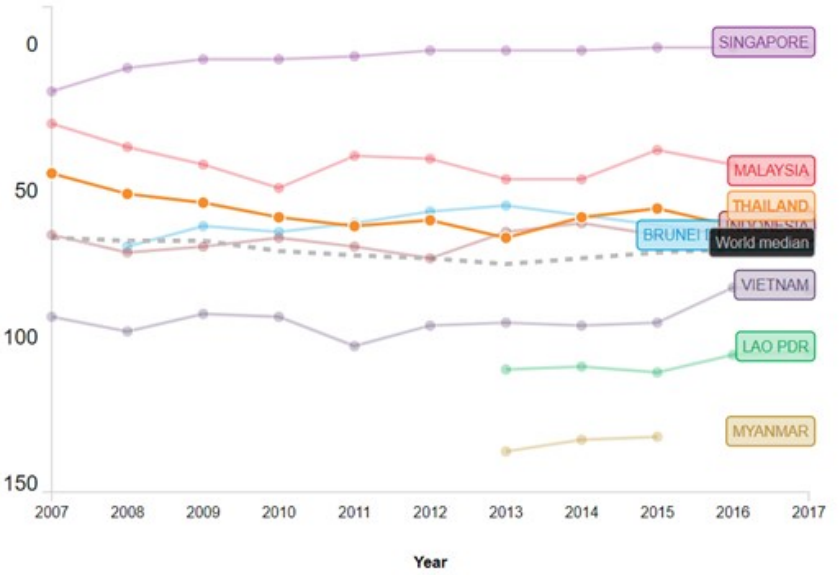

Figure 2: A comparison between the world competitiveness performance indicators by WEF in terms of higher education and training based on the ASEAN member

Source: World Bank (2021)

Singapore

Singapore continually pays attention to education since it considers people as a national resource. Education is greatly provided in all sectors and people could freely access the education. Both primary and secondary schools in this country are mostly the governmental unit and some are the state enterprises. Only the kindergarten and international school are in the private sector. Ministry of Education Singapore (2019) reports that Singapore's government nominated the committees, being responsible for education administration and budget allocation to the universities. This is because National University of Singapore (NUS) and Nanyang Technological University (NTU) have become dependent on financial and human resource management to rebound on the challenges of the present economic world. An audit system has also been developed to ensure the proper utilizing of the budget allocated by the government and this leads to the efficient performance. The university itself is, therefore, committed to carrying out their missions to drive the university to the eyes of the world (Sanders, 2020).

Singapore has a very indestructibility government and has continued to focus on people development which enable the government to formulate a clear education policy and to continuously function until their ultimate goals are achieved. The Singapore's educational learning outcomes are also more advanced than any other countries in the region, as well as the independent management of the university are workable. These allow Singapore to control the number and quality of their students and education staffs effectively.

Malaysia

Malaysia has an ever-evolving higher education system which can nationally increase the enrollment of students and internationally obtain more reputation through research publications, patent, and the quality of the institution. This country has been becoming the first prior alternative for international students to choose to study. There are also some Malaysia universities are ranked in the top 100 of the best universities in Asia. One of them is, moreover, the country's leading institution in the Organization of Islamic Cooperation (OIC) and there are some placed in the top 200 in the specific expertise and specialization in the field. The government's contribution in the investment is at the comparable level to those in the developed countries. Therefore, the country's overall performance, comprising resources, environment, coordination and international connectivity, and productivity was ranked in the 28th out of the 50th.

In Malaysia, the system of higher education policies has been improved to meet domestic needs and international directions. This leads to a development of the National Education Blueprint (Malaysian Education Blueprint 2015-2025) to assess their current performance and challenges. In other words, it is the curriculum reformations, focusing on the system in five areas: access, quality, equality, unity, and efficiency. These are purposively provided to each stakeholder with the corresponding benefits, rights, and responsibilities. Moreover, the students in this country could obtain a quality course using technology-based learning and hands-on experience through entrepreneurial networking. This not only concomitantly

strengthen the students' skills, abilities, and knowledge, but also prepare them for the future employment. The online learning options (MOOCs) as well as an academic community are both alternatively available.

The teaching and learning management system, as mentioned above, gives students with a variety of career options. Moreover, receiving the compensation based on the students' expertise, the support from the industry, the development courses between both national and international institutions are other advantageous earning from this developed system. The board of public institutions have gained more decision-making powers and they are properly regulated in the effective way. The roles of policymakers and regulators are also taken into the consideration by the way of eliminating the complicated processes and increasing self-regulation instead. Apart from these, the industry is another sector which has gained a high-quality workforce driven by the values of their works.

Based on the higher education system, there are categorized groups according to the administration of the state, namely public and private higher education institutions. Another categorization is divided by specializations which are research intensive university, objective-oriented universities (focused universities), and multidisciplinary universities (comprehensive universities). All these are administrated under the Ministry of Higher Education. The ministry also supervises on the approval of programs and certification of higher education institutions' quality. The educational reforms have started to authorize more self-regulation for the public universities which enable them to generate themselves income and funding and to increase administrative and financial management power. In terms of budget allocation, the ministry, who has a right on the management, has formulated a policy that will take a consideration based on the performance-based funding in order to create more competitive context. The assessment that is employed in the consideration will also have various indicators to evaluate the work performance. In the higher education system, there is a national quality assurance system which could be able to compare the quality with other oversea universities. There is the mobility of the system which has changed from consolidating state powers to the self-regulation, enabling the universities with greater flexibility in funding sources and

administration. It has also a policy of improving management efficiency in order to respond expeditiously to the economic trends. However, the universities must still comply with highly strict government requirements. Therefore, the universities still do not benefit from this self-regulation system.

The main income of the higher education institutions will depend on the type of that institution. The public unit will receive a large amount of support from the government while the private one will only have a source of income from the students' fees. Moreover, a high ranking and good performance rating of the institution could potentially draw the attention from the international students. In addition to these aspects, there is a human resource management, rating the staff from the executive level to the staff level. This management emphasizes on the consulting, contracts, research and training. and focus on financial credibility, but there is still some problematics on the evaluation. The direction of the institution tends to be to create university subsidiary companies (university spin-off companies) to increase financial turnover and revenue growth, promote a talent mobility courses, and increase revenue generation channels such as setting up a donation fund. As for the institutional model, a learning management is promoted through an open-online course and focused on entrepreneurial skills in responding to the market. Although there have been developed on the country in many sectors as mentioned, Malaysia still makes an attempt to improve both the governance and management on human and financial resources for the development of its full potential (Vongsaroj, 2020).

Research Methodology

Research design

This research is qualitative research that relies on documentary approach to collect secondary data from related documents. Document research is a method for compiling documents from the prints, media, electronic, video, or even images which are stored by the researcher without being involved in the recording. The document research is suitable for research that requires in-depth phenomenal facts which are not drawn from the academic documents. (non-technical literature) such as work reports, meeting minutes, strategic plans, etc. (Bowen, 2009; Yin, 2011).

In order to verify the reliability of the document before analyzing the data according to the principle of triangulation method, the source of the papers comes from various sections, including an analysis of documents or publications from government agencies related to the white papers of Malaysia's and Singapore's higher education policy, articles from both national and international academic journals, and higher education policy articles from foreign agencies related to higher education development (Harmsen & Braband, 2021), such as Organization for Economic Co-operation and Development (OECD), United Nations Educational, Scientific and Cultural Organization (UNESCO), seminar video related to the development of higher education policies both domestically and internationally, and articles published by consulting companies such as McKinsey & Company, Deloitte and KPMG. All documents were archived during the period 2019-2021.

Data Analysis

Step 1: After gathering the information from various documents related to the implementation of higher education policies of Malaysia and Singapore, the data will be analyzed by employing the content analysis to categorize the content according to the subject genres (coding and grouping). This research is applied the international policy comparative framework of Dobbins et al. (2011), UNESSCO (2014), Ziguras (2016) and SEAMO (2017). The gained data included the points related to the higher education development, including policy, competitiveness, ranking, pattern and levels of supervision, quality assurance, mobility, source of income, productivity, potentiality, administrative structure, and institutional category.

Step 2: When getting information according to subject genres related to the implementation of higher education policies, a comparative analysis is therefore employed to scrutinize the data between Malaysia and Singapore and decipher the lessons learned of higher education development to formulate of a new higher education policy redesign guidelines for Thailand.

Findings

From the analysis of data on higher education policy developments among the best practice countries in ASEAN (Table 1), it was found that Malaysia is a country that focuses on a development of higher education capabilities which aim to compete others in the global stage. In doing this, it is to achieve the development goals. The Malaysia Education Blueprint 2015–2025 was initiated in 2015 as a cornerstone for the development of higher education which was believed that it could lead the country to become a high-income country through the student development guidelines. It consists of a conceptualization and development of learners' abilities to have the entrepreneurial skills, a development of a work-based education system, and a technical training developed from a traditional academic focus. Also, an emphasis on using the results of technology and innovation to meet the social needs, a learner experience creation, a balance maintenance between public and private institutions as well as the aim for independent administration of higher education institutions, and creating financial sustainability for higher education institutions by reducing dependency on the state budget and relying on the funds from the stakeholders of the higher education sector are also the elements of the guidelines.

Singapore, on the other hand, aims to use higher education to develop the country into an innovation-driven and knowledge-based society. Singapore, on the other hand, aims to use higher education to develop the country into an innovation-driven knowledge-based society, however, this country has the embedded values in its education system. That is the wealth of a country, believed that it is depends on their people. This such value has preached the national education system to have a strong quality assurance system from the elementary to the higher education level. Previously, the government focused on the development of individualized education to expectedly develop only life skills and literacy. It has, however, become the development of higher education to conduct a competitiveness for the nation to support the knowledge-based economy, employing technology and innovation as a driver mechanism. To achieve the goal, the government has provided three key development plans: Smart Nation Singapore, Skills Future and the creation of three

new universities initiatives. The initiated plan of Skills Future plays a significant role as a stimulator for their people to have a self-development as a lifelong learning approach. The program provides guidelines for helping people to access their self-improvement alternatives in terms of education, training, vocation. The development of the integrated education and training to meet people's needs in a time are also included. The guidelines also point to the aspect of encouraging the employers to focus on their skills, expertise-based employment, and supporting and promoting a culture of lifelong learning.

Table 1: Comparison of goals and development of higher education policies among the best countries in ASEAN

Compared Goal	Best practice country	
	Malaysia	**Singapore**
Goal of higher education development	Develop of a higher education system to be ranked in the world class and promote the country's competitiveness in a globalized economy.	Develop and nurture people through an innovation-driven knowledge economy to compete on a global scale.
Higher Education Policy	- Re-conceptual and develop learners' abilities to have entrepreneurial skills. - Develop a work-based education system and technical training rather than a traditional academic focus. - Emphasis on the outcomes of technology and innovation applications to meet the needs and create a learner experience.	Under the Skills Future plan includes the following tasks: - Help people to have access to self-improvement options in education, training and careers. - Develop an integrated education and training system to meet the needs within the limited time.

Table 1: Comparison of goals and development of higher education policies among the best countries in ASEAN (Cont.)

Compared Goal	Best practice country	
	Malaysia	**Singapore**
Higher Education Policy	- Maintain a balance between public and private higher education institutions as well as aim for independent administration of the institutions. - Build financial sustainability for higher education institutions by reducing dependence on the state budget and relying on funds from users of the workforce from the higher education sector.	- Encourage the employers to focus on skills and expertise-based employment. - Support and foster a culture of lifelong learning.

Source: Vongsaroj (2020)

For the aspects related to the goals of higher education development, the policy, competition between higher education institutions, grouping, patterns and levels of supervision, quality assurance, mobility, source of income, productivity, potentiality, and the administrative structure as the patterns of higher education institutions (Table 2) which were drawn from the comparative analysis will be illustrated below.

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN

Compared point	Best practice country	
	Malaysia	**Singapore**
1) Competition between higher education institutions and the grouping of higher education institutions	The private and public sectors are competitive and complementary. While the private sector provides access to higher education opportunities. by focusing on creating courses according to market requirements such as business and administration, tourism, medicine, and technology, the public one can allocate funds to those important but low demand courses.	-Junior Colleges or Centralized Institutes -Autonomous University -Private educational institutions -Post-secondary educational institutions (PSEIs)
2) Pattern and level of higher education institutions supervision	Ministry of Higher Education under the Ministry of Education plays an important role in supervising all sectors; higher education, both public and private universities, community colleges, polytechnics and other government units involved in higher education,	Ministry of Education is centralized as the controlling, cooperating, and encompassing the education in all levels.

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN (Cont.)

Compared point	Best practice country	
	Malaysia	Singapore
2) Pattern and level of higher education institutions supervision	both public and private universities, community colleges, polytechnics and other government units involved in higher education activities. However, the government still has a great influence on regulating higher education institutions although there is some better changing in the cooperation systems. The study found that Malaysia and Indonesia had less self-regulatory powers than countries in the OECD.	
3) Quality assurance of higher education institutions	The relevant quality assurance agency, for example the National Qualifications Assurance Agency (MQA) has a key role in quality assurance in all programs at higher education	Singapore's education management system can be divided into 3 levels: - Early Childhood Education Stage

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN (Cont.)

Compared point	Best practice country	
	Malaysia	**Singapore**
3) Quality assurance of higher education institutions		- There is a certification system called Singapore Pre-School Accreditation Framework (SPARK). - Basic (Primary - Secondary Education), using a system called School Excellence Model (SEM) - Diploma and vocational level, employing Edu Trust system
4) Mobility of higher education institutions		Singapore is decentralized in education, but this decentralization is primarily aimed at enhancing the efficiency of the education system. This management allows Singapore to drive university operations in line with the government's long-term policies in managing higher education.

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN (Cont.)

Compared point	Best practice country	
	Malaysia	Singapore
5) sources of income of higher education institutions	The Government of Malaysia grants 90% of the appropriations budget each year to public higher education institutions and 10% comes from the students' fees while in the private institutions, the main budget is derived from the income of the institution. The state university budget depends on the negotiation between the Ministry of Higher Education and the institution itself. As to polytechnic institutes and community colleges are the institution that receive budget from the state, managed by Ministry of Higher Education, polytechnic, and community College.	Universities or institutions that are governed by the state are funded directly by the government while those that are not under the supervision of the state is finically supported by a private organization, gained budget from the government. Also, the pricate sector will receive a full or partial funding from the tuition fee payment.

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN (Cont.)

Compared point	Best practice country	
	Malaysia	Singapore
6) Productivity of higher education institutions	Malaysia's enrollment rate has increased to 70% from public and private institutions over the past 10 years.	The enrollment rate (GER) ratio for university students is 25% while the rest of the population goes to polytechnics and technical education institutions, which are considered as some of the best world institution.
7) The potential of higher education institutions	The Universitas 21 report ranks the higher education system at the 28th of 50 countries.	Singapore has two top world ranking university from 200 universities in the world, raked at the 25th and 48th, according to the latest Times Higher Education rankings.
8) Structure and operation model	The higher education institutions are under the Ministry of Higher Education of the Ministry of Education, being responsible for post-secondary education to higher education.	The government aims to improve the efficiency and effectiveness of education. The concept of government regulation

Table 2: A comparison of the overall higher education policy implementation among the best practice countries in ASEAN (Cont.)

Compared point	Best practice country	
	Malaysia	**Singapore**
		and state-owned governance approaches to higher education institutions have the agency's operational methods and roadmaps, used to assess internal and external audit mechanisms. Its purpose is to protect the interests of the stakeholders, state intervention, and to enhance corporate governance standards of higher education institutions.

Source: Vongsaroj (2020)

1) Competition between higher education institutions and the grouping of higher education institutions

For the competition between higher education institutions ranked in the best practice group, it was found that the institutions play a part in filling the market and there is an intense competition in attracting students by building their reputation and conducting renowned research.

In some best practice countries, the expansion of private higher education institutions has also offered the opportunities for people to access into the systems. This is because of the traditional value of admission to only those, the public sectors. When considering the categories of the higher education institutions in the best practice countries, it showed that they share the similar characteristics which can be grouped into 3 large levels: the institutions after secondary school or junior college level, the university level, and the specialized institutions level. All these have slightly differences in their operational details according to the operating structure managed by the public and private sectors.

2) Form and level of supervision of higher education institutions

In terms of grouping type of higher education institutions, there are different patterns and levels of institutional unit which are linked and referred to the national policies on self-governance and non-governmental unit. For example, in Malaysia, the Ministry of Higher Education is responsible for a controlling role in the overall picture of all institutions in the country, while the Ministry of Education of Singapore takes the absolute power in compassing the direction of education at all levels.

3) Quality assurance of higher education institutions

Each country has their own different quality assurance unit of educational institutions specifically. This is because the performance of quality assurance has been conditionally related to criteria of budget allocation to each institution. The Malaysian Qualifications Framework (MQF) of The National Qualifications Assurance Agency (MQA) is an example of quality assurance in Malaysia, setting the national standards and systems as a reference frame for evaluating the quality of higher education institutions in the country.

4) Flexibility in management

Streamlined operations of higher education institutions depend on self-regulatory policies, autonomizing from the public sector, and the form of supervising the institutions. In other words, in Malaysia, the structure of the higher education system is consolidated while Singapore has decentralized some tertiary institutions to increase operational efficiency.

5) Sources of income of higher education institutions

The sources of income of higher education institutions varies according to the nature of their operating structures. That is the public tertiary institutions are primarily funded by the government while the main income from the private sector comes from tuition fees, donations, and investment on the private sector and various educational organizations. Some may have partial support from the state budget.

6) Productivity of higher education institutions

The best practice countries create an outcome product from higher education institutions that stand out in both quantity and quality terms. In Malaysia, for example, it has been increased in tertiary enrollment rates of 70% from public and private institutions over the past 10 years, while Singapore has an enrollment rate (GER) ratio for university students of 25%. The rest of the populations goes to polytechnics and institutes of technical education, considered to be some of the word best quality institution.

7) The potential of higher education institutions

The number of educational institutions' productivity and their policies related to the higher education system of the best practice countries has positively driven some universities to be on the global competition stage such as Singapore's NUS and NUT.

8) Structure and operation model

The operational patterns of higher education institutions remain an agency, providing education, research and consulting services. However, the roles of them may differ according to the structure of operations, policies of self-regulation, and autonomizing from the public sector. The grouping of higher education institutions according to their organizational missions is another point making the role of the institutions different as for found in Malaysia for instance.

Summary of study results and policy recommendations

From the results of the comparative analysis between Malaysia and Singapore to extract the lessons learned for the design of new higher education policies in Thailand, it can be summarized into four parts for the design of policy recommendations for the development of higher education in Thailand as follows:

The first part is that the best practice countries determinately aim to institute their countries into a knowledge-based society driven by technology and innovation. Both countries implement a higher education as a tool to build human asset and construct the country's competitiveness through the formulation of the higher education blueprint and lifelong learning platform. The purpose in doing these is to encourage their people to realize the importance of self-improvement.

The second is that Malaysia and Singapore share the same high proportion of the national budget supported to the higher education and investment in national research. The results of these educational investment in higher education budget variously and effectively contributes to the rates of high school attendance, university enrollment, quality of the education system, quality of management of mathematics and science education, quality of educational institutions, teaching management, internet access in schools, and the research and training services that can be accomplishable and realistic. The scope of training and the dimensions of both quality and quantity of graduates have resulted the Malaysia and Singapore to be outstandingly ranked as good reputation in higher education policy development continually.

The next is that the best practice countries gives an importance on the student-centered approach (El-Azar & Nelson, 2020), emphasizing on the learning styles that could build working skills through entrepreneurship, networking and collaboration, for example, to build a network of connections with graduate users and higher education stakeholders such as the central government, international governments, domestic industry sector, social sector business sector. Also, social sector was received a chance in curriculum development, including organizing training, internships, and contracting employment insurance with local entrepreneurs.

In addition, industry groups are encouraged to play a role in financial proportion to support higher education and in raising funds to reduce the government's fiscal burden.

Finally, both Malaysia and Singapore have a clear policy implementation in functioning a higher education development due to political stability. The clear development policy on higher education has resulted in the ecosystem agencies which could continuously develop their manpower according to the ultimate goals set by the country.

According to the comparative analysis among the best practices, the data obtained can be used as an input in preparing to formulate the scene together with the analysis of key factors to help the next step of the generic foresight process framework. The gap could be more completed for research studies related to the future depiction of higher education in Thailand.

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Lesson Learned of Organic Agricultural Policy of Sikkim State, India to Thailand

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Abstract

This study is a qualitative research paper to investigate the organic agricultural policy of Sikkim State and the Republic of India. The research utilizes government reports, documents and the policies of Sikkim and India. Sikkim officially announced it was the first to achieve its goal of 100 percent organic status, and the first in the world to become an organic state. There are three notable remarks of transformation to organic state: (1) Sikkim is a decentralized state in India and has independent policy-making; (2) continuous and comprehensive organic promotion of the Republic of India since 2000; and (3) continuous and comprehensive organic promotion of Sikkim state since 2003.

Lessons learned from Sikkim which can be applied to Thailand include (1) potential areas or priority zones of organic agriculture in Thailand should be identified; (2) policy formation and policy implementation of organic agriculture of both central and provincial government should be relevant, and financial decentralization is essential to meet the provincial context that has been declared the potential areas or priority zones of organic agriculture; and (3) a ministry/office should be established to have responsibility of direct promotion of organic agriculture.

Keywords: Organic Agricultural Policy of Sikkim State, Organic Agricultural Policy of The Republic of India, Lesson Learned of Organic Agricultural Policy

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ถอดบทเรียนนโยบายเกษตรอินทรีย์ของรัฐสิกขิมประเทศอินเดีย เพื่อปรับใช้ในประเทศไทย

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รับวันที่ 30 สิงหาคม 2565 *ส่งแก้ไขวันที่ 1 พฤศจิกายน 2565* *ตอบรับตีพิมพ์วันที่ 23 พฤศจิกายน 2565*

บทคัดย่อ

งานวิจัยนี้เป็นการศึกษาเกี่ยวกับนโยบายเกษตรอินทรีย์ของรัฐสิกขิมและสาธารณรัฐอินเดีย โดยใช้ระเบียบวิธีวิจัยเชิงคุณภาพผ่านเอกสารชั้นต้น อาทิ เอกสารต่างๆ ของรัฐบาลสิกขิม รัฐบาลสาธารณรัฐอินเดีย และบทความวิชาการ ผลการวิจัยพบว่า รัฐสิกขิมเริ่มมีการประกาศ การทำเกษตรอินทรีย์อย่างเป็นทางการในปี 2546 และในปี 2559 รัฐสิกขิมได้ประกาศว่าเป็นรัฐแรกของโลกที่เป็นเกษตรอินทรีย์ 100 เปอร์เซ็นต์ การศึกษาครั้งนี้สามารถถอดบทเรียนที่สำคัญ จากการศึกษานโยบายด้านเกษตรอินทรีย์เต็มรูปแบบได้ 3 ประการ คือ (1) การกระจายอำนาจของรัฐบาลสาธารณรัฐอินเดียไปสู่รัฐบาลระดับรัฐ (2) นโยบายส่งเสริมด้านเกษตรอินทรีย์อย่างต่อเนื่องและครบวงจร ของรัฐบาลกลางที่หนุนเสริมเกษตรอินทรีย์ในรัฐสิกขิมตั้งแต่ปี 2546

บทเรียนที่อาจมาปรับใช้กับประเทศไทย ได้แก่ **ประการแรก** การศึกษาสภาพพื้นที่และจัดแบ่งโซนพื้นที่และจัดแบ่งโซนพื้นที่ที่มีศักยภาพในการทำเกษตรอินทรีย์ เพื่อทำให้ส่งเสริม และสนับสนุนสอดคล้องกับสภาพบริบท **ประการที่สอง** กำหนดนโยบายเรื่องเกษตรอินทรีย์ที่สอดคล้องกัน ระหว่างนโยบายของรัฐบาลกลางกับนโยบายของจังหวัดซึ่งประกาศเป็นพื้นที่ส่งเสริมเกษตรอินทรีย์ และการกระจายอำนาจหน้าที่และงบประมาณให้เหมาะสมกับบริบทของพื้นที่ที่มีการประกาศส่งเสริมเกษตรอินทรีย์ ประการที่สาม การจัดตั้งกระทรวง/หน่วยงานที่มีภารกิจหลักในการส่งเสริมด้านเกษตรอินทรีย์โดยตรงระดับประเทศและจังหวัด

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The Global Status of Organic Farming

For decades, food quality, food safety, and environmental issues have become an increasing concern since a lot of synthetic chemicals and fertilizers are used in conventional agriculture and the food chain becomes contaminated. As a result, consumers have called for food production to be more eco- friendly for higher food safety (Rembialkowska, 2007 cited in Das, Chatterjee and Pal, 2020, p.1).

Globally, organic agriculture is practiced in 187 countries and the number of organic farmers are 3.1 million with 72.3 million hectares. Sale of organic products amounted to about 106 billion euros in 2019 (FAO, 2021). According to "The World of Organic Agriculture", the Research Institute of Organic Agriculture indicated that a 2019 survey of the institute revealed the prospects of organic products. Organic areas rose in almost every region to 1.1 million hectares or 1.6 per cent (FiBL, 2021, p. 21).

In 2017, it was reported that the practice of organic agriculture had increased to a great extent. The proportion of organic production in the Asian continent was the highest in the world at 40 per cent; Africa 28 per cent; Latin America 16 per cent; Europe 14 per cent; Oceania 1 per cent; and North America 1 per cent. In India, there were 835,000 organic producers (Das et al, 2020, p. 4). In addition, in 2020 India was ranked 1st in terms of amounts of organic producers and 8th regarding World's organic land (FiBL & IFOAM Year Book, 2020 cited in Agriculture and Processed Food Products Export Development Authority (APEDA))

Sikkim: World's First Organic State

Sikkim is a mountainous state located in the Indian Himalayan Region and has a total area of 7,096 sq. km with a total population 610,577 people in 2011. The state economy is fundamentally based and dependent on agriculture and ecosystem services. The farming includes agriculture and livestock rearing in the northern high-altitude lands; traditional rain-fed crop production such as upland and wet terraced rice fields, maize, pulses, millets, buckwheat, barley, turmeric, potatoes, soybean, mustard and vegetables in the middle hill farms; and cash crop cultivation like large cardamom, tea, ginger, horticultural crops like orange and floriculture (International Centre for Integrated Mountain Development, 2019, p. 13-14).

Sikkim is the first state of India which officially adopted organic agriculture in 2003 to preserve soil fertility and ecological systems, to protect the environment, and to promote healthy food production and healthy living; and to reduce the risk of illness. Eventually, after 13 years, an area of 7,096 sq. km was transmitted to full organic practice. In 2016, Narendra Damodardas Modi declared officially Sikkim was India's first 100 per cent agriculturally organic state (The Hindu, 2016).

In Thailand, the policy of organic agriculture since the 1980s had not been comprehensive or consistent and it mainly focused on organic standards and organic certification. In 2005 Organic farming became part of the government policy due to consumers' concerned about chemical residue in agricultural crops from conventional agriculture and consumers' higher demands of organic products. Organic agriculture was then identified in the Seventh National Economic and Social Development Plan (2011-2015) as alternative agriculture to promote sustainable development (Chinavarasopak, 2015). However, organic products had not grown much and it was reported that since 2006 organic farming area has increased by 0.1% yearly and the total organic agriculture area of Thailand was only 0.2% in 2011 (Government Public Relations Department, 2014 cited in Win, 2017).

Sikkim was the first state in the world that achieved 100 per cent organic status in 2016. In addition, according to the Thailand Ministry of Agriculture and Cooperatives, it was said "It is Thailand's goal to become the leader in organic food production in the ASEAN region" (Neo, 2022); however, as mentioned above, Thailand's agricultural land which was certified as organic was only 0.2% in 2011. This documentary research examined the lessons learned about the organic farming policy of Sikkim and knowledge to apply in Thailand to increase the nation's certified organic land. The qualitative method focused on studying primary online document such as newspapers, academic papers and studies, and government documents.

Federal State Promotion of Organic Agriculture

India is one of the countries in the world that has a large agricultural sector, comprising of 52% agriculture areas with a variety of climate and geographical landscapes with various kinds of crops, husbandries, and fisheries. Since the green revolution in India during 1960-1970 agricultural productivity has intensified until the supplies met the domestic demands. Even though primitive farming was practiced in India more than 4,000 years ago, organic agriculture according to standards of modern world and western definition has developed only recent decades. Nevertheless, "Zero Budget Natural Farming (ZNBF)"- the concept of farming without using any fertilizers, pesticides, and external inputs, had been proceeded in mid -1990s as the alternative agriculture to green revolution (Press Information Bureau, 2021).

The agricultural areas in India could be arranged into 3 classifications and the two first areas have potential to transition to organic farming. (Meena, Meena, Dotania and Sinha, 2013, p. 34):

Category I: agricultural chemical use is low in this area i.e. Assam, Jharkhand, Orissa, Jammu & Kashmir, Himachal Pradesh, Karnataka, Madhya Pradesh, Chhattisgarh and Rajasthan, and other north-eastern states

Category II: the area is hilly and rain-fed and promoted crops converting to organic such as tea, coffee, spices and cashew.

Category III: the area has irrigation system and a large number of agrochemicals are used.

Chadha & Srivastava (2020, p. 89) indicated that organic farming land in India had significantly expanded from 0.186 million hectare in 2005 to 1.93 million hectare in 2018. According to YES BANK, Ingenus Strategy and Creative Research (2016, p. 19) the following ten states had the highest organic food production in the country: Madhya Pradesh, Himachal Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Andhra Pradesh, Uttarakhand, Karnataka, Orissa, and Sikkim.

Table 1: Top Ten Highest Organic Food Production States of India in 2014-15.

State	Organic farming land with forest area (Million hectare)	Per cent %
Madhya Pradesh	1.93	39.4%
Himachal Pradesh	1.37	28%
Rajasthan	0.48	9.9%
Maharashtra	0.22	4.4%
Uttar Pradesh	0.11	2.2%
Andhra Pradesh	0.10	2.1%
Uttarakhand	0.09	1.9%
Karnataka	0.09	1.9%
Orissa	0.09	1.9%
Sikkim	0.08	1.6%

Since 2001 the federal government has implemented many policies and projects consistently to support organic agriculture. The first national preprogramme to promote organic agriculture namely National Programme for Organic Production (NPOP) was established by the Ministry of Commerce and Industry in 2001 to lay the foundation of systematic development of organic farming of the nation in terms of organic agriculture certification, organic production and processing that complies with the National Standards for Organic Products (NSOP). The organic agriculture certification encompasses livestock, aquaculture, animal feed processing and management business, mushroom cultivation, seaweed, aquatic plants and greenhouse plants (Agricultural and Processed Food Products Export Development Authority, 2018, P. 3).

In 2004, it is regulated that Indian organic product export must be certified by the accredited certification bodies of India and accepted by the importing countries (Prakati India, 2021). Through NPOP many states such as Kerala, Gujarat, Uttaranchal, Madhya prides, Maharashtra, Andhra Pradesh, Rajasthan, Tamil nadir, Sikkim, Nagaland, and Mizoram have been promoting organic farming (Yadave, 2017, p. 157).

In the same year, the Indian Organic Certification Agency (INDOCERT) was registered by a non-government organization and national farmers' association and certified by National Accreditation Body (NAB) under NPOP. It is a non-profit organization and the first Indian agency of organic agriculture certification that deals with producers, processors, traders, and exporters. The agency certifies organic standards acknowledged by the importing countries i.e. U.S. Department of Agriculture (USDA); Canada Organic Regime (COR); and INDOCERT Organic Standards (INDOCERT, 2022).

In 2004 the International Competence Center for Organic Agriculture (ICCOA) was founded to represent the organic farming movement in India and to build capacities of individual farmers and organizations related to organic agriculture in South Asia. The center had projects in 19 states: Andhra Pradesh, Karnataka, Tamil Nadu, Chhattisgarh, Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Sikkim, Tripura, Uttarakh, Jammu and Kashmir, and Odisha (Saathi Re, 2017).

The main mission of the center involves five aspects.

Promoting conversion to organic farming: The conventional farmers are trained on producing their own farm inputs such as organic fertilizers and educated on organic agricultural standards, how to grow organic crops, and applying for organic certification.

Organic market development: The center has attempted to develop the organic market through channels of conferences, seminars, workshops, and national and international trades show for organic products.

Building the capacities of practicing organic agriculture: national and international seminars, conferences, trainings, and workshops related to organic agriculture are arranged to enhance organic farming and to build capacities of the farmers; for instance, training on organic agriculture and compost fertilizer preparation; pest, insect, and plant disease management; internal control system (ICS) and organic farming requirements.

Policy advocacy and research: The center has participated in advocacy on organic policy in many states of India like Andhra Pradesh, Karnataka, Gujarat, Himachal, Pradesh, Kerala, Madhya Pradesh, Mizoram, Nagaland, Sikkim, and Tamil Nadu.

Consultation and cooperation: Consultants are provided to farmers, private companies, entrepreneurs, and volunteer organizations in terms of organic business development; supply chain management; and brand building and management. The center cooperates with both national and international organizations such as The Research Institute of Organic Agriculture (FiBL), International Federation of Organic Agriculture Movements (IFOAM), The Swiss Import Promotion Programme (SIPPO), Nurnberg Messe (BioFach), National Centre of Organic Farming, Agricultural and Processed Food Products Export Development Authority (APEDA), National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), and The Confederation of Indian Industry (CII).

In 2004 the National Centre of Organic Farming, under the national mission of sustainable agriculture, was established to promote organic farming and to cooperate with the regional centers in other six states i.e. Karnataka, Bhubaneswar, Manipur, Madhya Pradesh, Nagpur, and Haryāna (National Centre for Organic and Natural Farming, 2021).

Rastriya Krishi Vikas Yojana was initiated in 2007 to develop and restore the agricultural and related sectors that had retarded growth; and to stimulate more government investment in agricultural sectors and related ones in order to increase farmers' income with the target of four per cent growth of agriculture sector during the 11th and 12th National Development Plans.

The National Mission for Sustainable Agriculture (NMSA) was launched from the year 2014-2015 under the sustainable agriculture mission that is one of the eight missions under National Action Plan on Climate Change (NAPCC). The mission has the objective to promote the growth of the agricultural sector especially in rain-fed agricultural areas covering 60 per cent of agriculture areas and 40 per cent of food production areas of India. Natural resources' conservation and sustainable usage was promoted as well as integrated agriculture, effective usage of the water, and soil health management. The measures are focused on improving crop seeds, livestock, fish culture, pest management, farming, nutrition management, agriculture insurance, credit and market supports, and information access, and livelihood diversities (Ministry of Agriculture Coperation & Farmers Welfare, 2019).

In addition, the NMSA included five components: (1) Rain-fed Area Development (RAD) based on an integrated farming system to escalate productivity and to diminish the risks related to climate change; (2) Sub-Mission on Agroforestry (SMAF) started in 2016-2017 to boost tree planting on farm areas with crops; (3) National Bamboo Mission (NBM) focused on employing the market potential of bamboo to expand its production and to establish a value chain system; (4) Soil Health Management (SHM) aimed at promoting crop specific sustainable soil health management, residue management and organic agriculture; (5) Climate Change and Sustainable Agriculture: Monitoring, Modeling and Networking (CCSAMMN) providing creation and dissemination of information and knowledge on climate change.

In 2015, Paramparagat Krishi Vikas Yojana was launched as the extended project of Soil Health Management (SHM) under the National Mission on Sustainable Agriculture (NMSA). The schemes in eight Union Territories were fully budgeted by the federal government. The North Eastern States of India and the Indian Himalayan states were assisted financially in the ratio of 90:10 (center:states) and the rest states in the ratio of 60:40 (center:states). The project aimed to develop sustainable organic agriculture through the convergence of ancient wisdom and modern science. The farmers were empowered via farm management, farm input production, participatory guarantee system (PGS), and value added of agricultural products and marketing. (Department of Agriculture, Cooperation & Farmers Welfare, 2017, p.1)

The central government recognized the northeastern states' potential of organic agriculture. Therefore, the Organic Value Chain Development in North Eastern Region Scheme was inaugurated in 2015 and implanted in Arunchal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The scheme aimed to develop and to increase the value chain of certified organic farming and its products in the markets through facilitating organic product gathering, processing, and branding (Integrated Nutrient Management Division, Department of Agriculture, Cooperation and Farmer's Welfare, 2018, p. 3).

All the central government projects to promote organic agriculture since 2001-2015 can be concluded in the Table 1.

Table 2: Federal Government of India Projects to Promote Organic Agriculture Since 2001-2015

Year	Policy/Project	Policy/Project Features
2001	National Programme for Organic Production (NPOP)	Established by Ministry of Commercial and Industry in 2001 to lay the foundation of systematic development of organic farming of the nation in terms of organic agriculture certification and organic production and processing complied with the National Standards for Organic Products (NSOP)
2001	Indian Organic Certification Agency (INDOCERT)	Registered by non-government organization and national farmers' association and certified by the National Accreditation Body (NAB) under NPOP. It is the first Indian agency of organic agriculture certification and deals with producers, processors, traders, and exporters. The agency certifies organic standards acknowledged by the importing countries i.e., U.S. Department of Agriculture (USDA); Canada Organic Regime (COR); and INDOCERT Organic Standards.

Table 2: Federal Government of India Projects to Promote Organic Agriculture Since 2001-2015 (Cont.)

Year	Policy/Project	Policy/Project Features
2003	International competence center for organic agriculture (ICCOA)	Founded to be representative of organic farming movement in India and to build capacities of individual farmers and organizations related to organic agriculture in South Asia. The main missions of the center are involved in five aspects: (1) promoting conversion to organic farming; (2) organic market development; (3) building capacities of practicing organic agriculture; (4) policy advocacy and research; and (5) consultation and cooperation
2004	National Centre of Organic Farming	Established under the national mission of sustainable agriculture to promote organic farming and to cooperate with the regional centers in other six states i.e., Karnataka, Bhubaneswar, Manipur, Madhya Pradesh, Nagpur, and Haryāna.
2004	Authorized accreditation agencies for organic farming.	The ministry of commerce, government of India authorized agricultural and processed food product export development authority coffee board, spices board, tea board, coconut development board coca and cashew nut board to be an accreditation agency for organic farming.

Table 2: Federal Government of India Projects to Promote Organic Agriculture Since 2001-2015 (Cont.)

Year	Policy/Project	Policy/Project Features
2007	Rastriya Krishi Vikas Yojana	Project initiated in 2007 to develop, to restore the agricultural sector and related sectors that had retard growth; and to stimulate more government investment in agriculture sectors and related ones in order to increase farmers' income with the target of four per cent growth of agriculture sector during the 11st and 12nd National Development Plans.
2014-2015	National Mission for Sustainable Agriculture (NMSA)	Launched from the 2014-2015 under sustainable agriculture mission that is one of the eight missions under the National Action Plan on Climate Change (NAPCC) to promote the growth of agriculture sector especially in rain-fed agriculture area; to conserve natural resources; and to promote integrated agriculture, effective usage of the water, and soil health management. The NMSA included five components: (1) Rain-fed Area Development (RAD); (2) Sub-Mission on Agroforestry (SMAF); (3) National Bamboo Mission (NBM); (4) Soil Health Management (SHM); and (5) Climate Change and Sustainable Agriculture: Monitoring, Modeling and Networking (CCSAMMN)

Table 2: Federal Government of India Projects to Promote Organic Agriculture Since 2001-2015 (Cont.)

Year	Policy/Project	Policy/Project Features
2015-2017	Organic Value Chain Development in North Eastern Region Scheme	The central government recognized the north eastern states' potential of organic agriculture. Organic Value Chain Development in North Eastern Region. Scheme was inaugurated in 2015 and implemented in Arunchal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The scheme aimed to develop and to increase the value chain of certified organic farming and its products in the markets through facilitating organic product gathering, processing, and branding.
2015-2018	Paramparagat Krishi Vikas Yojana	The schemes launched as extended project of the Soil Health Management (SHM) under the National Mission on Sustainable Agriculture (NMSA) in eight Union Territories were fully budgeted by the federal government. The North Eastern States of India and the Indian Himalayan states were assisted financially in the ratio of 90:10 (center: states) and the rest ones in the ratio of 60:40 (center: states). The project aimed to develop sustainable organic agriculture through the convergence of ancient wisdom and modern science. The farmers were empowered via farm management, farm input production, participatory guarantee system (PGS), and value added of agricultural products and marketing.

How Sikkim Transferred to Fully Organic State

The Constitution of India identifies India as a Union of States and Unitary States. The government of India is classified into three levels: the federal government of India, state government, and local government. Substantial power still rests with Federal government even if there is decentralization of the state government. In case of national emergency, power is vested in the central government. State government exercises internal security and other state issues and have the sole power to legislate on subjects as law and order, public health and sanitation, local government, taxation, etc. except judicial power. Local government is comprised of both rural and urban government in which local bodies have been elected by the local people (Soikham, 2021).

Figure 1: Map of India with Sikkim State

Note: Sikkim State is in the North Eastern of India. From https://www.mapsofindia.com/

Figure 2: Map of Sikkim State, India

Note: Sikkim State Map and the provinces. From https://www.mapsofindia.com/maps/sikkim/

The development of organic agricultural policy of Sikkim could be classified into three phases: (1) visionary declaration of organic agriculture in 2003; (2) preparation stage to fully organic state (2004-2010); and (3) final stage of preparation and declaration of fully organic state (2010-2015).

Stage I: Visionary declaration of organic agriculture in 2003

Nowadays, neo-liberalism focusing on growth and increasing productivity without concerns about the environment, ecology and sustainable development plays the dominant role in the world economy. Nevertheless, Sikkim state prefers the priority of sustainable livelihood as the state policy with the strong belief that the policies and policy implementations are necessary to conserve the environment. (International Centre for Integrated Mountain Development, 2019, p. 47)

As mentioned above, the state government can exercise and issue policy on internal subjects such as law and order and in 2003 the first policy initiative towards organic agriculture in Sikkim had commenced. The Sikkim Legislative Assembly under the Chief Minister Shri Pawan Chamling adopted a resolution to convert Sikkim into an organic state (International Centre for Integrated Mountain Development, 2019, p. VII) after Sikkim encountered the severe environmental and health problems due to intensive usage of agricultural chemicals since 1994 (Dresrüsse, 2018). Since 2003 pesticides and chemical fertilizers were banned and nonorganic vegetables from other states were not allowed to be imported into the state as well (Gowen, 2018). The subsidies of chemical pesticides and fertilizers was reduced by 10 % annually until totally banned in 2014 (Beyond Pesticides, 2018).

Stage II: Preparation to fully organic state (2004-2010)

The promotion of organic farming of the Sikkim government in this stage included four aspects namely (1) development of internal control system and organic certification; (2) promotion of farm inputs; (3) organic agriproduct processing and value addition of organic products; and (4) development of marketing and brand building (International Centre for Integrated Mountain Development, 2019, p. 6-7; Singh, 2020).

In 2003- 2009, the villagers were trained to be bio-villages as the first step of converting to organic farming with effective microorganisms. Organic practice and producing of agricultural inputs such as compost, organic fertilizers and pesticide made from local plants and cow urine were instructed (Panorama, 2019).

During 2003-2010, agricultural infrastructures were promoted and constructed to respond to farmers' needs such as post-harvest technology, organic seed preparedness center, soil testing laboratory and mobile soil testing lab, earthworm cultivation and, bio- fertilizer production and organic input production unit. In 2006-2007, eight earthworm cultivation units were set up in five government farms. Three Krishi Vigyan Kendras Centers (KVKs) were established in northern, western, and southern parts of Sikkim for training and transferring agricultural knowledge and technology to farmers (Agriculture Department, 2019).

Internal control system and organic certification had been promoted since 2006 with the support of related agencies of the Sikkim government with experts, and non-government organizations to assist the farmers to obtain organic certification registration. Public information and knowledge on organic agriculture via various media outlets were promoted to build the perception of organic farming to people. Organic farming schools were established to create job opportunity for unemployed youths in Sikkim (International Centre for Integrated Mountain Development, 2019, p. 7).

Stage III: Final stage of preparation and declaration of fully organic state (2010-2015)

In 2010 Sikkim government launched "Sikkim Organic Mission" as an organic agriculture development framework for public offices and people. The mission aimed at Sikkim state to become a 100% organic state with the following vision and mission.

Vision

"People of Sikkim relish healthy food and enjoy sustainable livelihoods by practicing organic farming in a secure environment"

Mission

"To lead the change and leave no one behind by strengthening organic farming, entrepreneurship and green economic development"

(International Centre for Integrated Mountain Development, 2019, p. 1)

From the mission, six indicators were determined to succeed the goal of fully organic state in 2015 (SIKKIM ORGANIC MISSION Policy Vision and Mission. (n.d.) p. 4-5).

Goal 1 All forest areas and forest vegetables, fruits, flowers, and wildlife are naturally organic; therefore, the areas and forest products are completely organic certified.

Goal 2 From total agriculture areas 100,000 hectares, 50,000 hectares would be converted to organic farming covering 60,000 families.

Goal 3 Sikkim organic brand would be created based upon the development of selected organic products and, organic entrepreneur creation for export organic products such as oranges, gingers, tea, bamboo shoots, etc.

Goal 4 The domestic organic production in farm would be replaced imported agricultural products such as vegetables, milk, fruits.

Goal 5 Hill farmers' food security would be increased from their own organic farms and household consumptions.

Goal 6 Mechanism of government institutes would be effective to drive the growth of organic sectors.

In 2010, the Human Resource Development Department of Sikkim applied organic agriculture in public schools at the secondary level to integrate sustainable learning through life skill development and working with nature. Students were able to design their own organic farms, organic food systems, and related agriculture activities. Thirty-four pilot project public schools out of 767 total public schools participated in this scheme with the support of public agencies for agriculture tools, seeds, materials to make organic compost, and technical supports (Syangbo, 2019, p. 129-130).

In addition, in 2010 'livelihood schools' were set up in 41 public schools to train students with skills they were interested in and organic farming practice in three schools in Tadong, Daramdin and Bermiok in the east, the west, and the south of Sikkim respectively. This project aimed to prepare and train local people for the organic agricultural sector in the state and to build the job opportunities for educated youth still unemployed (Soi, 2022; and Skill Development Department, 2019).

The Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act was issued in 2014 to control import, sale, distribution and usage of inorganic agricultural, horticultural inputs and livestock feed to prevent the health risk of them to human beings, animals, and the environment and to help Sikkim into an organic state and all other matters related to the organic issue (Government Gazette, 2015). The Sikkim State Organic Certification Agency (SSOCA) was founded as an independent organization budgeted by the Sikkim government in 2015 to organic certification according to national and international standards not only in the state but also other states in India (Sikkim State Organic Certification Agency, 2021). Eventually, after 13 years of formally adopted organic agriculture in 2003, on 18 of January, 2016 Sikkim state was officially announced as the first fully organic state of India and all agricultural areas in 75,000 hectares were certified organic land (The Economic Times, 2016).

All the Sikkim government projects to promote organic agriculture since 2003-2016 can be summarized in the table 2.

Table 3: Sikkim Government Projects to Promote Organic Agriculture Since 2003-2016

Year	Policy/Project Features
Since 2003	On-farm production of organic manure to increase soil fertility
2003 -2010	Infrastructure facilities for post-harvest technology
2003-2010	Organic seed preparedness center
2003-2010	Soil testing laboratory and mobile soil testing lab
2003-2010	Earthworm hatcheries
2003-2010	Ginger processing unit
2003-2010	Biofertilizer Manufacture
2003	Reducing the subsidy on chemical pesticides and fertilizers by 10 per cent every year and totally banned them in 2014.
2005	Cancellation of quota of Chemical fertilizers from the federal government
2006	Organic certification supported by the related agencies of the Sikkim government, NGOs, service providers, and agricultural extension center (Krishi Vigyan Kendra)
2010	Declaration of Organic Mission
2014	Issue of Sikkim Agricultural, Horticultural Input and Livestock Feed Regulatory Act
2015	Established Sikkim State Organic Certification Agency (SSOCA)
2016	Formally announcement of fully organic state

Why does Organic Agricultural Policy Work in India and Sikkim?

According to Thanaphongsathon (1985, p. 78-86) and Sapru (2019, p. 21-24), factors influencing policy formation of organic farming in India and Sikkim could be analyzed into four significant aspects: geographical and historical, political, economic, and social dimensions.

Geographical and Historical Aspects

Agriculture has been in Inida since 9000 BC. (Janardhana, n.d., p. 40.) Nowadays, agricultural sector is still the main economic sector of Indian livelihood. 58 percent of overall Indian populations are in an agricultural sector. The value added of agriculture, forest, and fishery is an estimated 276.37 billion USD in 2020 fiscal year. Total value added of agricultural sector and other related sectors was 17.8% in 2020 fiscal year. Food industry of India is expanding and Indian food products worldwide increased every year especially in industry of processing food. Indian food market and Indian consumer goods market is in the sixth largest ranking of the world. Indian processing food Industry is calculated as 32% of all food market of the country. Export of agricultural products and related business is valued at 41.25 billion USD in the 2021 fiscal year (India Brand Equity Foundation, 2022). In Sikkim state, the climate suits for produce farm plant and horticulture such as rice, wheat, maize, millet, barley, soil bean, mustard, cardamom etc. There are plenty of rare plants, animals, 5,000 flora species, and 424 herbal species in the state. Besides, with magnificent nature and top hills covering with snow, Sikkim has high potential of tourism industry such as homestay, ecological tourism, and health tourism (India Brand Equity Foundation, 2022). It can be seen that Sikkim and India have propitious backgrounds in terms of geographical, cultural, and historical circumstance related to agriculture; therefore, organic agriculture agenda and policy was set and implemented in both the federal government and state government.

Political Aspect

In the case of organic agricultural policy of the Indian government and Sikkim government, an important political element to policy making is the leader's perspective and regime. Prime Minister of Inidia Narendra Damodardas Modi and Chief Minister Pawan Chamling of Sikkim viewed the importance of organic farming. PM Modi emphasized in the parliament speech that organic food sector was the first priority in aspects of sustainable farm and consumers and organic agriculture must be set as national agenda (YES BANK, Ingenus Strategy and Creative Research, 2016, p.1).

PM Modi spoke via video conferencing at the National Conclave on Natural Farming in the Anand district of Gujarat. He said,

> *"... We need to shift to organic farming methods ..." Desi cow's dung and urine can act as a solution to protect your farm produce and also increase productivity. Everything can be done naturally. [Then], we wouldn't have to pay for manure or any kit in this way ..."*
> (India Today, 2021)

Shri Pawan Chamling Chief Minister of Sikkim mentioned the way of developing Sikkim state and organic agriculture in the state as a strategy for sustainable ecosystem and livelihood. He said,

> *"... Sikkim, in its humble way, made its choice and decided to prioritize a sustainable way of life as state policy. Our deep conviction that the environment is not a use-and-throw production facility has been central to our policy-making process ..."* (International Centre for Integrated Mountain Development, 2019, p. V)

In addition, the regime influenced policy making of organic farming. India is a Union of States and Unitary State. However, the federal system is applied as well. Decentralized state government is enabled to issue and to legislate on subjects as law and order, public health and sanitation, local government, taxation, etc. Sikkim could pass the law to ban import and usage of chemical fertilizers and pesticides and could initiate its own state policy of converting to a fully organic state.

Economic Aspect

Trends of consuming organic food for health care has ascended including the direction of worldwide organic food business. According to Global Marketing Associates from 1999 to 2018, it indicated world trade of organic goods increased from about ten billion US dollars in 1999 to 90 billion US dollars in 2018 respectively.

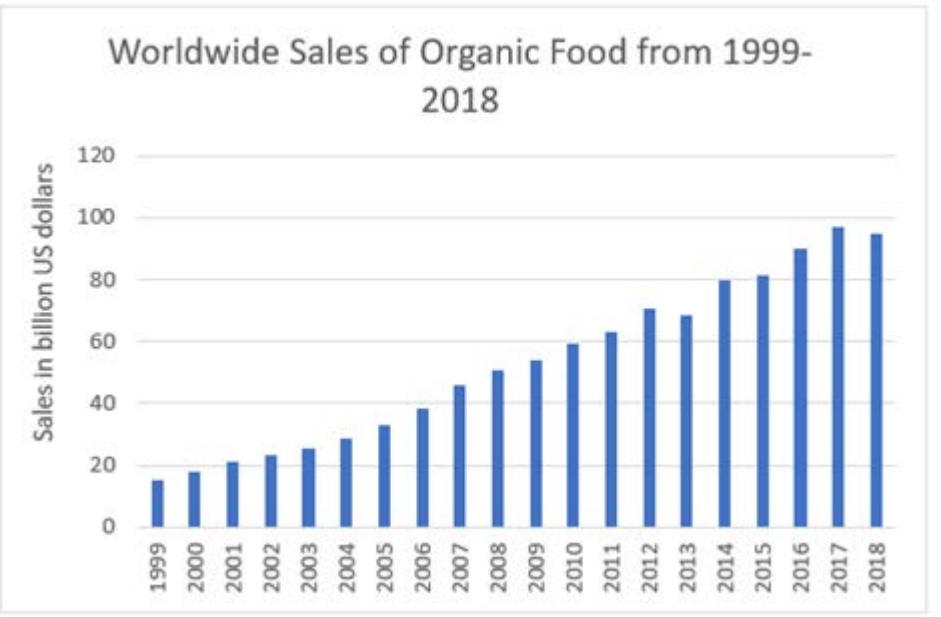

Figure 3: Statistic of Global Organic Food Marketing 1999-2018

"Global organic market: export opportunity analysis" (Global Marketing Associates, 2022)

In part of the organic market in India, prospect of the organic food could be seen and forecasted. The Techsci Research (2021) shows increasing trade of organic market from 2016 fiscal year to the 2026 fiscal year.

Figure 4: Statistic of Organic Food Marketing in Indian Regions
"Report Description" Techsci Research, May 2021,
https://www.techsciresearch.com/report/india-organic-food-market/1761.html

Lessons Learned from the Organic Agricultural Policy of Sikkim State to Apply to Thailand

The study revealed that the government influenced the organic farming policy formulation, implementation, and success. Even if India is a Union of States and Unitary State; the federal system is part of the government as well. There is decentralization to state government and the state government is able to issue and to legislate on subjects as law and order, public health and sanitation, local government, taxation, etc. As a result, Sikkim could ban the chemical fertilizers and pesticides and could declare its own state policy of converting to a fully organic state.

From the study, it can be seen that even if Thailand and India government are dissimilar, in terms of geographical, and economic aspects Thailand is similar to India that could be competitive advantages with other countries in term of organic agriculture policy. According to The World Bank Group (2022), per cent of Thailand agricultural land since 1961-2020 has increased by 100 percent from 22.8% to 45% of the total land mass of Thailand. All agricultural outputs in Thailand were in 12th ranking and the 6th largest rice producing globally in 2019 in accordance with Thailand Board of Investment (2022).The lesson from the organic agricultural policy of Sikkim can be noted in 3 recommendations to apply in Thailand.

Firstly, political, administrative and financial decentralization is required. The study found that the federal government of India has not promoted organic farming in all the states of India. The central government did support Sikkim as the state developed on organic farming policy. Sikkim which is one of the potential states for organic farming had its own policy to promote organic agriculture. In addition, the federal government has strived in the same direction to promote organic farming. Sikkim promoted the 'Sikkim Organic Mission' and had strong views to convert it to an organic state. Several projects from upstream, midstream, and downstream of organic agriculture had been implemented. In the meantime, the projects and budgets of Indian government reinforced the organic practices of Sikkim as well; for example, the National Programme for Organic Production, Indian Organic Certification Agency, and Organic Value Chain Development in North Eastern Region Scheme.

According to Prakash (2022, p. 18), effective decentralization includes political, administrative and financial decentralization. Three forms of decentralization are crucial to success of organic farming as well. Since 2005 organic agriculture was adopted as the national agenda in Thailand (Chinvarasopak, 2020, p. 107) as a top-down policy and the promotion is applied nationwide. Political decentralization is needed for the provinces to have self-determination to choose whether they need to promote organic agriculture and administrative and if financial decentralization will permit the provinces to implement organic farming policy that complies with their provincial contexts and parallels with central supports.

Secondly, a ministry/office should be established that is directly responsible to promote organic agriculture both in provincial and national level. The research results revealed that in India there is the National Programme for Organic Production responsible for organic certification directly under the Ministry of Commerce and Industry. In Sikkim, Sikkim State Organic Certification Agency was established to certify organic farming to inner and outer states in accordance with national and international organic standards.

In Thailand, the main ministry that is responsible for the promotion of organic agriculture is the Ministry of Agriculture and Cooperatives and the promotion work is assigned to a number of agencies such as the Office of the Permanent Secretary for Ministry of Agriculture and Cooperatives, the Department of Agriculture Extension, the Department of Agriculture, and Land Development Department, etc. It seems that in Thailand too many bureaus in charge of organic farming promotion are disadvantageous and it is unquestionable that these agencies promote conventional agriculture also. Thailand needs a central governing agency to promote organic agriculture and the provinces that adopt organic farming need to have one agency to facilitate organic agriculture development and coordination with the central government.

Lastly, but most importantly, zoning of organic agriculture areas and potential areas should be identified. In India, the agricultural areas could be arranged into 3 categories with two classified high potential to transition to organic farming areas. Moreover, the National Bureau of Soil Survey and Land Use Planning cooperated with the Indian Institute of Soil Science, Bhopal, and Food and Agricultural Organization (FAO) to start the scientific research in 2011 to show organic carbon stock in the soils of all states of India via a geo-spatial digital map. The study identified that besides Sikkim, almost all of north-eastern India including Assam, Meghalaya, Tripura, Mizoram and Minipur are perfectly fit for organic farming (Behl and Manka, 2017). This information reflected that database and zoning play significant roles to promote organic agriculture. In Thailand, there is only agricultural zoning and agricultural economics crop zoning.

Table 4: Summary of the Lesson Learned and Recommendations

Lessons from Sikkim State	Recommendations to Thailand
The government influenced the organic farming policy formulation, implementation, and success.	The political, administrative and financial decentralization is required in Thailand to promote organic agriculture
National and state agencies are set up to be in charge of organic agriculture promotion	A specific ministry/office in both provincial and national level should be established that is directly responsible to promote organic agriculture.
Database and zoning of potential areas of organic agriculture play significant roles to promote organic agriculture in India.	Zoning of organic agriculture areas and potential areas should be identified to promote organic agriculture in Thailand.

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Retailing Beyond Fuel: The Teaching Case Study of PTTOR's Aviation Fuel Market During the COVID-19 Pandemic*

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Abstract

On April 7, 2021, in the aftermath of the very first of an annual shareholder meeting of PTT Oil and Retail Business Public Company Limited ("PTTOR"), Mr. Pattra (hypothetical name), Risk and Planning Division, was asked by the Vice President, Mr. Nopporn P., to prepare an expansion plan, with which to fulfill the commitments that the President team had made to the shareholders at the OR annual shareholder meeting. Since the PTTOR's IPO on 11 February 2021, this was the first time of the annual shareholder meeting and it had been a contentious one, with the major shareholders having expressed concern with the challenges from the COVID-19 pandemic and the Government Policy Responses and Measures toward to COVID-19 on the Company's performance during the year 2020 and the first quarter of the year 2021. They voiced for immediate and responsive actions by the management team to improve the Company's performance and to ensure that the Company would be resilient and be able to get through the challenges faced during the COVID-19 crisis.

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* This Teaching case is intended for the use of instructors who have obtained permission to use the case study, "Retailing Beyond Fuel: The Teaching Case Study of PTTOR's Aviation Fuel Market during the COVID-19 Pendamic." NIDA Cases and Teaching Notes are developed solely as the basis for class discussion, and are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective administrative or managerial practice.

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In response to the shareholder meeting, the President had indicated that he was going to call for the internal meeting with all the Vice Presidents and discuss about the strategies to cope with the PTTOR's performance that had been seriously affected by the COVID-๑๙. At the internal meeting, the President and the Vice Presidents had investigated that the major adversity resulted from the intense competition in the oil business, the global economic recession, and the sharp decline in oil demand especially on the aviation oil that were affected by the closure of airports, disoperation of airlines business, and the government responses measures related to travel restrictions.

By the end of the meeting, the Vice President of Aviation Oil Market has assigned Mr. Pattra to be responsible for conducting the strategic plan including management of concentration risk in order to stabilize the company's financial performance during the COVID-19 pandemic and projected challenges from penetration plan to European markets. The Risk and Planning Division finds himself genuinely content that he has been entrusted with this significant task by the Vice President. Though he realizes that there is much to be done, and in a relatively short time frame. He is going to prepare this specific expansion plan and to make a presentation to the Vice President at the next scheduled meeting by the end of next week. Therefore, Mr. Pattra determines to get started right away.

Keywords: Multinational corporation, PTTOR, International expansion, Geographical diversification

กรณีศึกษาปตท. น้ำมันและการค้าปลีก จำกัด (มหาชน) กับการดำเนินธุรกิจน้ำมันอากาศยานภายใต้ภาวะวิกฤตโควิด*

เวสารัช เอื้อมบุญสุข**

รับวันที่ 18 เมษายน 2565 *ส่งแก้ไขวันที่ 9 ตุลาคม 2565* *ตอบรับตีพิมพ์วันที่ 20 ตุลาคม 2565*

เมื่อวันที่ 7 เมษายน พ.ศ. 2564 ภายหลังการประชุมผู้ถือหุ้นประจำปีครั้งแรกของบริษัท ปตท. น้ำมันและการค้าปลีก จำกัด (มหาชน) (“PTTOR”) คุณภัทร (ชื่อสมมติ) ฝ่ายความเสี่ยงและการวางแผน ถูกตั้งคำถามโดย รองกรรมการผู้จัดการ นายนพพร เพื่อเตรียมขยายแผนงานเพื่อบรรลุพันธกิจที่ประธานคณะผู้บริหารได้ให้ไว้กับผู้ถือหุ้นในการประชุมผู้ถือหุ้นประจำปีของ OR นับตั้งแต่การเสนอขายหุ้น IPO เมื่อวันที่ 11 กุมภาพันธ์ พ.ศ. 2564 นับเป็นครั้งแรกของการประชุมผู้ถือหุ้นประจำปีและเป็นประเด็นถกเถียงที่ผู้ถือหุ้นรายใหญ่ได้แสดงความกังวลเกี่ยวกับความท้าทายจากการแพร่ระบาดของโควิด-19 และการตอบสนองต่อนโยบายและมาตรการของรัฐบาลสู่สถานการณ์โควิด-19 ในผลการดำเนินงานของบริษัทในช่วงปี 2563 และไตรมาสแรก ของปี 2564 โดยได้ประกาศให้ฝ่ายจัดการดำเนินการในทันที เพื่อปรับปรุงผลการดำเนินงานของบริษัทและเพื่อให้มั่นใจว่าบริษัทจะมีความยืดหยุ่นและสามารถ ผ่านพ้นวิกฤตการณ์ COVID-19 ไปได้

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* กรณีศึกษาด้านการเรียนการสอนนมีไว้สำหรับการใช้งานของผู้สอนที่ได้รับอนุญาตให้ใช้กรณีศึกษา "กรณีศึกษาปตท. น้ำมันและการค้าปลีก จำกัด (มหาชน) กับการดำเนินธุรกิจน้ำมันอากาศยานภายใต้ภาวะวิกฤตโควิด" กรณีศึกษานี้ถูกจัดทำขึ้นเพื่อเป็นพื้นฐานสำหรับการอภิปรายในชั้นเรียนเท่านั้น และไม่ได้มีวัตถุประสงค์เพื่อใช้เป็นการรองรับ แหล่งข้อมูลหลักหรือภาพประกอบของการปฏิบัติด้านการบริหารหรือการจัดการที่มีประสิทธิภาพหรือไม่มีประสิทธิภาพ

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กรรมการผู้จัดการใหญ่ได้แจ้งในการประชุมผู้ถือหุ้นว่าจะเรียกประชุมภายในกับรองประธาน ทั้งหมด และหารือเกี่ยวกับกลยุทธ์ในการรับมือกับผลการดำเนินงานของ PTTOR ที่ได้รับผลกระทบ จากโควิด-๑๙ อย่างร้ายแรง ในการประชุมภายใน ฝ่ายบริหารได้ข้อสรุปว่าอุปสรรคสำคัญเกิดจาก การแข่งขันที่รุนแรงในธุรกิจน้ำมัน ภาวะเศรษฐกิจถดถอยทั่วโลกและความต้องการใช้น้ำมันที่ลดลง อย่างมาก โดยเฉพาะน้ำมันอากาศยานที่ได้รับผลกระทบจากการปิดสนามบิน การล่มสลายของ ธุรกิจสายการบินและมาตรการตอบโต้ของรัฐบาลที่เกี่ยวข้องกับการจำกัดการเดินทาง

เมื่อสิ้นสุดการประชุม รองประธานฝ่ายตลาดน้ำมันอากาศยานได้มอบหมายให้นายภัทรรับผิดชอบในการดำเนินการตามแผนยุทธศาสตร์รวมถึงการบริหารความเสี่ยงด้าน concentration risk เพื่อรักษาเสถียรภาพทางการเงินของบริษัทในช่วงการระบาดของไวรัสโควิด-19 และคาดการณ์ความท้าทายจากแผนการเข้าสู่ตลาดยุโรป แม้ว่าเขาจะรู้ว่านี่เป็นภาระงานที่สำคัญและมีรายละเอียดมากมายที่ต้องทำให้สำเร็จในกรอบเวลาอันสั้น แต่นายภัทรรู้สึกเป็นเกียรติอย่างยิ่งที่ได้รับมอบหมายให้รับผิดชอบหน้าที่สำคัญนี้ เขาจึงตั้งใจที่จะเริ่มต้นทันทีเพื่อจะเตรียมแผนการขยายตลาดนี้และ นำเสนอต่อรองประธานในการประชุมผู้บริหารครั้งต่อไปภายในสิ้นสัปดาห์หน้า

คำสำคัญ: บริษัทข้ามชาติ ปตท. น้ำมันและการค้าปลีก การขยายธุรกิจสู่ตลาดต่างประเทศ ความหลากหลายเชิงพื้นที่

> *"...with the current COVID-19 crisis, ever-changing technological transformation and rapid changes of consumer behavior, OR is facing a great challenge across all its business sectors. As a leader of Thailand's oil and retail businesses, OR is relentlessly adjusting its portfolio to make greater strides beyond the conventional oil business by employing its unique "Retailing Beyond Fuel" business model to better serve customers' needs in terms of mobility and future lifestyles ..."*
>
> Message from the Board of Director, PTTOR's Annual Report 2020, p. 33.

It was during the first annual shareholder meeting of PTT Oil and Retail Business Public Company Limited ("PTTOR") on April 7, 2021 since its shares were publicly traded in the Stock Exchange of Thailand (SET) from February 11, 2021. The Initial Public Offerings (IPOs) of PTTOR has gained such attention from both institutional and individual investors that its first day price was closed at 29.25 THB (from the IPO price of 18.00 THB). Consequently, the price continually rallied up to 36.50 THB a few days later, resulted in a double profit trading. However, during the past month before the date of its first annual shareholder meeting, the share price had fallen by 15 per cent and closed at 31.75 THB on the day before its significant meeting. This was a market reflection on much concern regarding the fate of Aviation Fuel market that had been severely impacted by the policy responses toward the COVID-19 pandemic since its first discovery in December 2019 in China.

With only one month after the COVID-19 initiation, it had been spreading worldwide and been declared as a global pandemic and a public health emergency of international concern (PHEIC), which was the WHO's highest level of alarm under international law (World Health Organization, 2020). Amid the COVID-19 impacts, the global and local (Thai) aviation fuel market had been adversely distressed and in particular, it caused 90 percent decline in aviation fuel revenue of PTTOR. Perceiving the situation as apparent evidence that illustrated the risk of market concentration, management team had been discussing about the plan to manage PTTOR concentration risk by geographically diversifying into the European market.

The situation has triggered the Vice President to assign task on risk management plan to the Risk and Planning Division, Mr. Pattra to prepare the report and the presentation on the alternative response actions that the PTTOR could exercise. In specific, the task is expected to include concentration risk, country's attractiveness and risk analysis, and the international market penetration opportunities and challenges. The report and presentation are expected to be delivered during the internal management meeting scheduled in the upcoming week.

PTT Oil and Retail Business Public Company Limited : Overview & Developmental Highlights

> *"...Retailing beyond fuel - OR uplifts the petrol station experience to be "more than just a petrol station" for consumers by engaging a variety of retail business to fulfill every need for every lifestyle ..."*
>
> Message from the Board of Director, PTTOR's Annual Report 2020, p. 23.

PTT Oil and Retail Business Public Company Limited ("PTTOR") was a PTT Group flagship company operating the oil and retail businesses in domestic and international markets radiating from its home base in Bangkok, Thailand to its neighborhood countries in continental Southeast and East Asia including Lao P.D.R., Cambodia, Philippines, Myanmar, Singapore, and China (See Exhibit 1: PTTOR International Business). Initially, PTTOR was the core business of PTT PLC established on December 29, 1978 under the Petroleum Authority of Thailand Act B.E. 2521 (1987) to operate petroleum and other related businesses with the aim to solve the second world crisis of petroleum shortages (See Exhibit 2: The 1978 – 2020 Developmental Highlights of PTT & PTTOR). Later, PTT was corporatized into a public company limited under the Corporatization Act B.E. 2542 (1999) with registered capital of 20 billion THB. in the Stock Exchange of Thailand on December 6, 2001, while maintaining the status as a state enterprise under the supervision of the Ministry of Energy. Over the course of decades, the Oil Business under PTT PLC expanded rapidly, and continuously created value through business chain ranged from upstream, intermediate, downstream, to end customers (See Table 1: The Oil Business in PTT's Business Value Chain)

Table 1: The Oil and Retail Business in PTT's Business Value Chain

PTT PLC	Upstream	Intermediate	Downstream	End customers
Oil Business	Crude Oil Procurement, Trading	Logistics, Refineries	Oil, LPG, Lube Base Plant	PTT stations, Transportation, Household, Lubricant
Gas Chain	Exploration and Production	Gas Separation and Plants	Industry	District Cooling System
Infrastructure Business	Natural Gas, Crude and Petroleum Products	Gas Transmission Pipeline	Power Plants, NGV	Electricity

Table 1: The Oil and Retail Business in PTT's Business Value Chain (Continue)

PTT PLC	Upstream	Intermediate	Downstream	End customers
Petrochemical Chain	Olefins and Aromatics Plants	Petrochemical Intermediate Plants	Plastic and Bio-Plastic Resins	End Product, Export Market
New Business	Coal Mining	Biodiesel Plants and Ethanol Plants, Asset Management and Facility Management	Sustainability Management/Consultancy, Engineering and Project Management	Gasohol (E10, E20, E85), Biodiesel (B7)
Oil Business	Crude Oil Procurement, Trading	Logistics, Refineries	Oil, LPG, Lube Base Plant	PTT stations, Transportation, Household, Lubricant

Sources: https://ptt.listedcompany.com/misc/factsheet/20210319-ptt-factsheet-2020.pdf (Access date: December 9, 2021)

PTT Oil Business operated oil distribution covering petroleum products (fuel oil and LGP), lubricants, and retail business in Thailand and overseas. There were three customer segments, which could be categorized into:

1) Commercial Business (B2B) including corporate customers, public sector (government agencies and state enterprises) and the private organizations who purchased petroleum products for their internal uses,

2) Supply Sales who were oil sellers or vendors, and

3) Retail Business (B2C) including consumers and gas station operators through its nationwide network of over 1,300 gas stations. Its retail businesses also covered Café Amazon, PTT Fit Auto car care service, LPG (cooking gas) retailers, and lubricant

retailers. By the year 2015, the company operated 8 Petroleum Oil Terminals, 15 LPG Terminals, and 14 Aviation Fuel Terminals/Stations across Thailand. (See Exhibit 3: Petroleum Terminals and Aviation Fuel Station Map). PTT Oil and Trading Business generated the biggest proportion of revenues to PTT PLC. Revenue from oil business comes from marketing margins of diesel oil, jet oil, and gasoline.

To enhance the potential competitive advantage and flexibility of its Oil and Retail Business during the wake of intensified market competition, on July 1, 2018, PTT restructured its organization and transferred all businesses under its Oil Business Unit, including the shares of related companies, to PTT Oil and Retail Business Public Company Limited (PTTOR). Since then, PTTOR continued to grow and build its own accomplishments. 2018 marked a good year for PTTOR business outlook being the leader in the oil industry due to rise in oil price based on global economic growth and China's control of commodities supply (see Exhibit 4: PTTOR's market share in the year 2019-2020). During the year 2020, PTTOR expanded its business into various segments through activities including (1) a partnership with Flash Incorporation Co., Ltd. ("Flash") to explore business opportunities in the mobility and lifestyle ecosystems, where Flash provides express delivery and integrated e-commerce business under the brand "Flash Express", (2) an international expansion of Café Amazon in Vietnam through a joint venture with Central Group, and (3) an investment in Peaberry Thai Company Limited not only to support the operation of Café Amazon outlets as this new company will source raw material, procure equipment, and provide equipment maintenance service to Café Amazon but also to open up an opportunity to enter the specialty coffee market through the Pacamara brand.

As of December 31, 2020, PTTOR operated 2,367 gas stations, 3,729 Café Amazon outlets, 2,118 convenience store (Jiffy and 7-Eleven) outlets in the domestic and international markets. In addition, retail business also comprised restaurants where it had bought the right in expanding businesses including Hua Seng Hong (only dim sum products), Daddy Dough, and Texas Chicken. (See Table 2: Portfolio of the PTT's Business Value Chain).

Table 2: Portfolio of the PTTOR's Business Value Chain

	Total Million THB	Oil Business	Non-Oil Business	International Business	Other Business
Revenue	428,804	90.9%	3.9%	4.9%	0.3%
EBITDA	17,619	68.9%	25.5%	4.9%	0.7%

Sources: PTTOR's Annual Report 2020, p. 23

Table 2 illustrates that most of PTTOR's revenues (90.9 percent) came from their oil business. In this business area, PTTOR supplied gasoline, diesel, liquefied petroleum gas (LPG), lubricants, kerosene, and several other products at over 1,900 PTT Stations operated across Thailand, which were enriched by retail businesses like a convenience store, a Café Amazon coffee shop, an eatery, or a car care service under the concept of Living Community which were also operated by PTTOR. Additionally, PTTOR distributed different oil-based products like fuel or lubricant to over 2,000 customers including aviation, marine, and industrial customers, as well as government agencies and they were also offering different consultations as an Energy Solution Provider.

The second source of their revenues (4.9 percent) was generated in their international business. This business comprised a network of 337 retail fuel service stations, 5 FIT Auto service stations, 265 Café Amazon outlets and 95 Jiffy convenience stores across the Philippines, Cambodia and Laos.

The third source of revenues (3.4 percent) was generated with PTTOR's non-oil business. This included the previously mentioned retail businesses. In this area, the company's network consisted of Café Amazon outlets, the Thailand's largest café chain, food and beverage outlets, and convenience stores. In this context, the Café Amazon outlets offer coffee and other refreshments, bakery products and light meals, the beverage outlets offer light meals and beverages, under the licensed brands "Texas Chicken", "Hua Seng Hong Dim Sum" and "Pearly Tea".

Lastly, under the brands "Jiffy" and "7-Eleven" a variety of food, beverages and basic goods are offered. Furthermore, PTTOR also provides space management services, comprising leasing and other services, which allow other brands and business to operate their business in locations managed by PTTOR. Due to this business carrying an operating profit margin of nearly 20 per cent

(compared to 1-2 percent for oil sales), PTTOR had been planning to expand this business area by investing 74 billion THB during the following five years (2022-2026), which also included buying a 20 per cent stake in an organic food restaurant, Ohkajhu, for 500 million THB and a partnership with a food delivery platform Line Man Wongnai (Reuters, 2021). This long-term plan also included an overseas expansion to triple the number of overseas shops in its Cafe Amazon coffee chain to 1,000 by 2025 (Asia.Nikkei, 2021).

After the split from PTT PLC, PTTOR distributes a wide variety of products to customers in various segments including aviation, marine, industrial customers, and government agencies. Oil Business became the major contribution to the PTTOR revenue. Aviation fuel business group expanded to neighboring countries including Cambodia, Philippines, and Hong Kong.

PTTOR in the Aviation Fuel Industry

PTTOR had been distributing premium aviation fuels since 1975. It had been the aviation fuel supplier to more than 60 leading commercial airliners worldwide under strict adherence to the JIG Standards (Joint Inspection Group standards for aviation fuel quality control and operating procedures). PTTOR replete product logistics system and its efficiency, whether piped, trucked, shipped or 200-liter tanked. PTTOR also offers over 60 aviation fueling vehicles, including dispensers, refuelers, and trailers, covering over 15 domestic airports and over 100 airports in 15 countries via its cooperation with leading local companies.

Aviation Fuel Market in Thailand

Aviation fuel was produced and provided by the oil and gas industry, which strongly depends on the aviation industry. The top 3 oil and gas companies that provided aviation fuel in the Thai market were: Exxonmobil, PTTOR, and Bangchak. PTTOR was leading with an oil market share of 37.23 percent, Exxonmobil which belongs to Esso had an oil market share of 10.74 percent and Bangchack had a market share of 10.10 percent (Mordor Intelligence, 2021). The main customers who consumed aviation fuel were the Airforce, airports, and civil aviation.

The oil corporations worked with the fuel in service provider BAFS (Bangkok Aviation Fuel Services) and they supplied Jet A-1 to all airlines that fly out of Suvarnabhumi, Don Mueang, Samui, Sukhothai, and Trat Airports. The into-plane service cost was included in the Into-wing Contract when the oil firm formed a fuel contract with the airline.

Due to the COVID-19 pandemic, the overall market value of the oil and gas industry had been declined by 39.9 percent (MarketLine, 2021). As a result of the decrease, the crude oil prices started to drop and since Thailand's reserve on crude oil was also in deficiency, the import of crude oil started to increase (Mordor Intelligence, 2021). The most affected part of the oil and gas industry was the aviation fuel, which was due to the impact the covid-19 restrictions on the aviation industry.

Impact of the COVID-19 on the Aviation Market

As the COVID-19 pandemic had globally affected the economy, it had negatively impacted the travel market, which had also inflicted the aviation industry. The impact of the pandemic on the aviation industry was shown in the following table in terms of the decreasing rates of the passengers' seats globally in 2020 compared to the year 2019. (See Table 3: Decline in Passenger Seats Globally in 2020 compared to 2019).

Table 3: Decline in Passenger Seats Globally in 2020 compared to 2019

Number of Passenger Seats	World	Asia Pacific
Total	-50%	-45%
International	-55% - 64%	-71.9% - 77.5%
Domestic	-18% - 23%	-12.9% - 16.2%

Sources: State of Thai Aviation Industry 2020, The Civil Aviation Authority of Thailand, 2021, p.3

As shown in the table, there was a decline of 50 percent of the world's passengers' seats and a decline of 18-23 percent of passengers' seats for Thailand. Table 3 illustrates how worldwide and domestic travel restrictions have resulted in significant cutbacks in the aviation industry. In 2020, there were 64.7 percent fewer passengers than the previous year, with international passengers falling by 81.7 percent and domestic passengers falling by 44.9 percent. The total number of flights dropped by 53.1 percent, with international flights falling by 73.9 percent and domestic flights falling by 33.8 percent. Thailand's Airfreight was also affected, even though there have been no restrictions on airfreight transportation. The reason why there have been declines was that the airfreight transport of Thailand operates with passenger's flights instead of freighters (see Table 4: The Statistics of Thailand's Air Transport in 2020 compared to 2019).

Table 4: The Statistics of Thailand's Air Transport in 2020 compared to 2019

Air Transport	Passenger		Flight		Freight	
	Million	%	Number	%	Ton	%
Total	58.25	-64.7%	500,435	-53.1%	954,377	-36.0%
International	16.25	-81.7%	133,940	-73.9%	922,163	-34.7%
Domestic	81.70	-44.9%	366,495	-33.8%	32,214	-58.6%

Sources: State of Thai Aviation Industry 2020, The Civil Aviation Authority of Thailand, 2021, p.4

As a result, the demand for aviation fuel has declined the most, for about 54 percent, in comparison to gasoline, which decreased by 11.4 percent, and petrol by 0.2 percent. Furthermore, as illustrated in Figure 1, the Jet fuel prices started to decline, with the EIA predicting that global oil demand would only return to pre-pandemic levels in 2022. According to the Thai Energy Policy and Planning Office, aviation fuel consumption would average 8-11 million gallons per day in 2021, up from 7.3 million litres per day in 2020. According to Krungsri Research, commercial demand for jet fuel would progressively increase to 19-20 million litres per day by 2023, the level before the first COVID-19 outbreak (Krungsri, 2021). Moreover, to help the aviation industry the government has approved a jet fuel tax reduction and in 2020 the prices of jet fuel had reached record lows as seen in Figure 1.

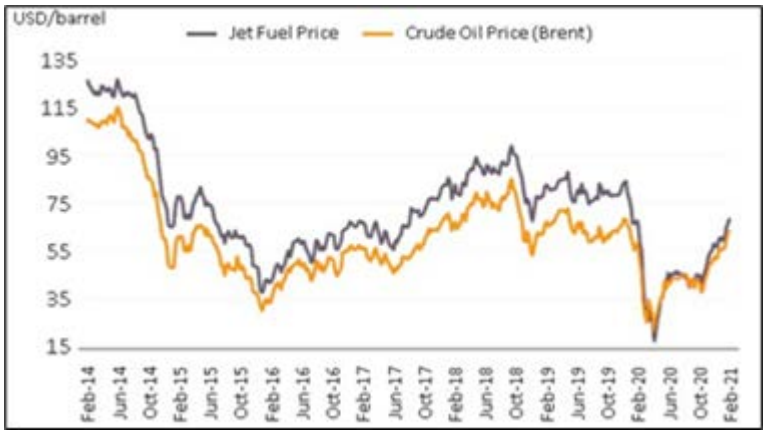


Figure 1: Decline in Jet Fuel Prices

Sources: Krungsri.com

To sum up, the pandemic had a heavy toll on the aviation industry and the aviation fuel market. Therefore, the prospects of a recovery for the industry are tied with the measures of getting the pandemic under control

Impact of the COVID-19 Pandemic on the Aviation Fuel Market

Since 2009 global fuel consumption by commercial airlines was increasing each year, reaching an all-time high of 95 billion gallons in 2019. The pandemic has reduced fuel consumption to 52 billion gallons in 2020 and increased to 57 billion gallons in 2021 (Statista, 2021). As can be seen in Figure 2, there was a slump in demand for gasoline of more than 50 percent in March 2020, due to the outbreak of the pandemic. It could also be seen that demand in China has recovered more quickly than in Europe or the USA. (See Figure 2: Decline of Jet Fuel Sales Volume During the Year 2020).

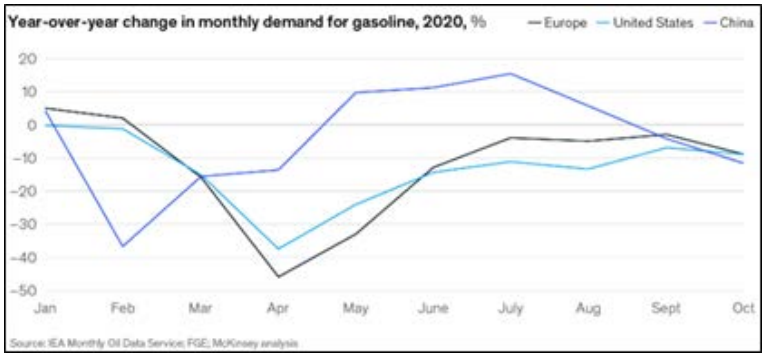


Figure 2 Decline of Jet Fuel Sales Volume During the Year 2020

Sources: McKinsey.com

The reduction in passenger flights in 2020 by about 75 percent compared to 2019, came from the lockdowns imposed by many countries and the attempt to contain the virus and the share of global air cargo capacity remained unbalanced (Statista, 2021). Globally, jet fuel consumption for commercial passenger flights decreased by 0.7 million barrels per day between February and March 2020, before increasing to 2.4 million barrels per day between March and April. It recovered by only 0.1 million barrels per day in May and 0.3 million barrel per day in June 2020 (Daily Energy Insider, 2020).

The third wave of COVID-19 hit Thailand hard, worsening the situation for airlines as passenger volume fell from 35.5 percent to 27.8 percent, according to the Civil Aviation Authority of Thailand (CAAT). As Thailand was particularly dependent on tourism, the country was one of the hardest-hit markets, with seat capacity at 13 percent of pre-pandemic levels (Bloomberg, 2021). The aviation and the tourist industry also played a major role in Thailand's economic growth. The jobs and expenditure generated by airlines and their supply chain, the flows of trade, tourism, and investment generated by users of all airlines servicing the country, and the city pair linkages that enable these flows were the three ways that the aviation business impacts the economy (IATA, 2017). The Thai aviation market had a compound annual growth of 11.4 percent with an average annual growth rate of international passengers of 10.8 percent and an average annual growth rate of domestic passengers of 12.1 percent from 2010 up until 2019 (The Civil Aviation Authority of

Thailand, 2019). Crude oil prices have fallen from 67.3 USD per barrel late last year to 23.4 USD per barrel in the first quarter of 2020 due to the oil price war between the Organization of Petroleum Exporting Countries and Russia and oversupply (PTTOR, 2021; Reuters, 2020).

Impact of the COVID-19 Pandemic on PTTOR

Due to the sharp drop in oil prices and the decline in demand for petrochemicals, which has led to heavy losses, PTTOR PCL, Thailand's largest energy company, planned to cut back its domestic investments by 15 percent and postpone investments that were not a priority. For the first quarter in 2020, the company reported a loss of 1.55 billion THB (48.2 million USD). This represented the first loss in four years, as the same period last year saw a profit of 29.3 billion THB (Reuters, 2020). Also, PTTOR announced that oil and fuel sales fell by 10 percent due to the mobility restrictions imposed by COVID-19 (Thai Enquirer, 2021). The refinery's operating profit has decreased by 35.7 billion THB from inventory loss as a result of the oil price decline. (See Table 5: PTTOR's Financial Performance during the year 2019-2020).

Table 5: PTTOR's Financial Performance during the year 2019-2020

	Unit	2019	2020	Variance
Sales	Million THB	577,134	428,804	-25.7%
EBITDA	Million THB	17,005	17,619	+3.6%
Net Profit	Million THB	10,896	8,791	-19.3%
Earnings per Share	THB	1.21	0.98	-19.0%
Return on Equity	Percent	32.7	22.9	-30.0%
Return on Assets	Percent	7.3	5.9	-19.2%
Debt to Equity	Times	0.7	1.1	+57.14%
Paid up Share	Million Shares	9,000	9,000	

Sources: PTTOR's Annual Report 2020, p. 22

Accordingly, PTTOR planned to reduce the production of jet fuel and produce diesel fuel as the demand for it has only slightly decreased, and expected the refinery utilization rate to reach 90 to 100 percent in 2020 (Reuters, 2020). For 2021, PTTOR has reduced its business expansion targets as the third wave outbreak wreaks havoc on the economy and reduced demand for both the oil and non-oil sectors. Analysts at KGI Securities estimated OR's oil and fuel sales for the full year 2021 at 22.8 billion litres, down from 24.4 billion litres in the previous year, and forecast an annual profit of 11.7 billion THB (Thai Enquirer, 2021). Going forward, PTTOR was laying out a five-year, 180.8-billion-THB investment plan that would expand its gas business. In addition, 203.5 billion THB of preliminary investments were flowing into liquefied natural gas and gas-to-power projects (Reuters, 2020).

The decline in PTTOR's performance during the year 2019-2020 was primarily attributed to the sharp decrease in global petroleum product prices, the continuation of price war between the OPEC and Russia that pulled up global oil supply simultaneously with an unexpected plummet in global demand for petroleum products due to the COVID-19 pandemic, and the decline in domestic demand as a result of the government response policies to COVID-19 pandemic in Thailand including the quarantines, closure orders, curfews, and widespread travel restrictions. Jet fuel was seriously affected the most by sharp drop in air travels and international flight restrictions. Moreover, the non-oil business also experienced, although not as much as the oil business, a slight reduction in sales from convenience stores (see Table 6: PTTOR's Sales Growth Categorized by Business and Table 7: Performance of the Top Four Oil Business Segments).

Table 6: PTTOR's Sales Growth Categorized by Business

Unit: THB Million	2019	2020	Variance
Total Sales	577,134	428,804	-25.7%
Oil	539,835	396,708	-26.5%
Non-Oil	17,016	16,867	-0.9%
International	33,656	21,361	-36.5%
Other	1,715	1,609	-6.2%

Sources: PTTOR's Annual Report 2020, p. 22

Table 7: Performance of the Top Four Oil Business Segments

Unit: THB Million	**2019**	**2020**
Total Volume Sold	27,627	24,400
Diesel	40.2%	46.3%
Gasoline	21.4%	24.7%
Aviation Fuel	15.8%	7.2%
LPG	14.7%	14.0%

Sources: PTTOR's Annual Report 2020, p. 135

Table 7 illustrates the proportion of the total volume sold on the top four oil business segments. It can be seen that there was a drop in the total volume sold. However, there was an alteration in the proportion of each oil product. Diesel and gasoline, the top two oil business segments have gained higher proportion in the year 2020, compared to their proportion in the year 2019. LPG experienced merely slight decline. While Aviation fuel had experience the most adverse impact from the COVID-19 pandemic as evidenced by the huge loss of its volume sold proportion, from almost 16% down to only 7% approximately, causing it to fall in the volume sold proportion from the third rank to the fourth rank (See Exhibit 5: PTTOR's Financial Summary during the year 2019-2020).

Based on the empirical evidences and the above information, it could be concluded that there were several risk factors that PTTOR had experienced during the unexpected event of the COVID-19 pandemic including the fluctuation in fuel price, the sharp decline in aviation fuel demand, the travel restrictions, and the unforeseeable economic recovery that resulted in its disappointing operating and financial performance during the year 2020. Therefore, it was essential that PTTOR closely monitored its risk factors and employed an effective risk management practice.

Risk Management of PTTOR

PTTOR established the Enterprise Risk Management Committee (ERMC) to engage in risk management in order to achieve sustainable growth and to maintain the confidence of shareholders and all groups of stakeholders. ERMC was responsible for several key activities including:

1. providing opinions on and approvals of the company's annual risk management plan, ensuring its consistency with strategic directions, business plans, and key indicators.

2. providing opinions on new investment projects/ large-scale investment projects that presented significant risks to the company.

3. closely monitoring the company's risk management during the COVID-19 pandemic and proposing proactive management to prevent the escalation of risks into issues.

Essentially, an apparent evidence at the current situation demonstrated that the above three key activities of the ERMC were vital to PTTOR's sustainable growth and its prospects for the year 2022. Consequently, the top management had been preparing for its strategic plan with the aim to manage its concentration risk by having a risk diversification in terms of geographic expansion and variety in its business segments. In specific, the management team had been discussing on the concentration risk management plan by geographically diversifying into the European market. Although this long-term expansion plan had been prolonged on shelf for a length of time, the management was still indecisive on which country in the European market would be more opportune for PTTOR's penetration. This circumstance has prompted the Vice President to assign task on the concentration risk management plan to the Risk and Planning Division, Mr. Pattra to develop the report and the presentation on the alternative response actions that the PTTOR could exercise. In specific, the task is expected to include the European market expansion plan, starting with a country screening process, an analysis on country's attractiveness, and the international market penetration opportunities and challenges. The report and presentation are expected to be delivered during the internal management meeting scheduled in the upcoming week.

A Pertinent Time to Pull Off

With an ongoing burden from the shareholders' expectation toward PTTOR operating and financial performance for the upcoming year, the president had made unequivocal when he appointed Mr. Pattra to formulate the scheme of work on the international market expansion plan and conduct an investigation on the country risk analysis and attractiveness, and the anticipating opportunities and challenges. the analysis was an urging priority since the concentration risk utterly contributed to PTTOR's operating and financial performance during the year 2020. If the expansion was to be successful, the longer time it was deferred, the higher opportunity cost from concentration risk that PTTOR had to bear with. Mr. Pattra had to propose an optimum country based on his analysis on country screening and country's attractiveness, together with the anticipated opportunities and challenges before the upcoming Board Meeting on April 14, 2021.

Addendum of Exhibits

Exhibit 1: PTTOR International Business

PTT (LAO) Co.,LTD., Lao P.D.R. Website : www.pttlao.com
PTT (Cambodia) Limited, Cambodia. Website : www.pttcambodia.com
PTT Philippines Corporation, Makati City, Philippines. Website : www.pttphilippines.com
Brighter Energy Company Limited, Myanmar. Email : info@brighterpttor.com PTTOR Singapore Private Limited, Singapore. Website : www.cafeamazon.sg PTTOR International Holdings (Singapore), Singapore. Email : interholdco_sg@pttor.com PTTOR CHINA (Shanghai) Company Limited, Shanghai, the People Republic of China FST Aviation Services Limited, Hong Kong International Airport Lantau, Hong Kong

Exhibit 2: The 1978 – 2020 Developmental Highlights of PTT & PTTOR

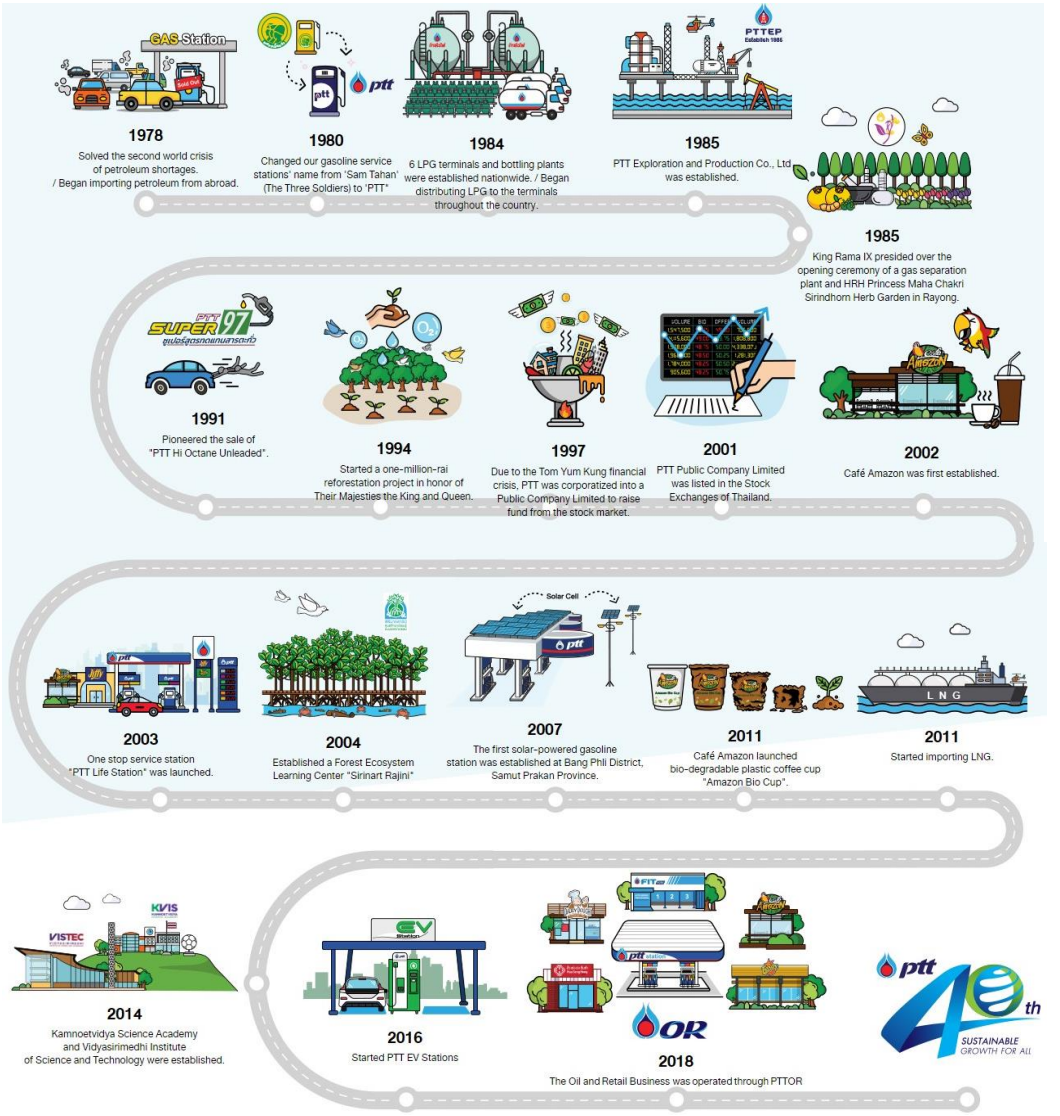


Exhibit 3: Petroleum Terminals and Aviation Fuel Station Map

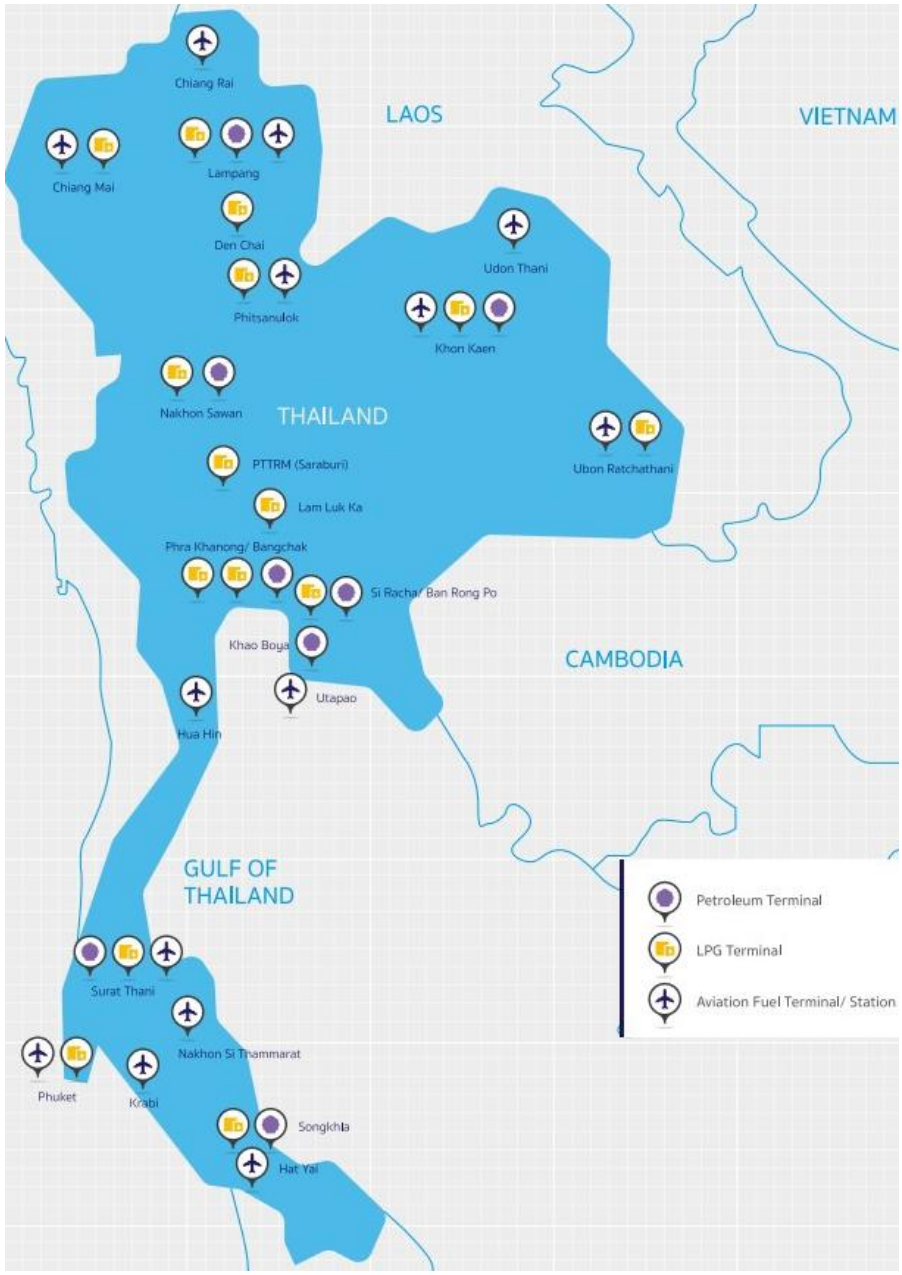
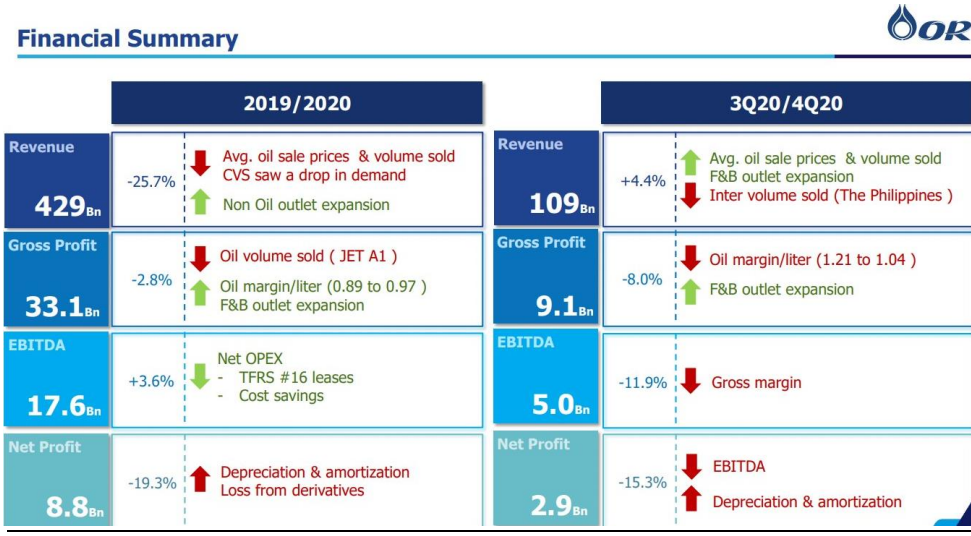


Exhibit 4: PTTOR's Market Share in the year 2019-2020

Source: Department of Energy Business, Ministry of Energy

Total product (FO-EGAT excluded)

Exhibit 5: PTTOR's Financial Summary during the year 2019-2020



Additional sources: More figures and tables are available from https://investor.pttor.com/en/downloads/one-report, https://investor.pttor.com/en/stock-info/historical-price https://or.listedcompany.com/misc/presentation/20210225-or-am-fy2020-02.pdf, https://www.pttor.com/en/about/business/business_or/International-Business International Business (pttor.com), https://www.pttplc.com/en/About/About-Ptt/Background.aspx, PTT Public Company Limited: Our History (pttplc.com),Hofstede Insights website (https://www.hofstede-insights.com/country-comparison/),

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Applying Lean Six Sigma to Improve Telephone Bill Payment: A Case Study of A Real Estate Developer

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Abstract

This case study is about deploying Lean Six Sigma methodology to improve performance as well as assist in developing improvement practices in organizations. The objectives of this study are to focus on process efficiency and to ensure that the payment lead time is within the due date. The steps have been taken through systematic thinking, including DMAIC, and by utilizing Lean tools to streamline the process. The Six Sigma methodology uses data and facts to identify the root causes of the problem, while the Lean method eliminates wastes and non-value-added steps. Process Flow, Fishbone Diagram, and Failure Mode and Effects Analysis (FMEA) are utilized to confirm causes and provide potential improvement actions. In the end, the accounting staff reduced the workload in handling the telephone bill payments from five days to two days per month. The administrative staff and the management have spent less time dealing with all the telephone invoices. This was done by eliminating some non-value-added steps. Moreover, the payment lead time can be processed on time with accuracy.

Keywords: DMAIC, FMEA, Lean Six Sigma, Payment Process, Process Improvement

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การประยุกต์ใช้ลีนซิกซ์ซิกม่าในการปรับปรุงกระบวนการชำระบิลค่าโทรศัพท์จากกรณีศึกษาของบริษัทพัฒนาอสังหาริมทรัพย์

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บทคัดย่อ

กรณีศึกษาเรื่องนี้เกี่ยวกับการนำกระบวนการลีนซิกซ์ซิกม่ามาใช้ในการปรับปรุงการดำเนินงาน ซึ่งรวมถึงการพัฒนาปรับปรุงวิธีการปฏิบัติงานในด้านต่างๆขององค์กรให้ดีขึ้น วัตถุประสงค์ของการศึกษามุ่งที่ความมีประสิทธิภาพของกระบวนการเพื่อทำให้มั่นใจว่าระยะเวลาในการชำระเงินอยู่ภายในกำหนดเวลา ขั้นตอนการดำเนินงานได้ผ่านกระบวนการคิดอย่างมีระบบและได้ใช้หลัก DMAIC ร่วมกับเครื่องมือของลีนในการช่วยให้กระบวนการสั้นและกระชับ วิธีการของซิกซ์ซิกม่าใช้ข้อมูลและข้อเท็จจริงในการหาสาเหตุที่แท้จริงของปัญหา ในขณะที่กระบวนการลีนลดความสูญเสียและขจัดขั้นตอนที่ไม่ก่อให้เกิดคุณค่า แผนภูมิแสดงกระบวนการไหล แผนภูมิก้างปลา การวิเคราะห์ข้อบกพร่องและผลกระทบถูกนำมาใช้เพื่อแสดงสาเหตุของปัญหาและแนวทางการปรับปรุงกระบวนการสุดท้ายแล้วพนักงานในแผนกบัญชีสามารถลดปริมาณงานในการทำจ่ายบิลค่าโทรศัพท์จาก 5 วัน เหลือเพียง 2 วันในแต่ละเดือน พนักงานที่ทำงานธุรการและผู้บริหารต่างใช้เวลาลดลงในการจัดการกับบิลค่าโทรศัพท์ซึ่งมาจากการลดขั้นตอนที่ไม่ก่อให้เกิดคุณค่ายิ่งไปกว่านั้นการทำจ่ายบิลค่าโทรศัพท์อยู่ภายในกำหนดเวลาและมีความถูกต้อง

คำสำคัญ : ลีนซิกซ์ม่า กระบวนการจ่ายเงิน การปรับปรุงกระบวนการ การวิเคราะห์ข้อบกพร่องและผลกระทบ

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Introduction

To compete in a dynamic business situation and explore ways to enhance the bottom line, organizations are looking for strategies for process improvement. Six Sigma was introduced and applied more than 20 years ago. Lean Six Sigma has received extensive use around the world. Applying Lean Six Sigma (LSS) is one of the popular tools used to help organizations succeed in improving their processes that enhance customer satisfaction and financial savings (Gijo, Antony, & Sunder, 2019; Snee, 2010). Lean Six Sigma can enhance many business areas, such as streamlining the process flow to reduce complexity, improving product quality, and reducing process variation (Snee, 2010). In addition, the benefit of using LSS is its methodology in situations where the solutions are unknown and the root causes are not understood (Gijo et al., 2019). Applying Lean Six Sigma requires a systematic approach to attack the problem (Antony, 2012). Then, the team must analyze and identify root causes based on data and facts. Therefore, improvement should be made properly and able to solve the problem effectively.

This case is conducted by applying the Lean Six Sigma practice to one of the land developers in Thailand. The company has been unidentified and is named SA Company. The company constructs condominiums, houses, and townhouses, and each construction site is called a "project site." This study focuses on the payment process of telephone bills. This payment process has involved several units of the organization, including telephone and internet users, administrators of each unit, accounting, and treasury departments. The various process steps, including obtaining an invoice and preparing a memorandum, until processing payment in the system, are quite complicated and time-consuming. Sometimes, administrators who are involved in document preparation are confused with various due dates and different service providers; therefore, delayed payments happen. If this kind of problem persistently occurs, service providers may terminate and stop the services for those specific phone numbers. Therefore, the management has realized the importance of paying the telephone bills on time. Once, the company has implemented Lean Six Sigma training and desires to improve several projects related to customers as well as enhance the efficiency of the process. This project has been assigned to the working team and has been deployed as the Green Belt project.

Currently, the administrative staff of each project site prepares the documents for the payment process. These documents are approved by the management and sent to the Accounting Department for processing the payment to the vendors. Telephone costs are one of the main utility expenses of the SA Company. The current payment processes are time-consuming and require an accounting staff to proceed with the transactions for five days per month. For each project site, the administrative staff prepares the documents based on due dates, which are different every week. Therefore, SA Company decided to deploy LSS to improve process efficiency.

This case study has incorporated LSS methodology to improve telephone bill payment by combining Lean tools with the Six Sigma concept (Define, Measure, Analyze, Improve, and Control phases). LSS is the right choice since the root causes of the problem and solutions are not unknown. Wastes and non-value-added steps are identified by Lean tools. The Six Sigma method has helped team members become more organized and rational in their approach to the problem. This case has shown how to apply lean LSS with the support of team members and make conclusions based on facts rather than gut feelings. Some tools have scoring and rating methods that can reduce subjectivity in the transactional areas.

Literature Review

Six Sigma

Six Sigma is a business concept first developed by an engineering team of Motorola in 1979 that includes various tools used for reducing process variation (Harry & Schroeder, 2000). The structure of Six Sigma involves statistical tools to obtain knowledge and identify the root causes of problems (Breyfogle III, 1999). Companies deploying the Six Sigma methodology improve their process quality, which is consequent upon the final product or service and can enhance customer satisfaction. Furthermore, companies can increase their profitability through quality and efficiency improvement (Harry & Schroeder, 2000). GE claimed that Six Sigma delivered more than $300 million in operating income in 1997 (Breyfogle III, 1999).

Moreover, many world-class companies, for example, Motorola, Honeywell, and Sony, have reported substantial benefits of the Six Sigma practice (Lee et al., 2013). According to the study by Smutkupt and Naratornsawatdikul (2019), the practice of DMAIC steps supports the solution to eliminate delayed delivery problems and ensure improvement sustainability in the long term.

Six Sigma methodology consists of five phases, which are Define, Measure, Analyze, Improve, and Control (DMAIC) (Sheila & Shahbaz, 2012). The objective of the Define phase is to identify the problem, customer, and scope of the project. A project charter is prepared during this phase to reveal necessary information to be shared among the team members and a project champion. The main objective of the Measure phase is to understand the current state of the process. The data collection plan must have been conducted.

In the Analyze phase, the root causes of the problem are investigated and confirmed based on the collected data (Schroeder et al., 2008). The objective of the Improve phase is to develop improvement actions to reduce/eliminate the root causes and validate the improved results. In the Control phase, the improved actions are monitored by the process owner to ensure that the root causes will not reoccur (Sangphang et al., 2020; Sheila & Shahbaz, 2012).

Generally, projects are identified as Black Belt, Green Belt, or Yellow Belt as they depend on the complexity of the problems under investigation (Gijo et al., 2019). Normally, Black Belts have been assigned to work full-time to be responsible for executing their application projects, while Green Belts are part-time and can take on mini-projects of their own (Harry &Schroeder, 2000). Black Belt can initiate and implement large-scale and cross-functional projects. Green Belt usually leads Six Sigma projects within their functional units. Regarding Yellow Belt, the roles and responsibilities are less than the Black Belt and Green Belt. Yellow Belt is usually assigned as a team member of Black Belt or Green Belt projects. Another main concept that is widely used in the process improvement project is the Lean methodology, which is discussed in the next topic.

Lean Concept

The Lean philosophy is introduced and is mainly based on the Toyota production system, which develops the production processes to remove overburden, enhance smooth production, and eliminate waste (Furterer & Elshennawy, 2005). The concept of Lean normally focuses on streamlining the process by eliminating non-value-added work and achieving zero waste in the system, which helps provide better quality (Chahal & Narwal, 2017). Lean operations are considered very efficient and have few wasted resources Under Lean, originally, there were seven types of waste, which were overproduction, delays, excess transport or defects from transport, overprocessing, excess inventory, excess movement, and making defects (Langley et al., 2008; Villareal et al., 2012). Since Lean has evolved into the rest of the organizations around the globe, additional waste and non-utilized talent have been added.

In a study conducted by Villareal et al. (2012), the Lean manufacturing approach was also applied to eliminate waste in the distribution operation by using value stream mapping and paying attention to bottleneck facilities. In addition, a study by Chahal and Narwal (2017) reviewed the literature on Lean manufacturing and Lean strategies. They mentioned that it was not practically easy to implement because no one had wanted to change it until it was highly required. However, Lean practices have more advantages than the traditional system and are still popular nowadays. Later, the combination of the principles and tools of Lean and Six Sigma emerged and was named Lean Six Sigma.

Lean Six Sigma (LSS)

Lean Six Sigma (LSS) concept focuses on enhancing quality, reducing variation, eliminating waste (Furterer & Elshennawy, 2005; Snee, 2010), improving cycle time, and eliminating non-value-added steps (Snee, 2010). Currently, a number of researchers apply LSS to improve the organization's performance in the manufacturing process, services, and support functions. Technically, Lean tools are used to focus on the speed of the process, while Six Sigma is used to improve the accuracy (Salmon, 2017) by identifying the root causes of the problems (Sangphang et al., 2020).). Generally, LSS is focused on finding the variables that account for the

main variations in the process, which is aligned with the Pareto concept (Snee, 2010).

Burch et al. (2016) presented a case study on the application of LSS in service-based logistics organizations. The LSS methodology helped to identify the potential areas for improvement, eliminate development rework, and speed up the proposal review process. Also, various quality tools related to this study were applied. A house of the quality diagram (QFD) helped to identify a number of engineering requirements that reflected the customers' viewpoints. A Fishbone diagram was used in the Measure phase to identify the root causes of the problem. Moreover, a Pareto chart was used in the Analyze phase to point out the main causes of issues. This case has demonstrated how LSS helped to streamline the processes of selecting and implementing a new ruggedized handheld device for their field workers

Additionally, in a study by Gijo et al. (2019), the authors applied the LSS methodology to reduce the complaint resolution time from 12.5 to 8.5 hours and the turn-around time of all main processes in the company. The authors have utilized a case study approach in the system maintenance department. They have worked systematically through the define, measure, analyze, improve, and control phases. In the Define phase, identifying the problem and scope were addressed. After that, in the Measure phase, collecting data to understand the current process and the performance baseline was conducted. During the Analyze phase, the team used a flow chart to understand the process complexity by investigating value-adding or non-value-adding activities. Moreover, brainstorming with the team to identify potential causes of delay in complaint resolution was also applied. After that, the selected solutions for the root causes were implemented. Finally, in the Control phase, the sustainability of the results such as standardization procedures and training employees was implemented.

According to previous research, the LSS approach can be applied to several situations, and numerous quality tools can be properly chosen to handle different types of data based on the company's evidence.

Process Flow

The Process flow is a tool used to recognize the inputs, outputs, and other factors that can affect the process. It represents the sequence of products, paperwork, operator activities, or administrative procedures. Generally, the Process flow is often a starting point for process improvement and can be used to identify unnecessary complexity, duplication, or redundancy, and it also helps generate ideas for improvement (Salmon, 2017).

A number of studies used the Process flow/map as one of the key tools in dealing with process improvement issues. For example, a study by Kuaites et al. (2020) confirmed that the Process map helped to see the complete working steps more clearly; therefore, the delays, bottlenecks, or incorrect steps were identified. A study by Lee et al. (2013) revealed that the team used this tool to collect information about the refund process to establish relationships between input and output variables and to identify possible sources of processing errors and inefficiencies. Moreover, a study by Sangphang et al. (2020) used the Process map to visually highlight delays and breakdowns in the process. After that, the operation team brainstormed potential actions to improve the process. Then, the new Process flow was redesigned and verified; consequently, the process lead time was reduced from 11 hours to 4 hours.

Fishbone Diagram

A Fishbone diagram or a Cause-and-Effect diagram is a useful tool to initiate ideas about potential causes of the problem (Burch et al., 2016; Kuvvetli & Firuzan, 2019). Generally, it is often appropriate to deliberate on six areas of causes, including materials, machines, methods, personnel, measurement, and the environment (Breyfogle III, 1999). Salmon (2017) supported that the Fishbone diagram can be accomplished easily in a group setting because it is used as a concept of visual display and helps to brainstorm on the potential causes of the problem. Moreover, the sub-cause branches or sub-bones of the causes can be expanded. The information generated from this diagram can help the team members obtain more ideas for further actions, such as planning to collect detailed data to confirm the root causes (Aummontha & Smutkupt, 2017; Smutkupt & Naratornsawatdikul, 2019). The case studies by Burch et al. (2016) and Gijo et al. (2019) also used the Fishbone diagram with a team brainstorming approach to identify potential causes of issues.

Failure Mode and Effects Analysis (FMEA)

Failure mode and effects analysis (FMEA) is a structured method for identifying how a product or a process fails and for removing or reducing the risk of failure. FMEA can be used in process design or improvement actions (Lee et al., 2013). Breyfogle III (2000) supported that organizations apply FMEA to recognize and remove concerns early in the development of a process or design. If the process is well designed, defects or incorrectness can be prevented. Moreover, applying FMEA to the existing products or processes is used to recommend potential improvement actions to reduce failures from reaching the customer/user (Milena & Arvilla, 2014). This tool is very beneficial in enhancing process efficiency.

A study by Salmon (2017) mentioned that the implementation of FMEA in the case of a public school district was unsuccessful due to its complications, which required in-depth information on the causes of failure. Studies by Lee et al. (2013) and Appollis et al. (2020) applied FMEA for business process improvement when implementing Statistical Process Control (SPC) in a chemical manufacturing company and found that it is one of the most powerful tools to identify causes and help find a way to remove them.

To apply FMEA to the project, key processes that contain defects/errors should be identified. Practically, the main factors to evaluate the current process performance include the potential failure mode, potential effect of failure, potential cause of failure, and current control in place to prevent the cause from happening (Salmon, 2017). In addition, the four key measurements of FMEA, Severity, Occurrence, Detection, and Risk Priority Number, must be brainstormed among the team members. Severity (SEV) is used to assess the seriousness of the effect of the potential failure mode. Normally, it relates to the harm produced to the customer (Milena & Arvilla, 2014). Occurrence (OCC), which estimates the possibility that causes the potential failure mode, is measured. Detection (DET) of the ability of the existing control to notice the subsequent failure mode of the process is assessed. The product of SEV, OCC, and DET is identified as a Risk Priority Number (RPN). A higher RPN should be given high priority for process improvement rather than a lower RPN. However, a high severity rating even though the RPN score is low may get special attention (Breyfogle III, 1999).

Research Methodology

This study applied the five steps of DMAIC and used some Lean tools. DMAIC helps all the team members make decisions based on facts. In this study, Lean tools played an important role in identifying non-value-added steps and potential wastes that occurred in the current operations. After collecting the necessary data, various tools were revealed and analyzed to come up with the root causes of the delay in payment. Improvement actions were conducted. The new process (to-be process) has been set as a standard of the operating procedure. Monitoring and controlling the improvement factors are handled by the process owner to ensure that the problem will not reoccur. The details of the five phases are discussed below.

Define Phase

This study focused on the process efficiency of paying all telephone bills on time and with accuracy. Under this phase, the problem statement must be identified and communicated with all concerned parties. At the beginning of the project, a project charter was developed, which contained the necessary information, as shown in Table 1.

Generally, the project charter was developed by Green Belt with the support of a team member and a project champion. This chart was used to communicate key information with the team members and to monitor the overall project scope. When team members reviewed the details and agreed on the project scope and timeline. Afterthat, the management approved the project charter. Then, the Measure phase started.

Table 1: Project Charter

Topics	Details
Problem Statement	The current processes related to all telephone bill payments are inefficient, which impacts the process lead time and the correctness of payment transactions.
Project Goals	To improve the payment process efficiency To pay the correct telephone bills on time To pay only active phone numbers (terminate no longer used numbers)
Project Scope	To cover all types of telephone bills, which include office telephone (landline), mobile phone, and internet numbers
Project Benefits	To improve the process efficiency that helps reduce wrong/ delayed payments and eliminate non-valued- added steps
Project Milestones	Tentative-around 6 months Define phase – July Measure phase – August Analyze phase – September Improve phase – November Control phase – December
Team Members	Accounting Department Administrative staff from key project sites

Measure Phase

Under the Measure phase, understanding the current workflow is necessary. Green Belt worked with the team members to develop the current process flow, as shown in Figure 1. Potential non-value-added steps were discussed among the team members.

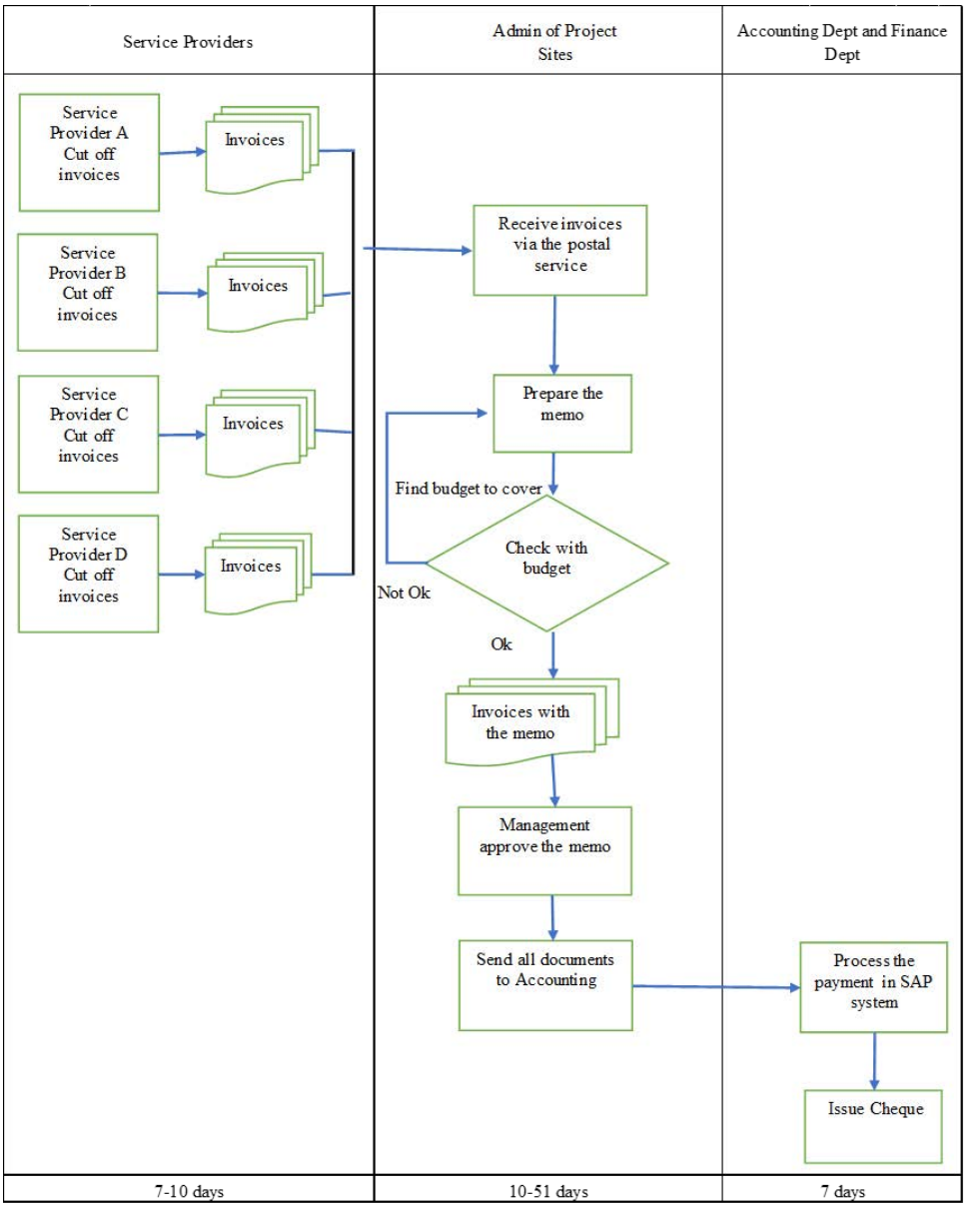

Figure 1: As-Is Process Flow with Lead time

According to the flow, telephone invoices come from different service providers based on usage, including telephone lines, mobile phones, and internet numbers. Once the administrative staff receives the bills, they have to prepare a memo and get management approval. After that, those documents are sent to the Accounting Department. In some cases, the administrative staff of the project sites face problems such as budget inadequacy, invoices exceeding the dateline, and the urgent payment process by the Accounting Department that needs to be conducted. In a normal case,

after the Accounting Department receives the complete documents, the payment will be processed in the SAP system on a weekly basis.

During this phase, Green Belt liked to confirm the lead time of each process step to identify the potential causes of the delay in payment. So, Green Belt randomly selected some invoice transactions and measured the range of lead time of the key process steps, as shown in Table 2.

Table 2 Sample Data of Lead time of Key Process Steps

Process Steps	Transaction # 1 Date (dd/mm)	No. of days	Transaction # 2 Date (dd/mm)	No. of days	Transaction # 3 Date (dd/mm)	No. of days	Transaction # 4 Date (dd/mm)	No. of days
Cut-off Invoice (Service Provider)	09/06		21/06		29/02		12/03	
Issue Tax Invoice (Service Provider)	14/06	5	26/06	5	07/03	7	17/03	5
Received Tax Invoice	17/06	3	29/06	3	10/03	3	20/30	3
Prepare a memo	29/06	12		2		0		0
-First approval	29/06	0		0		0		0
-Second approval	05/07	6		4		0		0
All documents sent to Accounting dept	08/07	3	08/07	3	30/40	51	30/40	41
Accounting process and issue cheque	15/07	7	15/07	7	07/05	7	07/05	7
Total		36		24		68		56

Table 2 shows four samples of data on the lead time of the key process. Overall, Green Belt found that the average lead time to process the payment was around 30 days from the invoice date. However, in some cases (transactions #๓ and #4), the lead time was high because the administrative staff failed to receive the invoices and did not realize that those invoices were overdue already. Hence, when overdue cases are found, an urgent procedure must be followed to ensure that the invoices are paid as soon as possible.

In addition, Green Belt used the Fishbone diagram to identify the potential causes of the inefficient payment, as shown in Figure 2.

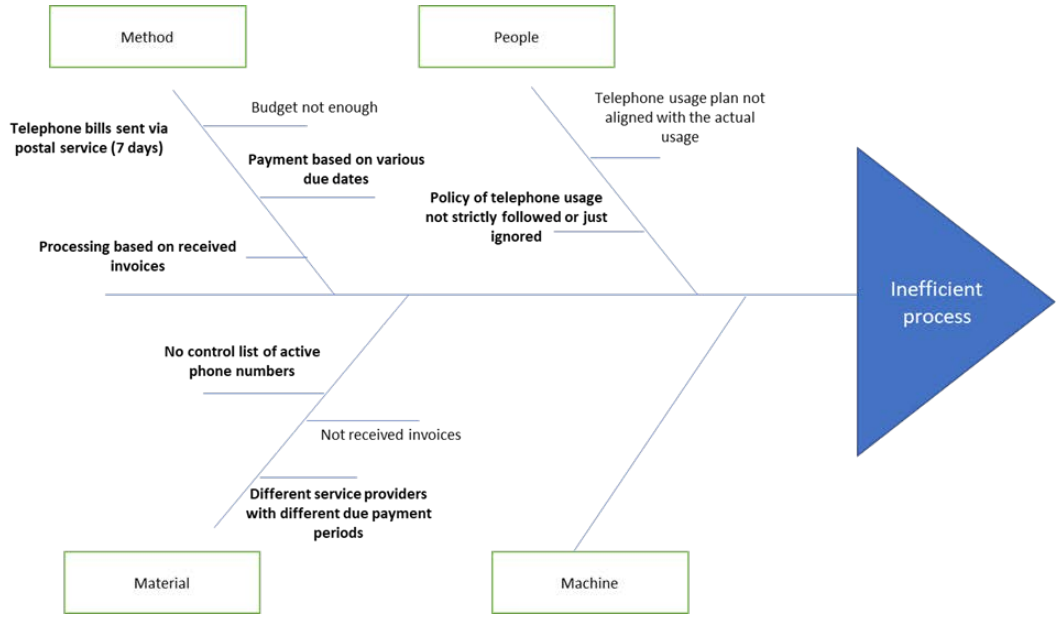

Figure 2. Fishbone Diagram

All potential causes were generated by the team members and concerned parties familiar with these process steps. The causes are grouped into three categories: Method, Material, and People, which can be broken down into sub-bones: processing based on received invoices; invoices sent via postal service; payment based on various due dates; lack of control list; different service providers with various due dates; and telephone usage policy not strictly followed. Based on the data from the actual lead time and Fishbone diagram, the root causes were further examined and finalized in the Analyze phase.

Analyze Phase

According to the current process flow, Green Belt and the team members applied the Lean concept and identified two types of waste, which are defects and over-processing.

The two defects were the missing payment of some invoices and the payment of inactive numbers. First, the administrative staff did not realize that the invoices needed to be processed because they had not received the actual invoices from the service providers. For this defect, there is no tool to remind them about the numbers that require payment and the due dates. Therefore, if they are busy with other work, they may forget to monitor and perform their jobs on time. Regarding the second defect, the team found that the company had kept paying for the telephone bills, which numbers were no longer used. This case happened because some

users were rotated to other functions or had resigned from the company, but their mobile phone numbers were not updated. In this situation, if invoices are sent to the administrative staff, they will process them as usual. Green Belt asked each concerned function to review the inactive numbers, and the team found that 100 numbers out of 460 numbers were no longer used and should be terminated.

Regarding the over-processing of waste, various phone numbers have different due dates from various service providers. The operations and the accounting staff have to proceed with the payment transactions on a weekly basis to meet the variability of due dates. Moreover, the project sites are responsible for the various telephone invoices from the different service providers, and the staff must prepare a cover sheet based on the different due dates of each service provider. This practice is time-consuming and is classified as over-processing since the process is conducted every week.

Besides wastes, Green Belt also used the Failure Mode and Effect Analysis (FMEA) to prioritize major failures. Firstly, the potential failure modes of the key processes and their causes and effects were examined. The severity score (SEV) of each failure was discussed. It was based on the failure's effect on the customers. If the failures are caused by "no payment" to the service provider, the SEV score is assessed as high. If the failures lead to a delay in payment, the SEV score is low. Next, the occurrence score (OCC) is based on the frequency of the cause. Scores are given based on the experiences of the team members who are familiar with the processes. Lastly, a detection (DET) of failures or causes is identified. In a current situation, if there is a tool or step to control or prevent the causes, the DET score is low. On the contrary, if there is no tool to control or detect the causes, the DET score is high at 8–9.

Finally, the products of Severity, Occurrence, and Detection were calculated and resulted in the risk priority number (RPN). After that, the team members brainstormed and discussed the current situation, and all the information was put into the template, as shown in Table ๓. According to the key steps, the main causes are also shown in the table.

Table 3: Failure Mode and Effect Analysis (FMEA)

Item/Function	Potential Failure Mode	Potential Effects of Failure	SEV	Potential Cause	OCC (Prevent/Detect)	Current Process Control	DET	RPN
Preparation of a cover sheet based on received invoices/bills	Did not realize which invoices/bills are missed from the process	No payment	9	Many telephone numbers and no active telephone list	8	No	9	648
Process the payment Various due dates	Time-consuming	Late payment	7	Many telephone numbers and no active telephone list	8	No	9	504
	Time-consuming	Time-consuming payment	5	Many telephone numbers and no active telephone list	8	No	8	320
Invoices sent via the postal service	Delivery late	Late payment	7	Many telephone numbers and no active telephone list	5	No	9	315
Request/transfer/ cancel phone numbers (policy deployment)	Confusion during payment process	Wrong/delay payment	7	Many telephone numbers and no active telephone list	5	No	9	315

The information shown in the Process flow and Fishbone diagram has helped the team members to identify the problem steps and the potential causes of the process inefficiency. FMEA was used to define failure details, potential causes, and the current control method/tool. Combining all the information, the root causes are summarized as follows.

Prepare a memo based on received invoices

The administrative staff prepares a memo for the payment based on the invoices received from the service providers. The due dates are varied. This current practice makes the administrative staff and accounting staff proceed with the payment on a weekly basis or at least four times a month. It is inefficient since the staff performs the job more frequently. Moreover, the staff works based on hard copy invoices, and if there are missing invoices, the staff may not realize it. This situation potentially leads to a delay in payment.

Invoices sent via the postal service

The administrative staff waits until the invoices are received via mail. If the invoices arrive late or are lost while being sent via mail, late payment is likely to happen, so an urgent transaction must be in place.

Unclear policy of telephone usage

The policy of telephone request/transfer/termination is not regularly communicated to all staff. Therefore, users may not remember and follow the required policy. This issue has caused the company to pay for the unused/inactive numbers. The next step is to identify the potential improvement alternatives and assign tasks to responsible parties to implement and validate the result.

Improve Phase

Green Belt has set up a few meetings with the concerned parties to identify the improved actions. The team members also focused on eliminating the non-value-added processes and solving the root causes. The solutions to the selected root causes are explained as follows.

To combine different due dates of each phone number to be one due date per month for each service provider

The assigned person asked the support of each service provider to change the invoice from different due dates to one due date. Therefore, each service provider has

its due date. This method can help both the Administration and the Accounting department reduce their processing time from four times a month to once a month. The new practice enhances process efficiency. The administrative staff is required to prepare the memo on a monthly basis. The management also reduces its work in reviewing and approving the document. The accounting staff handles the payment process monthly. Overall, the detailed processes are reduced quite significantly.

To implement the control list of office phone/mobile/internet numbers

This list can prevent the administrative staff from forgetting to proceed with the invoices that have not been received. If there are missing invoices, the administrative staff will follow up with the service providers. This action can enhance the accuracy of telephone payments in the ongoing process.

To clean up inactive phone numbers

Before the telephone list was implemented, Green Belt had requested all the project sites to verify the active phone numbers and terminate the unused numbers. Moreover, the new procedure for telephone requests has been clearly identified and communicated to all users. If someone is rotated or has resigned, the phone numbers must be reviewed immediately and updated on the list accordingly. This practice will ensure that there are no unused and paid numbers. For the ongoing process, the policy to request a new mobile phone has been communicated to all users and is being used as the standard operating procedure (SOP). If there are newcomers, rotated employees, or resigned staff, the control list must be updated to reflect the current workers.

To request each service provider to send invoices via e-mail instead of the postal service

All service providers agreed to provide invoices via e-mail. This process ensures that SA Company gets the bills right after the cut-off dates. The company does not need to wait to receive the invoices via mail. Hence, missing invoices during the postal service will not happen again.

After the improved actions had been implemented, the FMEA templates were updated with the recommended actions, new Occurrence (OCC), and Detection (DET) scores, as shown in Table 4. If the actions reduce the frequency of causes, the occurrence number will be low. For the new processes, if the actions taken prevent or detect the potential problem, the detection score will be identified as low, too. So, the new RPN scores are calculated. The low RPN score confirms that actions have supported the main functions and enhanced process efficiency.

Table 4: Updated Failure Mode and Effects Analysis (FMEA)

Item/Function	RPN (Before)	Recommended Actions	Actions Taken	SEV	OCC	DET	RPN (After)
Preparation of a cover sheet based on received invoices/bills	648	The admin staff should have an updated list of all telephone numbers, then it can be used to control and update	Implemented telephone control lists by each section/department. Head of the section monitor the list regularly	9	3	3	81
Process the payment with various due dates	504	Reset payment due date to be one time/month for each service provider.	Requested each service provider to set due date to be one time/month.	7	3	2	42
	320	Propose new approval process to streamline the process	Studied and reviewed the approval authority	5	8	8	320
Invoices sent via postal service	315	Request to send invoice via e-mail.	Requested each service provider to send invoice via e-mail.	7	3	2	42
Request/transfer/cancel phone numbers (policy deployment)	315	Review policy and make it clear to all concerned parties	Accounting dept reviewed telephone policy and communicated to all concerned parties	7	3	7	147

When the processes had been improved, the To-Be process was drawn, as showing Figure 3. Overall, the range of lead time for each step has been shortened.

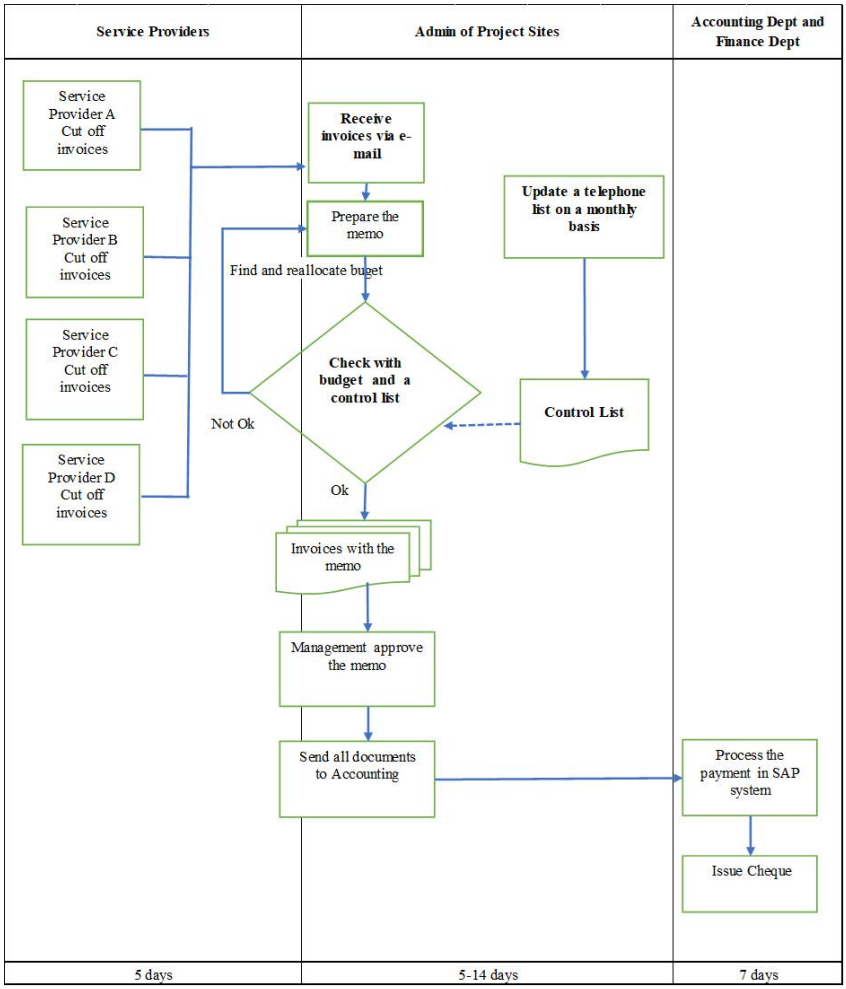

Figure 3. To-Be Process with New Lead time

Overall, the average lead time has reduced significantly. The maximum lead time of the overall process has been reduced from more than 60 days to 26 days. The main result came from eliminating the missing invoices to proceed at the project sites. The new practice ensures that transactions are paid on time.

In addition, combining the due dates of each service provider obviously reduces the processing time of the accounting staff who takes care of all the invoices, from approximately 5 days to 2 days per month. The improvement in working time also frees up the accounting staff, so they can handle additional work if needed in the future. Besides, the workloads of the accounting staff, the administration, and the head of each

project site dealing with the telephone invoices have been reduced in preparing and reviewing those documents. The goals of this project are achieved since SA Company can pay its telephone bills on time with accuracy, improve process efficiency by eliminating some process wastes, and reduce the working hours of the Accounting Department.

Although the actions revealed an improved process, Green Belt needs to develop a monitoring plan to ensure that the root causes will not reoccur.

Control Phase

The purpose of the Control phase is to develop a control strategy to maintain the improved process in the long term. The critical elements must be regularly reviewed. Implementing an error-proofing tool is preferable. The telephone list of each project site can be utilized as the control checklist and can support the administrative staff in controlling invoice payments. The updated list has been set as the standard operating procedure (SOP). In addition, the heads of the project sites agree to monitor and update the list monthly to reflect the active numbers. Furthermore, the procedure/policy of requesting and terminating the mobile phone has been reviewed and communicated to all users to make them aware of the mobile phone utilization. In addition, the heads of the project sites are responsible for controlling the telephone costs and managing the utility budget efficiently. Overall, the lead time of the telephone bill payment will be checked by accounts payable to ensure that the invoices for each service provider will be paid on the agreed due dates.

Discussion of Results and Conclusion

This study presents a real-world case of how the LSS DMAIC methodology enhances the process efficiency of invoice payment and eliminates some non-value-added steps. If the organization follows systematic thinking and uses facts in making decisions, it can eliminate the root causes of the problem and improve the process in the long term.

Green Belt started by revealing the actual detailed process flow, and the lead time of each process shows the potential causes of the delay in the payment process. A data collection plan was conducted. The random sampling cases helped to confirm the average and range of the lead times of the key steps and to point out potential delays. In addition, the team brainstormed by using the Fishbone diagram to discuss all the potential causes. However, applying Failure Mode and Effects Analysis (FMEA) revealed more details of failures, causes, and current control methods. Combining varied quality tools and using the collected data facilitated the team members' analysis and confirmed the root causes. After the root causes had been declared, the improved actions were generated from the knowledge and experiences of the team members. Moreover, all members have studied the situation, and they have come up with potentially improved alternatives. The improvement actions were implemented and monitored for a certain period.

The objectives of this project have been achieved. The telephone bill payment process is more efficient. The repetitive transactions have been eliminated. Wastes and non-value-added steps were reduced. The staff's workload has decreased. The accounting staff confirmed that the processing time has been reduced by three days a week. The available time can support more tasks for a future project. Moreover, the payment lead time can be met on time and with accuracy. The control list makes each project site aware of the numbers required to pay each month. The missing numbers or delay in payment should be prevented. In addition, the problem of budget utilization for the utility will be regularly monitored and controlled.

Finally, the control characteristics were identified and implemented. The actions in the Control phase were updating the telephone control lists according to the SOP and monitoring the payment lead time regularly. The control list is used to regularly monitor the active phone numbers to ensure that the company pays for the in-use numbers that support the mistake-proofing concept.

In conclusion, this case study provides a systematic problem-solving procedure to tackle a real-world issue through the effective implementation of LSS. The concept of LSS can be applied to service and support functions to identify the root causes of a problem and fix it permanently (Breyfogle III, 1999). Lean tools generally help to identify wastes (Furterer & Elshennawy, 2005) and non-value-added steps (Chahal & Narwal, 2017), while the Six Sigma methodology supports the team to work systematically by following the DMAIC method (Antony, 2012; Sheila & Shahbaz, 2012), and it uses facts to make the right decisions. The root causes of the problem were properly identified and solved (Sangphang et al., 2020; Sheila & Shahbaz, 2012). Critical to quality (CTQ) related to critical key elements was monitored regularly in the long term. The project owner and the working team can be assured that the problem will not occur anymore (Sangphang et al., 2020; Sheila & Shahbaz, 2012). In addition, several quality tools were revealed and were able to show orderly steps on how to attack problems, identify root causes, and take improved actions. The author believes that this case study will provide certain benefits not only to scholars but also to practitioners by showcasing the application of LSS in transactional functions within a real estate developer.

Moreover, the LSS approach can contribute to bottom-line benefits for the organization along with bringing process improvements. The significance of continuous improvement, employee engagement, and process thinking was created by the success of the process improvement project. Typically, the project was recognized by the top management, and the project team got appreciation from several levels in the organization. Consequently, the successful execution of simple projects in supported processes can motivate practitioners to tackle harder initiatives in the future.

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A Service Redesign in Customer Experience Management for International Luxury Beach Hotel Chains in Phuket: A Fresh Perspective from COVID-19 Pandemic in Thailand

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Abstract

The spread of the novel coronavirus 2019 or COVID-19 has hit the world severely. Tourism industry tremendously got an effect from this pandemic because people refrain from traveling. Hotel business is one of the most affected businesses. Redesigning service of the hotel with a proactive strategy to create a great customer experience is a challenging issue for hotel marketers to be considered.

This concept paper aims 1) to present perspective of service to be redesigned in customer experience management affected by COVID-19 pandemic for international luxury beach hotel chains in Thailand; and 2) to propose future research direction on redesigning service in customer experience management affected by COVID-19 pandemic for international luxury beach hotel chains in Thailand.

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The author integrates a concept of service design, customer experience, and customer loyalty based on a concept of international luxury beach hotel chain and synthesizes with the effect of COVID-๑๙ as moderating effect to service design and customer experience. The proposed perspective of service to be redesigned in creating customer experience The author hopes this proposition can be a service blueprint to the hotel marketers to retrieve the business from this disaster as much as possible.

Keywords: Service redesign, Customer experience management, International luxury beach hotel chain, COVID-19

การออกแบบบริการใหม่ในการจัดการประสบการณ์ลูกค้าสำหรับโรงแรมเครือข่ายนานาชาติแบบหรูหราริมชายหาด: มุมมองใหม่จากการระบาดของ COVID-19 ในประเทศไทย

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บทคัดย่อ

การแพร่ระบาดของโรคโคโรน่าไวรัส หรือ COVID-19 ได้ส่งผลกระทบต่อโลกอย่างรุนแรง อุตสาหกรรมการท่องเที่ยวได้รับผลกระทบอย่างมากจากการระบาดใหญ่นี้ เนื่องจากผู้คนงดการเดินทาง ธุรกิจโรงแรมเป็นหนึ่งในธุรกิจที่ได้รับผลกระทบมากที่สุด การออกแบบบริการใหม่ของโรงแรมด้วยกลยุทธ์เชิงรุกเพื่อสร้างประสบการณ์ลูกค้าถือเป็นความท้าทายสำหรับนักการตลาดโรงแรมที่จะต้องพิจารณา

บทความนี้มีวัตถุประสงค์ 1) เพื่อนำเสนอมุมมองของการบริการที่จะได้รับการออกแบบใหม่ในการจัดการประสบการณ์ลูกค้าที่ได้รับผลกระทบจากการระบาดใหญ่ของ COVID-19 สำหรับโรงแรมเครือข่าย นานาชาติแบบหรูหราริมชายหาดในประเทศไทยและ 2) เพื่อเสนอทิศทางการวิจัยในอนาคตเกี่ยวกับการออกแบบบริการใหม่ในการจัดการประสบการณ์ลูกค้าที่ได้รับผลกระทบจากการระบาดของ COVID-19 สำหรับโรงแรมเครือข่ายนานาชาติแบบหรูหราริมชายหาด

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ผู้เขียนรวบรวมแนวคิดของการออกแบบบริการประสบการณ์ของลูกค้าและความภักดีของลูกค้าโดยอิงจากแนวคิดของโรงแรมเครือข่ายนานาชาติแบบหรูหราริมชายหาดและสังเคราะห์ด้วยผล กระทบของโควิด-19 ที่ส่งผลต่อการออกแบบบริการและประสบการณ์ของลูกค้ามุมมองที่เสนอของบริการที่จะได้รับการออกแบบใหม่ในการสร้างประสบการณ์ของลูกค้าสำหรับโรงแรมเครือข่ายนานาชาติแบบหรูหราริมชายหาดที่ได้รับผลกระทบจากการระบาดของ COVID-19 ได้แก่ การรับร้ การพิจารณา การจอง การเข้าพัก และความภักดี ผู้เขียนหวังว่าข้อเสนอนี้จะเป็นต้นแบบการบริการสำหรับนักการตลาดโรงแรม เพื่อกู้วิกฤตจากพิยัติครั้งนี้ให้ได้มากที่สุด

คำสำคัญ: การออกแบบบริการใหม่ การจัดการประสบการณ์ลูกค้า
โรงแรมเครือข่ายนานาชาติแบบหรูหราริมชายหาด โควิด-19

Background and Significant of the Study

Hotel business is categorized into the hospitality industry (Dogru et al., 2020). In a recent period, international luxury hotel chain (ILHC) becomes an important segment of the hotel business and is considered as one of the most popular choices among the tourists globally when they would like to travel for either leisure or business (Manthiou, 2020). One of the goals of ILHC is to offer its guests an enjoyment of comfortable products to fulfill their experience. Most of ILHC's guests feel that they have preferable affective satisfaction and greater memorable experiences staying at ILHC comparing with other types of hotel (Lee et al., 2019).

Concept of ILHC is not about the physical evidence, facilities, decorations, or amenities (Lin, 2020); it also considers both emotional and experiential aspect, especially experience of luxury is all about the guests' attitude, opinions and feelings (Sudbury-Riley et al., 2020). To keep business survived, many hotels are vigorously competing with each other to create competitive advantage, product differentiation, and good relationship with their customers (Latunreng & Nasirin, 2019). At present, customers have various choices and sources of information to purchase products or services. It brings to the attentions to the hotel in managing this challenges to attract the customers to get the best products and services to be reasonable to their money (Grover et al., 2018).

On top of that, retaining customers is another noteworthy mission that hotel cannot be ignored. The ability to retain customers is a crucial challenge for every type of business.One of the most powerful and competitive approach that helps business to successfully compete with each other is Customer Experience Management (CEM) (Kandampully et al., 2018). To engage between customers and services for a long-term profit, many researchers claimed that a company should integrate CEM with their existing marketing strategy (Flavián et al., 2019). Many marketing scholars concluded that CEM is considered as a key factor for a service company which is shifted from service-based economy to be experience-based economy (Fernandes & Pinto, 2019). In addition, CEM is an interaction between a company, a customer and a service which blend a physical, sensorial, rational and spiritual measurement of a customer expectation on different levels from the moment of contact (Witell et al., 2020).

Until it comes to the most notable situation of the world, when the spread of Coronavirus disease 2019 (COVID-19) was reported in the city of Wuhan, China since December 2019 (Qiu et al., 2020). Tourism and hospitality gradually got a huge effect from this pandemic. People all over the world stop travelling and are asked to keep social distancing with fully aware of hygiene (Gupta et al., 2020). Severely, it causes a disruption of economic globally (Hubbard & Strain, 2020). This is considered the most severe disruption in the recent history since we faced many pandemics such as SARS in 2002-2003, Swine Flu in 2009-2010, Ebola in 2014-2016, MERS in 2015-present (Chaleplioglou & Kyriaki-Manessi, 2020). Many scholars summarized impacts affected by COVID-19 on hotel business in various destinations. Focusing in Thailand as one of top ten destinations by international tourist arrivals (Chulaphan & Barahona, 2018), it is revealed that the hotel occupancy rate of the first 4 months in 2020 is decreased to be around 21% due to a measurement to control the spread of the COVID-19. This caused both Thai and foreign tourists canceled their stay and postponed their trip until further notice resulting there were no tourists visited in April, especially important tourist cities such as Bangkok, Chonburi, Chiang Mai, Phuket (Parks et al., 2020)

One of the main reasons that international tourists visit Thailand is the beauty of the beaches (Tinakhat et al., 2022). There are 2 different sides of the beach in Thailand, which are the Gulf of Thailand and the Andaman Coast (Kompor et al., 2018). The preferred tourist destinations in the Gulf of Thailand are Chonburi, Phetchaburi, Prachuap Khiri Khan, Rayong, and Surat Thani (Sucharitakul et al., 2019). Samui Island in Surat Thani is claimed as the most popular destination in the Gulf of Thailand among Thai and international tourists (Samsuvan et al., 2019); nonetheless, there are some limitations to accessing the island by transportation as there is only one full-service airline flying directly from Bangkok to Samui Island (Zheng et al., 2020), while the low-cost airlines mostly land in the Muang District of Surat Thani. Tourists need to take cruises from the mainland to the island, which makes the tourists waste their time traveling to and from the island for almost the whole day (Burbano et al., 2022). Whilst travelling to the other side of the coast of Thailand in the Andaman Coast is easier, the tourists can reach the destination-

by various types of transportation according to their budget such as full-service airlines, low-cost airlines, local buses, vans, trains, and cars (Guides, 2018). According to Planet et al. (2018), Similan Islands, Phi Phi Islands, Phang-Nga Bay, Samet Island and Ang Thong Islands are the five most important islands in Thailand, while the Andaman Islands ranked the third among the top 5 highest-income islands. As a result, tourism in the Andaman Islands is well-developed and can earn income from both domestic and international tourists (Das, 2018). Furthermore, convenience transportation makes the tourists prefer visiting the Andaman Coast destinations more than the Gulf of Thailand (Suwanvijit, 2019).

The Andaman Coast area is beautiful from the sea to the high mountains and there are various cultures and arts according to the history that have flourished in the past, which is a blend of civilization between Buddhism - Brahman - Chinese – Islam (Mahbubani & Sng, 2017). With the charm of the emerald city in the south or Andaman paradise, Phuket is the center which is like the "Pearl of Andaman" (Pathumporn et al., 2020). From a study on the loyalty of Thai and foreign tourists towards tourist attractions travel in Phuket by Mechinda et al. (2009) in studying the sample of tourists who visit a tourist attraction more than once to consider demographic characteristics psychopathic traits and tourism behavior of tourists who have loyalty to tourist attractions patterns of loyalty to tourist attractions and factors affecting the loyalty of tourist attractions including comparing the results study between Thai and foreign tourists, the results of a study in Phuket Province found that Thai tourists traveling to Phuket more than once, have low loyalty to attractions. The factors affecting loyalty include commitment to tourist attractions, a desire to bring other people to travel and want to explore tourist attractions. Foreign tourists who visit Phuket repeatedly, most of them are Europeans, males, aged 54-25years, earning from 50,000baht or more per month, have high loyalty to tourist attractions and ties to the source travel respectively.

In addition, the nature of tourism influences both tourism choices among Thai and foreigners which are the scenery and there is an incentive to travel to seek exotic.

One of the reasons making the Andaman Coast more preferred than the Gulf of Thailand is from the popularity of Phuket province, which is perceived as the second favorite destination among the tourists aside from Bangkok (Tinakhat, 2020). Moreover, a study by Akkajit et al. (2019) emphasized that the beaches in Phuket are very popular among tourists and they considered Phuket as a destination in Thailand that the tourists should not miss. This results from the Phuket Provincial Administrative Organization promoting its strategies as a world-class tourism center to increase the revenue of the province (Sinlapasate et al., 2020). Consequently, Phuket welcomed approximately 14.58 million visitors from around the world, making the income around 443,000 million Thai Baht in 2019 (Taecharungroj & Mathayomchan, 2019).

As a famous holiday destination in Thailand, tourism in the Phuket has been facing huge competition in aligning the marketing strategies with the development of tourism activities for different markets (Bu-lud, 2017). Knowledge of different travel motivations has a great contribution to the hotel business in showing differences in customers' behaviors and expectations (Wu & Gao, 2019). Consolidating new innovations and technology for service creation with the target market and state-of-the-art hotel strategic management divinely enables the sales activities of the hotel in the period of modern hotel business management (Dyshkantiuk et al., 2020). Each hotel applies different strategies to attract the customers, while luxury marketing and experiential marketing are mostly used in chain hotels (Jelassi & Martínez-López, 2020). Hence, it is thus challenging for hotels to find the most efficient and effective strategy that matches market trends, segmentations, and clients' expectations and behavior (Yadegaridehkordi et al., 2021). To engage between guests and services for a long-term viability, many hospitality scholars mentioned that luxury chain hotels should integrate Customer Experience Management (CEM) with their current operation strategies (Kandampully et al., 2018). According to Lee, Zhao, et al. (2019), CEM is the ability to personalize the guests' experiences with

the reliability and competence of service performance. Measuring customer experience is delicate and complicated (Seyi-Olajide et al., 2020) because hotels need to apply a seamless experience strategy from searching, purchasing, consuming, and after-selling throughout the customer journey (Varnali, 2019).

Recent tourism and hospitality scholars about effect of COVID-19 toward hotel business mostly focus on reducing health risk (Douglas et al., 2020) whereas the government continues to launch tourism promotions and campaigns to support the business (Toubes et al., 2021). So far, there has been little discussion focusing on strategy formulation in designing a customer experience model despite the fact that it is considered as a survival strategy for a dynamic future in the hotel business (Bonfanti et al., 2021; Jiang & Wen, 2020), especially for luxury chain hotels, which are considered as one of the most preferred hotel choices among tourists (Supanun & Sornsaruht, 2019). The researcher considers that it is interesting to study how luxury chain hotels in Phuket design customer experiences that are shifted into the new normal era affected by the pandemic. This conforms to the study of Kandampully et al. (2014) that found service experience, which concerns satisfaction, service quality, and value, is the most preferred topic to comprehend hospitality service from the perspectives of customers.

Literature Review

Customer Experience Management (CEM)

Customer experience management is not a new concept. Many studies found that CEM has its root from buyer/customer behavior since 1960s aiming to understand customers' decision when consuming products or services (Ershadi et al., 2019). Then, Thomas V. Bonoma, professor of Business Administration at the Harvard Business School who is known for his writings on consumer behavior and industrial marketing, including managing marketing, conceptualized relationship marketing in 1976 as a concept of identifying key attitudinal drivers to broaden customer response scope considered in customer experience, and it has been explicitly used by Berry in 1983 (Payne & Frow, 2017; Van Tonder & Petzer, 2018).

In 1980s, service quality concept of Parasuraman has been widely accepted to incorporate ambience and environment linked to marketing and quality of operations (Hamari et al., 2017; Parasuraman et al., 1985). Schmitt (1999) identified experiential marketing into five senses: sensory, affective, cognitive, physical, and social-identity which caught as interest to marketers in broadening the scope of customer responses considered in the customer experience during 1990s (Le et al., 2019; Wiedmann et al., 2018). In 2000s, customer centricity has been brought up to embed customers and their data deeper into the organization which is focused on redesigning customer experience from customer perspective (Fader, 2020; Komulainen & Saraniemi, 2019). To create a long-term competitive edge for an organization, customer relationship management has been recognized as a form developing innovative capabilities and providing sustainable competitive advantage during 2011-2015 (Anshari et al., 2019; Buttle & Maklan, 2019). For the past years, CEM has set a phenomenon to marketing practice and research (Homburg et al., 2017; Kandampully et al., 2018; Keiningham et al., 2020) because it is regard to be a significant key for business success and competitive advantage (Foroudi et al., 2018; Homburg et al., 2017). The evolution of customer experience in hospitality industry is illustrated in Figure 1.

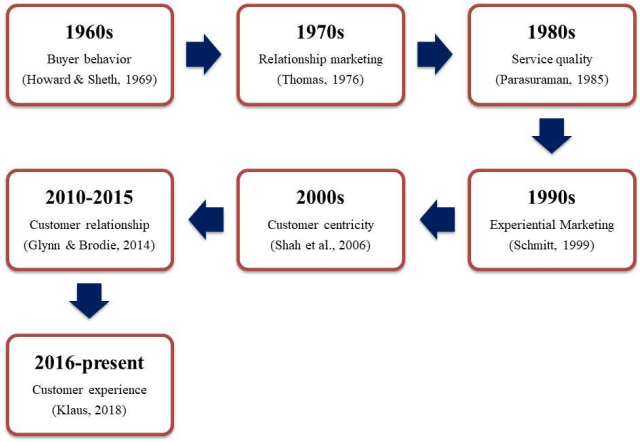

Figure 1: The evolution of customer experience in hospitality industry

Source: Author's literature review

In hospitality industry, CEM is not only concerned the business; hotel, food and beverage, entertainment, but also connected with supporting realms including esthetics, entertainment, education and escapism (Pine & Gilmore, 1998). The author found some fresh perspectives of customer experience in hotel business. Bi et al. (2020) explored asymmetric effects of attribute performance on customer satisfaction in the hotel industry, and defined its meaning that it was a profoundly positive emotional state generally resulting from having one's expectations exceeded to a surprising degree. Järvi et al. (2020) studied value co-destruction in hotel services exploring the misalignment of cognitive scripts among customers and providers, and suggested that customer experience was customers' expectations and experience that provide fewer insights on supplier expectations and experiences, and on the interaction between both parties' expectations and the resulting experiences. Ko (2020) explored hotel customer service experience, and defied customer experience as an interaction that leads to positive feelings and emotions die to that customer want to repeat the experiences that not only influence satisfaction of the customer but also results into brand loyalty. From the literature review, the author can summarize the definition of customer experience as an interaction between a company, a customer and a service which blends the physical, sensorial, rational and spiritual measurement of the customer expectation on different levels from the moment of contact, it is reflected by the ability of the organization in personalizing the customers in their specific requirements from the reliability and competence of service performance.

Service Design

Every service-related business needs a good operation and well-planned service design in order to attract the customers, satisfy their needs, reach their expectations, and retain as loyalty customers (Tinakhat et al., 2015). A real need of consumers are not just "utility" or "appearance" of the product, they also demand for satisfaction from the service that must be linked to every need in their life (Liu et al., 2019). Most businesses profit nowadays is no longer the most efficient production line, yet caused by service sector that can create the most satisfaction for consumers (Meesala & Paul, 2018). This drastic change in the consumer market has forced the world of design

to re-think. Service designers should consider that a service does not just create momentary experiences, but also opportunities to help create and drive the business in the long run (Pettersson et al., 2018). Service design is not just a design for service, it includes developing, improving and creating innovative designs for products and experiences (Carlson et al., 2018).

Advancements of today's internet technology enable consumer access to products and various services easily (Verhoef et al., 2017). Anyone can compare information of similar products in advance, access the same service from various channels, etc. These behaviors have significantly changed the trend of demand in the consumer market. For example, from the day when people used to be delighted with the most advanced technology, they now only need technology that can be linked with daily life "from Hi-Tech to Hi-Touch" (Park et al., 2018).

Modern manufacturing methods that keep the same standard of products and services result consumers begin to look for new value from things that are created especially for them only from Standardization to Customization (Kasiri et al., 2017). The automation from the technology has started products and services become "emotionless", today's world has returned to craving for the meticulousness of the human touch again "from Automatization to Crafting"), especially in the tourism industry, education, infrastructure, health and social services (Vázquez-Ingelmo et al., 2019). Therefore, whether it is the public sector or the private sector, it is necessary to adapt to the changing trends.

According to Patrício et al. (2018), service design process is not yet finalized when implementing, it's a back and forth process which must be constantly improved over and over again. It can be divided into 3 phases: 1) Exploration: In the early stages of designing a service, research and data collection must be done first. This will help identify the real needs of the customer, new market gaps or opportunities for using to design services to fulfill those needs. This phase consists of three activities: understand the challenge, gather insights, and synthesis; 2) Creation: The results from phase 1 will be used to design the service concept. All concerned stakeholders will join in the co-creation design process in order to gain concept involved in the service and to create an experience that consumers can be linked to the service at any touch point, whether before, during, or after using the service.

Creating a service concept consists of ๓ concepts: idea development, co-creation, conceptualization; and 3) Reflection & Implementation: When getting a service concept, then test it if it can be used or not. It may be tested over and over until ideas are best suited to the objectives or problems outlined earlier. A prototype may be developed to study opportunities and possibilities, including flaws and testing the actual operation of the service system developed to give customers the most satisfaction.

Customer Loyalty

Customer loyalty is important to a growth of a business (Khan et al., 2020). It is thought to be an imperative aspect in accomplishing business goal and long-term sustainability (Moisescu, 2018). Customer loyalty helps business to maximize marketing activities, marketing communications, market opportunities and margins (Šerić et al., 2020).

Customer loyalty in hotel business is considered as an essential strategy to maintain guests to support a business in a long run (Iglesias et al., 2020). It is likely to say that hotel should position itself to be different from its competitors by designing a service to impress, attract, and retain the guests (Koo et al., 2020). According to Dick and Basu (1994), they categorized 4 types of customer which are 1) No loyalty is a situation that customers have poor attitude or have no impression with the service/product and not to consider buying it again in the future, makes customers change their mind to support the competitors, 2) Loyalty is a situation that customers have strong attitude, feel impressive, and get a good experience from company. They will; moreover, repeat a purchase and intend to continue a patronage, 3) Latent loyalty is customers who have good attitude toward service/ products, but have low repetitive behaviors, and 4) Spurious loyalty is customers who have high repetitive behaviors but low attitudinal attachment with the brand.

Customer Journey

To trade in a business, the key factor is the survey of information about the target customers from defining a customer persona to communicating to potential customers for a product or service that can solve their problems (Salminen et al., 2020).

This includes providing a good experience for customers with customer journey analysis. Customer journey will tell about the customer experience from the first awareness of the brand identity to the purchasing process, product/service trial, until long-term brand loyalty (Khan et al., 2020). It's all about the interactions and experiences that customers have with the brand. Customer journey is a powerful tool helping business understand customer context to get a clear picture of where customers know the brands, where to find the service/product, what made them decide to purchase and repurchase to reach the goal as a brand loyalty (Ballestar et al., 2018).

Many companies put great importance on customer journey and understand the consumer journey whether customer decides to buy either product or service, what behaviors and factors affect decision making, then try to find a way to get what the companies want to sell into the customer journey (George & Wakefield, 2018). When companies fully understand the behavior of customers, they will be able to define a marketing strategy to bring the message they want to convey to customers on the right platform at the right time (McAfee & Brynjolfsson, 2017). After reaching the target audience, companies will be able to optimize their advertising to create content and other marketing to get better results by acquiring information (Bala & Verma, 2018; Dodson, 2016). Customer journey may come from questionnaires, interviews, web search, or marketers can observe by analyzing data collected through various data analytics platforms (He et al., 2019). Quarterly (2009) proposed the consumer decision journey which helps to let the company knows what the consumer wants through which channel, creates an awesome customer experience, makes the company knows what problems to fix for customers to decide to use the services, generates more sales, and reduces marketing costs but increase efficiency. It is divided into 5 stages as showed in Figure 2.

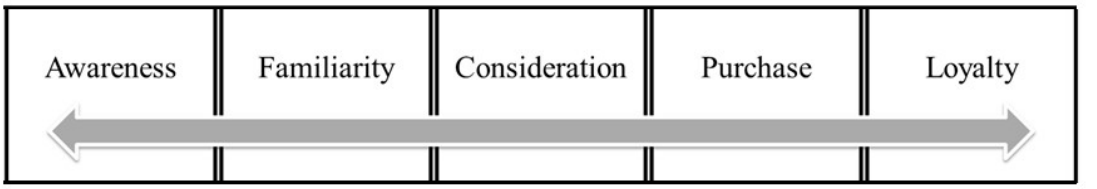

Figure 2: consumer decision journey

Source: Quarterly (2009)

1) Awareness: It is the first way to get customers to know the business to build awareness through various advertising media, channels and platforms that customers currently use. Channels for customers to receive advertising from companies are available both online and offline (Wang & Zhang, 2018). The popular offline channels that can reach customers are such as television, radio, public relations through brochures, billboard, advertisement, etc. (Katz, 2019). But doing business today would not be able to ignore online channels since consumer behavior in the digital age is ranked number one on social media through various platforms (Wolff, 2017). It could be buying advertising through online channels such as Facebook Ads, IG Ads, Youtube and Ads Google etc.

2) Familiarity: Company can create familiarity through many types of activity (Ramesh et al., 2019). However, the use of sending news activities, organizing events which are associated with social responsibility is another activity that helps to build familiarity and promote attachment intertwined with the product (Reiter-Salisbury, 2018). In addition, the use of various media can be considered as making familiarity with consumers both offline and online media by using such media including necessary activities that must be consistent in the same direction because these are essential in building loyalty based on consumer engagement (Tsiotsou et al., 2016).

3) Consideration: When the customer knows the company and product, it isn't that they decided to buy the product immediately (Scholz & Duffy, 2018). They will search for product information via social media to compare the its benefits if they really want (Li et al., 2018). Most of the time, consumers will trust the information from other consumers who have already used the products, known

as a reviewer (Asioli et al., 2017). In this case, the company may be able to generate content reviews from the company by using well-known influencers that match with the products. This will help create more understanding for consumers to consider the products/services (Jiménez-Castillo & Sánchez-Fernández, 2019).

4) Purchase: If the customers pass the searching steps for making decision and they are confident that they will buy products, they then will enter to the sales process (Jun & Park, 2016). If a company has a showroom, customers may walk in to shop and buy. For customers in the digital age, they may buy products through the website such as Shopee, Lazada or other branded platforms (Jauhari et al., 2019). Companies should set up a sales system from product selection, order confirmation, settle a payment to be convenient to consumers (Khan, 2017). This is a quick way to guide consumers to the closing stage and keep them from leaving incomplete orders.

5) Loyalty: When companies can deliver a pleasurable experience for customers, they eventually become loyal customers and will definitely keep coming back (Espinosa et al., 2018). Not only that there may have a word-of-mouth to invite others to become customers, it also allows companies to expand their customer base as well (Godey et al., 2016). At this stage, companies may be able to build a strategy to attract more loyal customers by offering promotions or special services that are only available to specific customers (Ramanathan et al., 2017). This will enable the companies to retain the same customers along with create a new customer at the same time.

Customer journey in hotel business is begun from a customer is motivated and perceived about a hotel, contacts with the hotel to make decision booking a room. This is a factor helping the hotel to better understand decision process of the customer to get a good service experience (Kim & Park, 2017). The hotel business, one of the key supply chains of the tourism industry, is one of the critical businesses affected by COVID-19 pandemic. The impact situation became even more severe when governments decided to use decisive measures in an emergency situation. Hence, service redesign that can create a good experience for guests is therefore a matter that the hotel should take into account when reopening the business. This will be discussed in the proposition.

International Luxury Hotel Chain (ILHC)

Many studies have been attempting to define meaning of "luxury" in many aspects to fit with its concept and characteristic. Makkar and Yap (2018) summarized that luxury is the power to pursue someone's passion. While Singh et al. (2017) concluded that luxury is an art that brings psychological satisfaction to the user. Su and Reynolds (2019) defined luxury as a service/product provided more than the basic need. Hence, it can be said that luxury is the feeling or touch that is provided more than the expectation to fulfill someone's passion and makes one satisfied. International luxury hotel chains become an important segment in hotel business. Most of them are located in the world destination countries such as USA, UK, Canada, Hong Kong, and France (Sun et al., 2017; Xu et al., 2018). ILHC looks elegant comfortable facilities, provides high quality service, unique style, good pamper from well-trained staff with hoping the guests have a memorable experience during they stay. Preferred locations of ILHC are in city center, beach or mountain around major tourist destinations. ILHC can be divided into three segments: 1) Luxury major, for example Sofitel, Ritz Calton, JW Marriott, etc., 2) Luxury exclusive, for example Four Seasons, Kempinsku, Mandarin Oriental, etc, and 3) Upper upscale, for example Hilton, Sheraton, etc. (Dick, 2019; Tissot, 2018). The targeted market of ILHC is quite heterogeneous (Gao et al., 2020; Hossain et al., 2019). Most of the guests are generation X and Y who are multi-cultural, tech savvy, and demand for personalized service from professional and well-experienced staff (Muslim et al., 2020; Oswald, 2020). Price, promotion, and place strategy are still the important factors influencing the guests to consider the booking (Cró & Martins, 2018; Jang & Moutinho, 2019).

Hotel business in Thailand during 2019 was forecasted to grow along with the tourism industry (Chaivichayachat, 2019; Palang & Tippayawong, 2019). There were more investments in hotel properties in major tourist destinations such as Bangkok, Pattaya and Phuket (Horwath, 2018). Many leading international hotel chains such as Marriott, Hilton, Accor, IHG, etc. remain outstanding and produce more occupancy rate to accommodate the demands of the visitors, while Thai hotel chains are steadily sharing the markets (Rittichainuwat et al., 2020). There are

many significant factors influencing visitors to choose hotels to stay in Thailand such as location, safety, destination image, reasonable price, trust and reliability of website, and service quality (Taecharungroj & Mathayomchan, 2019; Tweephoncharoen & Vongurai, 2019). These are fit with the aspects of ILHC in responding and providing a great service and experience to their guests. The COVID-19 also impacts ILHC to its revenue and cash flows due to all confirmed bookings have been cancelled because of governmental lockdown policy (Filimonau et al., 2020). Many ILHC, especially in tourism cities in Thailand need to rethink and reconsider a proactive strategy to reclaim the business effectively.

Effect of COVID-19 toward Hotel Business in Thailand

The situation of COVID-19 inevitably urged the business to adapt faster (Ross et al., 2020), especially entrepreneurs in the tourism and service sectors like "hotel business" who were severely affected when the number of guests was zero because travel was not allowed during the epidemic (Fernandes, 2020; Jiang & Wen, 2020). Overall, the hotel business for the first 4 months of 2020 continued to contract from Thailand and foreign countries' economic and trade problems (Rittichainuwat et al., 2020). Since the COVID-19 globally spreads, it results various countries start a policy to treat and stop the epidemic which heavily affected employment, income and lifestyle (Ratten, 2020).

In Thailand, there was a huge increase of new cases on March 17, 2020 (Tantrakarnapa et al., 2020). The cabinet then issued urgent measures to prevent the Covid-19 crisis and shut down all risk areas including issuing lockdown measures (Djalante et al., 2020). This caused both Thai and foreign tourists cancel their trips and hotel reservations resulting in the number of tourists in all areas disappeared. The hotel business is expected to recover gradually in the second half of the year (Bank, 2020). This is because the domestic Covid-19 epidemic situation is likely to continue to improve. As a result, the government can begin to relax preventive measures until allowing the hotel to start operating normally from mid-May (Siamhan & Trirath, 2020). If the government agrees with the opening a country for tourism or a full country open, it is expected that foreign tourists will choose Thailand as

the first destination for their trip. This is in accordance with a survey from C9 Hotelworks Market Research and Delivering Asia Communication, they surveyed Chinese tourists which ranks the first of international tourists travelling to Thailand. It is found that 71 percent from the survey still chose Thailand as their preferred destination to travel (C9 Hotelworks Market Research and Delivering Asia Communication, 2020). Thus, the third hypothesis is:

Discussion

This paper discusses a possible perspective of service to be redesigned in customer experience management on hospitality marketing and management which can be outlined into 5 stages: recognition, consideration, reservation, occupancy, and loyalty adapted from Lemon and Verhoef (2016) and Varkaris and Neuhofer (2017) to guide future research direction in the hotel business as illustrated in Figure 3.

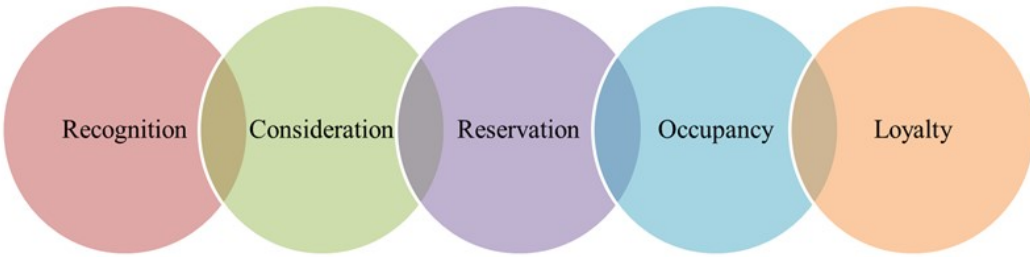

Figure 3: Proposed perspective of service to be redesigned in customer experience management

Source: Adapted from Lemon and Verhoef (2016) and Varkaris and Neuhofer (2017)

Recognition

It is a step in building awareness among the targeted customers of hotels. Before creating recognition, hotel needs to set up Segmentation - Targeting – Positioning (STP) process in order to know the target audience that will communicate because hotel cannot take care of all customer groups (Dewanti et al., 2018). By not setting the target audience to communicate, the hotel will waste its budget because it will be a one-way communication and doesn't know who the target audience is (de Vries, 2020). When hotel doesn't know its target, communication strategies cannot be properly designed.

Returning to restart the hotel, a marketer has to explore the changes of the hotel first, whether it is in the same position before the COVID-19 (Craven et al., 2020). Some hotels positioned themselves as 3-star hotels before pandemic, then transformed into a boutique hotel by adding the hotel's identity and hygiene facilities as a key factor in presenting customers. This process of generating recognition should occur after the hotel has planned according to the STP and has clearly defined the target audience. It may be a small and specific target group like fragmentation, which allows hotel to save the budget for choosing a channel to create recognition of the target audience (Nga, 2020).

The tools for generating recognition for hotels may need to be categorized according to the type of customer group (Ramos et al., 2018). The main customer audiences are FIT (Free Individual Travelers), corporate groups, companies and organizations, government, and travel agencies (Leung, 2019). This does not include sub-targeting groups such as hoteliers, airline staff which each of the above groups uses a different recognition method (Ahmad & Sun, 2018; Fathy & Zidan, 2017).

In addition, the content that wants to create recognition may add some details focusing on the customers to clearly see the identity of the hotel in any matter, such as a recognition to the customer to know the hotel is located in this area and let them recognize that the hotel is one of the options to consider if staying in this area (Al-Aomar & Hussain, 2018). Therefore, the main function of the hotel is to analyze each customer group and find the ways to create recognition that will best reach each group to communication in order to create recognition both online and offline.

Consideration

It is a step in getting the attention of the customers when they are aware of the recognition stage. If hotel can successfully communicate and create recognition, the customers will be interested in the product/service, so they will search for information to make decision which can occur at this stage only after the customers have created interest in a hotel (Krizanova et al., 2019). Currently, many business products and services are driven by big data (Tao et al., 2018; Zhao et al., 2019). It is easy for customers to access to a wide variety of resources such as images and hotel experience from others which are needed to keep track the expected channels that customers would like to learn more about when interested in a hotel (Koc, 2020).

These usually include: 1) Social Media: customers who are interested in a hotel will study information from various social media sources such as the hotel's Facebook page or the hotel's Instagram, etc. (Garrido-Moreno et al., 2018). Most of them are in the form of various reviews both positive and negative. The hotel is essential to monitor the various reviews as well as the dramas in the online world that relate to the hotel (Jimenez-Marquez et al., 2019), 2) Website: customers will learn more information of the hotel via the hotel's website (Birinci et al., 2018), which is a caution for the hotel to keep updating the information of the hotel on the website. And 3) Asking information from others: this is done by asking their friends and families who have experience in the hotel service before (Wolff et al., 2017). This may be linked to the hotel's loyalty program. If hotels have a positive feedback, customers are also likely to have positive consideration which leads to confirm a reservation (Tse & Poon, 2017).

Reservation

At this point, hotel needs to plan a distribution channel, which customers can book the rooms. Most of customers book the rooms via online travel agent (OTA), Facebook page, or line chat (Hapsari Sulistyo & Pranata, 2020). Sometimes, it's a direct booking with the hotel such as walk-in or direct-calls (Yılmaz et al., 2019). No matter what which distributions are, hotels need to adapt to customer behavior to create impression and the best customer experience because this is a critical step in the creation of the entire hotel customer journey (Buehring & O'Mahony, 2019).

The after-sales service is involved in this stage in order to make customers decide to come back and stay with the hotel again (Othman et al., 2020). In this case, customers may be asked after their stay for their satisfaction to review their experience via the hotel's social media channels in order to return to the channels of Recognition- Consideration to other customers.

Occupancy

During an in-house period, hotels need to change their existing service model to adapt to changes in the customer experience (Khan et al., 2020). For example, a hotel restaurant may start offering spoons or plates that are served privately (Larisa et al., 2020), reducing direct contact with food or with staff (Wan et al., 2020), and a design of a personal one-dish menu instead of a buffet (Bae & Chang, 2020).

According to Viglia and Dolnicar (2020), Minor International increases the confidence in cleanliness, for example, a buffet breakfast will become a set menu, free room service, wash the sheets/towels every day for cleanliness. ALPICO Group provides QR Code for customers to select the menu from their mobile phone, cancels serving large dishes together, but divides into small plates for each guest instead. Dusit International lets staff help the guest do shopping for local souvenirs and can order food at any time to eat in the room. Customers will pay more attention to the safety of their food choices. They will be more convinced that the source of the ingredients is reliable. For example, improper raw food choices are the root cause of the epidemic.

In response to the change in consumer thoughts, hotel must make appropriate adjustments such as return to the basics of hotel standards, adhere to Hazard Analysis Critical Control Point (HACCP), promote the importance of hygiene within the hotel, create a safety perception to ensure customers confidence in the service (Kuo & Hsiao, 2020).

For example, Hilton International has done check-in, check-out as a digital key through customers' mobile phone in order to reducing touch (Dikken, 2020). Anantara hotels collect guest check-in information prior to arrival to reduce check-in at the lobby (Aeberhard et al., 2020). The Marriott Hotel Group is preparing to install the aerosol to help clean guest rooms and common areas, including adjusting the setting for placing furniture within the area to comply with the 1.8 meter distance maintenance policy (Jiang & Wen, 2020). for placing furniture within the area to comply with the 1.8 meter distance maintenance policy (Jiang & Wen, 2020).

Loyalty

Service loyalty is a voluntary of customer who continues to use the service from the same service provider on a regular basis (Torres et al., 2019) and decides to use the same service as the first choice although there are other channels or opportunities to choose from (Xu & Jackson, 2019). Loyalty is a result of a positive attitude and behavior towards the service provider to keep good relationship with customers not to change to other services (Suhartanto et al., 2019). Customer loyalty is a sustainable key success to the hotel business (Koo et al., 2020). Every hotel gives importance by creating challenges that doesn't just attract customers but it also means using various strategies to keep customers with them as long as possible (Aldaihani & Ali, 2018) as following dimensions:

1) Recommending to others is an impressive expression of customers after using the service leading to word-of-mouth or suggestion influencing others interested in using the service as well (Foroudi et al., 2020). This behavior is due to having positive attitude to products/services. In addition, word-of-mouth marketing which is considered as a viral marketing becomes more influential and popular (Chu & Kim, 2018). It is a powerful channel for public relations and information

dissemination faster. Loyal customers will help spread the hotel information through online communication that is becoming very popular, and also a channel that is convenient to access to extensive database (Boateng et al., 2020). The final result is an increasing of new customers and profits in the long term.

2) Purchase intention starts with an idea of customers who decide to use products/services through the process they perceived, but has not yet done (Prasad et al., 2019). However, this feeling shows customers' advance purchase behavior because intention to purchase is a factor to measure loyalty. This factor identifies a positive attitude of the customer to the business, and becomes the reason for the following behaviors such as word-of-mouth, recommending to other, repeat purchases, etc (Iyer & Griffin, 2020). When customers are impressed, a memorable experience will be created and become their first choice when deciding to stay in that hotel again.

3) "Price sensitivity" means that competitor's price does not affect loyal customers, unlike low loyal customers will pay attention to the price because customers are willing to pay regardless of competitors' prices (Qiu & Rao, 2020).

At present, hotel business is highly competitive due to the expansion in the tourism and communication technology (Morozov & Morozova, 2020). Therefore, loyalty plays an important issue because it results in more sales and long-term business growth (Chaudhuri et al., 2019). Measuring customer loyalty level must be appropriate to the changing context of the hotel business which are behavior and attitude of the customer (Ngobo, 2017). The indicators that are implemented in the hotel business are behavioral intention and a positive word-of-mouth, especially an electronic word-of-mouth (E-WOM) (Nuseir, 2019).

It can be said that a study how to measure customer loyalty is a useful point to hotel marketers as well as being able to develop to create effective marketing strategies and response to the needs of customers efficiently. The hotel business is in a stagnant situation now, a current uncertain situation should make hotel businesses around the world try to adjust their business model and adapt themselves as much as possible in order to give guests and customers confidence and come back to use the service.

Future research direction

Tourism is classified as an important industry that can generate a significant amount of income in Thailand contributing to a turnover and income distribution as well as promoting investment in various businesses that are relevant widely (Esichaikul et al., 2020). Hotel business market tends to be more competitive in order to compete for a high end market, with more emphasis on quality and service competition by making it stand out and differentiate itself from competitors to meet the needs of a more specific group of customers (Sangwichien & Jaroenwisan, 2017). Studying customer experience management for hotel business is always necessary to marketing researchers and entrepreneurs (Gilboa et al., 2019). A huge impact from COVID-19 pandemic encourages marketers to intentionally focus on implementing and designing the right way to provide a memorable experience to their guests (Bonfanti et al., 2021). Many studies are attempting to propose a marketing strategy to make hotels survive from this crisis.

In relation to this, scholars are suggested to analyze loyalty behavior through customer's experience factors. It is crucial to know the customer's experience from the pre-purchase stage, which is linked to a customer journey (Grewal & Roggeveen, 2020). Hotel business is categorized in the hospitality industry that has to adapt itself to the effects of COVID-19 (Yacoub & ElHajjar, 2021). As soon as the hotel can be fully operational, guests will likely need new services, such as keyless access to their rooms, check-in and check-out without interacting with employees, including various personal services (Mourmoura, 2020).

Additionally, hotel staff will always sanitize all areas before the guest enters the hotel and goes straight to the elevator going up a room without having to touch anything or get the service as comfortable as ever (Bove & Benoit, 2020). It is time for the hotel to leverage all strategies greatly, restore the confidence of their guests, and redesign new service experiences. Designing customer experience is a vital agenda for marketing scholars and practitioners (Alcañiz et al., 2019). Guests may be surprised with the level of service unlike in the past, especially in a service of luxury hotels (Lee & Park, 2019). Shared space services such as buffet rooms and mini bars, as well as services that require intimacy such as spas, porter services, and valet service would be suspended for a while (Bhatia et al., 2018).

Other forms of operation and innovation will be found from this behavior shift. For instance, Jiang and Wen (2020) presented three issues that will be influential to hotel business as affected by COVID-19: artificial intelligence (AI) and robotics, hygiene and cleanliness, and health and health care. This study suggests scholars to take a serious analysis and develop the opportunities and challenges of each issue (Song et al., 2018). Even though many research antecedents, mediators, and moderators have been extensively examined through various service experiences, still there is a need to take other relevant factors into consideration, such as service journey influencing service experience (Law et al., 2018).

In conclusion, further research could firstly examine how hotel managers built customer experiences after COVID-19 has been declared over to identify possibly alternate hotel solutions and vice versa. Furthermore, given that some researchers (Liang & Wu, 2022) have proposed that customer experience has a positive impact on customer trust and retention a customer's desire to participate in future transactions, resulting in a sense of decreased future risk (Javed & Wu, 2020) – future research could secondly look into how hotels' hygienic measures influence customer trust. Despite of COVID-19, many hotels, including upscale hotels, services based on technology implementation to increase customer experience during COVID-19 (Pelet et al., 2021). Hence, it is recommended to study customer experience and luxury hotels under technology as it becomes a norm in a way to satisfy the key target markets and enrich guest experience in the hotel business. Third, a comparison of perceived experiences

between Thai and international tourists from the service design of the hotel is interesting to study because a difference of culture could reflect needs and expectations from various demands in order to provide the right strategy to provide them a memorable and seamless experience (Buhalis & Karatay, 2022).

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