



**SMALL ARMS SIMULATOR FOR MILITARY AND
SECURITY TRAININGS - AN INDUSTRY AND
COMPETITOR ANALYSIS**

BY


MISS RANCHIDA KHANTONG

**AN INDEPENDENT STUDY SUBMITTED IN PARTIAL
FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE PROGRAM IN MARKETING
(INTERNATIONAL PROGRAM)
FACULTY OF COMMERCE AND ACCOUNTANCY
THAMMASAT UNIVERSITY
ACADEMIC YEAR 2016
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ENTITLED

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was approved as partial fulfillment of the requirements for
the degree of Master of Science Program in Marketing (International Program)

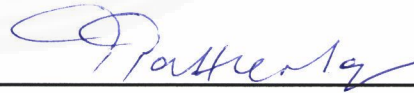
on..... 8 MAY 2017

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Independent Study Title	SMALL ARMS SIMULATOR FOR MILITARY AND SECURITY TRAININGS - AN INDUSTRY AND COMPETITOR ANALYSIS
Author	Miss Ranchida Khantong
Degree	Master of Science Program in Marketing (International Program)
Major Field/Faculty/University	Faculty of Commerce and Accountancy Thammasat University
Independent Study Advisor	Professor Paul G. Patterson, Ph.D.
Academic Year	2016

ABSTRACT

The small arms simulator is an appealing option for shooting training because of its benefits in lowering the cost, safety issues and waste management. It is well worth to study the market opportunities for small arms simulator as it is one of the defense technology that can lead to numerous trading opportunities. Moreover, it is likely to play an important role in the evolving military training industry.

This independent study comprises the industry summary and competitor analysis focuses on the small arms simulator technology and its opportunity in Thailand. Exploratory research was conducted using secondary data and in-depth interview. The secondary data reports the overview about the defense industry and the small arms simulator industry, Thai military procurement process, the utilization of small arms simulator in military training, military expenditure, budget allocation structure and trend. In-depth interviews with key persons in the buying process show the insight on the importance of the shooting training simulators and describe the buying center in practice.

Some military units are using the small arms simulators alongside the traditional field training in Thailand. The systems are from both local manufacturers and importation. Still, there are the demands for such systems as shooting is a fundamental training and the requirement for each level of training is different. The potential users are Royal Thai Army, Royal Thai Navy, Royal Thai Air Force and

(2)

Royal Thai Police along with their sub-units. The procurement of the simulators follows regulation of the Office of Prime Minister on Procurement B.E.2535 (1992). Nevertheless, a well-established connection with the right person in the procurement process is also important apart from selling the product that can serve user's needs.

Keywords: Small Arms Simulator, Small Arms Simulator Industry, High Technology Buying Process



ACKNOWLEDGEMENTS

I would like to thank my advisor, Prof. Dr. Paul G. Patterson, for his intensive support throughout this independent study period. His authentic suggestions and thoughtful opinions have guided me to the best possible way to succeed in this independent study.

I also would like to express my deepest gratitude to the senior military officers and other participants for sparing their precious time to provide the insightful information. This independent study would not be as discreet without their kindness cooperation.

Lastly, I especially thank my family for being there for me whenever I need someone to hold on to. Their love and support inspire me to try my best to overcome any obstacle and achieve my goals.

Miss Ranchida Khantong

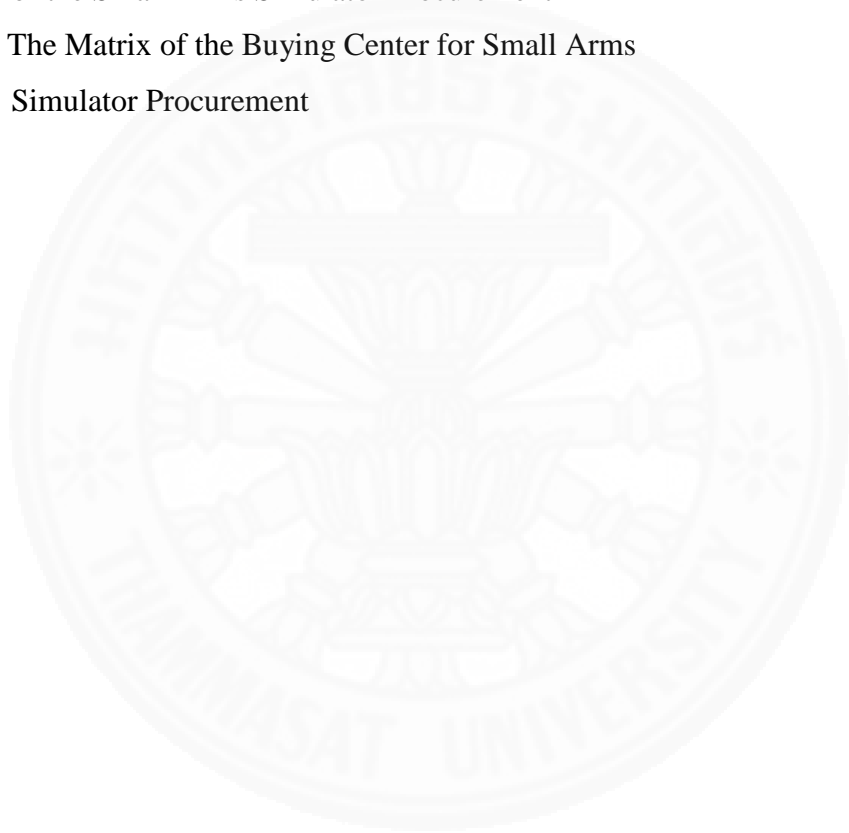
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CHAPTER 1

INTRODUCTION

1.1 Introduction

“Practice makes perfect”

This is also true for military operations, especially those related to the hazardous field combat such as shooting because one shot can result in life and death. Shooting simulator enables user to train in a realistic and interactive environment with comparable fidelity to the actual shooting. The technology is highly attractive because of its safety, cost effectiveness, flexibility and training efficacy (Gun Simulation Facts, 2016).

The cost of resources, especially ammunition and time, for live firing range is high making it an uneconomical way of training (Jameson, 2016). The small arms simulator, thus, becomes more appealing because of its benefits over the traditional shooting range in lowering the cost, safety issue, and waste management (Yu-bing, 2011). Small arms simulator can provide realistic and effective training experience in the way that it allows the trainees to get used to the weapons and practice shooting with the ease in monitoring the performance by the instructors (Jameson, 2016). It can also serve both novel and professional shooters to be familiar with the weapons prior to using the real ones. Hence, the small arms simulator lessens the risk from undesirable threat of guns. Furthermore, users can be trained in the dangerous or intense situations without actually harming themselves. The system can also help to lower the cost of training as the expense on ammunition can be cut-off and the system installation is cheaper than building the actual shooting range. By the application of computer-simulated environment, the training can be set for shooters with any skill levels and the scenarios can be changed referring to users' preferences. In addition, the training can be arranged any time without having to concern about environmental factors such as weather condition. The lifelike situations, provided by the system, benefit the trainees to have realistic experiences in handling and responding to the dangerous situations. Moreover, the system can keep the record of the users'

performances in the training making it possible to review the result (Gun Simulation Facts, 2016).

In 2015, the small arms simulator held 54% share of the total global indoor shooting ranges market. It was predicted that the shooting simulator will continue to seize the market size, market share and growth from the traditional indoor shooting ranges within 5 years (Shooting Ranges Market Forecast to 2020, 2015) . This growing demand on the small arms simulator pinpoints the interest in seeing the opportunity in Thailand' s defense market as shooting training is one of the fundamental military practice. The military budget is continuously rising year by year even though Thai government hopes to diminish military supports from other countries (Strategy Technology Analysis Department, 2016). Thus, this gives room for the domestic defense technology to grow. The study can be the motivation for the development of small arms simulator system in the country as well as stirring the growth of R&D in defense technology in Thailand, decreasing the expense from purchasing imported system and helping to reduce the cost of training with commendable use of military budget.

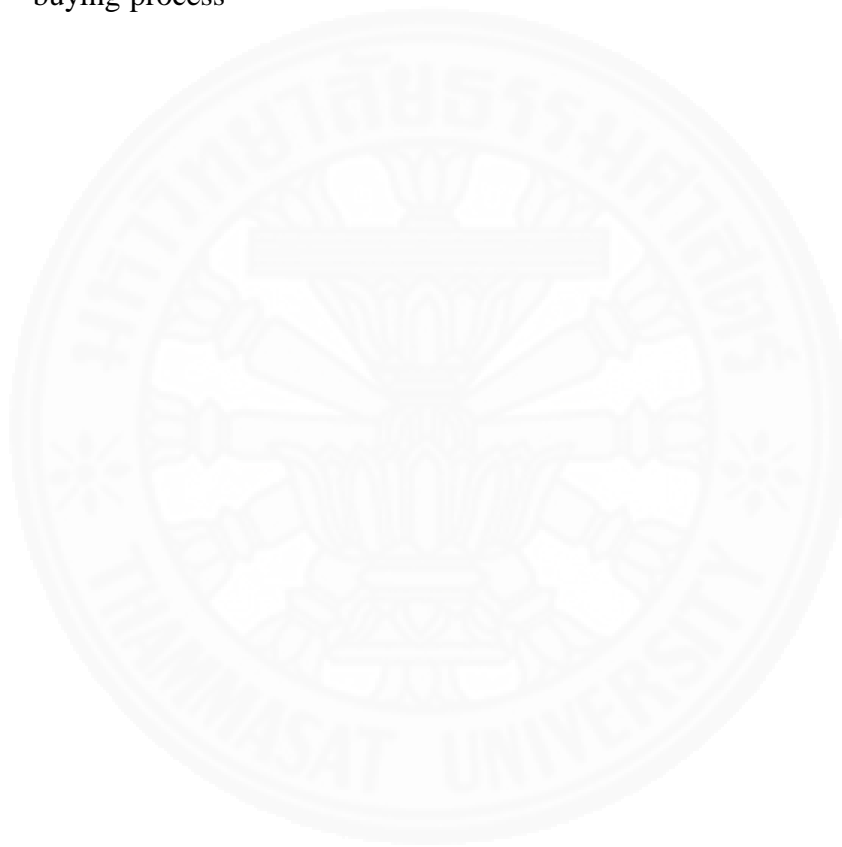
1.2 Research Objectives

This study contains the information about the small arms training simulator in terms of the technology opportunity in Thailand. The information can supply the game developer or software developer with a better vision on the potential of the small arms simulator market in Thailand.

The objectives of this study are listed as follows:

1. To understand AEC defense industry and the trend in defense-related budgeting and allocation
2. To determine Thailand's market opportunities for the small arms simulator
 - 2.1. To understand the trend in defense-related budgeting and allocation in Thailand
 - 2.2. To understand the market demand for the small arms simulator for military and security trainings
 - 2.3. To identify the key competitors that are currently in the small arms simulator market in Thailand

3. To identify the key factors that are relevant to the procurement process of small arms simulator system for military and security trainings in Thailand
 - 3.1. To define the procurement structure of the military and the key person(s) who are responsible for the key roles in procurement process
 - 3.2. To identify the buying criteria such as price, compatibility with existing simulators, maintenance cost, etc.
 - 3.3. To develop a matrix of decision makers, influencers, etc. at each stage of buying process



CHAPTER 2

REVIEW OF LITERATURE

2.1 Organizational Buying

Organizational buying involves decision-making process where formal organizations initiate the need to buy products or services by identification, assessment and selection of brands and suppliers. The difference between organizational buying and the individual consumer's buying is that there are more transactions happen in the process. The decision-making unit in purchasing structure is called "the Buying Center" which includes:

- 1) Initiators who express the needs to purchase something. They can also be the users of the product or service.
- 2) Users who use the product and service
- 3) Influencers who have the influence on buying decision i.e. technical expert
- 4) Deciders who determine the product specification and suppliers
- 5) Approvers who approve the actions of deciders or buyers
- 6) Buyers who are authorized to select, negotiate and construct purchase agreement with vendors
- 7) Gatekeepers who manage the flow of information and sellers in reaching the buying center

A person can take several roles simultaneously as each role can be held by many people. Understanding this structure is important for business-to-business marketing as it helps to define the right contact points and selling efforts.

In business buying, all costs and benefits are taken into account in terms of monetary viewpoints. Thus, the compensation between the benefit and cost is crucial to encourage the buying decision. (Kotler & Keller, 2014). Furthermore, the complexity of the buying decisions arises as more parties, more money, more risk and more careful and well-rounded consideration are needed (Kotler & Pfoertsch, 2006).

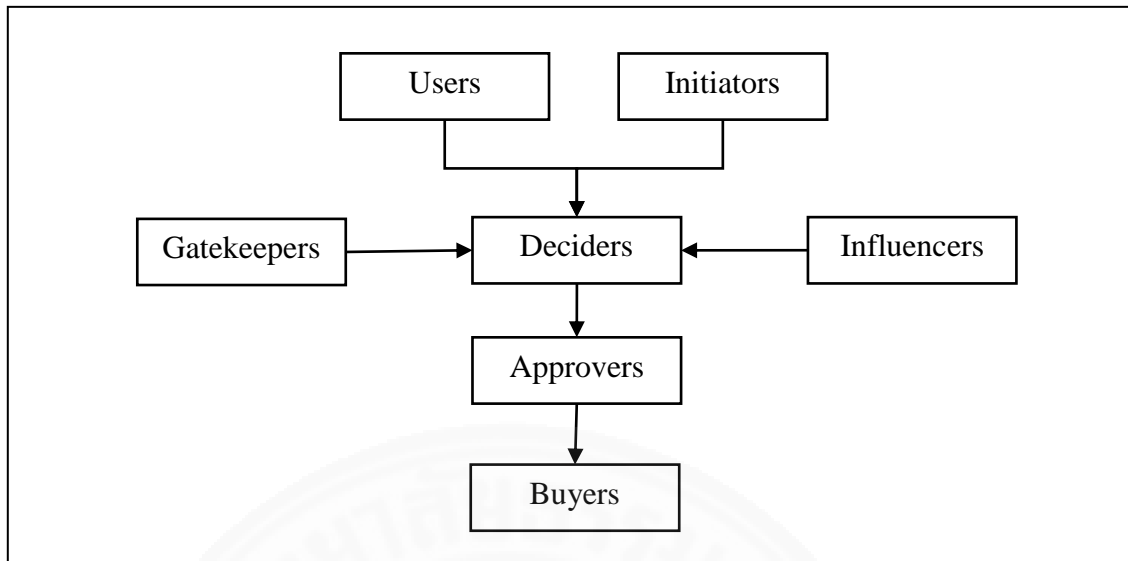


Figure 2.1: The Diagram of Buying Center

The business buying-decision process can be described in 8 stages called “Buyphases” (Kotler & Keller, 2014) as follows:

- 1) Problem Recognition: The beginning of the buying process when the needs or problems are reckoned and addressed by an acquisition of a product or service by either internal or external incentive
- 2) General Need Description: The outline of the preferred quantity and timeframe to obtain the products or services (Kotler & Pfoertsch, 2006)
- 3) Product Specification: The establishment of the desired product or service specification in detail including technical term, commercial term and other relevant agreements
- 4) Supplier Search: The attempt to find the suitable vendors through both online and offline media
- 5) Proposal Solicitation: The submission of proposal from the qualified potential suppliers for evaluation and selection
- 6) Supplier Selection: The identification of the supplier by ranking the desired attributes of the candidate companies from evaluation criteria
- 7) Order-routine Specification: The agreement on finalized order specifications, quantities, warranties and other relevant deals
- 8) Performance review: The evaluation of the chosen supplier’s performance (Kotler & Keller, 2014)

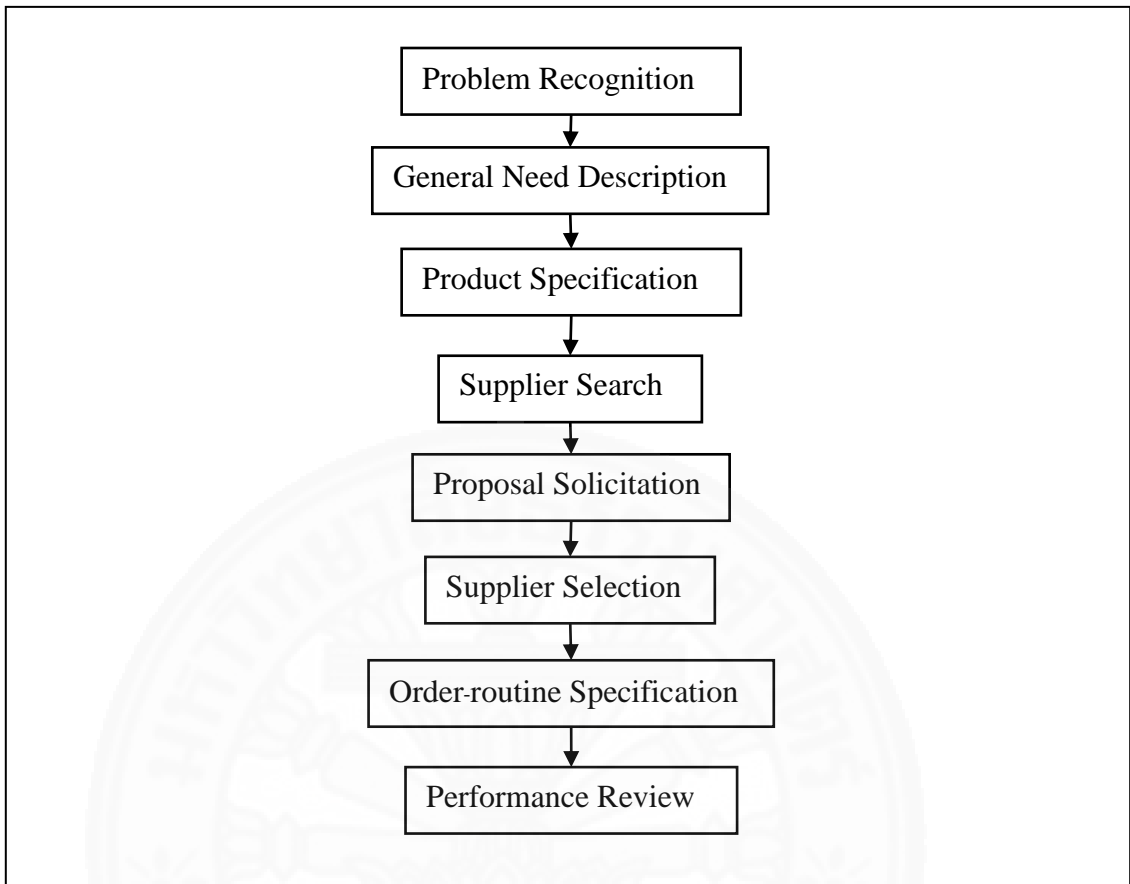


Figure 2.2: Buyphases of the Industrial Buying Process

CHAPTER 3

RESEARCH METHODOLOGY

Secondary data sources and qualitative research approaches were used to investigate the research problem. The detailed research design is explained as follows:

3.1 Secondary Data Collection and Observation

The desk research was implemented to gather secondary data from various credible sources such as books, magazines, websites, government publications, conference interviews, related market research reports, etc. These sources of information were able to provide the information on the following:

- The comparison of military budgeting between Thailand and other countries in AEC region
- The procurement regulations for government organizations in Thailand
- The market trend of the small arms simulator both in Thailand and worldwide
- The policy to support the growth in self-help defense technology in Thailand

3.2 Interviews with Military Officers

The primary data were acquired only through in-depth interviews as the target respondents were quite limited and specific. These interviews were the main source of data to get the insights about the military and security trainings. They were conducted with the officers who were the influencers or the decision makers in buying the small arms simulators of military units and other defense-related organizations. The result of the interview delivered the information on the current methodology of trainings, the interest in looking for the substitution or addition of the training media, the criteria which they consider when they make a purchase, etc.

3.2.1 Target Population

Nonprobability sampling method was used to recruit the respondents for this study. The respondents were selected based on their roles in the decision-making unit. For the purchase of small arms simulators, the population includes:

- 1) Military Officers who partook in the military procurement process, especially for the Small Arms Simulator mainly from Royal Thai Army and Royal Thai Air Force
- 2) An expert from Defense Technology Institute who is working on a small arms simulator project called Virtual Shooting Range

Unit	Appointment Date
Defence Technology Institute	October 27, 2016
Security Force Training Center, Royal Thai Air Force	December 21, 2016
Technical Affairs Division, Directorate of Joint Communication, Royal Thai Air Force	January 23, 2017
31 th Infantry Regiment King's Guard (Rapid Deployment Force), Royal Thai Army	February 15, 2017

3.2.2 Data Collection Plan

In-depth interview

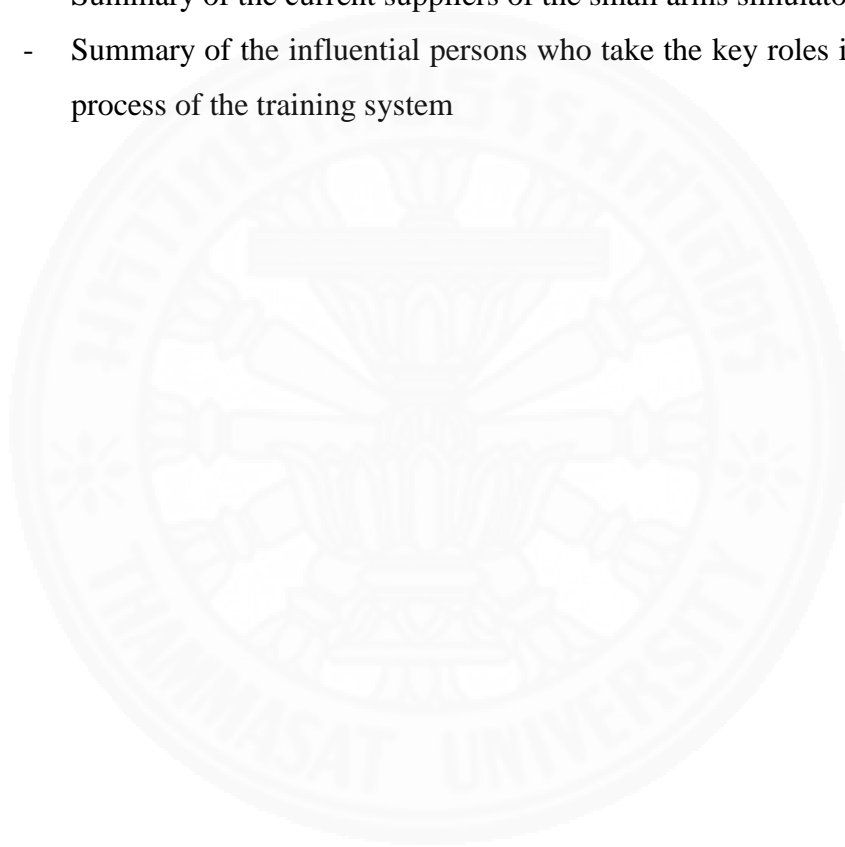
Method of recruitment	Personal connection
Duration per interview	No more than 60 minutes
Method of interview	Face-to-face and telephone
Location	On-site as appointed by the respondents

3.3 Analysis of Qualitative Data

The information from each in-depth interview was simplified, analyzed and summarized by using content analysis to draw the conclusion for the research

objective 2.2, 2.3, 3.1 and 3.2. The interview response was extracted based on the following frameworks:

- Noteworthy actual quotes from the officers
- Summary of the comments on the current training methodology or system used in trainings
- Summary of the perception toward the use of small arms simulator as an aid of trainings
- Summary of the current suppliers of the small arms simulator in Thailand
- Summary of the influential persons who take the key roles in procurement process of the training system



CHAPTER 4

RESULTS AND DISCUSSION

4.1 Main Findings from In-depth Interview

- The training centers, which are currently owning the shooting training simulators, use both field training and simulator in marksmanship training.
- Small arms simulator can help to reduce the cost of training and provide more efficient utilization of resources.
- By practicing with shooting simulator, the trainees are able to be familiarized with the weapon with minimal risk of getting injured from the unacquainted use of the firearm.
- Various training situations can be implemented and adjusted to serve training objectives in order to offer “we train as we fight” experience to the trainees.
- The trainees are able to maintain or enhance their marksmanship skill through training in the simulated shooting environment.
- The Ministry of Defence is expecting for the simulator that is produced by the local manufacturers in order to decrease cost as well as to support the Research and Development of defense technology within the country.
- *“The market in Thailand alone is quite big because shooting is a fundamental skill that needs to be trained. Every unit that requires the use of guns are our potential customers. However, the extent of advancement of the simulator, such as fidelity, functionality, etc. varies according to the level of the users.”* said the interviewee who is a project manager on Virtual Shooting Range project at Defence Technology Institute.

4.2 AEC Defense Industry

The ASEAN Economic Community (AEC) comprises 10 countries in Southeast Asia region: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Vietnam and Thailand. It was established with the

aim to accelerate the regional economic growth and encourage cooperation between the member states in developing and assisting on the matters of mutual interest (About ASEAN, n.d.). ASEAN is on the rise to become more influential in the global defense industry (Smith, 2016). Southeast Asia's Military expenditures steadily grew during 2010 to 2014 and accounted for USD 38.2 billion in 2014 (Thai Military and Asian Region, 2016). During 2009 to 2016, the defense imports of the region went up by 71%. Furthermore, Indonesia and Vietnam are considered to be in the top 5 of defense import countries over the next ten years. (IHS Global Defence Trade Report, 2016).

Table 4.1: Summary of Defense Budget and Procurement Expenditure

Country	Defense Expenditure 2017 (USD)	Predicted growth in Defense Expenditure (2017-2021)	Defense Procurement Expenditure 2017 (USD)	Predicted growth in Defense Procurement Expenditure (2017-2021)
Indonesia	7.39 billion	+26%	1.57 billion	+42%
Vietnam	4.85 billion	+26%	922 million	+33%
Malaysia	4.13 billion	+11%	0.98 billion	+16%
The Republic of Philippines	3.9 billion	+17%	767 million	+29%
Singapore	9.8 billion	+9%	1.7 billion	+14%
Brunei Darussalam	387 million	+3%	64 million	+13%
Cambodia	435 million	+20%	45 million	+28%
Myanmar	2 billion	+14%	518 million	+13%
Thailand	6 billion	+6%	743 million	+11%

Indonesia – the country has long been having an upward trend for the investment in defense. With its strong growth in economic, its defense expenditure increased nearly 40% from USD 5.36 billion to USD 7.39 billion since 2012 to 2017. It is expected to reach USD 9.32 billion by 2021. Indonesia Armed Forces (TNI) is modernized based on the “Minimum Essential Force” (MEF) strategy that determines the minimum capabilities of the nature of Indonesian military to response to both internal and external threats. With this strategy, the defense procurement is predicted to go up by 42% from USD 1.57 billion in 2017 to USD 2.24 billion in 2021 from the major procurement plan for purchasing weapons and armaments. The competition in the defense market of Indonesia is strong as there are many military suppliers presented (Anderson & Burton, Navigating the Emerging Markets - Indonesia, 2017).

Vietnam – the increase in defense investment stemmed from the continuous and fast growing economy of the country as of 2017 and its inclination to open up its defense market. The country’s defense budget is predicted to increase by 26% from USD 4.85 billion in 2017 to approximately USD 6.12 billion by 2021. Within the same period, the procurement expenditure is forecasted to rise sharply from USD 922 million to USD 1.22 billion. Vietnam is seen as a high potential defense market. With the offshore challenge, the country pursues the strategy on developing the military competence in air and naval domains (Anderson & Burton, Navigating the Emerging Markets - Vietnam, 2017).

Malaysia – the slowdown in economic growth of Malaysia restricted the expansion of Malaysia defense market. However, it is forecasted that the economic growth will be resumed between 2016 to 2020 causing a slight increase in the core defense budget around 11% from USD 4.13 billion in 2017 to USD 4.60 billion in 2021. The procurement spending is also expected to rise from USD 0.98 billion to USD 1.14 billion during 2017 to 2021. Numerous security concerns and the desire to keep up with military modernization are the drivers for Malaysia in military procurement (Anderson & Burton, Navigating the Emerging Markets - Malaysia, 2016).

The Republic of Philippines – the transferring of military pensions to a different part of national expenditure program during 2011 to 2014 caused the defense budget to remain stable. It is expected to rise from USD 3.9 billion to 4.6 billion or

increase by 17% during the period between 2017 and 2021 after the reorganization. The procurement expenditure also opts the same trend with the projected increase of 29% starting from USD 767 million in 2017 and rising up to USD 990 million in 2021. The drivers of the growth in procurement spending are internal insurgent issues and tension in offshore territory incursions (Anderson & Burton, Navigating the Emerging Markets - Philippines, 2016).

Singapore – the defense investment of Singapore is determined by the mature foreign policy. The country intends to balance between developing military capability to conquest regional rivals without accelerating tensions, at the same time, stirring a regional arms race through inflammatory purchases of materiel. The defense budget increased by 6.4% from 2015 to 2016 which brought it up to USD 10.2 billion. The budget is forecasted to rise 9% from USD 9.8 billion in 2017 to USD 10.7 billion in 2021. The projected growth in procurement spending is about 14% from USD 1.7 billion in 2017 to USD 1.9 billion in 2021. The country's defense market is influenced by its strong national economy, stable political system and potential regional disturbance (Anderson & Burton, Navigating the Emerging Markets - Singapore, 2016).

Brunei Darussalam – an overall increase of 3% is projected for the defense budget during 2017 to 2021 (from USD 387 million to about USD 400 million). The procurement expenditure is predicted to climb from USD 64 million to USD 72 million or approximately 13% throughout the same period. The country is committed to the advancement of military technology and the borders and maritime territory security. Therefore, a large proportion in the defense budget is allocated to the procurement (Anderson & Burton, Navigating the Emerging Markets - Brunei, 2016).

Cambodia – the country owns one of the lowest defense budget in Asia. However, the military budget will go up around 20% from USD 435 million in 2017 to USD 522 million by 2021. The procurement budget is expected to have 28% growth from USD 45 million in 2017 to USD 58 million in 2021. Cambodia does not encounter any apparent external threat. No primary threats toward the national sovereignty despite the risk related to land borders, transnational crime and civil unrest. The expenditure budget will mainly be used to improve salaries and conditions

for soldier with limited procurement allocation (Anderson & Burton, Navigating the Emerging Markets - Cambodia, 2017).

Myanmar – the country has high economic potential with 14% forecasted rise in defense expenditure between 2017 and 2021 from USD 2 billion to USD 2.32 billion. Similar rate is also applied to the growth in procurement spending which is estimated to reach USD 594 million by 2021. This figure is accounted for 13% increase from USD 518 million in 2017. The country's reformation in 2011 leads to the needs of military modernization to improve its strategic position in the region as well as defend offshore assets and attain military balance with regional rivals (Anderson & Burton, Navigating the Emerging Markets - Myanmar, 2017).

4.2.1 Thailand's Defense Industry

The current military government is the key driver to the domestic defense industry in Thailand. Thai military budget rises continuously every year (Thailand-Defense and Security, 2016). In 2014, Thailand had 15% of ASEAN total military expenditure which ranked the third place for budget in the region (Thai Military and Asian Region, 2016). It is reported that the 2017 defense budget of THB 210.7 billion or USD 6 billion was approved by Thailand's National Assembly. This figure represents 7% of total government expenditure during the year and is 2% higher than expenditure in 2016 (Grevatt, 2016): more than 49% is allocated to Royal Thai Army, 19% to Royal Thai Navy and 18% to Royal Thai Air Force (Thailand-Defense and Security, 2016). The military budget is predicted to keep rising by 6% during 2017 to 2021. It is also forecasted that the procurement budget will portray overall growth of 20% from USD 743 million in 2016 to USD 842 million by 2021. The purpose of increasing the military budget is to sustain combat readiness, equalize the competition in ASEAN in growing the number of powerful armaments and elevate the arm forces capabilities of the country (Anderson & Burton, Navigating the Emerging Markets - Thailand, 2016).

In 2015, Thailand earned high rank on the Institute for Economic & Peace Terrorism Index (ranked 10th), which signified high number of terrorist activities comparing to other countries worldwide (Global Terrorism Index 2015, 2015). Consequently, it shows the promise for the surge in demand of defense and security

equipment with the US as a major source of defense equipment (Thailand-Defense and Security, 2016).

The local defense industry in Thailand is dominated by the Ministry of Defence who also possesses defense-related factories as well as cooperates and supports the development of facilities with private firms. Furthermore, Thai government plans to advance the industry to lessen the dependency on imports, encourage technology transfer and reinforce national security. More defense technology development and defense intelligent systems are to be invested and procured in order to strengthen military capabilities (Thailand-Defense and Security, 2016).

The offset policy is pushed forward in response to this determination. This offset policy, in terms of defense industry, is a kind of purchase contract that is not only relevant to monetary matter of trading products or services but also on other profitable aspects such as transfer of technologies, localized production, etc. The term of the agreement usually focuses on increasing the competitive advantage of the buyer country through knowledge and technology transfer from the seller country. This contributes the self-help concept in defense technology in the long run. The offset policy is able to lessen the time required for Research and Development (R&D), reduce the cost of technology transfer and production in defense industry. Consequently, it can lead to the development in economical competency of the country with earnest investment, R&D promotion, employment, diminished trading deficit and advance the production for export (Strategy Technology Analysis Department, 2016).

According to the result from the in-depth interview, Thai military uses both local and international manufactured small arms simulators. The simulators are purchased through authorized distributors in Thailand for each system. Furthermore, Defense Technology Institute, a public organization under the Ministry of Defence, has an ongoing project to develop the system in order to serve the demand from user units with lower cost.

4.3 Small Arms Simulator Industry

4.3.1 Industry Structure

The small arms simulator is included in the indoor shooting ranges market which is accounted for about 40% of the total shooting ranges worldwide market in 2015 with the projected CAGR of 10.39% . The small arms simulator, itself, owned 54% share in the total global indoor shooting ranges market in 2015 and was predicted with CAGR of 12.49% from the market size of USD 156.83 million in 2015 to USD 282.54 million in 2020. In terms of volume, the market size for the small arms simulator in 2015 was around 496 units and expected to reach 513 units by 2020. It is also forecasted that the shooting simulator will grasp the market size, share and growth from the traditional indoor targets during 2015 to 2020 (Shooting Ranges Market Forecast to 2020, 2015).

Table 4.2: Major Small Arms Simulator Systems

Company	System	Users
Meggitt	FAT M100	UK, Canada, Italy, Australia, USA
Cubic	Engagement Skills Trainer 2000, EST 3000	Middle East
Thales	Sagittarius Evolution	Netherlands, Japan, Botswana, Denmark, Portugal and India
RUAG	SITTAL	France
Saab	SAVIT	Saudi Arabia, Japan, Malaysia

Nowadays, there are many small arms simulator systems existing in the market. Meggitt Training Systems' FAT M100 is widely used in many countries including the UK, Canada, Italy, Australia and the US. Cubic's systems, Engagement Skills Trainer 2000 and EST 3000 are widely used especially in the Middle East although they were initially developed for the US Army. Thales's Sagittarius Evolution is used in Netherlands, Japan, Botswana, Denmark, Portugal and India. RUAG's SITTAL small arms trainer is exploited by the French Army. Saab's SAVIT

serves their customers in Saudi Arabia and Japan (Jameson, 2016). The latter system is also used in the Malaysian Armed Forces and is claimed to enhance the training for their defense personnel (Saab Has Solution for Realistic Training of Malaysia's Defence Personnel, 2016).

In Thailand, there are 3 major suppliers for small arms simulator systems: Amornmas Co., Ltd., Astra Technology Co., Ltd. and Global Technology and Ex-Im Co., Ltd. These companies are the importers of military training equipment and technology (DOTTS-10, n.d.; Astra Technology, n.d.).

4.3.2 Current Suppliers

Amornmas Co., Ltd. has been serving Thai armed force for more than 25 years with the competency in military training technology. They locally develop DOTTS-10, a laser shooting system for training infantry shooting skill that can be used from basic to advanced trainings. The system, built by their in-house technology, also includes the modified weapons which can simulate realistic force and input various parameters used in training such as number of bullets, trigger pressure, etc. Furthermore, they offer custom-built scenarios and shooting programs (DOTTS-10, n.d.).

Astra Technology Co., Ltd., founded by experienced executives in defense related business activities is a supplier for military products and services from USA, Europe and Israel to Royal Thai Armed Forces (Astra Technology, n.d.). This company is the distributor for Milo Range, the world leading simulation manufacturer which standardizes interactive use-of-force, tactical judgement training and firearms training system globally. They offer wide range of shooting simulation training systems from compact scale to multi-room for team training with their cutting-edge technology and solutions. The simulations are also equipped with advanced training features, such as weapons, knowledgebase, trainee action capture as well as customizable and ready-to-train scenarios to meet their customers' training objectives (Milo Range Products, n.d.).

Global Technology and Ex-Im Co., Ltd., is the distributor for Meggitt Training Systems' FATS M100. With high fidelity in visuals and target presentation, the simulator can be used in joint training up to 24 weapons and multiple-hit detected

channels for scalable training abilities. It also supports mixed weapons for Lanes and Collective sessions. The simulation can be built upon the users' requirement (FATS M100 Simulation Training System, n.d.).

Table 4.3: Small Arms Simulators Suppliers in Thailand

Company	System	Users
Amornmas Co., Ltd.	DOTTS-10	Royal Thai Army
Astra Technology Co., Ltd.	Milo Range	The 31 st Infantry Regiment King's Guard Rapid Deployment Force, Royal Thai Army
Global Technology and Ex-Im Co., Ltd.	FATS M100	Security Force Training Center, Royal Thai Air Force

These companies are competing at the B2G level in which similar marketing strategies are adopted to push their products to the key persons in the buying decision-making process. They have their product showcase at defense-related tradeshows or directly approach the senior officers whose responsibility to elevate the military units' competencies in order to build the awareness to the company. It was found from the in-depth interview that the well-established connection is one of the keys to the successful buying agreement besides the product specifications and features offered that can serve the user's requirement and appropriate price.

There are no contracts signed to commit the users with the particular suppliers once they buy the product. However, the suppliers normally offer limited-time warranty, training session for instructors who need to be familiarize with the system, maintenance and technical service and regular on-site visit. These approaches help to maintain the relationship between the buyers and the suppliers.

4.4 The Structure of Military Procurement Decision Making

Thailand's military procurement process follows the regulations of the Office of Prime Minister on Procurement B.E.2535 (1992) (Regulations of the Office of the

Prime Minister on Procurement B.E.2535 (1992) , 1992). This regulation is also applied to other government organizations and across different military services. The overall structure of the parties relevant to the procurement process is the same among military and security units which include Royal Thai Army, Royal Thai Air Force, Royal Thai Navy, Royal Thai Armed Force and Royal Thai Police.

The military procurement is generally conducted in a bottom-up manner. The process can be divided into 3 levels on the basis of the amount of budget to be approved. The summary of the overall procedure can be summarized as shown in Figure 4.1.

Starting from preparing the Term of Reference (TOR), the User Units state the need recognition, general need description and specification of the desired product and submit the request to the Procurement Division. The Procurement Division considers the availability of the resources to create a procurement plan as well as setup a procurement committee to assess the plan with the preliminary approval from the Commander-in-Chief. The procurement plan is sent to the Directorate of Operations before it is evaluated and forwarded to the Commander-in-Chief. The approval of the procurement can be done at this position if the requested budget is within the authorized budget limit which is no more than THB 50,000,000. For higher budget limit authorization, the procurement plan must be approved by the Supreme Commander. At this level, the proposal is scrutinized based on the military service regulation and 5-year defense plan. The Joint Chiefs of Staff examines the proposed needs and prioritizes the budget allocation based on the type of equipment, the operation unit that requests for the product and the security requirement (Wattanayagorn, 1998).

“The purchase approval of equipment mainly based on the category in which the equipment falls into. Weapon is considered as the highest priority in military procurement and Small Arms Simulator is categorized as a weapon for operation training.” said a former officer of Technical Affairs Division, Directorate of Joint Communication, Royal Thai Air Force in an in-depth interview.

“Our unit is one of the most important operation units in Royal Thai Army. Thus, our need is always on the top priority to be served.” said the

deputy military commander of the 31st Infantry Regiment King's Guard Rapid Deployment Force, Royal Thai Army.

The approval of the procurement plan is made by the Supreme Commander in accordance with the Joint Chiefs of Staff's consideration. Then, it is passed to the Directorate of Joint Operations for recommendations before sending it to the Permanent Secretary. The joint committee is constituted by the representatives from the military services. At this point, the proposal is checked against the policies and regulation of the ministry before it is submitted to the Ministry of Defence for approval. However, only the plan limited to no more than THB 100,000,000 can be approved by this level. The procurement proposal above this limit is sent further to the Cabinet with the confirmation on the availability of fund from the Bureau of the Budget. If it is approved by the Cabinet, the procurement plan will be included in the Ministry of Defence expenditure and proposed to the Parliament for the next government budget preparation. The Budget Scrutiny Panel of the House of Representatives assesses the proposed budget with the consultancy from the Military Affairs Committee of the House of Representatives on any particular issues related to military procurement proposals. Finally, the approved budget plan is submitted to the Parliament to be included in the blueprint of the annual budget bill. The normal routine of military procurement can be executed by the Ministry of Defence in the following fiscal year after the bill is accepted (Wattanayagorn, 1998).

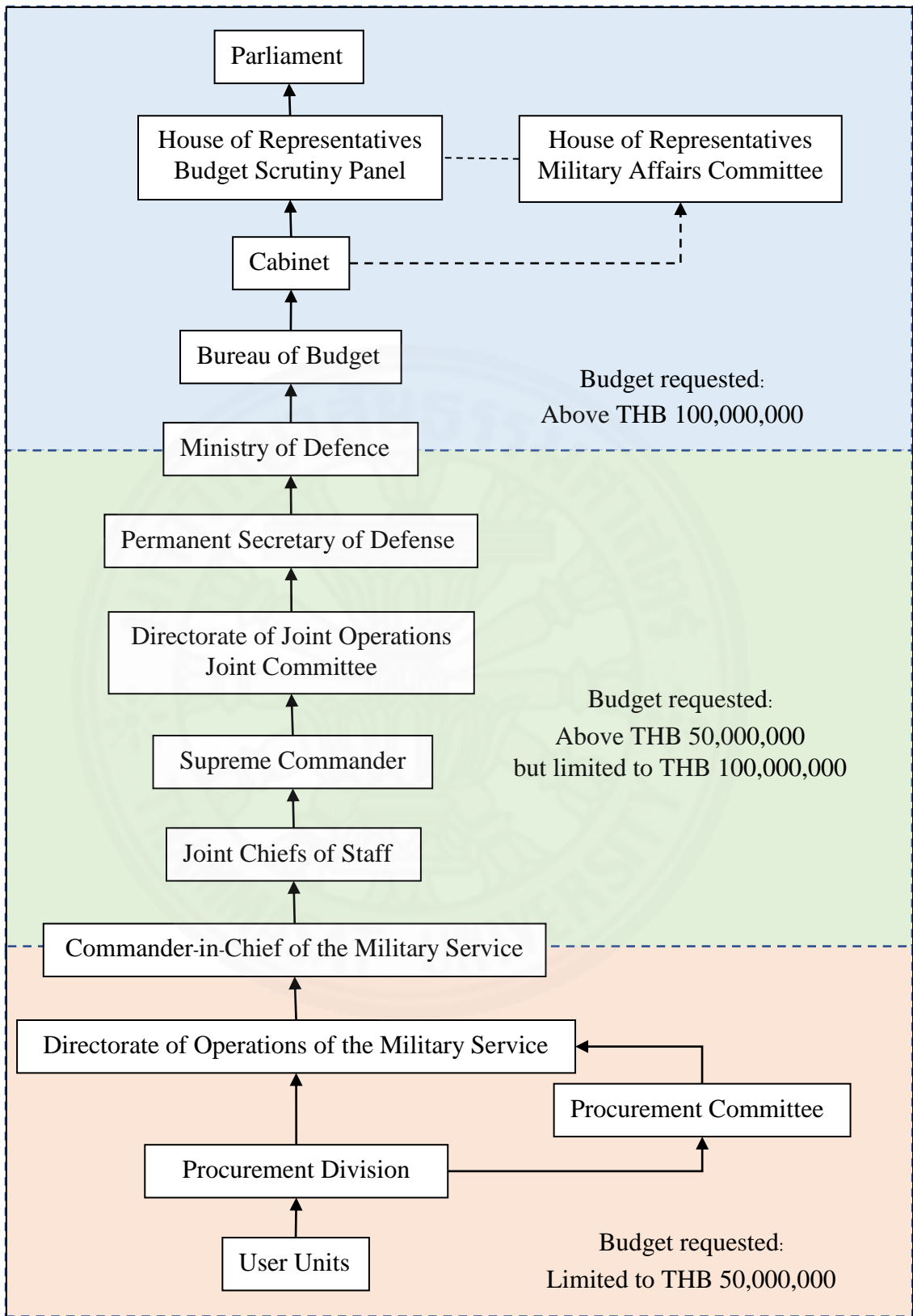


Figure 4.1: The Diagram of Military Procurement Structure

4.4.1 The Buying Center in Practice for Small Arms Simulator

Procurement

Additional information of the procurement process for Small Arms Simulator was investigated through the in-depth interviews with senior officers from the current User Units. Similar patterns in the buying process are described as below;

The need recognition comes either from the User Units' initiation, the product presentation from suppliers or the suggestion from the Technical Affairs Division, Directorate of Operations. The User Units, then, draw up the Term of Reference (TOR) stating their general need description as well as product specification. Although the User Units are responsible for searching the information about their desired system, they are not authorized to specify the suppliers of the simulation. Instead, the approval committee, consisting of Directorate of Operations and Chief of Staff from Technology-related sector, is responsible to find the best suitable provider respectfully to meet the need required from the users. The Directorate of Operations is also accountable to evaluate, negotiate and adjust the submitted proposal together with the suppliers in order to generate the best trading agreement. This also includes order-routine specification. The approval of the procurement depends solely on the authorized money limit as mentioned earlier.

Table 4.4: The "Buyphases" Matrix from the Existing Case of the Small Arms Simulator Procurement

Buying Stage	User Units	Directorate of Operations	Suppliers
Problem recognition	•	•	•
General need description	•		
Product specification	•		
Supplier search		•	
Proposal Solicitation		•	•
Supplier Selection		•	
Order-routine specification		•	•
Performance review	•		

With this practice, the matrix of buying center can be developed as in Table 4.5. It can be seen that one personnel can be responsible for multiple roles in the buying center. The influencers can be the Directorate of Operations who seek for appropriate suppliers to serve the users' requirement, the commander-in-chief who is approached by the suppliers and sees the benefits of the simulator in enhancing the units' competencies or even the suppliers themselves who can attract the personnel in the buying center with their sales strategy. As mentioned earlier, good connection can bring about a successful trading agreement. Therefore, approaching gatekeepers can be considered as an important part in this nature of business dealing. User Units act as the gatekeepers even though they cannot choose a specific supplier because they can express their interest in the product through their outlined product specification when writing TOR. The Directorate of Operations is the gatekeeper in the way that they can choose or not choose a particular supplier and propose to the approval committee while the Commander-in-Chief and higher level personnel can decide whether to recommend the product to User Units or Directorate of Operation after they have been approached by the suppliers.

Table 4.5: The Matrix of the Buying Center for Small Arms Simulator Procurement

Buying Center	User Units	Directorate of Operations	Commander-in-Chief or higher	Suppliers
Users	•			
Decision-makers		•		
Influencers		•	•	•
Gatekeepers	•	•	•	
Approver			•	
Buyer		•		

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Small arms simulator is a tool that can help to enhance military officers in marksmanship. It offers comparable training experience in gun shooting practice with several benefits over the traditional shooting range. First, it provides better utilization of training resources especially the expenses on ammunition and time. The virtual shooting range does not require the use of real bullets. Hence, it is also good for waste management. Furthermore, the training set-up can be done easily in no time. Second, the use of small arms simulator can address the safety issues in shooting training. It is able to diminish the risk of damages caused by the unfamiliarity of using weapons. In addition, dangerous situations can be implemented as the training scenario without causing any physical harm to trainees. Third, the simulators can track the performance of the trainees unlike the traditional firearm training.

Small arms simulator has become more popular over time. It is reported that it captured 54% share of the total indoor shooting ranges market in 2015 globally and is forecasted to win over the traditional indoor shooting ranges in market size, market share and growth in five-year time. The expansion of this technology is also portrayed through the number of competitors in the global market. Thai military solely uses firearm simulators from 3 major suppliers: Amornmas Co., Ltd., Astra Technology Co., Ltd. and Global Technology and Ex-Im Co., Ltd. Each of them is the distributor of different simulator companies. In addition, Defense Technology Institute, a public organization under Ministry of Defence, is currently conducting a research and development of such system to lessen the cost in purchasing the simulators to better cope with the demand from user units.

AEC defense industry is becoming more prominent in the global defense market. Most of the countries in the region experience the growth in military budget and expenditure including procurement spending. Each country aims to elevate their military competence with respect to the foreseeable threat from both inside and outside of the country. Moreover, the military modernization signifies the supremacy

position of the country within the region. This is reflected through the undergoing regional arm race. This can be seen as the opportunity for the small arms simulator to grow in the AEC region.

Thailand, itself, also adopts the military modernization. Large amount of budget is allocated to procure the materiel to keep up with other ASEAN nations with the military government as the key driver of the domestic defense industry of the country. The plan is to advance the industry to lessen the dependency on imports, encourage technology transfer and reinforce national security.

The small arms simulators in the military units in Thailand are either imported or manufactured locally by the aforementioned suppliers. It is also one of the ongoing project at the Defence Technology Institute with the attempt to supply the military training units with the simulator at lower price. Shooting skill is a fundamental capability that the defense personnel needs to be trained. Thus, there are the demand gaps to be filled as the potential users are the sub-units of the military service and the training requirements are different among the levels of trainees.

The buying process of a small arms simulator follows the step assigned by the Office of Prime Minister on Procurement B.E.2535 (1992). The bottom-up buying conduct starts from the procurement proposal from User Units and forwards up to the level with the authority in budget approval. The User Units are responsible to seek information about their preferred system specification and state their needs in the procurement proposal. However, they are not obliged to specify a particular supplier. Instead, the supplier is chosen by the Directorate of Operations with credibility as one of the significant criteria besides the product attributes and appropriate price. Therefore, it is important for the suppliers to approach the right person in order to be in the consideration set. After the procurement plan is done and the supplier is selected, the document is forwarded to the authorized approval body based on the requested budget.

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APPENDIX

APPENDIX A

Example of In-depth Interview Questions

1. Can you explain the current training methodology used in your unit?
2. Have you ever heard of small arms simulator?
3. Have you ever tried/used the small arms simulator in training?
4. Which small arms simulator system are you using? Can you explain about it?
5. From which source did you purchase the small arms simulator system?
6. Can you explain the process of buying the small arms simulators for your unit?
7. Can you state the buying center in the procurement process of the small arms simulators for your unit?
8. What are the difficulties that you need to go through in the buying decision process?
9. Are there any warranty or contract that restricts you from buying the system from other suppliers?
10. How well do you think the small arms simulator enhance the training?
11. What are the most important factors that impact the effectiveness of training?
12. Any recommendation for improving the small arms simulator that you are currently using?
13. Will you be interested if there is small arms simulator that is produced in Thailand?

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