

# Competitive Potential in Business of the Optical Fiber Cable Production in Thailand – Conceptual Framework

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**Abstract**—This paper presents the conceptual framework of the qualitative research to find out the innovations to enhance the competitive advantage in business of Thai optical fiber cable manufacturers. In-depth interview, group conversation, and brain storming among the stake holders in the supply chain of fiber cable business are focused, analyzed and finally evaluated.

**Keywords**—optical fiber business, fiber cable market, competitive advantage

## I. INTRODUCTION

The growth rate of data transmission in the worldwide telecommunication infrastructure is rapidly rising without limit due to the increasing adoption of internet applications. Two main transmission systems as wireline and wireless systems are promise technologies in communication networks. Wireless technologies such as mobile communications (ie., 3G, 4G, 5G) and wifi are quite popular for mobility access network, whereas wireline technology using optical fiber as the transmission line plays important role in both globally core and access network. For examples, dense wavelength division multiplexing (DWDM) is the solution for high-capacity bandwidth service in the core network where as fiber to the home (FTTH) provides very high-speed broadband communication in the access network. The optical fiber communication system is currently the key technology in telecommunication network all around the world. Since the optical fiber still has plenty of room to carry bandwidth more than the present capacity in one single fiber, researchers have developed technology to share further bandwidth from various operators in the same telecommunication infrastructure. Hence this is known as Open Access Network (AON) [1]. Researcher also worked out for a multi-core single optical fiber to carry very much more amount of data for the future as well [2]. Then, it is obvious that business in optical fiber cable product is and will be attractive as long as the optical communication networks still play important role in the telecommunication infrastructure.

Optical fiber cable has been the key components in telecommunication infrastructure in Thailand for more than two decades. This requires a large number of optical fiber cables for installation of communication networks for the whole country. Investing in telecommunication infrastructure requires huge capital. This has intensely attracted business sectors to produce

and sell optical fiber cables in Thai market. Since the beginning of optical communication network in Thailand, seven optical fiber cable manufacturers have been established in the country to serve fiber cable business market in Thailand as well as to reduce the cost of transportation to the customer as the business sector believed at the early-stage time. For almost the past half decade under the circumstance of pandemic Covid-19, the optical fiber cable produced by Thai manufacturers has faced difficulty while doing business in Thailand due to the high competition resulting from the cable production importing from many countries such as China. It is also known that the products from China can offer lower price than the competitors in the market because of the low production cost of mass production in China. The major problems of doing business in Thailand arise from the cost of material and line production whereas the minor problems come from labor cost and the extension of the local market [3]. These might have been the cause that at least two manufacturers in Thailand have completely shut down their line productions of the optical fiber cable early this year. Losing the competitive potential in business of the optical fiber cable production from Thai manufacturers implies the negative signs to approach the sustainable development of Thai economy in this business sector.

The objective of this paper is to offer an opinion of the conceptual framework to seek out for the solutions to enhance the competitive potential in business of the optical fiber cable production from Thai manufacturers. The framework will be performed as the qualitative research approach by investigating the business market, the demand and supply, the industrial law and regulation, etc., and interviewing the stake holders in the business sector of the optical fiber cable supply chain.

## II. PRELIMINARY BACKGROUND

### A. Optical fiber cable market in Thailand

TABLE 1. Values of import and export of optical fiber cable in Thailand.  
(Source: E&E Intelligence Unit)

Calenda year	Import value (million baht)	Export value (million baht)
2558	7,771.57	1,097.37
2559	8,772.49	1,718.41
2560	7,729.68	1,726.51
2561	6,864.12	1,735.71
2562	5,523.29	1,220.48
2563	5,140.24	1,060.83
2564	1,813.82	1,085.03

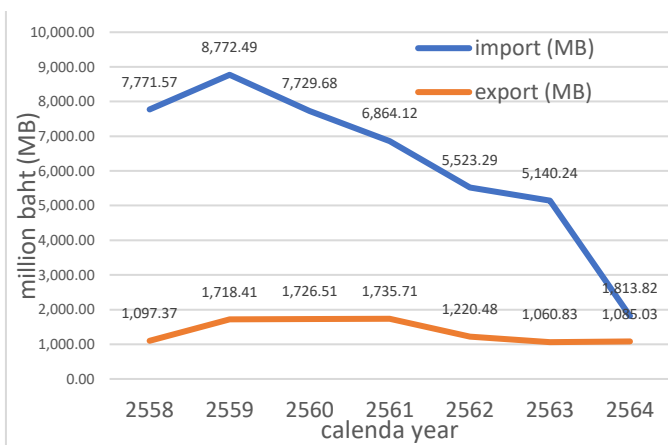


Fig. 1. Graph shows values of import and export of the optical fiber cables in Thailand. (Source: E&E Intelligence Unit)

Regarding to the statistic information from the Electrical and Electronics (E&E) Intelligence Unit, Ministry of Commerce, the values of import and export of the optical fiber cable in Thailand is shown in Table 1 [4] whose values were plotted as shown in Fig. 1. The values of fiber cable import were high in B.E. 2559 (2016) and then have reduced continuously until now whereas the values of fiber cable export do not significantly vary for the last 7 years despite of facing the situation of Covid-19 pandemic. In fact, the value of optical fiber cable in Thai market is greater than the value cable of import because the manufacturers in Thailand produce the fiber cable not only for export but also for selling in the country. In addition, the report of the Department of Business Development (DBP), Ministry of Commerce, shows that total sales of all optical fiber manufacturers in Thailand in B.E. 2560, 2561, 2562, 2563, and 2564 are 4,077,147,872.69 Baht, 3,436,382,597.75 Baht, 3,193,048,169.72 Baht, 2,365,770,538.84 Baht, and 2,118,036,069.84 Baht, respectively [5]. The author has also received the confidential information from an undisclosed manufacturer that this company could make the circulation of fiber cable in Thai market of almost 2,000 million baht in B.E. 2560 (2017). Since then, the circulation has been significantly reduced to about one-tenth last year due to the red ocean of fiber cable market in Thailand.

## B. Industrial law and regulation

Optical fiber cable business in Thailand involves the outdoor and indoor cable products. Outdoor fiber cables are main components in communication network infrastructure. Then, they become majority in the market. In the past, telecommunication infrastructure was controlled by the state-owned enterprise named the Telephone Organization of Thailand (TOT) who played both regulator and operator roles in the country. Since B.E. 2540 (1997), under the Thai constitution, telecommunication infrastructure sector has been changed by splitting the rolls of regulator out of the operator. TOT became the operator only and then was privatized. TOT is presently National Telecom Public Company Limited (NT). Also, many telecommunication companies have been established in telecommunication business sector. Mega projects in Telecommunication network infrastructure are usually activated by the regulator or government by means of the concession which is the license granted by the government sectors such as the Ministry of Digital Economy and Society (MDES) and the National Broadcasting and Telecommunication Commission (NBTC). When the company or telecommunication operator wins the concession in building the communication networks, a lot of fiber cables are required and then the competition among the fiber cable suppliers occurs. It is generally known that the resources of fiber cable product are from local manufacturers and importing from oversea especially from China. The operators who own the concession will choose the product by consideration of price and quality. The product quality can be guaranteed by the Thai Industrial Standard (TIS), or มอก. in Thai, which is issued by the Thai Industrial Standard Institute (TISI), Ministry of Industry. There are two common types of TIS defined by law as the Industrial Product Standard Act, B.E. 2511 (1968) [6]. One is mandatory TIS and another one is non-mandatory TIS, which is so-called general TIS. There are many mandatory and non-mandatory (general) Thai Industrial Standards issued for optical fiber cables and components. For example, TIS-2166 is presently mandatory Thai Industrial Standard which defines the detail of the self-supporting aerial telecommunication outdoor fiber cable which is the most popular types of cable being installed in telecommunication infrastructure in Thailand.

Since the product with TIS certification guarantees the industrial standard quality, optical fiber cables from every supplier requires TIS registration before selling to the operators, who own the concession of the telecommunication infrastructure projects, if the type of fiber cable is in the scope of mandatory TIS. However, if the fiber cable type is out of scope of mandatory TIS, or in the scope of non-mandatory TIS, then it can be either registered or not registered. Products that need TIS registration must be designed and produced to comply with the relevant industrial standard and they need to pass the test according to the standard method.

In general, the outdoor cable type following TIS-2166, which is mandatory industrial standard, is mostly used in Thai telecommunication network. Then, selling this type of fiber cable strongly requires TIS-2166 registration. This seems to be fine. However, there is a loop pole from the law. Regarding to the Industrial Product Standard Act, B.E. 2511 (1968) [6] and

relative laws and orders, if the product following the mandatory TIS, either products made in Thailand (local) or importing products from overseas can get TIS registration. But if the product following the non-mandatory (general) TIS, only the products made in the Kingdom of Thailand can get TIS registration whereas the importing products cannot. Hence, the state-owned enterprises such as NT (National Telecom Public Company Limited), MEA (Metropolitan Electricity Authority), PEA (Provincial Electricity Authority), EGAT (Electricity Generating Authority of Thailand) must buy the products with TIS registration only. Then, the non-mandatory industrial standard will directly support Thai manufacturers to sell product without competitor from overseas. This is good for Thai economy and society.

C. Approach to the alternative innovation

To stay alive and success in the optical fiber cable business that is presently in the red ocean in Thailand, not only the good quality of the product must be strongly concerned but alternative innovation for running industrial business must be developed and created also. P. Phon-ngarm [7]. mentions that the process of innovation development in the organization requires the cooperation of organization staffs, who are the most valuable assets that can create the value-added to the organization. The innovation development can be achieved by the following steps:

- Understand the idea and principle of innovation
- Study innovations from the other organization and use it as a guideline to develop its own innovation
- Synthesize the idea and model of innovation development in the organization
- Learn how to utilize the innovation
- Know the evaluation method when utilizing the innovation

By using the above steps, the alternative innovation to increase the potential in doing optical fiber business in Thailand may include product innovation, service innovation, and management innovation [8].

III. CONCEPTUAL FRAMEWORK

The qualitative approach will be applied in this research to find the methods to raise the competitive potential in business of Thai optical fiber cable manufacturer. Fig. 2 shows the conceptual framework proposed in this research whose detail can be summarized as follows:

- The literature review process includes not only the research publications but the laws and regulations also.
- In-depth interview will focus on 5 high-level executive persons and 20 employees in the fiber manufacturers in

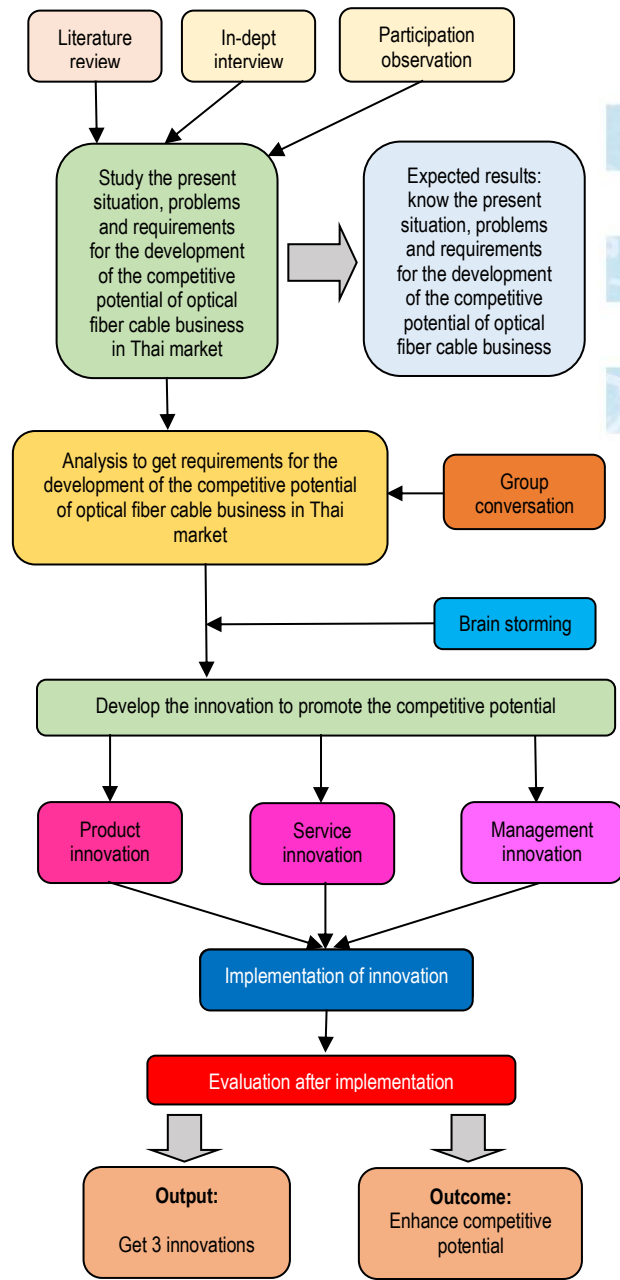


Fig. 2. Conceptual framework to raise the competitive potential for Thai manufacturers in optical fiber cable business.

Thailand. The interviewees should have earned experiences in fiber business not less than 3 years. The objective of the interview is to find the present situation, problems and requirements for the development of the competitive potential of optical fiber cable business in Thai market. In some situations of the in-depth interview, participant observation will be included.

- All information will be analyzed to find requirements for the development of the competitive potential of optical fiber cable business in Thai market

- Group conversation composes of about 10 managers, who have more than 10 years experiences in the business of the optical fiber cable.
- Brain storming will be performed from many stake holders in fiber cable business such as optical fiber cable manufacturers, NT (National Telecom Public Company Limited), MEA (Metropolitan Electricity Authority), PEA (Provincial Electricity Authority), True Corporation, AIS, the Federation of Thai Industries, Suppliers, System integrated companies, etc. The number of participants is about 30.
- Then, the innovations as product innovation, service innovation, and management innovation will be developed to promote competitive potential of Thai manufacturers in fiber cable business.
- 3 innovations above will be implemented in an undisclosed optical fiber manufacturer using the sample group of about 30 volunteer members following Burns & Grove [9]. The statistical significance will be defined defined as  $\alpha = .05$ , the power of test 0.80, and the effect size 0.60.
- Evaluation of implementation will be performed and summarized by the chief executives, administrative persons, and employees. The number of this evaluators is about 15.

#### IV. EXPECTATION

The expected results from this conceptual framework research will let us understand the present situation of the optical fiber cable market in Thailand, the advantage/disadvantage of the suppliers from local and oversea, the opportunity to do business in the optical fiber cable, and etc. The expected output includes 3 models of innovation as product, service, and management, which brings the outcome that is the solution, we assume, to enhance the competitive advantage in business of Thai optical fiber manufacturers.

#### V. CONCLUSION

This paper presents the conceptual framework of qualitative research to find out the method to raise the competitive potential in business of the optical fiber cable manufacturers in Thailand. The framework consists of literature survey in research papers and industrial law and regulation, in-depth interview, participant observation, group conversation, and participant brain storming from the stake holders in the business sector of the optical fiber cable supply chain to create the innovations in product, service, and management in the optical fiber cable business. Then, the models of innovation will be implemented and evaluated. The output and outcome will be expectedly useful for Thai manufacturers in the business of the optical fiber cable.

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