

# **BULIDING FACILITY MANAGEMENT FOR DEVELOPMENT OF BUILDING DESIGN FOR MANAGEMENT THE BUILDING TO PREVENTIVE HEALTH PROMOTING CENTER MANAGEMENT OF ELDERLY PERSONS.**

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## **ABSTRACT**

The purpose of this research is to study the Building facility management in order to develop the building design of preventive health promoting center management for elders and develop the model of preventive health promoting center for elders. From study result, the elderly persons are more conscious to look after their physical health which require various designs of preventive health promotion activities including exercise area, swimming pool, fitness center, art education area, hobby and recreation area, treadmills, healthcare massages, and parking lots with conveniences and common activities area. In addition, the various activities should be switched and changed according to the requirements or interests of the elderly persons in each period. Moreover, there have health experts to advise elderly persons closely for supervising and supporting the building facility management and security systems, surveillance camera, emergency alarm buttons in order to prevent any risks during the activity and prepare for solve problems in the future. Because the society are entering the aging society completely. The elderly persons are increasingly interested in looking after their own health. Moreover, Studied the feasibility of the building design development of preventive health promoting center management for elders and found that the investment of facility design development is able to estimate the operational budget for building the facility as the model of preventive health promoting center for elders that the initial construction investment is 30,000,000 Baht, the estimated during the first operational year is 8,500,000 Baht, and the estimated income of the first year is 20,000,000 Baht that the revenue is worthy for investment. The Net Present Value (NPV) is 23,414,431.86 Baht, Profitability Index (PI) is 1.67, Internal Rate of Return (IRR) is 28.21%, Pay Back Period (PBP) is 4 Year 6 Month. These factors indicated the worth of revenue for investment.

**Keywords:** building facility management, elder, building design development, health promoting center, preventive

## **INTRODUCTION**

At the present, Thailand population structure has changed rapidly with declined birthrate, death rate, and medical and public healthcare technology advancements that prolongs the population averaged life expectancy which lead to the manipulation of Thailand population structure into Aging society [1]. Prolonged human life expectancy cause from the advancement of medical sciences and these factors increasing the intensity of entry into the elderly society in globally [2]. Elders which are 60 years old or more for both male and

female, calculated by calendar year, have been changed physically, mentally, and their social responsibilities [3]. Thailand became the Aging society since 2002 categorized by the United Nation Aging Society criteria. We will completely become Aging society within 2022 and the highest level of Aging society in 2031[4]. Some scholars of Thailand and other countries that are becoming the aging society proposed to adjust the age level of elderly persons to be higher, for example, from 65 years old to be 75 years old for Japan [5,6,7]. Consequently, there are some problems on health affecting to the quality of life at the terminal of elderly persons [8].

The behavior of elderly population in Thailand tends to pay more attention on their health by the advancement and development of medical technology that allows them to access the knowledge for looking after themselves properly [9]. For the health of elders, it is found that the changing of physical, mentality, social relationship, and body conditions bring about illnesses which lead to be anxious and cause the mental condition for unstable emotions, lowered self-control and the social issue from decreased social role [10]. From health issues that affect their quality of life, these elders seem to have more healthcare awareness by gathering for community healthcare support events and providing community exercise area from the government. On the other hand, it's still inadequate for coverage the community requirement and lack of operation and maintenances [11].

The significance of Building facility management is the fundamental concept of physical resource management, the administration concept that is able to apply with all types of building or facility. The fundamental concept is to manage physical resources to meet the requirement of facility users effectively during the optimized physical resource management [12]. For the physical resource management and operation, building design will affect to the effective service, the management of physical resource management during the facility usage and its life cycle [13]. Providing security systems and preventing potential risks are depended on the property estate and facility resources management [14]. Landscape design, that developed into the landscaping and security, does not concern only its appearance but also the safe landscape as well, including the coverages of facility layout designs as follows; direction signs, maps, walkway lights, preventive measurements, first aids, and safe parking lot [15]. and the knowledge of landscape architecture to understand the plants and its features to match the utilities of facility interior [16]. The analysis of potential business administration with strategic planning for real estate contains useful information on the key marketing decision. Most demand of strategic planning and business management in product [17]. confirmed by Katharina Bause [18]. agreed that the definition of feasibility study in economic is a product development for profitable. There are some of a major component included in preparation the market feasibility study and financial analysis for the project. Area, demographic, and neighborhood analysis Site review Market analysis Proposed development usage and pricing analysis Financial analysis Valuation analysis and Comparison of value created by projected costs [19]. the feasibility of the project in order to evaluate the financial viability which is closed to the study of Saran Ukraihasa [20]. Therefore, the study of demands before starting of the project is very important. It is not only informed the need of design and decoration but also guild the security, repair and maintenance. The research of AMM Liu [21]. To calculate the ratio of return on the investment by using ratio follows, 1)Internal rate of return (IRR) is the rate of internally return, must be greater than the return on other investment 2) A net present value (NPV) is the present value, must be greater than zero, so it would be potential for investment 3) Profitability Index (PI) is the index of profit, greater than one index is potential for investment [22,23]. As many researches can be seen from both the domestic and international such as the study of Joseph H.K. Lai [24].

Therefore, the study of building facility management is for developing the building design of preventive health promoting center management for elders in order to support their requirement. In addition, the elderly person who are necessary to receive health promotion, have continued increasing. Then, both public and private healthcare facilities for elders should develop the building design with facilities to achieve the requirement of the elders.

## **OBJECTIVES**

1. To study the building facility management in order to develop the building design of preventive health promoting center management for elders
2. To develop the model of preventive health promoting center for elders.

## **METHODOLOGY**

This research is the qualitative study with in-depth interview, Participatory Action Research (PAR), and group discussion that contain 2 steps as follows; 1) in-depth interview to study the building facility management in order to develop the building design of preventive health promoting center management for elders. The main contributors are 10 healthcare entrepreneurs and staffs, 3 Geriatrics medical staffs, 6 elders who had been in health promoting center, 3 expertized professor and academics in facility design for elders for the total contributors of 22 people. The number of experts comply with the criteria that conforms to the concept of Thomas T. Macmillan [25]. who suggested that the error rate result would be the least and stabled at the level of 0.02 if the experts' group was 22 people or more. The tool in this study is semi structured interview and 2) group discussion conference that the group of main contributors is the same group as in-depth interview for providing feedback on the model development of preventive health promoting center for elders. 3) Feasibility Analysis of Investment Project.

## **RESULTS AND DISCUSSION**

From the study of the building facility management in order to develop the building design of preventive health promoting center management for elders by analyzing the data from 2 steps of in-depth interview, it is found that;

Step 1: the result from general information about building facility management in order to develop the building design of preventive health promoting center management for elders:

From in-depth interview with healthcare entrepreneurs and staffs, it is found that "there are many types and activities of healthcare businesses. By way of surveying, we found many designs of exercise area, swimming pool, fitness center, art education area, hobby and recreation area, treadmills, healthcare massages, and parking lots with conveniences and common activities area. Moreover, the events should be flexible regarding to the requirement or interests of elders properly and there should provide healthcare experts for consulting and supporting the elders and staffs for taking care in order to prevent any risks during the activities. The building facility management should provide for indoor security, surveillance camera, emergency alarm buttons, and indoor security systems as follows; fire extinguish system, lighting system, air conditioner and ventilations. However, each facility building are designed differently and the building of specific enterprise with constraints for elders about indoor facilities as follows; no handrail installation in restrooms or leveled floor between the restroom and the outside which are the problems for both self-reliable and incapacity elders that the design improvement still need to adjust while expanding the target group to elders."

From in-depth interview with Geriatrics medical staffs, it is found that “The building design development for building facility management in order to develop the building design of preventive health promoting center management for elders should contain healthcare support activities including physical, mentality, and social supports and the activity should match with the elders who starts to have degenerative body, mental sensitivity, and decreased social interactions. The group activity should encourage to learn with light exercises that support them to take care of themselves. The facility surroundings should be shady with transportation convenience that close to the health promoting center. For healthcare support facility indoors, the design should allow elders with constraints to access the whole facility with obviously clear direction signs and there should be no leveled pathway. The furniture should be in group with easy movability to match with activities and encourage for interpersonal interactions.

From in-depth interview with elders who had been in health promoting center, it is found that “Elders need the activities for exercise, singing and dancing activities, exercises in the water, occupation training, healthcare massages, playing games, learning activity for elders to take care of themselves. These activities should be changed occasionally due to the requirement, interests, and popularity of elders with healthcare experts for elder to consult and support staffs provided.”



Figure 1 In-depth interviews and area surveys



Figure 2 Focus Group Discussion

Step 2: the model development of preventive health promoting center for elders:

Researcher had synthesized the collected data of in-depth interview to develop the model development of preventive health promoting center for elders as shown in figure 3 to 9.



Figure 3 shows the model development of preventive health promoting center for elders: exterior

From figure 3, shows the model development of preventive health promoting center for elders: exterior, the facility contains 2 floors with contemporary design including swimming pool and treadmills around the building. There is a garden around the building for shaded nature that seems like the park or home garden for warmth and privacy. There is a ramp for wheelchaired elders and the parking lot in front of the facility for elder customers.



Figure 4 shows the model development of building exterior: swimming pool area

From figure 4, shows the model development of building exterior: swimming pool area, exercise machine outside the building with sitting benches for elders and soft shock absorption floor material as another view from figure 1.





Figure 5 shows the model development of building exterior: garden area

From figure 5, shows the model development of building exterior: garden area, the garden around the building for shaded nature that seems like the park or home garden for warmth and privacy for pleasant atmosphere with treadmill around the building and soft shock absorption floor material.



Figure 6 shows the model development of building interior: hallway area

From figure 6, shows the model development of building interior: hallway area, in front of the reception area is designed with high ceiling and group furniture to encourage the interpersonal interactions and comfortable, warmth, luxury, including privacy atmosphere. The security system is provided with surveillance camera and alarm button for emergency cases and there are also healthcare experts for elder to consult and support staffs provided.



Figure 7 shows the model development of building interior: fitness center area

From figure 7, shows the model development of building interior: fitness center area, there are exercise machines provided for elders with surveillance camera and alarm button for emergency cases and there are also healthcare experts for elder to consult and support staffs provided during the exercises.

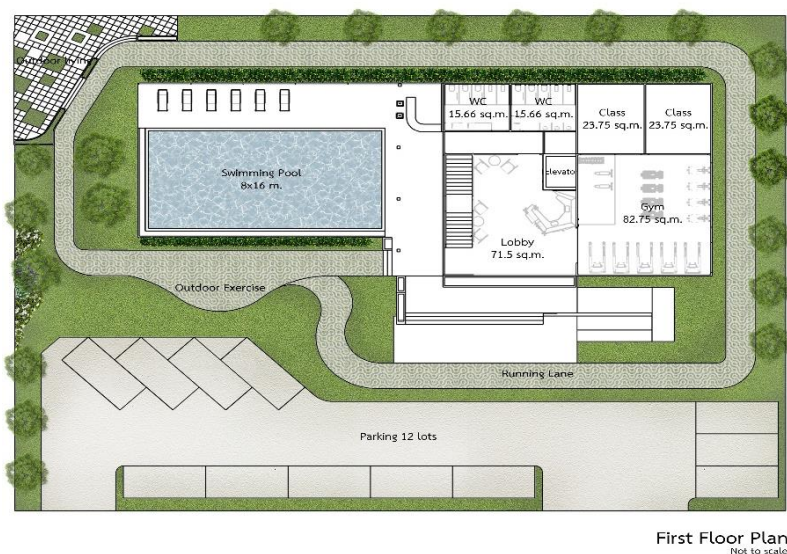


Figure 8 shows the model development of preventive health promoting center for elders: 1<sup>st</sup> floor plan

Figure 8, shows the model development of preventive health promoting center for elders: 1<sup>st</sup> floor plan, the facility model development contains rectangle swimming pool for exercise that designed for elders to exercise in the water safely. In front of the reception area is designed with high ceiling and comfortable, warmth, luxury, including privacy atmosphere for improving elders' expression skills. In fitness center area, there are exercise machines provided for elders and treadmills around the building and soft shock absorption floor material. There are male and female restroom that also available for wheelchaired elders to access including handrails installed. There is 1 elevator to access both upper and lower floor



provided. For participating in any activities, the security system is provided with surveillance camera and alarm button for emergency cases and there are also healthcare experts for elder to consult and support staffs provided. There is a ramp for wheelchaired elders and the parking lot in front of the facility for elder customers.

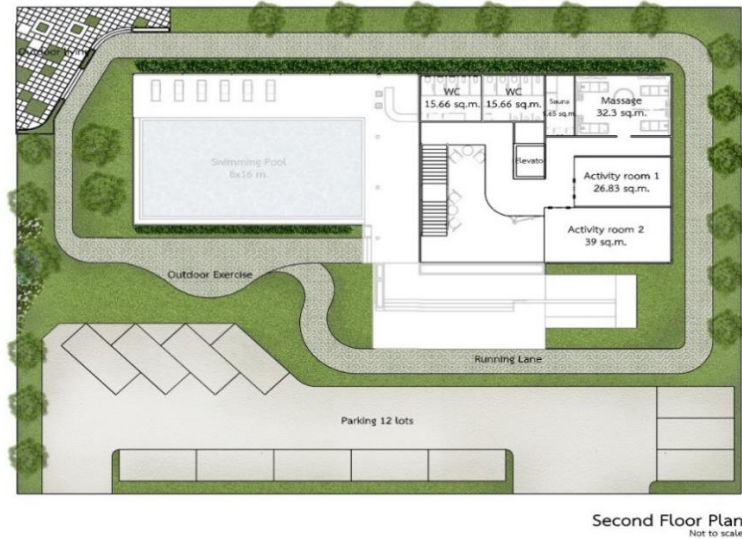


Figure 9 shows the model development of preventive health promoting center for elders: 2<sup>nd</sup> floor plan

Figure 9, shows the model development of preventive health promoting center for elders: 2<sup>nd</sup> floor plan, the facility model development contains 2 activity rooms for lecturing, leaning arts and hobbies with adjustable functionality to match the room size with participated elders. Table and chairs are easily movable matched with the activity and support elders' healthcare.

Researcher had studied the feasibility of the building design development of preventive health promoting center management for elders and found that the investment of facility design development is able to estimate the operational budget for building the facility as the model of preventive health promoting center for elders that the initial construction investment is 30,000,000 Baht, the estimated during the first operational year is 8,500,000 Baht, and the estimated income of the first year is 20,000,000 Baht that the revenue is worthy for investment. The Net Present Value (NPV) is 23,414,431.86 Baht, Profitability Index (PI) is 1.67, Internal Rate of Return (IRR) is 28.21%, Pay Back Period (PBP) is 4 Year 6 Month. These factors indicated the worth of revenue for investment.

## CONCLUSION

From in-depth interview, it is found that elders tend to pay more attention on their health and there are many healthcare support activities as follows; provided exercise area, swimming pool, fitness center, art education area, hobby and recreation area, treadmills, healthcare massages, ramps for wheelchaired elders, parking lots with conveniences and common activities area, Moreover, events should be changed due to requirement or interests of elders properly and there should be healthcare experts for elder to consult and support staffs provided to prevent any risks during the activity. The building facility management should provide with indoor security, surveillance camera, alarm buttons for emergency cases to prepare for handling and solving any issues because we, elders, will completely become



Aging society. The elders tend to pay more attention on their health that conforms to the study of Pornporm Khaichaiyapum and Poranee Sirichote [26]. that studied the welfare requirement for elders of Nonthai Sub-district Municipality, Nonthai district, Nakhon Ratchasima province, and found that elders required health promoting center with family issue consultants, crafting occupation training, participating in social activities, and social role provided. It shows that preventive health promoting center for elders is worthy for investment and there are still a lot of demands in the market. The feasibility study of the building design development of preventive health promoting center management for elders is conformed to the study of Treerat Promplui [27]. that studied the worthy of preventive health promoting center for elders in Nakhon Pathom province, Trirat Promphui and Thirawat Chantuek [28]. that studied Cost and Sensitivity Analysis of Business in Spatial Elderly Health Promotion Center in Nakhon Pathom Province, and Woraphon Samrongthong and Thirawat Chantuek [29]. that studied Cost and Sensitivity Analysis of Sports Club Business in Nakhon Pathom Province, found that it's worthy for investment with good revenue and fast payback period because there were many healthcare support activities for elders to choose the matched activity for them and also encourage their activities to adjust and support with the popular activities properly in order to meet the various requirements from elders in the future and it is also conformed to the study of Moritz Jahn [30]. that studied the feasibility of spa and health promoting center and found that it was also worthy for investment as well.

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