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### Demand for Housing Improvement of Working-Age Groups Who Will Be the Elderly in the Future

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**Abstract:**

The working-age group (45-59 years old) who will become the elderly in the future have their own residences that have not been renovated to prepare for the aging society. Therefore, the problem of comfort and safety in their own homes also arises. The objectives of this research were to 1) analyze the demand for housing improvement of working-age groups who will be elderly in the future and 2) provide guidelines leading to a business model for housing improvement to support the aging society. This study is quantitative research. The target population, working at the end of the age range of 45-59 years and living in Bangkok, includes 385 samples. The questionnaire was validated by three experts for data collecting. The sampling was not random, but a purposive selection method was used. The data were analyzed using descriptive and inferential statistics with frequency, percentage, and chi-square. The analysis results showed that the target group needs renovation or repair of the bathroom, followed by the bedroom, living room, kitchen, terrace or balcony, parking lot, prayer room, and all renovations. The decision to renovate their houses was taken by 90.9% of the target group. Access channels for services, repairs, and renovations include social media, friends/acquaintances, and construction companies. The housing renovation company needs to plan the cost structure to generate profits. Also, the company should have business partners such as building material stores, construction companies, and subcontractors to increase the number of customers, the company's revenue, and profit. This research provides important information on the need to improve the housing of working-age groups aged 45-59 who are entering an aging society in the future. Therefore, the research results will be useful in seeking business opportunities in the construction business for further development into a fully integrated business.

**Keywords:** housing improvement, demand, working-age groups, the elderly.

### 未来将成为老年人的劳动年龄组的住房改善需求

**摘要:**

未来将成为老年人的工作年龄组（45-59 岁）拥有自己的未装修住宅，为老龄化社会做准备。因此，也出

现了自己家中的舒适和安全问题。本研究的目的是 1) 分析未来将成为老年人的工作年龄组对住房改善的需求, 以及 2) 为支持老龄化社会的住房改善商业模式提供指导。本研究为定量研究。目标人群在 45-59 岁年龄段工作并居住在曼谷, 包括 385 个样本。问卷由三位专家进行数据收集验证。抽样不是随机的, 而是使用了有目的的选择方法。使用频率、百分比和卡方的描述性和推论性统计分析数据。分析结果显示, 目标群体需要翻新或维修浴室, 其次是卧室、客厅、厨房、露台或阳台、停车场、祈祷室, 所有装修。90.9% 的目标群体做出了翻新房屋的决定。服务、维修和翻新的访问渠道包括社交媒体、朋友/熟人和建筑公司。房屋装修公司需要规划成本结构以产生利润。此外, 公司应拥有建材商店、建筑公司和分包商等业务伙伴, 以增加客户数量、公司收入和利润。这项研究提供了有关改善未来进入老龄化社会的 45-59 岁工作年龄组住房需求的重要信息。因此, 研究结果将有助于在建筑业务中寻找商机, 以进一步发展为全面整合的业务。

**关键词:** 住房改善、需求、工作年龄组、老人。

## 1. Introduction

The challenge of the aging population, community-based care services (CBCS) have developed rapidly in China to meet the needs of the elderly. Few studies have described the development trend of CBCS availability in rural and urban areas and evaluated their effectiveness. This study aims to demonstrate the availability of CBCS in China and analyze the impact of CBCS on the cognitive functions of the elderly. It was found that the availability of CBCS in China increased significantly from 2008 to 2018. This study sheds light on the positive correlation between CBCS and cognitive functions among the elderly in China. The findings suggest that policymakers should pay more attention to the development of CBCS and the equality of CBCS supply in urban and rural areas (Yue et al., 2021). More and more older adults live alone without support from their children, such as daily care and spiritual comfort. In response, the Chinese government has vigorously developed CBCS to compensate for the lack of family support. Although CBCSs have developed rapidly and made considerable progress in China, little is known about their prevalence in relatively large countries or their impact on the health of older people in China, particularly on cognitive function (Wang et al. 2014; Wu et al. 2010; Xie et al. 2009).

Since 2021, Thailand has become a fully aging society with over 20% of the total population over 60 years old. Advances in science, technology, and medicine have led to the increased life expectancy of the population and a decrease in mortality, resulting in a rapid increase in the number and proportion of elderly people in Thailand. Thailand has a working-age population between 15 and 59 years old, which is important for the country's development as the engine of the economy. There are three groups of working-age people: early working age (15-29 years), middle working age (30-44 years), and end of working age (45-59 years), and the working-age population between 45-59 years, in particular, is expected to become an elderly group in the future (Khanaroek & Chanpet, 2019). The

National Committee for the Promotion and Coordination of the Elderly (2002) concluded that Thailand had formulated the 1st National Elderly Plan (1982-2001) and the 2nd edition (2001-2021), which is quite comprehensive in all dimensions. In principle, there is a basic concept that includes the process of creating stability for society, the value and potential of older people for the benefit of society, and the dignity of older people who deserve to live in their communities with quality.

The Real Estate Information Center (2019) found that most of the working-age group (45-59 years old) who will become the elderly in the future have their own residences that have not been renovated to prepare for the aging society. Therefore, the problem of comfort and safety in their own homes also arises. Developing and improving housing for the elderly are more complex than developing property for the young. In addition to housing design under life safety conditions, creating a quality society that leads to good mental health is also important. This may include handrails for support in bathrooms, non-slip floors, emergency buttons in rooms, steep walkways, interior design without corners, etc. However, future housing design for older people should focus on structure, furnishings, and placement or installation of amenities to accommodate physical impairments related to vision, hearing, and movement.

Krungsri Research Center concluded that the value of the construction material business had declined steadily since 2019 as the construction industry in both the public and private sectors declined due to the impact of the COVID -19 crisis. In 2021-2022, the construction business will improve as 1) the economy recovers after the crisis COVID -19, 2) the government has accelerated investment in major projects, and 3) new real estate projects are launched in Thailand's economic hub. It is expected that in the competitive situation, interesting business areas in the construction industry will be expanded, namely, housing repairs and renovations (Bank of Ayudhya Public Company Limited, 2020).

Entrepreneurs are also interested in the Canvas Business Model, planning a residential renovated business to meet the needs of working-age people who will become seniors in the future. The business plan consists of 9 components: Value proposition, customer segment, distribution channels, customer relationships, revenue streams, key resources, key activities, key partners, and cost structure (Department of Industrial Promotion, 2021).

The importance as mentioned above corresponds to the age group of working people (45-59 years old) who need to renovate their residence to keep up in the aging society. This results in business opportunities in the field of home repairs and renovations. For this reason, this study is titled “The demand for housing improvement for working-age groups who will become elders in the future, Thailand”. Thus, the question is whether the working people aged 45-59 years old, who will belong to the elderly group in the future, require home renovation services or not. The construction companies will expand these services and thus increase their sales and profits. Moreover, the research results can be useful in making business plans for construction companies in the future.

## 2. Literature Review

The research on demand to improve the housing of working-age groups who will be the elderly in the future has explored concepts and related research to guide the development of a conceptual research framework, including the creation of a research questionnaire tool for collecting data from the sample group. It is also used as a reference for discussing research results to ensure credibility. The research focused on Bangkok as it has the highest number of elderly people in Thailand. Therefore, entering an aging society inevitably results in problems that affect the economy, society, and city management. Preparing to enter the aging society revealed that the elderly in Bangkok has the highest income compared to other provinces.

Life satisfaction is widely regarded as an important indicator of the subjective well-being of older people. It also reflects whether they can adapt well to changing circumstances as they age, which in turn affects their physical and mental health (Hang-yue, 2018).

The growth and expansion of cities in the 20th century have produced housing typologies with small spaces that are currently still inhabited without meeting many basic requirements for habitability, safety, and comfort. The United Nations also warns of the global importance of efficient and sustainable urban renewal that allows buildings to adapt to the new demographic demands of the 21st century. Urban, social and health policies promote the concept of “aging at home” or “aging in place”, which promotes a higher quality of life for older people in their familiar living environment

through renovation proposals that would adapt and improve indoor and outdoor living conditions (Serrano-Jiménez et al. 2020).

### 2.1. The Concept of Demand for Housing and Housing Improvement of Working-Age Group to Become the Elderly in the Future

Rawisaengsun (2016) concluded that the proportion of the elderly population tends to increase continuously. This situation reflects that the world is entering an aging society. It is estimated that the aging population will reach 32 percent of the world’s total population by 2040. Looking at the situation in Thailand, we find that Thailand has entered an aging society since 2006. Entering an aging society affects the socio-economic conditions, especially the care and welfare of the elderly.

Moreover, National Housing Authority (2020) concludes that improvements in housing will create better living conditions to meet people’s basic needs. The working-age group is best placed to renovate their homes because of their income from their jobs. Therefore, housing renovations are necessary for Thai society to beautify the landscape and remodel family facilities, where engineers and architects are hired to design and renovate housing.

Kortawat et al. (2018) concluded that older people should be encouraged to improve their living environment as soon as possible, e.g., toilets, doors, stairs. Appropriate housing for older people is important because older people have physical limitations and needs that are different from those of a young or working person. Accommodation for older people who need comfort, security, and the pleasure of living in a house must meet the physical deterioration and the need for rest after a long work period. For example, a study by Jongpipitporn (2015) found that the older adults who want to live independently in Bangkok are the population who are prepared to do so when they are of working age.

Salee (2010) described the improvement of housing conditions to reduce the number of accidents among the elderly and enable them to live happily. The problems identified include deterioration of the home, the bathroom is not usable, living space in the house is disorganized, stairs are quite steep, and there are no handrails which lead to falls. McDougall et al. (2019) analyzed that in New Zealand, 190,000 older people are part of the core demand for social housing and that this number is expected to increase as the population ages. A market-led response through the supply of social housing for older people is required to address this. Current research indicates that there is little information at a national or international level on the specific need for social housing for older people, particularly in New Zealand. In addition, the elements of specific indoor spaces, spatial configuration, accessibility, outdoor space, light, privacy and security, and social aspects

need to be considered.

Therefore, it can be concluded that the need for residential improvements includes the bathroom, bedroom, living room, kitchen, patio or balcony, parking, prayer room, and all areas of the home.

## **2.2. Factors Determining the Demand for Improved Housing**

Panraluk (2014) concluded that the average budget for housing renovation for the elderly does not exceed 2,390 USD, and this budget does not include labor costs for the improvement. In addition, the National Statistical Office (2020) stated that home accidents could occur for two important reasons:

(1) person-related causes, which can be originated by oneself or others, such as the deterioration of the body, mental state, the individual's knowledge base, and actions,

(2) causes related to the home environment, such as appliances, tools, and electrical devices.

The income of most working-age groups before and after retirement ranges from 600 - 1,494 USD. Funds for housing improvements were found to come mainly from personal savings, followed by salaries, pensions, and children's money. Only 4.9 percent of the elderly raised their home improvement budget through borrowing, which is consistent with the life cycle saving and investing theory. The theory assumes that when the working-age group retires, their savings will be negative due to the retirement period. Therefore, the budget for house construction mainly comes from personal savings rather than salary or pension (Khamsook & Jarutat, 2020). Therefore, the elderly group should be encouraged to improve their housing environment as soon as possible. Finally, the website of the housing improvement company, which is a communication channel for the working group to become the elderly group in the future, must be equipped with all the details of the services (Jongpipitporn, 2015).

According to Yu and Cai (2021), there is an interactive relationship between housing prices and urban innovation, rather than housing prices exclusively affecting urban innovation. In turn, as urban innovation improves, housing prices increase accordingly. The effect of housing prices on urban innovation exhibits an inverted U-shape; that is, as housing prices increase, the vitality of urban innovation first increases and then decreases. When housing prices pass a turning point, the continuous increase of housing prices gradually weakens the innovative vitality of the city. The empirical analysis shows that the increase in urban housing prices is generally positively correlated with the city's innovation outcomes and talent attraction, suggesting no crowding-out effect on the city's innovation performance (Lin et al., 2021).

Streimikiene & Balezentis (2020) analyzed the

current situation in the selected country. They presented the results of a case study on the willingness to pay (WTP) for energy retrofitting of residential buildings in Lithuania. The survey of 104 Lithuanian households living in unrenovated apartment buildings was conducted. The main findings of this pilot study indicate that there are several important organizational and economic barriers to energy retrofitting in multi-flat buildings and that current policies and support programs do not adequately address these barriers. However, the main barriers were inadequate government support, unwillingness to borrow due to low income, and inability to make collective renovation decisions due to lack of cooperation and housing association.

Although there are various renovation techniques, implementing comprehensive renovation in senior communities is still a major challenge due to the low willingness of residents to renovate. The results showed that residents were willing to accept basic renovation but had a low willingness to accept quality improvement. Socio-economic variables, housing characteristics, and indoor thermal sensation influenced residents' willingness to accept comprehensive renovation. Tailored renovation programs based on existing community problems and residents' willingness could significantly promote the implementation of comprehensive renovation (Liu et al., 2021). In low- and middle-income countries, social innovations have provided creative solutions to address barriers related to access to and cost of care. There is a need to focus on various disease areas in high-income countries. Compared to studies in other disciplines, health researchers have applied social innovation mainly from an instrumental and technocratic point of view to promote greater patient and beneficiary participation in health programs. No empirical evidence has been presented on whether this process leads to empowerment, and social innovation has not been presented as transformative. The studies provided practical evidence on how to improve the implementation of social innovation in health systems and practice (van Niekerk et al., 2021)

It can be concluded that the key factors for the need to improve housing are the budget for improvement, the average monthly income before retirement, the residential area that needs improvement, and the channels to reach the target group.

## **2.3. Business Model Concept**

Department of Industrial Promotion (2021) has introduced entrepreneurs in Thailand to use the Canvas Business Model concept for business planning, which includes the following key elements; (1) Value proposition: The Value Proposition describes the bundle of products and services that create value for a specific Customer Segment, (2) Customer segment: The

Customer Segments defines the different groups of people or organizations an enterprise aims to reach and serve, (3) Distribution channels: The Channels describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition, (4) Customer Relationships: The Customer Relationships describes the types of relationships a company establishes with specific Customer Segments, (5) Revenue streams: The Revenue Streams represents the cash a company generates from each Customer Segment, (6) Key resource: The Key Resources describes the most important assets required to make a business model work, (7) Key activities: The Key Activities describes the most important things a company must do to make its business model work, (8) Key Partnerships: The Key Partnerships describes the network of suppliers and partners that make the business, and (9) Cost structure: The Cost Structure describes all costs incurred to operate a business model. A business model describes the rationale of how an organization creates, delivers, and captures value. The Business Model Canvas visual represents how an organization creates, delivers, and captures value (Desai, 2014; Osterwalder et al., 2011).

A business strategy that may service both sides of the eHealth industry, with a particular focus on social innovations for social care, one of which is geriatric care. The findings revealed that a business model that serves both sides of the market must provide a structure that facilitates contact and transaction among various actors. The lack of middlemen or brokers to minimize transaction costs and drive competitive advantage is a fundamental barrier in developing efficient business models. However, broker business models are likely to overcome the social innovation gap existing currently in the eHealth market due to the lack of market makers that bring buyers and sellers together, facilitate transactions, establish discourse, and stimulate both sides of the market (Vimarlund et al. 2021). Cicellin et al. (2019) looked at new business models recently introduced in Europe and borrowed from less developed economies. They conducted a comparative case study of three low-cost Italian firms. Four social criteria were used to choose the cases: start-up capital, social value proposition, social value equation, and social profit equation. As a result, the low-cost business model can meet the demand for cheap housing while also providing social innovation.

The Business Model Canvas was used in this study. It includes the nine key elements of the value proposition, the customer segment, the distribution channels, the customer relationships, the revenue streams, the key resource, the key activities, the key partnerships, and the cost structure, according to Desai (2014); Osterwalder et al. (2011); Department of Industrial Promotion (2021).

### 3. Methodology

This research is quantitative research with a survey. The target population, working at the end of the age range of 45-59 years and living in Bangkok. Bangkok is Thailand's capital as well as the country's economic hub. Research studies are used to organize the importance of research problems, formulate research objectives and hypotheses, develop research concepts, identify target populations and sample size, create and develop data acquisition tools, collect data from the sample group, analyze the data obtained, summarize the research results, and discuss the findings.

#### 3.1. Research Sample

The working-age group (45-59 years old) was the target group, with a total of 5,075,299 people (The Bureau of Registration Administration, 2020). It was estimated using Taro Yamane's (1967) method of 385 samples, with an acceptable sampling error of 0.05 at the 95 percent confidence level, to generate a good representative sample from the population. The sampling was not random, but a purposive selection method was used.

#### 3.2. Research Tool

The research questionnaire was broken down into three sections:

(1) It contains demographic information on the target group, such as age, gender, marital status, education, occupation, average monthly income, tenure, and type of dwelling.

(2) It is data about housing improvement requirements, such as renovation budget, average monthly income before retirement, deteriorating housing environments, and channels to contact target clients.

Parts 1 and 2 of the questionnaires were closed-ended questions with a checklist form.

(3) Additional suggestions, in the form of an open-ended questionnaire, allow the sample group to independently express their opinions on the research subject.

The design and quality of questionnaires consisted of (1) researching research ideas and related research articles, (2) defining the framework and scope of questionnaires per research objectives, (3) using selected samples as a guideline for asking questions, improving questionnaire questions to be correct, (4) creating a questionnaire according to the framework and scope, (5) using the questionnaire to confer with experts who have knowledge, expertise, and experience connected to this research, three people; and (6) a comprehensive questionnaire to be utilized in gathering information from the target group.

#### 3.3. Research Data Collection

The study used 385 samples from a target group who

volunteered to participate in the investigation. In addition, this study gathered information on housing repair needs from secondary sources such as housing estates, condominiums, and other organizations. It also gathers information from research reports and associated academic papers. In addition, the study region was classified as a part of Bangkok. The questionnaire was used to collect data from April 24 to May 30, 2021.

### 3.4. Hypotheses

The following hypotheses were developed to achieve the goal:

Null hypothesis (*H0*): Working-age groups with different occupations and average monthly incomes will not need to improve their accommodation at the statistical significance level of 0.05.

Alternative hypothesis (*Ha*): Working-age groups with different occupations and average monthly incomes will need to improve their accommodation at the statistical significance level of 0.05.

### 3.5. Statistical Analysis

The demand for housing improvement for working-age groups who will become elders in the future, Thailand is a quantitative analysis by using a computer software package as a tool to analyze the data obtained from the questionnaire design according to the objectives and assumptions set out as follows:

Objective 1 was to analyze the need to improve the housing of working-age groups who will be the elderly in the future by using descriptive and inferential statistics such as frequency, percentage, and chi-square.

Objective 2 serves as a guideline for a business model to improve housing to support the aging society using content analysis.

## 4. Results

Most of the target groups were 45-49 years old, (44.4%) and 50-54 years old, (35.6%), male and female in a proportion of 48.1% and 52.9% respectively, marital status 54.3%, bachelor's degree 67%, occupation of government employees and state-owned enterprises in similar proportions 32.5% and 33.5%. Average monthly income was 896 – 1,494 USD 54.8%, own residence 68.8%, detached houses and townhouses 41.6% and 33%. The target group plans the budget for repairs or renovations of 1,494 – 2,092 USD to support the elderly in the future (34.5%), followed by a budget of 896 - 1,494 USD (26.2%). Most of the target groups have an average monthly income before retirement in the range of 896 – 1,494 USD (59%). In addition, the target group expected average monthly income after retirement to be less than 896 USD and 896 - 1,494 USD, 42.6% and 44.9%, respectively. The results of the analysis can be summarized as follows according to the research objectives:

The results of the analysis of the need for repair or renovation showed that the areas that need improvement are the bathroom (56.6%), followed by the bedroom (38.4%), living room (31.4%), kitchen (28.3%), terrace or balcony (26.2%), parking space (26.2%), prayer room (7.8%), and all areas of the residence (3.4%) (Table 1).

Table 1. The need to repair or renovate the residence

Area	Quantity	Percentage
Bathroom	218	56.6
Bedroom	148	38.4
Living room	121	31.4
Kitchen	109	28.3
Terrace or balcony	101	26.2
Car park	101	26.2
Prayer room	30	7.8
All areas of residence	13	3.4

Access channels to business services for housing repairs or renovations were social media (53.2%), followed by channels through relatives, friends, and acquaintances (38.7%), and construction companies (31.0%) (Table 2). The target group decided to repair and renovate their homes to accommodate themselves when they were the elderly, 90.9%, and only 9.1% decided not to repair or renovate.

Table 2. The results of the analysis of media channels to reach the target group

Channel	Quantity	Percentage
Social media	205	53.2
Relatives, friends, and acquaintances	149	38.7
Construction companies	31	8.1
Total	385	100

The hypothesis testing results showed that working-age groups aged 45-59 years living in Bangkok have different occupations and average monthly incomes. When entering an aging society, there will be different decision-making to repair or renovate a home (Table 3 and Table 4).

Table 3. The results of the hypothesis testing of the working-age people (45-59 years old) with different occupations who had varying housing improvement demands

Occupations	Decision making to repair or renovate		Total
	Yes	No	
Government employees	106	20	126
State-owned enterprises	125	4	129
Own business	55	5	60
Work in a private company	64	6	70
Total	350	35	385

Pearson Chi-Square = 12.678<sup>a</sup> at Asymptotic Significance (2-sided) 0.005

Table 4. The results of the hypothesis testing of the working-age people (45-59 years old) with different average monthly incomes who had varying housing improvement demands

Average monthly incomes	Decision making to repair or renovate		Total
	Yes	No	
Less than 896 USD	116	17	133
896 – 1,494 USD	201	11	212
More than 1,494 USD	33	7	40
Total	350	35	385

Pearson Chi-Square = 9.521<sup>a</sup> at Asymptotic Significance (2-sided) 0.009

#### 4.1. The Business Model of Housing Improvement to Support the Aging Society

A guide to a business model of home repair or

renovation to support an aging society focuses on the two main customers, namely, primary and secondary customers. Therefore, businesses use social media channels to make the relationship and public relations directly to the target customer group as efficient as possible. Besides, the company strives to be friendly with customers, aims to provide quality services, selects standardized building materials, and enters into business partnerships with building materials stores, construction companies, and subcontractors. In addition, residential repair or renovation services should be offered at a standard price that makes the business profitable and ensures the company's profitability (Table 5).

Table 5. The business model of housing improvement to support the aging society

<b>Cost Structure</b> Establish a cost structure for housing repairs or renovates.	<b>Key Partners</b> Network of related business partners, such as building materials stores, construction companies, and subcontractors.	
	<b>Key Activities</b> Residential repairs and renovations for primary and secondary customers.	<b>Key Resources</b> <ul style="list-style-type: none"> <li>• Friendly to customers,</li> <li>• Committed to quality work,</li> <li>• Selecting materials from companies that have standards.</li> </ul>
	<b>Value Proposition</b> <ul style="list-style-type: none"> <li>• Vision and knowledge of executives at all levels,</li> <li>• Wholesale price,</li> <li>• Small and easy to move, business-friendly environment,</li> <li>• Take care of customers as if they were family members.</li> </ul>	
<b>Revenue Streams</b> Income from renovation and repair of the resident for main and secondary customers: <ul style="list-style-type: none"> <li>• Business to Customer (B2C),</li> <li>• Business to Business (B2B),</li> <li>• Business to Business to Customer (B2B2C)</li> </ul>	<b>Customer Relationship</b> <ul style="list-style-type: none"> <li>• Customers are divided into groups according to the company image value,</li> <li>• Customer interaction system to learn customer needs,</li> <li>• To create long-term customer satisfaction.</li> </ul>	<b>Channels</b> <ul style="list-style-type: none"> <li>• Social media (53.2%),</li> <li>• Relatives, friends, and acquaintances (38.7%),</li> <li>• Construction companies (31.0%).</li> </ul>
	<b>Customer Segments</b> <b>Primary customers:</b> government employees and state-owned enterprises with an average monthly income of 896 – 1,494 USD, own detached house, and ability to renovate or repair with a budget of 1,494 – 2092 USD. <b>Secondary customers:</b> own business, work in a private company or other occupations with average monthly income above or below 896 – 1,494 USD, own residence, ability to improve or repair with a budget above or below 1,494 – 2092 USD.	

## 5. Discussion

Most working-age people (45-59 years old) will become the elderly group in the future; 68.8% have their own residence. The findings are in line with the Real Estate Research Center (2019), which found that the demand for housing repairs or renovations represents an opportunity for the construction business. The analysis results showed that the target group needed renovation or repair of the bathroom, followed by the bedroom, living room, kitchen, terrace or balcony, parking lot, prayer room, and all renovations. The most frequently renovated area was the bathroom, as in the renewed research by Panraluk (2014) and Salee (2010). In addition, the results are consistent with those of McDougall et al. (2019), who analyzed in New Zealand that for the elderly group, the elements of specific indoor spaces, spatial configuration, accessibility, outdoor space, light, privacy and security, and social aspects must be considered.

The most influential factor in communicating with the target group was social media channels (53.24%), which is consistent with the research of Jongpipitporn (2015), which found that the website channel is the factor that had the greatest impact on communication with the elderly in Bangkok, Thailand. However, our research result does not agree with Vimarlund et al. (2021). It was stated that brokerage business models should fill the gap in the market today because there are no markers that bring buyers and sellers together to facilitate transactions, create a dialogue, and stimulate the two sides of the market.

As for the budget for repairs or improvements, it is 1,494 – 2,092 USD, which is consistent with the research of Panraluk (2014), which found that the budget for renovation of the elderly's residence, excluding wages, is not more than 2,390 USD. However, the budget for residence renovation was 998 – 1,384 USD, compared to the average monthly income

of most elderly in the range of 598 - 1,494 USD (Khamsook & Jarutat, 2020).

In addition, this research found that most incomes before or after retirement were 896 – 1,494 USD, which was sufficient for the budget to improve each housing area. Thus, the budget for repairs or renovations came from the savings of the working-age group who will be elderly in the future. This finding contradicts the research findings of Khamsook & Jarutat (2020), who found that the budget for repairs or renovations came from personal savings, pensions, and money from children or grandchildren. It was also a loan from a financial institution. However, the result of this study was not consistent with the empirical analysis of Lin et al. (2021), who found that the increase in urban housing prices is generally positively correlated with the city's innovation outcomes and talent attraction, suggesting that there is no crowding-out effect on the city's innovation performance. Cicellin et al. (2019) studied innovative business models in European countries. Also, they found that the low-cost business model is, therefore, able to respond to the demand for affordable housing while providing social innovation.

## 6. Conclusion

The housing repair or renovation company in Thailand needs to consider the demand factors for repairs or improvements from both the primary target group and the secondary target group in terms of the improvement budget. Businesses need to plan the cost structure to generate profits that will allow the company to continue in the long run.

In addition, social media channels, such as LINE, Facebook, Twitter, etc., should be used for advertisement and communication to build relationships with the target customers. Also, the company should have business partners such as building material stores, construction companies, and subcontractors to increase the number of customers, revenue, and profit of the company. Another way to increase the revenue and profit of the company is to offer mobile service through the company's call center.

A review of related research papers revealed that the main focus of the targeted home repair or renovation business should be on a low-cost business model and the broker business model.

## 7. Further Study

The research will be undertaken qualitatively to obtain full analysis, using focus groups and in-depth interviews. In addition, additional research was undertaken in different parts of Thailand on the main target group working at the end of the working-age people (45-59 years old) to acquire general information for beginning a house repair or renovation business.

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## Authors' Contributions

Assoc. Prof. Kwunkamol Donkwa has worked at the Suranaree University of Technology for more than 20 years. The public's interest in aging societies is growing both domestically and internationally. Research papers have been published in both national and international publications. Professor Dr. Suksun Horpibulsuk, an expert in civil engineering research and a consultant for educating private and governmental organizations, cooperated on this study. He has published research papers in national and international journals. Ms. Paranya Timthong has graduated Master's degree in Civil Engineering and works as an engineer at the construction company's office. This collaboration has a common interest in the issue of the growing elderly group and the improvement of buildings and residences that increase the convenience of living for the elderly.

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