RELATIONSHIP BETWEEN ACTIVITY AND BEHAVIOR OF SENIOR WORKERS AND READINESS FOR POST-RETIREMENT EMPLOYMENT OF SENIOR WORKERS

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ABSTRACT

This study aims to investigate (1) the difference between personal factors and activities and behaviors of senior workers in pre-retirement (aged between 50-55 years), (2) the difference between personal factors and readiness for post-retirement employment of senior workers, (3) the relationship between activities and behaviors of senior workers and readiness for post-retirement employment of senior workers. This study uses a quantitative research approach (a questionnaire that has a confidence level of .05) on 424 randomly selected senior workers in the auto industry Eastern Economic Corridor (EEC). The study found that differences in personal factors such as age, education and monthly income led to different behavior and activity of senior workers before their retirement with statistical significance of .05. To personal factors and employment readiness after retirement of senior workers, the study found that personal factors such as age, gender, education, monthly income, debt and additional income influenced the post-retirement employment readiness of senior workers with statistical significance of .05. Activities and behaviors of senior workers before retirement and post-retirement employment readiness were correlated. The study found that senior workers' pre-retirement activities and behaviors such as employment status, source of income and desire to continue working after retirement were related to post-retirement employment readiness with a statistical significance of .05.

Keywords: Pre-retirement senior workers, Post-retirement employment readiness, Activities and behavior of pre-retirement senior workers

Introduction

The world today is facing demographic change: the number of elderly people is increasing due to advances in medical technology, and greater efficiency in healthcare. Life expectancy is increasing, in contrast to the declining birth rate. In 2015, the world population was 7,349 billion, of which 901 million were over 60 years old (12%). Thus, it can be said that the world population is aging. In Asia, 59 million people were over 60 years old, which is 9%. The population of three countries is considered aged: Singapore (18%), Thailand (16%) and Vietnam (10%) (Department of Senior Affairs, 2017). The rate at which a country enters the state of aging society depends on the environment, nutrition, medical development and

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economic growth (OECD and World Health Organization, 2020; Poyen, 2019; Dhrif, 2018). The aging society is classified into three levels 1) Aged society: 10% of the population is over 60 years old or 7% over 65 years old, 2) Complete Aged Society: 20% of the population is over 60 years old or 14% over 65 years old, 3) Super Aged Society: 30% of the population is over 60 years old or 7% over 65 years old. In Thailand, the population has been in aged status since 2005. In 2014, 14.9% of Thai population was over 60 years, and it is estimated that in 2028, 23.5% of the Thai population will be over 60 years, thus will be a completely aged society (Phromphakdi, 2013).

Due to increasing number of elderly people and the declining birthrate, there is a labor shortage worldwide (Poyen, 2019). A study by the Thailand Development Research Institute (TDRI) and the Office of Industrial Economics estimates that in 2022, the supply of labor will be 42.5 million , compared to a demand of 48.9 million, with a difference of over 6 million (Panyindee, 2018; Thermpittayapaisit, 2017). This labor shortage will affect domestic production. Both the public and private sectors are forced to adapt to the demographic changes in the 21st century as labor shortages are pervasive (Bryan & Agnieszka, 2018). Some countries are experimenting with the use of automated labor, which is expensive in terms of capital and technology (Thermpittayapaisit, 2017).

Other countries alleviate the labor shortages by extending the retirement age or reemployment after retirement (Poonsawad, Chirinang, Raktham, & Tharawas, 2020; Natheeprasithiporn & Chaichompoo, 2019; Sullivan & Ariss, 2019). There is increased reemployment after retirement, departing from the normal practice of mandatory retirement at age 55 or 60 (Poonsawad et al., 2020; Sullivan & Ariss,

2019). The employer takes into account the past performance, suitability and health of the retired employee (Natheeprasithiporn & Chaichompoo, 2019). In Singapore, the statutory retirement age is 62 years and thereafter, the employer can rehire the retired employee until he or she is 65 years old based on voluntary choice, past performance and health. The employer is entitled to Special Employment Credit (SEC) from the Singapore government at a maximum of 8% of the employee's salary if the employee is above 50 years of age, and 11% for employees who are above 65 years of age. The SEC would be reduced for employees earning over 3,000 Singaporean dollars (Ministry of Labor, 2016). In Thailand, government agencies are developing strategies and plans to deal with the increasing aging of the workforce, such as greater emphasis on post-retirement employment through a pilot program (in collaboration with the Thai Gerontology Research and Development Institute (TGRI) Foundation and 12 establishments) of reemployment in 12 enterprises, founding the establishment of service center for older workers, and a registration center for older workers. There are also training programs for older workers to increase employability and legislative changes to facilitate post-retirement employment (Ministry of Labor, 2017).

Another part that determines the importance of the choice to conduct this research is the area. The Eastern Economic Corridor Project is a strategic plan under Thailand 4.0 for economic development in areas that build on the success of the Eastern Seaboard development project. The main objective is to promote investment, that will improve the country's industry, increase competitiveness and enable the Thai economy to grow in the long term. In the first phase, the area in 3 provinces, namely Chonburi, Rayong and

Chachoengsao, will be upgraded to be an Eastern Special Economic Zone to support systematic and efficient economic development. Incidentally, all three areas are considered as the most important industrial zones in the country. This is done at the Integrated Plans for Special Development in Eastern Region: Infrastructure and utility development plans, implementation plans, and a comprehensive government service plan. It covers the development of infrastructure, industrial business, innovation hub, tourism, building new cities and towns to make Thailand as a hub for aviation, transportation, trade, advanced manufacturing, tourism, innovation, global business and as the metropolis of the future. In the special development zones, three provinces are focusing on improving policies that will help reduce the shortage of skilled workers and that will provide these highly skilled workers. It will be necessary for the automotive and artificial intelligence industries of the future.

To the development of target industries in the aforementioned Eastern Economic Corridor, skilled manpower is needed because skilled workers can effectively work with advanced technology. Most industries, especially the automotive industry, require high skilled workers. Therefore, preparing manpower for the automotive industry labor market is an urgent matter.

So it is a great opportunity for senior workers because they have more alternatives. Nevertheless, studies on senior workers have found that the desire to continue working after retirement depends on personal factors such as health, marital status, income, debt, residence, employment history, primary and secondary source of income, and education (Bender, Hollstein, & Schweppe, 2020; Chuanchom, Chantuk, & Siriwong, 2018; Penpong, 2019). These personal factors act as cofactors on

senior workers' pre-retirement activity and behavior, consisting of 1) employment activity and behavior, 2) income source activity and behavior, 3) health activity and behavior (Hurtado & Topa, 2018) and 4) behavior and activity related to the desire to continue working after retirement. These factors influence post-retirement employment readiness (Theerakittikon & Woenthongm, 2020; Eismann, Verbeij, & Henkens, 2019; Yura, Iris, & Lawrence, 2018). Post-retirement readiness can be measured by four aspects: 1) employment potential, 2) social support, 3) self-care, and 4) self-value. This readiness would influence the decision to continue employment after retirement (Poonsawad et al., 2020; Natheeprasithiporn & Chaichompoo, 2019; Sullivan & Ariss, 2019). In light of this background and importance, despite myriad means of preparing for reemployment after retirement, most of these efforts focus on organizational preparation, such as employment patterns and policies, while preparation on the part of senior workers is low (Weerasombat, 2018). Such preparation cannot be done in the short term (Chuanchom et al., 2018). The lack of studies on workforce preparedness remains a problem, especially in the industrial sector where personal factors form a very clear dividing line between groups. Physical labor, skilled labor, clerical labor, and supervisory labor have different levels of retirement readiness. The reason for this readiness must come from the activity and behavior that dictates pre-retirement preparation (Theerakittikon & Woenthongm, 2020; Panyindee, 2018; Eismann et al., 2019; Kesornbua, 2018), therefore it can be used to provide a guideline for retirement preparation for senior industrial workers. Although it is limited to a specific group, the result of this study can be used to prepare for quality retirement or reemployment after retirement for other groups. Business

owners can use the result of this study for human resource planning to deal with labor shortage, prepare their work environment for changing work conditions, increase job satisfaction, productivity and performance. This leads to the study on personal factors, activity and behavior of senior workers related to post-retirement employment. The concept is shown in Figure 1.

Objectives of the Study

1. Examine the difference between personal factors and activity and behavior of senior workers before their retirement.
2. Examine the difference between personal factors and preparation for post-retirement employment of senior workers.
3. Examine the relationship between activity and behavior of pre-retirement workers and post-retirement employment of senior workers.
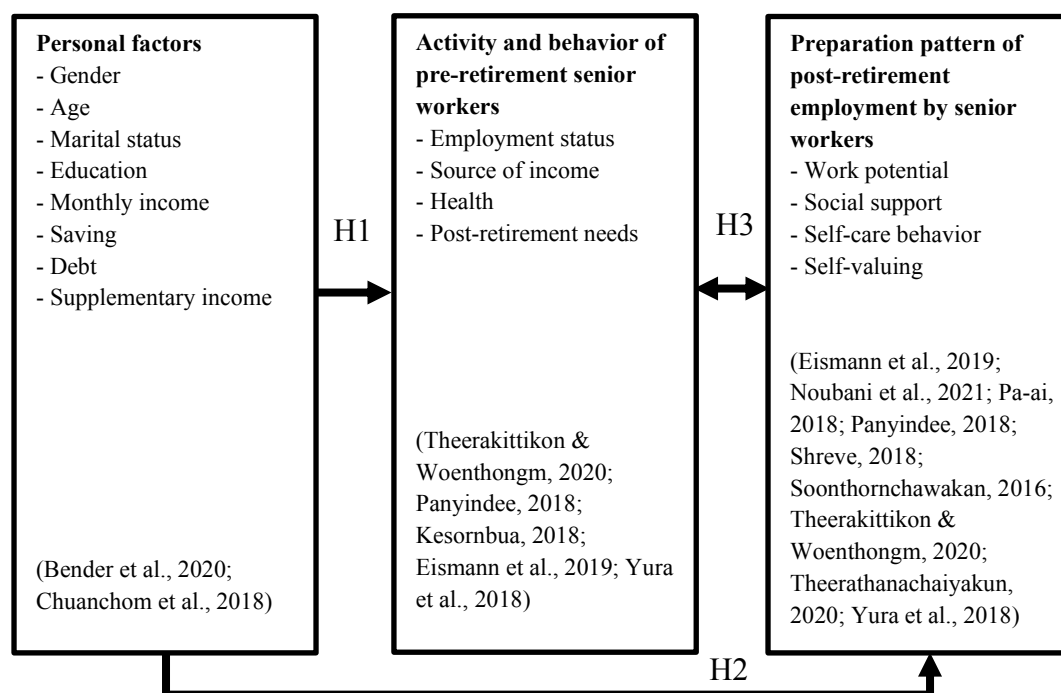
Conceptual Framework

Figure 1 Conceptual framework

Hypotheses

1. Different personal factors lead to different activities and behaviors of senior workers in pre-retirement.
2. Different personal factors lead to different post-retirement employment preparation of senior workers.
3. Activity and behavior of senior workers in pre-retirement are related to their preparation for post-retirement employment.

Literature Review

Studies of senior workers' pre-retirement activities and behaviors related to their preparation for post-retirement employment include the following theories, concepts and research.

Personal factors on activity and behavior of pre-retirement senior workers

Studies on senior workers by Bender et al. (2020), Chuanchom et al. (2018), and Penpong (2019) found differences in activity and behavior as well as preparation for retirement, leading to readiness or non-readiness for retirement. Different personal factors led to different activities and behaviors, depending on personal characteristics such as gender, age, marital status, income adequacy, debt, residence, employment history, primary and supplementary income sources, and education of the senior workers.

Activity and behavior of senior workers who are prepared for post-retirement employment

Panyindee (2018) stated that SOC theory, a psychological theory that relates to age-related adjustment and balance of body, mind, society and environment through selection, optimization and compensation, is the source of explanation for employment potential, self-care behavior and readiness for reemployment after retirement. The concept of activity and behavior, based on activity theory developed by Havighursts Kansas City Study in 1968, found that active seniors are generally happier than seniors who are not involved in any activity (Sombutboon, 2019). Seniors (who usually have a family of their own) with good interaction with other people were fitter than those who do not engage in social interaction. Social interaction led seniors to be more satisfied with continuing the activities they were involved in. This theory showed that continued employment after retirement (Panyindee, 2018) was a behavior that would allow seniors to feel worthy, happy, satisfied and successful. Similarly, society would care less about seniors if seniors did not care about themselves.

Senior citizens wanted to be part of society for the rest of their lives (Bruggencate, Katrien, & Janienke, 2018). This theory believed that seniors' happiness comes from their contribution to society. Once they quit a job, they have to find other replacement jobs (Banyongkid, Lake, & Teokul, 2018). Therefore, seniors continued to work and make new relationships and friends to compensate for the loss of their usual roles after retirement. Sometimes, seniors had income and health problems, so they were unable to undertake activities by themselves, and relied on government support. This theory believed that active seniors would be happier and live longer (Natheeprasithiporn & Chaichompoo, 2019). Activity theory is often used to explain senior-related research because it is believed that seniors would continue their activities and good attitudes from middle-aged years with vigor as long as possible, and if they had to retire or stop their usual activities, they would find replacement activities (Wongfan, 2017). The activity level affects the social participation of middle-aged and seniors because they would maintain their activity and attitude, and they would quickly find substitute activities if they were forced to give up their original activities (Novak, 2018).

In this study, pre-retirement activity and behavior of senior workers that affect their preparation for retirement or reemployment have readiness such as 1) readiness activity and behavior related to employment status (Panyindee, 2018), which can be indicated with factors such as attitude towards task, part of effort in the company and part of work improvement, 2) readiness activity and behavior related to source of income (Jantorn & Yansomboon, 2018) consisting of various indicators such as full-time employment, overtime and other supplementary income sources, 3) activity and behavior related to

health, consisting of indicators such as good health, regular exercise and health examination (Hurtado & Topa, 2018), and 4) activity and behavior related to the desire to continue working after retirement (Kesornbua, 2018), which may be indicated by the desire to continue working in the original organization or elsewhere, or to start their own business after retirement. Such factors influence preparation for reemployment (Theerakittikon & Woenthongm, 2020; Eismann et al., 2019; Yura et al., 2018).

Post-retirement reemployment preparation
The theory of reemployment readiness after retirement defines readiness as the performance of the person who is willing to work or perform an action, relying on his readiness of the mind, intelligence and experience to achieve the goal (Noubani et al., 2021). Readiness in reemployment after retirement, in short, means the willingness to continue working after retirement, relying on their readiness of mind, intelligence and experience to achieve the goal (Panyindee, 2018; Shreve, 2018; Theerakittikon & Woenthongm, 2020; Eismann et al., 2019; Yura et al., 2018). It is also noted that most reemployed senior workers are in agriculture, trade, repair (cars, tools, etc.), hotel and manufacturing. Most of the senior workers are in service sector followed by skilled jobs. Reemployed senior workers need an annual health check, exercise, nutrition and knowledge about retirement (Soonthornchawakan, 2016). Factors in senior workers' decision to continue working after retirement are 1) personal factors, as senior workers see that they are still able to work, help others, maintain their own income, and feel bored, 2) economic factors, as many senior workers are in debt without having sufficient savings, stable income, or any income at all, and 3) social factors, as senior workers want to maintain their social status and interaction

with others (Theerathanachaiyakun, 2020; Noubani et al., 2021). Similarly, a study by Soonthornchawakan (2016), Boonyasana and Phunnarong (2017), on employment opportunities for senior workers found that many seniors do not have children, do not have enough savings, and therefore are forced to work. The studies found that seniors with no education or less than elementary school have low incomes, and have no savings, thus forcing them to work. Nevertheless, seniors would face challenges in reemployment, including internal factors such as health, e.g. poor eyesight, mental acuity, chronic diseases, or attitude, personality or behavior that cannot easily adapt to the modern world. On the other hand, external factors are the willingness of companies to accept older retired workers, along with the law and government policies that could encourage reemployment through subsidies (Pa-ai, 2018).

Reemployment readiness
Reemployment readiness of senior workers (Panyindee, 2018) can be measured by 1) employment readiness which consists of (1) constant potential development, (2) constant learning about new technologies, (3) communication skills, (4) adaptability, (5) success, 2) social support (Theerathanachaiyakun, 2020) consisting of (1) care and love from family members, (2) acceptance from others, (3) support from others, (4) good relationships with family, community, and society, (5) receiving constant information or knowledge about lifestyle, 3) self-care behaviors (Panyindee, 2018) consisting of (1) good diet, (2) regular exercise, (3) good self-care ability, (4) stress management and (5) adequate sleep, 4) self-value, consisting of (1) self-pride, (2) confidence, (3) hope, (4) self-empowerment, and (5) self-esteem (Panyindee, 2018; Shreve, 2018).

Research Methodology

Population

Workers in the automotive industry in the Eastern Economic Corridor (EEC).

Sample

Senior citizens aged between 50-55 years working in the automotive industry in the Eastern Economic Corridor (EEC).

Sample size

Since the author is uncertain about the exact size of the population, Cochran's formula is used to calculate the sample size (Cochran, 1963). The result of the calculation is 385, but to increase the reliability of SPSS processing and reduce the error due to incompletely filled forms, the author increases the population by 10%, which is 424 sets of survey questionnaires (Meehanpong et al., 2019).

Research tool

The research tools used in this study are questionnaires that contain both closed-ended (with choices for the respondent) and open-ended questions (respondents could answer freely).

Research tool validation

The author validates the research tool by checking 1) content validity which is validated by five experts, the result of calculating the reliability value is 0.985, 2) reliability, which is validated by Cronbach's Alpha coefficient. Then, the revised questionnaire is tried on 30 of the sample group (senior workers aged 50-55 years, employed in automotive industry in Eastern Economic Corridor (EEC)). The experimental data are validated and encoded for processing using SPSS for Windows. The data are processed considering Cronbach's Alpha coefficient. When the value of the questionnaire approaches 1, it is reliable and 0.7 is the minimum acceptable value (Wanichbancha, 2014). The questionnaire of this study has a reliability value of 0.941. The

final check is the ethical validation, the author submits the revised questionnaire to the ethics committee of Burapha University for validation before actual use (Human Research Ethics Committee Burapha University, 2019).

Data analysis

After all the information has been collected, the author checks its integrity and validity of the questionnaire. Then the questionnaire is encoded according to a statistical method and processed in a computer program. The result of the computer processing is used to create a statistical analysis table for explanation. The statistics used are 1) Descriptive Analytical Statistics, which is used to explain the data characteristics (Frequency, percentage, arithmetic mean and standard deviation are used) and 2) Inferential Analysis Statistics, which is used to analyze the effect of the independent variables on the dependent variables. Inferential Analysis Statistics uses sample data and analysis methods as follows:

For hypothesis I: Different personal factors lead to different activities and behaviors of senior workers before their retirement, and independent samples t-test and One-way Analysis of Variance: One-way ANOVA are used.

For hypothesis II: Different personal factors lead to different preparation for post-retirement employment of senior workers, and independent samples t-test and One-way Analysis of Variance: One-way ANOVA are used.

For Hypothesis III: Activity and behavior of senior workers before retirement are related to their preparation for employment after retirement, and Pearson's Product Moment Correlation Coefficient is used.

Results

The results of the study "Relationship between activity and behavior of senior

workers and readiness for post-retirement employment of senior workers" shows that difference in personal factors leads to difference in activity and behavior of senior workers before retirement with statistical significance of .05. Difference in personal factors also leads to difference in preparedness for post-retirement employment with statistical significance of .05. Activity and behavior of senior workers before retirement are related to preparation for post-retirement employment of senior workers with statistical significance of .05.

Table 1 Different personal factors lead to different activities and behaviors of pre-retirement senior workers

	Personal factors	Mean	t	Sig.
Activity and behavior of pre-retirement senior workers	Gender	.01451	.372	.942
	Age	.436	2.796	.017*
	Marital status	.218	1.368	.256
	Education	1.526	9.987	.000*
	Monthly income	1.674	11.558	.000*
	Saving	.21029	3.093	.912
	Debt	-.10244	-2.375	.238
	Supplementary income	.20272	5.040	.055

*P < 0.05

From Table 1, the t-test on differences between age, education and monthly income indicated differences in activities and behavior of pre-retirement senior workers with statistical significance (Sig. value .017*, .000*, and.000* respectively).

Table 2 Different personal factors lead to different preparation for post-retirement employment of senior workers

	Personal factors	Mean	t	Sig.
Preparation pattern of post-retirement employment by senior workers	Gender	-.07616	-1.716	.039*
	Age	.436	2.796	.017*
	Marital status	.218	1.368	.256
	Education	1.526	9.987	.000*
	Monthly income	1.674	11.558	.000*
	Saving	.34133	4.353	.621
	Debt	-.23095	-4.202	.000*
	Supplementary income	.14266	2.906	.041*

**P < 0.05

From Table 2, the t-test on differences between age, gender, education, monthly income, debt and supplementary income indicated differences in post-retirement preparation of pre-retirement senior workers with statistical significance (Sig. value .039*, .017*, .000*, .000* and .0410* respectively).

Table 3 Activity and behavior of pre-retirement senior workers that are related with their post-retirement employment preparation

Activity and behavior of pre-retirement senior workers	Pearson correlation	Sig.
Employment status	.465	.000**
Source of income	.074	.127
Health	.635	.000**
Desire to continue working after retirement	.442	.000**

**P < 0.05

From Table 3, Pearson Correlation-based study of relationship between employment status, source of income and desire to continue working after retirement showed relationship with post-retirement employment preparation in senior workers with statistical significance (Sig. value .000*, .000* and .0000* respectively).

Discussion

Various personal factors, including gender, savings, debt, and supplementary income, have been found to have different influences on the elderly workers' pre-retirement activities and behaviors, and various personal factors have been found to influence preparation styles. Readiness to work after retirement varies among elderly workers. This is consistent with research by Bender et al. (2020) and Chuanchom et al. (2018) who found differences in workers' activities and behaviors related to different retirement preparations. As a result of willingness or unwillingness to work after retirement, there will be different pre-retirement activities and behaviors of elderly workers depending on personal characteristics such as age, gender, status, adequacy of income, indebtedness, region of residence, work history, income sources-additional income and education level of elderly workers, Bender et al. (2020), Chuanchom et al. (2018), and Penpong (2019). Pre-retirement activities and behaviors of elderly workers are in relation to post-retirement work readiness patterns of elderly workers. This is consistent with research by Panyindee (2018). The results can be measured by the factors of 1) Readiness of work potential which consists of (1) Developing competence to be always suitable for work, (2) Continuous pursuit of knowledge in technology related to work, (3) Communication skills, (4) Ability to change, and (5) Success in work, 2) Willingness for social support (Theerathanachaiyakun, 2020) which consists of (1) Receiving love and care from family members, (2) Recognition that people around him are respected, and (3) Receiving help, (4) Having good interactions with family, community, and society, and (5) Continuously receiving information or advice that is useful in daily life, 3) Willingness to engage in caring behaviors. Self (Panyindee, 2018), which consists of the factors of (1) eating nutritious and adequate food, (2) exercising regularly, (3) being able to take care of

oneself when one is sick, (4) being able to cope with stress, and (5) Adequate sleep, and 4) Self-esteem readiness which includes (1) feeling of self-respect, (2) being confident that you always get what you want, (3) always having hope in life, (4) feeling that you can handle things, and (5) feeling that he or she is a valuable person (Panyindee, 2018; Shreve, 2018).

Conclusion

The conclusion of the study "Relationship between activity and behavior of senior workers and readiness for post-retirement employment of senior workers" based on the research objectives can be described as follows:

Hypothesis #1 (H1): to investigate the relationship between personal factors and pre-retirement behaviors and activities of senior workers. The study found that differences in personal factors such as age, education, and monthly income led to different behavior and activity of senior workers before their retirement.

Hypothesis #2 (H2): to examine differences between personal factors and employment readiness of senior workers after retirement. The study found that personal factors such as age, gender, education, monthly income, debt, and supplementary income affect the employment readiness of senior workers after retirement.

Hypothesis #3 (H3): to examine the relationship between activity and behavior of senior workers prior to retirement and post-retirement employment readiness. The study found that senior workers' pre-retirement activities and behaviors, such as employment status, source of income, and desire to continue working after retirement were related to post-retirement employment preparedness.

Most senior workers should have preparation for reemployment after their retirement, along with preparation related to activity and behavior as follows:

Most senior workers have income from their full-time employment, so they should look for additional income, and maintain their knowledge, skills and abilities for work, so that they can get important tasks, get more opportunity to attend meetings to solve problems and improve the work. They should constantly learn new things and technologies to improve themselves, have a better ability to deal with changing circumstances and become more successful. They should have good communication skills, a sense of good self-management and self-pride. Senior employees should have good health for regular work, along with the love and support of their families.

Recommendations

From the result of the study, the author would like to suggest following recommendations:

1. Regarding the activity and behavior of senior workers in pre-retirement related to employment status, senior workers should improve themselves to get important jobs and be admitted in conferences to solve problems or improve the work. Since most senior workers have income from full-time jobs, they should strive for additional income. They should exercise regularly and have regular health checkups. Since most senior workers want to continue working at their original jobs, they should develop skills to keep up with changes in the organization.

2. Preparation for reemployment of senior workers, in terms of potential, senior worker should constantly refine their skills and knowledge for work and learn new knowledge. Senior workers still need the support of family and others. Therefore, family and others should provide support for

senior workers. As for self-care behavior, senior workers are bad at handling stress, so they need counselors or guidance to cope with stress. As for self-value, senior workers still need to feel valuable to the family, community and society, so the family, community and society should find activities to maintain this feeling.

Limitations and Recommendations for Further Study

This research has limitations. In this research, the researcher collected data from questionnaires. (Questionnaire) with elderly people aged 50 to 55 years working in the automotive industry of Eastern Economic Corridor (EEC). An additional study should be conducted on establishments and government agencies to design new patterns of reemployment preparation that meet stakeholders to obtain a more comprehensive retirement preparation. Suggestions for Future Research: Researchers can use a combination of research methods. (Mixed-method design) by using a quantitative method (quantitative research) and qualitative research method by using quantitative research as the main and qualitative research to extend the depth of research.

Acknowledgments

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PUBLIC ADOPTION OF TELEHEALTH TECHNOLOGY
IN THAILAND

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ABSTRACT

This study examines key determinants and challenges in the public adoption of telehealth technology in Thailand. It aims to provide managerial implication for Thai healthcare and telecommunication policy makers in designing and planning for the nation-wide adoption of the telehealth technology, in order to remedy long-standing healthcare problems including a medical staff shortage and an inefficient care delivery. In addition, it aims to contribute to the existing telehealth technology adoption literature in the context of rural areas where environmental factors could play a major role in a successful adoption. The TOE was employed as the framework to conduct a qualitative study using an in-depth interview a 12 out of 35 Thai public primary, secondary, tertiary and specialized care centers, participated in the pilot phase of the Telehealth project which was initiated by the National Broadcasting and Telecommunication Commission (NBTC) of Thailand and the Thai Ministry of Public Health (MOPH). Findings reveal that the compatibility with disparate legacy information technology systems, the disagreement over the balance between data privacy and data usage, and the ineffectiveness in the requirement gathering process from key stakeholders are main technological barriers for adoption. Furthermore, organizational factors including the continuous infrastructure and financial supports, the work process redesigning, the digital literacy training, and the motivation schemes for a sustainable adoption are cited to be crucial determinants. Lastly, concerned policy makers need to take into consideration environmental factors including the needs for systematic collaboration among care centers at all levels, the belief in a physical meeting between care providers and receivers, and the regulatory risks related to data privacy and intellectual property rights, for a successful adoption of the telehealth technology nationwide.

Keywords: TOE, Telehealth, Telemedicine, Technology adoption

Introduction

The Fourth Industrial Revolution (Industry 4.0), similar to the revolutions that preceded it, has the potential to improve quality of life for the global population by leveraging digital technologies. In healthcare industry, the digital revolution has made possible many innovative remote healthcare services that are more efficient and more effective.

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In combination with modern information and communication technologies (ICTs), the digital technologies allow us to resolve the prolonged issues of poor healthcare quality and inequality. Underserved patients in remote areas where there are shortages of doctors and nurses, and those who are in needs of specialized or personalized healthcare services can all benefit from a greater accessibility provided by these emerging integrated technologies. For instance, Tortorella, Fogliatto, Mac Cawley Vergara, Vassolo, and Sawhney (2019) found that Internet of Things (IoT) is one of the most common applications in Healthcare 4.0, whereas it expands the Internet connectivity to medical tools allowing for remote monitoring and care. In addition, the concept of patient-centered healthcare is getting more attention as populations are being more familiar with individual smart devices (Redfern, 2017; Haluza & Jungwirth, 2018; Gogia, 2020). IoT devices can appear in forms of wearable smart devices and mobile applications which can be used to monitor patients' daily health behaviors and conditions for both health monitoring and risk prevention purposes outside of traditional healthcare centers (Haluza & Jungwirth, 2018).

Among all the applications of healthcare technologies, Telemedicine has been increasingly adopted globally as a solution to the healthcare issues mentioned above. Nevertheless, many developing countries often face crucial challenges in telemedicine adoption, such as the unavailability of an appropriate infrastructure, the insufficient data security system, and the lack of resources (Adelakun & Garcia, 2019; Gogia, 2020). In addition, many telehealth projects were reported to halt in the pilot stage and were unable to scale up due to many adoption barriers (Taylor, Coates, Wessels, Mountain, & Hawley, 2015; Sisk et al., 2020). In the existing literature though, only a few studies though focus on telemedicine adoption in rural areas where healthcare problems seem to be prevalent.

In Thailand, the effort to adopt appropriate technologies to provide Telemedicine services nationwide was in the form of the Telehealth project initiated by the National Broadcasting and Telecommunication Commission (NBTC) of Thailand and the Thai Ministry of Public Health (MOPH). The main purposes of the Telehealth project are to improve the accessibility and the quality of healthcare services in remote areas where there is a lack of healthcare personnel and effective medical equipment.

The Telehealth project was initially rolled out as a pilot project whereas telemedical and telecommunication devices and relevant software are procured, distributed to and installed at the facilities of 35 provincial hospitals and local public health centers in Thailand. Contingent upon the success of the pilot project, the project scope will be extended nationwide and to include healthcare services for other diseases. It is thus crucial for Thai policy makers to understand key determinants of telehealth technology adoption, especially environmental factors rarely discussed in the existing literature, based on a widely adopted technology adoption framework in order to ensure a successful adoption of the new technology. See Appendix for more details.

Objectives of the Study

The main purpose of this study is thus to examine the determinants and the challenges of the adoption of the telemedical technology as part of the NBTC and MOPH's Telehealth pilot project. The practical insights obtained from the in-depth interviews with relevant stakeholders in the sample of participating Thai provincial hospitals and local healthcare centers in the pilot project, could help ensure a

successful extension of the Telehealth project to other geographical regions in Thailand, and to much needed healthcare services for other diseases. In addition, findings from this research could add to the existing literature with regard to the determinants and challenges of the adoption of telemedical technology in the rural area context.

Literature Review

Background on telemedicine

Telemedicine has emerged to improve healthcare quality and cost-effectiveness (Sanders et al., 2012), especially for the care of underserved populations where there is a physical distant between patients and professional care providers by transmitting information, such as image, voice, and health data over a device rather than moving the health professionals or patients (Lin et al., 2018; Harst, Lantzsch, & Scheibe, 2019; Gogia, 2020). The technology enables clinicians to discuss a case in a face-to-face manner over a video conference, examining the patients' conditions both from their live conditions and behaviors, and from the additional IoT devices that can monitoring patients' health data digitally, and transmitting the data for interpretation and diagnosis to the professionals (Gogia, 2020).

Telemedicine can narrow various ongoing gaps in healthcare services as its main benefit is to deliver healthcare service remotely. The problems of the shortage or immobility of the professional care providers, especially doctors, as well as the inaccessibility to healthcare services by patients who are unable to travel, could be remedied with the adoption of telemedical technology (Gogia, 2020).

Specifically, there are four types of Telemedicine classified by Gogia (2020), including real time (video conference and live diagnosis over digital equipment), store and forward (of information, including personal health data, image, and comments), tele-monitoring (medical profiles and data are obtained from the additional monitoring devices), and mobile-health, which enables possibly all of the above features on mobile devices. The current usage appears in the form of combination of all the above features. Behind these features, internet infrastructure availability with stable connectivity is required to set up the technology efficiently (Adelakun & Garcia, 2019; Gogia, 2020).

Since Noncommunicable diseases (NCDs) have been the main cause of the global death to date (Redfern, 2017), telemedical technology adoption has been frequently found to focus on the healthcare services related to chronic diseases, whereas frequent monitoring and visits are required for unserious nature of the NCD cases (Gogia, 2020). As a result, previous studies on telemedicine often focus on the medical conditions of chronic diseases, such as diabetes (Harst et al., 2019). Recently, infectious diseases are among the major drivers to increase the adoption of telemedicine in order to reduce contact between patients and professionals, thus to prevent risks of infection. The rate of telehealth use has dramatically rise in response to the COVID-19 pandemic (Sisk, 2020).

Technology adoption frameworks

Various technology adoption models have been examined in healthcare ICT and telemedicine studies. The conceptual frameworks widely used in the previous healthcare technological adoption studies include TAM: Technology Acceptance Model (Davis, Bagozzi, & Warshaw, 1989), UTAUT: Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003), TPB: Theory of Planned Behavior (Ajzen, 1991), DOI: Diffusion of Innovation (Rogers, 2003) and TOE: Technology-

Organization-Environment (Tornatzky, Fleischer, & Chakrabarti, 1990), whereas each of the frameworks provide different aspects of technology adoption in healthcare.

Harst et al. (2019) systematically and extensively reviewed previous studies with regard to end-user acceptance of telehealth adoption and reported the use of different theories in those studies. The author found TAM and UTAUT to be frequently used in the literature. TAM was reported to be presented more in the telehealth adoption studies which emphasized on professional healthcare provider aspects, while UTAUT, which differs from TAM with regard to social influence aspect, was found to be more suitable with patients' telemedicine adoption.

The TAM contains perceived ease of use and perceived usefulness as two main constructs originally. Perceived ease of use refers to the level of a person's belief that using the technology require minimum effort (Davis et al., 1989). While perceived usefulness is defined as the degree to which a person believes that using a technology will further improve the performance (Davis et al., 1989). Harst et al. (2019) mentioned that perceived usefulness is the most common significant factor that drive the telehealth adoption in care provider's perception. These TAM factors are often included other adoption frameworks.

Apart from commonly-used TAM, DOI proposed by Rogers (2003) focuses on the adopter's perceptions which affect technology diffusion process. Five general adopters' perceptions that many studies have consistently found to influence the technology adoption are Relative advantage, Compatibility, Complexity, Observability, and Trialability (Ramayah, Mohamad, Omar, Marimuthu, & Leen, 2013). Relative advantage refers to the perceived benefits over existing technology. Compatibility refers to the degree to which the adopters perceived technology to be consistent with existing values, past experiences and needs. Observability refers to the visibility of the adopted technology that others perceive. Lastly, trialability refers to the possibilities that the adopters can experiment the technology before adoption (Espadanal & Oliveira, 2012; Rogers, 2003). Compatibility is important for telehealth adoption, as evidenced in many studies regarding the telehealth adoption (Vuononvirta et al., 2011; Peeters de Veer, van der Hoek, & Francke, 2012; Taylor et al., 2015; Tsai, Cheng, Tsai, Hung, & Chen, 2019). For example, ability to share the telehealth data to existing patient record system is currently absence and become a barrier in adoption (Taylor et al., 2015). The weakness of the DOI is that it ignores the influence of the external factors (Espadanal & Oliveira, 2012; Sulaiman & Magaireah, 2014). Unlike the aforementioned technology adoption frameworks, there is no fixed set of attributes to the TOE framework, as it can vary for different kinds of technology, making it suitable as a governing framework in which a variety of factors from other frameworks can be borrowed and integrated into. TOE focuses on technological factors, organizational factors, and environmental factors that influence technology adoption. Technological factors refer to the characteristic and usefulness of the technology that are available for adoption (Chiu, Chen & Chen, 2017). Organizational factors refer to the organizational structure, characteristics and internal matter that can support or inhibit the adoption of the technology. Environmental factors refer to the structure and characteristics of the setting, where the organization operates in, can affect the adoption of the technology (Bhatiasevi & Naglis, 2018; Espadanal & Oliveira, 2012). The framework integrates both human and non-human factors into one single model

(Wong, Leong, Hew, Tan, & Ooi, 2019). For TOE, common significant technological factors that influence health ICT adoption are data privacy and security (Sulaiman & Magaireah, 2014; Campbell et al., 2017), reliability (Sulaiman & Magaireah, 2014; Adelakun & Garcia, 2019), perceived usefulness or relative advantage (Maarop, Win, Masrom, & Hazara Singh, 2011; Campbell et al., 2017; Harst et al., 2019; Kamal, Shafiq, & Kakria, 2020), and perceived ease of use or complexity (Hu, Chau, & Sheng, 2000; Maarop et al., 2011; Campbell et al., 2017; Adelakun & Garcia, 2019; Harst et al., 2019; Kamal et al., 2020). While a common and important organizational factor is the technological readiness which include the infrastructure readiness (Marques, Oliveira, Dias, & Martins, 2011; Sulaiman & Magaireah, 2014; Adelakun & Garcia, 2019). Lastly, the common significant environmental factors from health ICT are industry competition and governmental support (Sulaiman & Magaireah, 2014; Ngongo, Ochola, Ndegwa, & Katuse, 2019).

Determinants of telehealth technology adoption
The main purpose of telemedicine projects is to make healthcare services accessible in the areas where there are scarce resources or those distanced from service points. Based on the TOE framework, the adoption of the telemedical technology in such areas are often unsuccessful due to the lack of technological resources and financial supports, as evidenced in previous studies (Adelakun & Garcia, 2019; Harst et al., 2019; Gogia, 2020; Sisk et al., 2020). As a result, technology adoption projects are usually initiated by the government, or requires its supports (Gogia, 2020; Sisk et al., 2020). Important technological resources are mainly dependent on the availability and stability of internet connectivity in the area of adoption. In countries where there is a lack of sufficient telecommunication infrastructure

coverage, it is challenging to implement the technology as it relies heavily on the connectivity of internet to facilitate remote healthcare services (Adelakun & Garcia, 2019). Apart from the availability, stability, and quality of internet connection, the inability to share the data across different systems can be an important obstacle for the operators as it doubling, sometimes even tripling their responsibilities (Taylor et al., 2015). Furthermore, the maintenance of the hardware and medical devices involved in telehealth systems is required frequently, adding up more financial burden to the providers (Sisk et al., 2020).

End-user acceptance of the telehealth is another important determinant, including both providers and patients (Adelakun & Garcia, 2019; Harst et al., 2019; Sanders et al., 2012). The immediate integration of the technology can become a burden for the assigned operators to train, set up new work flows for the adoption, and become more familiar with the new routine, making it rather more complex with the newly adopted healthcare technologies (Taylor et al., 2015; Lin et al., 2018; Sanders et al., 2012). The common reasons of refusal to adoption include being discomfort with the new technology, being already occupied with current workload, and the preference of existing traditional services over the new ones (Sanders et al., 2012).

In addition, the patient's acceptance of the technology also proves to be the challenges to telehealth technology adoption. As telehealth usually supports home clinic, the acceptance of technology among patients, especially elders who may be unfamiliar to technologies, is required (Harst et al., 2019; Sanders et al., 2012). This could also be the issue that inhibit the acceptance of the users at home, as the medical devices of the telehealth may be too complex for patients' self-management (Sanders et al., 2012). In summary, the changes of patient-

provider interactions that Telemedicine presents create the barriers to adoption among the users, both patients and providers (Harst et al., 2019). In this study, it is considered that the integration of various technology adoption models will best explain the telemedical technology adoption behaviors of the healthcare centers, especially at the beginning stage when an external environment for adoption can be redesigned and emerging factors can be discovered. In addition, in the context of the local healthcare system in Thai rural areas, local healthcare providers work hand-in-hand with governmental-supported village health volunteers who act both as assistant providers and care receivers, allowing them to share the perspectives of both stakeholders simultaneously for this study. TOE is thus believed to be more superior to single-stakeholder-focused frameworks such as TAM and UTAUT and to be the most suitable as the main framework to examine the determinants of technology adoption for the Telehealth project. In this study, significant determinants from previous studies, such as the perceived usefulness and the perceived ease of use from TAM, the compatibility from DOI, and other significant adoption factors mentioned in the existing literature, will be examined. Note that, in this study, the UTAUT is inapplicable since the Telehealth project does not include home-clinic application of Telemedicine. In addition, the competition construct in the TOE framework is irrelevant in this study whereas there is no competition assumed for the public project in this study.

Research Methodology
Objective
The main objective of this study is to examine potential drivers and challenges that influence and impact telemedicine technology adoption in Thai public care centers and hospitals,

employing TOE as the integrated technological adoption framework.
Methodology
This study is exploratory in nature and utilizes qualitative evidence collected via semi-structure interviews. Since the NBTC and MOPH's Telehealth project is in its pilot stage with a minimal number of chosen adopters, the reliability of quantitative results would be adversely affected by low statistical power effects, and thus is inappropriate for the context in this study. Given the uncertain and intricate nature of new telemedical technology adoption, an in-depth interview deems suitable for examining the interpretations of the relevant stakeholders since it provides rich insights for exploring, identifying, and understanding viewpoints, attitudes, and influences (Healy & Perry, 2000). Furthermore, it allows for a greater control over the interview situation and provides the opportunity for making clarifications and for collecting supplementary information (Frankfort-Nachmias & Nachmias, 1996, Walsham, 1995, Hannabuss, 1996).

For an interview, to allow informants the freedom in expressing their viewpoints and give them time to prepare for the interview, they were provided with the same set of open-ended questions in advance. Interview durations varied, ranging from and minimum of 65 minutes to the maximum of 175 minutes. The interviews were all conducted in Thai, audio recorded, and translated back into English by the author during the transcription process. The original language of the transcribed data is available on request from the corresponding author.

After gathering and transcribing all the primary data from the interviews, coding was conducted to organize all the collected primary data into themes, in line with technology, organizational, and environmental contexts.

Codes were developed which provided the basis for cross-case analysis and helped identify and analyze emerging patterns of themes (Carson, Gilmore, Perry, & Gronhaug, 2001; Patton, 1990; Rao & Perry, 2003).

We believe that construct validity has been adequately addressed. First multiple sources of information were used (Yin, 1989). While interview constitute primary source of information, some of the informants provided supporting documentation which may include user manuals, traditional physical test forms, and working procedures, anonymous patient records. Furthermore, interviewees provided more information through the illustrations of both legacy and new telemedical technologies. Secondly, the informants in the sample belongs to four different levels of public health care centers, formally categorized by the Thai Ministry of Public Health, and therefore allows for different perspectives which constitutes an important of triangulation of qualitative information sources (Patton, 1990). Third, two interviewers conducted 11 of 12 interviews, and both analyzed all of them in order to reduce a potential bias which is commonly cited as a limitation of interviews (Frankfort-Nachmias & Nachmias, 1996; Yin, 1989). Finally, the chain of evidence, tracing the conclusions to the interview summary and to the interview transcripts was also maintained.

These enhance the construct validity as well as the reliability of this study, thereby boosting its overall quality, according to Yin (1989).

Participants

All 35 healthcare centers included in the NBTC and MOPH's Telehealth project were approached by phone calls. Key informant representatives of these 12 centers agreed to be interviewed. The sample comprised 8 primary care hospitals (ID1-ID8), 1 district hospital (ID9), 2 provincial hospitals (ID10-ID11), and 1 specialized center (ID12). The participants for an interview are all users of the telemedical technology and may include nurses, village health volunteers, physicians and specialists, and public health technical officers, which some of them are the care center's directors. This allows for the examination of cross-communication among different levels of care providers who perform different roles and are subjected to different set of medical and ICT devices.

Results

The findings below revealed a number of contributing factors and challenges with regard to the adoption of the new telemedical system by the participating Thai medical care centers included in this study. Figure 1 summarizes these determinants using the TOE framework.
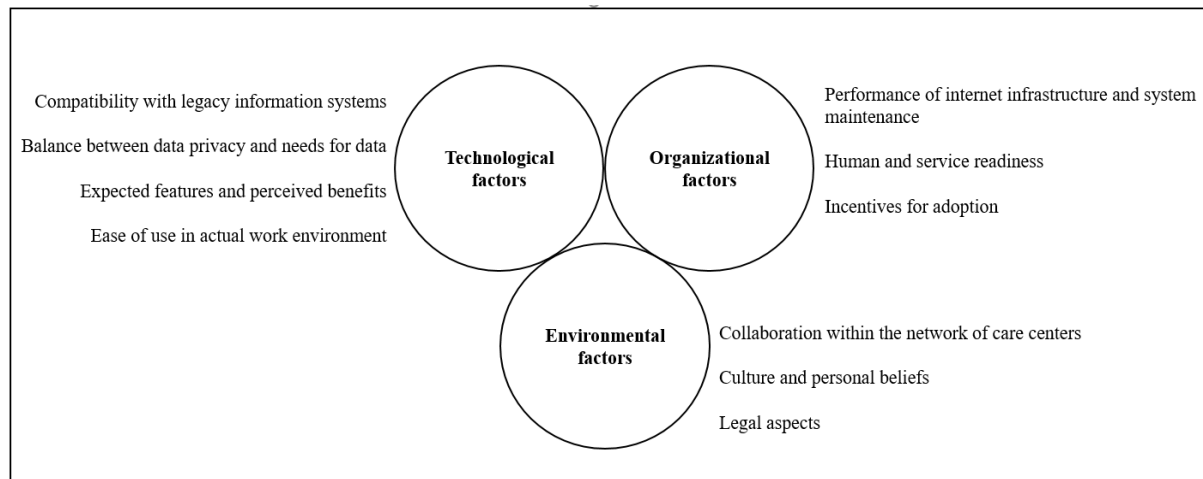
Figure 1 TOE adoption factors of the telemedical technology in the Telehealth project

Technological factors

Compatibility with legacy information systems

The majority of the respondents from the primary and secondary care centers, who play the role of front line users of the new telemedical equipment, agreed that the incompatibility between the new telemedical system and the legacy ones discouraged them from adopting the new system. The incompatibility issue seemed to hinder the ability of these users to reap expected benefits including time saving, process streamlining, and efficient nationwide healthcare service provision. For examples, the following respondents reflected on their relative experience implementing the new health system compared to the legacy information system:

"At first glance, it seems like things would be easier and faster since I can conduct KYC activity, perform and record health screening test results without the needs to manually key in data, using this new smart telemedical equipment. But, after I really used them, I felt that there was no so much

difference in term of time taken to conduct these activities using the old and new systems. Also, I still needed to manually key

some data items in the legacy system, namely HosXP, since some important data items, such as the diagnosis, comments or prescriptions by physicians, cannot be synced from the database of the new telemedical system (ID1)".

"Oh I think this is a big problem, there is no uniform information system across provinces in Thailand. Administrators from each tertiary care center (provincial) choose their own information system from a few choices provided by the Ministry of Public Health, which in turn will be used by all healthcare centers in that province. These alternative systems are usually incompatible with regard to features, data items, and versions. I guess it would be difficult to scale up the Telehealth project since it has to be compatible with these scattered information system and databases and the costs to do so might be so high. In that case, the features such as the teleconference for medical consultation may not work nationwide, and thus cannot help with the problem of the shortage of medical staffs in remote areas (ID9)".

Interviews with the respondents from tertiary and specialized care centers also reveal an additional evidence, added to the incompatibility issue, that the new telemedical system does not

link at all to self-developed information systems and field-specific databases. For example, the new telehealth system has a feature for taking pictures of eyes, which are stored and can be shared across locations where the telehealth system is installed, but not with the main database for research and development in the field of Ophthalmology, called Vision 2020. The issue thus demotivates them to use the new telemedical system since they are unable to use collected data to improve operations or to perform specialized research.

Balance between data privacy and needs for data

Reflections with regard to data privacy reveal conflicting perspectives between respondents from primary and secondary care centers and those from tertiary and specialized care centers. While respondents from primary and secondary care centers stressed the needs to access to more data for research and management of preventive healthcare purposes (ID2, ID6, and ID9), those from higher-level care centers argued for a stricter control over the use of data, citing cases of concerns whereas "patients data was stolen by staffs and sold to insurance companies (ID11)". The latter also called for a proper data authorization and security system per international standards (ID12) across all levels of care centers, and thus expect the new telemedical system to function accordingly.

Observations of the health screening process and documents reviews at the primary care centers revealed a minimal evidence of a proper awareness and control over the privacy of patients' data including the informed consent process, password control, and real-time data backup. Nevertheless, patients who visited the primary care centers seemed to have no awareness nor concerns over possible threats of their personal data breach.

Expected features and perceived benefits

The overall theme with regard to expected features and perceived benefits by the adopter of the telemedical technology, is the lack of mutual understanding and agreements on objectives, use cases, and work procedures, between technology suppliers and end-users. This results in responses stating about missing expected features and benefits. For instances:

"Even though it looks promising, it does not help much for our routine work for walk-in patient cares. Using the telemedical system would even slow down the process of handling about 50-60 cases a day. it is better to use it case by case, not for vital sign recordings for all patients. The technology would be more helpful for the annual health screening (ID4)".

"We have health stations in each village and it would be nice if the new system can distribute EKG test results there, so that we can monitor people at risk more closely (ID1)".

"I cannot see webpages where I can print statistical reports, just like I did with the HosXP system. For HosXP, I can sort data and browse for needed data. In fact, I don't even know where the data is stored and how the data is backed up on the new system (ID9)".

"I would love to also have this kind of blood sugar testing equipment at the village health station, so that I can monitor vital signs of the people, especially the elders who cannot conveniently visit the primary care center, as often as I can (ID2)".

"For skin diseases, it is better to meet the patient in person than to look at these photographs (ID4)".

Healthcare staffs at the secondary care centers added that the new system was lacking "some crucial functions such as alerts for consultation requests, online status of care providers, and patient queuing (ID9)" as these are features that could create seamless adoption experience.

Some respondents casted doubts over the benefits to healthcare receivers including elders, those with low literacy level and those who live in remote areas. They further provided examples of cases where machines or equipment given were not needed or inappropriate, but were provided as part of the Telehealth project. One was on the case of eye chart, where a Snellen chart provided was "useless to those who cannot read (ID4)" Another instance was the response from staffs at a primary care center located near a district-level care center, questioning about the benefit of the teleconference station installed. The respondents argued that "patients prefer to see doctor in person if it is not so far (ID9)" and added that "the teleconference system would benefit more for those in remote areas (ID9)" Along the same line, some respondents indirectly implied that the teleconference system was not needed, by sharing a sufficiently satisfying experience using video call and messaging features of a popular free-of-charge mobile application, namely Line, to consult with doctors in another area.

The ability to accomplish tasks more efficiently was mentioned, by staffs at the primary care centers, as a main benefit expected when adopting a new technology. Specifically, the users expected that the telemedical system is a one-stop system equipped with features that allow them to conduct all necessary care activities. This was reported not to be the case, as users explained the needs to still manually key in some patient record items and doctors' comments in legacy information systems, to use another isolated medication system, and to use another patient referral system, for example.

The last point worth mentioning is the trust on the new technology. Given an unclear communication with regard to the objective and the role of the Artificial Intelligence (AI)

feature embedded in the ophthalmoscope, the new technology deemed insignificant to users at the secondary and tertiary care centers, who argued for more trust on ophthalmologists' diagnosis (ID9 and ID10). Ophthalmologists who were part of the AI development team addressed the question, confirming that the purpose of the AI feature was for initial screening and should be followed by a thorough diagnosis. In the case of decision conflict between the AI and medical staffs in the screening process, the decision by human staffs should be more superior, although the AI accuracy level is greater than 95% in the test environment (ID12).

Ease of use in actual work environment

Based on the illustration and the reflection of their experience, it could be seen that participating users at all levels of care centers were quite comfortable and seemed to adapt well using the new telemedical machines and equipment. The excitement and the eagerness to learn and try could be observed. Respondents also cited the benefits of trainings and manuals provided.

Nevertheless, several respondents reported uneasiness in several instances using the new machines and equipment in the real work settings. Respondents from secondary and tertiary care centers provided insights to the issue as follows:

"Although it is not that difficult to use the new machines and equipment, it just doesn't suit the working style here. Doctors and staffs are always on the go. They have several things to do. It is rather inconvenient to have to come here all the time. Also, the location for installing these things should be near the entrance of the hospitals since its purpose is for preliminary health screening (ID11)".

"I know it is a web-based application and I tried to use it on my tablet, but it was not so easy to navigate and use (ID9)".

"I prefer using my own desktop when doing teleconference. But the machine is quite old. I need another desktop camera for teleconference (ID10)".

"I tried to give a consultation using the new telemedical system, but I had to still pull up the patient's record from the current HosXP information system. The new databased did not give me historical records for the patient (ID10)".

Health care staffs and volunteers at the primary care centers also described their discomfort trying to use the new machines and equipment as part of their routine working procedure. Here are some excerpts.

"One of our main job is to visit people and give them annual health screening services at the center of the village and often their houses. These new machines are only good for people who can come here. How about elderly people? So it would be better to have something that we can use on sites and test records can be automatically upload from there, so no double work (ID3)".

"I tried the new mobile application, it is ok. I can see my test results in case I forget. But there are too many applications already. Some are from private companies and some are from the Ministry of Public Health, and now this. So sometimes I feel that it is a waste of my limited pre-paid internet connection availability (ID1)".

Organizational factors

Performance of internet infrastructure and system maintenance

The success of the telemedical technology adoption obviously lies on the stability, the reliability, the speed, and the coverage of the internet connection at care centers and local healthcare service sites. Respondents at all levels of care centers showed no concern over the above mentioned characteristics. The reason, however, was not that the internet connection was flawless, but rather that the users accepted its deficiency and were able to switch to offline mode of working. Observations during service hours at a few primary care centers confirmed that patient identification, automatic data recording, and record pulling processes were sometimes quite slow due to a low speed of internet connection, forcing the care providers to immediately switch to their normal paper-based procedure. With regard to the potential use of the telemedical technology at the local sites in each village, volunteers and field care providers raised a strong concern over the poor performance of the free internet connection provided by the government as mentioned by a healthcare volunteer in the excerpt below.

"The Wi-Fi signal here covers only 10 to 15 meters from that box and it is rather very slow. That is why we record everything on papers and drive to deliver them to staffs at the primary care centers. For our work, we have to visit many houses where there is no internet signal. I don't want to use my mobile internet to record live data and upload it. They should also pay for my internet connection (ID2)".

Another concern from the respondents is the insufficiency of system maintenance budget and services. They raised doubts over the period and the readiness of technical services for the new machines and equipment. In addition, respondents at the primary care centers revealed their frustration for not being able to "sustainably adopt the new system (ID6 and ID8)" due to a potential cut of budget for internet connection, hardware maintenance, and software update costs.

Human and service readiness

Observations on the use of the telemedical system revealed that the teleconference service was far from being ready. This was not for the technical readiness as the reason, but due to the lack of a concrete human resource planning

and a proper teleconference procedure. A respondent, who tried to initiate teleconference requests, complained about the difficulties in "knowing doctors" availability and expertise (ID4)". Another was unsure whether he should initiate a real-time request or a scheduled appointment for teleconsultation. The majority of the respondents from the tertiary and care centers hesitated to provide a clear answer on doctors' availability. This is a main hurdle to be overcome if we were to successfully solve the shortage of medical personnel problem by having the nationwide network of doctors available to provide teleconsultation services to those in remote areas.

It was also observed and responded at all levels of care centers that new or modified work procedures (ID2, ID7, ID8, ID9, ID11, and ID12) were needed to accompany the new machines and equipment, not just the "manuals for using machines and equipment (ID9 and ID10)" for a successful implementation of the telemedical system.

Respondents from a specialized care center provided an important insight with regard to the needs for a holistic training and awareness building program that include, not only how to use new machines and equipment, but also digital literacy, telemedicine, limitations of technology, and data management (ID12).

Incentives for adoption

Beside the expected intrinsic benefits in terms of time saving and a more efficient working process, as the main motivation for the adoption of the telemedical system, other forms of motivation were reported to be crucial for the adoption of the telemedical system. For instances, a few respondents at the primary care centers explained that they were motivated to actively conduct screening tests and to record results on the legacy HosXP system, since it was one of the assigned Key Performance Indexes (KPIs). They however "had no knowledge (ID1)" and "was not informed (ID7)" about such KPI for adopting the telemedical system.

Doctors at the tertiary care centers cited "complex cases (ID10)" and "severe symptoms (ID11)", usually found at the provincial-level hospitals, as desirable challenges which allow them to enhance their skills and knowledge. Visiting patients on sites or providing teleconsultation services, however, was seen as required duties without a clear incentive.

New data obtained from the telemedical system could be another form of motivation for providing teleconsultation services, cited by the specialists at a specialized care center (ID12), given that the new and the current field-specific databases were perfectly synced. More data was considered not only a KPI, but also a valuable asset for research and development.

Environmental factors

1. Collaboration within the network of care centers

Respondents, especially from primary and secondary care centers, urged for a more systematic and effective collaboration with those at higher-level care centers. The teleconference and the referral system, as parts of the telemedical system, were cited as the examples of features requiring mutual operational and human resources planning and service process redesigning, among care centers in the network. An instance was the comment provided by a respondent from a primary care center:

"The appointment and referral system on the telemedical system are useless because there is no one monitoring them online and accepting the cases (ID6)".

2. Culture and personal beliefs

Culture and personal beliefs played an unneglectable role in the success of the

telemedical system adoption as evident in the case where respondents from primary care centers shared their observations on the visitors from rural areas trying the teleconference system. They stated that the patients expressed an "uneasiness (ID3)" and that they "trusted more (ID7)", and "felt more relieved (ID8)" if they were to meet doctors in person.

Along the same line, responses from care providers through the teleconference system indicated the belief that a physical meeting was still crucial for a diagnosis to be accurate (ID1, ID7, ID9, ID11, and ID12).

3. Legal aspects

Some concerns were mentioned, by respondents from a specialized care center, with regard to the lack of regulatory risk considerations in the Telehealth project. Top among them were on the compliance with the Personal Data Protection Act (PDPA) and the intellectual property rights of the AI algorithm developed (ID12). Disputes over these issues could be to be costly for the adopters and providers of the telemedical system.

Discussion

Technological factors

In line with the findings in Maarop et al. (2011), Campbell et al. (2017), Harst et al. (2019), and Kamal et al. (2020), perceived usefulness was found to be a significant determinant of telehealth technology adoption. This could be in the forms of missing expected features e.g., the consultation request alert and the patient queuing functions as part of the teleconference system, the unavailability of equipment or shared data at the needed locations e.g., the EKG result and the blood sugar testing equipment at the village health station, and the uselessness of some equipment e.g., the Snellen chart for those who cannot read and the teleconference system installed at

the primary care centers located near a district-level hospital. The insight suggests that the requirement gathering process at the beginning stage of the project may be ineffective and need to be carefully conducted using a proper software system development and stakeholder analysis processes.

Most of the respondents in this study demonstrated their satisfaction with the ease of use aspect of individual devices and system components, indicating that the ease of use or complexity is a main determinant of telehealth technology adoption, as found in Hu et al. (2000), Maarop et al. (2011), Campbell et al. (2017), Adelakun & Garcia (2019), Harst et al. (2019), and Kamal et al. (2020). This however was not the case when the new hardware and software were adopted in the actual caregiving environment. An inappropriate location for installation, an unfriendliness of the web-based application on mobile devices, too many mobile applications with a similar purpose, and the absence of a one-stop system were cited as the evidence of the unease of use in actual care settings. The finding added to the literature with regard to the definition of the ease of use as a technological factor whereas the actual work setting could greatly impact the adoption effectiveness. To remedy this problem system designers and policy makers need to ensure a thorough site survey to learn about physical constraints.

As one of the five general adopters' perceptions proposed in the DOI framework (Rogers, 2003), the incompatibility with the legacy systems and databases was found to be another significant barrier to adoption, the finding commonly found in Vuononvirta et al. (2011), Peeters (2012), Taylor et al. (2015), and Tsai et al. (2019). The incompatibility problem was reported to be the result of the disparate information systems and databases. The responses from the adopters participated in this

study indicated that the incompatibility issue led to the problems of missing perceived benefits e.g. the needs to key in data in multiple databases, and the unease of use problem. The issue calls for an extensive review of the existing technological infrastructure and risks associated with the implementation of the new system.

The disagreement among the adopters at different care center levels regarding the accessibility and sharing of medical data and patients' record revealed that data privacy was a key determinant of the telehealth adoption, in line with Sulaiman and Magaireah (2014) and Campbell et al. (2017). An insight worth mentioning from this study was the needs from the adopters for a clear and mutually accepted data privacy policy and a global-standard data management system which effectively balance between a protection of data privacy and an effective data use.

Overall, the perceived usefulness, the ease of use, the compatibility, and the data privacy as the technological factors mentioned in this study are in line with the findings in the existing literature. The importance of the observability and the trialability as the technological factors proposed by Rogers (2003), though cannot be found in this study.

Organizational factors

The findings from this study supported the common postulation by Marques et al. (2011), Sulaiman and Magaireah (2014), and Adelakun and Garcia (2019), that infrastructure readiness plays a key role in telehealth technology adoption. a key insight emerged from the adopters' responses, that the key concern was, however, not on the lack of a sufficient telecommunication infrastructure coverage, citing the reason for the flexibility to switch back to providing care offline. The main concern was rather on the long-term financial and technical supports by the government to

sustainably maintain the readiness of the infrastructure and the healthcare services, consistent with the findings in the previous studies (Adelakun & Garcia, 2019; Harst et al., 2019; Gogia, 2020; Sisk et al., 2020). The policy makers and project sponsors thus should prepare the project budget which would ensure that there will be sufficient financial and technical supports in long term.

Another factor focusing on the end-user acceptance of the telehealth technology adopted was the human readiness. As revealed by the findings of this study, the requests for a clear list and schedule of available doctors who can provide teleconsultation and the needs for a better understanding with regard to the new workflows, the new equipment and systems, and the updated knowledge on digital literacy, would help end-users to be more comfort with the new technology over the traditional ones (Taylor et al., 2015; Lin et al., 2018; Sanders et al., 2012). The focus of the policy makers for this project thus should not be only on care receivers, but also care providers including doctors, nurses and supporting staffs. An effective human resource planning including recruitment and training should be among the top priorities.

Interestingly, incentive for adoption was found to be a significant organizational determinant of telehealth technology adoption in this study, despite for it having been rarely discussed in the existing literature. The care providers who participated in this study reported the needs for motivation schemes in the forms of a clear KPI assignment, an intellectual challenge, and an access to data, beyond the time and cost saving benefits as the main incentives.

Environmental factors

As mentioned in Harst et al. (2019) and Sanders et al. (2012), the acceptance of technology among patients, especially elders and those with low literacy level may be a key

challenge for the adoption of telehealth technology. The personal belief of the care providers and the care receivers with regard to the trust on a physical meeting between them was reported to be a concern for adopting the new technology. A suggestion which could be made to ensure a smooth transition of adoption behavior is that a plan for dual system implementation should be put in place. This will allow adopters to have time to learn the new system while maintaining the confidence that their regular work would not be disrupted since they can always go back to adopt the legacy ones.

An additional insight from this study derived from the concerns with regard to the regulatory environment and the needs for a proper regulatory risk management. The compliance with the newly enforced regulations including the PDPA and intellectual property rights of the AI algorithm developed for the Telehealth project were cited as the instances. The concern adds to the existing literature with regard to the regulatory environment whereas people are becoming more aware of the data privacy, rights and regulations and is found to be a significant factor in this study.

Lastly, an extensive involvement and collaboration of all the project stakeholders in the whole technology adoption process was found to be a frequently mentioned need by the adopters to ensure a successful adoption of the telehealth technology, which was multi-party in nature.

Conclusion

In this study, we examined key factors and challenges of the telemedical technology adoption. Specifically, we interviewed medical staffs, administrators, and healthcare volunteers from a total of 12 out of 35 Thai primary, secondary, tertiary, and specialized care centers which participated in the pilot phase of

NBTC and MOPH's Telehealth project, which employed the TOE analysis framework.

In line with the existing literature on telehealth technology adoption, we found that perceived benefit and perceived ease of use were main technological determinants for the adoption. Key challenges found were the incompatibility with the legacy information systems, the conflicting needs for data security and use, and the uneasiness for adopting the new technology, with the reason being the lack of stakeholder involvement in the system requirement gathering process.

Organizational factors also played key roles in the success of the telemedical technology adoption, whereas adopters cited a sustainable infrastructure, financial, human readiness, and motivational supports.

Lastly, the personal belief in a physical patient-provider interaction, the regulatory risk regarding data privacy and intellectual property, and the needs for a strong and committed collaboration among healthcare stakeholders, were key environmental factors and challenges to be overcome.

Recommendations

The primary aim of this research is to provide insights and considerations for successfully extending the Telehealth project nationwide. Based on the key findings in this study, we recommend policy makers and project stakeholders as follows.

First, we recommend project planners and implementers to conduct a robust information system development process with a strong involvement from key stakeholders including care receivers, care providers at all levels, project financial and infrastructure sponsors, technology creators, legal counselors, and related parties. This steps could include site survey to learn about currency infrastructure readiness, physical constraints and the nature

of work. Doing so since the beginning of the project help ensure actual use cases in an actual working environment are key inputs for designing an effective system which help overcome the incompatibility, the unease of use, missing expected benefits, challenges found in this research. An effective system development process would help ensure that there is a strong collaboration in adoption, that cultural factors are taken into consideration, and that project risks are managed properly.

Secondly, plans for a strong and sustainable organizational supports including an effective and accessible internet infrastructure, ongoing financial and technical supports, trainings, human resources, and incentives for adoption should be put in place to warrant a sustainable supporting adoption environment.

Finally, policy makers and system designers must take adopters' perception and behaviors into account. Trust in the face-to-face and the legacy systems should not be undervalued but must be managed by allowing for a dual system implementation to ensure a smooth adoption of the new system. The adopters' changing awareness with regard to data privacy and the compliance to new regulation must also be addressed in the project design stage of the nationwide Telehealth adoption.

Limitations and Recommendations for Further Study

Clearly, this study is based on the Thai context. We thus accept that its external validity cannot be ensured, Consequently, our findings may not be readily generalizable beyond this study. To ensure generalizability, further research required in both other healthcare technology and other geographical contexts.

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Appendices

Purpose and scope of the telehealth project

The Telehealth project initiated by NBTC and MOPH aims to address existing main healthcare problems in Thai rural areas where populations are unable to access basic and specialized healthcare services due to the shortage of medical personals and specialists. The population to medical doctor ratio in Thailand were 1292 citizens to 1 doctor, exceeding World's Health Organization's (WHO) standard ratio of 439 citizens to 1 doctor. Specialist shortage situation in Thailand is rather worse, as one ophthalmologist is responsible for 47,900 of the population, and there are only 100 dermatologists in Thailand, excluding Bangkok.

The project also aims to address the needs to improve the quality of healthcare services related to NCDs, which considered to be the most common diseases and cause of death in Thailand. Based on the statistics provide by the Thai Ministry of Public Health in 2019, the number of patients with NCDs in Thailand has been rising, statistically 18.25 million people annually, in which the death causes by NCDs accounts for 73 percent of the total deaths in Thailand.

Specifically, the Telehealth project was initiated for population's health promotion, monitoring, and risk prevention, as well as for leveraging and extending telecommunication infrastructure to the remote area for the citizen's related use. There are 5 types of diseases targeted in the projects are diabetes, hypertension, dermatitis, eye diseases (including diabetic retinopathy, aged-related macular degeneration and glaucoma), and cardiovascular diseases.

The main deliverables of the project are the procurement and the installation of smart medical devices and software that allow for digital Know-Your-Customer (KYC) verification, medical measurements and tests, digital health data recording and reporting, system management through dashboard, AI-based diagnostic, live video conference consultation (both on the basis of live consulting based on doctor's availability and on the basis of appointment accordingly to specialists' time table), as well as, manuals and trainings for care providers.

Apart from these medical devices provided, other support devices, software, and infrastructure of the system are also installed to related care centers, namely all in one PC as the center of the system (specialized care centers are given high-spec PC for diagnosis digitally), smart ID card reader, QR code reader, fiber optic internet, private cloud storage, firewalls, uninterruptible power supply (UPS), surge protector, and teleconference devices (PC, microphone, speaker, and camera). The project provides the maintenance service for all the devices up to 5 years of usage. Nevertheless, the project enables patients to

monitor their health test results from the Telehealth devices performed at any care centers real time with broad health advices for them in accordance to the results, as well as being able to message the doctor directly over the private chat feature in Telehealth platform using their smartphones.

In the pilot phase of the Telehealth project, there were a total of 35 public healthcare centers in 12 provinces from all Thai regions chosen to participate in the project. The pilot of group of healthcare centers were from all levels based on the official categorization by the Thai Ministry of Public Health including 16 primary care clusters (community level), 7 secondary care centers (district level), 9 tertiary care centers (provincial level), and 3 national specialized care centers.

FACTORS INFLUENCING CONSUMER PURCHASE DECISION OF INSURANCE TOWARDS WORD OF MOUTH: A CASE STUDY OF FOREIGNERS LIVING IN THAILAND

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ABSTRACT

The purpose of this study is to determine factors influencing consumer's purchase decision on life, health and accidental insurance through word of mouth among foreigners living in Thailand. Customer satisfaction, trust and loyalty were hypothesized to have a significant relationship on word of mouth which mediates the consumer decision to purchase insurance packages. The conceptual framework of this study is adapted from the theoretical studies of the decision-making behavior, naturalistic decision-making and relative attitude behavior relationship. The pilot test of 35 respondents was accounted with Cronbach's Alpha reliability test. The sample (n = 380) were collected from online and offline questionnaires by using convenience and snowball sampling method. The data was anatomized by using Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) to confirm validity, reliability, goodness-of-fit and hypotheses testing. As a result, customer loyalty has the greatest influence on word of mount, followed by customer trust. Word of mount also significantly impacts buying decision. However, customer satisfaction is found to have no significant on word of mount. Marketers are recommended to build brand awareness and image to gain trust and loyalty, provide training programs for sales agents to increase customer satisfaction and bring new technology to enhance positive word of mouth to accomplish customer's purchase decision.

Keywords: Insurance, Customer satisfaction, Trust, Loyalty, Word of mouth, Consumer purchase decision, Customer behavior theory

Introduction

Insurance in Thailand does not have obvious evidence to mention on the emergence of the industry. However, it was found in Ayutthaya era because foreign merchants had a major role to bring insurance system to Thailand. At that time, it was applied as marine transportation without government permission to the foreigners. At the beginning, the process was complicated to the Thais. Afterwards, Thais were educated by the king Rama III in 2368. Insurance industry in Thailand was officially started by French companies owing to Greenfield operation in 2399. The industry has continued with obstacles and opportunities for more than 100 years. During the introduction of

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life insurance to Thai market, there were two main problems which consisted of inconvenient process and lack of customer intention. An important point was that the process of life insurance was lengthy because the insurance company needed to wait for documents from an outside country in Europe, which is why insurance was not very well-known in Thailand in earlier days (Office of Insurance Commission, n.d.). Fortunately, Thai government and international companies were the influencers to develop the insurance industry until customer perception and behavior has changed (Office of Insurance Commission, n.d.). Nowadays, people recognize more about its advantage due to social media, and there are many insurance companies in Thailand such as AIA, Thai Life, Muang Thai, AXA and so on. In recent statistics from year 2015 to 2019, the industry has grown approximately at 5 percent or 550,000 million THB per year, given the fluctuation of economic situation and was expected to expand by increasing consumer intention in the future (The Thai Life Assurance Association, 2019).

Furthermore, revenue from the insurance market was expected to be stimulated by increasing the number of expatriates and immigrants in Thailand. In recent statistics from 2018, the annual average rate of foreigner has increased approximately at 25 percent of the total or 2,500 people per country such as Japan, China, Philippines, India, UK, US, Korea, France, Taiwan and so on. Those of them have the objective to stay for a longer period to work mostly for education, business and marriage (The Agent, 2018). Therefore, the group of these people would like to prepare for medical welfare to take care of themselves while they live in Thailand. The important thing is to understand the current situation in insurance

industry that they become one of the target customers who seek for life, health and accidental insurance to save medical expenses from hospital. Nevertheless, Thai insurance market is still lack of a clear communication channel to contact and get informed about the Thai legislation for this customer group. For instance, the age of majority in each country is different. Thai people become Sui Juris on the completion of their 20 years of age, however people in Japan attain the majority at the age of 18 (Voa Thailand, 2018).

Researcher found that there has been a marketing study demand for insurance businesses for better understanding of factor affecting buying decision of insurance products in Thailand among non-Thai customers. This topic can make a great impact to Thai insurance industry and help driving economy of Thailand from foreigners' spending on Thai products. In addition, the previous study from Wisankosol (2021) who study Thai citizen's buying decisions of insurance products, recommended to extend the study group of non-Thai consumers. Hence, the objective of this study is to investigate the factors which include satisfaction, trust and consumer loyalty that have an influence on positive word of mouth that potentially affects purchase decision of life, health and accidental insurance among non-Thai consumers in Thailand.

Literature Review and Hypotheses

The decision-making approaches

Assignment Point (n.d.) mentioned that behavioral approach is focused to apply in the decision-making stage for customers. It is known as descriptive approach which is proposed by Herbert A. Simon, an American economist, political scientist and cognitive psychologist. It explains the decision-making

skills in real life that are different under certain conditions and situations such as stimuli, responses and reinforcements. These factors have an influence on human decision based on behaviors. Behavioral approach consists of task-orientation, employee-orientation and goal. At first, task-orientation explains on behalf of behavior based on the assignment. Employee-oriented focuses on action from relationship and environment. Lastly, path-goal requires user experience and skill while making decision. Besides, according to the norm of Herbert A. Simon, satisfaction is the key decision-making approach in choosing alternatives.

Naturalistic decision making (NDM)

This Theory examines the types of decision-making process with experiences to solve the conditions in different situations. NDM model is applied as a study tool in the direction of individual decision-making system in terms of diagram. The pattern will generate several options to choose the best solution in that time (Klein, 2008 a, b).

Satisfaction

Satisfaction is commonly defined as the standard of company to meet customer expectations by their products or services that can be presented with marketing mix: product, place, price, promotion and process (Kobylanski & Pawlowska, 2012). Satisfaction normally consists of two points of view for consumers in terms of economic side such as customer opportunities from their products or services to approach customer requirement, and the satisfaction in terms of psychology with relationship between seller and buyer (Geyskens, Steenkamp, & Kumar, 1999; Didyasarin, Vongurai, & Inthawadee, 2017). In addition, satisfaction is a major marketing objective to achieve for organization to improve customer demand and positive word of mouth that are

good customer feedback (Casalo, Flavian, & Guinaliu, 2008).

There are several business cases that customer satisfaction can bring many opportunities to make company successful such as Argos and Cadburys, they have studied and emphasized to identify customers' needs and want to improve customers' level of satisfaction (Business Case Studies, 2012). Moreover, majority of customers are willing to choose company that treat them well and eventually make them feel satisfied, especially in the service sector. Few researchers explained that satisfaction is more valuable than price because it will probably promote customer retention and positive word of mouth for the company. As a result, one of the successful business signs is to attain satisfied clients (Wish desk official, 2018).

Word of mouth (WOM)

Word of mouth is normally defined as a free form of communication among customers who discuss about performance of a product or service by their experiences (Dichter, 1966). The private communication is a powerful evaluation form buyers to sellers in the marketplace via online and offline marketing channels such as face-to-face, Facebook, Twitter, Line, Blogger and so on. These methods have become a reference for decision making (Christodoulides, Michaelidou, & Argyriou, 2012). In addition, word of mouth is usually accepted by trustworthy person or from a media mentioning about any special topic (Burnkrant & Cousineau, 1975). However, word of mouth is a double-edged sword because it is difficult to control, and it can cause both positive and negative influence for organization (Christodoulides et al., 2012).

MarketingOops (2019) mentioned that it was noted as word of mouth was effective in

marketing for a longer period because it creates an influence in terms of social proof. Hence, the marketers use this method to increase sales even though it is complicated. For instance, marketing company like Nielson found 84% of consumer trust in word of mouth. When they find information in some products, they always seek for recommendation and evaluation from experienced person.

The relationship between satisfaction and word of mouth was mentioned in many studies that customer satisfaction is an effect to create word of mouth in a positive way (Casalo et al., 2008). The fact is that satisfaction has a major role of usability and consumer behaviors in service sector, including insurance industry. Although, this action is indirectly an informal communication, it influences on other's decision in terms of recommendation which is very strong and supportive (Amron & Mursid, 2018). Hence, a hypothesis is derived H1: Satisfaction has a significant influence on word of mouth for insurance company.

Trust

In fact, trust is explained in psychology as the relationship between seller and buyer which can defend the uncertainty of a business action. This emotion can build the confidence in the interaction. In addition, trust enhances the willingness of a group of action to be more valuable. Trust will be created among the relationship when they meet their expectations from each other (Mayer, Davis, & Schoorman, 1995). The relationship between trustor and trustee is difficult to create, but easy to break. There are several aspects that have effects to trust in the service sector such as emotions, caring, effectiveness and competence (Johnson & Grayson, 2000). Therefore, trust and risk are significantly related. When trust is considered, risk of failure in motivation to do

something get minimized significantly (Mayer et al., 1995).

Recently, Duct Tape Marketing (n.d.) identified that marketers of the companies are keeping up with their customer to enhance consumer trust level which helps companies to generate sales revenue. For example, Lexus Sweden was a successful automaker in Europe who mostly concerned on feedback and customer trust. They created brand awareness by recommendation. Their customers were willing to recommend the brand to friends and families. Moreover, McDonalds in UK used social media marketing to communicate honestly with customers. The engagement made them improve and build trust. Finally, in 2006, McDonald's has increased their sales revenue by 8.5%.

For the Lexus Sweden case, it depicted a positive relationship between trust and word of mouth. The company has improved product and service after receiving the feedback, so they got high customer trust at 4.7 out of 5. When customer relied on Lexus, they were willing to spread their word of wisdom to their friends, families or acquaintances (Duct Tape Marketing, n.d.). Besides, Terres Santos, and Basso (2015) studied and proved that customer trust has a significant relationship with word of mouth toward the same direction. Consequently, the following hypothesis is set:

H2: Trust has a significant influence on word of mouth for insurance company.

Relative attitude behavior relationship

Dick and Basu (1994) studied on the relationship between customer loyalty and repurchase intention. Repurchase intention represents as consumer behavior in having repeat experiences of the product and service. Another factor is a strong attitude that is explained in terms of customer's opinion to purchase the product and service with strong

relative attitude. Hence, this theory also showed the four results of the relationship. If the customers have high attitude and experience, they are considered loyal. On the other hand, with low purchase intention, the customers do not have loyalty. In case of customer behavior with positive attitude but low purchase experience, they eventually generate loyalty in the long run. Besides, customers who have high experience with negative attitude are spurious loyalty (Fields, 2019).

Loyalty

Loyalty is normally defined as the strength of two relationships between individual's attitude and another party which can be individual or organization. Moreover, loyalty is used to explain a customer group who feels favorable in the brand of that product and service (Dick & Basu, 1994). In addition of the definition, loyalty is always applied to explain as one of the influencing factors to cause customer behavior in the decision-making process (Fields, 2019). It also will have strong motivation and belief of the consumer in positive attitude for the company (Casalo et al., 2008). Loyalty can be a competitive advantage in order to increase market share in a competitive industry. Including, many businesses nowadays would like to use customer loyalty to promote themselves by creating positive word of mouth.

Casalo et al. (2008) have analyzed the information on improving word of mouth in business action and they found that there is a strong relationship between word of mouth and customer loyalty in financial service provider. It can be summarized in term of marketing's word of mouth which is more important and has strong effect on the service sector of an organization. Therefore, word of mouth development should be concerned as a determinant factor to generate opportunity

for a company. The theoretical relationship is obtained to determine a hypothesis:

H3: Loyalty has a significant influence on word of mouth for insurance company.

Buying decision

Buying decision is commonly defined as a decision-making process which is completed by strategy to meet customer expectation for motivation. Decision is created by individuals in psychological, organizational behavior and marketing (Lye, Shao, Thiele, & Fausnaugh, 2005). The concepts of decision-making must be performed by consumers while purchasing products or services (Vongurai, Elango, Phothikitti, & Dhanasomboon, 2018). Additionally, the process is related to various options in buying decision according to the decision-making approaches and naturalistic decision-making theory (Lye et al., 2005). Consumer behavior will be motivated from the factors such as satisfaction, preference, relationship and incentive because customers will consider information under conditions that they have to identify the best solution in given situation (Klein, 2008 a). Moreover, customers need to obtain information from several sources through personal experience and other media to help them make buying decisions and spreading positive word of mouth (Woo, Ahn, Lee, & Koo, 2015).

There are several researchers who have discovered that the decision making of an individual creates a major impact when it comes to increasing sales revenue which is influenced from positive word of mount. Jaakkola (2007) studied on purchase behavior on decision-making with consumer services. It shows that a buying decision is affected by a positive referral or word of mouth. Thus, H4 is set:

H4: Word of mount has a significant influence on buying decision for insurance company.

Research Methods and Materials

Research framework

The conceptual framework of the study is constructed from studying of the previous theoretical frameworks related to this research. It refers to the theoretical model of buying decision in the marketing of Sharia Life Insurance (Amron & Mursid, 2018) and the model of the role of satisfaction and website usability in developing customer loyalty and positive word-of-mouth in the e-banking service (Casalo et al., 2008). As a result, this study aims to study on the effect of customer satisfaction (S), trust (T) and loyalty (L) on word of mouth (W) that influences foreigners' buying decision (BD) on insurance in Thailand per illustrated in Figure 1.
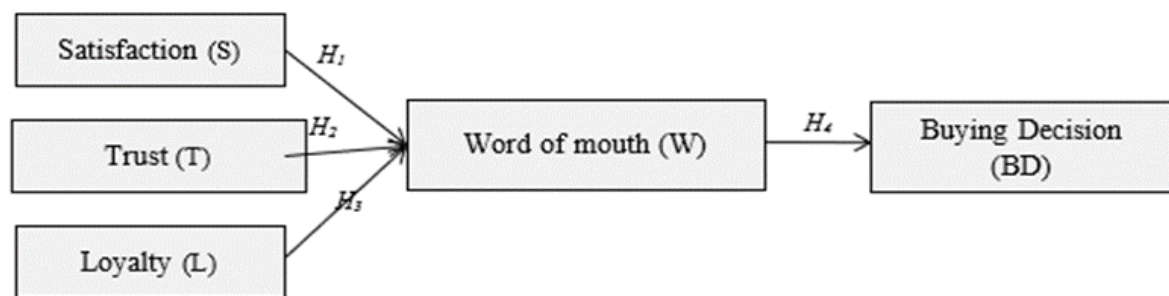

Figure 1 Conceptual framework

Methodology

This research is conducted by using a quantitative approach. The questionnaires were prepared and distributed through online channels via Line and Facebook and paper. The target respondents of the questionnaire were chosen of non-Thais, aged 20 years old and above, living in Thailand and have experience in purchasing insurance. The data were consolidated from the target group as participants whose response were analyzed to identify the factors influencing customer purchase decision toward life, health and accidental insurance through word of mouth. The questionnaire comprises of three parts. The first part represents the screening questions. The second part refers to consumer opinions on factors influence consumer purchase decision of insurance product. The survey instruments were developed by using the scales from the previous studies that have similar scope and context of this study. The third part represents the demographic profile of the target respondents. The factor measurement for consumer purchasing decision used a five-point Likert scale for measurement, in which 1 represents "Strongly Disagree" and 5 stands for "Strongly Agree".

Population and sample size

The research population for this study comprises of non-Thais aged 20 years old and above, with legal capacity according to Thai Law, living in Thailand and have experience in purchasing insurance. Foreigners as a sample group in this research contributes as an important group of customers who have a significant spending power to buy insurance product in Thailand. The researcher has referenced sample size calculator to determine the recommended minimum sample size by applying A-Priori Sample Size Calculator for Structural Equation Models (SEM) from Daniel Soper's website. The parameter values used were 5

latent variables and 19 observed variables with a probability level of 0.05. As a result, parameter recommended minimum sample size to measure the influence stands at 376 respondents. The researcher collected responses from 422 respondents and after screening the respondents as per its defined targeted population, the qualified respondent for the study is finalized at 380.

Sampling technique

The questionnaires for this research were distributed online and offline by using non-probability sampling method of convenience sampling and snowball techniques for data collection from target respondents. The collected data were screened to confirm that respondents meet the criteria of non-Thais aged 20 years old and above who have been living in Thailand and have previously purchased insurance product. The questionnaires were randomly given through paper and online channels via social media applications such as Facebook and Line, and

the respondents may pass on the questionnaires to their friends and colleagues who also meet the same characteristics. The researcher has opted out the questionnaires with missing data, insufficient responses, or unmet requirement of the screening questions from the statistical analysis to gain accuracy of the results.

Pilot test

Each variable in this study was analyzed by using Cronbach's Alpha to ensure the reliability of the test and unidimensional of the measurement scales. A set of 30 responded qualified questionnaires were anatomized by using SPSS Amos Version 26 to verify the reliability. Table 1 shows the results that all variables have Cronbach's Alpha Coefficient of 0.70 and above. The results ranged between 0.717 to 0.831 which means that the data and measurement of the participating variables are acceptable with a high degree of reliance (Tavakol & Dennick, 2011).

Table 1 Cronbach's Alpha for reliability test (N = 30)

Variables	Source of questionnaire (measurement indicators)	Number of items	Cronbach's α
Satisfaction (S)	Casalo et al. (2008)	4	0.717
Trust (T)	Amron and Mursid (2018)	4	0.758
Loyalty (L)	Casalo et al. (2008)	2	0.780
Word of mouth (W)	Amron and Mursid (2018) Taghizadeh, Taghipourian, and Khazaei (2013)	4	0.831
Buying decision (BD)	Amron and Mursid (2018)	5	0.746

Results and Discussion

Demographic factor

Per Table 2, there are seven questions to collect demographic profile from the respondents of non-Thais with the age range of 20 years old and above, living in Thailand and have experience in purchasing insurance.

The sample consists of 380 valid respondents, from which 41.8 percent (159) were men and 58.2 percent (221) consisted of women. Age of the respondents were mostly ranged between 20 to 30 for 60.8 percent (231), with a monthly income ranging between THB 10,000 and THB 50,000 for 63.7 percent (242). Besides, majority of the answers came

from the Chinese respondents for 47.9 percent (182) and people who have bachelor's degree for 65.3 percent. Moreover, the data showed that most respondents are employed for 63.9 percent (243).

In term of the most favorite insurance brand in respondents' mind, majority of the respondents with 53.7 percent (204) decided

AIA is the most preferred, followed by Krungthai-AXA representing 16.1 percent (61), Muang Thai representing 13.2 percent (50), Thai Life representing 6.1 percent (23), SCGLIFE representing 4.5 percent (17) and the rest mentioned several companies such as Allianz, NZI, AETNA and Cigna.

Table 2 Demographic profile

Demographic and behavior data (N = 380)		Frequency	Percentage
Gender	Male	159	41.8%
	Female	221	58.2%
Age	20 to 30 years old	231	60.8%
	31 to 40 years old	94	24.7%
	41 to 50 years old	39	10.3%
	51 years old and above	16	4.2%
Income per month	Below THB 10,000	22	5.8%
	THB 10,000-50,000	242	63.7%
	THB 50,001-100,000	105	27.6%
	Above THB 100,000	11	2.9%
Nationality	Chinese	182	47.9%
	American	27	7.1%
	Japanese	80	21.1%
	Singaporean	21	5.5%
	Hong Kong	34	8.9%
	Others	36	9.5%
Education	Associate degree	11	2.9%
	Bachelor's degree	248	65.3%
	Master's degree	110	28.9%
	Doctoral degree	11	2.9%
Occupation	Student	59	15.5%
	Employed	243	63.9%
	Unemployed	17	4.5%
	Self-employed	61	16.1%
The most preferred insurance brand	AIA	204	53.7%
	Muang Thai	50	13.2%
	Thai life	23	6.1%
	Krungthai-AXA	61	16.1%
	SCGLIFE	17	4.5%
	Other	25	6.6%

Confirmatory factor analysis

The results of confirmatory factor analysis (CFA) explained that most of the variables are significant and have acceptable factor loading to demonstrate discriminant validity. Guidelines recommended by Hair, Black, Babin, Anderson, and Tatham (2006) are also used in determining the significance of factor loading of each item and acceptable values in determining the goodness of fit. Factor loadings are greater than 0.50 and p-value is lower than 0.05. Furthermore, relating to the suggestions from Fornell and Larcker (1981), Table 3 represents that the construct reliability is higher than the threshold of 0.7 and the average variance extracted (AVE) is higher than the threshold of 0.5. Majority of the squared multiple correlations are higher than 0.30 and all estimates are positive.

The square root of average variance extracted in Table 4 shows that all the correlations exceed the variable's correlation values. Furthermore, all indicators such as GFI, AGFI, CFI, NFI, and RMSEA are used to test a good model fit in CFA. The values of this study were shown in Table 5 at their acceptable values. Therefore, the convergent validity and discriminant validity is assured. Additionally, the results of the model measurements formed discriminant validity along with a validation to perform SEM estimation subsequently.

Table 3 Confirmatory factor analysis results, composite reliability (CR) and average variance extracted (AVE)

Variables	Factor loading	S.E.	T-value	CR	AVE
Satisfaction (S)				0.866	0.619
S1	0.694				
S2	0.823	0.079	14.652*		
S3	0.835	0.078	14.842*		
S4	0.787	0.080	14.060*		
Trust (T)				0.863	0.612
T1	0.712				
T2	0.788	0.071	14.409*		
T3	0.818	0.075	14.989*		
T4	0.807	0.076	14.921*		
Loyalty (L)				0.705	0.548
L1	0.821				
L2	0.649	0.069	12.969*		
Word of mouth (W)				0.848	0.583
W1	0.721				
W2	0.801	0.089	13.736*		
W3	0.693	0.076	14.408*		
W4	0.832	0.104	13.638*		

Table 3 (Continued)

Variables	Factor loading	S.E.	T-value	CR	AVE
Buying decision (BD)				0.878	0.590
BD1	0.752				
BD2	0.768	0.066	14.919*		
BD3	0.842	0.061	15.110*		
BD4	0.669	0.059	12.747*		
BD5	0.800	0.056	15.511*		

* = Significant at the 0.05 significant levels (p < 0.05)
<u>Remark</u> CR = Composite reliability, AVE = Average variance extracted

Table 4 Discriminant validity

Variables	Factor correlations				
	S	**T**	**L**	**W**	**BD**
S	**0.619**				
T	0.532	**0.612**			
L	0.494	0.515	**0.548**		
W	0.376	0.503	0.496	**0.583**	
BD	0.344	0.358	0.388	0.451	**0.590**

<u>Remark</u> The diagonally listed value are the AVE square roots of the variables

The acceptable values can determine the goodness of fit which include CMIN/DF = 1.879, GFI = 0.945, AGFI = 0.911, NFI = 0.955, CFI = 0.978, TLI = 0.968, RMSEA = 0.048 and RMR = 0.025 as measurable criteria referring to Table 5. Consequently, the results are acceptable and in harmony of with empirical data.

Table 5 Goodness of fit for confirmatory factor analysis (CFA)

Index	Acceptable values	Values
CMIN/DF	< 3.00 (Hair et al., 2006)	1.879
GFI	≥ 0.90 (Hair et al., 2006)	0.945
AGFI	≥ 0.85 (Schermelleh-engel, Moosbrugger, & Muller, 2003)	0.911
NFI	≥ 0.90 (Arbuckle, 1995)	0.955
CFI	≥ 0.90 (Hair et al., 2006)	0.978
TLI	≥ 0.90 (Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004)	0.968
RMSEA	< 0.05 (Browne & Cudeck, 1993)	0.048
RMR	< 0.05 (Hair et al., 2006)	0.025

<u>Remark</u> CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, NFI, normalized fit index, TLI = Tucker-Lewis index, CFI = comparative fit index, RMSEA = root mean square error of approximation, and RMR = root mean square residual

Structural equation model (SEM)

To investigate the conceptual model fit, structural equation model (SEM) is employed as a reference suggested by Klein (2008 b). The goodness of fit index is estimated for testing. Besides, Hair et al. (2006) recommended that the value measurement for model fit should be less than or equal to 3 for Chi-square/degrees-of-freedom (CMIN/DF) ratio and GFI and CFI should be more than 0.9. After running the SEMs and emending the model by using SPSS Amos Version 26, the goodness-of-fit index is CMIN/DF = 1.709, GFI = 0.954, AGFI = 0.922, NFI = 0.960, CFI = 0.983, TLI = 0.974, RMSEA = 0.043, RMR = 0.023 as measurable criteria referring to Table 5.

Research hypothesis testing

The significant relationship of the variables in the model was assessed from its regression weights and R2 variances. As the results in Table 6, all hypotheses were supported with a significance at p = 0.05, excluding H1 which assumed connections between satisfaction and word of mouth. Loyalty has the strongest influence on word of mouth (β = 0.332), followed by Trust (β = 0.266). In addition, the result also showed in H4 that word of mouth has a significant influence on buying decision (β = 0.513). According to Figure 2 below, the model is obviously able to explain 48 percent of the variance about the relationship of the factors to word of mouth and 58 percent of a relationship between word of mouth and purchase decision.

Table 6 Hypothesis and the structural equation model analysis

Hypotheses	Paths	Standardized path coefficients (β)	S.E.	T-value	Test result
H_1	W <= S	0.138	0.081	1.829	Not supported
H_2	W <= T	0.266	0.131	2.186*	Supported
H_3	W <= L	0.332	0.128	2.314*	Supported
H_4	BD <= W	0.513	0.117	11.052*	Supported

*$p < 0.05$

Direct, indirect, and total effects of relationships

SEM also differentiates between direct, indirect, and total effects (Joreskog & Sorbom, 2001). Direct effect refers to a relation or a connection between two variables without the help of a mediating variable. On the other hand, indirect effect is normally influenced by a variable of one dependent variable through other variables. A total effect is the comprising of direct and indirect effects (Asher, 1983).

Table 7 Direct, indirect and total effects of relationships

Variables	W				BD			
	Direct effect	Indirect effect	Total effect	R^2	Direct effect	Indirect effect	Total effect	R^2
S	0.138	-	0.138	0.482	-	0.154	0.154	0.584
T	0.266*	-	0.266*		-	0.296*	0.296*	
L	0.332*	-	0.332*		-	0.369*	0.369*	

*$p < 0.05$

Table 7 shows that the highest influencing variable of direct and indirect effects on customer loyalty is positive word of mouth (0.332), followed by consumer trust (0.266). Customer satisfaction was not accepted in hypothesis even it has the total effect to word of mouth at 0.138. Nevertheless, the variable's p-value is not less than 0.05. The most influencing direct and indirect effect on buying decision through optimistic word of mouth is also loyalty (0.369). The next influencing factor is trust (0.296). Therefore, there are three significant impacts which show trust and loyalty significantly affect word of mouth from customer, and it will cause continually to make non-Thai consumer's decision to purchase life, health and accidental insurance from the insurance companies.
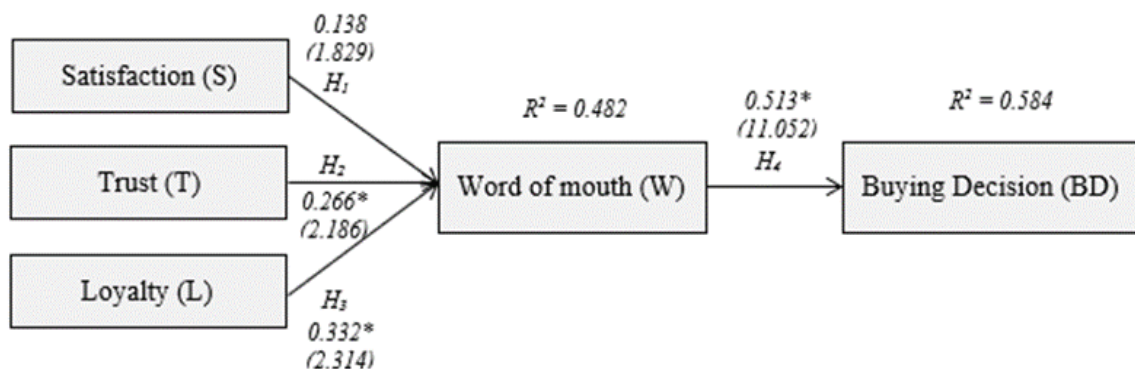

Figure 2 The results of structural model

The results from Table 7 and illustrating in Figure 2 can be explained as below.
The summary of H1 is not significant because P-value is more than 0.05 as illustrated in Table 6 even though the model depicts its factor coefficient value of 0.138. Therefore, customer satisfaction has not a significant influence on purchase decision through word of mouth. This result can be interpreted that even though consumers are satisfied with product, place, price, promotion and process of the company, they still do not have enough motivation to purchase insurance products and create positive commendation. This finding has a contrast with previous research conducted by Casalo et al. (2008) which was already explained on positive relationship between word of mouth and satisfaction.
From the H2 result, it depicted that the hypothesis is supported with significant factor coefficient value of 0.266. It means that trust has significant influence on buying

decision through word of mouth. This can be explained that when insurance companies earn customer trust as competitive advantage in the industry, this factor would take a favorable possibility in increasing their sales from word of mouth. The customers are more willing to recommend the product of the company to their acquaintances. Furthermore, it can be assumed that foreign consumers in Thailand are possibly motivated in buying decision by trust and recommendation. The result is aligned with the previous research (Amron & Mursid, 2018; Casalo et al., 2008). Although the hypothesis is supported, customer trust has the least influence on purchase decision towards word of mouth when compared to other variables from the model.

H3 of customer loyalty has clearly hypothesized on having a significant influence on purchase decision through word of mouth. The hypothesis is supported with a factor coefficient value at 0.332. According to SEM results, consumer loyalty is lower than 0.05 of p-value which relates to relationship between loyalty and word of mouth in order to enhance purchasing decision of life, health and accidental insurance. The result also indicated that consumer or foreign buyers of insurance product and service has a probability of being influenced by customer loyalty through recommendation from reliable person. Moreover, this statement follows a relative attitudinal relationship concept on connection of loyalty and action (Fields, 2019). To summarize, the relationship has strengthened the findings of previous researchers (Taghizadeh et al., 2013; Casalo et al., 2008). H4 explains that positive word of mouth has a significant influence on customer buying decision and it is clearly accepted with coefficient value of 0.513. The decision-making approaches and naturalistic decision-

making theory also can be used to support this hypothesis because it explains on human behavior that affects the purchase decision of the consumers (Klein, 2008 a, b). The consumer is likely to be involved in the buying decision if foreigners have opinion that they are willing to provide word of mouth to the company in a positive way. The respondents of this study are mostly experienced in purchasing those insurance, so this hypothesis shows relationship between word of mouth and buying decision among foreigners in Thailand. In addition to the result, this has the same reflection of the result with the previous studies (Casalo et al., 2008).

Conclusion, Recommendation and Limitation

Conclusion

The objective of this study is to determine the major aspects of purchase decision of foreign consumers living in Thailand through word of mouth. In addition, the study also determines the influence of word of mouth on purchase decision. The researcher applied psychological and sociological theories for the conceptual model to study the relationship between independent and dependent variables to get the outcome as buying action from consumers. The representative target group for the study were those who are non-Thais aged 20 years old and above, living in Thailand and have experienced purchasing insurance, as they have full legal capacity according to the Thai law in order to get mostly correct data. The data were collected by questionnaires to analyze by using SPSS Amos Version 26 program to test the reliability of the data. Moreover, the researcher applied confirmatory factor analysis (CFA) and structural equation model (SEM) to analyze of the research framework.

These models depicted the influencing factors to buying decision of foreign customers in Thailand when they are willing to mention or recommend to others in a positive way on their positive experience.

This research illustrated four major findings in customer aspect for buying insurance. The result showed that there are three out of four significant relationships which consist of customer trust towards word of mouth, customer loyalty towards word of mouth and word of mouth towards purchase decision. On the other hand, customer satisfaction towards word of mouth is only one assumption which was not approved after analyzing.

At first, customer trust has a significant influence on word of mouth. Therefore, the level of trust can help companies to build brand reputation and image in the competitive marketplace because customer is willing to speak about them in a good way, in both online and offline communication when consumer trust increases. Secondly, customer loyalty has causal relationship towards word of mouth at the most influencing rate among other factors. When customer has high loyalty towards the insurance company, the probability of being company's voice would be high. However, there is no causal relationship between customer satisfaction and word of mouth. This implied that people could feel satisfied with their product or service, but it cannot persuade them to enhance confidence in spreading positive word of mouth to others. Lastly, customer loyalty is the most important part of the bridging relationship between word of mouth and customer buying decision. Therefore, whenever people are willing to build and receive positive recommendations from their friends and families, they are more likely to take part in making purchase decisions.

Recommendations

The findings of this study indicated on consumer's purchase decision through positive word of mouth, which can be affected through customer trust and customer loyalty. Therefore, the researcher provided suggestions to marketer and salesperson on the importance of building and improving customer relationship in the service sector because when customers have trust and loyalty, they would like to purchase insurance. However, insurance industry is tailored to provide customer service in times of their needs. Therefore, companies should improve each department to create more confidence for the market. The researcher provides certain recommendations to improve customer service standards. Firstly, marketers need to build awareness and image as a credible brand to increase market reliance which aims to build trust and increase higher level of customers' satisfaction. According to this, the company can build trust by achieving timely response, financial transparency and achieving commitments in terms of delivering timely service, English consultancy, and claim acquisition for foreign customers. Secondly, a company should provide professional training programs to employees, especially sales agents who are mostly close to the customers. In addition, the company should hire customer services personnel in different languages such as English, Chinese and Japanese. Thirdly, a company should prepare tools and improve technology for staff to provide the best service for customers because customer trust and loyalty will be built through performance and action from customer's observation and their perspective towards that brand. Lastly, marketing and sales should co-operate and organize special activities with customers to create customer brand engagement followed by generating customer loyalty.

Limitation for further study

There are obvious limitations in this research, which is applicable for further study. The point of this study only focuses on non-Thai customers who are 20 years old and above, living in Thailand and had a chance to purchase life, health and accidental insurance. The fact is that the findings are based on foreigners only; therefore, the view of findings and recommendation can be wider if questionnaire is also distributed to the Thais living in Thailand. The opinion will be diverse, and the marketers and salesperson definitely need to understand more on the need of insurance market by comparing each target group in Thailand because difference in cultures may cause different aspects of thought and lifestyle. In addition, the other variables can be further explored such as acceptability of insurance conditions, attitude toward insurance, competency, etc.

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FACTORS AFFECTING COLLEGE STUDENTS' INTENTION TO USE U-LEARNING FOR ENGLISH STUDIES IN SICHUAN, CHINA

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ABSTRACT

This research aims to examine the effects of perceived ease of use, social influence, service quality, perceived usefulness, satisfaction, and attitude toward using on intention to use of u-learning system for English studies among college students. This study applied technology acceptance model (TAM), information systems success theory (IS success theory) and unified theory of acceptance and use of technology (UTAUT) to propose a conceptual framework. The quantitative approach was employed to collect the data. Prior to data collection, Item-Objective Congruence (IOC) and Cronbach's Alpha (CA) were used to ensure validity and reliability of constructs. The data were gathered by using purposive and convenience sampling. For data analysis, confirmatory factor analysis (CFA) was carried out to test factor loadings, convergent validity, discriminant validity and fit model. Structural equation model (SEM) was utilized to confirm the hypotheses and relationships among constructs. The results indicated that perceived ease of use, social influence, service quality, perceived usefulness, satisfaction and attitude were factors affecting college students' intention to use u-learning for their English studies. In addition, perceived ease of use has the strongest impact on intention to use. For practical application, system developers and academic practitioners are recommended to improve perceived ease of use and perceived usefulness of u-learning systems, to ensure the service quality of the system, to increase satisfaction level of students and promote a positive attitude to the systems. Furthermore, educators are suggested to emphasize the importance and advantages of u-learning for more efficient study and motivational environment of English classes among college students.

Keywords: U-learning, Perceived ease of use, Social influence, Service quality, Perceived usefulness, Satisfaction, Attitude toward use, Intention to use

Introduction

Ubiquitous learning (u-learning) refers to a learning environment which provides self-pace learning, lifelong learning and interactive learning with timely feedback and support. U-learning is a new way of learning that is delivered by electronic' devices with internet access such as personal computer, tablet, mobile and smart phones (Casey & Mifsud, 2005; Ley, 2007; Tan, Liu, & Chang, 2007; Shih, Chu, Hwang, & Kinshuk, 2011).
According to the survey from Pearson Education, 81% of global respondents believe

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that learning style has become more and more independent. Globally, nearly 76% of respondents believe that college students demand more online learning courses. About 80% of learners in China, the United States, Australia and Europe said that they have been engaging with online professional short-term courses (Hong, 2019). From the statistics above, it is concluded that self-learning has been becoming a trend, and u-learning is more popular than ever.

U-learning is a very practical and effective way for language study. According to former studies, u-learning is the most frequently used for learning method in field of language training courses (Joiner, Nethercott, Hull, & Reid., 2006; Chen & Li, 2010; Liu & Chu, 2010). It is explained as comprehensive learning, which means that a learner does not only learn a subject, but also obtains related knowledge in the process of learning. For instance, students are studying French in a language station, the station might provide related information and knowledge like French history or culture afterwards (Megan, 2020).

College's English learning in China had developed since the restoration of college's entrance examination in 1978. Since then, English had become a compulsory subject that students could graduate on a condition to pass English examinations for entering universities. As more students chose to study abroad after finishing undergraduate or even senior high school, the role of English learning has been exerted a greater importance. In the 2000s, a large-scale language tutoring agencies has emerged. Those agencies provide modern learning platforms for students to study English. English learning is not restricted to classrooms or universities, people of different ages and identities have more opportunities to learn English at any time and any place. Therefore, English learning in China becomes much more diversified (China Daily, 2016).

The technology related to teaching and learning that have been arisen dramatically due to Covid19 outbreak. The problem stated that many students are prohibited to have face-to-face contact and physical class have been avoided. Most schools and universities must adopt quickly to use different kinds of online learning. Therefore, u-learning integrates online solutions in order to help educators continuing their classes during the pandemic. Since English learning in universities has evolved from traditional classroom learning to u-learning in order to provide college students with a better learning environment, it is necessary for researchers to figure out what factors impacting college students' intention to engage u-learning for their English lessons. The researchers intend to provide additional knowledge for the adoption of u-learning for English language studies in universities. In addition, the findings of this study would highly contribute for the technological practices among system developers, educators and practitioners to consider the influential factors to develop or use the u-learning integrated with the educational programs

Literature Review

Theories used in the study
In this study, three theories were utilized to construct the research framework, which include technology acceptance model (TAM), information success theory (IS success theory) and Unified Theory of Acceptance and Use of Technology (UTAUT).

Firstly, technology acceptance model (TAM) was developed by Davis (1989) which indicates whether people accept a technology or not and is significantly influenced by perceived ease of use and perceived usefulness of the technology. Later, TAM was incorporated with social influence in the model (Hsu & Lu, 2004).

Secondly, information success theory (IS success theory) was stated by DeLone and McLean (1992) which pointed out that people's acceptance of a certain information theory depends on system quality and information quality. (DeLone & McLean, 2003). The original IS success theory was updated with adding service quality into the model. In the new model, information quality, system quality, and service quality affect users' satisfaction and adoption of information system.

Thirdly, unified theory of acceptance and use of technology (UTAUT) is developed by Venkatesh, Morris, Davis, & Davis (2003). It is widely used in most research to investigate the adoption of information technology. The full model is constructed with key variables such as performance expectancy, effort expectancy, social influence and facilitating conditions that have impact on intention to use toward actual usage. This study emphasizes social influence from UTAUT which predicts perceived usefulness that effect intention to use u-learning (Cheung & Lee, 2009; Kim, Ferrin, & Rao, 2009; Venkatesh, Thong, Chan, Hu, & Brown, 2011; Wang & Chiang, 2009).

Perceived ease of use

Zhang, Zhao, and Tan (2008) indicated that perceive ease of use is when users believe that using a technology is easy. According to Kao and Lin (2018), perceived ease of use refers to what performance users can conduct by using online learning systems. Teo, Lim, and Lai (1999) stated that people hold a positive opinion toward a system if they think the system is easy to utilize. Dalhberg, Guo, and Ondrus (2015) demonstrated that perceived ease of use plays a significant role in predicting consumers behavior to make a payment by mobile phones. In research of Van der Heijden (2004), perceived ease of use had a positive effect on online consumers' intention to browse entertainment websites both directly and indirectly via perceived usefulness.

Perceived usefulness

In field of ubiquitous learning, perceived usefulness is the belief of users that ubiquitous learning can help them derive study quality (Lin, 2013). For mobile payment context, perceived usefulness presents what extent that mobile payment system is advantageous to people (Kalinic, Marinkovic, Molinillo, & Liebana-Cabanillas, 2019). Former researchers focus on online banking which indicated that perceived usefulness exerts a great influence on users' attitude and intention (Celik, 2008; Chau & Ngai, 2010; Cheng, Lam, & Yeung, 2006; Chiou & Shen, 2012; Lee, 2009 a). According to a report of mobile commerce in Taiwan, perceived usefulness was proved to have a positive impact on people's behavioral intention toward mobile commerce (Hung, Hwang, & Hsieh, 2007; Lin & Shih, 2008).

Social influence

Social influence is to what extent that people see an importance of other persons' ideas and behaviors (Venkatesh & Davis, 2000). Kim, Ko, and Takahashi (2008) explained social influence as how people are affected by others and imitate others' behaviors. Teo and Pok (2003) postulated that when a new behavior emerges, social influence exerts a strong effect on behavioral intention. Social influence is explained in three aspects. The first aspect is an agreement with others in own mind. For second aspect, people's decision is affected by famous people. The third aspect is an agreement with others and a person presents his or her point of view in a public (Kelman, 1958). Mallat, Rossi, Tuunainen, and Öörni (2006) pointed out that people's acceptance of a certain product or technology is significantly influenced and decided by advice from others.

Service quality

Service quality is a system which fulfills users' needs. It represents trust, timely response and focus of individual needs (DeLone & McLean, 2004; Ahn, Ryu, & Han, 2007; Wang & Lin,

2012). Gronroos (1984) proposed that service quality is a comparison and evaluation between the perception of service and the obtained actual service. Sufficient and good service quality from IT department and workers make users perceive that the system is helpful (Park, Roman, Lee, & Chung, 2009; Lee, 2010). Gefen (2002) indicated that online service quality exerts a positive effect on users' trust and loyalty. Per the study of Allen, Mahto, and Otondo (2007), under the circumstance of job's online hunting, as job seekers are not able to contact with employers directly, a company's website is viewed as a service quality that significantly attracts job hunters.

Attitude toward use

Al-Debei, Al-Lozi, and Papazafeiropoulou (2013) defined attitude as the degree whether a person accept a behavior or not before taking actions. Kim and Woo (2016) described attitude as an individual assessment of a certain object in a positive or negative way. Nunnally and Bernstein (1994) mentioned that attitude is a social interaction that people exchange their own opinions with each other and to prove or disapprove others' opinions, as well as to impact others. Previous studies showed that attitude was a significant factor of users' acceptance of information technology (Angst & Agarwal, 2009; Bhattacherjee & Sanford, 2006; Kitcharoen, & Vongurai, 2021).

Satisfaction

Oliver (1980) defined satisfaction as individuals' psychological responses to the product or service they receive. Bitner and Hubbert (1994) proposed that, in terms of commercial activities, satisfaction refers to a personal evaluation after engaging a certain purchasing occasion. An effect of satisfaction is that it builds trust between customers and brands (Hyun, 2010; Roman, 2003; Singh & Sirdeshmukh, 2000). Numerous researchers indicated that websites serve as a gateway between customers and companies, so its

interface might affect satisfaction of customers who experience in surfing product information via online channel (Anderson & Srinivasan, 2003; Bansal, McDougall, Dikolli, & Sedatole, 2004). Assael (1987) found that satisfaction plays a significant role on customer's positive attitude toward a certain product or service, which promotes consumers repurchase behavior.

Intention to use

In terms of technology acceptance, intention to use is defined as a possibility of utilizing the technology (Karjaluoto, Shaikh, Leppaniemi, & Luomala, 2020; Benjangjaru & Vongurai, 2018). For internet's surfing and obtaining information, intention to use is explained as people's tendency to use a certain website to look for necessary information (Sumaedi, Bakti, Rakhmawati, Astrini, & Jati, 2020). As far as online technology is concerned, users' satisfaction can boost a positive attitude and intention to use the technology (Wu & Liu, 2007; Lee, 2009 b). Perceived usefulness of information technology is considered to be the most influential element in predicting users' intention to utilize the technology (Venkatesh, Thong, & Xu, 2012; Venkatesh et al., 2003). Miltgen, Popovič, and Oliveira (2013) discovered that people's strong intention to use information technology can promote and probably recommend the technology to others.

Research Hypotheses

Perceived ease of use and perceived usefulness

Many empirical research showed that perceived usefulness was affected directly and indirectly by perceived ease of use (Davis, 1989; Venkatesh & Davis, 2000). According to Bruner and Kumar (2005), if a system is easy to operate and improve users' work efficiency, they perceive that the system is useful. Hence, the researcher proposed the following hypothesis:

H1: Perceived ease of use has a positive effect on perceived usefulness.

Social influence and perceived usefulness
According to previous studies, perceived usefulness was positively affected by social influence (Venkatesh & Davis, 2000; Yi, Wu, & Tung, 2005). In terms of online commerce, consumers' behavioral intention was influenced by social influence via perceived usefulness (Cheung & Lee, 2009; Kim et al., 2009; Venkatesh et al., 2011; Wang & Chiang, 2009). Thus, the following hypothesis was set:
H2: Social influence has a positive effect on perceived usefulness.

Service quality and perceived usefulness
Former studies on consumers' satisfaction in retail industry found that service quality of check out system affected perceived usefulness of consumers (Fernandes & Pedroso, 2017). Ayo, Oni, Oyerinde, and Eweoya (2016) carried out a series of research on online banking and confirmed that perceived usefulness of users was significantly affected by service quality of online banking systems. The theoretical relationship was derived to determine a hypothesis:
H3: Service quality has a positive effect on perceived usefulness.

Perceived usefulness and attitude toward use
In technology acceptance model, perceived usefulness is an important factor of attitude (Childers, Carr, Peck, & Carson, 2001; Curran & Meuter, 2005; Kleijnen, Wetzels, & de Ruyter, 2004; Nysveen, Pedersen, & Thorbjørnsen, 2005; Porter & Donthu, 2006; Robinson, Marshall, & Stamps, 2005). Previous studies about online banking business showed that perceived usefulness had a positive effect on users' attitude and intention (Celik, 2008; Chau & Ngai, 2010; Cheng et al., 2006; Chiou & Shen, 2012; Lee, 2009 a). Hence, the proposed hypothesis was derived:
H4: Perceived usefulness has a positive effect on attitude toward use u-learning.

Satisfaction and attitude toward use
Assael (1987) indicated that satisfaction is an important factor of consumers' positive attitude, which raise the possibility of repurchasing. According to Olsen (2002), consumers' attitude toward products was influenced by satisfaction. From u-learning perspective, this study hypothesized that satisfaction positively effects attitude toward using ubiquitous learning as stated in the following hypothesis:
H5: Satisfaction has a positive effect on attitude toward use u-learning.

Perceived usefulness and intention to use
Rogers (1995) posited that it would be easier for people to accept new things or ideas in condition to that they believe the new things are outstanding and helpful. Nysveen et al. (2005) stated that if users perceive a service is beneficial to solve problems and improve work efficiency, users' intention to use the service would be very high. Thus, the following hypothesis was proposed:
H6: Perceived usefulness has a positive effect on intention to use u-learning.

Attitude toward use and intention to use
Previous studies affirmed a point of view that people's behaviors rely on and are influenced by their attitude (Bobbitt & Dabholkar, 2001; Fishbein & Ajzen, 1975). In online banking concept, researchers showed that users utilize online banking systems and service if they have a positive attitude toward using the systems and service (Lai & Li, 2005; Cheng et al., 2006; Suh & Han, 2002; Lee, 2009 a; Chiou & Shen, 2012). Therefore, this study proposed that attitude toward use potentially effects intention to use, with the assumptions shown below.
H7: Attitude toward use has a positive effect on intention to use u-learning.

Satisfaction & intention to use
Numerous studies showed that satisfied website users have a high intention to revisit and use the website. Consequently, they would suggest

others use it (Collier & Bienstock, 2006; Cristobal, Flavian, & Guinaliu, 2007; Bansal et al., 2004; Wolfinbarger & Gilly, 2003). On the contrary, other studies indicated that dissatisfied website users reduce reliance on the website or even refuse to use the website, thus, they look for other websites as replacement (Anderson & Srinivasan, 2003; Yoo & Donthu, 2001). Based on this discussion, the following hypothesis was proposed.

H8: Satisfaction has a positive effect on intention to use u-learning.

Perceived ease of use and intention to use

Doll and Torkzadeh (1988) attested that in terms of technology acceptance, users tend to employ a technology that is easy to use. Chang, Li, Hung, and Hwang (2005) theorized that if people perceive an online service system is easy to use, it probably raises their intention to use the system. Hence, the researcher hypothesized that perceived ease of use positively impacts intention to use:

H9: Perceived ease of use has a positive effect on intention to use u-learning.

Research Methods and Materials

Research framework

The research framework was constructed based on four previous empirical studies. Firstly, Kao and Lin (2018) studied how service quality, perceived ease of use, perceived usefulness and other factors impacted usage intention of e-learning for police education. Secondly, Hu and Lai (2019) examined factors influencing students' behavioral intention to use learning management systems on computer and mobile which showed that social influence was one of the important variables to be considered in this study. Thirdly, Athiyaman (1997) carried out on how students' satisfaction influenced attitude toward service quality of the university, and together impacted students' communication behaviors. Lastly, Kashive, Powale, and Kashive (2020) investigated factors affecting both professionals' and students' intention to use artificial intelligence that enabled e-learning, and how satisfaction and attitude impacted intention to use e-learning. The research framework of this study is illustrated in Figure 1.
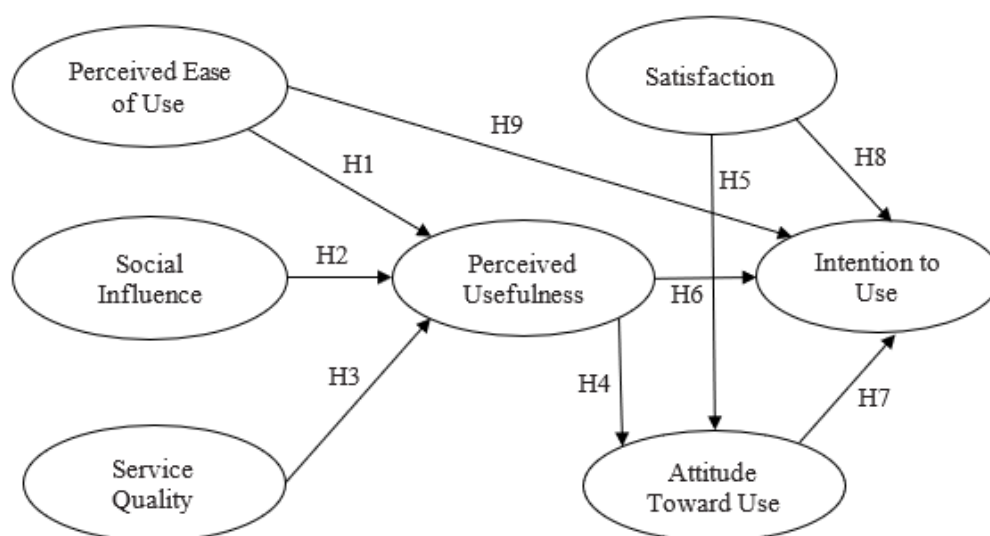

Figure 1 Conceptual framework

The study aims to examine how perceived ease of use, social influence, service quality perceived usefulness, satisfaction and attitude toward use affect college students' intention to use u-learning for English studies in Sichuan, China. 7 variables and 9 hypotheses were developed as a research framework.

Methodology

This research applied a quantitative method to distribute online questionnaires for data collection. There are three parts in the questionnaire. The first part is screening questions, the second part is scale items with 5-point Likert scale and the last part is respondents' demographic questions.

Before collecting data, Item-Objective Congruence (IOC) was validated by the rating score of three experts. Cronbach's Alpha (CA) reliability test was employed to 30 participants for a pilot study. Afterwards, the survey was distributed to 500 respondents for the data gathering. The sampling technique was applied by using purposive to select the second-year undergraduate students and convenience sampling to distribute survey via online channels. The data were analyzed by confirmatory factor analysis (CFA) and structural equation model (SEM), using SPSS and AMOS software.

Population and sample size

According to Schmidt and Pardo (2014), target population is a group of people that is chosen to be studied in research. In this study, the researchers select the second year of undergraduate students who have been studying school of mathematics and school of economics and management at Southwest

Jiaotong University in Sichuan province of China as a target population. The reason for the target selection was that the second-year students are appropriate group that have sufficient experience in u-learning for English studies, comparing to the freshmen and not as busy as the third and the fourth-year students. According to Kline (2011), sample size is a quantity of sampling that researcher considers including in the research. The minimum sample size of 425 was recommended by Soper (n.d.). As a result, the researcher considered 500 samples to be a proper sample size for this study.

Sampling technique

In this study, the researcher applied purposive sampling to select the second-year undergraduate students who have been studying school of mathematics and school of economics and management at Southwest Jiaotong University in Sichuan province of China and convenience sampling to distribute online questionnaires to 500 participants.

Purposive sampling

According to Robinson (2014), purposive sampling is purposeful selection of respondents who can represent characteristics relevant to the research objectives. In this study, the criteria used to select the target population was the participants who are second year of undergraduate students in school of mathematics and school of economics and management at Southwest Jiaotong University in Sichuan province of China. Those students must have experience in using u-learning for their English classes. The proportional calculation of sample size is presented in Table 1.

Table 1 Sample size (second year undergraduate students)

School	Population size	Proportional sample size (N = 500)
School of mathematics	207	139
School of economics and management	537	361

Convenience sampling
According to Cooksey and McDonald (2019, p. 858), convenience sampling is the selection of respondents who are effort-free and cost-minimized to reach for the data collection. Questionnaires were distributed via online and social media channels which include WeChat and QQ that allow respondents to complete at their convenience.

Results and Discussion

Demographic information
According to Table 2, among 500 respondents, 47.81% were male and 52.19% were female. Most respondents had been using u-learning for English classes more than 3 months but less than 1 year. For time spent on weekly English learning, 1 hour to 5 hours ranked the first place. Nearly half of respondents aim to improve English reading through u-learning. More than 90% of respondents preferred using mobile phone as the equipment to attend u-learning for English courses.

Table 2 Demographic Information

N = 500		Percentage
Gender	Male	47.81%
	Female	52.19%
Experience in u-learning for English classes	< 3 months	27.49%
	3 months-1 year	53.19%
	> 1 year	19.32%
Time spent per a week for English learning	< 1 hour	18.13%
	1 hour-5 hours	51.59%
	> 5 hours	30.28%
Literacy skills improvement purpose	Listening	37.65%
	Speaking	16.14%
	Reading	40.24%
	Writing	5.98%
Preferred devices for u-learning	Computer	9.16%
	Mobile phone	90.84%

Confirmatory factor analysis (CFA)
According to Hair, Anderson, Tatham, and Black (2010), confirmatory factor analysis (CFA) is widely used to examine the variables and scale items which draws a conclusion to approve the measurement model. As of Table

3, factor loadings of each variable were above 0.5, t-value > 1.98 and p-value < 0.05 (Hair et al., 2010). Composite reliability (CR) was greater than 0.7 and average variance extracted (AVE) was greater than 0.5 (Fornell & Larcker, 1981). In summary, all estimates were significant.

Table 3 Confirmatory factor analysis result, composite reliability (CR) and average variance extracted (AVE)

Variables	Source of questionnaire (measurement indicator)	No. of item	CA	Factors loading > 0.5	S.E.	t-value > 1.98 & p-value < 0.5	CR > 0.7	AVE > 0.5
Perceived ease of use (PEOU)	Du, Zhu, Zhao, and Lv (2012), Lin (2013), Gao and Bai (2014)	4	0.875	0.716-0.965	0.035-00.35	23.195***-20.588***	0.878	0.646
Social influence (SI)	Du et al. (2012), Lu (2014), Bashir and Madhavaiah (2015)	5	0.887	0.743-0.910	0.040-0.041	20.500***-21.180***	0.889	0.617
Service quality (SQ)	Zhou (2011), Aboelmaged (2018)	4	0.860	0.711-0.907	0.040-0.040	20.548***-18.692***	0.863	0.614
Perceived usefulness (PU)	Watjatrakul (2013), Du et al. (2012), Cheng (2020)	5	0.890	0.731-0.911	0.038-0.040	22.611***-20.051***	0.891	0.623
Satisfaction (SA)	Watjatrakul (2013), Carlson and Cass (2010), Yu, Roy, Quazi, Nguyen, and Han, (2017), Cheng (2020)	4	0.863	0.727-0.908	0.041-0.043	19.338***-20.552***	0.866	0.619
Attitude toward using (ATT)	Loiacono and McCoy (2018), Bashir and Madhavaiah (2015)	4	0.864	0.729-0.922	0.040-0.042	19.747***-20.903***	0.867	0.622
Intention to use (IU)	Watjatrakul (2013), Gao and Bai (2014), Du et al. (2012)	6	0.903	0.744-0.919	0.038-0.039	21.163***-22.023***	0.904	0.612

*** = Significant at the 0.05 significant levels (p < 0.05)

<u>Remark</u> CA = Cronbach's Alpha, CR = Composite reliability, AVE = Average variance extracted

According to Fornell and Larcker (1981), discriminant validity was evaluated by computing the square root of each AVE. In this study, the value of discriminant validity was larger than all inter-construct factor correlations, therefore, the discriminant validity was considered to be acceptable as shown per Table 4.

Table 4 Discriminant validity

	PEOU	SI	SQ	PU	SA	ATT	IU
PEOU	**0.804**						
SI	0.565	**0.785**					
SQ	0.590	0.571	**0.784**				
PU	0.587	0.507	0.572	**0.789**			
SA	0.581	0.569	0.580	0.554	**0.787**		
ATT	0.536	0.532	0.590	0.589	0.561	**0.789**	
IU	0.618	0.561	0.554	0.577	0.574	0.567	**0.782**

Remark The diagonally listed value is the AVE square roots of the variables

As shown in Table 5, the fit model of CFA presented that CMIN/DF, GFI, AGFI, CFI, NFI, TLI and RMSEA were measured to confirm convergence validity and discriminant validity. All estimates were greater than acceptable values. Therefore, the convergence validity and discriminant validity were ensured.

Table 5 Goodness of fit for confirmatory factor analysis (CFA)

Index	Criterion	Statistical values
χ^2/df (CMIN/df)	< 3 (Hair et al., 2010)	1.143
GFI	> 0.90 (Bagozzi & Yi, 1988)	0.940
AGFI	> 0.85 (Sica & Ghisi, 2007)	0.929
CFI	> 0.95 (Hu & Bentler, 1999)	0.994
NFI	> 0.95 (Arbuckle, 1995)	0.953
RMSEA	< 0.08 (Hu & Bentler, 1999)	0.017
Model summary		Acceptable model fit

Remark CMIN/df = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, CFI = comparative fit index, NFI = normalized fit index, and RMSEA = root mean square error of approximation.

Structural equation model (SEM)

According to Jöreskog and Sörbom (1993), structural equation model (SEM) is a tool that utilizes parameters in the observation variables and latent variables analysis. Besides, it examines the relationships with latent variables. Per Table 6, SPSS AMOS was used to measure and modify the model of the Goodness of Fit index for structural equation model. Consequently, the fitting values were all acceptable including CMIN/df = 1.213, GFI = 0.937, AGFI = 0.925, CFI = 0.991, TLI = 0.990, and RMSEA = 0.021.

Table 6 Goodness of fit for structural equation model (SEM)

Index	Criterion	After adjustment
χ^2/df (CMIN/df)	< 3 (Hair et al., 2010)	1.213
GFI	> 0.90 (Bagozzi & Yi, 1988)	0.937
AGFI	> 0.85 (Sica & Ghisi, 2007)	0.925
CFI	> 0.95 (Hu & Bentler, 1999)	0.991
NFI	> 0.95 (Arbuckle, 1995)	0.990
RMSEA	< 0.08 (Hu & Bentler, 1999)	0.021
Model summary		Acceptable model fit

Remark CMIN/df = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, CFI = comparative fit index, NFI = normalized fit index, and RMSEA = root mean square error of approximation.

The significance of each variable was calculated by regression weights and R^2 variance. All hypotheses' results of the structural model in Table 7 were significantly supported when p = 0.05. Perceived usefulness has the strongest effect on attitude toward use at β = 0.428, followed by perceived ease of use on intention to use (β = 0.424), satisfaction on attitude toward use (β = 0.418), perceived ease of use on perceived usefulness (β = 0.359), service quality on perceived usefulness (β = 0.334), satisfaction on intention to use (β = 0.290), attitude toward use on intention to use (β = 0.209), and social influence on perceived usefulness (β = 0.129). Hence, all estimates were supported.

Table 7 Hypothesis result of the structural model

Hypothesis	Standardized path coefficients (β)	t-value	Test result
H1: PEOU→ PU	0.359	6.265***	supported
H2: SI → PU	0.129	2.316***	supported
H3: SQ → PU	0.334	5.759***	supported
H4: PU → ATT	0.428	8.278***	supported
H5: SA → ATT	0.418	8.140***	supported
H6: PU → IU	0.232	2.528***	supported
H7: ATT → IU	0.209	3.655***	supported
H8: SA → IU	0.290	3.510***	supported
H9: PEOU → IU	0.424	5.954***	supported

***p < 0.05

The results from table 7 are summarized as followed:
H1: The standardized path coefficient between perceived ease of use and perceived usefulness was 0.359 (t-value = 6.265***). Therefore, perceived ease of use had a positive effect on perceived usefulness. Consequently, H1 was supported.
H2: The standardized path coefficient between social influence and perceived usefulness was

0.129 (t-value = 2.316***). Hence, social influence had a positive effect on perceived usefulness. Subsequently, H2 was supported.

H3: The standardized path coefficient between service quality and perceived usefulness was 0.334 (t-value = 5.759***). Then, service quality had a positive effect on perceived usefulness. Consequently, H3 was supported.

H4: The standardized path coefficient between perceived usefulness and attitude toward use was 0.428 (t-value = 8.278***). Therefore, perceived usefulness had a positive effect on attitude toward use u-learning. Accordingly, H4 was supported.

H5: The standardized path coefficient between satisfaction and attitude toward use was 0.418 (t-value = 8.140***). Thus, satisfaction had a positive effect on attitude toward use u-learning. Consequently, H5 was supported.

H6: The standardized path coefficient between perceived usefulness and intention to use was

0.232 (t-value = 2.528***). Therefore, perceived usefulness had a positive effect on intention to use u-learning. Accordingly, H6 was supported.

H7: The standardized path coefficient between attitude toward use and intention to use was 0.209 (t-value = 3.655***). Therefore, attitude toward use had a positive effect on intention to use u-learning. So, H7 was supported.

H8: The standardized path coefficient between satisfaction and intention to use was 0.290 (t-value = 3.510***). Hence, satisfaction had a positive effect on intention to use u-learning. Accordingly, H8 was supported.

H9: The standardized path coefficient between perceived ease of use and intention to use was 0.424 (t-value = 5.954***). Hence, perceived ease of use had a positive effect on intention to use u-learning. As a result, H9 was supported. In accordance with the hypotheses results, the direct, indirect and total effects of relationships are presented in Table 8.

Table 8 Direct, indirect and total effects of relationships

Independent variables	Dependent variables											
	PU				ATT				IU			
	DE	IE	TE	R^2	DE	IE	TE	R^2	DE	IE	TE	R^2
PEOU	0.359	-	0.359	0.535	-	0.154	0.154	0.559	0.341	0.083	0.424	0.587
SI	0.129		0.129		-	0.055	0.055		-	0.030	0.030	
SQ	0.334	-	0.334		-	0.143	0.143		-	0.077	0.077	
SA	-	-	-		0.418	-	0.418		0.203	0.087	0.290	

Remark DE = Direct effect, IE = Indirect effect, TE = Total effect (DE+IE)

Conclusion and Implications

Conclusion

This research paper aims to investigate factors affecting college students' intention to use u-learning of English studies. The target population in this research were second year undergraduate students of two programs at Southwest Jiaotong University, Sichuan province of China. From relevant literatures, the researcher proposed research framework which contains 7 latent variables and 9 hypotheses. The quantitative method was

conducted to distributing online questionnaires for data gathering. Before collecting data, IOC and Cronbach's Alpha pilot test were used to confirm validity and reliability of the research. After collecting data, CFA and SEM were applied to verify the research framework.

The results are summarized as follows. For the influencers of usage attitude, perceived usefulness had the strongest effect on attitude toward use u-learning which conveyed those benefits of u-learning could influence the positive attitude of students to engage this form of learning for their English lessons. Attitude toward use was

also influenced by satisfaction which explained that students who feel satisfied with u-learning are more likely to accept to use this technology which aligns with previous studies (Bobbitt & Dabholkar, 2001; Fishbein & Ajzen, 1975).

There were three factors that affected perceived usefulness in this study which involves perceived ease of use, service quality and social influence. Perceived ease of use was the most influential factor of perceived usefulness (Nysveen et al., 2005). Students who feel that u-learning is easy to function tends to see the benefit of using it. Service quality as tools and network provided by the school can also endorse the perception of benefit. Social influence is referred to their teachers and friends who convince students to use u-learning to improve their English literacy skills.

Perceived ease of use, satisfaction, perceived usefulness and attitude toward use were found to have a positive effect on intention to use accordingly. These findings confirmed the technology acceptance model that the behavioral intention occurs when students perceive the ease of use, feel satisfied of the outcome from using, obtain clear benefits to improve their English learning's efficiency and engage positive attitude toward the usage of u-learning (Doll & Torkzadeh, 1988; Collier & Bienstock, 2006; Cristobal et al., 2007; Bansal et al., 2004; Wolfinbarger & Gilly, 2003). In conclusion, the results achieved its research objectives to confirm determinants affecting intention to use of u-learning for English studies among students.

Implications

The implications of this study are explained in both theoretical and practical way. Theoretically, the findings precisely confirmed previous theories, namely, technology acceptance model (TAM), information systems success theory (IS success theory) and unified theory of acceptance and use of technology (UTAUT).

For the first of practical implications, perceived ease of use u-learning for English studies receives the greatest attention as the results showed that perceived ease of use had the most influential impact on intention to use the system. For u-learning system developers, it is an obligation to produce a user-friendly platform to enhance u-learning environment. Secondly, according to TAM, as perceived usefulness was another important factor which affected behavioral intention, the improvement of perceived usefulness should be emphasized. For instance, an individualized learning style and tracking service are essential in u-learning systems. In that case, students are able to choose English courses in different contents and levels according to their situation. A useful u-learning system helps students to study more systematically and efficiently, which can increase students' intention to use the system. Thirdly, an efficient learning system can win users' satisfaction which is explained that it is easier for a user who is pleased with a system to create more positive attitude. Thus, users' intention to use the system is increased. Fourthly, as far as behavioral intention is concerned, service quality and social influence are two vital elements which cannot be ignored. For system developers, timely update of u-learning system content and service are greatly important. In language learning, it is a common sense that constant learning and regularly review are the way to help mastering a foreign language. A learning system with a good service quality ensures active learning environment and provides timely feedback to users. Besides, system providers should provide more guidance to users, reduce their stress, and increase their confidence in using u-learning systems. In addition to the improvement of u-learning system functions, universities' leaders and educators are able to increase students' intention to use u-learning

for their English studies by enhancing social influence of the platforms and systems. For instance, some training and communication activities can be organized to help students share learning experience and feedback of the usage a better learning solution. Students can acquire knowledge from other users who have successfully utilized and have received benefits from using u-learning systems. These practices potentially increase social influence and students' intention to participate in u-learning environments.

Limitation and further study

The limitation of this study is the restriction of latent variables. In behavioral intention studies, especially in technology acceptance model, apart from the variables used in this study, there are other important factors which impact behavioral intention. In that case, the future study might include additional variables to examine their relationships with behavioral intention such as information quality, system quality and facilitating conditions.

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FACTORS INFLUENCING INVESTORS' INVESTMENT IN FOREIGN INVESTMENT FUND-THE CASE OF INVESTORS IN BANGKOK METROPOLITAN AREA

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ABSTRACT

Since the beginning of 2021, Foreign Investment Fund (FIF) grew by 27.5%, accounting for 20% shares of the Thai mutual fund industry. With the recent shift fueled by investment by retail investors, this research aims to deepen understanding on the factors influencing investment in foreign investment fund (FIF). More specifically, this study examines how fund related qualities, fund sponsor qualities, investor related services and demographic factors influence investors' investment decision in FIF. Survey questionnaires were conducted among investors in Bangkok Metropolitan area with the target sample size of 267 based on Cochran's approach. There were 359 usable sets of questionnaires. The majority of respondents was male (55%) in below 30 age group (32.6%) and 31-40 age group (57.9%), with 6-10 years investment experience (64.6%). Logistic regression was used for quantitative analysis. Results showed that fund related qualities, fund sponsor qualities, investor related services and demographic factors had a statistically significant influence towards investors' decision in FIF. More specifically, only gender had a statistically significant influence towards FIF investment. In terms of fund characteristics, results showed that fund performance, quality of AMC, and customer support were key influencing factors towards investment in FIF. For practical application, the result of this study provides information for customer targeting and segmentation for investment advisors for promoting Foreign Investment Fund.

Keywords: Foreign investment fund, Fund characteristics, Investment experience, Information disclosure

Introduction

At the beginning of 2021, the Thai Asset Management industry witnessed a phenomenal growth of the Foreign Investment Fund (FIF). Fuelled by strong performance of technology related foreign investment funds, the Thai asset management industry saw an inflow of USD 1,900 million in January 2021 alone. In fact, the shift towards FIF was one of the main investment strategies among Asset Management Companies, resulting in the rapid launches of new FIF under a wide range of investment themes. As of the end of April 2021, the number of FIFs has reached 801 funds, an increase of 1% MoM (+9 funds) and 11% YoY

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(+81 funds), spanning investment in fixed incomes, equities, thematic funds such as ESG and Technology to name a few (Association of Investment Management Companies (AIMC), 2021).

Despite the recent frenzy, international investment is nothing new for Thailand. According to a recent study by the Bank of Thailand, the Thai investors have been investing overseas since 2015. At that time, the value of international investments was approximately USD 45 billion, led mainly by institutional investors such as mutual funds, Social Security Funds, Government Pension Funds, and Insurance Companies with a small percentage of direct overseas investment by High-Net-Worth Individuals (Bank of Thailand (BOT), 2021). The primary vehicle of investment concentrated mainly on conservative investment instruments such as foreign currency deposit, fixed income securities and mutual funds, with a negligible allocation to equity investment.

With the continual relaxation of foreign capital control and overseas investment, international investments have continued to expand. Statistically, the total net asset value of FIF reached THB 1.158 trillion, representing the market share of 22.14% of all types of mutual funds in Thailand as of April 2021. Apart from allocation to conservative assets, international investment is trending towards equity investment and alternative assets, particularly the technology related funds. More specifically, the current composition as of April 2021 of FIFs in Thailand is made up of foreign equity (429 funds), foreign fixed income (214 funds), mixed fund (94 funds) and others (64 funds) (AIMC, 2021).

Apart from the shift in asset allocation, further analysis on the types of investors in FIFs shows an increasing participation of retail investors. According to the study by Portfolio Investment Abroad, the share of foreign investment by retail investors has increased from USD 3 million in 2015 to USD 3.2 billion in Quarter 2, 2020 (+967%) (Portfolio Investment Abroad (PIA), 2020).

Such statistics are in line with the record increase in the number of new customer accounts among asset management companies during the second half of 2020. It was reported that new customer accounts had increased by 50-60%. It was further reported that the fund flows from these new accounts were channeled mostly to the foreign mutual funds (eFinance Thai, 2021).

Such demand could be explained partly by the subdued investment sentiment in Thailand, and relaxation of international investment regulation. As investors are seeking diversification, overseas investment has seen increasing allocation on equities among other traditional assets. A recent study showed that retail investors invested in foreign equity (36%), foreign unit trust (30%), foreign currency deposit (15%), foreign fixed income (14%), and other foreign instruments (4%) (Rimantanai, Sophonpana and Thongteeraphap, 2020).

The recent participation of retail investors in FIF raises several questions. Firstly, what are the demographic characteristics of retail investors in FIF? Is FIF more popular among young investors or experienced investors? Do they possess the knowledge and investment experience in understanding the international investment climate, investment policy of the underlying fund and relevant risks and charges? Secondly, does the investor invest in FIF as part of investment diversification or yield enhancement? Thirdly, what are the criteria that investors consider in choosing the asset management companies for FIF investment.

Although there have been several studies on investment behaviors towards mutual funds both in Thailand and abroad, investing in FIFs has not been explicitly addressed. For example, the work of Chunnananda (1998) discussed the role of investment gender, attitude towards mutual funds, and economic context as the key influencing factors when choosing mutual funds. More recent works tend to focus on specific types of mutual fund offerings, characteristics of asset management companies, fund features and promotion, with additional focus by specific age group, particularly GEN Y (Montreepak, 2017; Rattanapian, 2015; Jungprasertkul, 2009).

With regards to FIFs, there is a little research work on the topic. To the best of the researcher's knowledge, there was a study conducted by Tepchaitanawong in 2015. Although the study examined factors influencing investment decisions in FIFs among the working age population in Bangkok, the emphasis of the research was the 7 P marketing mix. To contribute to academic discussion, this research proposes to investigate factors influencing investment in FIFs in Thailand, focusing on the influence of investors' demographics and key criteria in choosing among different asset management companies for FIFs investment.

In doing so, the research aims to better understand the investment decision criteria. Such information could be used to support investment consultants and asset management companies in designing the target segment and contributed to better understanding of investors' behavior towards FIF investment.

Literature Review

To examine the factors on FIFs selection, this research identifies the commonly used criteria for mutual fund selection. According to Cook and Hebner (1993), investors possess different characteristics and preferences. As a result, they formulate different rankings based on multiple criteria in selecting the mutual fund. They further presented the multi criteria approach to mutual fund selection, extending Jensen's (1968) risk adjusted return to incorporate fund expenses, fund diversification and service quality.

With continual globalization of the mutual fund industry, the mutual selection criteria have been expanded to cover a wide range of factors namely fund performance (Capon, Fitzsimons, & Alan Prince, 1996; Ramasamy & Yeung, 2003; Kozup, Howlett, & Pagano, 2008; Vyas, 2013; Tepchaitanawong, 2015), fund characteristics (Tepchaitanawong, 2015; Sharma, 2019), competency of asset management company (Ranganathan, 2006) and quality of services (Sharma, 2019).

These determinants have been widely researched across developed and developing markets (Capon et al., 1996; Ramasamy & Yeung, 2003; Kozup et al., 2008). They are often grouped into three main categories, which are the quality of funds, the quality of asset management companies and the information disclosure and services for investors. Relevant academic studies are discussed below.

Fund related qualities

In assessing fund related qualities, investors often pay attention to past performance (Capon et al., 1996; Ramasamy & Yeung, 2003; Kozup et al., 2008; Vyas, 2013; Tepchaitanawong, 2015) and fund characteristics such as reputation of fund, tax benefit, and withdrawal facilities (Tepchaitanawong, 2015; Sharma, 2019). When considering the fund quality, past performance is often the first factor that comes to investors' mind, given that it is the easiest to understand and the most

direct method to measure fund performance. Several studies have supported this observation. More specifically, the study of 3,386 U. S. investors on their investment decision in mutual funds showed that past financial performance was the only one prominent factor in considering investment in mutual funds (Capon et al., 1996). Similarly, Kozup et al. (2008) studied the effects of summary information on consumer perceptions of mutual fund characteristics in the U.S. and found that the past performance of mutual funds had a positive influence on investors' attitudes toward the specific fund, investment intentions, expectations of future performance and perceived risk.

Apart from past performance of the funds, investors consider many other factors in determining the quality of the funds. Based on the studies among mutual fund investors in Iran, India, Malaysia and Thailand, researchers found that investors considered the characteristics of the fund such as the minimum initial investment, withdrawal facilities and transaction costs (Ramasamy & Yeung, 2003; Ranganathan, 2006; Vyas, 2013; Chawla, 2014) and qualitative factors fund rating, portfolio investment schemes, tax benefits or reputation of the portfolio managers (Seesanit, 2010; Chawla, 2014; Sharma, 2019; Tepchaitanawong, 2015; Amiri & Gil-Lafuente, 2016).

To examine the influencing factors towards investors' decision in FIF, this study incorporates two key factors namely fund performance and fund characteristics under fund related qualities. It is hypothesized that fund related qualities positively influence investors' investment decision in FIFs.

Fund sponsor qualities

Fund sponsor qualities refer to the characteristics and reputation of asset management companies.

From the academic perspective, corporate reputation has a strong linkage with financial performance, perception of various stakeholders' groups. Numerous studies in consumer behavior showed that corporate reputation had a positive impact on customer purchase intention and the willingness to pay premium prices (Heh & Xie, 2009) through customers' trust and customers' identification as the mediating factor.

In the same token, competency and reputation of asset management companies exhibited a strong positive influence towards investors' decision in mutual funds (Ranganathan, 2006). Such findings are echoed in the work of Vyas (2013) and Seesanit (2010) based on investors in India and Bangkok Metropolitan, Thailand towards investment in Long-term equity funds, respectively.

For mutual fund companies, factors that contribute to the fund sponsor qualities, include the quality of financial advisors, qualities of infrastructure and research. According to Gill, Biger, Mand, and Gill (2011), the investment decision in mutual funds of Indian investors was positively related to the investors' perceptions about consultation with investment advisors.

Moreover, Kaur, Batra, and Anjum (2013) found that efficient or expertise of asset management company is factor that facilitate investment in mutual funds.

In conclusion, fund sponsor qualities such as competency and reputation of asset management companies exhibit positive influences towards investors' investment decisions in FIFs.

Investor related services

Prior to selecting a mutual fund, the investors pay attention to the quality of services provided to investors. From the consumers' behavior perspective, service quality has long

been discussed. Studies in retail and services related industries reported evidence of service quality mainly with customers' satisfaction and customers' loyalty (Cengiz, 2010).

Studies on mutual funds showed that investors pay attention to fringe benefits and quality of services (Ranganathan, 2006; Amiri & Gil-Lafuente, 2016; Sharma, 2019). More specifically, investors looked for efficiency and convenience in transaction processing such as the cut-off time for switching in and switching out, customer service system particularly the grievance mechanism and other factors such as research provided to investors, and simplicity of the offer document (Sharma, 2019).

Another important aspect of mutual fund services deals with information disclosure. With the increasing variety of mutual funds, regulatory requirements, and recommended practice on information review before making investment decisions, information disclosure has become an essential part of services provided by mutual fund companies.

In particular, investors focused on vital information such as the fund prospectus, past performance, fund rating, expenses details and Net Asset Value (Sharma, 2019). According to Sharma (2019), information disclosure has shown a positive relationship with investors' decisions in mutual funds. Therefore, this study incorporates investors' related services in examining the relationship with investors' decisions to invest in FIFs with a positive influence on investors' investment decision in FIFs.

Demographics

Demographic factors have been identified as one of the most important factors towards investment in mutual funds. Several studies found that gender, education level, financial knowledge and income level significantly influenced investors' decision towards mutual

funds (Gill et al., 2011; Jonsson, Söderberg, & Wilhelmsson, 2017; Wang, 2011; Tepchaitanawong, 2015). Generally speaking, investors with a higher level of financial knowledge, education level and income level tend to hold a relatively higher portion of investment in mutual funds or other advanced financial instruments.

In terms of gender, empirical evidence often suggested that women exhibit less risk-taking than men in their most recent, largest, and riskiest mutual fund investment decisions (Dwyer, Gilkeson, & List, 2002). Studies further showed that there was a significant difference between male and female in mutual fund selection criteria. Nevertheless, it is important to note that the effect of gender was often weakened when investors' financial knowledge was considered as the control variable in the analysis (Dwyer et al., 2002).

As demographics represent one of the commonly used variables in relevant research, this study further examines the influence of demographics factors towards investors' decision in mutual funds. In particular, the role of gender, age, education, income, marital status, occupation, and investment are examined.

Based on the preceding literature review, this study applied the framework from Ranganathan (2006) by applying the proposed independent variables under fund related qualities, fund sponsor qualities, investor related services and demographics to examine the investors' decision to invest in FIFs. To understand the influence of independent variables, this research used two research methods which were factor analysis and logistic regression. Firstly, the Principal Component Analysis (PCA) was used to analyze the interrelationships among independent variables and group them along the measurement dimension. Secondly, Logistic regression was applied to find the relationship between one or more predictor

variables (four group of independent variables) and a binary dependent variable (investors decision (Yes or No)) as shown in the conceptual framework.

Objectives of the study

1. To examine factors influencing investors' investment decision in FIF

2. To examine demographics of investors in FIFs investment

In light of the preceding literature, the proposed conceptual framework for the study is demonstrated in Figure 1 and Table 1 summarizes the components of independent variables.
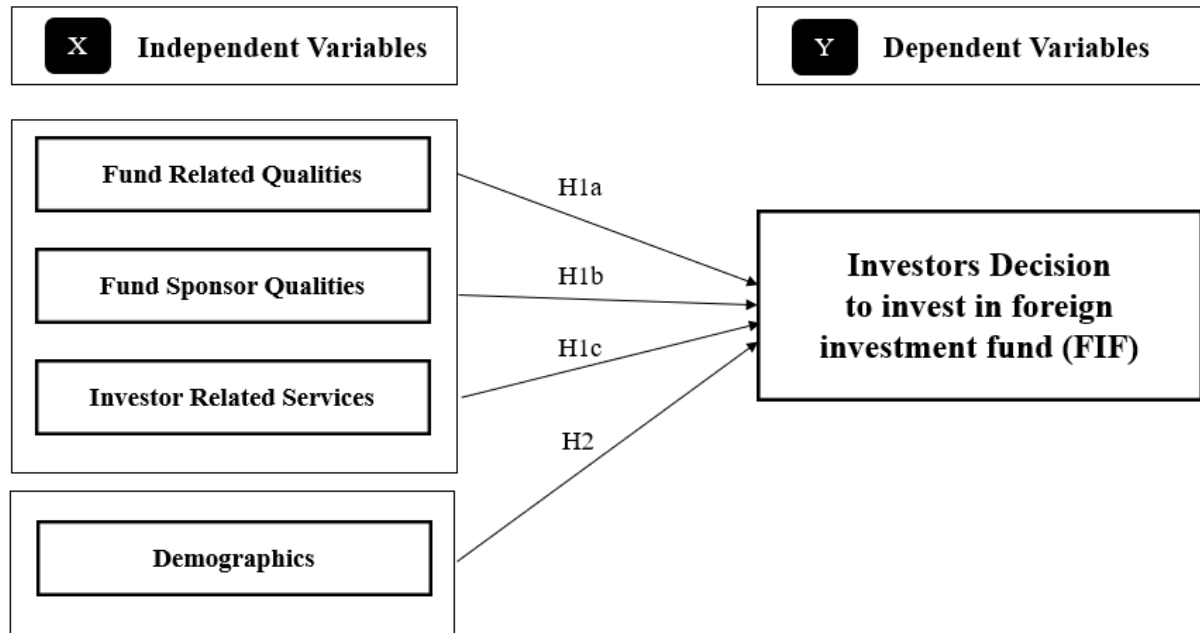

Figure 1 Conceptual framework

Table 1 Summary of components of the independent variables

No. 1: Fund related qualities	No. 2: Fund sponsor qualities	No. 3: Investor related services
Fund performance record	Reputation of AMC	Disclosure of investment objectives on the website
Fund reputation/ brand name	AMC has a recognized brand name.	Disclosure of periodicity of valuation on the website
Scheme's expense ratio	AMC has a well-developed agency and network	Disclosure of sales and repurchases in the offer documents
Scheme's portfolio investment		
Reputation of fund manager	Expertise of AMC in managing money	
Withdrawal facilities (lead time in processing or isbursement of funds)	AMC has well-developed research & infrastructure	Disclosure of NAV
Favorable ratings by rating	Past performance of AMC in	Disclosure of deviation of the investment from the

Table 1 (Continued)

No. 1: Fund related qualities	No. 2: Fund sponsor qualities	No. 3: Investor related services
agency	terms of risk and return	original pattern
Innovation of fund schemes	Expertise of AMC in	Redressal of investors'
Tax benefits	managing FX hedging	grievance
Front-end vs Back-end fees	policy	Other benefits
Minimum initial investment		

Hypotheses

The relevant hypotheses for the preceding conceptual framework are as follows:

Table 2 Summary of hypotheses

Summary of hypotheses
H1a   H0: There is no significant relationship between Fund Related Qualities (FRQ) and Investors' Decision to invest in mutual funds H1: There is a positive and significant relationship between Fund Related Qualities (FRQ) and Investors' Decision to invest in mutual funds
H1b   H0: There is no significant relationship between Fund Sponsor Qualities (FSQ) and Investors' Decision to invest in mutual funds H1: There is a positive and significant relationship between Fund Sponsor Qualities (FSQ) and Investors' Decision to invest in mutual funds
H1c   H0: There is no significant relationship between Investor Related Services (IRS) and Investors' Decision to invest in mutual funds H1: There is a positive and significant relationship between Investor Related Services (IRS) and Investors' Decision to invest in mutual funds
H2   H0: There is no significant relationship between demographics factors and Investors' Decision to invest in mutual funds H1: There is a positive and significant relationship between demographics and Investors' Decision to invest in mutual funds

Research Methodology

Population and sample

To determine the sample size, this study defined the population as residents of Bangkok Metropolitan areas with employee or entrepreneur profiles to reflect the income level, financial knowledge, and characteristics of the target investors in FIFs. The relevant statistics from the National Statistical Office of Thailand are reported in Table 3.

Table 3 Number of employment people in Bangkok (as of Dec. 2020) (National Statistical Office of Thailand, 2020)

(In million people)	Total	Male	Female
Employee	5.35	2.79	2.56
Entrepreneur	0.57	0.02	0.55
Total	5.92	2.81	3.11

Sample size

Sample size is determined by using Cochran's formula (Cochran, 1977), which takes into account the margin of error and the alpha level. Based on Cochran's formula, the estimation of population proportion (p) of 0.5 indicates the maximum variability in a population, which is often used to determine a more conservative sample size. Given the population size in table 3, the sample size was approximately 267 people. Given that the sample size of 267 people do not exceed 5% of the population ($5,921,418 \times 5\% = 296,071$ people), Cochran's correction formula is not required.

Sampling methods

The probability and non-probability sampling methods are applied for data collection during April to May 2021. The probability sampling method using stratified sampling, is applied to distribute the online questionnaires through groups of investors who currently work or live in the Bangkok metropolitan area via Line and Facebook application.

Non-probability sampling method using snowball sampling, is applied to recruit participants via other participants, such as asking friends for further forwarding questionnaires to other friends. In total, the research received 413 responses. After validating the completeness of responses and input errors, the final number of responses is 359 people.

Questionnaire development

This study adapted the survey questionnaire from the world of Ranganathan (2006). The instrument was separated into three parts. The first section contained demographic questions, covering broad demographic factors such as age, gender, education, and investment experience. At the same time, data on investment objectives and current investment holdings were asked as an indicator of the investment expertise. The second section related to the investment preference, comprising five questions. The last part measured the factors influencing investment in FIFs. Altogether there were three questions. Each question contained the components of the proposed independent factors. Respondents were asked to rate the importance of each factor using the 5-point Likert scale where five points mean

highly important, and one point mean not at all important.

Reliability test

The pilot test was conducted during 20-22 April 2021 among 32 respondents. Cronbach's alpha was used to test its reliability or internal consistency and how closely related a set of items were as a group. Results showed that Cronbach's alpha for all three independent variables was higher than 0.7. This score is considered acceptable in the social science research. More specifically, the Cronbach's alpha for Fund Related Qualities (11 variables), Fund Sponsor Qualities (7 variables) and Investors' Related Services (7 variables) were 0.8570, 0.8956 and 0.8856 respectively.

Quantitative analysis

Data analysis was performed through SPSS, using two key methods. Firstly, principal component analysis (PCA) is used to analyze the interrelationship among the components of each independent variable. This technique reduces the dimensionality of large data sets and identifies one with statistical significance towards investors' decision in FIFs. Kaiser-Meyer-Olkin, the measure of sampling adequacy, was performed on the three independent variables. The second part of data analysis was performed through logistic regression. The aim of the analysis was to examine the relationship between one or more predictor variables (group of factors) and a binary dependent variable, which is represented by investors' decision as Yes or No. The equation for logistic regression is presented below.

Logistic equation for three main categories of influencing factors;

$$ln\left(\frac{p}{1-p}\right) = \beta 0 + \beta 1x1 + \beta 2x2 + \beta 3x3 + \beta 4x4 + \beta 5x5 + \beta 6x6$$

Where

p is the probability of success (investors who answer yes for currently invest in FIFs)

$1-p$ is the probability of failure (investors who answer no for currently invest in FIFs)

β values are the linear parameters

$x1$ is the 1st predictor variable named fund performance (Fund Related Qualities)

$x2$ is the 2nd predictor variable named funds characteristics (Fund Related Qualities)

$x3$ is the 3rd predictor variable named subscription and redemption details (Fund Related Qualities)

$x4$ is the 4th predictor variable named quality of AMC (Fund Sponsor Qualities)

$x5$ is the 5th predictor variable named information disclosure (Investor Related Services)

$x6$ is the 6th predictor variable named customer support (Investor Related Services)

Logistic equation for demographic factors;

$$ln\left(\frac{p}{1-p}\right) = \beta 0 + \beta 1x1 + \beta 2x2 + \beta 3x3 + \beta 4x4 + \beta 5x5 + \beta 6x6$$

Where

p is the probability of success (investors who answer yes for currently invest in FIFs)

$1-p$ is the probability of failure (investors who answer no for currently invest in FIFs)

β values are the linear parameters

$x1$ is the 1st predictor variable named gender

$x2$ is the 2nd predictor variable named age

$x3$ is the 3rd predictor variable named academic qualification

$x4$ is the 4th predictor variable named marital status

$x5$ is the 5th predictor variable named occupation

$x6$ is the 6th predictor variable named investment experience

Results and Discussion

Descriptive statistics

Overall, the respondents fairly reflected the profile of the target population. Table 4 summarizes the key characteristics. Broadly speaking, the respondents were relatively balanced between male (55%) and female rest (45%). The majority aged between 31 to 40 years old (58%), followed by below 30 years old (33%). Over 76% of the respondents obtained Bachelor's degree, followed by Master's degree or above (23%).

In terms of occupation, the respondent closely matched the target population, being a corporate employee (87%) and entrepreneur (13%). When assessing the characteristics of investment profile and experiences, the majority of respondents possessed 6 to 10 years (65%), followed by more than 10 years' experience (23%), representing over 88%.

Table 4 Demographic profile summary

Demographic	Characteristics (N = 359)	Frequency	Percentage (%)
Gender	Male	199	55.4
	Female	160	44.6
Age	Below 30 years old	117	32.6
	31-40 years old	208	57.9
	41-50 years old and above	34	9.5
Academic qualification	Less than Bachelor's degree	4	1.1
	Bachelor's degree	273	76.0
	Master's degree or above	82	22.8
Marital status	Single	235	65.5
	Married	123	34.3
	Divorced and others	1	0.3
Occupation	Entrepreneur	46	12.8
	Employee	313	87.2
Investment experience	0-5 year(s)	46	12.8
	6-10 years	232	64.6
	More than 10 years	81	22.6

Multiple response question (respondents are able to answer more than one answer)

Table 4 (Continued)

Demographic	Characteristics (N = 359)	Frequency	Percentage (%)
Saving objective	For retirement	312	28.2
	For tax benefit	321	29.0
	For purchase of assets	284	25.7
	To meet contingency	170	15.4
	For children's education	20	1.8
Current investment	Equity	324	18.2
	Bond	204	11.4
	Mutual funds	340	19.1
	Foreign investment fund (FIF)	289	16.2
	Saving deposit	309	17.3
	Real-estate	79	4.4
	Insurance	216	12.1
	Gold	21	1.2

Apart from the preceding demographic factors, the overall responses on investment objectives and investment instruments were consistent with the investment experience. In general, the respondents had multiple saving objectives, ranging from retirement, tax benefits and purchase of assets. In reflection of the multiple saving objectives, respondents invested in multiple assets from equity, bonds, mutual funds, FIF, to name a few. These responses reflected the understanding of key investment concepts. Therefore, the respondents of this study had adequately captured the intended population.

Factor analysis

Results of Kaiser-Meyer-Olkin Measure of Sampling Adequacy for fund related qualities, fund sponsor qualities, and investor related services are 0.840, 0.857, and 0.825 respectively. Since the respective values were close to 1, factor analysis was, therefore, useful with the data set. Additionally, factor analysis enabled grouping of new components based on the loading score provided in the component matrix. Using 0.5 as a benchmark, the variables are reclassified into six components. More specifically, factor analysis identified three components under Fund Related Quality. They are Fund Characteristics, Subscription and Redemption Details, and Fund Performance. For Fund Sponsor Quality, all variables could be grouped as one component, referred to as Quality of AMC. Finally, the Investor Related Services could be classified into two main components namely Information Disclosure and Customer Support. Table 5 summarizes results of factors analysis and descriptive statistics corresponding to each component.

Table 5 Summary for factors analysis and descriptive statistics

	Components by factor analysis	Variables	Mean	SD
Fund related qualities	Funds characteristics	Fund's reputation or brand name	3.56	0.70
		Scheme's expense ratio	3.45	0.65
		Scheme's portfolio of investment	3.47	0.74
		Reputation of the fund manager/ scheme	3.46	0.77
		Withdrawal facilities (lead time in processing purchase or reimbursement of the fund)	3.51	0.73
		Favorable rating by a rating agency	3.43	0.74
		Innovativeness of the scheme	3.41	0.80
		Products with tax benefits	3.34	0.91
	Subscription and redemption details	Front-end & Back-end fee	4.00	0.63
		Minimum initial investment	4.08	0.67
	Fund performance	Fund performance record	4.44	0.59
Fund sponsor qualities of AMC	Quality of AMC	Reputation of AMC	3.64	0.69
		AMC has a recognized brand name	3.57	0.66
		AMC has a well-developed agency & network	3.57	0.68
		Expertise of AMC in managing money	3.74	0.68
		AMC has well-developed research & infrastructure	3.63	0.68
		Past performance of AMC in terms of risk and return	4.06	0.55
		Expertise of AMC in managing FX hedging policy	4.14	0.95

Table 5 (Continued)

	Components by factor analysis	Variables	Mean	SD
Investor related services	Information disclosure	Disclosure of investment objective on the website	3.41	0.75
		Disclosure of periodicity of valuation on the website	3.34	0.68
		Disclosure of the method and the periodicity of the schemes sales and repurchases in the offer documents	3.31	0.66
		Disclosure of deviation of investment from the original pattern	3.33	0.70
		Other benefits	2.55	1.01
	Customer support	Disclosure of NAV	4.01	0.54
		Redressal of investor's grievance	3.76	0.74

Logistic regression

The overall results of logistic regression showed the overall predictive accuracy of factors influencing investors' decisions to invest in FIFs and demographic variables were above 80%. In particular, the overall predictive accuracy of the factors influencing investors' decisions to invest in FIFs recorded 83%, while that of the demographics factors was 82.2%.

Furthermore, this study showed that Fund Performance, Quality of AMC and Customer Support showed a significant positive influence on investors' decisions to invest in FIFs. The t-stats were statistically significant at 95% confidence interval. In general, these findings were consistent with the general criteria for investment selection in mutual fund investments. Fund performance had long been recognized as the primary influencing factor towards investors' investment selection criteria. Indeed, the result was consistent with prior research in this area in both developed (Capon et al., 1996; Kozup et al., 2008) and developing markets (Ramasamy & Yeung, 2003; Vyas, 2013; Tepchaitanawong, 2015; Seesanit, 2010).

Table 6 Logistic regression for three main categories of influencing factors

							95% C.I. for EXP(B)	
Variables in the equation								
	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp (B)**	**Lower**	**Upper**
Constant	-9.29	1.96	22.38	1	0.00	0.00		
Fund performance	0.71	0.25	8.24	1	0.00**	2.04	1.25	3.32
Funds characteristics	-0.04	0.40	0.01	1	0.91	0.96	0.44	2.11
Subscription and redemption details	0.39	0.26	2.18	1	0.14	1.47	0.88	2.46
Quality of AMC	1.40	0.44	10.28	1	0.00**	4.07	1.73	9.60
Information disclosure	-0.48	0.34	2.01	1	0.16	0.62	0.32	1.20
Customer support	0.72	0.33	4.93	1	0.03*	2.06	1.09	3.90

*, ** imply level of statistical significance of the coefficient estimates, where ** implies high statistical significance.

In terms of the Quality of AMC, respondents placed important weight on both reputation and competent performance of AMC. In general, this finding is consistent with prior studies on investment criteria in mutual funds. Both reputation and competent performance were indeed important criteria for mutual fund selection, although some studies only documented the importance of either one. For instance, Seesanit (2010) found that only competent performance of AMC was important in influencing investment in mutual funds, whereas Vyas (2013) reported that the reputation of AMC was the key influencing factor for investment in mutual funds.

The importance of reputation and competent performance of AMC could be explained from the perspective of corporate reputation. According to Heh and Xie (2009), corporate reputation was a result of a long-term process within an organization. Several researchers documented the connection between corporate reputation and financial performance (Fombrun, 1996; Roberts & Dowling, 1997, 2002). Within the context of the B2C setting, Keh and Xie (2009) showed that corporate reputation influenced customer trust, customer identification and customer commitment.

The final factor that had a significant influence on investors' decisions in FIFs was Customer Support. This factor was made up of two components namely disclosure of NAV and redressal of investors' grievances. Although the finding was consistent with the investors' intuition to review the NAVs of FIF before making investment decisions (Babbar & Sehgal, 2018), it was surprising that other types of information disclosure was not important from the investors' view. As prudent practices of mutual fund investments, other

studies found that investors considered components in fund fact sheet as valuable insights, in mutual fund selection. For instance, investors considered size of fund (AUM) (Ferreira, Keswani, Miguel, & Ramos, 2012; Babbar & Sehgal, 2018), growth of fund size (Ciccotello, 1996; Babbar & Sehgal, 2018), and age of fund (Blake & Timmermann, 1998; Ferreira et al., 2012; Babbar & Sehgal, 2018) as criteria before invest in mutual funds. This aspect would be further discussed in recommendation for future research.

Table 7 Logistic result for demographic factors

Variables in the equation								
	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp (B)**	**95% C.I. for EXP(B)**	
							Lower	**Upper**
Constant	-0.61	1.27	0.23	1	0.63	0.54		
Gender	-0.69	0.29	5.60	1	0.02*	0.50	0.28	0.89
Age	0.43	0.27	2.49	1	0.12	1.53	0.90	2.60
Academic qualification	-0.05	0.33	0.03	1	0.87	0.95	0.49	1.82
Marital status	0.43	0.36	1.47	1	0.23	1.54	0.77	3.10
Occupation	0.45	0.39	1.27	1	0.26	1.56	0.72	3.38
Investment experience	0.24	0.25	0.92	1	0.34	1.27	0.78	2.08

*, ** imply level of statistical significance of the coefficient estimates, where ** implies high statistical significance.

When examining the logistic regression for demographic variables, this study found that gender was the only factor that had an influence on the investors' decisions to invest in FIFs. The t-stat was significant at 95% confidence level. It is important to note that the negative coefficient was due to the coding of male and female as 1 and 2, respectively. Furthermore, it is important to also note that the gender coding of male as 0 and female as 1 also produced the same result. Based on this information, the negative coefficient indicated that the male investors were more likely to invest in FIFs when compared with the female investors. This finding may be associated with the general risk appetite between male and female investors. In general, FIFs contained a higher investment risk due to foreign exchange fluctuation and underlying fund characteristics. As a result, FIFs might not be the top investment choices for conservative investors. In this study, the sampled female respondents indicated a higher level of risk aversion, as supported by descriptive statistics of female respondents who answer not to invest in FIFs for 39 people (11% of total respondents), higher than the similar answer from male respondents of 25 people (7% of total respondents). Results were consistent with Dwyer et al. (2002), Wang (2011), and

Tepchaitanawong (2015).

Conclusion

To better understand the factors influencing investment in FIFs, this study examined how fund related qualities (FRQ), fund sponsor qualities (FSQ), investor related services (IRS) and demographic factors influenced the investors' decisions in FIFs in the Bangkok Metropolitan area. Results of logistic regression revealed that fund performance (FRQ), quality of AMC (FSQ), customer support (IRS), and gender (Demographics) are statistically significant in influencing the investors' investment decision in FIFs.

In the context of FIFs investment, this study found that investors would pay attention to fund performance, quality of AMC encompassing reputation and AMC superior performance and expertise in Foreign Exchange hedging. In terms of investor's related services, investors focused mainly on the disclosure of Net Assets Value and mechanism to handle customers' grievances.

In comparison with prior research work of Tepchaitanawong (2015), the finding on fund performance remained consistent. This study did not find influence of other factors identified by Tepchaitanawong (2015) which were fund characteristics and security. Indeed, our findings suggested that investors placed emphasis on both fund specific factors such as fund performance and disclosure of NAV along with broader factors such as the reputation and track record of the AMC.

For demographic factors, Tepchaitanawong (2015) documented the influence of three demographic factors. Firstly, male investors were more likely to invest in FIFs more than female investors. Secondly, investors in the older age group (31-40) were more likely to invest in FIFs. Finally, investors in the higher income bracket (THB 50,000-THB 70,000) were more likely to invest in FIFs, compared to ones in the lower income range. Among the demographic factors considered in this study, only gender was statistically significant. Similar to Tepchaitanawong (2015), this study noted that male investors were more likely to invest in FIFs, compared to female investors.

The fact that age did not show any influence in this study could be explained by the change in investors' access to FIFs investment. Compared with 2015, the Asset Management Industries in 2020 became more accessible. Specifically, there has been an increasing number of Asset Management Companies using Financial Technology to make investment in mutual funds and FIFs much easier (SET Invest Now by The Stock Exchange of Thailand (SET), 2021). Apart from that, the widespread usage of social media communication by asset management companies and investment advisors had helped create greater awareness of FIFs investment among wider investor groups (Manager Online News, 2021). Finally, the change in the minimum investment amount in FIFs to only THB 1,000 had significantly opened opportunities for individual small investors (The Securities and Exchange Commission, Thailand (SEC), 2014). As a result of the shifting environment, it might be possible that wider groups of investors were able to invest in FIFs, regardless of age or income level.

It is important to note that other hypothesized factors that were not statistically significant at 95% confidence interval might be attributed to the responses from respondents, who expressed interests but did not invest in FIFs at this point. As FIFs is gaining greater momentum in the Thai Asset Management Industries, it is important to develop better understanding towards the investors' decision-making mechanism

beyond the scope discussed in this study. Such understanding would enable better segmentation and investment selection among Thai investors to support their personal investment success.

Limitations and Recommendations for Further Study

In terms of limitations, it is important to note that the study targeted employees and entrepreneur investors in Bangkok metropolitan area. As a consequence, the result of this study may not be generalized to represent broader investors in Thailand. Furthermore, this study did not consider investors' income level. Future research may consider segmentation by retail investors and high-networth investors to examine the difference in investment criteria among two groups.

Furthermore, this research documented that female investors were less likely to invest in FIFs. In light of the ongoing debate on the role of gender, future studies should include other control factors such as investment experience, financial knowledge and risk attitude (Rosplock, 2010; Dwyer et al., 2002). Such an approach would enable researchers to deepen their understanding on factors that exert real influence on FIFs investment decision. Consequently, future research should focus on investment preference of female investors.

Last but not least, this research documented that disclosure of NAV was the only statistically significant factor, compared to other components relating to information disclosure. Future research may focus on various types of information disclosure, sources of information and the respective influence over the investors' decision to invest in FIFs. Lastly, there might be other external factors affecting to investors' decision to invest in FIFs such as exposure to international investment or influence of social media of investment behaviors (Khalil & Nilsson, 2021) for the future study.

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