An Empirical Study of Internet Insurance in Taiwan Adopting the Theoretical Framework of UTAUT2

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Abstract

Insurance company managers must focus on improving the quality of internet insurance services in the near future. Since young people are early adopters of internet insurance, insurance companies in Taiwan must introduce value-added services to young people regarding internet insurance and provide more convenient services to older customers. This study investigated the factors that influence the intention of using internet insurance in Taiwan, adopting the theoretical framework of UTAUT2. The study determined which factors influence the intention to use internet insurance to allow insurance companies to develop more marketing strategies. The results of the study revealed that Performance Expectancy, Effort Expectancy, Facilitating Conditions, Perceived Risk, and Price Value significantly influenced consumers' intention to use insurance online services. Facilitating Conditions were also found to be a mediating variable with enhanced effectiveness between Behavioral Intention and Use Behavior. The intention to use had a significant effect on the Use Behavior of insurance network services.

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1. Introduction

A leading industry trends research firm found that the growth of the internet insurance market in major European economies between 2010 and 2015 was 22% significantly higher than the overall insurance market (Mordor Intelligence, 2020). Additionally, according to a study by Ernst & Young Global Limited entitled "2020 China Insurance Outlook," mainland China is the second largest insurance market in the world. The most important task after 2020 is to create and develop an online and data-based sales ecosystem in addition to the traditional insurance sales channels. In the same vein, Mordor Intelligence found that in the first half of 2018, more than 24% of the total insurance market in mainland China was generated by premiums from internet insurance. In addition to the rapid wave of internet insurance in Europe and China, the U.S., the world's largest insurance market, is also experiencing rapid growth in internet insurance. According to a study by ISI World, as many as 20.4% of insurance brokers in the U.S. will have adopted the internet insurance model to provide insurance sales services to their clients by 2020, with an annual growth rate of 6.7%.

In a survey conducted in 2020 by InsightXPlorer, nearly 75% of respondents had used the websites of insurance companies to inquire about products, 37.3% had purchased insurance through websites in the past, and more than 30% had purchased insurance more than four times. Purchasing insurance through online platforms is a new way to refresh the insured rate in Taiwan. It should be noted that in addition to relying on salespeople, many consumers are already buying insurance online, particularly non-life insurance. Consumers choose to purchase insurance through the internet due to better pricing and a simpler and faster application process. The survey also showed that nearly 30% of respondents would consider changing their insurance company within a year due to the expiration of their insurance policies or new insurance needs. This shows that it is not easy to gain a foothold in the minds of consumers by providing insurance services through the internet. However, high demand for online consumers does not mean it will be able to attract a large number of customers to the online market; sellers now face the most discerning consumers in history in addition to cross-industry competitors (Lu, 2021). The future of finance will be characterized by customers' demand for disintermediated services and the availability of financial services through ordinary, non-financial channels.

From the perspective of the entire value chain of insurance, including policy design, merchandising, insurance underwriting, and insurance claims, insurance technology must be an important foundation for traditional insurance companies to transform and operate internet insurance or for technology innovation companies to compete in the pure internet insurance market (Lee, 2020). However, even with the support of insurance technology in the design of insurance policies and sales services, if consumers' needs for insurance protection services are not satisfied or accepted, there will be obstacles in the promotion of internet insurance. Therefore, when studying issues related to the development of internet insurance, research should not only be concerned about whether insurance companies have sufficient insurance

technology development in the back office to solve the problem of underwriting and claims automation and efficiency but also consider the acceptance of internet insurance products and services by insurance consumers in the front office. This is because the "appropriateness" of online marketing depends on the nature of the insurance products and services (Karimi, 2013; Phutong, 2022). Whether it is a pure internet insurance company or a traditional insurance company that also operates internet insurance, the direct-to-consumer service is a critical outpost for the success or failure of internet insurance (see Figure 1).
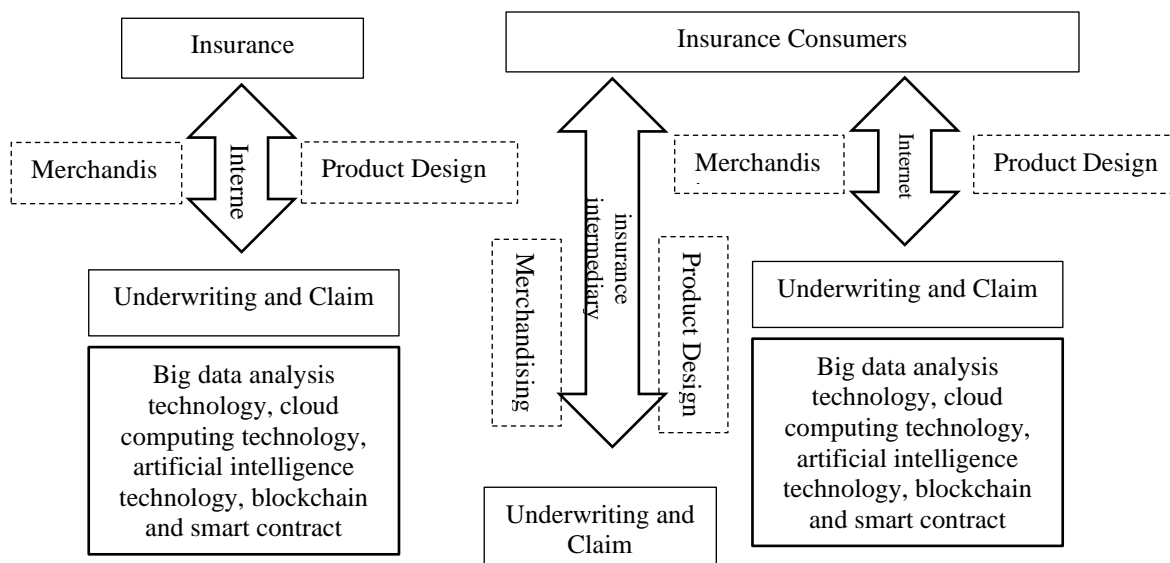

Figure 1: The operation process of traditional insurance companies that operate pure network insurance and network insurance

Although the insurance field is becoming more aware of the suitability of using online technology channels to sell insurance, there is little research on this topic in the extant literature (Tiwari et al.,2019). In Taiwan, there have been few research papers on the issue of internet insurance in recent years (e.g., Chang, 2019; Hsieh, 2018; Li, 2018; Chiu, 2017; Chang, 2009; Pan, 2006), all of which designed their own questionnaires to collect and analyze data and draw conclusions and did not specifically focus on consumers' acceptance of insurance products and services when technology is used as the base. Moreover, Network Insurance is not simply and directly transferring traditional insurance products to the internet while using the internet to sell insurance products. Therefore, it will be meaningful to investigate the acceptance of insurance consumers, meeting the needs of insurance consumers so that internet insurance products or services can be better adapted to market demand (Hsia, 2019). Otherwise stated, it will be more innovative to conduct research related to the development of internet insurance products and services from

the perspective of insurance technology acceptance and usage.

To address this research gap and provide a clearer reference for traditional insurance companies that are either purely or partly engaged in internet insurance to develop internet insurance products and services, this study has the following aims:

1) To develop and establish the user intent model of internet insurance from the perspective of information technology of internet insurance products and services.
2) To provide a theoretical basis for the development of internet insurance products and services to introduce internet insurance services that are easily accepted and used by insurance consumers in practice.

2. Literature Review

2.1   Evolution of Technology Acceptance Model

The most famous research paper on information technology (IT) acceptance behavior comes from the Technology Acceptance Model (TAM) proposed by Fred D. Davis in 1986. Although TAM has a theoretical foundation and simple application (Chih, 2009), it has been criticized for being based on realism and practical purposes only, without considering the feelings of technology users themselves (Chen, 2013). TAM has been improved since its publication and application in 1986, and other similar models have been developed; however, its integrity is still lacking. Therefore, Venkatesh et al. proposed a more complete Unified Theory of Acceptance and Use of Technology (UTAUT) integrated model theory (Venkatesh et al., 2003). This model integrates TRA (Theory of Reasoned Action), TAM/TAM2, Motivation Model (MM), Theory of Planned Behavior/Decomposed-TPB (TPB/DTPB), Combined-TAM-TPB, Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT) and eight other models of technology acceptance. Thus, the explanatory power of the model is as high as 56%, which is better than that of the eight models mentioned above (Venkatesh et al., 2012). UTAUT has four main components: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. The entire framework of UTAUT is shown in Figure 2.
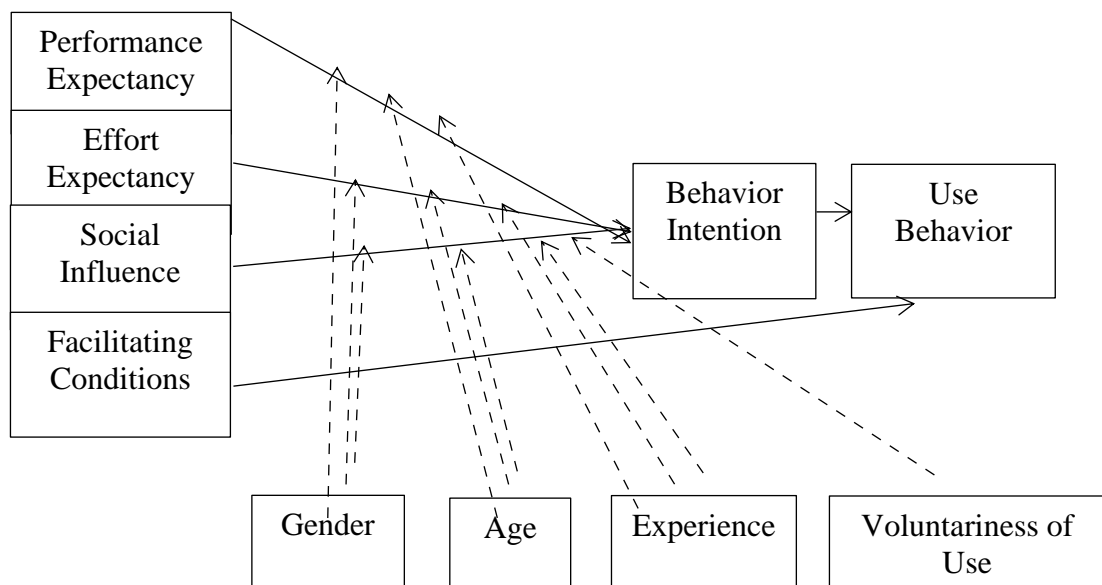
Figure 2: UTAUT Technology Acceptance Integration Model

Source: Venkatesh et al. (2012)

The UTAUT theory was introduced in 2003 and has been widely applied in various fields of technology acceptance research. Venkatesh, Thong, and Xu added Hedonic Motivation, Price Value, and Habit to the UTAUT proposed in 2003, while eliminating Voluntariness as an adjustment variable (Venkatesh et al., 2012). As Hedonic Motivation is a key predictor in many studies of consumer behavior or technology user backgrounds, it is important to consider intrinsic Hedonic Motivation in addition to the Performance Expectancy construct. Additionally, many studies of consumer behavior have demonstrated that cost is an important factor in explaining consumer behavior and that consumers bear the cost of purchasing system devices and services. Therefore, Price Value can support the importance of the impact on intention to use beyond the Effort Expectancy construct. Similarly, habits are distinct from experience, and experience is a necessary but not sufficient condition for habit formation, while habits can be described as a perceptual framework that responds to the results of prior experience. Thus, habits should be added as a separate construct. Finally, among the four interfering variables of the UTAUT technology acceptance integration model, Voluntariness is slightly redundant to the study of consumer intention as many empirical studies have found that most consumer behavior is voluntary (Chen, 2017). Venkatesh, Thong, and Xu found that UTAUT2 has 74% higher explanatory power in consumer usage of intent compared to UTAUT (Venkatesh et al., 2012).
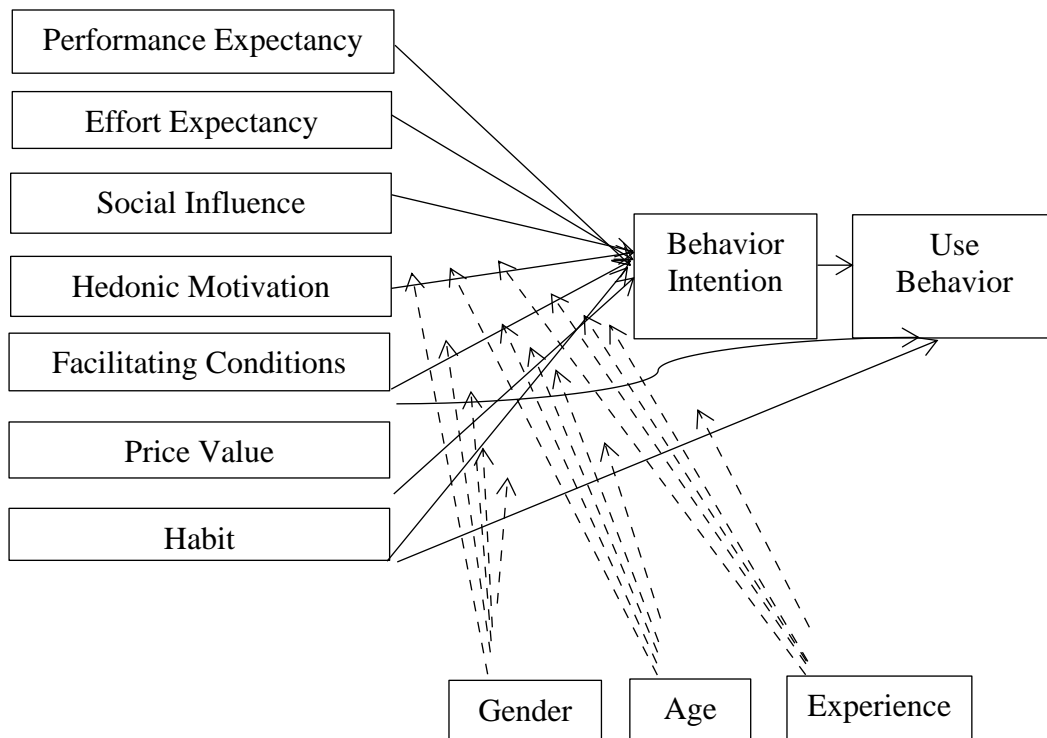
Figure 3: UTAUT2 Technology Acceptance Integration Model

Source: Venkatesh et al. (2012)

2.2   Empirical studies related to technology acceptance models in different fields

Qu, Li, and Zhang used the UTAUT2 model to validate the acceptance of electronic cash payments by consumers in mainland China (Qu et al, 2022). Miraz et al. analyzed the intention to use cryptocurrency and found that Performance Expectancy harmed the use of cryptocurrency in the market (Miraz et al., 2022). Phuthong (2022) used the UTAUT2 model to examine consumer engagement in Augmented Reality (AR) shopping during the COVID-19 epidemic. The study found that the most important factor influencing customer engagement was digital service experience, followed by enjoyment motivation, effort expectancy, Price Value, Social Influence, individual innovation, and Perceived Risk. Gronhaug and Stone cited Perceived Risk in consumer behavior studies in 1995 and 1999 and even in the field of public administration (Gronhaug and Stone, 1999). Based on UTAUT2, the related study investigated the factors that influence the satisfaction of using mobile commerce and confirmed that Perceived Risk affects consumers' intention to use online shopping or government services (Khattab et al., 2015). Koman (2016) found that age negatively moderated the relationship between intention to accept mobile internet services and Perceived Risk in a study on mobile internet service acceptance.

Mahmud et al. (2022) used the UTAUT2 model to study the acceptance of the rural financial system app (Siskeudes) by Indonesian people. The results of the analysis found that Performance Expectancy and Effort Expectancy are the most important factors influencing the intention to use Siskeudes APP (application). The effect of Facilitating Conditions on the intention to use Siskeudes APP was not significant. However, the intention to use and Price Value had a significant impact on action taken to use Siskeudes APP. Due to many problems in using internet banking, banks in India are unable to convince their customers to use the services available on internet banking. Therefore, Inder, Sood, and Grima used the UTAUT2 model to explore consumer acceptance of internet banking (Inder et al., 2022). They found that Performance Expectancy, Hedonic Motivation, Experience, Habit, Website Usability, Reliability, and Security were factors that impacted the Behavior Intention of Internet Insurance. Lee and Kang used the UTAUT2 model to explore the reasons for the low usage of internet banking in Taiwan and found that inertia and technological anxiety negatively affect internet banking acceptance, while internet banking acceptance positively affects the intention to use internet banking (Lee and Kang, 2021). Merhi et al. conducted a study on technology acceptance based on UTAUT2 and found that age moderates the relationship between Facilitating Conditions and intention to use mobile internet banking services (Merhi et al., 2021).

Although there are many empirical studies related to technology acceptance models in the insurance field compared to many other fields, the focus on the use of the UTAUT2 model is not as abundant. Chen explored the factors influencing online gamers' willingness to purchase virtual property insurance from a model developmental perspective, combined with the TAM of consumer behavior, and finally conducted a structural equation modeling (SEM) empirical analysis and examination of the hypotheses (Chen, 2016). It was found that players' willingness to insure was positively related to the perceived ease of use and perceived usefulness of the initial model and players' subjective norms and trust in the extended model. However, willingness to insure is inversely related to Perceived Risk. Similarly, for the study related to internet insurance consumption, Liu improved the original UTAUT model based on the referenced literature and added four variables: Website Quality, Online Word-of-Mouth, Perceived Risk, and Perceived Trust, and adjusted the interference variables appropriately before forming a research model for internet insurance consumption intentions (Liu, 2016). It was found that the factors affecting the consumption intention of internet insurance were perceived trust, Social Influence, internet word-of-mouth, and website quality. Among the interfering variables, age, education level, monthly income, and number of times purchasing insurance products had significant effects on consumption intention.

Yi used online consumer behavior theory to conduct a factor analysis of the willingness to buy online life insurance based on planning behavior theory, constructing a survey questionnaire based on the research hypotheses and conducting logistic regression analysis on the obtained data (Yi, 2016). Yi (2016) learned that the factors affecting willingness to purchase online life insurance

included product promotion, and public awareness, perceived value of website pages; the factors that influenced willingness to purchase online life insurance included product promotion, public awareness, perceived value of website pages, understanding of online life insurance product information, and online security. In addition to broad studies, some scholars have also studied specific internet insurance companies as their subjects. By employing the theory of planned behavior and TAM, Shen surveyed 298 subjects on their willingness to purchase internet insurance and used logistic regression to analyze the main factors that may affect consumers' willingness to purchase (Shen, 2017). The empirical analysis revealed that age, income level, internet financial usage, insurance knowledge, reputation of internet insurance companies, involvement of consumers' close friends, evaluation of internet insurance services, and security of internet insurance system had significant effects on the purchase intention of internet insurance. Using the same logistic regression analysis method and based on the planning line theory, Zhang and Li (2018) found through empirical analysis that the variables of consumers' income level, attitude toward online financial insurance awareness, degree of internet insurance promotion, credibility of the insurance company, and perceived ease of use of multi-channel business assistance and online financial insurance purchases had significant effects on purchase intention.

There has been a gradual increase in the proportion of studies using the UTAUT model to analyze purchase intentions of internet insurance since 2018. Based on the UTAUT model and the current status of internet insurance development, Deng studied the factors influencing purchase intentions of internet insurance from the perspective of consumers' needs. A total of 7 potential variables and 35 observed variables were designed and 388 valid questionnaires were returned and analyzed using SPSS22.0 and AMOS22.0 software (Deng, 2018). The results of the study showed that the variables of Performance Expectancy, effort expectancy, and Social Influence had direct or indirect effects on willingness to purchase internet insurance. However, gender and experience of purchasing internet insurance did not interfere with the whole model.

In the same period, Li obtained similar findings in his study on the characteristics of internet insurance consumer behavior and factors influencing demand (Li, 2018). Yu (2019) also developed a UTAUT model to study consumer behavior concerning internet health insurance based on the original four core variables of the UTAUT model, adding Perceived Risk as a new indicator and making appropriate adjustments to the interfering variables in the original model. Based on the variables in the model, corresponding questions were designed. It was found that Performance Expectancy, Social Influence, and Perceived Risk had significant effects on consumption intention. The variables of occupation, education level, monthly income, health status, and usage experience interfered with the study, while consumer intention had a significant effect on consumer behavior. To purchase intentions of specific insurance products, Wu, in an empirical analysis of the factors influencing consumption intentions of internet travel insurance in mainland China, first constructed a model of the factors influencing consumption intentions of

internet travel insurance based on past related literature, adding Perceived Risk, Perceived Trust, and Hedonic Motivation to the original four core variables of the UTAUT model (Wu, 2019). The analysis of the returned questionnaires revealed that Social Influence, Perceived Trust, and Hedonic Motivation had significant effects on consumer intention. Still using travel insurance as the research object, Wang constructed an analytical framework of residents' willingness to take out insurance under the "Internet+" model based on the UTAUT model and then used a binary logistic model to empirically study the influence of residents' willingness to purchase internet travel accident insurance (Wang, 2020). The study found that the variables of website access speed, service usefulness, knowledgeability, media publicity, information usefulness, and personal information security all had significant effects on willingness to purchase internet travel accident insurance.

Studies on the influence of internet insurance purchase intentions in Taiwan are rare and most of them did not use related technology acceptance models. There is also a lack of studies using the UTAUT2 model; thus, results may not fully capture the influence of technology usage factors.

2.3   Theoretical model construction

This study uses UTAUT2 as the basis of a theoretical model to explore the factors that influence intentions to use internet insurance in Taiwan for the following two reasons: (1) From the above literature, we can learn that UTAUT2 has not only integrated eight technology acceptance models and adjusted variables with the development of technology but also is currently the most explanatory technology acceptance model. (2) From the above literature, this study finds that the UTAUT2 model has been used in a wide range of research areas, from payment, shopping, and finance; thus, it has wide applicability. However, the use of UTAUT2 is not accepted across the board and variables must be adjusted appropriately according to the nature of the research area.

Based on the characteristics of the insurance industry and the aforementioned related research papers, this study developed a technology acceptance integration model based on the existing model of UTAUT2 as shown in Figure 4.
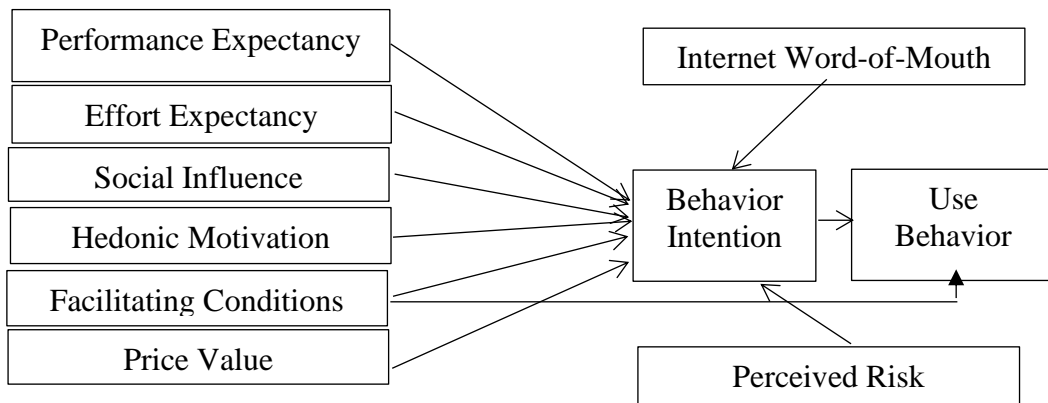
Figure 4: Technology acceptance integration model for this study

2.4   Reasons for adjusting the variables of the technology acceptance integration model and definitions of the new variables

This study removed one variable (habit) and two moderating variables (gender and experience) from the original UTAUT2 model but added two new variables (Internet Word-of-Mouth (IWOM) and Perceived Risk).

According to Markets and Markets, global insurance online platforms will only account for 13.7% of total premium revenue in 2023 and, even in Taiwan, internet insurance will only account for 0.3% of total premium revenue (Markets and Markets,2022). Otherwise stated, the market penetration rate of internet insurance is very low and most policyholders have not formed the habit of internet insurance consumption. In addition to habit, from the aforementioned literature, there is little evidence that gender moderates intentions to use technology in the financial sector; thus, it was excluded from the model. However, two new variables were introduced in the technology acceptance integration model, which are defined as follows:

1.Perceived Risk

Perceived Risk refers to the consumer's perception of the expected loss that may result from a consumer decision error. Scholars have confirmed that Perceived Risk affects intentions to use technology (Gronhaug, 1999; Featherman and Pavlou, 2014; Shivani et al., 2022). Since there are certain privacy and personal data security risks associated with internet financial insurance, this variable was added to this study.

2. IWOM (Internet Word-of-Mouth)

Hennig-Thurau et al. defined IWOM as any positive or negative statements about a product or company made by potential, actual, or established customers via the internet (Kalinić et al., 2019). As many related papers have found that IWOM influences technology Behavioral Intentions, this study incorporated IWOM variables into the technology acceptance integration model (Henning-Thurau,2004; Loong et al., 2018).

2.5   Research hypothesis and survey design

2.5.1   Research Hypothesis

According to the integrated model of technology acceptance in Figure 4, the research hypotheses of this study are summarized in Table 1.

Table 1: Summary of study hypotheses

H_N	Hypotheses
H_1	Performance Expectancy has a significant positive impact on consumer intentions to use internet insurance platforms
H_2	Effort Expectancy has a significant positive impact on consumer intentions to use internet insurance platforms
H_3	Social Influence has a significant positive impact on consumer intentions to use internet insurance platforms
H_4	Hedonic Motivation has a significant positive impact on consumer intentions to use internet insurance platforms
H_5	Facilitating Conditions have a significant positive impact on consumer intentions to use internet insurance platforms
H_6	Price Value has a significant positive impact on consumer intentions to use internet insurance platforms
H_7	IWOM has a significant positive impact on consumer intentions to use internet insurance platforms
H_8	Perceived Risk has a significant negative impact on consumer intentions to use internet insurance platforms
H_9	Facilitating Conditions have a significant positive impact on Behavior Intentions when using internet insurance platforms
H_{10}	Behavior Intentions have a significant positive impact on Use Behavior when using internet insurance platforms
H_{11}	The factor of Behavior Intentions mediates the relationship between Facilitating Conditions and Use Behavior

2.5.2   Questionnaire design

In this study, the questionnaire design was based on the literature regarding each of the dependent variables; the finalized questions are listed in Table 2.

Since internet insurance is a new type of insurance purchase channel, general consumers are not clear about its specific definition. To enable respondents to understand the content of the questionnaire correctly, a clear definition of internet insurance was provided at the beginning of the questionnaire and the purpose of the questionnaire was explained. The questionnaire was divided into two sections. The first section concerned basic demographic information, including gender, age, occupation, income, education level, and marital status. The second section concerned the measurement of the variables that influence consumers' acceptance of internet insurance platforms. The questions for each factor were designed to be

tested on a five-point Likert scale. The response options were 1 for strongly disagree, 2 for disagree, 3 for no opinion, 4 for agree, and 5 for strongly agree.

Table 2: Research variable measurement questions

Variable	Measurement Questions	Reference
Performance Expectancy	1. Through the rich information on insurance network platform, I can fully understand the insurance products and services. 2. Through insurance network platform, I can take out insurance policies anytime and anywhere to improve the efficiency of insurance purchases. 3. Through insurance network platform, I can compare different insurance products and services, which is beneficial to making a good purchasing decision.	(Venkatesh et al., 2012) (Mahmud et al., 2022)
Effort Expectancy	4. With a little learning time, I can become familiar with using insurance network platform. 5. I can easily and clearly understand the process steps of taking out insurance or using insurance services on insurance network platform.	(Venkatesh et al., 2012 ; Phuthong, 2022) (Mahmud et al., 2022)
Social Influence	6. My friends, family, and colleagues recommend that I buy insurance or use insurance services on insurance network platforms. 7. When people who influence me buy insurance or use insurance services through the internet, I seriously consider using insurance network platforms. 8. When I buy or use goods or services on insurance network platform, it is easier for me to integrate into social groups on the internet. 9. I consider buying insurance or using insurance services through insurance network platforms because of the publicity of social media.	(Venkatesh et al., 2012; Phuthong, 2022)
Hedonic Motivation	10. I have a pleasant experience when I use the insurance network platform. 11. When I use insurance network platform, I am exposed to many multimedia displays such as videos and pictures that are entertaining.	(Venkatesh et al., 2012; Phuthong,2022)
Facilitating Conditions	12. I have the necessary resources such as a smartphone, computer, or online payment device when I use insurance network platform. 13. I have basic insurance knowledge and can understand the content and instructions on the insurance network platform. 14. When I purchase insurance or use services through insurance network platform, I can get timely assistance if I encounter difficulties or have questions.	(Venkatesh et al., 2012)
Price Value	15. I can get discounted premiums when I buy insurance or use services through an insurance network platform. 16. Insurance network platform can provide me with a good price ratio. 17. I can get a reasonable premium when I buy insurance or use services through an insurance network platform.	(Venkatesh et al., 2012; Phuthong,2022) (Mahmud et al., 2022)
IWOM	18. When purchasing insurance or using services through insurance network platforms, I refer to the relevant experiences and evaluations of other purchasers on the internet. 19. The more adequate the evaluation of the relevant insurance network platform, the more it will influence my decision of purchasing insurance or using services on the insurance network. 20. I choose insurance network platform with a better reputation to purchase insurance or use services.	(Hennig-Thurau et al., 2004; Kalinić,et al., 2019)

Perceived Risk	21. I am worried that my personal information will be leaked when I use insurance network platform. 22. I am worried that when I use insurance network platform to buy insurance, I will buy a fake policy. 23. I am worried that there will be fraudulent premiums when I buy insurance through insurance network platform. 24. I am worried that I will not receive timely assistance when I have difficulties or questions when purchasing insurance or using services through insurance network platform.	(Shivani Puri et al., 2022)
Behavior Intentions	25. I have purchased insurance or used services through an insurance network platform. 26. I have recommended insurance and/or insurance services available on insurance network platforms to my friends, relatives, and/or colleagues. 27. I will buy insurance or use insurance services through insurance network platforms more frequently in the future.	(Venkatesh et al., 2012)
Use Behavior	28. I have started to use insurance network platform to purchase insurance or use insurance services. 29. I often use insurance network platform to purchase insurance or use insurance services. 30. I have recommended using insurance network platform to buy insurance or use insurance services to my friends, relatives, and/or colleagues. 31. I will continue to use insurance network platform to purchase insurance or use insurance services in the future.	(Venkatesh et al., 2012)

3. Methodology

3.1   Sample Size and Sampling Method

Since the subject of the study was the analysis of the intentional model of insurance online platform usage, the data were collected from consumers who had purchased insurance or used insurance services through the internet. However, according to the research report of Taiwan Internet Information Center in 2020, a higher percentage of internet users are between 15 and 35 years old, and it is not possible to purchase insurance under 20 years old. Therefore, the age of the respondents in this study was between 20 and 40 years old. The sample size was calculated according to the following sample size formula.

$$n = \left[\frac{Z_{\frac{\alpha}{2}}\sigma}{e}\right]^2$$

The range rule was used to estimate s as [5 − (−5)] / 4 = 2.5. At a confidence level of 95%, Zα/2 was set to 1.96. The error value e of the mean estimate was also set to not exceed 0.25. Therefore, n = [1.96 ∗ 2.5/0.20] ∗ [1.96 ∗ 2.5/0.20]. Otherwise stated, the sample size that needed to be achieved in this study was 600.25 with a confidence level of 95% and the error not exceeding 0.2. Thus, the number of questionnaires to be distributed randomly in this study was approximately 600.

3.2   Data Analysis Method

In addition to analyzing the sample composition, this study further analyzed the data through correlation analysis, path analysis, adjustment, and mediation analysis.

4. Results

4.1   Results of sample data collection and sample structure

A total of 600 questionnaires were distributed from the beginning of May 2021 to the middle of July 2021. After deducting 45 invalid questionnaires, 555 valid questionnaires were distributed. The distribution of the sample structure of this study is shown in Table 3. Most of the respondents were men aged between 29 and 39; more than half of them had a university education, most were corporate employees, and most earned between NT$30,000 and NT$50,000.

Table 3: Sample structure distribution

Item	Category	Number of persons	%
Gender	Male	296	53.33
	Female	259	46.67
	Total	555	100
Age	20-29	183	32.97
	30-39	176	31.71
	40-49	152	27.39
	50-59	35	6.30
	Over 60	9	1.62
	Total	555	100
Education Level	High school and below	23	4.14
	College degree	167	30.09
	Bachelor	339	61.08
	Master and above	26	4.68
	Total	555	100
Occupation	Public sector employees	159	28.65
	Corporate staff	327	58.92
	Freelance worker	46	8.29
	Other	23	4.14
	Total	555	100
Income (per month) (NT$)	30,000 and below	29	5.23
	30,001-40,000	189	34.05
	40,001-50,000	228	41.08
	50,001-60,000	56	10.09
	60,001-70,000	28	5.05
	70,001-80,000	16	2.88
	80,001 and above	9	1.62
	Total	555	100
Marital Status	Single	214	38.56
	Married	341	61.44
	Total	555	100

4.2   Descriptive Statistical Analysis of Variables

There were ten variables in this study; the descriptive statistics for each variable are shown in Table 4. Perceived Risk had the highest mean value (3.512), followed by IWOM (3.484), and Effort Expectancy (3.419). All other variables also had a mean value higher than 3. The overall level of agreement was good.

Table 4: Descriptive statistical analysis of variables

Variables	Sample Size	Mean	Standard Deviation
Performance Expectancy	555	3.325	1.125
Effort Expectancy	555	3.419	1.303
Social Influence	555	3.176	1.252
Hedonic Motivation	555	3.229	1.116
Facilitating Conditions	555	3.128	1.154
Price Value	555	3.142	1.189
Internet Word-of-Mouth	555	3.484	1.248
Perceived Risk	555	3.512	1.179
Behavior Intention	555	3.317	1.227
Use Behavior	555	3.189	1.152

4.3   Reliability and validity analysis of the questionnaire

In this study, Cronbach's Alpha reliability analysis, which is commonly used by researchers, was used to analyze the reliability of the questionnaire. Generally, a Cronbach's Alpha value greater than 0.7 is acceptable and a value greater than 0.9 indicates good reliability (Taber, 2017). The results of the reliability analysis of the questionnaire in this study are shown in Table 5.

Table 5: Cronbach's Alpha values for the reliability analysis of the questionnaire

Variable Name	Cronbach's Alpha	Number of measurement questions
Performance Expectancy	0.895	3
Effort Expectancy	0.932	2
Social Influence	0.875	4
Hedonic Motivation	0.901	2
Facilitating Conditions	0.862	3
Price Value	0.907	3
IWOM	0.854	3
Perceived Risk	0.914	4
Behavior Intentions	0.829	3

The variables and questionnaire design of this study were drawn from related literature and appropriately modified according to the nature of the study. The variables could be measured accurately and effectively, it was thus inferred that the questionnaire questions met the purpose of the study and had a considerable degree of content validity. A validated factor analysis was used to measure the scale; the suitability of the pre-designed technology acceptance integration model was analyzed first and the main reference indicators were revised as shown in Table 6.

Table 6: Suitability indicators for validity factor analysis

Indicators	$\chi^{2/df}$	RMSEA	GFI	CFI	IFI	PNFI
Value	2.314	0.048	0.101	0.112	0.995	0.901
	<3	<0.08	>0.9	>0.9	>0.9	>0.5
	Good adaptability	Good adaptability	Good adaptability	Good adaptability	Good adaptability	Good adaptability

In summary, the values of the indicators in Table 6 above showed that the overall fitness of the integrated model of technology acceptance was good and in the acceptable range; thus, the measured model had good fitness. Factor Loading (FL), combination reliability (CR), and average variance (AVE) were also used to measure the convergent validity of the questionnaire. The results are shown in Table 7.

Table 7: Results of the structural validity analysis of the technology acceptance integration model

Potential variables	Measured questions	FL>0.5	PV<0.001	CR>0.7	AVE>0.5
Performance	1	0.623	✓	0.778	0.622
Expectancy	2	0.742	✓	0.854	0.701
	3	0.801	✓	0.763	0.713
Effort	4	0.668	✓	0.719	0.599
Expectancy	5	0.736	✓	0.823	0.598
Social	6	0.859	✓	0.901	0.684
Influence	7	0.648	✓	0.911	0.752
	8	0.725	✓	0.827	0.669
	9	0.698	✓	0.761	0.642
Hedonic	10	0.736	✓	0.861	0.672
Motivation	11	0.801	✓	0.896	0.639
Facilitating	12	0.769	✓	0.923	0.751
Conditions	13	0.804	✓	0.881	0.707

	14	0.845	✓	0.793	0.664
Value	15	0.793	✓	0.894	0.681
Price	16	0.627	✓	0.903	0.703
	17	0.669	✓	0.915	0.658
IWOM	18	0.761	✓	0.864	0.539
	19	0.724	✓	0.753	0.628
	20	0.815	✓	0.897	0.594
Perceived	21	0.614	✓	0.916	0.685
Risk	22	0.765	✓	0.893	0.664
	23	0.830	✓	0.779	0.587
	24	0.753	✓	0.906	0.608
Behavior	25	0.811	✓	0.921	0.682
Intention	26	0.731	✓	0.838	0.637
	27	0.668	✓	0.845	0.708
Use	28	0.806	✓	0.794	0.625
Behavior	29	0.816	✓	0.867	0.556
	30	0.794	✓	0.917	0.704
	31	0.698	✓	0.848	0.681

According to Table 7, the integrated model of technology acceptance consisted of 10 potential variables and the FLs of the measured questions under all potential variables were greater than 0.5. The CR was greater than 0.7 and the AVE was greater than 0.5. Therefore, the adequate convergent validity of the structure of the integrated model of technology was accepted.

4.4   Variable correlation analysis

The purpose of variable correlation analysis is to measure the strength of the relationship between variables; the Pearson correlation method was used in this study. The correlation coefficients between the 10 variables in this study are shown in Table 8.

Table 8: Correlation coefficients between variables

Variables	Performance Expectancy	Effort Expectancy	Social Influence	Hedonic Motivation	Facilitating Conditions	Price Value	IWOM	Perceived Risk	Behavior Intentions	Use Behavior
Performance Expectancy	1									
Effort Expectancy	0.201**	1								
Social Influence	0.428**	0.217**	1							
Hedonic Motivation	0.326**	0.274**	0.279**	1						
Facilitating Conditions	0.157*	0.361**	0.271**	0.270**	1					
Price Value	0.227**	0.345**	0.249**	0.231**	0.317**	1				
IWOM	0.351**	0.211**	0.301**	0.153**	0.372**	0.359**	1			
Perceived Risk	0.118	0.013	0.106	0.103	0.073	-0.005	-0.002*	1		
Behavior Intentions	0.347**	0.328**	0.427**	0.137**	0.452**	0.441**	0.431**	-0.132**	1	
Use Behavior	0.269**	0.284**	0.304**	0.227**	0.305**	0.373**	0.407**	-0.036	0.437**	1

** P<0.01

According to the correlation coefficients between the variables in Table 8, there were significant positive correlations between Performance Expectancy and Behavior Intentions (0.347, P<0.01), Effort Expectancy and Behavior Intentions (0.328, P<0.01), Social Influence and Behavior Intentions (0.427, P<0.01), Hedonic Motivation and Behavior Intentions (0.137, P<0.01), Facilitating Conditions and Behavior Intentions (0.452, P<0.01), Price Value and Behavior Intentions (0.441, P<0.01), IWOM and Behavior Intentions (0.431, P<0.01), Behavior Intentions and Use Behavior (0.437, P<0.01), and Facilitating Conditions and Use Behavior (0.305, P<0.01). There was a significant negative correlation between Perceived Risk and Behavior Intentions (−0.132, P<0.01).

4.5   SEM model

In this study, SEM was used to verify the hypothetical relationships in and structure of the integrated model of technology acceptance. SEM was divided into two parts of verification: one to verify the relationship between the potential variables and the variable observations and the other to verify the relationship between the potential variables. In Figure 5, the ellipse represents the potential variable, the rectangle represents the observation, and the circle is the error term. Before verifying the relationship between the potential variables, it is important to verify the suitability of the technology acceptance integration model. As shown in Table 9, the fit of the technology acceptance integration model was good and within the acceptable range.

Table 9: Suitability analysis of technology acceptance integration model

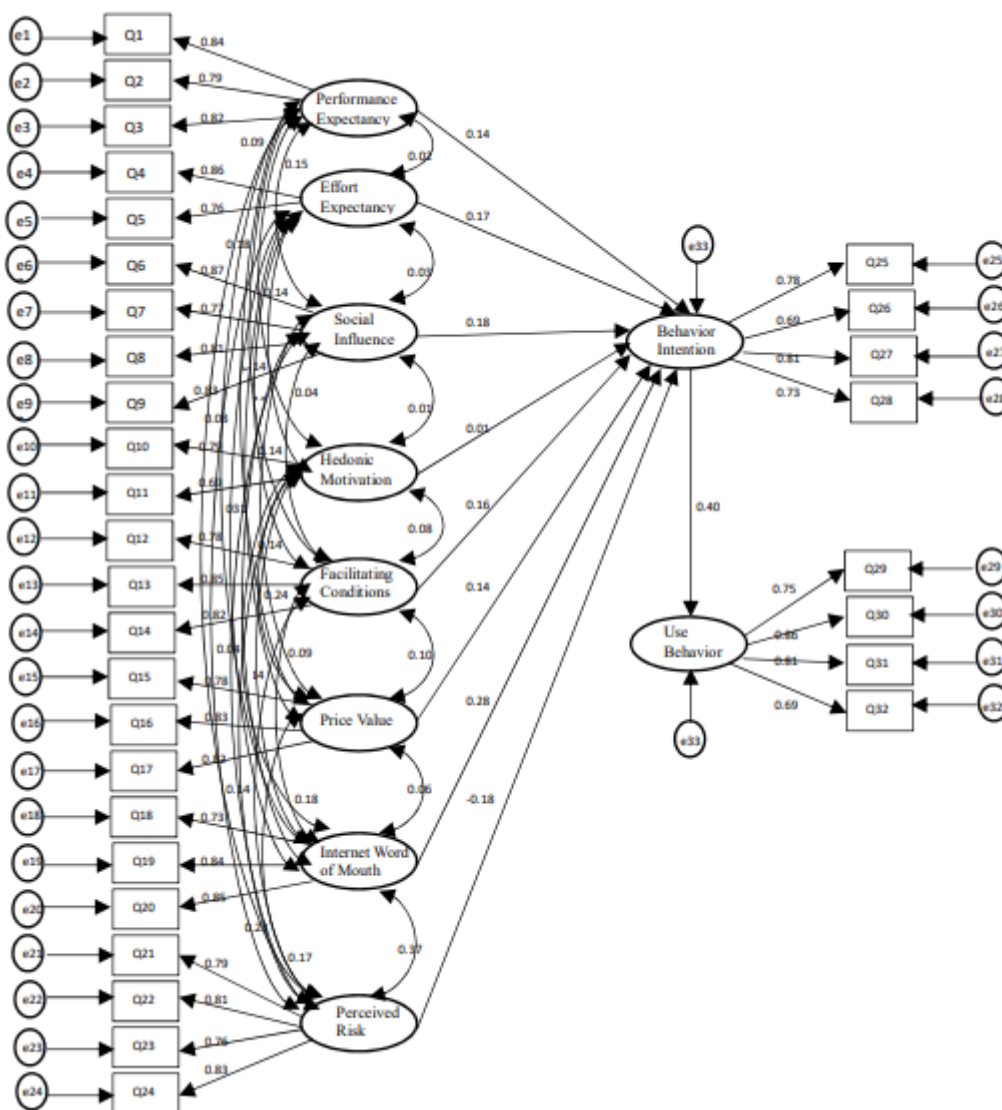| Index	$\chi^{2/df}$	RMSEA	GFI	CFI	IFI	PNFI
value	2.019	0.052	0.165	1.187	1.028	0.761
	<3	<0.08	>0.9	>0.9	>0.9	>0.5
	goodness of fit is good	goodness of fit is good	goodness of fit is good	goodness of fit is good	goodness of fit is good	goodness of fit is good

Figure 5: Technology acceptance integration model and standardized path coefficients

This study continued to verify the relationship between potential variables using AMOS software in IBM SPSS Statistics 25; the results obtained are shown in Figure 5 and Table 10.

Table 10: Relationships between Potential Variables

Potential Variables	Coefficient of Potential Variables	S.E.	T	P-Value
Performance Expectancy and Behavior Intentions	0.143	0.024	3.969	***
Effort Expectancy and Behavior Intentions	0.174	0.051	4.892	***
Social Influence and Behavior Intentions	0.182	0.043	2.357	0.144
Hedonic Motivation and Behavior Intentions	0.005	0.058	1.247	0.301
Facilitating Conditions and Behavior Intentions	0.159	0.029	4.388	***
Price Value and Behavior Intentions	0.138	0.046	4.993	***
IWOM and Behavior Intentions	0.279	0.033	2.913	0.204
Perceived Risk and Behavior Intentions	−0.183	0.027	5.358	***
Behavior Intentions and Use Behavior	0.402	0.052	6.781	***
Facilitating Conditions and Use Behavior	0.157	0.068	3.698	***

*** P-Value <0.001

The coefficient of Performance Expectancy on the path of Behavior Intentions was 0.143 and had a significant positive effect (t = 3.969, P-Value < 0.001). The coefficient of Effort Expectancy on the path of Behavior Intentions was 0.174 and had a significant positive effect (t = 4.892, P-Value < 0.001). The coefficient of Facilitating Conditions on the path of Behavior Intentions was 0.159 and had a significant positive effect (t = 4.388, P-Value < 0.001). The coefficient of Price Value on the path of Behavior Intentions was 0.138 and had a significant positive effect (t = 4.993, P-Value < 0.001). Perceived Risk had a significant negative effect on the path of Behavior Intentions, with a coefficient of −0.183 (t = 5.358, P-Value

< 0.001). The path correlation coefficient of Behavior Intentions was 0.402 and had a significant positive effect on Use Behavior (t = 6.781, P-Value < 0.001). The path correlation coefficient of Facilitating Conditions on Use Behavior was 0.157 and had a positive significant effect (t = 3.698, P-Value < 0.001). Social Influence, Hedonic Motivation, and IWOM had effects on the path of Behavior Intentions, although these were not significant.

4.6   Mediation effect

This study also investigated whether there was a mediating effect between Facilitating Conditions and Use Behavior. The results of the mediating effect test, which was repeatedly sampled 2,000 times using the Bootstrap mediating test in IBM SPSS Statistics 25 AMOS, are shown in Table 11 below.

Table 11: The effect of Behavior Intentions as an Intermediary Variable

			Bootstrap Behavior Intention (95%)	
Agency Path	**Impact Size**	**SE**	**Lower limit**	**Upper limit**
Direct Impact (Facilitating Conditions to Use Behavior)	0.157	0.052	0.054	0.236
Indirect effects (Facilitating Conditions to Behavior Intentions to Use Behavior)	0.083	0.027	0.029	0.183
Total Impact	0.301	0.048	0.148	0.420

Facilitating Conditions had a significant positive effect on Use Behavior, with a path correlation coefficient of 0.157, a mediating effect size of 0.083, a confidence interval of (0.029, 0.183), not including 0, indicating a significant mediating effect, and a mediating effect ratio of 27.57% (0.083/0.301= 27.57%).

4.7   Summary of research hypotheses

The 11 hypotheses proposed in this study were statistically validated by AMOS. The validation results are summarized in Table 12 below.

Table 12: Summary of the results of the technology acceptance integration model validation

Item	Hypotheses	Results
H1	Performance Expectancy has a significant positive impact on Intention to use internet insurance platforms	Significant
H2	Effort Expectancy has a significant positive impact on consumer intentions to use internet insurance platforms	Significant
H3	Social Influence has a significant positive impact on consumer intentions to use internet insurance platforms	Not Significant
H4	Hedonic Motivation has a significant positive impact on consumer intentions to use internet insurance platforms	Not Significant
H5	Facilitating Conditions have a significant positive impact on consumer intentions to use internet insurance platforms	Significant
H6	Price Value has a significant positive impact on consumer intentions to use internet insurance platforms	Significant
H7	IWOM has a significant positive impact on consumer intentions to use internet insurance platforms	Not Significant
H8	Perceived Risk has a significant negative impact on consumer intentions to use internet insurance platforms	Significant
H9	Facilitating Conditions have a significant positive impact on Behavior Intentions when using internet insurance platforms	Significant
H10	Behavior Intentions have a significant positive impact on Use Behavior when using internet insurance platforms	Significant
H11	Behavior Intentions mediate the relationship between Facilitating Conditions and Use Behavior	Significant

Eight out of eleven hypotheses were valid. Performance Expectancy, Effort Expectancy, Price Value, and Facilitating Conditions had significant positive effects on consumers' intentions to use internet insurance platforms. Perceived Risk had significant negative effects on consumers' intentions to use internet insurance platforms. Behavioral intentions had significant positive effects on consumers' intentions when using internet insurance platforms. Facilitating Conditions had significant positive effects on consumers' intentions when using internet insurance platforms. Behavioral intentions had mediating effects on the relationship between Facilitating Conditions and consumers' behaviors when using internet insurance platforms. There was also a mediating effect of behavioral intentions on the relationship between Facilitating Conditions and internet insurance platform Use Behavior. The technology acceptance integration model of this study was examined and is shown in Figure 6.
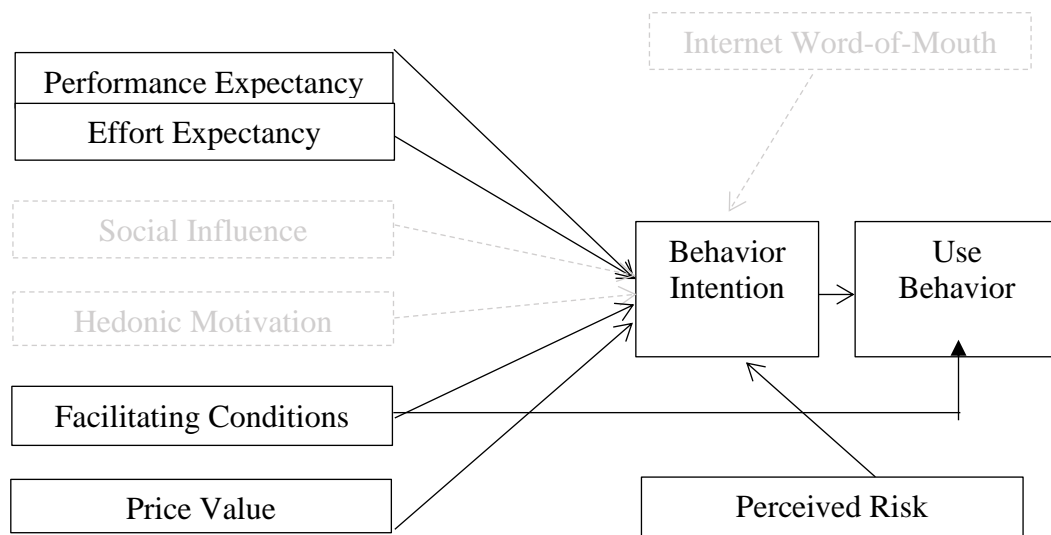
Figure 6: Post-validation technology acceptance integration model

5. Conclusions and Recommendations

5.1   Research Conclusion

Based on the results of this study, the following conclusions are drawn.

1) The path coefficients of Perceived Risk and Behavior Intentions are the highest compared to Effort Expectancy, Facilitating Conditions, Performance Expectancy, and Price Value; however, they are negative. Otherwise stated, the risk of personal information leakage, fake policies, fraudulent premiums, or barriers to the use of insurance online platforms are the biggest factors that reduce consumers' willingness to use internet insurance platforms.

2) The second highest path coefficient of Effort Expectancy and Behavior Intentions was the linkage path. Consumers were positive regarding the convenience and friendliness of using insurance online platforms. This may be because insurance policies that can be purchased on internet insurance platforms are relatively simple, do not have many complicated options, and can be started with a little browsing. It may also be that most of the consumers interviewed in this study were frequent users of the internet and familiar with the online shopping environment; thus, they were able to comfortably navigate the internet insurance platform in a very short time.

3) The path coefficient of Facilitating Conditions and Behavior Intentions was positive. This may be because mobile devices are becoming more affordable and the online trading environment is becoming more popular, which aids consumers' intentions to use insurance online platforms. Additionally, since the insurance policies currently sold on the internet insurance platform are relatively simple and most are insurance products that consumers frequently purchase,

consumers can easily understand the content and prices of insurance products on the internet as education is popular in Taiwan; therefore, using an internet insurance platform is encouraged.

4) The path coefficient of Performance Expectancy and Behavior Intentions was also positive. This was likely due to the high efficiency of using an internet insurance platform to purchase insurance, which not only has no limitations regarding time and place but also can compare different insurance products and services simultaneously to obtain more information about insurance products and services.

5) Price Value and Behavior Intentions also showed a positive link path coefficient, meaning that if consumers could obtain a discounted premium and perceive a relative price/performance ratio when purchasing insurance through an internet insurance platform, their intentions to use the online platform to purchase insurance increased. However, as the current insurance policies sold through online platforms are relatively simple, the premiums are usually not high; even when there is a significant percentage discount, the amount is usually not significant. Therefore, although the incentive of Price Value exists, the strength of the intention to use an internet insurance platform is not as high compared to other factors such as Perceived Risk, Effort Expectancy, Facilitating Conditions, Performance Expectancy, etc.

6) Facilitating Conditions are more likely to increase the frequency of using an internet insurance platform and the likelihood of recommending them to friends and relatives when the intention to use them has already been formed.

5.2   Research Recommendations

Based on these conclusions, the recommendations of this study are as follows:

1) The most important factor that affects consumers' willingness to use an internet insurance platform is the risk they may encounter when using it, such as personal information leakage, premium fraud, and barriers to using online platforms. Therefore, an internet insurance platform must pass various representative information security certifications. For example, they should be certified in cloud security, join the Cloud Security Alliance (CSA), or obtain ISO/IEC 27001 certification. This will help gain the trust of consumers who wish to use the network safely. Additionally, there must be 24-hour customer service to help consumers troubleshoot problems when using internet insurance platforms.

2) Another important factor that affects consumers' willingness to use internet insurance platforms is their convenience and friendliness. Therefore, the design of webpages on internet insurance platforms must be simple and easy to use. Responsive web design can be presented differently on different devices to ensure user-friendliness and convenience. Additionally, it is important to note that the web design must be conducive to search engine ranking optimization and provide rich information that consumers can easily read and understand.

3) Internet insurance platform owners should not be overly optimistic that simply offering a small price discount will effectively increase consumers' willingness to purchase insurance online. If other factors such as online risks and the friendliness and convenience of the online platform are not addressed, price concessions alone are not sufficient to significantly increase consumers' willingness to use insurance online platforms.

4) The insurance offered on online platforms must be specially designed and suitable for sale through the internet, rather than simply moving insurance products of traditional insurance companies to online platforms or treating online platforms as a new channel for selling products. It is important to examine whether the insurance products or services designed and offered can achieve the desired results mentioned in this study when sold on online platforms.

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