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The relationship between attitude toward using and customer satisfaction with mobile application services

An empirical study from the life insurance industry

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Abstract

Purpose – The methodology of mobile commerce as a significant application for both enterprises and customers are becoming crucial, but few studies discuss the usage attitude toward and customer satisfaction with mobile application (app) services in the life insurance industry. The purpose of this paper is to investigate the effects of attitude toward using life insurers' mobile app services on customer satisfaction.
Design/methodology/approach – The study is based on a questionnaire survey of 538 respondents in Taiwan. The data are analyzed through ANOVA, multiple regression, and path analysis.
Findings – The results indicate that all variables significantly and positively affected usage attitude. Among them, compatibility had the most significant influence. In addition, consumers' perceived usefulness and perceived ease of use positively affected customer satisfaction. Furthermore, the path analysis result demonstrates that usage attitude is the most significant factor for customer satisfaction, and the second-most important factor is the cognition of compatibility's indirect effect on usage attitude.
Originality/value – The paper extends our understanding of the insured's usage attitude toward and satisfaction with life insurers' app services by integrating the technology acceptance model and innovation diffusion theory. The results have practical implications for reinforcing customer relationship management and contribute to fulfilling the need for marketing evidence in life insurance.
Keywords Customer satisfaction, Perceived playfulness, Technology acceptance model, Compatibility, Life insurance
Paper type Research paper

Introduction

The development of modern wireless communication technology, coupled with the increasingly high penetration rate of the internet, is promoting mobile commerce (MC) as a significant application for both enterprises and customers (Rupp and Smith, 2002). In a dynamic environment, many insurers seek new strategies that facilitate online information sharing and transactions. Linking insurance businesses to customers through mobile application (app) services are one of these competitive strategies. An app provides clients with access to insurance information, communication, and transactions,

such as policy wording, premium payments, and other insurance products and claim services from anywhere, at any time. As mobile devices are becoming popular access points, an app service has many emergent benefits for both insurers and customers. To attract customers, the services provided through apps are diverse, including customer service, policy loans, advertising, insurance information or transactions, health management, claim handling, wealth management, and simple games. Therefore, characteristics of life insurance app services include insurance information and perceived usefulness, perceived ease of use, compatibility, and emotional factors.

However, insurance is a human enterprise, which means it is important to provide customer service and implement customer relationship management (CRM). Therefore, there is a need to understand life insurers' app services by examining factors that influence users' attitudes and customer satisfaction. This may guide strategic planning and inform decision making by life insurers when introducing or developing app services for customers in different contexts. The technology acceptance model (TAM) (Davis *et al.*, 1989) aims to investigate user acceptance of a new technology or system. Many studies have applied TAM as the base model for examining acceptance in a variety of fields such as banking (Pikkarainen *et al.*, 2004) and electronic communication (Luo *et al.*, 2010). Life insurers' app services include rich insurance knowledge and information, personal finance, entertainment, health management, and so on. They not only allow users to search for information but also gradually may include entertainment and insurance advertising. However, users' acceptance of a new technology or system should not be limited to the rational level; it is also subject to emotional factors (Kulviwat *et al.*, 2007). Few studies discuss user acceptance and customer satisfaction with life insurance app services.

Based on the above, this study not only constructs an integrated app service model by combining perceived usefulness and perceived ease of use but also adds perceived playfulness and compatibility to explore the effect of attitude toward using an app service on customer satisfaction. The main contributions of this study are the following. First, this study investigates the effects of perceived usefulness, perceived ease of use, perceived playfulness, and compatibility on attitude toward using an app service to allow the life insurance industry to improve or strengthen the evaluation of value-added services and functions. Second, this research explores the effect of consumers' attitude toward using an app service on their satisfaction to serve as a reference for CRM and marketing management practices in the life insurance industry. Third, few studies on app services apply to the insurance industry; this study supplements the gap in the literature on insurance.

Literature review
TAM
The theory of reasoned action (TRA), proposed by Fishbein and Ajzen (1975), is a well-established model that has been used broadly to predict and explain human behavior in various domains (Chen *et al.*, 2002). Davis (1989) proposed the TAM, derived from TRA; it offers a powerful explanation for user acceptance of and usage behavior toward new technology. In comparison with alternative models, the TAM is considered to be favorably rigorous in behavior prediction in the realm of information technology adaption (Venkatesh and Davis, 1996; Venkatesh and Bala, 2008). The central argument in the TAM is that an individual's behavioral intention to use a system or a piece of technology is determined by two beliefs (Amin, 2009; Shen and Eder, 2009): perceived usefulness and perceived ease of use (Davis *et al.*, 1989).

Perceived usefulness refers to the user's perception of the degree to which using a technology will improve his or her condition.

Perceived ease of use indicates the user's perception of the amount of effort (i.e. time and resources) required to use a system or to introduce/update a piece of technology (Davis *et al.*, 1989). In addition, the model indicates that system usage is indirectly affected by both perceived usefulness and perceived ease of use. In summary, because of its simplicity, the TAM has become one of the most widely used models in the information systems field (King and He, 2006). The TAM has been applied to understand user acceptance of internet-based applications and services such as CRM systems, e-mail, web site, online shopping, social networking site Facebook, and so on (Gefen, 2000; Pavlou, 2003; Suh and Han, 2003; Vella and Caruana, 2012; Rauniar *et al.*, 2014).

Compatibility and playfulness

Innovation diffusion theory (IDT), proposed by Rogers (1983), is another well-known theory. IDT has been widely used in relevant information technology and information systems research (Taylor and Todd, 1995; Karahanna *et al.*, 1999). IDT includes five significant innovation characteristics: relative advantage, compatibility, complexity, trialability, and observables. However, research has suggested that only relative advantage, compatibility, and complexity are consistently related to innovation adoption (Agarwal and Prasad, 1998). Relative advantage is similar to perceived usefulness, whereas complexity is similar to perceived ease of use. Compatibility reflects the match among the operator, the technology, the task to perform, and the situation (Karahanna *et al.*, 2006). More specifically, compatibility measures a technology's consistency with users' values, past experience, and needs (Rogers, 1995). High compatibility leads to preferable adoption. Agarwal and Prasad (1999) asserted a positive relationship between an individual's prior compatible experiences and acceptance of the new information technology. Numerous studies have successfully integrated IDT into the TAM to investigate users' technology acceptance behavior (Hardgrave *et al.*, 2003; Wu and Wang, 2005; Chang and Tung, 2008).

Playfulness is abundant and pervasive in everyday life (Bologh, 1976). Webster and Martocchio (1992) defined perceived playfulness as the appeal of games that attract players. They pointed out in their study of computers that perceived playfulness refers to the degree of fun perceived during interactive computer use. Moon and Kim (2001) noted that perceptions of playfulness appear to influence users' attitude toward using the Word Wide Web, providing more concentration, curiosity, and enjoyment. Playful behaviors are positively related to user satisfaction with specific technology products (Woszczynski *et al.*, 2002). Among the additions proposed, playfulness has been regarded as a factor that can increase user acceptance (Lin *et al.*, 2005). Therefore, perceived playfulness is also an important factor that influences usage attitude.

Attitude toward using and customer satisfaction

Attitude toward using refers to a user's assessment of the desirability of using a specific information system application (Ajzen and Fishbein, 1980). Agarwal and Prasad (1998) believe that attitude is a person's affective response to use new technology. In general, customer satisfaction is viewed as a response based on evaluations and expressed some time during the purchase-consumption process. Kotler (2000) considered customer satisfaction as a mental state which results from customer's comparison of expectations prior to a purchase with performance perceptions

after a purchase. In addition, customer satisfaction is the customer's assessment of a service in terms of whether that service has met the customer's needs and expectations (Zeithaml *et al.*, 2006). Therefore, we view consumer satisfaction as a consumer's overall emotional response to the entire service experience following the last purchase.

Research hypotheses and model

Relationship between perceived usefulness, attitude toward using, and satisfaction
According to the TAM, perceived usefulness affects a person's attitude toward using a system or technology (Davis *et al.*, 1989). Many researchers have empirically proven that perceived usefulness has a significant and positive effect on attitude toward using information technology or associated systems (Venkatesh and Davis, 2000; Venkatesh and Bala, 2008). Recently, Feng *et al.* (2014) also demonstrated that perceived usefulness can positively affect attitudes toward using securities brokers' online ordering systems. Devaraj *et al.* (2002) argued that perceived usefulness has a notable impact on satisfaction in the e-commerce channel. The effect of perceived usefulness on satisfaction and continuance usage has been verified in previous research (Bhattacherjee, 2001; Praveena and Thomas, 2013). Hou *et al.* (2008) explored salespersons' acceptance of CRM and demonstrated that the perceived usefulness by salespersons in the insurance industry positively influences their satisfaction. This study suggests that life insurance app services provide service and information to solve users' problems related to insurance in their daily lives. Users' higher perceived usefulness positively influences attitude toward using a life insurance app service and customer satisfaction. Based on the preceding discussion, this study proposes the following hypotheses:

H1. Perceived usefulness positively impacts attitude toward using life insurers' app services.

H2. Perceived usefulness positively impacts customer satisfaction with life insurers' app services.

Relationship between perceived ease of use, attitude toward using, and customer satisfaction
In studies on MC, many researchers have demonstrated that perceived ease of use influences users' attitudes and intentions (Lai and Li, 2005; Wakefield and Whitten 2006; Castaeda *et al.*, 2007). In the internet banking environment, Chau and Lai (2003) indicated that easy-to-use services may increase users' levels of intrinsic motivation and lead to favorable attitudes toward internet banking. Perceived ease of use not only directly influences attitude toward using but also indirectly enhances attitude toward using through perceived usefulness (Davis *et al.*, 1989; Kulviwat *et al.*, 2007). Chen *et al.* (2010) studied self-service systems at convenience stores and demonstrated that perceived ease of use has the greatest influences on users' attitudes and that it is more significant than perceived usefulness. In addition, perceived ease of use has been found to significantly influence satisfaction and the continuance of intention to use an information system (Bhattacherjee, 2001). For example, Lin *et al.* (2010) found that perceived ease of use has a positive direct effect on customer satisfaction. Hence, according to previous studies, this study proposes the hypotheses below:

H3. Perceived ease of use positively impacts attitude toward using life insurers' app services.

H4. Perceived ease of use positively impacts customer satisfaction with life insurers' app services.

Relationship between perceived ease of use and perceived usefulness
Davis (1989) demonstrated that a system's ease of use positively influences the usefulness of the system. According to past research, there is a positive relationship between ease of use and usefulness for self-service technology (Moon and Kim, 2001; Chen *et al.*, 2002). Research by Davis (1993), Bruner II and Kumar (2005), and Wu and Wang (2005) also support this statement. Hence, based on the previous reviews, hypothesis is proposed as follows:

H5. Perceived ease of use positively impacts the perceived usefulness of life insurers' app services.

Relationship between perceived playfulness and attitude toward using
Usefulness is the external motivation to use information technology (Davis, 1989; Davis *et al.*, 1992). Playfulness is based on satisfaction in the process of use and is an internal motivation (Deci and Ryan, 1985; Moon and Kim, 2001). When the perceived playfulness of information technology is higher, people have a positive attitude toward that information technology (Davis *et al.*, 1992; Igbaria *et al.*, 1996). Moon and Kim (2001) suggested that past research on technology acceptance mostly focussed on the external motivations for users' behaviors. Therefore, internal motivation factors for perceived playfulness should be added. According to previous research results, perceived usefulness, perceived ease of use, and perceived playfulness influence users' attitudes. In comparison to perceived usefulness, perceived playfulness more significantly influences attitude toward using and use intention. Ahn *et al.* (2007) also realized that perceived usefulness and perceived playfulness positively influence users' attitudes. Therefore, according to the previous studies, this study proposes the hypothesis below:

H6. Perceived playfulness positively impacts attitude toward using life insurers' app services.

Relationship between perceived compatibility and attitude toward using
In research on online shopping behavior, Vijayasarathy (2004) indicated that when consumers find compatibility between an innovation and their original lifestyle, values, and needs, they have more positive adoption. Wu and Wang (2005) indicated that compatibility has the most important effects on behavioral intention to use and the second-most important effects on actual use in MC. Using the extended TAM, Hsiao and Cheng (2008) explored consumers' intention to purchase online life insurance and demonstrated that compatibility significantly influences attitude toward the online purchase of insurance. They suggested that when consumers find that online insurance matches their needs or lifestyle, their attitude toward online insurance is more positive. Chang and Hisao (2010) studied mobile services and showed that perceived ease of use, usefulness, playfulness, and compatibility positively influence consumers' attitudes toward a mobile service. Based on the preceding discussion, this study proposes the following hypotheses:

H7. Compatibility positively impacts attitude toward using life insurers' app services.

Relationship between attitude toward using and customer satisfaction
In research on networks and behavior in enterprises, Chang (2002) realized that there is significant and positive correlation between attitude toward using a network system and satisfaction with that system. Lee (2009) explored the attitude, satisfaction, and behavioral intention of users of job bank web sites in Taiwan and suggested that users' attitudes significantly and positively influence customer satisfaction Therefore, according to the previous studies; this study proposes the hypotheses below:

H8. Attitude toward using positively influences customer satisfaction with life insurers' app services.

Research model
Based on the literature review and theory development, a research model is developed to examine the effect of app service usage attitude on customer satisfaction in the life insurance industry. The proposed research framework is illustrated in Figure 1.

Methodology
The study is to investigate the effects of life insurers' app services attitude toward using on customer satisfaction. Due to the purpose of this study is relatively simple, and which the problem of variables co-linearity are unable to deal with in Structure Equation Modelling (SEM), but multiple regression analysis to provide a diagnostic message of co-linearity in this study. Therefore, we do not consider the SEM to deal with the intricacies of those relationships, and we follow some researchers such as Venkatesh and Davis (2000), Shih (2004), Yu and Tao (2009), Sipior *et al.* (2011), Al-Jabri and Sohail (2012), and Feng *et al.* (2014) in using multiple regression and path analysis to explore TAM and IDT in this study. Further analysis is as follow:

Sample and data collection
This research uses judgment sampling to collect data using a questionnaire survey; the subjects are consumers who have purchased life insurance and used life insurers' mobile app services in Taiwan. A pilot study with a small sample size of 30 was conducted to clarify the overall structure of the questionnaire. The respondents provided comments on the clarity of some items in the questionnaire. Following the pilot test, the main survey was administered. In all, 600 questionnaires were distributed
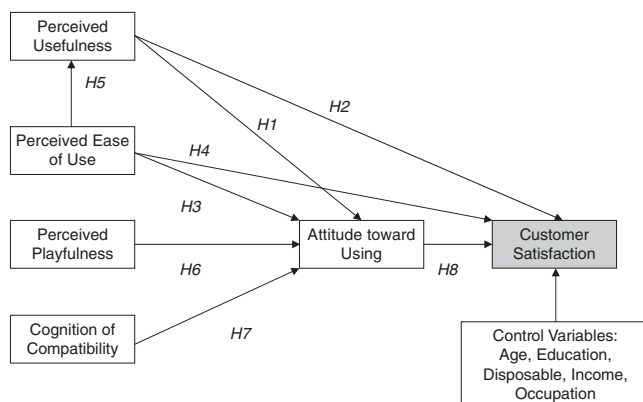

Figure 1.
Research framework

in the main survey and 538 valid samples were collected after eliminating 62 invalid samples; the valid questionnaires account for an effective response rate of 89.7 percent. A description of the sample is shown in Table I.

Questionnaire design and measures of constructs
The survey questionnaire consisted of two parts. The first recorded the subject's demographic information. The second recorded the subject's perception of each variable in the model. The demographic variables assessed were gender, age, level of education, disposable income, and occupation. The second section asked each subject to indicate his or her degree of agreement with each item. Data were collected using a seven-point Likert scale to facilitate measurement. Participants were asked to fill in the questionnaire and indicate their current situation for each variable item (1 = strong disagreement and 7 = strong agreement). The questionnaire consisted of 27 items measuring the six variables. Table II summarizes the definitions of the variables.

Reliability and validity analysis
Reliability analysis measures the consistency of item content in scales and the stability of scale measurements for dimensions. This study can apply Cronbach's α value to verify the consistency of items. According to Nunnally (1978), a score of more than 0.7 is considered reliable. This study's questionnaire covers six dimensions: perceived usefulness (five items), perceived ease of use (five items), perceived playfulness (four items), cognition of compatibility (three items), attitude toward using (five items), and customer satisfaction (five items). The empirical analytical result shows the Cronbach's α of the scales to be 0.906-0.947. This means that the consistency of the scale content is high and that the questionnaire has high reliability. Regarding the validity, the contents of this study's questionnaire are based on the relevant theories,

Item	Category	Number of sample	(%)
Gender	Male	250	46.47
	Female	288	53.53
Age	20-29 years	205	38.10
	30-39 years	180	33.46
	40-49 years	102	18.96
	Over 50 years	51	9.48
Education	Under senior high school	16	2.97
	Senior high school	102	18.96
	College/University	386	71.75
	Graduate school	34	6.32
Disposable income (NT$)	Less than 10,000	98	18.22
	10,001-20,000	95	17.66
	20,001-30,000	87	16.17
	30,001-40,000	112	20.83
	40,001-50,000	83	15.43
	Over 50,001	63	11.71
Occupation	Financial sector	103	19.14
	Service	241	44.80
	Manufacturing	61	11.34
	Other	133	24.72

Table I.
Description
of sample

Note: $n = 538$

Construct	Definition	Sources
Perceived usefulness	The degree to which a person believes that engaging in life insurers' App services would enhance or improve his or her condition	Davis *et al.* (1989)
Perceived ease of use	The degree to which a person believes the engaging in life insurers' App services would be free of effort	Davis *et al.* (1989); Yiu *et al.* (2007)
Perceived playfulness	The strength of one's belief that interacting with life insurers' App services will fulfill his or her intrinsic motives	Moon and Kim (2001)
Compatibility	The degree to which engaging in life insurers' App services are perceived as being consistent with the potential use's existing values, beliefs, previous experiences, and current needs	Rogers (1983); Chan and Lu (2004); Tan and Teo (2000)
Attitude toward using	The strength of one's feeling of favorableness or unfavorableness toward life insurers' App services	Davis *et al.* (1989); Moon and Kim (2001)
Customer satisfaction	A person the feeling of pleasure or disappointment attainment, which is derived from consumer expectations (or result) of the service	Kotler (2000); Zeithaml *et al.* (2006)

Table II.
Definition of the
key variables

referred to related literatures' questionnaire contents and include the opinions of scholars. Thus, this study has a considerable degree of content validity. The Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy test and Bartlett's Sphericity test are carried out to evaluate the adequacy of each item. Hair *et al.* (1998) demonstrated that, when the KMO value is larger than 0.6 and the *p*-value of the Bartlett's Sphericity test is closer to 0, it means that the item is adequate for factor analysis. In this study, the KMOs of all dimensions are more than 0.7 and Bartlett's test of sphericity is significant. Therefore, factor extraction is suitable for the data. To test the construct validity of the questionnaire, factor analysis is performed on each construct. Hair *et al.* (1998) suggest that when factor loading is higher, convergent validity is more significant.

In general, the value of factor loading is higher than 0.5, the result of factor analysis and shows that the values of factor loading are all higher than 0.5 for each item. The results indicate that each construct is highly valid. This study conducts the principal component method and varimax rotation to extract factors with eigenvalue greater than 1. Based on this rule, this study obtained six dimensions: perceived usefulness, perceived ease of use, perceived playfulness, cognition of compatibility, attitude toward use, and customer satisfaction. In addition, Chiou (2006) suggested that cumulative explained variance can measure validity. When it is higher than 50 percent, the validity of the construct is good. The cumulative explained variances of this study's constructs are 62.8, 69, 74.7, 78.3, 82.1, and 82.8 percent, respectively, all higher than 50 percent. Hence, the dimensions have good construct validity. The results of reliability analysis are shown in Table III.

Common method variance test
As this study utilized one self-report survey to collect data on all of variables, common method bias may be resent. Following Podsakoff *et al.* (2003), the Harma's one-factor test is used. A factor analysis of the dependent and independent variables did not yield a single-factor structure that would account for majority of the variance, thus it is not a problem in the samples.

Empirical analysis and results

Variation analysis of demographic variables, usage attitude, and customer satisfaction
This study first analyzes the influence of demographic variables and attitude toward using life insurers' app services on customer satisfaction. Since there are only two gender groups, a *t*-test is performed. The results show that gender has no significantly different effects on cognition of attitude toward using and customer satisfaction. Since age, education, disposable income, and occupation are variables with more than three groups, this study uses the analysis of variance (ANOVA) to test whether they have significantly different effects on the awareness of attitude toward using life insurers' app services and customer satisfaction. The results show that disposable income and occupation have significant differences in terms of the cognition of attitude toward using and customer satisfaction, indicating that insurers can apply these two different dimensions to develop service marketing strategies. The results of the *t*-test and ANOVA in terms of the demographic variables, attitude toward using, and customer satisfaction variables are summarized in Table IV.

Relationships between attitude toward using mobile app services and customer satisfaction (H1, H3, H6, H7)
This study uses multiple regression analysis to determine the effect of perceived usefulness, perceived ease of use, perceived playfulness, and compatibility on attitude toward using life insurers' app services to verify *H1*, *H3*, *H6*, and *H7*. As a higher variance inflation factor (VIF) value represents more significant co-linearity of variables, VIF value above 10 indicate serious problem of co-linearity (Gujarati, 1995). First, in the co-linearity analysis, the VIF values of all variables are less than 4, indicating that there is no problem of co-linearity between variables. The result is summarized in Table V. The regression equation has a level of significance ($F = 435.783$, $p = 0.000$), and the model predictability (Adj R^2) value is 0.764, indicating the model exhibits explanatory power. The aspect of perceived usefulness ($t = 7.727$, $p = 0.000$), perceived ease of use ($t = 4.769$, $p = 0.000$), perceived playfulness ($t = 4.281$, $p = 0.000$), and compatibility ($t = 4.769$, $p = 0.000$) indicate that all variables

Construct	Number of items	Cronbach's α value
Perceived usefulness	5	0.918
Perceived ease of use	5	0.929
Perceived playfulness	4	0.906
Compatibility	3	0.907
Attitude toward using	5	0.945
Customer satisfaction	5	0.947

Table III.
Summary of reliability analysis

	Gender		Age		Education		Disposable income		Occupation	
Variables	*F*-value	*p*-Value	*F*-value	*p*-Value	*F*-value	*p*-Value	*F*-value	*p*-Value	*F*-value	*p*-Value
Usage attitude	2.769	0.179	1.868	0.314	1.207	0.306	5.414	0.000***	8.594	0.000***
Satisfaction	6.801	0.104	2.350	0.072	1.430	0.229	5.398	0.000***	12.268	0.000***

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table IV.
Demographic variables of the *t*-test and ANOVA analysis

significantly and positively affect attitude toward using. The standardized coefficient β values suggest perceived usefulness of $\beta = 0.269$, perceived ease of use of $\beta = 0.173$, perceived playfulness of $\beta = 0.155$, and compatibility of $\beta = 0.372$, indicating that the effect of compatibility on attitude toward using is the most significant influence.

This study uses the multiple regression models to determine the effect of perceived usefulness, perceived ease of use, and attitude toward using on customer satisfaction to verify *H2*, *H4*, and *H8*. First, in the co-linearity analysis, the VIF values of variables are all lower than 4, indicating there is no problem of co-linearity between independent variables. The result is shown in Table VI. The regression equation has a level of significance ($F = 603.827$, $p = 0.000$), and the model predictability (Adj R^2) value is 0.771. The aspect of perceived usefulness ($t = 4.288$, $p = 0.000$), perceived ease of use ($t = 4.388$, $p = 0.000$), and usage attitude ($t = 17.118$, $p = 0.000$) indicate that all variables significantly and positively affect customer satisfaction. The standardized coefficient β values show perceived usefulness of $\beta = 0.152$, perceived ease of use of $\beta = 0.151$, and usage attitude of $\beta = 0.630$, indicating that the effect of attitude toward using on customer satisfaction is the most significant influence.

This study uses the simple regression models to determine the effect of perceived ease of use on perceived usefulness to verify *H5*. First, in the co-linearity analysis, the VIF values of independent variables are all lower than 3, indicating that there is no problem of co-linearity between independent variables. The result is summarized in Table VII. The regression equation has a level of significance ($F = 661.060$, $p = 0.000$), and the model predictability (Adj R^2) value is 0.551. The aspect of perceived ease of use ($t = 25.711$, $p = 0.000$) indicate that it has a positive and significant impact on perceived usefulness.

| Variables | Dependent variables: attitude toward using | | | |
	Standardized coefficient	*t*-Value	Significant	VIF
(Constant)		1.160	0.247	
Perceived usefulness	0.269	7.727	0.000***	2.762
Perceived ease of use	0.173	4.769	0.000***	2.982
Perceived playfulness	0.155	4.281	0.000***	2.981
Compatibility	0.372	9.542	0.000***	3.469
F-value		435.783		
p-Value			0.000***	
Adj R^2			0.764	
Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$				

Table V.
Multiple regression analysis – attitude toward using mobile App service

| Variables | Dependent variables: customer satisfaction | | | |
	Standardized coefficient	*t*-Value	Significant	VIF
(Constant)		−0.164	0.870	
Perceived usefulness	0.152	4.288	0.000***	2.933
Perceived ease of use	0.151	4.388	0.000***	2.788
Usage attitude	0.630	17.118	0.000***	3.180
F-value		603.827		
p-Value			0.000***	
Adj R^2			0.771	
Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$				

Table VI.
Multiple regression analysis – customer satisfaction on mobile App service

Path analysis of attitude toward using mobile app services and customer satisfaction
Path analysis is based on a series of multiple regressions. Through an assumed framework, different equations are combined to form a structural model and explain the possible causal relationships among variables. This study validates the overall framework using path analysis. According to path effect in Table VIII, attitude toward using is the key influence factor on customer satisfaction (path coefficient = 0.630), followed by the indirect effect of cognition of compatibility (path coefficient = 0.234). In addition, cognition of compatibility is the most significant factor for attitude toward using, followed by perceived usefulness (path coefficient = 0.269). The effect of perceived ease of use on perceived usefulness is the most significant.

Discussion, conclusions, and managerial implications

Discussion, conclusions, and future research
The purpose of this study is to investigate the effect of consumers' attitude toward using life insurers' app services on customer satisfaction. The results are summarized as follows:

(1) The empirical results of this study suggest that perceived usefulness positively impacts attitude toward using life insurers' app services, as proposed by

| Variables | Dependent variables: perceived usefulness | | | |
	Standardized coefficient	t-Value	Significant	VIF
(Constant)		11.537	0.000***	
Perceived ease of use	0.743	25.711	0.000***	1.000
F-value		661.060		
p-Value			0.000***	
Adj R^2		0.551		

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table VII.
Regression analysis – the impact of perceived ease of use on perceived usefulness

Relationship (Paths)	Path coefficient	Significant
Perceived usefulness→customer satisfaction	0.152	0.000***
Perceived usefulness→usage attitude→customer satisfaction	0.169	0.000***
perceived ease of use→customer satisfaction	0.151	0.000***
Perceived ease of use→usage attitude→customer satisfaction	0.109	0.000***
Perceived ease of use→perceived usefulness→customer satisfaction	0.113	0.000***
Perceived ease of use→perceived usefulness→usage attitude→customer satisfaction	0.126	0.000***
Perceived playfulness→usage attitude→customer satisfaction	0.098	0.000***
Compatibility→usage attitude→customer satisfaction	0.234	0.000***
Usage attitude→customer satisfaction	0.630	0.000***
Perceived usefulness→usage attitude	0.269	0.000***
Perceived ease of use→usage attitude	0.173	0.000***
Perceived ease of use→perceived usefulness→usage attitude	0.199	0.000***
Perceived playfulness→usage attitude	0.155	0.000***
Compatibility→usage attitude	0.372	0.000***
Perceived ease of use→perceived usefulness	0.743	0.000***

Notes: **$p < 0.01$; ***$p < 0.001$

Table VIII.
Path analysis of variables

Davis *et al.* (1989) and Feng *et al.* (2014). Hence, when life insurers' app services benefit users and they perceive this value, users' attitude toward using life insurers' app service will be higher. Consumers are concerned about practical application in their daily lives.

(2) This study shows that among consumers who use life insurers' app services, perceived usefulness positively influences customer satisfaction. Life insurers' app services solve users' insurance-related problems in their daily lives by providing services and information. When consumers recognize the benefits of using app services in their lives, their satisfaction with apps will be greater. This will result in consumer repurchase behavior (Cardozo, 1965).

(3) The empirical results indicate that among consumers who use life insurers' app services, perceived ease of use positively influences attitude toward using. The results are consistent with the findings by Kulviwat *et al.* (2007). Hence, when consumers find an app service easy to use, they will have positive comments about it. Therefore, perceived ease of use positively influences attitude toward using.

(4) This study shows that among consumers who use life insurers' app services, perceived ease of use positively influences customer satisfaction. When users perceive an app to be easy to use, their satisfaction with the app will be greater. Thus, perceived ease of use positively influences customer satisfaction.

(5) This study presents that among consumers who use life insurers' app services; perceived ease of use positively influences perceived usefulness. This result matches the findings of Chen *et al.* (2002) and Moon and Kim (2001). Users can easily learn to use an app and accomplish their goals or enhance their living and work efficiency. Hence, perceived ease of use significantly influences perceived usefulness.

(6) This study shows that among consumers who use life insurers' app services, perceived playfulness positively influences attitude toward using. This finding matches the research result of Ahn *et al.* (2007). Therefore, when users perceive playfulness in an app service, they feel enjoyment, cheerfulness, and curiosity (Davis *et al.*, 1992; Moon and Kim, 2001). In other words, for users of an app service, an enjoyable and cheerful situation influences usage attitude. Thus, perceived playfulness positively influences attitude toward using.

(7) The empirical results indicate that among consumers who use life insurers' app services, compatibility positively influences attitude toward using. Compatibility means consistency between user values, past experience, insurance needs, and the app service. According to the research findings, life insurers' app services can satisfy consumers' life insurance demands. Therefore, consumers can accept life insurers' app services, and this cognition of compatibility positively influences attitude toward using.

(8) The empirical results suggest that among consumers who use life insurers' app services, attitude toward using positively influences customer satisfaction. Generally speaking, attitude toward using means customers' overall evaluation of the experience of goods or services (Fornell, 1992), and here indicates the intention to use life insurers' app services. When consumers' use of an insurance app service is more positive, their evaluation of that app is higher, and they will be more satisfied with the app service. Thus, attitude toward using positively influences customer satisfaction.

Future research can include data analysis from other industry types, such as banking and securities industry's app services. There are many variables in the behavioral theories that need to be investigated to improve the prediction of attitude toward using and customer satisfaction suggested by our integrated TAM and IDT model. Future studies can help in determining other factors and extending our research model in using Structural Equation Modeling (SEM). In addition, an interesting direction would to be engaged in a longitudinal examination on customer behavior and attitude toward using, which provided insight into the dynamics of the process to enhance the contribution of app services.

Managerial implications
With the progress and innovation of technology, future MC applications will influence individuals' lives. Life insurance companies will try to determine how to develop popular app services for consumers, and those app services will strengthen customers' convenience and demands to establish a customized relationship service. Thus, customer satisfaction will be enhanced, which leads to insurance repurchase intention. These results have both theoretical and practical contributions.

First, this study contributes to the integration of TAM and IDT theories. The study supports Chen *et al.* (2002) and Wu and Wang (2005) which empirically provided that an even stronger model than either standing alone. The outcome of the present study shed light on some important issues related to customers' practices regarding mobile app service attitude and satisfaction.

Second, according to the empirical finding of this study, multiple regression and path analysis demonstrate that attitude toward using is the most significant factor of customer satisfaction, followed by the indirect effect of compatibility on attitude toward using. It is suggested that life insurers should explore the factors of consumers' attitude toward using, particularly the cognition of compatibility, in order to improve and reinforce their current app services, increase customer satisfaction, and establish customized services and enhance CRM.

Third, the research also demonstrates that cognition of compatibility is the most critical factor of attitude toward using, followed by perceived usefulness. Therefore, life insurance companies can properly apply the relationships among variables and direct or indirect effects to plan their marketing practices; the use of value-added services and technology links insurers' mobile app services to enhance customer satisfaction and thus to provide differentiated services to increase firm performance.

Finally, the research proposes a model that helps to conceptualize mobile life insurer's app adoption through the integration of TAM and IDT models. The findings of this study have important implications for researchers and insurer's managers in today's dynamic environment.

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Appendix. Survey questionnaire (seven-point Likert type scale)

(1) Perceived usefulness:

- Using life insurer's App service makes my lifestyle convenient (e.g. the policy services; finance; insurance information, etc).
- Using life insurer's App service enhances my effectiveness to make the best allocation of resources.
- Using life insurer's App service enables me to access the new insurance information.
- Using life insurer's App service makes it easier to get new information with life insurance.
- Overall, life insurer's App service is very useful.

(2) Perceived ease of use:

- Learning to use life insurer's App service is easy for me.
- My interaction with life insurer's App service does not require a lot of mental effort.
- My interaction with life insurer's App service is clear understandable.
- I think life insurer's App installation with my existing applications without any conflicts.
- Overall, I think the features of life insurer's App service is easy to use.

(3) Perceived playfulness:

- Using life insurer's App service leads to my freshness.
- Using life insurer's App service makes me feel pleasure.

- • Using life insurer's App service stimulates my curiosity.
- • Using life insurer's App service makes me feel satisfied.

(4) Capability:

- • Using life insurer's App service fits well with my life style.
- • Using life insurer's App service fits into my work style.
- • Using life insurer's App service makes me feel insurance closer to my life.

(5) Attitude toward using:

- • I am happy to download and use life insurer's App service.
- • Using life insurer's App service is beneficial; allow me to increase the life insurance company's favor.
- • Using life insurer's App service is valuable; let me affirm life insurance company's services.
- • I feel good positive effects for understanding insurance from participating life insurer's App service.
- • Overall, my attitude toward life insurer's App service is favorable.

(6) Customer satisfaction:

- • I think that life insurer's App service function meets my needs.
- • Based on all of my experience with this life insurer's App service, I feel very satisfied.
- • I am satisfied with the insurance company to provide from App service.
- • I think that life insurer's App service has met my expectations.
- • Overall, I am satisfied with life insurer's App service.

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