# Task-Technology Fit and Adoption Behaviors of Mobile Business Systems

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**Abstract**

With the steady migration of both voice and data traffic, from wire-line and broadcast means, to mobile and the steady evolution of the mobile services towards sophisticated and complex services, the mobile devices are expected to become the mobile terminals of users in the future (UMTS forum, 2005). In mobile age, businesses should integrate mobile deeply into their operational practices, and employees can collaborate and communicate with in-house employees seamlessly and rapidly. In order to help employees improving task performance, many corporations have developed mobile business systems for their employees. Therefore, understanding the degree to which systems characteristics satisfy employees' task needs and what factors will influence the intention to continue using mobile business systems are critical in the implementation of mobile business system.

In this paper, a combined task–technology fit (TTF) and UTAUT model is proposed to explore the adoption of mobile technologies in the real estate and insurance industry. The research results indicate: (1) five constructs: data quality, authorization, timeliness, reliability, and relationship with users extract from TTF theory are the dominant factors in measuring the task-technology fit of using mobile business systems; (2) performance expectancy and effort expectancy mediate the influence of TTF on intention to continuing using mobile business systems; (3) data quality and relationship with users in TTF are the two factors that affect performance expectancy in using mobile commerce systems; and (4) relationship with users in TTF is the only factor that affects the effort expectancy in using mobile commerce systems.

**Keywords:** Adoption, Continue Using, Mobile Business, Task-Technology Fit Theory, UTAUT Theory

## 1. Introduction

Mobile commerce (m-commerce) refers to the conduct of information inquiries and/or business transactions by using mobile devices (e.g. cell phones, PDAs), via wireless communications. Based on a report of the Gartner Group, manufacturers are projected to sell 1 billion cell phones each year by 2009. By then, 2.6 billion people worldwide will be using cell phones. With the steady migration of both voice and data traffic, from wire-line and broadcast means, to mobile and the steady evolution of the mobile services towards sophisticated and complex services, the mobile devices are expected to become the mobile terminals of users in the future (UMTS forum, 2005). That is, in mobile age, businesses should integrate mobile deeply into their operational practices, and employees can collaborate and communicate with in-house employees seamlessly and rapidly. Consumers also can conduct inquiries or transactions via mobile devices easily and conveniently. Therefore, the implementation and adoption of mobile business systems will become a critical issue for information researchers and practitioners.

In order to help sales representatives or agents improve their task performance, many corporations developed mobile business systems for them. However, whether to use continuously is an option of sales representatives or agents. Therefore, understanding the degree to which systems characteristics satisfy agent task needs and what factors will influence the intention to continue using MBS are critical in the implementation of mobile business system.

Specifically, the purposes of this study focus on:

(1) Which mobile business systems characteristics satisfy agents' task.

(2) Which factors will impact the intention to continue using MBS.

(3) Can mobile business system improve the task performance of sales representatives or agents?

The rest of this paper is structured as follows. Section 2 is the literature reviews. Section 3 describes the two case systems and the functionalities of the two mobile business systems. The research model and hypotheses are presented in Section 4. Section 5 describes the research samples and measurement methodology. Section 6 reports the analyses and major research findings. Section 7 discusses the research findings and implications. Section 8 provides the conclusion, contribution and limitation of this study.

## 2. Literature Reviews

Measuring the success of information systems is a critical but hard issue (Melone, 1990; Delone & McLean, 1992; Goodhue, 1995). Venkatesh et al. (2003) combines eight competing technology acceptance models and proposes Unified theory of Acceptance and Use of technology (UTAUT). UTAUT is validated to explain as much as 70 percent of the variation in intention, and is a powerful tool to assess the success of new information technology introductions. In another stream of researches, to help IS researchers and practitioners measure the IS success effectively, Goodhue (1995) propose task-technology fit (TTF) as a user evaluation construct. The TTF construct focuses on the degree to which systems characteristics satisfy user task needs. TTF also is considered as a determinant of use intention. However, TTF has not been explicitly tied into UTAUT model (Venkatesh et al., 2003).

### 2.1 Unified theory of Acceptance and Use of technology (UTAUT)

User adoption of information technology is an important issue in information research and practice. Researchers have proposed eight competing technology adoption models: Theory of Reasoned Action (TRA)( Fishbein & Ajzen, 1975), Technology Acceptance Model (TAM) (Davis, 1989), Motivational Model (MM) (Davis et al. 1992), Theory of Planned Behavior (TPB) (Ajzen, 1985), Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), Model of PC Utilization (MPCU) (Thompson et al., 1991), Innovation Diffusion Theory (IDT) (Rogers, 1995; Moore & Benbasat, 1991), and Social Cognitive Theory (SCT) (Bandura, 1986; Compeau & Higgins,1995; Compeau et al., 1999).

Each technology acceptance model has different sets of adoption determinants. In order to integrate the fragmented theory and research on information technology adoption, Venkatesh et al. (2003) formulated the UTAUT that captures the essential elements of the eight existed models. In UTAUT, there are three determinants of intention to use (performance expectancy, effort expectancy, and social influence), and two determinants of usage behavior (intention to use and facilitating conditions).

### 2.2 Task-technology fit model (TTF)

The task-technology fit (TTF) model originated from the cognitive fit theory of Vessey (1991). Vessey's (1991) cognitive fit theory is based on the proposition that a cognitive fit between the problem solving aids and the problem solving task can reduce the complexity of the task and improve the problem solving effectiveness. The TTF theory believes that a fit among the task, the technology, and the users positively affects the adoption of information technology (Goodhue and Thompson, 1995; Goodhue, 1998). TTF focuses on the degree to which systems features fit

user task needs, and posits the higher task-technology fit will result in better performance (Goodhue, 1995). Eight general factors were developed to measure the task-technology fit: data quality, locatability, authorization, compatibility, production timeliness, systems reliability, ease of use/training, and relationship with users (Goodhue and Thompson, 1995).

## 3. The Cases of Mobile Business System

Users of two mobile business systems, Mobile Dr. Insurance system and Top Agent PDA system, are the subjects of this study.

### 3.1 Case 1: Mobile Dr. Insurance System

The Mobile Dr. Insurance system is the most popular mobile insurance system which is developed by company G and is adopted by more than twelve life insurance corporations in Taiwan for more than three years. Company G customized the Mobile Dr. Insurance system depend on the requirements of each life insurance corporation. Some life insurance corporations provide PDA and system for their agents; however, agents belong to the rest companies should buy PDA and system for themselves. Whether to use continuously is an option of all insurance agents.

The Mobile Dr. Insurance system is a PDA based system and has the following five major functions: (1)Product Information System – providing detailed information of all insurance products, (2)Contract Management System – providing the creation and inquiry of master customer records, (3) Proposal System – providing insurance proposals based on customer's insurance requirements, (4)Investment Products System – providing the returns and risks information of various mutual funds, and (5)Company Manuals System – providing the rules and information for insurance agent's tasks.

### 3.2 Case 2: The Top Agent PDA System

The Top Agent PDA system is developed by company S which is the largest realty brokerage corporation in Taiwan. Company S developed Top Agent PDA system for the tasks of their agents. Compared to case 1 system, the Top Agent PDA system is implemented for about only half year. That is, all users of Top Agent PDA system are in the initial stage of use. Whether to use continuously also is an option of sales representatives. To use the Top Agent PDA system, agents of company S should buy a PDA for themselves.

Through the Top Agent PDA system, the company S's sales representatives can access the database of company, make inquiries or down-load required information and files. The system also can directly show customers much more details about the houses on PDA, including the basic information, status of ownership, surrounding environments, photos of the houses, layouts of interior design, local maps, and information on what lies around the houses (such as schools, fire bureaus, hospitals, temples, or churches). By use of the system, sales representatives can accurately fill out the business forms quickly. Besides, the Top Agent PDA system is equipped with built-in mathematical formulas for such as property tax rates or interests of house loans, the best plan of renting, buying, or selling a house for customers can be made immediately.

## 4. Research Model and Hypotheses

### 4.1 Research Model

TTF focuses on the degree to which systems features match user task needs, and TTF is considered as one of important determinant of whether systems are believed to be more useful, more important, or give more relative advantage (Goodhue, 1995; Goodhue & Thompson, 1995). Hence, we extend UTAUT model with TTF and propose our research model as figure 1.

### 4.2 Research Hypotheses

We will validate the extended UTAUT model by confirm the relationships of TTF and UTAUT. As shown in figure 1, we will focus on the integration of TTF and UTAUT, and the relationships of TTF, performance expectancy, effort expectancy and use intention. Conforming to research objectives and model, we will validate the following hypotheses.

*Hypothesis 1: The agents' Evaluation of Task-technology fit of using Mobile Business System will impact the Performance Expectancy and Effort Expectancy.*

TTF of mobile business are used to measure the degree of systems features match user task needs. When agents perceived mobile systems with high TTT, they will have higher performance expectancy and effort expectancy on their task. Hence, we postulate the agents' evaluation of TTF of using mobile business system will impact the performance

expectancy and effort expectancy.

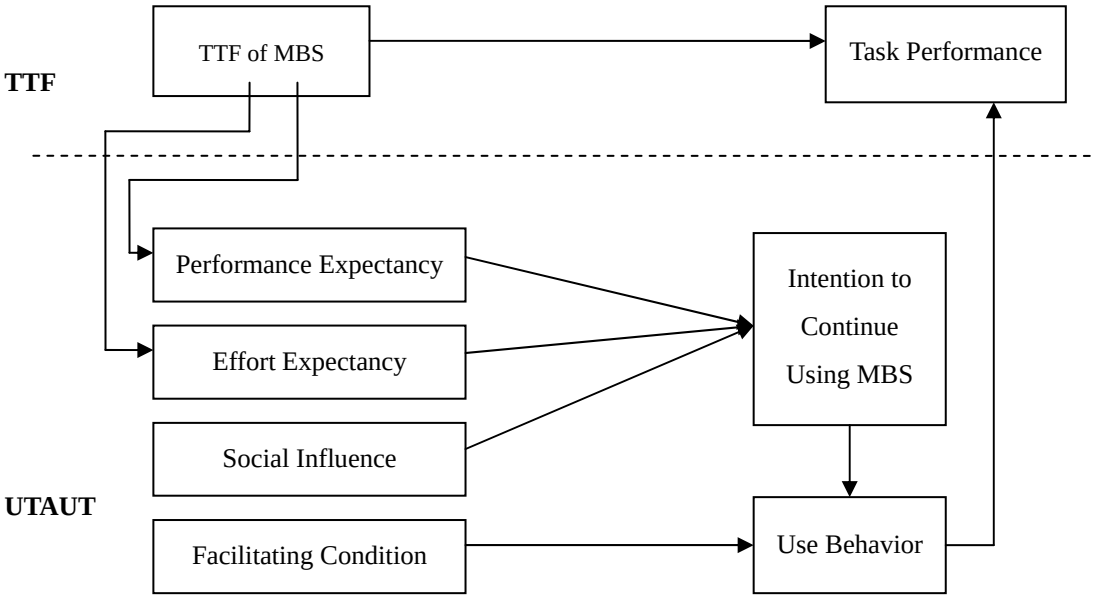


**Fig. 1 Research Model**

*Hypothesis 2: The Performance Expectancy and Effort Expectancy mediates the relationship of Task-Technology fit (TTF) and Intention to Continue Using (UCI) on using Mobile Business System.*

In UTAUT model, performance expectancy and effort expectancy are validated to impact the using intention (Venkatesh et al., 2003). Hence, we postulate the performance expectancy and effort expectancy are mediate variables of the relationships of TTF and continue using intention on using MBS.

*Hypothesis 3: The sub-constructs of TTF provide different impacts on Performance Expectancy and Effort Expectancy.*

Sub-constructs in TTF are developed to measure the degree of systems characteristics that feed the task needs of users (Goodhue, 1995). Each sub-construct represents a unique feature of the mobile business system. Hence, we postulate the sub-constructs of TTF provide different impacts on performance expectancy and effort expectancy.

## 5. Research Methodology

### 5.1 Research Samples

Research samples include insurance agents and real estate agents from subject companies which have implemented mobile business systems for their agents. Excluding incomplete and inconsistent questionnaires, we collected 268 final useful samples. Out of the 268 useful samples, 101 samples were real estate agents and 167 were insurance agents, and there were 46.6% male and 53.4% female. With respect to age groups, the highest percentage of the respondents was between 21 and 30 years old; however, the number of samples in three groups is nearly equal. In terms of education, majority of the respondents received bachelor degree, and the fewest respondents received master degree. The background of respondents is summarized in Table 1.

### 5.2 Measurement Methodology

We describe the measurement method for each variable in our study as follows:

**The TTF Theory:**

Mobile Business System Task-Technology Fit

We developed a questionnaire to assess the task-technology fit of applying Mobile Business System (MBS) for their tasks based on the eight factors of task-technology fit model of Goodhue and Thompson (1995). Eight components of TTF are used in this study. They are: data quality (DQ), locatability of data (LO), authorization to access data (AU), data compatibility (CO), ease of use /training (EU), production timeliness (PT), systems reliability (RL), and IS relationship with users (R/U). The TTF instrument uses a 5-point Likert scale.

**The UTAUT Theory:**

The UTAUT instrument uses a 5-point Likert scale. The research questionnaire was customized by using the

precise acronym and name of the MBS readily understandable by the correspondents. They are

Performance Expectancy (PE)

Performance expectancy is defined as the degree to which an individual believes that using the MBS will help him or her to attain gains in job (Venkatesh et al., 2003).

Effort Expectancy (EE)

Effort expectancy is defined as the degree of ease associated with the use of the MBS (Venkatesh et al., 2003).

Social Influence (SI)

Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the MBS (Venkatesh et al., 2003).

Facilitating Conditions (FC)

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the MBS (Venkatesh et al., 2003).

Intention to Continue Using (ICU)

Intention to Continue Using is defined as the degree to which an individual believes that he will continue using the MBS.

**Demographic Variables**

The demographic variables used in this research include gender, age, and education.

**Table 1 Background of Research Samples**

| Variables/classification | real estate | (%) | insurance | (%) | Total | (%) |
|---|---|---|---|---|---|---|
| **Gender** | | | | | | |
| Male | 60 | 59.4 | 65 | 38.9 | 125 | 46.6 |
| Female | 41 | 40.6 | 102 | 61.1 | 143 | 53.4 |
| **Age** | | | | | | |
| 21-30 | 68 | 67.3 | 35 | 21.0 | 103 | 38.4 |
| 31-40 | 28 | 27.7 | 55 | 32.9 | 83 | 31.0 |
| Above 41 | 5 | 5.0 | 77 | 46.1 | 82 | 30.6 |
| **Education** | | | | | | |
| High School | 11 | 10.9 | 54 | 32.3 | 65 | 24.3 |
| Associate Degree | 23 | 22.8 | 65 | 38.9 | 88 | 32.8 |
| Bachelor | 53 | 52.5 | 44 | 26.3 | 97 | 36.2 |
| Master or above | 14 | 13.9 | 4 | 2.4 | 18 | 6.7 |

### 5.3 Reliability and Validity of Research Instrument

#### 5.3.1 Factor analysis results and Cronbach's alpha coefficients

Measure of TTF and UTAUT overlaps in some constructs, e.g. ease of use is measured in both models. Factor analysis was performed to reduce the overlapping items and variables. Table 2 shows the factor analysis results and Cronbach's alpha coefficients. Three sub-constructs in TTF (locatability of data (LO), data compatibility (CO) and ease of use /training (EU)) had to be removed from further analysis due to low factor loadings and inconsistency in fitting into any of the underlying factors. To check the reliability of the ten resulting factors, Cronbach's alpha coefficients were computed.

The results indicate that all UTAUT constructs can be retained in extended UTAUT model and only five sub-constructs of TTF can be preserved ( data quality (DQ), authorization to access data (AU), production timeliness (PT), systems reliability (RL), and IS relationship with users (R/U)).

In practical application, the value of Cronbach's alpha should exceed 0.5. It has been recommended that "the internal consistency, as measured by the Cronbach's alpha, should be at least 0.60 for a self-report instrument to be reliable and at least 0.8 when used as a screening instrument" (Nunnally and Bernstein, 1994). The Cronbach's alpha

of our instrument ranges from 0.654 to 0.907, indicating a medium high to high reliability.

**Table 2 Factor Analysis Results and Cronbach's Alpha Coefficients**

| Factor | Variables | Factor loading | Eigenvalue | Percentage explained | Cronbach's alpha |
|---|---|---|---|---|---|
| Factor 1 Effort Expectancy | EE-1 | 0.738 | 4.484 | 10.677 | 0.866 |
| | EE-2 | 0.721 | | | |
| | EE-3 | 0.696 | | | |
| | EE-4 | 0.578 | | | |
| | EU-2 | 0.714 | | | |
| Factor 2 Relationship with Users | R/U-2 | 0.631 | 3.873 | 9.221 | 0.836 |
| | R/U-3 | 0.705 | | | |
| | R/U-4 | 0.766 | | | |
| | R/U-5 | 0.548 | | | |
| Factor 3 Social Influence | SI-1 | 0.795 | 3.487 | 8.302 | 0.826 |
| | SI-2 | 0.761 | | | |
| | SI-3 | 0.720 | | | |
| Factor 4 Intention to Use | IU-1 | 0.768 | 2.943 | 7.007 | 0.907 |
| | IU-2 | 0.858 | | | |
| | IU-3 | 0.830 | | | |
| Factor 5 Facilitating Condition | FC-1 | 0.721 | 2.630 | 6.262 | 0.794 |
| | FC-2 | 0.770 | | | |
| | FC-3 | 0.652 | | | |
| Factor 6 Production Timeliness | PT-1 | 0.722 | 2.336 | 5.562 | 0.798 |
| | PT-2 | 0.812 | | | |
| Factor 7 Data Quality | DQ-1 | 0.692 | 2.227 | 5.303 | 0.750 |
| | DQ-2 | 0.782 | | | |
| | DQ-3 | 0.593 | | | |
| Factor 8 Reliability | RL-2 | 0.829 | 1.983 | 4.721 | 0.772 |
| | RL-3 | 0.862 | | | |
| Factor 9 Performance Expectancy | PE-1 | 0.625 | 1.948 | 4.639 | 0.753 |
| | PE-2 | 0.618 | | | |
| Factor 10 Authorization | AU-1 | 0.796 | 1.716 | 4.085 | 0.654 |
| | AU-2 | 0.838 | | | |

### 5.3.2 Validity

Our questionnaire design was based on well-established and validated instruments from Goodhue and Thompson (1995) and Venkatesh et al. (2003), and the instrument can be seen with high content validity. In terms of construct validity, the factor loadings of the variables retained in the extend UTAUT model were between 0.578 and 0.858. In summary, both the content and construct validity of our research instrument have been achieved.

## 6. Research Results

### 6.1 The impacts of TTF on Performance Expectancy and Effort Expectancy

We perform a regression analysis of the impact of TTF on Performance Expectancy and Effort Expectancy. The results are summarized in Table 3.

Table 3 shows the regression analysis results of TTF on Performance Expectancy and Effort Expectancy of using MBS. It means that agents perceived higher TTF believed that the MBS will help them increase their task performance and will not consume them too much time on learning to use the systems. Therefore, Hypothesis 1 that the agents' evaluation of task-technology fit of using Mobile Business System will impact the performance expectancy and effort expectancy is supported.

**Table 3 Regression Analysis of TTF on PE and EE**

| *β Coefficient* | *Performance Expectancy* | *Effort Expectancy* |
|---|---|---|
| ***TTF*** | 0.518*** | 0.594*** |
| ***Adjusted R-Square*** | 0.266*** | 0.350*** |

*: p-value <0.05 **: p-value <0.01 ***: p-value <0.001

### 6.2 The validation of Performance Expectancy and Effort Expectancy as Mediators

Our research model in Figure 3 shows that the performance expectancy (PE) and effort expectancy (EE) of MBS mediates the relationship of task-technology fit (TTF) and intention to continue using MBS. To ascertain that PE and EE are indeed mediator variables, we construct three models where Model 1 regresses intention to continue using (ICU) on PE and EE, Model 2 regresses ICU on TTF, and Model 3 regresses ICU on TTF, PE and EE. The results are summarized in Table 4.

**Table 4 Validation of PE and EE as Mediators**

| *β Coefficient* | *Intention to Continue Using MBS* |
|---|---|
| ***Model 1:*** | |
| ***Regress ICU on PE and EE*** | |
| Performance Expectancy | .319*** |
| Effort Expectancy | .292*** |
| *Adjusted R-Square* | *.279*** |
| ***Model 2 :*** | |
| ***Regress ICU on TTF*** | |
| TTF | .341*** |
| *Adjusted R-Square* | *.113*** |
| ***Model 3:*** | |
| ***Regress ICU on TTF, PE and EE*** | |
| TTF | .004 |
| Performance Expectancy | .318*** |
| Effort Expectancy | .290*** |
| *Adjusted R-Square* | *.276*** |

*: p-value <0.05 **: p-value <0.01 ***: p-value <0.001

In Model 1 of Table 4, ICU is significant for PE and EE with adjusted R-squares of 0.279. In Model 2, TTF is significant for intention to use MBS with adjusted R-squares of 0.113. In Model 3 where TTF, PE and EE are tested for their influences on the intention to use MBS, PE and EE remains significant as in Model 1 while TTF drop out of significance. The aforementioned observations together with changes of adjusted R-squares in Models 1-3 corroborates the validity of TTF as a full mediator in our research model depicted in Figure 1. Therefore, Hypothesis 2 that the performance expectancy and effort expectancy mediates the relationship of task-technology fit (TTF) and intention to continue using (ICU) Mobile Business System is supported.

### 6.3 The impacts of TTF sub-constructs on Performance Expectancy and Effort Expectancy

Using regression analyses, we aim to identify those sun-constructs affecting the performance expectancy and effort expectancy of using MBS.

Table 5 shows that among the five task-technology fit factors of MBS, the “data quality” and “IS relationship with users” factors have positive and significant impacts on performance expectancy in using MBS. These results mean that the higher the cognitive fit of “data quality” and “IS relationship with users”, the higher the performance expectancy the MBS provides for tasks. Among these two factors, “IS relationship with users” has the highest impact.

With regard to the influence on effort expectancy, only “IS relationship with users” factor has positive and significant impacts in using MBS. In other words, higher the cognitive fit of “IS relationship with users”, the less effort

is expected to spend on using MBS.

Therefore, Hypothesis 3 that the sub-constructs of TTF provide different impacts on Performance Expectancy and Effort Expectancy is supported.

**Table 5: Regression Analysis of TTF Sub-constructs on PE and EE**

| *β Coefficient* | *Performance Expectancy* | *Effort Expectancy* |
|---|---|---|
| ***Data Quality (DQ)*** | 0.178** | 0.052 |
| ***Authorization to Access Data (AU)*** | 0.025 | 0.068 |
| ***Production Timeliness (PT)*** | 0.084 | 0.069 |
| ***Systems Reliability (RL)*** | -0.060 | 0.031 |
| ***IS Relationship with Users (R/U)*** | 0.407*** | 0.507*** |
| ***Adjusted R-Square*** | 0.323 | 0.328 |

*: p-value <0.05 **: p-value <0.01 ***: p-value <0.001

### 6.4 The Path Analysis

Figure 2 shows the path diagram of research model. All relationships in the extended model are significant except the influence of social influence on intention to continue using MBS.

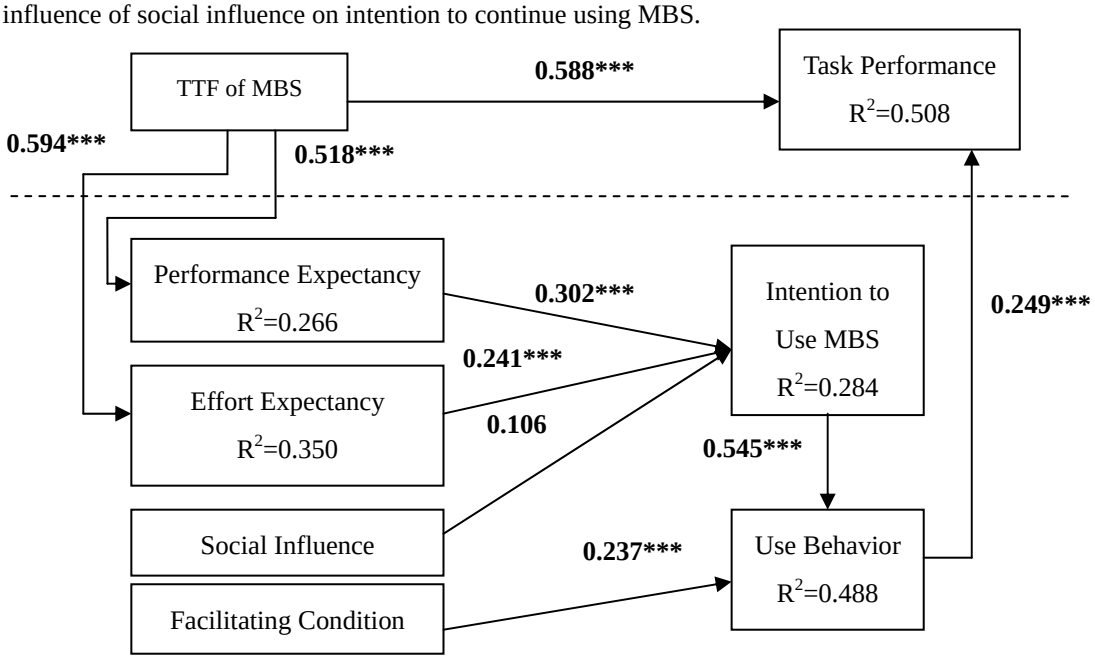


**Fig. 2 Path analysis for All Samples**

Figure 3 shows the path diagram of case 1: Mobile Dr. Insurance system. All relationships in the extended model are significant except the influence of effort expectancy on intention to continue using MBS.

Figure 4 shows the path diagram of case 2: Top Agent PDA system. All relationships in the extended model are significant except the influence of social influence on intention to continue using MBS.

## 7. Discussion

### 7.1 TTF of Mobile Business systems

As measure of TTF and UTAUT overlaps in some constructs, we performed a factor analysis to reduce the overlapping items and variables. Research results show that three sub-constructs in TTF (locatability of data (LO), data compatibility (CO) and ease of use /training (EU)) can be removed from the measurement of TTF due to low factor loadings and inconsistency in fitting into any of the underlying factors. That is, data quality (DQ), authorization to access data (AU), production timeliness (PT), systems reliability (RL), and IS relationship with users (R/U) can be used to measure the task-technology fit of mobile business system.

As the two mobile systems in this study are web based systems, PDA is used as a client end and is used to browse

the server side system. Because most information is pre-processed by the server system, the locatability of data (LO) and data compatibility (CO) are not still important to measure the characteristics of mobile business system for users. Besides, as our research model extended UTAUT with TTF, the ease of use /training (EU) variables is merged into the effort expectancy construct.

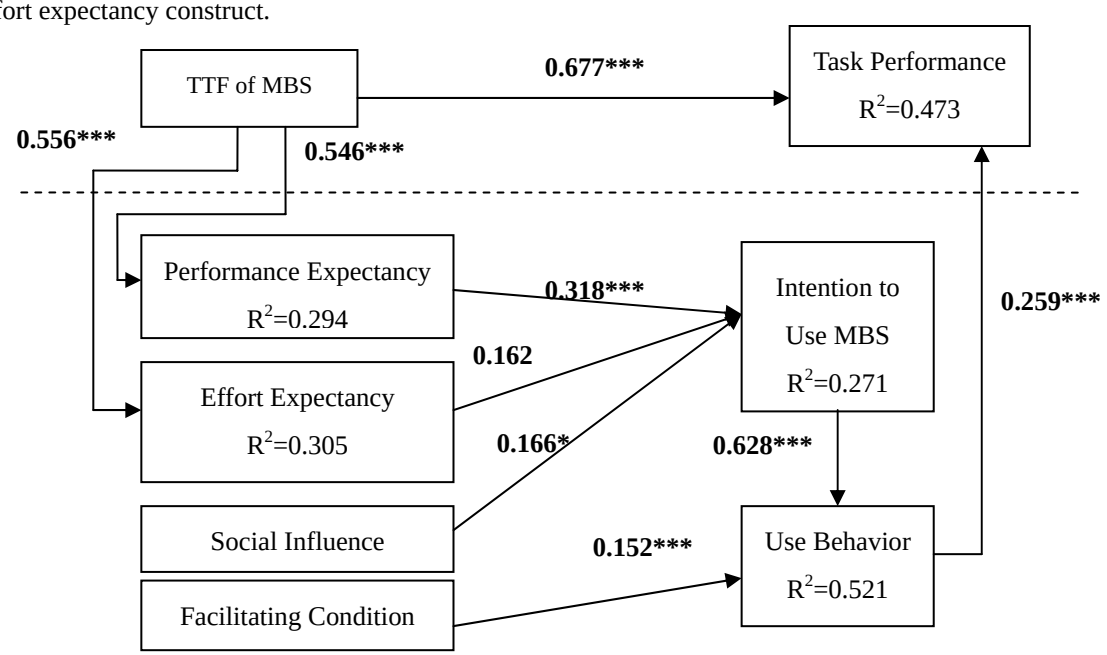


**Fig. 3 Path analysis for Case 1 Samples**

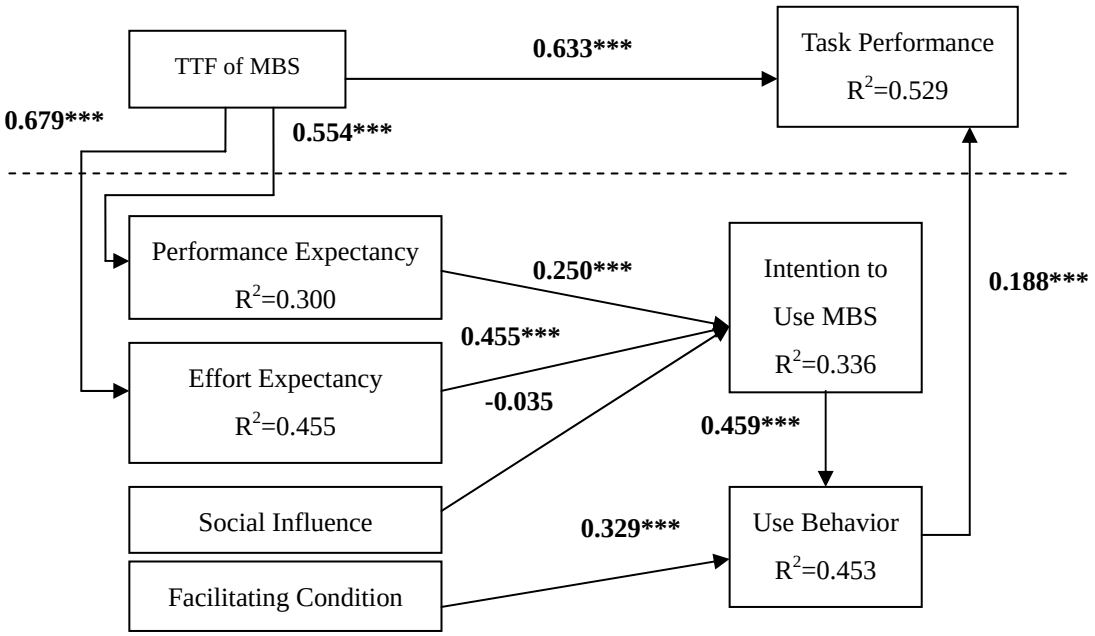


**Fig. 4 Path Analysis for Case 2 Samples**

### 7.2 TTF will impact Performance Expectancy and Effort Expectancy

The research findings indicate that TTF has impacts on performance expectancy and effort expectancy. This finding answers the question "TTF has not been explicitly tied into UTAUT model" by Venkatesh et al. (2003). That is, sales representatives and agents perceived higher TTF believed that the MBS will help them improve their task performance and will not consume them too much time on learning to use the systems.

### 7.3 Performance Expectancy and Effort Expectancy mediate the influence of TTF on Intention to Continue Using

Research findings indicate that the performance expectancy (PE) and effort expectancy (EE) of MBS mediates the influence of task-technology fit (TTF) on intention to continue using MBS. These results validate our proposed model

that extends UTAUT with TTF. That is, sales representatives and agents perceived higher TTF will increase the intention to continue using MBS via performance expectancy (PE) and effort expectancy (EE).

### 7.4 The impacts of TTF sub-constructs on Performance Expectancy and Effort Expectancy

Research results find that only the "data quality" and "IS relationship with users" factors in the five task-technology fit factors of MBS have positive and significant impacts on performance expectancy. The "data quality" factor refers to whether the data in the mobile business system are accurate and current with the right level of details to meet the requirement of the agents' tasks. The "IS relationship with users" factor refers to IS department has the characteristics of understanding of business, interest and dedication, responsiveness, delivering agreed-upon solutions, and providing technical and business planning assistance. In other words, the higher the cognitive fit of "data quality" and "IS relationship with users", the higher the performance expectancy the MBS provides for tasks.

Research results also find that only the "IS relationship with users" factor has positive and significant impacts on effort expectancy. That is, the more the agents feel that the IS department provides qualitative, quick, professional, and accurate services and is with dedicative attitudes, the less effort is expected to spend on using MBS.

In summary, the "IS relationship with users" factor plays a critical role on the influence of TTF on performance expectancy and effort expectancy. We can confirm that the better the agents perceive the IS relationship with users, the higher the performance expectancy the MBS provides, and the less effort is expected to spend on using MBS.

### 7.5 Comparisons of the two cases

From the paths analyses, we have following findings:

(1) TTF is the determinant of performance expectancy and effort expectancy for both cases and all samples.
(2) Performance expectancy will influence the intention to continue using of MBS for both cases and all samples.
(3) In case 2 system, which is in the initial stage of system implementation, effort expectancy play an important role on predicting the continuous use of MBS, but social influence will not impact the intention to continue using of MBS.
(4) In case 1 system, which is a relatively mature system, performance expectancy is the main factors that influence the intention to continue using of MBS, but effort expectancy will not impact the intention to continue using of MBS.
(5) We can reconfirm that perceived TTF and actual use of MBS will improve task performance of sales representatives and agents.

## 8. Conclusion

The objective of this paper is to explore the adoption behaviors of mobile business systems from task-technology fit and UTAUT perspectives. In particular, we study (1) which mobile business systems characteristics satisfy agents' task needs, (2) which factors will impact the intention to continue using MBS, (3) is performance expectancy and effort expectancy mediate the influence of TTF on intention to continue using MBS, and (4) which sub-constructs in TTF dominate the influence on performance expectancy and effort expectancy.

Our study finds that five sub-constructs of TTF: data quality (DQ), authorization to access data (AU), production timeliness (PT), systems reliability (RL), and IS relationship with users (R/U) can be used to measure whether the mobile business systems characteristics can satisfy agents' task needs.

Our study also finds that sales representatives and agents perceived higher TTF believed that the MBS will help them improve their task performance and will not consume them too much time on learning to use the systems. Our hypothesis that the TTF of using MBS will impact the performance expectancy and effort expectancy is supported.

In terms of the mediating effects of performance expectancy and effort expectancy, we discover that, the performance expectancy (PE) and effort expectancy (EE) of MBS mediates the influence of task-technology fit (TTF) on intention to continue using MBS. Therefore, our hypothesis 3 is supported and our research model that extends UTAUT with TTF also is validated.

The "data quality" and "IS relationship with users" factors in the five task-technology fit factors of MBS have positive and significant impacts on performance expectancy. And, only the "IS relationship with users" factor has positive and significant impacts on effort expectancy in using MBS. We can conclude that "IS relationship with users" factor plays a critical role on the influence of TTF on performance expectancy and effort expectancy. "IS relationship with users" factor refers to IS department has the characteristics of understanding of business, interest and dedication, responsiveness, delivering agreed-upon solutions, and providing technical and business planning assistance. In sum, the better the agents perceive the IS relationship with users, the higher the performance expectancy the MBS provides, and the less effort is expected to spend on using MBS.

From the paths analyses, we find, for a mobile business system in the initial stage of system implementation, effort expectancy play an important role on predicting the continuous use of MBS, but social influence will not impact the intention to continue using of MBS. On the other hand, for a relatively mature mobile business system, performance expectancy is the main factors that influence the intention to continue using of MBS, but effort expectancy will not impact the intention to continue using of MBS.

Our research provides useful contributions to both theory and the practice. In theory, we extended UTAUT with TTF and proposed combined model to investigate the use and adoption behaviors. The combined model is validated in this study and this model can be used to understand the intention to continue using mobile business systems for sales representatives and agents in real estate and insurance industry. In practice, two successful mobile business systems are reported and the use behaviors of the systems are studied. The experiences and insights of the implementation results and using behaviors can help other corporations and industries in adopting mobile technologies.

As with all research, this study has certain limitations. The sample of this study is limited to two mobile business systems users in Taiwan real estate and life insurance industry. As such, the research needs to be replicated to examine the robustness of findings across a wide range of industries and areas.

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