Adoption of Instant Messaging
By Travel Agency Workers in Taiwan:
Integrating Technology Readiness with the
Theory of Planned Behavior

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ABSTRACT
Instant messaging (IM) applications are beginning to move into the tourism workplace. This paper analyzes the range of influences affecting the adoption of IM by customer service representatives in Taiwan travel agencies. Variables were found in Parasuraman’s [2000] technology readiness index (TRI) and Ajzen’s [1991] theory of planned behavior (TPB). Data for this study was obtained from questionnaires administered to customer service representatives at 2,241 registered travel agencies in Taiwan. A total of 188 completed questionnaires were returned, and these variables were then factor analyzed. The results indicated that only the factor optimism leads to a positive attitude toward using IM tools, and that it indirectly leads to advantageous effects on behavioral intentions. Positive optimism toward IM at work explained best why some employees had a higher attitude and intention to adopt IM than others. The more positive optimism that a customer exhibits, the higher that person’s attitude and intention are to adopt IM. The results also indicated that IM tools have no barrier to adoption and use. That fact encouraged travel agencies in Taiwan to comprehensively adopt IM as on-line service tools. Limitations of the research are discussed, and implications for future research are presented.

Keywords: Instant messaging (IM), travel agency, technology readiness index (TRI), theory of planned behavior (TPB)
1. **INTRODUCTION**

The structure of the tourism industry has been affected dramatically by the Internet [Buhalís, 1998]. The Internet has also facilitated easy access to more information by travel consumers. The success of travel agencies will depend on their ability to immediately react to customer expectations and to meet the needs of the new generation of sophisticated dot.com consumers. In changing the nature of communication, use of the Internet has reduced some of the barriers to face-to-face interaction such as time constraints and location problems, including traffic, congestion, and parking. Now, numerous travel agencies interact with their customers over the telephone, by email, or via a web site.

Instant messaging (IM) software, such as AOL Instant Messenger (AIM), MSN Messenger, and Yahoo! Messenger, has become one of the most popular applications for many Internet users [To et al., 2008]. Instant messaging provides ready access to contacts around the globe for real-time interaction and information exchange [Zhou and Lu, 2010]. Instant messaging works as its name implies. It delivers the user’s message to his or her desired contact instantly, provided the contact person is online at the time. The client software allows the user to maintain a list of contacts with whom he or she wants to communicate. The user can send messages to any of the contacts on his or her list. Various communication means are available using instant messaging. With a web camera and voice, a person can hold an interactive web conference using instant messaging.

As a means of communication, IM has not only been influential at the personal level, but has also affected interaction between customers and business organizations. It is now making headway in the world of tourism. Few travel agencies in Taiwan have successfully enabled their employees to make contact with online customers using IM tools. With IM tools, customers can connect directly with customer service representatives at travel agencies, who can provide immediate answers to any questions they may have about accommodations, availability, or general information about holiday occasions.

With IM tools, holiday makers always get an instant answer, and this can often lead to an immediate booking. For example, TraveList, an online travel directory, added IM to its featured profiles so that they can use existing IM tools for prompt communication with their audience as well as potential business partners. Another example is La Vacanza, a small travel agency in Italy, which
uses IM to provide personal service: up to 20% of the agency’s new customers now make first contact with through IM tools [IBM Case Study, 2009].

Early studies focused on IM use at the personal level [Ruppel and Fagan, 2002; Segerstad and Ljungstrand, 2001]. Later, some researchers turned their attention to investigating IM use within organizations [Cameron and Webster, 2005; Huang and Yen, 2003; De Vos, Ter Hofte, and De Poot, 2004]. Although these studies contribute to the understanding of IM use, further research is needed on IM use and how it can be adopted to a specific industry, such the travel industry. Using a theoretical foundation, this study empirically explores the factors influencing the adoption of IM by customer service representatives at travel agencies in Taiwan.

Following this introduction, Section 2 presents a discussion of the adoption model used as a basis for our research. Section 3 discusses the methodology used, and Section 4 presents suggestions for future research. Section 5 concludes with a discussion of implications and contributions.

2. **INSTANT MESSAGING ADOPTION THEORY**

Theoretically, several models of adoption and continued use have been proposed [Pesonen and Palo-ojaa, 2010]. The theory of reasoned action (TRA), for example, suggests that adoption is an individual decision resulting from intent to use a technology. TRA holds that an individual’s behavior is determined by his/her behavioral intention, which is governed by individual attitudes toward performing the behavior and by subjective norms. The attitudes are based on evaluation of the consequences of engaging in the behavior, which are typically represented as product attributes or brand equity in marketing [Fishbein and Ajzen, 1975]. The framework of the TRA is shown in Figure 1.

This TRA was related to voluntary behavior. Later on, behavior appeared not to be 100% voluntary and under control. This finding resulted in the addition of perceived behavioral control as a factor. With this addition, the theory was called the theory of planned behavior (TPB), and its framework is shown in Figure 2. The TPB is a theory that predicts deliberate behavior, because behavior can be deliberative and planned. According to the TPB, attitude impacts users’ behavioral intention, which in turn influences their actual behavior. When individuals form a positive attitude toward IM, they will have a stronger intention toward adopting it, and are thus more likely to use it. Taylor and Todd [1995]
decomposed subjective norm and perceived behavioral control in TPB, and combined it with innovation diffusion theory (IDT) [Roger, 1983] to construct the decomposed theory of planned behavior (DTPB).

Figure 1. Theory of Reasoned Action
[adopted from Fishbein & Ajzen, 1975]

Figure 2. Theory of Planned Behavior
[adopted from Ajzen, 1991]
The technology acceptance model (TAM), which is shown in Figure 3, builds on similar principles. It suggests that technology adoption is a function of perceived utility and ease of use of the technology, as well as individual attitude toward the technology and the intent to use it. This model has been supported in prior studies, where people who perceived IM as both useful and easy to use were more likely to adopt and use IM [Chung and Nam, 2007; Lu, Zhou, and Wang, 2009; Wang, Hsu, and Fang, 2004].

![Technology Acceptance Model](image)

**Figure 3. Technology Acceptance Model**

*adopted from Davis, 1989*

Although previous research has found TAM to be a parsimonious and robust model, TAM uses only two variables – user attitude and user belief (perceived usefulness) – to explain behavioral intention. Based on eight models, including TAM, Venkatesh et al. [2003] formulated a unified theory of acceptance and use of technology (UTAUT) to explain users’ acceptance of an information technology. The UTAUT model included four core constructs: performance expectancy (perceived usefulness), effort expectancy (perceived ease of use), social influence (subjective norm), and facilitating conditions (perceived behavioral control).

Using flow theory, Csikszentmihalyi [1990] named the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it. Koufaris [2002] noted that online flow experience includes...
three dimensions: perceived enjoyment, perceived control, and attention focus. Lu et al. [2009] found that perceived enjoyment significantly influence people’s attitude toward using IM, which in turn impacts their behavioral intention.

Previous research on technology acceptance also suggests that individual differences may affect the acceptance [Im, Bayus, and Mason, 2003; Meuter et al., 2005; Parasuraman, 2000]. However, findings about the influences of these individual difference variables on technology acceptance are sparse or inconsistent [Dabholkar and Bagozzi 2002; Im et al., 2003].

Fortunately, Parasuraman [2000] has proposed a very promising scale for use with general consumer populations, which he calls the technology readiness index (TRI). The TRI measures a person's propensity to embrace and use new technologies for accomplishing goals in home life and at work [Parasuraman, 2000]. Parasuraman [2000] explored the technology readiness that can gauge both users' attitudes toward technology and other demographic attributes. In particular, the TRI incorporates people's feelings of optimism, innovativeness, discomfort, or insecurity toward the use of technology in a determination of a person's readiness to use technology. Parasuraman’s TRI model is shown in Figure 4.

![Figure 4. Motivators and Inhibitors of Technology Readiness](Parasuraman, 2000)
The four TRI dimensions clearly have different meanings, as follows:

- **Optimism**: A positive view about technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.
- **Innovativeness**: A tendency to be a technology pioneer and thought leader.
- **Discomfort**: A perceived lack of control over technology and a feeling of being overwhelmed by it.
- **Insecurity**: Distrust of technology and skepticism about its ability to work properly.

Parasuraman [2000] reports a 36-item scale based on four dimensions, and all relate to different psychological processes that underlie technology acceptance. Parasuraman [2000] explores optimism and innovativeness as positive drivers of technology readiness, whereas discomfort and insecurity would serve as inhibitors.

As mentioned above, researchers have developed a number of models for studying the IM tools adoption of end users. We are exploring the similarities and differences among these models with a goal of developing combined models with more explanatory power. Chen and Li [2010] show in full detail that integrating the theoretical constructs of TPB with TRI can definitely increase the accuracy of an integrated model to predict and explain users’ behavioral intentions. Thus, TRI and TRA are chosen as the theoretical basis to develop a research model for better interpretation and forecast of the IM adoption behavior of organizational workers.

Applying the foregoing explanation to the study of IM adoption, we expect that optimism and innovativeness of TRI could encourage workers to use IM tools, and to hold a positive attitude toward IM tools use. In contrast, discomfort and insecurity of TRI are the negative attitudes (i.e. inhibitors); they make workers reluctant or have less intention to adopt new technology [Yen, 2005, Lam, Chiang, and Parasuraman, 2008].

Chen and Li [2010] reported that the attitude of TPB has more importance than perceived behavior control in determining behavioral intention to use e-service. The result conforms to the findings reported in prior research. The subjective norm of TRA refers to “the perceived social pressure to perform or not

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to perform the behavior.” In other words, the subjective norm is related to the normative beliefs about the expectation from other people [Wu and Chen, 2005]. Several empirical studies have shown that subjective norms have a positive and direct impact on behavioral intention, but this influence is usually weaker than that of attitude and perceived behavioral control [Ajzen and Fishbein, 1980; Armitage and Conner, 2001]. Gretzel [2006] reported that technologies consumed in private make it less important to consider what other people would think. Intention determined by perceived behavioral control of TPB and some consideration concerning certain facilitating mechanisms help users adopt new IT tools with ease [Liao, Chen, and Yen, 2007].

The online travel market is experiencing on-going growth [Marcussen, 2008], and travel products and services are among the most popular goods on the Internet [Palmer, 2004]. The travel industry, however, faces the challenge of meeting the customers’ high expectations toward e-services. Quick responses to inquiries and complaints are perceived as an element of quality when communicating between tourism companies and their customers [Zeithaml, 2002]. The fact is that only a few travel agencies in Taiwan have successfully enabled their employees to make contact with online customers using IM tools. For the present, it may be useful to look more closely at the most important construct: attitude. Based on the above research model, we have articulated these questions into five hypotheses to test in our research:

H1: Optimism has a positive effect on attitude toward IM use.
H2: Innovativeness has a positive effect on attitude toward IM use.
H3: Discomfort has a negative effect on attitude toward IM use.
H4: Insecurity has a negative effect on attitude toward IM use.
H5: Attitude toward IM use has a positive effect on intention to use IM.

3. METHODOLOGY

The participants in this study were customer service representatives drawn from 2,241 registered travel agencies in Taiwan. The convenience sampling method was used. A total of 188 completed questionnaires were returned. This study integrated the construct of technology readiness with TPB to better explain users’ intentions to adopt IM tools. The items on the questionnaire used in the current study were modified from existing literature and were the participants’
self-report about any IM adoption and contacts with their customers (technology readiness, attitude, intention of IM use, and demographics).

The survey instrument included a total of 48 items to measure the four influence factors of TRI and the two variables of TPB. The 36-item technology readiness scales were adapted from Parasuraman [2000]. The attitude and intention to adopt the IM construct included 12-items that had been modeled after the behavioral intentions questions in Dabholkar [1994]. Regarding the attitude to adopt IM, the item would be:

"Using VoIP/texting of IM software to communicate is a good decision/pleased thing/good assistance."

For intention to adopt IM, the items would be:

"I'll add VoIP/texting of IM shortcuts to my favorites."
"When I want to communicate with customer service, I will consider the VoIP/texting of IM software."
"I will try to use the VoIP/texting of IM in the next three months."

All questions were measured using a Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). In addition, the survey asked respondents for information on gender, age, education, IM experience, on-line shopping experience, and general Internet use.

4. RESULTS

This section on results discusses the profile of respondents, construct validity, and multivariate statistics.

4.1. Profile of Respondents

Table 1 shows the descriptive statistics of sample data for the 188 subjects who participated in this study. A majority (58.8%) of the respondents were between the ages of 26 and 35 years, and 66.3% were female. The vast majority (89.8%) had at least graduated from college, and 70.6% had more than five years of IM experience. Only 2.1% of the respondents reported that they never use any IM tools, and 3.9% stated that they never buy anything on-line. A total of 83.4% reported using the Internet more than two hours each day.
Table 1
Profile of Respondents

<table>
<thead>
<tr>
<th>Item</th>
<th>Categories</th>
<th>Number of Samples</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>64</td>
<td>33.7</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>124</td>
<td>66.3</td>
</tr>
<tr>
<td>Age</td>
<td>Under 25 years</td>
<td>36</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>26-35 years</td>
<td>110</td>
<td>58.8</td>
</tr>
<tr>
<td></td>
<td>36-45 years</td>
<td>35</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>46-55 years</td>
<td>5</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>56 years or over</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Education</td>
<td>High school graduate</td>
<td>19</td>
<td>10.2</td>
</tr>
<tr>
<td></td>
<td>2-year college degree</td>
<td>56</td>
<td>29.9</td>
</tr>
<tr>
<td></td>
<td>4-year college degree</td>
<td>100</td>
<td>52.9</td>
</tr>
<tr>
<td></td>
<td>Graduate or master’s degree</td>
<td>13</td>
<td>7.0</td>
</tr>
<tr>
<td>IM Experience</td>
<td>Never</td>
<td>4</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Less than 1 year</td>
<td>7</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>1-3 years</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>3-5 years</td>
<td>30</td>
<td>16.0</td>
</tr>
<tr>
<td></td>
<td>More than 5 years</td>
<td>132</td>
<td>70.6</td>
</tr>
<tr>
<td>On-line Shopping Experience</td>
<td>Never</td>
<td>9</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Less than 3 times</td>
<td>22</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>4-10 times</td>
<td>60</td>
<td>29.3</td>
</tr>
<tr>
<td></td>
<td>More than 10 times</td>
<td>115</td>
<td>56.1</td>
</tr>
<tr>
<td>Internet Use Daily</td>
<td>Less than 2 hours</td>
<td>32</td>
<td>16.6</td>
</tr>
<tr>
<td></td>
<td>2-8 hours</td>
<td>78</td>
<td>41.7</td>
</tr>
<tr>
<td></td>
<td>More than 8 hours</td>
<td>78</td>
<td>41.7</td>
</tr>
</tbody>
</table>

4.2. Construct Validity

Table 2 summarizes the results of the reliability and validity tests. Internal consistency (Cronbach’s α) was calculated to assess the reliability of all constructs. We assessed the validity of the TRI construct by conducting a factor analysis on the TRI to make sure that all 10 TRI items loaded on the appropriate factor relating to that item (i.e., optimism, innovativeness, discomfort, and insecurity). Factor analyses with principal components as the extraction method and Varimax rotation were conducted. These factor analyses revealed that six factors had eigenvalues greater than 1, which is the traditional cutoff value. The data matrix was suitable for factoring with the Bartlett’s test of specificity...
significant \((\chi^2 = 5,155.476, \text{ degree of freedom} 630)\) and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy 0.88. The four-factor solution explained 70.5% of variance in the data.

<table>
<thead>
<tr>
<th>Construct Name and Items</th>
<th>Eigenvalues</th>
<th>Variance Explained</th>
<th>Cronbach (\alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>10.13</td>
<td>28.147</td>
<td>0.896</td>
</tr>
<tr>
<td>Optimism</td>
<td>6.51</td>
<td>18.082</td>
<td>0.956</td>
</tr>
<tr>
<td>Discomfort of control</td>
<td>3.28</td>
<td>9.099</td>
<td>0.892</td>
</tr>
<tr>
<td>Discomfort of use</td>
<td>2.24</td>
<td>4.905</td>
<td>0.956</td>
</tr>
<tr>
<td>Insecurity of transaction</td>
<td>1.77</td>
<td>6.232</td>
<td>0.889</td>
</tr>
<tr>
<td>Insecurity of communication</td>
<td>1.46</td>
<td>4.053</td>
<td>0.892</td>
</tr>
</tbody>
</table>

Factor analysis with all items revealed that no items needed to be reassigned for *optimism* and *innovativeness*. The results also indicated that *discomfort* and *insecurity* comprised two dimensions that signified reliability and intentions. The *discomfort* scale was therefore split into two separate dimensions: *discomfort of control* and *discomfort of use*. Both sub-scales have excellent measurement properties: They explained 9.099 (Cronbach’s \(\alpha = 0.892\)) and 4.905 (Cronbach’s \(\alpha = 0.956\)) of the variance in the data. The *insecurity* scale was also split into two separate dimensions: *insecurity of transaction* and *insecurity of communication*. Both sub-scales have excellent measurement properties: They explained 6.232 (Cronbach’s \(\alpha = 0.889\)) and 4.053 (Cronbach’s \(\alpha = 0.892\)) of the variance in the data. The reliability of the scale was assessed by calculating the Cronbach’s alpha coefficient for the overall 10-item scale [Cronbach, 1951]. The Cronbach's alpha for this sample was 0.865, which exceeds the 0.7 cutoff level suggested by Nunally [1978]. All resulting modified scales show improved reliability scores and high factor loadings and can be assumed to constitute a highly reliable measurement instrument. The revised model is shown in Figure 5.
Figure 5. Determinants of Attitude and Intention to Adopt IM Tools

4.3. Multivariate Statistics

The mean scores of the Likert scale for the model constructs are above 3, which indicate that the respondents are positive to all the dimensions. There were no significant differences between any item profiles of the subjects and the dimensions of the model.

A multiple-regression model was run to examine the influence of the new six constructs in the revised model on subjects' attitude and intention. The result, which is presented in Table 3, was significant. The included constructs explained 33.6% and 54.8% of the variance of the dependent variable. Looking at the specific relationships, which are shown in Figure 5, optimism emerged as the most and only influential factor. That is, only the factor optimism leads to positive attitudes toward using IM tools, and it indirectly leads to advantageous effects on behavioral intentions. Interestingly, no significant relationship was found for innovativeness, discomfort of control, discomfort of use, insecurity of transaction, and insecurity of communication.
Table 3
Summary of Multiple-Regression Analysis

<table>
<thead>
<tr>
<th>Dependent Variable: Attitude</th>
<th>Independent Variable (Stepwise)</th>
<th>R</th>
<th>R square</th>
<th>F Change</th>
<th>B</th>
<th>Beta(β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Optimism</td>
<td></td>
<td>0.580</td>
<td>0.336</td>
<td>94.293*</td>
<td>0.758</td>
<td>0.580</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*p &lt; .001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent Variable: Intention</th>
<th>Independent Variable (Enter)</th>
<th>R</th>
<th>R square</th>
<th>F Change</th>
<th>B</th>
<th>Beta(β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Attitude</td>
<td></td>
<td>0.740</td>
<td>0.548</td>
<td>225.790*</td>
<td>0.73</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*p &lt; .001</td>
</tr>
</tbody>
</table>

5. CONCLUSIONS

Instant messaging is a popular online communication tool among Internet users because of its high efficiency and low cost. This paper explores the adoption of IM in the workplace of travel agencies in Taiwan. The research effort focused on developing an integrated model designed to predict and explain the adoption of IM tools by customer service representatives in Taiwan travel agencies when they communicated with their customers. We analyzed data based on the concepts model of technology readiness index (TRI) and the theory of planned behavior (TPB).

The study results suggest that users’ optimism has the strong and only influence on TPB’s factors in this study. Users seem to confront IT more openly and positively and are less likely to focus on its negative aspects. The more positive optimism a customer has, the higher his or her attitude and intention to adopt IM. The study results indicate that there are no barriers to the adoption and use of IM tools. This finding should encourage travel agencies in Taiwan to comprehensively adopt IM tools in on-line service.

Secure communication is a concern reported by many respondents in this study. Organizations should understand and document the level of security
needed for the type of communication or transactions that would be conducted using IM. This precaution is needed in both public and private IM. If an organization is using public IM, then the level of security needed may be higher than if it were using private IM. Private IM may not need 128-bit SSL encryption, but, over a public IM network, this higher level will ensure that the message can be read only by the recipient.

The major limitation of this study is that the sampling procedure was not randomized; therefore, the evidence from our surveys might be somewhat biased. For example, the high mean scores of Likert scale for the model constructs are above 3. The result indicates that respondents might calibrate their responses to themselves to identify social desirability. In addition, the generalizability of the findings might be limited. The variation of IM policy in different companies and industries and the duration of IM adoption by different users could affect IM use to a certain degree. It is suggested that in-depth interviews could be conducted in the future to further understand the motivation, experience, and corporate policy of IM use in organizations.

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