Library mobile applications in university libraries

Chiao-Chen Chang

Department of International Business, National Dong Hwa University, Hualien, Taiwan, ROC

Abstract

Purpose – This research aims to integrate the unified theory of acceptance and usage of technology (UTAUT) with task technology fit to explain users' behavioral intention of using library mobile applications in university libraries.

Design/methodology/approach – By integrating the unified theory of acceptance and usage of technology (UTAUT) and the moderator of task-technology fit, this research proposes a library mobile applications usage intention model. The study data come from a convenience sample of 363 undergraduate and graduate students. A structural equation modelling (SEM) technique was conducted to identify causal relationships.

Findings – Results showed that the UTAUT model fits the data well. The empirical data reveal that performance expectancy, effort expectancy, social influence, and facilitating conditions determine users' behavioral intention of using library mobile applications. As a determinant in the UTAUT model, the moderating effect of task-technology fit is also significant. Moreover, individuals with different levels of task-technology fit will strengthen or weaken the relationships of determinants in the intention to use library mobile applications in university libraries.

Research limitations/implications – This study addresses self-reported behavioral intentions as part of the survey; as a result, the data may have introduced inaccuracies. The implications of the proposed library mobile applications success model are discussed.

Practical implications – University librarians should reinforce the efficiency of library mobile applications to influence users' willingness to use such applications.

Originality/value – This study combines both the constructs of the UTAUT model and task-technology fit to consider intentions to use library mobile applications in university libraries.

Keywords Library mobile applications, UTAUT, Task-technology fit, University libraries, Mobile technology

Paper type Research paper

Introduction

With the rapid growth and use of the internet, sweeping changes in users' information search behavior has been stimulated. Libraries are increasingly dependent on database and library software vendors for providing mobile software solutions and mobile access to pre-packaged content (Iglesias and Meesangnil, 2011). The user base for mobile devices (mobile phones, palmtops, PDAs, etc.) also raises the demand for such devices to access internet resources. On the other hand, applications in the context of university libraries should place an emphasis on the content that receives the most use for off-site users, such as library hours, an online public catalog, research guides, and directional aids. Therefore, library mobile applications enable users to download and study materials published by the university library on user mobile devices at anytime and anywhere.
In looking at user acceptance, researchers have put forth several IT theories in m-commerce. As an extension of the technology acceptance model (TAM) (Davis, 1989), the unified theory of acceptance and usage of technology (UTAUT) was proposed by Venkatesh et al. (2003). They found that user adoption and usage of information technology are primarily influenced by four factors: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). The application of the UTAUT model presented here hopefully illustrates one area of MIS research in which theory could be extended through its application in the library context; no doubt there are other research areas that would likewise benefit. It is hoped that this work will serve as the impetus for future work in these areas as well as in the library industry.

Building on previous work, this paper studied the factors affecting intention to use mobile devices/services by testing the UTAUT. Past research has added new constructs in order to expand the scope of the endogenous theoretical mechanisms outlined in UTAUT (e.g. Chan et al., 2008; Sun et al., 2009). However, simply focusing on user perceptions of the technology may not be enough. It is possible that, although users perceive a technology as advanced, they do not adopt it if they think the technology does not fit with their tasks and cannot improve their performance (Junglas et al., 2008). The UTAUT model considers these factors and is known to be a more comprehensive model. However, the UTAUT model fails to take technological elements into consideration, like in the construct of task-technology fit approach. Therefore, a combination of UTAUT and task-technology fit may improve the IT adoption model.

The purposes of this paper are as follows:

- To investigate whether the constructs of the UTAUT model significantly impact a user’s intention to use library mobile applications in university libraries. Then subsequently clarify which factors are more influential in affecting a user’s intention to use library mobile applications in university libraries.

- To examine the UTAUT model for the moderating effect of task-technology fit. To evaluate whether the moderator of task-technology fit can provide a better explanatory power for the intention to use library mobile applications in university libraries. This study also presents how the coefficients of the constructs in the UTAUT model varied in the moderator of task-technology fit.

Theoretical background and research hypotheses
Library applications (apps)
With the introduction of Apple’s App Store in 2008, one year after the introduction of the first iPhone, the term app has become a popular buzzword. Further, libraries are increasingly dependent on database and library software vendors for providing mobile software solutions and mobile access to pre-packaged content. Iglesias and Meesangnil (2011) also pointed out that one key consideration for librarians is that all of a library’s website simply cannot, and should not, be included in a mobile website. In general, library mobile application functions included library notices, search function for lists of books, and today’s menu. Library mobile applications (apps) can allow users to search, bookmark, annotate, link, and highlight content from scripture, general conference talks, lesson manuals, and other curriculum on mobile devices. Recently, many large public and academic libraries have also developed their own apps.
For example, the UCLA library app provides a convenient way for users to search content of the UCLA library on an Android phone. Users can also find library hours, contacts, and laptop availability at campus locations. Developed by the UCLA library, mobile applications include the following:

- search library catalog and filter (keyword, title, author, subject);
- see description, availability, and location of items;
- read reviews;
- find library hours and contacts; and
- see number of laptops available by campus location.

Indeed, university library apps can provide users access to the library catalogue, databases, and library guides from the palm of their hand. Users can also look up library locations, borrower information, library news, and ways to contact librarians. In addition, the location-based services are available only on a library mobile app, which peak user interests in terms of mobility. Therefore, libraries and librarians face the critical issue of determining how to stimulate intention for use of library apps and how to meet user needs.

**UTAUT model**

UTAUT is meant to be adjusted to fit the technology being queried (Venkatesh et al., 2003), and therefore a certain amount of rewording is expected. Behavioral intention is defined as “the person’s subjective probability that he or she will perform the behavior in question” (Fishbein and Ajzen, 1975, p. 288). The UTAUT model focuses on how to explain the user’s intention to use an information system and subsequent behavioral intention and identifies four key drivers of the adoption of information systems: performance expectancy, effort expectancy, social influence, and facilitating conditions. The relationships between the variables introduced by the UTAUT framework are graphically represented in the research model.

The UTAUT model has also been revised to study various types of electronic commerce acceptance, for example, Martín and Herrero (2012) adopted a new approach to the formation of online purchasing intentions by using as a reference the UTAUT in the context of rural tourism. The UTAUT model has also been applied in mobile commerce acceptance, such as for explaining mobile banking usage (Zhou et al., 2010). This paper takes a similar approach as past studies in adapting the UTAUT model to introduce the concept and characteristics of mobile applications and to discuss the usage of mobile applications in university libraries.

**Intention to use**

The UTAUT model, as well as the extended model (known as TAM2), proposed by Venkatesh and Davis (2000) were extensions to the original technology acceptance model (TAM) (Davis, 1989). These extended models suggest the inclusion of external variables that might directly or indirectly impact the main components of the original technology acceptance model. The UTAUT identifies two direct antecedents to the acceptance of technological innovations: the intention to use the system; and the facilitating conditions. In this sense, Venkatesh et al. (2003) consider that the intention to use is the main indicator of the effective use of an information system. Usage intention of library apps is also a form of information system adoption.
Performance expectancy
Performance expectancy indicates that a person believes that a system improves his or her performance. This construct is predictive of intention in mandatory as well as in voluntary settings (Davis, 1989; Venkatesh et al., 2003). Performance expectancy reflects the user's perception of performance improvement, such as convenience, fast response, and service effectiveness (Venkatesh et al., 2003). Accordingly, this study assumes that with the help of library mobile apps to find information and data in university libraries, users can improve their work performance, so their use intention is stronger. This leads to the following hypothesis:

**H1.** Performance expectancy has a direct positive effect on users' behavioral intention to use library apps in university libraries.

Effort expectancy
Effort expectancy refers to the degree of ease associated with the use of the technology (Venkatesh et al., 2003), and it also means that a learner believes that using a system is free of additional effort. When users feel that mobile banking is easy to use and does not require much effort, they will have high expectations toward acquiring the expected performance (Zhou et al., 2010). The construct has been shown to be a determinant of intention, with a stronger influence in the early stages of usage (Venkatesh et al., 2003). Hence, the effect of effort expectancy on the intention to use library apps is expected to be significant and positive. The following hypothesis was proposed:

**H2.** Effort expectancy has a direct positive effect on users' behavioral intention to use library apps in university libraries.

Social influence
Social influence is defined as “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451). This shows that an individual perceives that important others believe he or she should use a technology. Social factors are drawn from the Model of PC Utilization (Thompson et al., 1991), and are defined as “the individual’s internalization of the reference group’s subjective culture and specific interpersonal agreements that the individual has made with others in specific social situations” (Venkatesh et al., 2003, p. 452). In the mobile commerce setting, social influence plays a critical role in explaining the intention to use a mobile technology (Sreenivasan and Noor, 2010). In this study, it is assumed that the social influence of users has a significant effect on their use intention for the library mobile applications in university libraries. When those people that are important to users recommend using library apps, they may comply with these people’s opinion and adopt library apps. The following hypothesized relationship was generated:

**H3.** Social influence has a direct positive effect on users’ behavioral intention to use library apps in university libraries.

Facilitating conditions
Facilitating conditions in IS research mainly refer to training, guidance, infrastructure, and help-desk support, and these facilitating conditions can improve or hinder IT use. In this context, facilitating conditions act more like perceived behavioral control in the theory of planned behavior (TPB) and influence both intention and behavior (Ajzen,
Although facilitating conditions were the only antecedent that was not significant in explaining the intention in the original UTAUT by Venkatesh et al. (2003), the later version of the UTAUT positioned the intention as a direct response variable that, in turn, is expected to exert an influence on actual usage behavior. Park et al. (2007) pointed out that facilitating conditions have a positive effect on intention in terms of mobile communication technology, and utilized intention as a meaningful surrogate for behavior. Furthermore, people need to be equipped with mobile internet knowledge in order to use library apps (Zhou, 2012). If there are more conditions that support the use of a mobile technology, then people would be more likely to adopt the mobile technology. Thus the following hypothesis was proposed:

**H4.** Facilitating conditions have a direct positive effect on users’ behavioral intention to use library apps in university libraries.

*Task-technology fit*

Task-technology fit theory was applied to the field of mobile technology adoption (Yuan et al., 2010). In particular, Goodhue and Thompson (1995) defined the fit between task and technology (task-technology fit) as the degree to which a technology assists an individual in performing his or her portfolio of tasks. Task-technology fit refers to users’ acceptance of a technology only when it fits their tasks and can improve their performance (Gebauer and Ginsburg, 2009). It also means that people will use a technology based on the fit between the technology characteristics and task requirements (Goodhue and Thompson, 1995; Dishaw and Strong, 1999).

The moderating effects of task-technology fit were recognized in IT usage contexts (Sun and Zhang, 2006). Task-technology fit has been applied to explain users’ intention to use emerging internet services (Shang et al., 2007) and mobile technologies (Lee et al., 2007), such that a good task-technology fit will increase users’ intention to use technology, and a poor task-technology fit will decrease users’ intention (Lee et al., 2007; Lin and Huang, 2008).

Even if people perceive that the technology is advanced, they will not use it if they think it is unfit for their tasks and cannot improve their performance (Junglas et al., 2008; Zhou et al., 2010). Consequently, the perception regarding existing social influence or facilitating conditions is less important in the adoption decision when individuals have a high level of task-technology fit. Consequently, and in line with the approach of the UTAUT model, this study proposes the following research hypotheses with regard to the moderating influence of task-technology fit on the formation of the intention of using library apps in university libraries:

**H5.** The greater the user’s task-technology fit, the stronger the effect of performance expectancy on the behavioral intention to use library apps in university libraries.

**H6.** The greater the user’s task-technology fit, the stronger the effect of effort expectancy on the behavioral intention of using library apps in university libraries.

**H7.** The greater the user’s task-technology fit, the weaker the effect of social influences on the behavioral intention of using library apps in university libraries.
The greater the user's task-technology fit, the weaker the effect of facilitating conditions on the behavioral intention of using library apps in university libraries.

**Methodology**

**Research model**

Figure 1 graphically summarizes the research hypotheses that were previously defined. The direct relationships between the independent variables and the behavioral intention of using library apps, as well as the moderating influences of the user's technology task fit in the formation of that intention, are represented in the figure.

**Measurement**

The data-gathering instrument used for this study was a self-administered online questionnaire. This survey instrument is composed of profile questions for the target users and acceptability questions based on the UTAUT model. The UTAUT model was developed based on the instrument adapted from Venkatesh et al. (2003) and was used to measure the acceptability of library apps to their users. It contains four core determinants of intention and usage – performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance Expectancy (PE) refers to the degree to which the library patron believes that using the library apps will help him or her attain gains in job performance, including “Using the library apps increased my productivity,” “The library apps enable me to accomplish tasks more quickly,” “I find the library apps useful,” and “The library apps increase the quality of my output with minimal effort.” Effort Expectancy (EE) refers to the degree of ease associated with the use of the library apps, including “My interaction with the library apps is clear and understandable,” “I find the library apps easy to use,” “It is easy for me to become skilful at using the library apps,” and “Learning to use the library apps is easy for me.”
Social Influence (SI) refers to the degree to which library patrons perceive that others believe in the usefulness of the library apps, including “My teachers think that I should use the library apps,” “The library staff members are helpful in the use of the library apps,” “My classmates and friends think I should use the library apps,” and “The library encourages to use the library apps.” Facilitating Conditions (FC) refers to the degree to which library patrons believe that an organizational and technical infrastructure exists to support the use of the library apps, including such assertions as “I have the knowledge necessary to use the library apps,” “I have the resources to use the library apps,” and “Someone is available for assistance if I have difficulty with the library apps.” Task-Technology Fit (TTF) refers to the degree to which library apps assist a person in performing his or her portfolio of tasks. In this study, I adopt three items from Lin and Huang (2008) to measure TTF: “In helping complete my tasks, the functions of library apps are enough”; “In helping complete my tasks, the functions of library apps are appropriate”; and “In general, the functions of library apps fully meet my needs”. Behavioral intention means the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Ajzen and Fishbein, 1980). The remaining three items were adapted from Zhou et al. (2010) to measure behavioral intention: “The probability that I will use library apps again is high,” “The likelihood that I would recommend library apps to a friend is high,” and “If I had to do it over again, I would make the same choice.” Respondents gave their opinions to each statement on a five-point Likert scale, ranging from 1 – strongly disagree to 5 – strongly agree. Finally, the age, gender, experience, and voluntariness of use are included in the profiling questions.

Procedure
The questionnaires were first checked by a panel of library experts to assess whether there were any misunderstandings or ambiguities in the expressions and to check for content validity. In an attempt to effectively establish the reliability of the measures, a pilot study for mobile customers was then conducted to deal with considerations such as instructional clarity, item clarity, and relevance. A self-administered questionnaire was then designed for the survey. Respondents were first asked whether they had ever used library apps. If they replied in the affirmative, they were asked to participate in the survey and to point out what library app functions they used frequently. The questionnaire requested the respondents to provide a response about their opinions regarding library apps and to answer the remaining questions accordingly. For each question, respondents were asked to circle the response which best described their degree of agreement.

Data collection
The present study attempts to understand factors affecting university students’ usage intention of library apps in university libraries. The survey was administered in Taiwan in the context of adopting library apps in university libraries; the subjects selected were distributed across various departments, and undergraduate and graduate students in eastern Taiwan from each department and school were fairly evenly distributed to ensure valid comparison.

All subjects participated in the study voluntarily. There were a total of 363 participants – 168 males and 195 females. Within the sample population: 277 (76.3
percent) were undergraduate students and 86 (23.7 percent) were graduate students. The age of the participants ranged from 18 to 28 years. Most of the participants (69 percent) stated they were familiar with the term library APP before the survey.

Results
Based on the two-step approach recommended by Anderson and Gerbing (1988), this study first analyzed the measurement model to test the reliability and validity of the instrument, and then analyzed the structural model to test our research hypotheses.

Measurement model analysis
To determine the reliability of each item, this study examined the significance and magnitude of its loadings. All items loaded significantly on their respective latent factors, and they all achieved standardized loadings of at least 0.60. Two measures were used to assess the internal consistency of the constructs: composite reliability (CR) and average variance extracted (AVE). The CRs were in the range between 0.80 and 0.89, and the AVEs were in the scope from 0.75 to 0.84; therefore, all were above the recommended cut-off levels of 0.70 and 0.50, respectively, and revealed good internal consistency. In the validity analysis, the convergent validity was also examined through composite reliability. The composite reliability for both constructs is above the recommended guideline of 0.70 (Sharma et al., 1981). In addition, Fornell and Larcker (1981) suggested that discriminant validity be established if the square root of the average variance extracted (AVE) for an individual construct is greater than the correlation of that construct with other constructs. Tables I and II show that this condition is met in all cases. The measure indications of this model fit with the experts’ suggestion. The statistics of fit indications are acceptable compared to the ideal level.

As also shown in Table II, each factor loading of the observed variables onto their respective latent variables is in the anticipated direction and significantly different from zero at the 0.01 level, which corroborates the existence of convergent validity (Menor and Roth, 2007; Rosenzweig and Roth, 2007). Checks were then done to see whether the correlations among the latent variables were significantly less than 1. First, the 95 percent confidence intervals for each correlation coefficient were all less than 1, indicating discriminant validity. Second, chi-square difference tests were applied to freely estimate the correlations between all possible pairs of constructs and then constrained them to be 1. Checks were also done to determine whether the constraint caused a significant degradation in fit. This series of tests also showed discriminant validity. Third, the diagonal elements, which represent the square roots of the AVE for each construct, were all higher than the loadings of items designed to measure other constructs; similarly, the item loadings are considerably higher for their corresponding constructs than for other constructs. These results showed that all of the construct measures in our model achieved discriminant validity. Consequently, the testing for validity and reliability showed that the data was robust and provided us with a high degree of confidence in the scale items used in the study.

Structural model analysis
In a structural model, it is important to determine the significance and association of each hypothesized path and the variance explained: ($R^2$ value). The $R^2$ values represent the amount of variance explained by the independent variables. Together, the $R^2$ and
path coefficients indicated how well the data supported the hypothesized model. The first step in the model testing is to estimate the goodness-of-fit, which is typically done using a $\chi^2$ test; however, such tests are sensitive to sample sizes, and the probability of rejecting any model increases as sample size increases, even when the model is minimally false. Bentler and Bonett (1980) suggested the $\chi^2$/df ratio (df: degrees of
freedom) as a more appropriate measure of model fit. This ratio, which should not exceed 5.0 for models with good fit (Bentler, 1989), was estimated at a value of 2.32 in the hypothesized model ($\chi^2/df = 2.32, p < 0.001$). Table III also lists the recommended and actual values of fit indices of the goodness-of-fit (GFI), the adjusted goodness-of-fit (AGFI), the normalized fit index (NFI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). For all indices, the actual values are better than the recommended values. Therefore, the model has a good fit (Bentler, 1989).

The second step in the model testing is to examine the path significance of each hypothesis. Figure 2 shows the results of the tests performed with AMOS 19.0 software. As predicted in H1, performance expectancy was positively and significantly related to behavioral intention of using library apps, with standardized $\beta$ coefficients of 0.63 ($p < 0.001$). Similarly, the results revealed a positive relationship of effort

<table>
<thead>
<tr>
<th>Fit measures</th>
<th>Sample</th>
<th>Recommendation value</th>
</tr>
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<tbody>
<tr>
<td>$\chi^2/df$</td>
<td>2.32</td>
<td>$&lt; 5.0$ (Bentler and Bonett, 1980)</td>
</tr>
<tr>
<td>GFI</td>
<td>0.94</td>
<td>$\geq 0.90$ (Bentler, 1990)</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.92</td>
<td>$\geq 0.90$ (Bentler, 1990)</td>
</tr>
<tr>
<td>NFI</td>
<td>0.91</td>
<td>$\geq 0.90$ (Fornell and Larcker, 1981)</td>
</tr>
<tr>
<td>CFI</td>
<td>0.95</td>
<td>$\geq 0.90$ (Hu and Bentler, 1999)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.05</td>
<td>$&lt; 0.08$ (Brown and Cudeck, 1993)</td>
</tr>
<tr>
<td>Square multiple correlation</td>
<td></td>
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<tr>
<td>Behavioural intention</td>
<td>0.62</td>
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</tbody>
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Table III. Fit statistics

Figure 2. Research model for combined dataset
expectancy to behavioral intention of using library apps ($\beta = 0.57; p < 0.001$), in support of $H2$. The direct influence of social influence has a significant impact on behavioral intention of using library apps ($\beta = 0.43; p < 0.001$), and facilitating conditions also produced positive effects on behavioral intention of using library apps ($\beta = 0.26; p < 0.001$), validating $H3$ and $H4$.

In addition, multiple-group analyses served to test our hypothesis regarding the moderating effect of task-technology fit in the UTAUT model. This analysis can test whether the groups meet the assumption that they are equal by examining whether different sets of path coefficients are invariant. Using a $\chi^2$ difference test, the resulting model fit is then compared to the unconstrained base model in which all path coefficients are freely estimated. To measure task-technology fit, this study calculated the composite score of each participant and used a median split to identify the respective groups ($N_{high} = 184, N_{low} = 179$). In particular, to validate the key moderating role of task-technology fit, this study built separate structural models for two subsamples and conducted tests of moderation to determine whether the coefficients of the hypothesized paths differed. The baseline model allowed the effect of task-technology fit on behavioral intention to use to vary across groups. In the second model, this effect was constrained to be equal across subsamples. If the $\Delta \chi^2$ is higher than the threshold at the significant level of 0.05, then it means that there are variances between different levels of task-technology fit. The path from performance expectancy strengthened in the high-score subsample ($\beta = 0.73, SE = 0.04$) compared with the low-score subsample ($\beta = 0.52, SE = 0.02$); thus, $H5$ was supported ($\Delta \chi^2 = 4.25, \Delta df = 1, p < 0.05$). The impact of effort expectancy on the behavioral intention to use library apps is stronger for users with a higher degree of task-technology fit than for those with a lower degree of task-technology fit, validating $H6$ ($\Delta \chi^2 = 11.45, \Delta df = 1, p < 0.05$). The direct influence of social influence on the behavioral intention to use library apps is stronger for users with a higher degree of task-technology fit than for those with a lower degree of task-technology fit, supporting $H7$ ($\Delta \chi^2 = 8.32, \Delta df = 1, p < 0.05$). The direct influence of facilitating conditions on the behavioral intention to use library apps is stronger for users with a higher degree of task-technology fit than for those with a lower degree of task-technology fit, validating $H8$ ($\Delta \chi^2 = 8.32, \Delta df = 1, p < 0.05$).

As a result, all path coefficients are significant at $p < 0.001$. All hypotheses were supported; thus, the results suggest that the hypothesized model is acceptable.

Discussion

Implications for research

The results of this study provide several implications for researchers and practitioners. First, our results reveal the magnitudes of the impacts of the variables in the well-accepted UTAUT model in the context of mobile commerce, especially in the setting of library-app use.

Second, the impact of facilitating conditions on usage intention was less than performance expectancy, effort expectancy, and social influences, which is weakly significant in explaining the use of library apps. This implies that performance is an important factor affecting technology usage intention. The result is also consistent with the findings from Schaupp et al. (2010) about US taxpayers in e-file adoption.
Finally, the path coefficient is significant, so the moderating effect of task-technology fit exists. In particular, the task-technology fit degree is positive in strongly moderating the effects of performance expectancy and effort expectancy on the usage intention of library apps. Referring to the definition of task-technology fit, with the help of library apps to find information and data in university libraries, users can improve their work performance, so their usage intention is stronger, and when users feel that library apps are easy to use, their usage intention will also be stronger. Conversely, the effect of social influences on the intention of using library apps in academic libraries was negatively affected by the degree of task-technology fit. A possible reason that the moderating effect of social influence is negatively significant may be that people with a high degree of task-technology fit are very familiar with IT applications; thus, their perspectives about library apps are weakly influenced by their peer friends. In addition, task-technology fit demonstrated a negative moderating effect on the path from facilitating conditions to the intention of using library apps. Higher facilitating conditions lead to significantly weaker intention for using library apps.

Implications for practice
The implications of this study for practice are twofold. One practical implication is that based on the findings of the research model, librarians can make an effort in designing a well-download and well-use app in order to enhance the users’ performance expectancy, effort expectancy, and facilitating conditions of behavioral intentions of using library apps. In addition to the roles of performance expectancy, effort expectancy, and facilitating conditions on behavioral intentions, social influence also has a weak positive effect on behavioral intentions of library apps. That is, even in voluntary contexts, under the moderator of user’s degree of task-technology fit, social influence has shown to reduce users’ perceived risk and increase their likelihood of use. Librarians may still encourage users to spread positive word-of-mouth (e.g. positive ratings) to increase peers’ use.

Another practical implication is that the research presented in this paper demonstrates the moderating effect of task-technology fit for using library apps. Librarians can consider that how to develop a very complicated app which take into account an individual’s degree of task-technology fit in order to better match with app user needs.

Conclusions
The potential for mobile applications in university libraries is quite great. Most university libraries would benefit from understanding and pursuing the technologies available as users increasingly interact with library resources using mobile devices. Thus, this study used a well-established UTAUT model to measure the influence of the user’s experience toward each potential determinant of behavioral intention for library mobile applications in university libraries. In all cases, the results support the original UTAUT hypotheses. Accordingly, performance expectancy and effort expectancy are found to be the main determinants of behavioral intention, which was consistent with past research (Carlsson et al., 2006).

The results showed that social influence was negatively significant to respondents’ intention of using library apps. This suggests that peer influence becomes less
significant and important when individuals have a high degree of task-technology fit for library apps services. Therefore, it is essential that app service providers ensure that users have a positive task-technology fit while using library apps, thus enabling them to use the technology by themselves.

Facilitating conditions may be also found as explanations for behavioral intention of using library apps in university libraries. These refer to elements of organizational and technical infrastructure to support the use of the system and to remove barriers to use (Venkatesh, 2000). Although facilitating conditions became less important for those with greater levels of task-technology fit and who were using library apps, the results highlight the need to provide guidance in the selection of the apps and specialized instruction concerning the apps (Venkatesh et al., 2003), especially since the target population will have different levels of task-technology fit.

Limitations
Our study had several limitations, mainly in sampling and the technologies surveyed. One limitation is that the respondents were mainly young people who are generally more innovative and faster to accept new technologies, and this may have introduced bias to the results. Another limitation is that the results of this study can only apply to library apps in general; extended future research can discuss other adoptions of mobile applications in light of the differences in categories of apps.

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**About the author**

Chiao-Chen Chang is an Assistant Professor at the Department of International Business, National Dong Hwa University, Hualien, Taiwan. Her current research focuses on electronic commerce, internet marketing and consumer behavior. Chiao-Chen Chang can be contacted at: aka@mail.ndhu.edu.tw

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