Determinants of Students' Intentions to Use a Mobile Messaging Service in Educational Institutions: a Theoretical Model

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Abstract—Mobile marketing through mobile messaging service has highly impressive growth as it enables e-business firms to communicate with their customers effectively. Educational institutions hence start using this service to enhance communication with their students. Previous studies, however, have limited understanding of applying mobile messaging service in education. This study proposes a theoretical model to understand the drivers of students' intentions to use the university's mobile messaging service. The model indicates that social influence, perceived control and attitudes affect students' intention to use the university's mobile messaging service. It also provides five antecedents of students' attitudes—perceived utility (information utility, entertainment utility, and social utility), innovativeness, information seeking, transaction specificity (content specificity, sender specificity, and time specificity) and privacy concern. The proposed model enables universities to understand what students concern about the use of a mobile messaging service in universities and handle the service more effectively. The paper discusses the model development and concludes with limitations and implications of the proposed model.

Keywords—education, intention, mobile marketing, mobile messaging.

I. INTRODUCTION

Impressive growth of mobile marketing through mobile messaging is increasing in its revenues and subscriptions. The worldwide mobile messaging market will reach USD 233 billion and the worldwide mobile subscriptions will exceed 6.3 billion by the end of 2014 [1][2]. Among the mobile messaging services including SMS, MMS, mobile e-mail and mobile IM, SMS yielded the highest revenue in 2009 and annual worldwide SMS traffic volumes will break 6.6 trillion in 2010 [2]. Accordingly, there is high potential for e-businesses to communicate with their consumers through the mobile messaging service especially via SMS-messages.

Universities also perceive the growth and benefits of mobile messaging services and have adopted the mobile messaging to improve communication with their students. They start using mobile messaging such as SMS, MMS and mobile e-mail to contact with their students. The mobile messages provide a university's benefits in terms of cost effectiveness, flexibility,

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immediacy, ubiquity, traceability, and personalization [4][5]. The common types of university's mobile messaging services include direct messages and automated response messages. The direct messages are sent by the universities to students for informing news and updating information which mostly are free. The response messages are automated reply messages from a messaging system. Students must send a request (i.e. text or numbers) specified by the universities via SMS to retrieved content from the messaging system. Universities ought to get students' permission to send them messages by encouraging them to register for the university's mobile messaging service. The purposes of using mobile messaging are diverse. For examples, universities can send messages for reminding or changing of appointments, requesting a reason for unauthorized absences, informing cancellation of classes, and informing emergency for school closing [5]. Students, on the other hand, can query for their grade release, class schedules and examination schedules from the automated messaging systems via their mobile phones.

Recently, the growing body of academic research has focused on examining the determinants of mobile marketing acceptance in a business sector [7][8][9]. Little research, however, focuses on applying mobile marketing, particularly mobile messaging, in the education context. This study will fill this gap in literatures. In addition, the communication of message content via the mobile media can only be effective if message recipients permit the continuous reception of messages on their mobile phone [24]. It is important, therefore, to understand the factors influencing student's intentions to receive the university's mobile messages. This study develops the mobile messaging acceptance model to understand the key drivers of students' intentions to receive mobile messages from universities. The proposed model will help universities to understand their students' concerns about using the university's mobile messaging service and improve their mobile messaging services effectively.

II. DRIVERS OF STUDENTS' INTENTIONS TO USE THE UNIVERSITY'S MOBILE MESSAGING SERVICE

Recent research has studied the adoption of mobile marketing (e.g., [8][9][32][33]) and mobile advertising in particular (e.g., [29][30][31]). Most studies, however, are conducted in the context of business. As the purposes of using

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mobile technology in business and education are different (e.g., profit vs. knowledge), users' adoption of mobile technology in education might have some different aspects. Many studies extend the theory of reasoned action (TRA), technology acceptance model (TAM), and theory of planned behavior (TPB)—the predictive persuasion theories that have been applied in information technology—to understand the adoption of innovative technologies including mobile marketing (e.g., [6][9][18][30][31]). The TRA consists of three main components; behavioral intention (BI), attitude (ATT) and subjective norm (SN). The theory suggests that a person's behavioral intention depends on the person's attitude about the behavior and the subjective norms [34][35]. That is:

$$BI \; \alpha \; ATT + SN \qquad where \; \alpha \; is \; a \; proportion$$

TRA was extended to TAM by replacing the TRA's attitude measures with the two technology acceptance measures—perceived ease of use (PEOU) and perceived usefulness (PU) [28]. Hence,

$$ATT \; \alpha \; PU + PEOU$$

Both TRA and TAM assume that people will be free to act without limitation when they form an intention to act. In the real world, although people have intention to act, the act may not be succeeded. There will be some limitations to act such as skills and opportunities. To overcome this concern, Ajzen [36] proposed the theory of planned behavior (TBA) by adding a new component, perceived behavioral control (PBC), to the TRA. That is:

$$BI \; \alpha \; ATT + SN + PBC$$

Based on relevant literatures in mobile marketing and the three theories, the study develops the model to determine factors influencing students' intentions to use the university's mobile messaging service presented in the following sections.

A. Attitudes toward mobile messaging service

Almost every student in universities are using mobile messaging either SMS, MMS, mobile e-mail or mobile instant messages. However, mobile messaging service is not well established in educational institutions. Most students have not yet had the chance to use mobile messaging service from their universities. The acceptance of mobile messaging service in a university, therefore, cannot be measured the actual usage. Investigation of students' attitudes toward using mobile messaging services and identification of its relationship with intention to use the service is more appropriated and practically valuable for predicting usage behavior [9][10]. Attitude towards behavior is an individual's belief of the performing behavior and the individual's subjective evaluation of the belief [34][36] while intention to use refers to the perception of an individual's readiness to perform a particular behavior [34]. Under the TRA, TPB and TAM, a prospective user's attitude towards using an innovative technology is an antecedent to intentions to use the technology [28][34][35][36]. In the mobile messaging context, students with positive attitudes toward the mobile messaging service are more likely to use the mobile messaging service provided by their university.

The more positive the attitudes toward the university's mobile messaging service, the higher the students' intentions to use the university's mobile messaging service.

B. Social Influence

Social influence is a crucial factor in shaping individual behavior. It can be perceived as critical mass and social norms. A critical mass, the perception of numbers of people in the network externality using a particular innovative technology, will influence individuals to adopt the technology. If students feel the sense that many of their friends use the university's mobile messaging service, their understandings create a sense of social pressure to use the university's messaging service in order to maintain communication in their community. Social norm refers to the motivations of individuals who believe they should use technologies for positioning themselves in a reference group [11]. Under the TPB, individuals are motivated by other expectations to approve or disapprove of their performing a given behavior [36]. Individuals tend to adopt technology to obtain reward or avoid rejection from their community [12][13]. Students are more likely to use the university's mobile messaging service, if most of their friends perceive the service is valuable and clever persons use it. The social influence will positively impact on students' intentions to use the university's mobile messaging service.

The higher the perception of social influence, the more positive the students' intentions to use the university's mobile messaging service.

C. Perceived Control

Perceived control refers to people's perceptions of their abilities to perform a given behavior or activity [8]. Under the theory of reasoned action (TRA), perceived (behavior) control is not actual control but the perception of control associated with psychological interest [36]. Individuals have fully control over technology when they can decide at will to perform it or not to perform it. If they lack control over it, their intentions to use the technology are thwarted. The concept of perceived control is similar to self-efficacy that has been used to understand technology adoption and predict intention to use [7][42]. In the mobile marketing context, the relationship between perceived control and intention to use mobile communication is unclear [8]. The impacts of perceived control on the consumer permission for mobile advertising messages are varied across countries [8]. However, the feeling of lack of perceived control may prevent consumers from participating in mobile marketing service [8][25]. Accordingly, students are more willing to use the university's mobile messaging service, if students perceive that they can control over the university's mobile messaging service. For example, they can control the number of messages they received, choose the type of mobile messages (e.g., text, picture or video messages), and cancel the permission to receive mobile messages. Therefore, the students' perceived control over the mobile messages will have a positive effect

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on their attitudes toward using the university's mobile messaging service.

The higher the perceived control over the mobile messages received, the more positive the students' attitudes toward the university's mobile messaging service.

D. Perceived Utility

Under the technology acceptance model (TAM), many academics claim that consumer's perceptions of technology usefulness (or utility) and ease of use strongly influence consumers' attitudes toward using such technology [19][20][21][28]. In mobile messaging context, a user has no significant effort to perform the task. The perception of ease of use, therefore, will not include in the study model.

If consumers perceive a benefit in receiving advertising messages on their mobile phone, they are more likely to accept the advertising messages [22]. This implies that a student's attitude toward the university's mobile messaging service will be more positive if he/she perceives the higher the utility of this service. The perceived utility of mobile messages can be classified as information, entertainment and social utilities [9][23]. Messages providing timely, useful and up-to-date information are perceived as information utility. Based on the hedonic reason, participating in mobile messaging service making the recipients' exciting and enjoyable is perceived as entertainment utility. Message perceived as social utility if the recipients can share the messages they like or demonstrate their innovativeness to their community. In the university's mobile messaging service, students can receive timely useful information, enjoy interacting with automated messaging systems, and forward the messages among their friends.

The higher the perception of information, entertainment or social utilities concerning the university's mobile messages, the more positive the students' attitudes toward the university's mobile messaging service.

E. Information Seeking

Personal propensity to search and use information is an important construct in the analysis of consumer behavior [9]. Although mobile messages can be personalized to individual preferences, the personal relevance of the messages still relies on the individual's propensity to search information. It has been reported that individuals displaying a strong tendency towards information seeking behavior tend to exhibit a high propensity to search and use information [14] and it affect their attitude towards adopting mobile marketing [9]. Accordingly, individuals who seek information for their personal interests such as information update and product comparison enjoy reading more informed messages via the mobile phone. This implies that students who have high propensity to search information tend to subscribe to the university's mobile messaging service.

The higher the personal information seeking, the more positive the students' attitudes toward the university's mobile messaging service.

F. Innovativeness

Innovativeness can be viewed as "innate innovativeness" and "actual innovativeness" [15]. Consumer actual innovativeness refers to the actual adoption of a specific innovation such as goods, services or ideas by a particular consumer [9]. As the mobile messaging service in universities is new and few students has experience in receiving the university's mobile messages, actual innovativeness seems to have little importance for this study. Consumer innate innovativeness refers to a consumer personality associated with his or her willingness to adopt innovations [37][38]. Many empirical studies support that consumer innate innovativeness has a significant impact on the adoption of a product innovation [15][39][40][41]. Individuals having innate innovativeness are innovators who usually the first to explore new experiences (e.g., information, product or service). Innovators are likely to receive a large amount of information to gain substantial knowledge and make constructive use of information received [16][17]. Accordingly, students with a high level of innovativeness concerning mobile communication have more positive attitudes toward receiving the university's mobile messages.

The higher the personal innovativeness, the more positive the students' attitudes toward the university's mobile messaging service.

G. Transaction Specificity

Transaction specificity is significantly more valuable in a particular exchange than in an alternative exchange [43]. In the mobile messaging context, transaction specificity involves three principal considerations—specific contents for the recipients, specific senders of the messages, and specific time of sending the message.

An effective mobile messaging service is based on obtaining permission from message recipients [27]. The messages sent by unknown sender are classified as anonymous mass advertising leading the recipients to reject such messages [24]. The advertising message received from a legitimate sender can be expected to have a greater effect on the recipients' acceptance decision than a message directly sent by the advertisers or unknown senders [9]. Wais and Clemons [31] found that college students prefer to receive promotional messaging from a relevant person rather than a company. As a result, students will be more likely to accept the university's mobile messages sent by the legitimate senders they know.

The higher the university's messages sent by specific senders, the more positive the students' attitudes toward the university's mobile messaging service.

However, the mass messages sent several times a day may bothersome the recipients. If recipients can receive the messages at the same time a day, they will know who are sending the messages and perceive less intrusion from the message senders. Accordingly, students tend to receive the university's messages via the mobile phone if they know when they will receive the university's mobile messages. In

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other words, students prefer to receive the university's mobile messages that are sent at the specific time.

The higher the university's messages sent at the specific time, the more positive the students' attitudes toward the university's mobile messaging service.

In addition, a mobile phone is seldom used by any other person than its owner. It is thus always attributable to one single person allowing for highly personalized marketing messages [9]. If the messages sent by senders are thoroughly personalized, these customized messages help to reduce the likelihood of the message refusal [3][9]. As a result, students are more likely to receive the university's messages that are customized for them and reject general messages.

The higher the university's message content specific to students, the more positive the students' attitudes toward the university's mobile messaging service.

H. Privacy Concern

Consumer's privacy is perceived as the main risk of mobile marketing [26]. Mobile medium enables businesses to reach consumers anytime and anywhere. This creates the potential of risk associated with privacy concern. The recipient's phone number might be misused by a sender such as sending unwanted advertising messages or selling the phone numbers to others [29]. As the mobile messaging service is new for university students, students lack of experience with this new service and find themselves in a situation of high risk of privacy violation. Using the university's messaging service, students are aware of receiving too many messages, unwanted messages or repeated messages from either universities or other senders. Students therefore try to reduce the risk associated with personal privacy resulting in the tendency to deny the university's mobile messaging service.

The higher the privacy concern on receiving the university's mobile messages, the more negative the students' attitudes toward the university's mobile messaging service.

III. THE PROPOSED MODEL

According to the previous discussion, Table 1 identifies the construct variables and previous studies that are used to develop the study model.

TABLE I
CONSTRUCT VARIABLES AND THEIR PREVIOUS STUDIES

Construct variables	Examples of the previous studies
Behavior Intention	[34][35][36]
Social Influence	[11][12][13][34][36]
Perceived Control	[8][25][36][42]
Attitudes toward Use	[28][34][35][36]
Perceived Utility	[9][22][23][28]
Information Seeking	[9][14]
Innovativeness	[15][16][37][39][40][41]
Privacy Concern	[26][29]
Transaction Specificity	[3][9][24][27][31]

The relationships among construct variables can be depicted in Fig. 1 and the path diagrams of behavior intentions (BI) and attitudes toward (ATT) using mobile messaging

service can be translated into the structural equations (1) and (2).

$$BI = \beta_1 ATT + \beta_2 SI + \beta_3 PC + \varepsilon_1 \qquad (1)$$

and

$$ATT = \beta_4 IU + \beta_5 EU + \beta_6 SU + \beta_7 CS + \beta_8 SS + \beta_9 TS + \beta_{10} INV + \beta_{11} IS - \beta_{12} PR + \varepsilon_2 \qquad (2)$$

where:

β is a structural coefficient of each factor

ε is an error term

IU: information utility   INV: innovativeness
EU: entertainment utility   IS: information seeking
SU: social utility   PC: perceived control
CS: content specificity   PR: privacy concern
SS: sender specificity   SI: social influence
TS: time specificity   ATT: attitudes toward MS
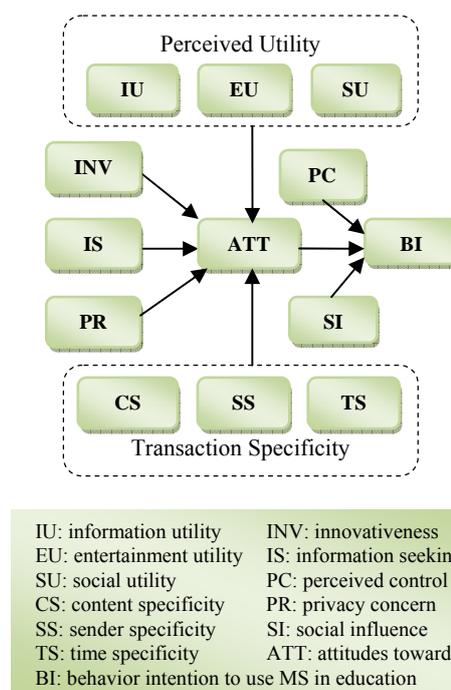BI: behavior intention to use MS in education

Fig. 1 Determinants of students' intentions to use the university's mobile messaging service.

IV. LIMITATIONS

As the proposed model is theoretically developed based on some previous studies and particular theories, the validity of the model might be questioned. An empirical study using this model should be conducted to strengthen the model validity. In addition, although the proposed model consists of important factors influencing students' intentions to use the university's mobile messaging service, some additional factors such as culture of mobile service usage and the readiness of mobile messaging technology should take into account when using the model in some particular circumstances.

V. IMPLICATIONS

The study has theoretical and practical implications. This study fills the gap in literatures by providing the theoretical model to understand the mobile messaging service adoption in the education context. The model can be used to compare and contrast between the proposed factors applied for mobile messaging service and the previous study's factors tested for other innovative technologies. The study model provides guidance for universities to manage their mobile messaging

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service effectively. For examples, universities ought to send mobile messages perceived by students and their colleagues as useful and gratitude information (manifestation of perceived utility). The messages should be specific to students and sent by the specific sender at specified time (manifestation of transaction specificity). Students should be able to cancel their mobile messaging service subscription if they do not want to receive further messages (manifestation of perceived control). Furthermore, universities should avoid sending students irrelevant mobile messages or sending them the same message repetitively as it will violate their students' privacy (manifestation of privacy concern).

VI. CONCLUSION

The paper provides a preliminary study of the mobile messaging adoption model in the education context. The theoretical model is developed to understand the key drivers of students' intentions to receive mobile messages from universities. The key drivers involve social influence, students' perceived control, and students' attitude toward using mobile messaging service which involves five antecedents: perceived utility (information utility, entertainment utility, and social utility), innovativeness, information seeking, transaction specificity (content specificity, sender specificity, time specificity) and privacy concern. The model fills the gap in literatures and enables universities to understand some students' concerns about the use of a mobile messaging service in universities and manage the services more effectively.

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