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# The Adoption of Mobile Short Message Services: Implications for Managing Value-Added Services in the Telecommunications Industry

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**Abstract:** This paper empirically explores several variables associated with the adoption of mobile short message services (SMS) from the consumer perspective. The results suggest that perceived usefulness, ease of use, behavioral control and reliability significantly explain the consumers' behavioral intention to use the mobile message services. The findings have practical implications for managing the value-added services in the telecommunications industry.

**Keywords:** Mobile commerce and business, value-added services, consumer behavior

## I. Introduction

Emerging mobile commerce has great potentials because of its mobility and flexibility. It operates in the environment that is different from e-commerce conducted over the wired Internet. As one of the value-added services, the wireless SMS is increasingly popular. A key issue for the service providers is to appreciate the major factors of the SMS and consumer behavior in order to achieve the expected value of the services.

Existing studies in relation to the acceptance of information technology tend to explore attitudes, beliefs, and behavioral intentions of users. For instance, the technology acceptance model (TAM) was used to explore the acceptance and adoption of computer-based information systems [5]. Numerous studies were conducted to assess, validate and extend the TAM [1] [13] [16] [18] [19] [21] [22]. In addition, the theory of planned behavior (TPB) was emerged as one of the dominant social cognitive frameworks for understanding exercise motivation and behavior [2]. The TPB provides a parsimonious explanation of informational and motivational influences on behavior. The TPB could be considered as a deliberative processing model, which might be used to account for situations when performing a behavior was not entirely under the volitional control of the actor [2] [3]. Furthermore, Taylor and Todd [18] present the decomposed theory planned behavior (DTPB), in which attitude, subjective norm and perceived behavioral control contribute to behavioral intention. Further, they demonstrate that both TPB and DTPB can explain behavioral intention.

As a technology-based service, the adoption of the mobile SMS might be influenced by a number of demand-

side variables. Therefore, this paper aims to explore the use of wireless SMS from the consumer perspective. It begins with the description of several hypotheses followed by research methods. On the basis of the regression results, it discusses the key variables together with their impacts on consumers' intention to use the wireless SMS. Finally, the paper is concluded by highlighting the implications for managing value-added services in the telecommunications industry.

## II. Hypotheses

Firstly, perceived usefulness affects individual attitude and intention to use a computer-based information system, which ultimately determines actual usage behavior [5]. It has been found that the acceptance of information systems is driven to a large extent by perceived usefulness [1] [7]. Other studies also show that perceived usefulness is positively associated with system usage [11] [12] [20]. It seems meaningful to test this argument in the case of the SMS. Therefore, H1 is proposed.

H1: Perceived usefulness positively influences consumers' intention to use the SMS.

Secondly, perceived ease of use could be a potential catalyst to increasing the likelihood of user acceptance [5] [7]. Perceived ease of use should be a quality attribute in IT-based services [4]. Perceived usability depends on ease of use [9]. This can be explained as stemming from a situation where the easier a technology is to use, the more useful it can be. As a matter of fact, perceived ease of use can directly contribute towards behavior [16]. In the case of the SMS, the message is entered through several keys and appears on a small display of a cell phone. It would be desirable if the operations were simple and user friendly. Therefore, H2 is proposed.

H2: Perceived ease of use positively influences consumers' intention to use the SMS.

Thirdly, social influence possibly affects the acceptance of a technology [8]. It may play a role in determining how users make their decisions about adopting and using a new technology [23]. According to [2], subjective norm reflects the degree to which referent others want the individuals to perform a particular behavior. The relative influence of subjective norm on intention is expected to be stronger for potential users, since they are likely to rely on the reactions

of others in forming their intentions [10]. In the technology domain, both peer and superior influences have been shown to be strong determinants of subjective norm [16] [19]. In order to test the impact of subjective norm on the SMS, H3 is proposed as follows.

H3: Subjective norm positively influences consumers' intention to use the SMS.

Moreover, the TPB incorporates a construct, namely perceived behavioral control, to account for a situation in which an individual lacks substantial control over the targeted behavior [2]. Perceived behavioral control refers to an individual's perception of the availability of requisite resources or opportunities that are necessary for performing a behavior. It can capture the perception about the skill and knowledge required to engage in a particular activity [2] [3]. It can also be measured by asking individuals about the potential barriers and costs of using a technology [14]. According to the TPB, perceived behavioral control has a direct effect on behavioral intention. Hence, H4 is proposed. H4: Perceived behavioral control positively influences consumers' intention to use the SMS.

Lastly, perceived reliability is fundamental to product and service quality. In the case of service operations, reliability refers to the ability to dependably and accurately perform a service [15] [17]. The mobile SMS involves such risks as privacy and security, which may affect consumer behavior and dependability of the service. Therefore, H5 is proposed.

H5: Perceived reliability positively influences consumers' intention to use the SMS.

### III. Research Methods

The research methods include survey and data analysis. Firstly, a questionnaire was designed to elucidate consumer feedback on the SMS. It consisted of a number of questions in relation to perceived usefulness, ease of use, subjective norm, behavioral control and reliability. The respondents were requested to provide their observations based on seven-point Likert-type scale ranging from 1 to 7. As a result, one hundred ninety five responses were received from mobile users at this stage. Based on the data collected, several procedures associated with the Statistical Package for Social Science were used to test the above hypotheses.

### IV. Results and Discussion

The impacts of several attributes on consumer behavioral intention are examined using multiple regression analysis. In the present regression model, consumer behavioral intention is endogenous variable, while perceived ease of use, perceived usefulness, subjective norm, perceived behavioral control and perceived reliability are exogenous variables. Table 1 displays the regression results based on the data

randomly collected from different mobile users. The regression analysis suggests that perceived ease of use, usefulness, behavioral control and reliability significantly influence consumers' behavioral intention ( $F = 43.309$ , Sig.  $< 0.001$ ). In addition, the value of adjusted  $R^2$  indicates that the exogenous variables collectively explain 52.7% of the variance of consumers' behavioral intention to use the wireless SMS. Therefore, H1, H2, H4 and H5 are supported.

In general, service providers can strengthen the relationships with customers through encouraging the use of a particular service. If the individuals start to use a value-added mobile service, they might gradually appreciate the usefulness and tend to use the service in a more frequent manner. In other words, the impact of perceived usefulness on behavioral intention to use may increase over time. In addition, perceived ease of use considerably affects consumers' behavioral intention. It remains a primary concern in the case of the mobile SMS, which is similar to the case of the implementation of information systems. Therefore, the mobile service providers should improve the interface of the wireless SMS and enable more user-friendly operations.

However, the results indicate that subjective norm does not significantly affect behavioral intention. Hence, H3 is not supported. The link between subjective norm and behavioral intention may due to perceptions of the real consequences associated with use [18] [19]. It seems that the behavior of the other people has little impact in the case of mobile SMS. The mobile users are likely to have independent assessments and simply use the service from time to time.

Table 1 Results of Regression Analysis

	$\beta$	$t$	Sig.
(Constant)		3.956	.000
Usefulness	.201	3.242	.001
Ease of use	.319	5.054	.000
Subjective norm	-.012	-.217	.828
Behavioral control	.148	2.104	.037
Reliability	.298	4.819	.000

Note: Adjusted  $R^2 = 0.527$

Furthermore, perceived behavioral control has a significant direct effect on behavioral intention. This is consistent with findings of prior studies [16] [18]. In this case, the consumers tend to use the SMS, if the service charge is very marginal in addition to the existing mobile service. This suggests that in order to encourage more consumers to use the SMS, the service providers should consistently reduce the cost of the service.

Finally, perceived reliability has a significant effect on behavioral intention. Consumers are concerned about the uncertainty and privacy when sending personal messages. Though the wireless SMS is useful for facilitating individual communications, individuals would not usually use the SMS to deliver sensitive personal data. However, the SMS has been widely used for promoting and advertising products

and services. It is not uncommon that the SMS has been abused to disseminate information for unacceptable commercial activities. Some may be frustrated by the receipt of many commercial messages. Therefore, the commercial SMS must be governed in order to enhance the confidence of the consumers in the mobile service providers.

## V. Conclusion and Implications

This study examines the major considerations in relation to the use of wireless SMS. The results suggest that perceived usefulness, ease of use, behavioral control and reliability have substantial effects on behavioral intention to use the SMS. In general, consumers have appreciated the usefulness of the SMS. They are able to use the service because it requires limited expenses. More importantly, the mobile service providers should devote to develop more easy to use interface and user-friendly programs for the SMS. Moreover, they should further enhance the reliability of wireless communications. Even if individual demands and expectations may vary in different environments, the service providers must pay attention to the changing needs of the customers and continuously improve their existing wireless service operations and competitive strategies.

The findings of the study have practical implications for developing and managing different value-added services in the telecommunications industry. At present, the SMS is relatively popular to mobile users. However, other wireless applications such as mobile shopping and mobile banking are yet to be further developed, although the services are recently available. Moreover, there are various innovative value-added mobile services being developed by different service providers at present. Some applications are still at the early stage of development and relatively new to consumers. It is not uncommon that individual consumers may not be able to evaluate the usefulness of an innovative value-added service prior to implementation. The difficulty in measurement might be attributed to the fact that perceived usefulness is a measure that takes time to assess. It is also difficult for the service providers to quantify the value of a new value-added service before it has been extensively used by different customers. Therefore, the service providers in the telecommunications industry are suggested to consistently explore the determinants of an innovative value-added service in a particular social context in order to formulate appropriate business strategy for the service and realize the expected business value of the service.

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## References

- [1] Adams, D.A., Nelson, R.R. & Todd, P.A. "Perceived usefulness, ease of use and usage of information technology: A replication," *MIS Quarterly*, 1992, 16 (2) 227-250.
- [2] Ajzen, I. "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, 1991, 50, 179-211.
- [3] Ajzen, I. & Madden, T.J. "Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control," *Journal of Experimental Social Psychology*, 1986, 22, 453-474.
- [4] Bagozzi, R.P. "Buyer behavior models for technological products and services: A critique and proposal," *Advances in Telecommunications Management*, 1990, 2, 43-69.
- [5] Davis, F.D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, 1989, 13 (3), 319-340.
- [6] Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. "User acceptance of computer technology: A comparison of two theoretical models," *Management Science*, 1989, 35 (8), 982-1003.
- [7] Davis, F.D. & Venkatesh, V. "A critical assessment of potential measurement biases in the technology acceptance model: Three experiments," *International Journal of Human-Computer Studies*, 1996, 45, 19-45.
- [8] Gefen, D. & Straub, D.W. "Gender differences in the perception and use of e-mail: An extension to the Technology Acceptance Model," *MIS Quarterly*, 1997, 21(4), 389-400.
- [9] Goodwin, N.C. "Functionality and usability," *Communications of the ACM*, 1987, 30 (3), 229-33.
- [10] Hartwick, J. & Barki, H. "Explaining the role of user participation in information system use," *Management Science*, 1994, 40, 440-465.
- [11] Igbaria, M. "End-user computing effectiveness: A structural equation model," *Omega*, 1990, 18 (6), 637-52.
- [12] Igbaria, M., Parasuraman, S. & Baroudi, J. "A motivational model of microcomputer usage," *Journal of Management Information Systems*, 1996, 13 (1), 127-43.
- [13] Jackson, C.M., Chow, S. & Leitch, R.A. "Toward an understanding of the behavioral intention to use an information system," *Decision Sciences*, 1997, 28 (2), 357-389.
- [14] Klobas, J.E. "Beyond information quality: Fitness for purpose and electronic information resource use," *Journal of Information Science*, 1995, 21 (2), 95-114.
- [15] Liao, Z. & Cheung, M.T. "Internet-based e-banking and consumer attitudes: An empirical study," *Information and Management*, 2002, 39 (4) 283-295.
- [16] Mathieson, K. "Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior," *Information Systems Research*, 1991, 3 (3), 173-191.
- [17] Parasuraman, A., Zeithaml, V.A. & Berry, L.L. "A multiple-item scale for measuring consumer perceptions of service quality," *Journal of Retailing*, 1988, 64(1), 12-40.
- [18] Taylor, S. & Todd, P.A. "Understanding information technology usage: A test of competing models," *Information Systems Research*, 1995, 6, 144-176.
- [19] Taylor, S. & Todd, P.A. "Assessing IT usage: The role of prior experience," *MIS Quarterly*, 1995, 19 (4), 561-570.
- [20] Thompson, R.L., Higgins, C.A. & Howell, J.M. "Personal computing: Toward a conceptual model of utilization," *MIS Quarterly*, 1991, 15, 125-43.
- [21] Venkatesh, V. "Creation of favorable user perceptions: Exploring the role of intrinsic motivation," *MIS Quarterly*, 1999, 23 (2), 239-260.
- [22] Venkatesh, V. & Davis, F.D. "A theoretical extension of the technology acceptance model: Four longitudinal field studies," *Management Science*, 2000, 46 (2) 186-204.
- [23] Venkatesh, V. & Morris, M.G. "Why don't men ever stop to ask for directions? Gender, social influence, and their pole in technology acceptance and usage behavior," *MIS Quarterly*, 2000, 24 (1), 115-139.