Antecedents of Mobile Shopping Adoption in the Information Age

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Abstract. Nowadays, mobile shopping has gradually become a way of people's daily consumption. Based on TAM, this paper constructs a theoretical framework model of influencing factors of consumers' adoption of mobile shopping. Through empirical test, the following conclusions are drawn: (1) subjective norms and performance expectations positively influence perceived ease of use, rather than perceived usefulness; (2) perceived entertainment positively affect both perceived ease of usefulness and perceived ease of use; (3) perceived risk and perceived cost have no significant impact on perceived ease of use and perceived usefulness; (4) perceived ease of use and perceived usefulness positively affect consumers' mobile shopping intention.

Keywords: Mobile Shopping, TAM, Mobile Shopping Intention

1 Introduction
Nowadays, most people purchase online by mobile phones. Why people adopt mobile shopping, that’s one of the focuses of scholars’ attention[1]. The objective of this paper is to investigate antecedents of consumers' mobile shopping adoption. We hope this investigation contribute to the theoretical research on mobile shopping. At the same time, it hopes that the conclusion of this research can help online retailers performance better.

2 Literature Review and Hypothesis
Based on previous research, the conceptual model is constructed. According to Fishbein & Ajzen[2], the degree of pressure that consumers perceive to support or oppose their purchase behavior by important reference persons or groups can be called subjective norms. Because the other people around are using mobile devices for online shopping, even if consumers have never used this way of shopping, they will feel it useful. Besides consumers can easily get help from people around them on how to use mobile shopping, so they will also feel it easy to use. According to Davis (2000)[3], it is confirmed that subjective norms positively affected perceived usefulness and perceived ease of use.
Based on this, this paper puts forward the hypothesis:

H1: subjective norms positively affect consumers' perceived usefulness.
H2: subjective norms positively affect consumers' perceived ease of use.

Perceived risk means the loss expected when using new technology[4]. To a great extent, consumers use mobile shopping to save money and energy. If consumers perceive that there may be property loss and the material object is not consistent with the introduction of online retailers, the usefulness evaluation from consumers could be greatly reduced. So, this paper puts forward the assumption:

H3: perceived risk negatively affects perceived usefulness.

In order to reduce the hidden danger of the transaction, consumers need to use mobile phones to carry out identity verification to reduce the security threat of the transaction, but the continuous verification through mobile phones will make consumers feel that they spend too much time and energy. Therefore, we proposed the assumption:

H4: perceived risk negatively affects user perceived ease of use.

Generally speaking, perceived cost means the time and energy consumed by consumers. Mobile phones have smaller screens than computers[5]. Therefore, consumers need to spend more time and energy to search product information when they shop online by mobile phones. The following hypothesis was proposed:

H5: perceived cost negatively affects consumer perceived usefulness.

When consumers use mobile devices to choose goods, the comparison of similar products becomes difficult due to the limitations of the screen size of mobile devices. Only when consumers obtain more shopping skills and methods can they get more information they need. Base on above analysis, we supposed that:

H6: perceived cost negatively affects consumer perceived ease of use.

Performance expectation means how customers expect to improve his work performance through using a new technology. In the modern fast-paced living environment, mobile shopping can meet consumers’ needs for anytime and anywhere, help consumers get the required product information faster, and communicate with merchants without regional and time constraints, so it can save more energy and time for consumers. Therefore, we assumed:

H7: performance expectation positively affects perceived usefulness.

H8: performance expectation positively affects perceived ease of use.

Perceived entertainment refers to the degree of joys when shop online by mobile phones. Moon (2001)[6] thinks that entertainment is an important factor in human-computer interaction. Byoungsoo (2009)[7] argues that the important factor of users' continuous use of mobile is perceived entertainment. When people realize that mobile shopping is very interesting and fun, more time and energy will be spent to understand the skills and methods of using this technology in order to get more benefits from it. Therefore, this paper puts forward the hypothesis:

H9: perceived entertainment positively affects perceived usefulness.

H10: perceived entertainment positively affects perceived ease of use.

Venkatesh & Morris (2000)[8] also argue perceived ease of use can positively affect both perceived usefulness and mobile shopping intention. That is to say, consumers will save time and energy in their work or life by using new technologies, which improves the perceived usefulness of users. In conclusion, this paper proposes the following assumption:

H11: perceived ease of use positively affects consumers' perceived usefulness for mobile online shopping.

Perceived usefulness means how consumers feel their performance could be improved because of a new technology. It refers to the high efficiency perceived by consumers in the process of mobile shopping. Davis (1989)[9] argues that perceived usefulness can positively affect consumers’ willingness to shopping online by mobile. So, we proposed:

H12: perceived usefulness positively affects mobile shopping intention.

Perceived ease of use means how easy it is for consumers to use new technologies. Thakur & Srivastava (2013)[10] propose that perceived ease of use is an important antecedent for people to use mobile shopping. Many studies argue that perceived ease of use positively influence mobile shopping
intention (Davis, 1989; Venkatesh & Morris, 2000). Therefore, this paper proposes the following assumptions:

H13: perceived ease of use positively affects mobile shopping intention.

3 Method and Results

3.1 Method
The conceptual model was checked by SEM. The scale of each construct had been tested by researchers before. Twenty-six items were concluded in the scale. This investigation gathered data both online and offline. Finally, we obtained 350 questionnaires and 306 questionnaires were accepted.

| Variables                  | Numbers of items | Estimate | AVE     | CR      | Cronbach’s alpha |
|----------------------------|------------------|----------|---------|---------|------------------|
| Subjective norms           | 4                | 0.769    | 0.822   | 0.771   | 0.656            |
|                            |                  |          | 0.751   |         |                  |
| Perceived cost             | 4                | 0.733    | 0.4881  | 0.7911  | 0.787            |
|                            |                  | 0.602    |         |         |                  |
|                            |                  | 0.699    |         |         |                  |
| Perceived risk             | 3                | 0.835    | 0.5655  | 0.7948  | 0.784            |
|                            |                  | 0.740    |         |         |                  |
| Performance expectations   | 3                | 0.696    | 0.5191  | 0.7611  | 0.750            |
|                            |                  | 0.835    |         |         |                  |
|                            |                  | 0.613    |         |         |                  |
| Perceived entertainment    | 3                | 0.853    | 0.731   | 0.8908  | 0.890            |
|                            |                  | 0.857    |         |         |                  |
|                            |                  | 0.855    |         |         |                  |
| Perceived usefulness       | 3                | 0.825    | 0.6935  | 0.8716  | 0.871            |
|                            |                  | 0.824    |         |         |                  |
|                            |                  | 0.905    |         |         |                  |
| Perceived ease of use      | 3                | 0.789    | 0.6411  | 0.8412  | 0.835            |
|                            |                  | 0.694    |         |         |                  |

Fig 1. Conceptual model
3.2 Reliability and Validity
This paper used SPSS 21.0 to test the reliability and validity. In order to test internal reliability, the alpha value was tested. It’s showed all the alpha values were greater than 0.70, and so was that of the total scale. The CR value of each construct was greater than 0.8. So, all the latent variables had a good reliability. Validity was checked by CFA. The result of CFA suggested a satisfactory fit: the value of $\chi^2/df$ was between 2 and 3, the value of RMSEA was less than 0.8, the values of CFI, NFI and IFI were more than 0.9, the values of GFI and AGFI were more than 0.8.

This investigation got measures from prior research. Besides, the questionnaire was further revised according to a pre survey, so we could conclude that the scale had a good content validity. According to Table 1, the factor loadings of each items were between 0.602 and 0.911. Furthermore, the AVEs were between 0.48 and 0.76, so we could conclude that the scale had a good convergent validity. Besides, a good discriminant validity was also established.

3.3 Hypothesis Testing

| Model Fit Indices | $\chi^2/df$ | GFI   | AGFI | CFI    | NFI  | IFI   | RMSEA |
|-------------------|------------|-------|------|--------|------|-------|--------|
| Critical Value    | <3         | >0.90 | >0.90| >0.90  | >0.90| >0.90 | <0.08  |
| Results           | 2.187      | 0.872 | 0.834| 0.911  | 0.868| 0.913 | 0.076  |

A path analysis was checked by AMOS 21.0. Path analysis results showed a satisfactory model fit: the value of $\chi^2/df$ was between 2 and 3, the value of GFI, AGFI and NFI were more than 0.8, the value of CFI and IFI were more than 0.9, the value of RMSEA was less than 0.8.

![Fig 2. Results of path analysis](image_url)

According to path analysis results, the standardized coefficients between subjective norms and perceived ease of use was significant. Therefore, H2 was supported. The standardized coefficients of performance expectations and perceived ease of use was significant. So, H8 was verified. H9 and H10 proposed perceived entertainment positively affected two mediators. The results suggested the standardized coefficients for these two paths were statistically significant (0.502 and 0.292, respectively). Perceived ease of use was verified to affect perceived usefulness positively, so H11 was supported. H12 and H13 contemplated two paths from two mediators to dependent variable. The standardized coefficients for these two paths were statistically significant (0.377 and 0.604, respectively). Besides, H1, H3, H4, H5, H6 and H7 were refused.
4 Conclusions

Through empirical test, this investigation gets some conclusions. These conclusions indicate a number of practical significance. First, mobile shopping businesses should strive to improve the effect of shopping experience. Mobile shopping operators should improve the client interface design, simplify the operation, increase the interaction with users, make consumers feel easier to use when operating, save learning and familiarity time, improve customers' perception of ease of use and usefulness. Second, mobile shopping businesses should pay more attention to entertainment. Simple and exquisite web page meets the sensory enjoyment of consumers. Many mobile shopping platforms now have different choices of page design and content opening methods. Interesting and beautiful pages, plus video recommendation products, make consumers' visual and auditory enjoyment satisfied, and further improve the entertainment of mobile shopping. Third, mobile shopping businesses should gradually establish interactive platforms. The so-called platform socialization is to let consumers not only see the display of products in the process of mobile shopping, but also more to make consumers satisfied with interactive communication with people, increase the functions of bargaining with sellers, chatting with friends, etc. The socialization of mobile shopping platform is the development trend in the future. In terms of communication function, it can enhance consumers' sense of pleasure by means of voice message, video call and rich emoticons.

To some extent, this study further enriches the theoretical research of mobile shopping, but there are still many deficiencies. First of all, due to the limitations of data collection, the age of the respondents is concentrated. Second, this research investigates a number of factors that affecting the mobile shopping adoption while the other factors are ignored. For example, factors such as product category and personal characteristics of consumers can be further verified in subsequent studies.

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