MOBILE COMMERCE PRIVACY CONCERNS:  
A PRELIMINARY STUDY ON KOREA AND US CONSUMERS

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ABSTRACT

M-commerce is usually considered an extension of e-commerce. However, there are major differences between the two when it comes to privacy protections. This study analyzes the privacy concerns of mobile phone users in the United States and South Korea. The study revealed that out of ten mobile activities identified emailing and mobile payment are the only two activities that were conducted by more US respondents than the Korea counterparts. In all other categories, the Korea sample indicates a significant more use than the US sample. More importantly, it has been found that the Korean sample showed less privacy concerns than the US sample. This indicates an important cultural difference. In countries where culture places great emphasis on collectivism, the country’s interest is more important than individual interest; and countries that are holding high value on collectivism tend to be less sensitive to privacy concerns comparing with countries that value more on individualism.

Keywords: M-commerce, privacy and security, cross-cultural study.

INTRODUCTION

Mobile Commerce, also known as M-Commerce, refers to the ability to conduct electronic commerce, using a mobile device such as a smartphone or a tablet. According to a study by Gartner, Inc., worldwide mobile device sales to end users totaled more than 1.77 billion units in 2011, a 10.6 percent increase from 2010 (Gartner Press Release, 2012). The smart phone sales to consumers in 2011 reached 472 million units and constituted for 31 percent of all mobile devices sales, up 58 percent from 2010. M-commerce activities worldwide are increasing rapidly as the number of mobile device users increases. In 2011 mobile commerce market doubled in size to $65.6 billion (ABI Research, 2012). This growth was largely fueled by the rapid adoption of smartphones in both mature and developing markets.

In spite of the seemingly unlimited potential to drive new applications and markets in m-commerce, security and privacy risks in m-commerce abound. So far most research studies on information privacy and security issues were done in the desktop e-commerce setting. Based on a survey conducted by Forrester Research (2010), 52% of the phone users were concerned about credit card security, which prevented them from adopting m-commerce.

There is very little empirical research on M-commerce consumers’ privacy concerns. Understanding the mobile user’s demographics and their attitudes toward privacy and security
concerns in different cultural contexts will help m-commerce business better serve global consumers or consumers with different cultural background.

PRIVACY ISSUES IN M-COMMERCE

Information privacy and security concerns have been a subject of research for many years (Goldfarb and Tucker 2012, Li, Sarathy, and Xu 2011, Bernard and Makienko 2011, Li 2011, Boritz and No 2011, Desai, Hui, Teo and Lee. 2007, Richards and Desai 2003, Dhillon and Moores 2001, Caudill and Murphy 2000, Hoffman, Novak and Peralta 1999, Sheehan 1999). Broadly, information privacy is defined as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin 1967). Information privacy concern is generally considered of consisting of four dimensions (Smith et al. 1996). Collection concern pertains to excessive personal data collected and whether they are stored appropriately. Unauthorized access refers to concern of data access by unauthorized people. Unauthorized secondary use reflects one’s concern regarding the use of personal information for a purpose beyond its intended use. For example, a bank uses income data collected on loan applications to classify customers into groups for targeted advertising. Data accuracy reflects an individual’s concern about whether data about her is adequately protected against accidental or intentional errors.

Zhang et al. (2002) identified five features that make m-commerce different from desktop e-commerce: portable, reachable, accessible, localizable, and identifiable. The mobile technologies allow a mobile device stay connected with the internet anytime and anywhere. Most privacy concerns come from the mobile technology’s capability to track a mobile user’s location and associated online activities.

M-commerce systems introduce new security and privacy risks beyond those currently found in desktop e-commerce systems. First, mobile devices such as smart phones and tablets are inherently less secure than their wired counterpart. This is due in part to their limited bandwidth, memory, and processing capabilities. Second, when in transit, mobile devices form ad hoc networks where a collection of peer mobile nodes communicates with each other in a decentralized approach. As a result, security breaches can occur when one of the cooperative nodes in the network is compromised. Third, mobile devices send and receive data through open air space where anyone with the right technology can intercept it. Although encryption technologies are available, they are not always properly setup by the wireless network providers or owners. According to KPMG, a consultancy firm, about 70 per cent of the Wi-Fi networks on commercial premises were not encrypted, leaving companies vulnerable to email snooping, password pilfering and data theft (Ducan 2005).

THEORETICAL BACKGROUNDS AND RESEARCH HYPOTHESIS

Since m-commerce shares many of the same privacy issues with those of desktop e-commerce and general online experience, this research will build on top of existing Internet privacy research findings.
Prior research studies have shown that gender is related to privacy concerns (O’Neil 2001; Sheehan 1999). O’Neil used data from the online databases maintained by the Georgia Institute of Technology’s Graphics, Visualization, and Usability (GVU) center. He found that 83.9% of women are “very concerned” or “somewhat concerned” with security on the Internet, as compared to 79.2% of male respondents. Two other studies also confirmed that females show higher level of privacy concerns in using the Internet, and their perceived risk of online shopping is greater than males (Garbarino and Strahilevitz 2004, Miyazaki and Fernandez, 2001).

Consumers’ culture differences may also impact their privacy concerns. Milberg et al. (1995) and Milberg et al. (2000) investigated Hofstede’s (1991) four measures of cultural values (power distance, masculinity/femininity, individualism/collectivism, and uncertainty avoidance) in regards to general information privacy concerns. Their studies found that the level of concern about privacy of personal information varied across countries, but the relative importance of four underlying dimensions of information privacy concern (i.e., collection, unauthorized access, error, and secondary use) did not appear to vary across countries. In addition, Milberg et al. (2000) found that differences in levels of consumer privacy concerns were associated with cultural values as well as differences in regulatory approaches. Bellman et al. (2004) used a global sample of online consumers to investigate whether concerns about information privacy can be explained by differences in cultural values, privacy regulations, and Internet experience. They found that cultural values do have an influence on privacy concerns, confirming the findings of Milberg et al. (2000) to a large degree.

With the above discussions, the following hypothesis is proposed: *The difference of mobile phone users’ security and privacy concern is significant between US and Korean respondents.*

**RESEARCH METHODS AND DATA ANALYSIS**

Smith et al. (1996) developed a survey instrument to measure one’s privacy concerns. Their survey contains questions grouped in four dimensions that constitute information privacy concerns: personal data collection, unauthorized data access, data accuracy, and unauthorized second use of personal information. The survey instrument used in this study was adapted from their instrument to fit mobile commerce setting. The survey was designed to focus on the mobile phone users experience and their privacy concerns.

We recruited participants to this study from two universities located in mid-western region of United States and one university in the southern part of Korea. The survey was voluntary and there were an overall 90% response rate. The final sample consisted of 276 US responses and 264 Korean responses. A preliminary data analysis has been done on the data collected. The following paragraphs summarized the preliminary findings.

**Demographics**

A total of 540 usable responses were collected from U.S. and S. Korea. The U.S. sample consists of 128 male students and 148 female students. The Korean sample is about evenly
divided between males and females. In terms of age, more than half of the respondents fall in the range of 21 to 25 years old in both samples. 45.9% of the U.S. respondents have a family income less than 50k, while 61.8% for Korean respondents. The average number of years of using mobile phone is 5.6 years for U.S. sample and 4.2 years for Korean sample.

Mobile Activities

Table 1 shows the percentage comparisons of mobile activities by the respondents from the two samples. Emailing and mobile payment are the only two activities engaged by more US respondents than their Korea counterparts. In all other categories, the Korea sample had a significant more use.

Table 1 Mobile Activities

<table>
<thead>
<tr>
<th>Mobile Phone Activities</th>
<th>USA (n=276)</th>
<th>S. Korea (n=264)</th>
<th>Combined (n=540)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text messaging</td>
<td>193 (69.9%)</td>
<td>244 (92.4%)</td>
<td>437 (80.9%)</td>
</tr>
<tr>
<td>Game playing</td>
<td>126 (45.7%)</td>
<td>170 (64.4%)</td>
<td>187 (34.6%)</td>
</tr>
<tr>
<td>Emailing</td>
<td>114 (41.3%)</td>
<td>73 (27.7%)</td>
<td>187 (34.6%)</td>
</tr>
<tr>
<td>News, weather info, etc.</td>
<td>199 (36.2%)</td>
<td>146 (55.3%)</td>
<td>246 (45.6%)</td>
</tr>
<tr>
<td>Maps, navigation, LBS, etc.</td>
<td>73 (26.4%)</td>
<td>81 (30.7%)</td>
<td>154 (28.5%)</td>
</tr>
<tr>
<td>Mobile banking</td>
<td>49 (17.8%)</td>
<td>59 (22.3%)</td>
<td>108 (20%)</td>
</tr>
<tr>
<td>Mobile payment</td>
<td>35 (12.7%)</td>
<td>18 (6.8%)</td>
<td>35 (6.5%)</td>
</tr>
<tr>
<td>Visit to mobile shopping websites</td>
<td>33 (12%)</td>
<td>61 (23.1%)</td>
<td>83 (15.4%)</td>
</tr>
<tr>
<td>Mobile ticketing or reservation</td>
<td>22 (8%)</td>
<td>57 (21.6%)</td>
<td>92 (17%)</td>
</tr>
<tr>
<td>Stock trading</td>
<td>13 (4.7%)</td>
<td>14 (5.3%)</td>
<td>27 (5%)</td>
</tr>
</tbody>
</table>

Cultural Difference (H1)

Independent sample t test was performed on the combined datasets of USA and Korea. The test indicates that US respondents were significantly more concerned than the Korean respondents (see Table 2).
Table 2. Group Statistics and Independent Sample Test Result

<table>
<thead>
<tr>
<th>Nationality</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy Concerns US</td>
<td>272</td>
<td>6.0569</td>
<td>0.80073</td>
<td>0.04855</td>
</tr>
<tr>
<td>Korea</td>
<td>264</td>
<td>5.7659</td>
<td>1.15952</td>
<td>0.07136</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Equal variance not assumed (F=37.33, sig 0.00)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>DF</td>
<td>Sig. (2-tailed)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

This finding that the Korean sample shows less privacy concerns than the US sample indicates an important cultural difference. In countries where culture places great emphasis on collectivism, the country’s interest is more important than individual interest; and countries that are holding high value on collectivism tend to be less sensitive to privacy concerns comparing with countries that value more on individualism.

Countries that are holding high value on collectivism tend to be less sensitive to privacy concerns comparing with countries that value more on individualism. Korean culture places great emphasis on collectivism, country’s interest is more important than individual interest.

CONCLUSIONS

In this preliminary study on mobile consumer privacy concerns, it has been found that regarding 10 mobile activities identified, only in two categories – emailing and mobile payment, US data shows a high percentage use than the Korea counterpart. In all other categories, the Korea sample indicates a significant more use than the US sample. More importantly, it has been found that the Korean sample shows less privacy concerns than the US sample. This indicates an important cultural difference. In countries where culture places great emphasis on collectivism, the country’s interest is more important than individual interest; and countries that are holding high value on collectivism tend to be less sensitive to privacy concerns comparing with countries that value more on individualism. In addition, both US and Korea sample shows that unauthorized data access and secondary use of personal information are more worrisome to mobile users than the action of collecting personal information and possibility of error in their personal data files.
REFERENCES


*NOTE: Complete list of references is available from the first author upon request.*