## ANALYSIS OF THE FACTORS EFFECTING THE ADOPTION OF LOCATION-BASED SERVICES FOR MOBILE COMMERCE

Q B. Chung Villanova University 800 Lancaster Avenue, Villanova, Pennsylvania 19085, USA q.chung@villanova.edu +1 610-519-7858

William P. Wagner Villanova University 800 Lancaster Avenue, Villanova, Pennsylvania 19085, USA William.wagner@villanova.edu +1 610-519-6446

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## EXTENDED ABSTRACT

One of the fastest growing applications within mobile commerce today is the use of locationbased services (LBS). These are services that use the location of a person or object as part of the application or service. Popular LBS applications include FourSquare and Yelp. Early studies have shown that a certain percentage of users are hesitant to adopt LBSs. This study uses a survey to build of model of both the inhibiting and facilitating factors for users contemplating whether to "check in" using a LBS application. The results should help later LBS application developers understand how to better accommodate potential adopters.

As the following research model indicates, this study is based on the premise that mobile users' intention to use LBS services such as "check in" is a function of facilitating factors and inhibiting factors.



Figure 1. Research model

The research variables have been identified as the following:

| Category     | Variable                    | Var. | Description                            |
|--------------|-----------------------------|------|--|
| Facilitators | Location-enabled            | FAC1 | Mobile device has GPS.                 |
|              | Browser-enabled             | FAC2 | Smartphone can access the Web.         |
|              | App-enabled                 | FAC3 | Apps can be downloaded and used.       |
|              | Social networking active    | FAC4 | Facebook, etc.                         |
|              | Online transaction active   | FAC5 | M-commerce experiences                 |
|              | Location aware              | FAC6 | Weather, map, tickets, etc.            |
| Inhibitors   | Speed disadvantage          | INH1 | Slower than laptop                     |
|              | Display disadvantage        | INH2 | Screen is too small.                   |
|              | Cost disadvantage           | INH3 | Cost is a concern.                     |
|              | Intrusiveness disadvantage  | INH4 | Location awareness is intrusive.       |
| "Check in"   | Check-in friendly           | CHK1 | "Check in" is a good idea.             |
|              | Social check-in willing     | CHK2 | Will check in to meet friends.         |
|              | Commercial check-in willing | CHK3 | Will check in if there is a good deal. |
|              | Social check-in active      | CHK4 | Met with friends by checking in.       |
|              | Commercial check-in active  | CHK5 | Used check-in for promotionals.        |

**Table 1.** Research variables and descriptions

College students attending a 4-year university on the East coast of the United States were surveyed using Qualtrics.

A total of 369 e-mail solicitations were sent out, and 130 responses were received yielding 35.2% response rate. The following descriptive statistics obtained:

- Total responses (N = 130)
- 70 males (53.8%); 60 females (46.2%)
- 102 smartphone users (78.5%)
- 84 GPS users (64.6%)
- 8 mobile consumers (6.2%)
- 13 users ever checked in (10.0%)

The high-level research model shown in Figure 1 can be broken down to the hypotheses depicted in Figure 2.

The initial analysis of collected data is summarized as Table 2 shown below, which includes the means, standard deviations, and Pearson correlations among the independent and dependent variables.



Figure 2. Hypothesized outcome

Based on the statistical analysis, the results of testing hypotheses in Figure 2 are graphically presented as Figure 3.

|      | Mean  | S.Dev | FAC1                    | FAC2                    | FAC3                    | FAC4                    | FAC5                    | FAC6                    | INH1                    | INH2                    | INH3                    | INH4                    | CHK1                    | CHK2                    | CHK3           | CHK54                   | CHK5 |
|------|-------|-------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|----------------|-------------------------|------|
| FAC1 | 0.646 | 0.480 |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| FAC2 | 0.785 | 0.413 | <b>0.708</b><br>0.000   |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| FAC3 | 0.677 | 0.469 | <b>0.727</b><br>0.000   | <b>0.718</b><br>0.000   |                         |                         |                         |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| FAC4 | 0.723 | 0.449 | 0.585<br>0.000          | 0.847<br>0.000          | <b>0.638</b><br>0.000   |                         |                         |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| FAC5 | 0.062 | 0.241 | <b>0.708</b><br>0.000   | 0.134<br>0.128          | <b>0.177</b><br>0.044   | 0.158<br>0.072          |                         |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| FAC6 | 0.554 | 0.499 | <b>0.825</b><br>0.000   | 0.584<br>0.000          | 0.604<br>0.000          | 0.447<br>0.000          | <b>0.165</b><br>0.060   |                         |                         |                         |                         |                         |                         |                         |                |                         |      |
| INH1 | 2.984 | 1.175 | - <b>0.401</b><br>0.000 | - <b>0.307</b><br>0.000 | - <b>0.352</b><br>0.000 | -0.264<br>0.002         | - <b>0.215</b><br>0.014 | - <b>0.361</b><br>0.000 |                         |                         |                         |                         |                         |                         |                |                         |      |
| INH2 | 2.797 | 1.045 | - <b>0.285</b><br>0.001 | - <b>0.187</b><br>0.033 | - <b>0.217</b><br>0.013 | -0.108<br>0.220         | -0.118<br>0.179         | - <b>0.217</b><br>0.013 | 0.298<br>0.001          |                         |                         |                         |                         |                         |                |                         |      |
| INH3 | 2.523 | 1.196 | - <b>0.377</b><br>0.000 | - <b>0.414</b><br>0.000 | - <b>0.263</b><br>0.003 | -0.334<br>0.000         | - <b>0.059</b><br>0.507 | - <b>0.372</b><br>0.000 | 0.259<br>0.003          | 0.141<br>0.110          |                         |                         |                         |                         |                |                         |      |
| INH4 | 3.296 | 1.085 | - <b>0.250</b><br>0.004 | - <b>0.201</b><br>0.022 | - <b>0.105</b><br>0.234 | - <b>0.208</b><br>0.018 | - <b>0.009</b><br>0.918 | - <b>0.240</b><br>0.006 | 0.120<br>0.175          | 0.203<br>0.021          | <b>0.112</b><br>0.203   |                         |                         |                         |                |                         |      |
| CHK1 | 2.659 | 0.956 | - <b>0.076</b><br>0.388 | -0.098<br>0.267         | - <b>0.104</b><br>0.238 | - <b>0.035</b><br>0.689 | - <b>0.135</b><br>0.127 | - <b>0.047</b><br>0.595 | <b>0.019</b><br>0.831   | - <b>0.126</b><br>0.153 | - <b>0.116</b><br>0.188 | <b>0.249</b><br>0.004   |                         |                         |                |                         |      |
| CHK2 | 2.208 | 0.904 | - <b>0.187</b><br>0.033 | - <b>0.170</b><br>0.053 | - <b>0.133</b><br>0.132 | - <b>0.086</b><br>0.329 | - <b>0.059</b><br>0.504 | - <b>0.171</b><br>0.052 | - <b>0.009</b><br>0.920 | - <b>0.068</b><br>0.443 | - <b>0.064</b><br>0.472 | <b>0.184</b><br>0.036   | - <b>0.488</b><br>0.000 |                         |                |                         |      |
| СНКЗ | 2.877 | 1.042 | - <b>0.165</b><br>0.060 | - <b>0.152</b><br>0.084 | - <b>0.129</b><br>0.142 | - <b>0.057</b><br>0.521 | - <b>0.124</b><br>0.160 | - <b>0.106</b><br>0.228 | - <b>0.123</b><br>0.162 | - <b>0.143</b><br>0.104 | - <b>0.189</b><br>0.031 | 0.098<br>0.268          | - <b>0.396</b><br>0.000 | - <b>0.398</b><br>0.000 |                |                         |      |
| CHK4 | 0.062 | 0.241 | - <b>0.056</b><br>0.530 | - <b>0.056</b><br>0.525 | - <b>0.040</b><br>0.651 | - <b>0.087</b><br>0.325 | 0.066<br>0.459          | - <b>0.101</b><br>0.253 | - <b>0.112</b><br>0.206 | - <b>0.089</b><br>0.313 | - <b>0.032</b><br>0.719 | - <b>0.242</b><br>0.005 | <b>0.128</b><br>0.148   | 0.332<br>0.000          | 0.030<br>0.732 |                         |      |
| CHK5 | 0.077 | 0.268 | - <b>0.153</b><br>0.082 | - <b>0.081</b><br>0.359 | -0.014<br>0.872         | - <b>0.114</b><br>0.196 | 0.074<br>0.403          | - <b>0.201</b><br>0.022 | -0.004<br>0.968         | - <b>0.041</b><br>0.645 | - <b>0.030</b><br>0.736 | - <b>0.250</b><br>0.004 | 0.018<br>0.837          | 0.126<br>0.154          | 0.173<br>0.049 | - <b>0.527</b><br>0.000 |      |

Table 2. Means, standard deviations, and Pearson correlations



Figure 3. Hypothesis testing result

Implications of the analysis can be summarized as the following points:

- Perceptions on mobile devices' technological disadvantage to stationary counterparts are insignificant.
- Both theoretically and practically, mobile marketing efforts using LBS, such as "checkin", in the United States among young mobile consumers is still in its infancy.
- For the most part, making a clear and crispy inference from the results seems difficult.