An empirical examination of factors influencing the continuance intention to use of SNS based mobile payment service focusing on the network externality

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What is ‘Fintech?’

Fintech = Finance + Technology
**Introduction**

The Periodic Table of FinTech

An overview of key private companies, investors and strategic acquirers in the FinTech space.

To receive updates to the Periodic Table, visit: www.cbinsights.com/blog/fin-tech-periodic-table

Source: CB insights
Introduction

The emergence of mobile payment service

Source: statista, eMarketer

Source: statista
The simple process of mobile payment service

1. Choose payment method.
2. Confirm the detail.
3. Enter the pin number or touch ID.
4. Payment finished.
Introduction

Various mobile payment service

- Google Wallet
- Amazon Payments
- Samsung Pay
- Venmo
- TenPay.com
- Payments in Messenger
- LoopPay
- Apple Pay
- LinePay
- Smile Pay
- KakaoPay
- Alipay.com
- Square Cash
Introduction

Various mobile payment service

Google Wallet
amazon payments
SAMSUNG pay
PayPal
Venmo
TENPAY.COM
LoopPay
Pay
KakaoPay
Alipay.com
微信支付

Square Cash
Introduction

Facebook messenger payment

Source: Facebook
Introduction

Process of WeChat payment

In-App WeChat Payment

1. Confirm Payment
2. Pay Now
3. ¥ 49.00

Source: Wechat payment
Introduction

Process of Line payment

Source: Line payment
Introduction

SNS based m-payment is a two-sided market

Network externalities

- Information
- Free use
- Ad target
- Charge

Direct transaction is impossible


Source: https://sudapeople.wordpress.com/2016/04/27/%EC%B9%B4%EB%93%9C-%EA%B2%BD%EC%9F%81%ED%95%98%EC%A7%80-%EB%A7%90%EA%B3%A0-%EB%8F%85%EC%A0%90%ED%95%98%EB%9D%BC-%EC%88%98%EB%8B%A4%ED%94%BC%ED%94%8C/
Direct network externality

Direct network externality means that when the total number of people using a product or service increases, or when people feel that there are more users around, the value they feel increases together.


Source: https://en.wikipedia.org/wiki/Network_effect
Indirect network externality

Lin and Lu (2011) proposed that indirect network external services, which provide various additional services such as sharing, have high intention of continuous use by users.
The variables used to study mobile payment service consumer adoption

- System quality
- Compatibility
- Attractiveness of alternative
- Technology anxiety
- Expressiveness
- Cost
- Trialability
- Mobility
- Convenience
- Trust
- Network externalities
- Context
- Social influence
- Observability
- Accessibility
- Speed of transaction
- Privacy
- Security
- Risk

There is little study of mobile payment acceptance researching network externality, and existing research has a limit in that it does not separate direct and indirect externalities.

The variables used to study mobile payment service consumer adoption

- **Ease of use**
  - System quality
  - Technology anxiety
  - Trialability

- **Usefulness**
  - Expressiveness
  - Mobility
  - Social influence
  - Speed of transaction

- **Attitude**
  - Observability
  - Privacy
  - Risk

- **Compatibility**
  - Cost
  - Convenience
  - Context

- **Direct / Indirect network externalities**

- **Accessibility**

**Variables related Mobile payment service**

Research model

Compatibility

Accessibility

Indirect network externality

Perceived ease of use

Perceived usefulness

Direct network externality

Trust

Attitude

Intention to use

H1

H2

H3

H4

H5

H6

H7

H8

H9
Compatibility

Chen et al. (2009), Corrocher (2011), Wu and Wang (2005), Mallat (2004), Schiertz et al. Al. (2010), among others, have suggested that, in the field of mobile services, compatibility directly or indirectly affects users’ attitudes toward and acceptance of information technology.

H1: Compatibility will have a positive influence on the perceived usefulness of mobile payment service.

Accessibility

Lin and Lu (2000) [34] and Lederer et al. (2000), accessibility is influenced by consumers’ websites and this research propose, accessibility can be a one of important variable of consumer adoption because it has a function of users’ mobility increasing.

H2: Accessibility will have a positive influence on the perceived usefulness of mobile payment service.
Indirect network externality

Lin and Lu (2011) proposed that indirect network external services, which provide various additional services such as sharing, have high intention of continuous use by users.

H3: Indirect network externality will have a positive influence on the perceived usefulness of mobile payment service.

Perceived ease of use

Davis (1989), when people are more readily available when using a product or service, the perceived ease of use increases and the rate of use or acceptance of a product or service positively affects perceived usefulness and user attitudes. Moore and Benbasat (1991) also demonstrated that perceived ease of use had an effect on perceived usefulness.

H4: Perceived ease of use will have a positive influence on the perceived usefulness of mobile payment service.

H5: Perceived ease of use will have a positive influence on the attitude of mobile payment service.
Perceived usefulness

Thair, Suhuai, and Peter (2010) and Pavlou (2003) suggested that perceived usefulness in the context of information technology, such as online or mobile shopping and payment environments, is one of the most important variables affecting user acceptance intention.

H6: Perceived usefulness will have a positive influence on the Attitude of mobile payment service.

Direct network externality

Sledgianowski and Kulviwat (2009) verified that the total number of users has a significant effect on the intention to use SNS, and Baker and White (2010) and that the intention to join the SNS increases when the number of users who use the service increases.

H7: Direct network externality will have a positive influence on the Attitude of mobile payment service.
In this virtual environment, the importance of trust is greater than the physical environment. It's an especially important factor that makes mobile payment service, which is directly related to money, safe to use.

**H8:** Trust will have a **positive** influence on the **Attitude** of mobile payment service.

**Attitude**

Previous research by Davis (1989) [43] concluded that user attitudes toward information systems have an effect on people's behavioral intentions, and many other studies support this.

**H9:** User attitude will have a **positive** influence on the **Continuous intention to use** of mobile payment service.
## Results

### Descriptive Statistics of respondents’ characteristics

<table>
<thead>
<tr>
<th>Division</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>153</td>
<td>48.9</td>
</tr>
<tr>
<td>Female</td>
<td>160</td>
<td>51.1</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 19</td>
<td>68</td>
<td>21.7</td>
</tr>
<tr>
<td>20-29</td>
<td>59</td>
<td>18.9</td>
</tr>
<tr>
<td>30-39</td>
<td>63</td>
<td>20.1</td>
</tr>
<tr>
<td>40-49</td>
<td>61</td>
<td>19.5</td>
</tr>
<tr>
<td>50 or older</td>
<td>62</td>
<td>19.8</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under high school</td>
<td>13</td>
<td>4.2</td>
</tr>
<tr>
<td>High school student</td>
<td>51</td>
<td>16.3</td>
</tr>
<tr>
<td>High school graduate</td>
<td>37</td>
<td>11.8</td>
</tr>
<tr>
<td>University student</td>
<td>36</td>
<td>11.5</td>
</tr>
<tr>
<td>University graduate</td>
<td>142</td>
<td>45.4</td>
</tr>
<tr>
<td>Master student</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>30</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Earnings (won)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 20,000.00</td>
<td>37</td>
<td>12.1</td>
</tr>
<tr>
<td>2,000,000–3,000,000</td>
<td>50</td>
<td>16</td>
</tr>
</tbody>
</table>

- Collect data by distributing questionnaires via PC and mobile
- Among the 322 Korean respondents who are using or intending to use the platform-based mobile payment service, 313 copies of the data are used as the analysis data
- Use SPSS 23.0 and IBM AMOS 21 for data analysis
Results

Reliability and Validity analysis

Model fitting Indices

<table>
<thead>
<tr>
<th>Index</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFI</td>
<td>0.911</td>
</tr>
<tr>
<td>CFI</td>
<td>0.912</td>
</tr>
<tr>
<td>TLI</td>
<td>0.903</td>
</tr>
<tr>
<td>Chi-square (df)*</td>
<td>1881</td>
</tr>
<tr>
<td>Chi-square /df</td>
<td>1371.528</td>
</tr>
</tbody>
</table>

The goodness of fit of all three models satisfied the acceptance criteria 0.9, suggesting the models are suitable for hypothesis testing.
Reliability and Validity analysis

Reliability test of questions

The reliability of all questions in this study was above 0.8, so we can verify that the test questions were reliable.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.898</td>
</tr>
<tr>
<td>Compatibility</td>
<td>0.830</td>
</tr>
<tr>
<td>Intention to use</td>
<td>0.901</td>
</tr>
<tr>
<td>Accessibility</td>
<td>0.898</td>
</tr>
<tr>
<td>Direct Network externality</td>
<td>0.817</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>0.855</td>
</tr>
<tr>
<td>Indirect Network externality</td>
<td>0.834</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>0.849</td>
</tr>
<tr>
<td>Trust</td>
<td>0.702</td>
</tr>
</tbody>
</table>
Results

Result of structural equation modeling analysis

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Estimate</th>
<th>S.E.a</th>
<th>C. R.b</th>
<th>p a</th>
<th>Hypothesis status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: IDN-&gt;PU</td>
<td>0.098</td>
<td>0.053</td>
<td>1.71</td>
<td>0.054</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: ACC-&gt;PU</td>
<td>0.158</td>
<td>0.054</td>
<td>2.32</td>
<td>0.011</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: PEOU-&gt;PU</td>
<td>0.443</td>
<td>0.075</td>
<td>4.69</td>
<td>0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: COM-&gt;PU</td>
<td>0.336</td>
<td>0.100</td>
<td>4.21</td>
<td>0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H5: PEOU-&gt;AT</td>
<td>0.182</td>
<td>0.099</td>
<td>1.67</td>
<td>0.032</td>
<td>Not supported</td>
</tr>
<tr>
<td>H6: PU-&gt;AT</td>
<td>0.530</td>
<td>0.140</td>
<td>4.36</td>
<td>0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>H7: DN-&gt;AT</td>
<td>0.260</td>
<td>0.069</td>
<td>4.10</td>
<td>0.001</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Note: COM; Compatibility, AES; Accessibility, PEOU; Perceived ease of use, PU; Perceived usefulness, ATT; Attitude, IU; Intention to use, DN; Direct network externality, IDN; Indirect network externality, TRU; Trust

***p<0.001
## Results

### Direct / Indirect network externality

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Estimate</th>
<th>S.E.(^a)</th>
<th>C.R.(^a)</th>
<th>(P^a)</th>
<th>Hypothesis status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: IDN-&gt;PU</td>
<td>0.098</td>
<td>0.053</td>
<td>1.716</td>
<td>0.05</td>
<td>Supported</td>
</tr>
<tr>
<td>H7: DN-&gt;AT</td>
<td>0.260</td>
<td>0.069</td>
<td>4.108</td>
<td>***</td>
<td>Supported</td>
</tr>
</tbody>
</table>

The results of this study are consistent with the findings of the research that mobile internet service externalities affect the intention to use in the same manner in mobile payment services.

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Note: COM; Compatibility, AES; Accessibility, PEOU; Perceived ease of use, PU; Perceived usefulness, ATT; Attitude, IU; Intention to use, DN; Direct network externality, IDN; Indirect network externality, TRU; Trust

\(^{**}p<0.001\)
Perceived ease of use

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Hypothesis status</th>
</tr>
</thead>
<tbody>
<tr>
<td>H5:PEOU-&gt;AT</td>
<td>0.182</td>
<td>0.099</td>
<td>1.675</td>
<td>0.132</td>
<td>Not supported</td>
</tr>
</tbody>
</table>

Mobile payment services can be regarded as being used for purchasing information technology. Therefore, it can be explained that perceived ease of use does not directly affect the acceptance of mobile payment services.
This study is meaningful in that it is the first paper to study the rapidly growing social network service-based mobile payment services.

In this study, network externality, which is a newly emergent variable, is divided into direct network externalities and indirect network externalities. It suggests that SNS-based mobile payment services can enhance users' satisfaction by providing services that use network externality.

> It suggests that SNS-based mobile payment services can enhance users' satisfaction by providing services that use network externality.
The sample size of this study was limited to a sampling of Korean consumers. However, in Korea, it is appropriate to analyze SNS-based mobile payment services because the Korean consumer space has high smartphone penetration and a variety of mobile payment services.

SNS-based mobile payment services are a new concept that have appeared within the past 1~2 years, and there is not much previous research on the subject. However, by examining past papers related to mobile payment that cover these concepts, we could close the theoretical foundation by studying TAM-based consumer acceptance intention.


Thank you for your listening

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