VALUE ADOPTION MODEL

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ABSTRACT

In this article, we will develop a model with perceived value to examine IT adoption towards cloud computing services. A motivation of our research is to develop a Value-based Adoption Model (VAM) and test IT adoption by examining the effects of perceived value in motivating intention to use cloud computing services. Second, our goal is to test a multi-dimension scale of perceived value that reflects dominant features of value of cloud services. Due to the distinctiveness of perceived value in cloud contexts, we test our theory by creating four constructs to capture perceived value of cloud computing services.

Key words: cloud, intention, perceived value

INTRODUCTION

Researchers argued that a strong association between perceived value and intention (H. W. Kim, Chan, & Gupta, 2007; Y. H. Kim, Kim, & Wachter, 2013; Lai & Chen, 2011; Lin, Wu, Hsu, & Chou, 2012; Ryu, Han, & Kim, 2008). Value-based Adoption Model (VAM) was adapted to technology acceptance by Kim et al (H. W. Kim et al., 2007) according to theory of consumer choice and decision making. This theory demonstrates that customers’ perception of the value of a technology service is a primary factor of intention to use. Customer value perceptions are defined as an acquisition value from utilitarian perspective(H. W. Kim et al., 2007). The perceived value based on cost reduction is essential but not our solely concern, the time and efforts saving from the cloud services are carefully considered by customers. In order to face the challenge of modern services, cloud computing offers tremendous values. According to current literature of cloud computing, we can easily see that there are some advantages acquiring cloud computing customers’ preference, indicating the benefits and values exist in adopting the cloud. These advantages
referring to omnipresence, collaboration support, efficiency and compatibility of cloud computing services; these four factors which can lead to individuals’ perceived value are our focus to study in this paper.

**RESEARCH MODEL HYPOTHESES DEVELOPMENT**

According to (Zeithaml, 1988), perceived value is the consumer’s overall assessment of the utility of a service based on perceptions of what is received and what is given. Cloud Computing is closely attached with low cost and efficiency, which highlighted the perceived value of its services. Customers are charged like conventional utilities (e.g., water, electricity etc.), that means clients are charged depending on how much services you use. Perceived value appears to be a direct antecedents of intention (Chen & Chen, 2010; Cronin, Brady, Hult, & Tomas, 2000; Dodds, Monroe, Grewal, Dodds, & Monroe, 1991). Hence, we hypothesize that

H1(+): Perceived value has a positive impact on intention to adopt cloud services.

Park and Ryoo generalize omnipresent and collaboration support as expected values to serve as positive sides to accept technology of cloud (Park & Ryoo, 2013). First, omnipresence is a distinctive merit of cloud because users can access and use their resources at any place anytime. Thus, users can utilize their resources efficiently via cloud computing services at anywhere anytime. Miller (2009) defined collaboration supports as to the extent of collaborative interaction among users for using cloud services. For example, sharing files drives straightforwardly to collaboration on files. The ability for different clients to effortlessly work together on the same tasks is one of the most attractive advantages to many clients offered by cloud computing services (Miller, 2009). The ability to share and manage files instantly among various clients is one of the essential benefits of internet based services. Along these merits, cooperation can encourage cloud adoptions with goal of completion of most group activities. Thus, collaboration support can offer more values. The rate of adoption, in general, is positively related to compatibility (Jurison, 1995; Tornatzky and Klein 1982) also argued that compatibility is one of the most key factors in describing association across a wide range of technology (Jurison, 1995; Tornatzky & Klein, 1982). Services speed can also be improved by saving time and efforts from installing, updating of hardware, software and maintenance. We hypothesize that:

H2a (+): Omnipresence has a positive impact on end-users’ perceived value.

H2b (+): Collaboration Support has a positive influence on perceived value

H2c (+): Compatibility has a positive influence on perceived value.

H2d (+): Efficiency has a positive influence on perceived value.
THE METHODOLOGY

A total 442 students participated an online survey. 385 were usable and 57 were discarded due to missing data or outliers. Each of the measurement items was designed on a seven point Likert scale. SmartPLS 2.0 software was utilized to test the model. In the CFA results, shown in Table 2 and Table 3, all path loadings exceeded 0.70 and were significant (Table 1). The lowest AVE of key constructs was 0.723, and the lowest composite reliability was 0.794. The indictors’ Cronbach alphas are above 0.7 showing that constructs consistent reliability was met. And composite reliability above the value of 0.7 means that internal consistent reliability was satisfied (Table 3).

Table 1 Confirmatory Factor Analysis Results

<table>
<thead>
<tr>
<th>Construct</th>
<th>Indicators</th>
<th>Original Sample (O)</th>
<th>Sample Mean (M)</th>
<th>Standard Deviation (STDEV)</th>
<th>Standard Error (STERR)</th>
<th>T</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>CP1</td>
<td>0.8906</td>
<td>0.8893</td>
<td>0.013</td>
<td>0.013</td>
<td>68.5661</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP2</td>
<td>0.9214</td>
<td>0.9203</td>
<td>0.0088</td>
<td>0.0088</td>
<td>105.0624</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP3</td>
<td>0.9038</td>
<td>0.9038</td>
<td>0.0132</td>
<td>0.0132</td>
<td>68.6989</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP4</td>
<td>0.7581</td>
<td>0.756</td>
<td>0.0325</td>
<td>0.0325</td>
<td>23.3456</td>
<td></td>
</tr>
<tr>
<td>Collaboration Support</td>
<td>CS21</td>
<td>0.8444</td>
<td>0.8421</td>
<td>0.0199</td>
<td>0.0199</td>
<td>42.4638</td>
<td></td>
</tr>
</tbody>
</table>
CS22  0.8752  0.8758  0.0166  0.0166  52.6566  
CS23  0.8697  0.8695  0.0189  0.0189  46.0216  
CS24  0.8452  0.8468  0.0156  0.0156  54.214  
Efficiency  
  EF1  0.8767  0.8743  0.0167  0.0167  52.4609  
  EF2  0.8807  0.8773  0.0209  0.0209  42.061  
  EF3  0.8774  0.8769  0.0173  0.0173  50.6562  
Perceived Value  
  PV1  0.843  0.8394  0.0234  0.0234  36.0134  
  PV2  0.8588  0.8547  0.0198  0.0198  43.4579  
  PV3  0.8744  0.8734  0.0168  0.0168  52.1508  
  PV4  0.8236  0.8244  0.0277  0.0277  29.7449  
Intention to use  
  U2  0.8897  0.8899  0.0147  0.0147  60.4889  
  U3  0.874  0.8731  0.019  0.019  45.9408  
  U4  0.8956  0.8949  0.0138  0.0138  64.6781  
  U5  0.9044  0.9037  0.0113  0.0113  79.7098  
  U6  0.8911  0.8903  0.0149  0.0149  59.7678  
Omnipresence  
  UB1  0.8422  0.8  0.0283  0.0283  29.7546  
  UB2  0.8677  0.8661  0.0244  0.0244  35.515  
  UB3  0.8642  0.8622  0.0252  0.0252  34.2969  
  UB4  0.8531  0.8521  0.0229  0.0229  37.3019  

Figure 2 Testing Results of the structure model

Note: Path coefficients (t-value)
Table 2: Assessment of construct validity: correlation among latent constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Collaboration Support</th>
<th>Compatibility</th>
<th>Efficiency</th>
<th>Intention to use</th>
<th>Omnipresence</th>
<th>Perceived Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration Support</td>
<td></td>
<td>0.8587</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Compatibility</td>
<td>0.6009</td>
<td></td>
<td>0.8709</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Efficiency</td>
<td>0.6488</td>
<td>0.7681</td>
<td>0.8782</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Intention to use</td>
<td>0.5183</td>
<td>0.6527</td>
<td>0.6587</td>
<td>0</td>
<td>0</td>
<td>0.891</td>
</tr>
<tr>
<td>Omnipresence</td>
<td>0.5472</td>
<td>0.5932</td>
<td>0.5207</td>
<td>0.4305</td>
<td>0</td>
<td>0.8569</td>
</tr>
<tr>
<td>Perceived Value</td>
<td>0.6098</td>
<td>0.6364</td>
<td>0.6902</td>
<td>0.6501</td>
<td>0.4387</td>
<td>0.8502</td>
</tr>
</tbody>
</table>

Note: Diagonal elements represent square root of AVE value for the corresponding construct.

Table 3: Reliability

<table>
<thead>
<tr>
<th>Construct</th>
<th>AVE</th>
<th>Composite Reliability</th>
<th>Cronbachs Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration Support</td>
<td>0.737</td>
<td>0.9182</td>
<td>0.882</td>
</tr>
<tr>
<td>Compatibility</td>
<td>0.758</td>
<td>0.9259</td>
<td>0.8917</td>
</tr>
<tr>
<td>Efficiency</td>
<td>0.771</td>
<td>0.9101</td>
<td>0.8518</td>
</tr>
<tr>
<td>Intention to use</td>
<td>0.794</td>
<td>0.9506</td>
<td>0.9351</td>
</tr>
<tr>
<td>Omnipresence</td>
<td>0.734</td>
<td>0.917</td>
<td>0.8798</td>
</tr>
<tr>
<td>Perceived Value</td>
<td>0.723</td>
<td>0.9125</td>
<td>0.872</td>
</tr>
</tbody>
</table>

**STRUCTURAL MODEL RESULTS**

All hypotheses results are summarized in the Table 4 through the analysis of the significance and sign of path coefficients in the structural model using the T test. The path between perceived value and intention to adopt shows a direct positive significant relationship. Compatibility and Efficiency
show a direct positive relationship with perceived value that is statistically significant. Therefore, hypotheses 1, 2c and 2d are supported. The paths between Omnipresence and perceived value show a direct positive relationship but not significant. Collaboration Support, shows a direct negative relationship with perceived value. Hypothesis 2a and 2b are not supported.

Table 4 Hypotheses results

<table>
<thead>
<tr>
<th>Table</th>
<th>Summary of hypotheses testing results</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1(+) : Perceived value has a positive impact on intention to adopt cloud services</td>
<td>Supported</td>
<td></td>
</tr>
<tr>
<td>H2a (+) : Omnipresence has a positive impact on end-users’ perceived value</td>
<td>Not Supported</td>
<td></td>
</tr>
<tr>
<td>H2b (+) : Collaboration Support has a positive influence on perceived value</td>
<td>Not Supported</td>
<td></td>
</tr>
<tr>
<td>H2c (+) : Compatibility has a positive influence on perceived value</td>
<td>Supported</td>
<td></td>
</tr>
<tr>
<td>H2d (+) : Efficiency has a positive influence on perceived value</td>
<td>Supported</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSIONS AND LIMITATIONS

In this research, we emphasized on four factors driving perceived values of cloud computing services: omnipresence, collaboration support, compatibility and efficiency. Our research made an extensive study about perceived value about cloud computing service. However, our sample size only consists less than 400 undergraduate or graduate students. Not all of the hypotheses had been proved. One of the main hypothesis between two driving factors of perceived values and perceived values were not significantly supported. This weakens our structure model empirically. We may consider that because young students value more compatibility and efficiency rather than omnipresence and collaboration support in order to save time and efforts to switch the new technology, and meanwhile they cannot afford to discard current devices.

REFERENCE


Miller, M. (2009). *Cloud computing: Web-based application that change the way you work and collaborate online.*


