The Antecedents of E-Grocery Store Continuance

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ABSTRACT
This study presents a respecification of the DeLone and McLean IS success model and empirically assesses it to predict customers’ future purchases in the context of the online grocery store. Survey data were collected from 376 customers of one online grocery store. Structural equation modeling was conducted to validate the research model. The results indicate that service quality, product quality, and perceived ease of use are significant predictors of user satisfaction with the online grocery store. Additionally, user satisfaction, service quality, product quality, and perceived ease of use are significant predictors of customer future intentions to repurchase groceries from the online grocery store. The results may be of importance in explaining factors that measure success of the online grocery store, as well as in providing operators of the online grocery service with a better understanding of how to maintain customer loyalty.

Keywords
DeLone and McLean IS success model, online grocery store, structural equation modeling, customer loyalty

INTRODUCTION
E-Grocery store provides time-saving convenience to enable the consumer to increase the number of tasks that can be accomplished during a single visit or reduce the amount of time required to complete the shopping task (Boyer & Hult, 2005, 2006; Chu, Arce-Urriza, Cebollada-Calvo, & Chintagunta, 2010; Morganosky & Cude, 2000). In the setting of E-Grocery store, customers involve no travel, product carrying or restrictions on shopping hours, offering greater accessibility (Boyer & Hult, 2005, 2006). Responding to this issue, many companies such as Peapod, Streamline, HomeGrocer, and Tesco have reinvented the grocery shopping experience as an online service to make procuring food a convenience. Additionally, the fact that online giant Amazon has now joined the e-grocery business indicates the increasing importance of the online grocery industry. However, according to Forrester’s recent report, the U.S. grocery market is a $538 billion industry, and only 2% of that revenue comes via online grocery sales – a share that is far less than in the pet supply, book, and baby products industries (Drell, 2012). Thus, the online grocery industry appears to be still in its infancy.

Although E-Grocery store provides considerable convenient services to customers, maintaining and developing online customer loyalty is still a pressing issue for the service providers because the number of loyal customers contributes to the value of an online store (Reichheld & Schefter, 2000). Previous studies indicate that acquiring new customers costs online vendors at least 20% to 40% more than it costs vendors serving a traditional market and renders many customer relationships unprofitable during early transactions (Gefen, 2002; Reichheld & Schefter, 2000). Due to the characteristics of online shopping, customers can easily compare alternatives and switch to other e-commerce vendors if a better alternative is provided. Thus, maintaining online customer loyalty becomes one of the key factors for determining the success of an online store (Reichheld & Schefter, 2000).

In order to better understand how to maintain online customer loyalty in this comparatively small but growing industry, the main purpose of this study is to examine major determinants of customers’ repurchasing intentions groceries online. Customer loyalty deals with customer intentions to repurchase from a company and to do more business with the vendor (Andreassen & Lindestad, 1998; Selnes & Hansen, 2001; V.A. Zeithaml, Berry, & Parasuraman, 1996). Although an E-Grocer is not necessarily a manufacturer, the reliable site it provides to customers would attract customers to go back and repurchase from them. Online giant Amazon provides a perfect example. Therefore, this study measures customers’ repurchase intention at a given online grocery store as a proxy for customer loyalty.

The DeLone and McLean IS success model (DeLone & McLean, 1992, 2003) has received a great deal of attention among IS researchers. This model posits that information quality, system quality, and service quality jointly affect user satisfaction and use. Thus, the current study draws upon DeLone and McLean’s IS success model and prior customer loyalty research to answer the following research question: Why do people want to continue to purchase groceries at a given online store?
LITERATURE REVIEW

The DeLone and McLean IS Success Model

IS researchers have derived a number of models to explain what makes Information Systems (IS) succeed. Due to the multi-dimensional nature of IS success, early attempts to define and measure IS success were not well-defined and measured. Responding to this issue, DeLone and McLean (1992) conducted a comprehensive review of IS success studies published during the period of 1981 to 1987 and proposed an IS success model. They identified six variables of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. Their model provided a scheme for classifying the multitude of IS success measures and suggested the temporal and causal interdependencies between these six variables. Shortly after they proposed this model, IS scholars increasingly called for the modification of this model. For example, many researchers have suggested that service quality be added to DeLone and McLean’s IS success model (James J. Jiang, Klein, & Carr, 2002; Pitt, Watson, & Kavan, 1995). Responding to this request, DeLone and McLean proposed an updated model in 2003 by adding service quality to reflect the importance of service and support in successful e-commerce systems. The updated model retains the premise of the original model, that is, the nature of IS success should be analyzed via multidimensional success dimensions that are interdependent in a process manner. In the updated model, intention to use a system has been added to measure user attitude, and individual impact and organizational impact has been collapsed into one success dimension called net benefits. Combing individual impact and organizational impact into net benefits addressed the criticism that an information system affects levels other than individual and organizational levels, thereby accounting for benefits at multiple level of analysis (DeLone & McLean, 2003).

In their updated model, system quality refers to the desirable characteristics of an information system such as ease of use or system flexibility. Information quality refers to the desirable characteristics of the system outputs (e.g., relevant and accurate management reports). Service quality refers to the quality of the support that system users received from the IS department and IT support personnel. System use refers to the degree in which staff and customers utilize the capabilities of an information system; user satisfaction refers to users’ level of satisfaction with reports, Web sites, and support services. And net benefits refer to the extent to which IS are contributing to the success of individuals, groups, organizations, industries, and nations (DeLone & McLean, 2003). The updated model has been widely used by IS researchers for understanding and measuring the information systems success. Thus, the current study employs the framework of DeLone and McLean’s updated IS success model to examine why people want to continue to purchase groceries online.

Customer Loyalty

Customer loyalty has been defined through two major approaches: behavioral and attitudinal (Dekimpe, Steenkamp, Mellens, & Vandenberghe, 1997; Dick & Basu, 1994). From the behavioral perspective, Newman and Werbel (1973) defined loyal customers as “those who rebought a brand, considered only that brand, and did no brand-related information seeking.” On the other hand, attitudinal loyalty includes cognitive, affective, and conative aspects (R.L. Oliver, 1997). Oliver (1997) included attitudinal and behavioral aspects to define customer loyalty as “a deeply held commitment to rebuy or repatronize a preferred product or service consistently in the future, despite situational influence and marketing efforts having the potential to cause switching behavior”. Customer loyalty deals with customers’ intentions to continue to purchase from a company, do more business with the vendor, and recommend that vendor to other customers (Andreassen & Lindestad, 1998; Selm & Hansen, 2001; V.A. Zeithaml et al., 1996). Achieving customer loyalty is one of the most important concerns for vendors. Loyal customers tend to show a special preference, attachment, commitment, low degree of switching to competitive brands, willingness to pay premium price, and provide positive word-of-mouth recommendations of the product or brand (Ganesh, Arnold, & Reynolds, 2000; Heskett, Jones, Loveman, & Sasser, 1994; V.A. Zeithaml et al., 1996). Customer loyalty plays an even more prominent role for online businesses because of the effect of word-of-mouth, and because support from loyal customers can be spread faster online as compared to offline (Reichheld & Schefter, 2000). Thus, an increasing body of IT studies has explored online customer loyalty to predict customers’ behavior in online service settings (Gefen, 2002; Kim & Son, 2009). The current study measures customers’ repurchase intentions as a proxy for customer loyalty.

RESEARCH MODEL AND HYPOTHESES

Drawing upon DeLone and McLean’s updated IS success model (2003) and prior literature, the research model is presented in Figure 1.
Service quality is the overall evaluation and judgment made by a customer regarding the excellence of service he or she receives (Parasuraman, Zeithaml, & Berry, 1985, 1988; Santos, 2003). Thus, in the setting of the online grocery store, service quality refers to the support and service received by a customer from an online service provider. Previous studies in marketing indicate that service quality is of importance to customers ordering groceries online because these customers value convenience and service over price (Delaney-Klinger, Boyer, & Frohlich, 2003). Additionally, most of IS studies also support the positive association between service quality and user satisfaction (DeLone & McLean, 2003; Molla & Licker, 2001; Petter & McLean, 2009; Zhu, Kraemer, & Dedrick, 2004). Thus, I hypothesize that:

**H1:** Service quality of the online grocery store is positively associated with user satisfaction.

Product quality is defined as “the customer’s subjective judgment about a product’s overall excellence or superiority” (Valarie A. Zeithaml, 1988). When consumers purchase groceries such as meats and dairy products, they greatly depend upon sensory examination such as touching, smelling, and feeling to determine the freshness or appropriateness of the product (Lim, Widdows, & Hooker, 2009). However, in the setting of the online grocery store, customers have limited opportunities for sensory examination. Thus, several studies of online grocery retailing indicate that uncertainty about product quality remains a substantial hurdle to the adoption of this channel (Ellis, 2003; Tanskanen, Yrjola, & Holmstrom, 2002). Given the limited sensory examination people can have in the setting of the online grocery store, this study argues that if an online grocery retailer can provide excellent products, customers may feel more satisfied about the products they receive from this online retailer. Thus, I hypothesize that:

**H2:** Product quality of the online grocery store is positively associated with user satisfaction.

System quality in the DeLone and McLean updated IS success model refers to the desirable characteristics of an information system such as ease of use, system flexibility or use friendliness (DeLone & McLean, 2003). The current study measured perceived ease of use with the online grocery store as a proxy of system quality. Perceived ease of use is the degree to which a person believes that using a particular system will be free from effort (Davis, 1989). One of the key advantages of online grocery shopping is to enable the consumer to increase the number of tasks that can be accomplished during a single visit or reduce the amount of time required to complete the shopping task (Boyer & Hult, 2005, 2006; Chu et al., 2010; Morganosky & Cude, 2000). However, previous studies indicate that if customers take over 80 minutes to order groceries online, there is little time savings for the customer over physically going the store (Boyer & Hult, 2005; Ellis, 2003), indicating the importance of ease of use in the setting of the online grocery store. Thus, I hypothesize that:

**H3:** Perceived ease of use of the online grocery store is positively associated with user satisfaction.

Intention to repurchase is the tendency that customers will purchase the goods or services at the same shop and share their shopping experience with friends and relatives (Cronin, Brady, & Hult, 2000; V.A. Zeithaml et al., 1996). Intention to repurchase has been frequently used to examine service quality (Alexandris, Dimitriadis, & Markata, 2002; Boulding, Kalra, Richard, & Zeithaml, 1993; V.A. Zeithaml et al., 1996). These results provided the evidence of the positive relationship...
between service quality and intention to repurchase. In the setting of the online grocery store, if the store’s employees are reliable in providing the service or respond well to customers’ service requests, customers are more likely to repurchase from this online grocery store. Thus, I hypothesize that:

**H4: Service quality of the online grocery store is positively associated with customers’ intention to repurchase.**

In the setting of the online grocery store, customers are not able to use sensory examinations such as touching, smelling, and feeling to determine the freshness or appropriateness of the product (Childers, Carr, Peck, & Carson, 2001). Thus, product quality is essential to trigger the adoption of this channel. Thus, I hypothesize that:

**H5: Product quality of the online grocery store is positively associated with customers’ intention to repurchase.**

If an online grocery store makes it difficult to search for products or conduct a transaction, there is little time savings for the customer over physically going the store (Boyer & Hult, 2005; Ellis, 2003). The service provider of an online grocery store must provide a simple and understandable online shopping environment to facilitate customers’ transactions. If an online grocery store is very difficult to navigate and place an order, customers are less likely to repurchase groceries from the same online grocery store. Therefore, I hypothesize that:

**H6: Perceived ease of use of the online grocery store is positively associated with customers’ intention to repurchase.**

According to expectation-confirmation theory (ECT), the degree of satisfaction customers perceive about a product or service is the primary motivation for their continuance (R. L. Oliver, 1980). Customers with a high degree of satisfaction tend to have a stronger intention to repurchase and to recommend both the purchased product and the store (V.A. Zeithaml et al., 1996). Similarly, in the IS field, previous studies also indicate that users’ IS continuance intention is determined primarily by their satisfaction with prior IS use (Bhattacherjee, 2001a, 2001b). Thus, if customers feel satisfied with their prior online grocery shopping experience at a given online grocery store, these customers are more likely to go back and repurchase groceries from the same online grocery store. Thus, I hypothesize that:

**H7: User satisfaction is positively associated with customers’ intention to repurchase.**

**RESEARCH METHODOLOGY**

The sample consists of the customers of one grocer utilizing online ordering for home delivery. The firm is Canadian. This firm generously shared its time and allowed us access to its customers, but prefers not to be identified by name given the dynamic and sensitive nature of the online grocery industry. We are also limited in the degree to which we can describe the sales and financial characteristic of the firm due to the highly competitive and developing nature of this industry. This grocer is a click retailer, with no physical stores, that operates by delivering orders from a centralized distribution or processing center located in major urban areas. This firm has annual online/home delivery sales of well over $50 million per year.

Data were collected via an online survey in which customers were contacted with an invitation to go to a third-party Web site to complete the survey. Dillman’s (1978) total design method was conducted for survey data collection: initial contact with follow-up reminders, a small incentive for completing the survey and the promise of anonymous in survey response. The grocer provided a small incentive to the participants. 376 customers participated in the study. The major purpose of the current study is to examine major determinants of customers’ intention to repurchase from the same online grocery store. Thus, the invitation was sent out to those customers who had made online transactions with this firm before. The process of collecting

All constructs and measures were used with items validated in prior research. Items measuring service and product quality were adopted from Boyer & Hult (2005). Measures of perceived ease of use were adopted from Venkatesh, Morris, Davis, & Davis (2003). Measures for user satisfaction were adopted from Seddon & Kiew (1996). And measures of intention to repurchase were adopted from Cronin et al. (2000). All items used a 7-point Likert-scale (1= strongly disagree to 7= strongly agree).

**DATA ANALYSIS AND RESULTS**

Data analysis for this study was performed use EQS 6.1 for Windows. Model estimation was done in EQS using maximum likelihood estimation (MLE). Data analysis proceeded in two stages: the measurement model was first examined for validating and refining the research instrument, followed by an analysis of the structural equation model for testing the associations hypothesized in our research model.
Measurement Model

First, construct validity for each scale was assessed by examining the standardized CFA factor loadings of its hypothesized items, as derived from EQS measurement model. All scales were allowed to covary. According to Hair et al. (1998), factor loadings of 0.50 or greater are considered practically important. Therefore, the current study proposed that each item should have a minimum factor loading of 0.50 on its hypothesized construct. This norm was met for 19 out of 26 items for the five scales. Four items had loadings in the 0.3-0.5 range and three others had loadings lower than 0.3. These items were dropped from subsequent analysis. After dropping these items, the reliability of each corresponding construct did improve.

This study applied the following indices to assess model fit: Chi-square/degree of freedom ratio ($\chi^2/df$), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The Chi-square/degree test yields the relative value ($\chi^2/df$) of 2.89, falling into the recommended range of 3 to 1 (Carmines & McIver, 1981). The current model has a CFA value of 0.913, which as above the recommended cutoff threshold of 0.90 suggested by Jiang and Klein (1999). The RMSEA value is .08, which is within the acceptable range. Other EQS outputs of CFA were used to examine the constructs’ unidimensionality and validity. Standardized regression weights showed that all items loaded appropriately on factors (constructs) as expected. All item loadings for each of the constructs are significant at 0.001 level.

Together, the results demonstrate convergent validity (see Table 1). Discriminant validity was tested with the approach suggested by Fornell and Larcker (1981) - comparing the square root of the AVE of each construct with the correlation between each of the constructs. As shown in Table 2, all average variances extracted were in excess of the shared variances between constructs for each of the two-factor models, demonstrating discriminant validity. The Cronbach’s coefficient ranged from 0.77 to 0.93. Therefore, all scales were considered reliable. Together, the above results support the overall reliability and validity of the scale items used to measure the hypothesized constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item loading</th>
<th>Composite Reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Quality</td>
<td>0.59-0.93</td>
<td>0.95</td>
<td>0.64</td>
</tr>
<tr>
<td>Product Quality</td>
<td>0.61-0.90</td>
<td>0.88</td>
<td>0.71</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>0.73-0.84</td>
<td>0.91</td>
<td>0.76</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>0.80-0.99</td>
<td>0.95</td>
<td>0.86</td>
</tr>
<tr>
<td>Intention to repurchase</td>
<td>0.55-0.89</td>
<td>0.87</td>
<td>0.69</td>
</tr>
</tbody>
</table>

$\chi^2/df = 2.89$, CFI = 0.913, RMSEA = 0.08

All item loadings ($\lambda$) in CFA model were significant at 0.001 level

Table 1. CFA for Convergent Validity

<table>
<thead>
<tr>
<th></th>
<th>SERQUAL</th>
<th>PROQUAL</th>
<th>EU</th>
<th>SAT</th>
<th>INT</th>
</tr>
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<tbody>
<tr>
<td>SERQUAL</td>
<td>0.80</td>
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<tr>
<td>PROQUAL</td>
<td>0.45</td>
<td>0.84</td>
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<tr>
<td>EU</td>
<td>0.21</td>
<td>0.21</td>
<td>0.87</td>
<td></td>
<td></td>
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<tr>
<td>SAT</td>
<td>0.65</td>
<td>0.51</td>
<td>0.29</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>0.48</td>
<td>0.43</td>
<td>0.24</td>
<td>0.58</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Table 2. CFA for Discriminant Validity

Structural Model

The first step in testing the proposed model was to estimate the goodness-of-fit of this model. The current study applied Chi-square/degree of freedom ratio ($\chi^2/df$), comparative fit index (CFI), and root mean square error of approximation (RMSEA) analyses to assess model fit. The Chi-square/degree test yields the relative value ($\chi^2/df$) of 2.93. The value of CFI is 0.912 and RMSEA is 0.81. Hence, this model fits reasonably with the observed data.
The second step in model estimation was to examine the path significance of each association in our research model and variance explained ($R^2$ value). The current study controlled for self-efficacy on computer usage. All seven hypothesized paths were supported (Figure 2). Service quality had a significant effect on satisfaction ($B = 0.51$, $p < .001$), supporting $H1$. Consistent with $H2$, product quality also had a significant effect on satisfaction ($B = 0.40$, $p < .01$). Additionally, perceived ease of use had a significant effect on satisfaction as well ($B = 0.13$, $p < .05$), supporting $H3$. Service quality, product quality, and perceived ease of use jointly explained 51% of the variance in satisfaction, with service quality contributing to a large proportion of that explanation. Intention to repurchase was predicted by satisfaction ($B = 0.34$, $p < .001$), service quality ($B = 0.32$, $p < .001$), product quality ($B = 0.24$, $p < .05$), and perceived ease of use ($B = 0.19$, $p < .01$), which jointly explained 52% if variance in intention to repurchase, supporting $H5$, $H6$, and $H7$. As expected, satisfaction contributes the largest proportion of the explanation for intention to repurchase.

![Figure 2. EQS Analysis of Research Model](image)

**CONCLUSION**

**Discussion**

The current study employs the framework of DeLone and McLean’s updated IS success model (2003) to examine determinants of repurchasing groceries online. The results indicate that service quality, product quality, and the perceived ease of use of an online grocery store jointly explain user satisfaction with the online grocery store. Service quality contributes the largest proportion of this relationship. Additionally, service quality, product quality, perceived ease of use, and customer satisfaction jointly explain 52% of the variance in customers’ intentions to repurchase groceries online. Consistent with previous studies, user satisfaction explains the most variance in this relationship.

This study concludes with implications for theory, research, and practice. For academics, the current study presents and empirically tests a theoretical model based on DeLone and McLean’s (2003) updated IS success model to better understand a continuously growing industry – the online grocery industry. The results contribute to the field’s understanding of why people would like to continue to purchase groceries online and also provide important practical implications for the vendors of online grocery services. Through the results of our study, the providers of online grocery services can realize that in the setting of the online grocery service quality plays an essential role in enhancing customers’ satisfaction. Thus, the providers should ensure services are always available and reliable to help customers facilitate their online purchasing experience. At the same time, given the limited sensory examination people can have online, managers also need to ensure that they provide excellent products to enable people to adopt this channel. Additionally, managers should be aware that a friendly and easy to use platform is also necessary to enable consumers to increase the number of tasks that can be accomplished during a single visit and reduce the amount of time required to complete the shopping task.
Limitations

Even though this offers valuable insights with respect to determinants of customers’ repurchasing groceries online, this study does have some limitations. First, since the current study only examined one online grocery store from one Canadian firm, it is unclear whether the results can be generalized to other online grocery stores. Future research needs to take account of this issue. Second, this study only measured customers’ intentions to repurchase groceries online. The current study did not measure customers’ actual use – a major characteristic of DeLone and McLean’s (2003) updated IS success model. Thus, future studies should measure customers’ actual behavior to provide a more comprehensive understanding of why people want to continue to purchase groceries online.

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