Full length article

Customer participation, value co-creation and customer loyalty – A case of airline online check-in system

Ching-Fu Chen*, Jing-Ping Wang

Department of Transportation & Communication Management Science, National Cheng Kung University, 1 University Rd., Tainan, 701, Taiwan

Abstract

Information communication technologies and self-service technologies, such as self-check-in kiosks or online check-in systems, are widely used in the air transport industry. This study proposes a conceptual model to investigate the relationships among customer participation, co-created values and customer loyalty in an air transport context, and empirically tests the model by using questionnaire survey data collected from Taiwanese airline passengers. In particular, three perceived values (i.e. enjoyment value, economic value and relational value) are specified to represent the passengers’ co-created values. The empirical results support the following hypotheses. Customer participation in using an online check-in system is positively related to all three values, which further lead to satisfaction with respect to the system. System satisfaction is also related to satisfaction with respect to the company, and both system satisfaction and company satisfaction have positive effects on customer loyalty.

1. Introduction

Information communication technology has widely transformed the interactions between service providers and consumers. With advances in information communication technology, self-service technology is replacing staff in many counter operations, enabling customers to participate directly in the service process, without employees getting involved (Bitner, Ostrom, & Meuter, 2002; Meuter, Ostrom, Roundtree, & Bitner, 2000). This allows the service company to provide services anytime, and anywhere (Lyytinen & Yoo, 2002). For example, both information communication technologies and self-service technologies, such as self-check-in kiosks or online check-in systems, are widely used in the air transport industry. The self-service technologies in check-in services not only allow airlines to optimize space and bring down their operating costs, but also help passengers to save time and money through the better and faster interactions they enable between service providers and their customers. In addition to airline’s willingness to adopt the self-service technologies, the success and benefits of such technologies rely crucially on customer participation.

Based on the service-dominant logic of marketing (Vargo & Lusch, 2004), the customer is always a co-creator of value. The service-dominant logic thus views customers as proactive co-creators rather than as passive receivers of value, and sees companies as facilitators of the value co-creation process, rather than as producers of standardized value (Chan, Yim, & Lam, 2010; Payne, Storbacka, & Frow, 2008). Customer participation is also consistent with the notion of “prosumption”, defined by Xie, Bagozzi, and Troye (2008) as value creation activities undertaken by the consumer that result in the production of products they eventually consume and that become their consumption experiences. Based upon both provider’s and user’s activity levels, Wunderlich, Wangenheim, and Bitner (2013) propose a smart service interactivity matrix with four types of smart services, such as interactive service, self-service, machine-to-machine service and provider active service. Here, self-service refers to those services with the characteristics of high user activity but low provider activity. Airline online check-in systems are one of the typical business-to-customer examples for the use of self-service technologies. Through customer participation, such systems can make it easy for passengers to check-in online anytime and anywhere, and not only reduce the costs and resources needed for the airline, but also provide better service to passengers. As such, the values shared by the airline and passengers can be co-created. Although the concepts of service-dominant logic and value proposition are
increasingly in use, little empirical research in the business-to-
customer context (Chan et al., 2010) has investigated how
customer participation affects customer perceived values, and how
the perceived values affect customer satisfaction and loyalty, the
benefits that are sought by the firms that use such technologies.

Since value co-creation is a central tenet of the service-
dominant logic and the main premise of customer participation
(Chan et al., 2010; FitzPatrick, Davey, Muller, & Davey, 2013), this
study proposes a conceptual model to investigate how customer
participation enables customers to co-create the intrinsic as well as
extrinsic values of participation, which then affect their satisfaction
and behavioral outcomes in an airline service context (see Fig. 1).
Specifically, three types of values (i.e., enjoyment value, economic
value and relational value) are specified to measure the passengers’
co-created values through their participation in using an online
check-in system.

2. Theoretical background and hypotheses development

2.1. Customer participation and co-created values

According to the service-dominant logic, customers are viewed
as proactive value co-creators rather than passive receivers of value,
and companies are thus urged to take up the role of facilitators of
the value co-creation process (Payne et al., 2008). Customer
participation reflects the related efforts in co-producing a service
(Chan et al., 2010), and such participation enables companies to
derive closer and more profitable relationships with their cus-
tomers (Bendapudi & Leone, 2003; Payne et al., 2008). In particular,
customer participation is a critical component of the value co-
creation process in the context of self-service technologies. Due
to the characteristics of a high user activity level but low provider
activity level (Wünderlich et al., 2013). Value co-creation is a cen-
tral tenet of the service-dominant logic, and the main premise of
customer participation. Customer participation has been shown to
deliver value to both customers and firms (Auh, Bell, McLeod, &
Shih, 2007; Chan et al., 2010; Dong, Evans, & Zou, 2008; Yim,
Chan, & Lam, 2012), and customers who perceive more value
through their co-producing a service tend to be more satisfied
(Chan et al., 2010; Dong et al., 2008; Ouschan, Sweeney, & Johnson,
2006; Yim et al., 2012). However, past findings about the effect of
customer participation on service outcomes, such as customer
satisfaction and loyalty, are mixed and inconsistent (Chan et al.,
2010; Yim et al., 2012). In light of the main premise of the service-dominant logic, customer participation itself is not the key
to greater customer satisfaction, but instead it is the co-created
values that are important here. Service research suggests that ser-
vice customers require extrinsic as well as intrinsic rewards as
motivations for participation in self-service or coproduction service
tasks (Dabholkar & Bagozzi, 2002; Etgar, 2008; Yim et al., 2012).
Therefore, the co-created values might act as critical mediators
between customer participation and service outcomes, such as
customer satisfaction and loyalty. Holbrook (1999) proposes a ty-
pology of value based on three dimensions: self-oriented vs. other-
oriented, active vs. reactive, and extrinsic vs. intrinsic. In this study,
we consider both the extrinsic values (economic and relational) and
intrinsic value (enjoyment) that drive customers to participate in
service coproduction. Economic value pertains to the benefit
and cost outcomes of the core services, such as offering better quality,
customized services, and ceding more control to customers,
whereas relational value relates to the value derived from the
emotional or relational bonds between customers and service
providers (Yim et al., 2012). In contrast, intrinsic value refers to
intrinsic rewards or psychological benefits, such as fun, pleasure
and enjoyment, that occurs in the experience of consumption
(Dabholkar & Bagozzi, 2002; Etgar, 2008). Recent studies have
confirmed the co-creation of enjoyment, economic and relational
values through customer participation (Chan et al., 2010; Yim et al.,
2012). Therefore, we propose the following hypotheses:

H1. Customer participation is positively related to co-created
values.

H1a. Customer participation is positively related to enjoyment
value.

H1b. Customer participation is positively related to economic
value.

H1c. Customer participation is positively related to relational
value.

2.2. Co-created values and satisfaction

Perceived value represents customer cognition of the nature of
the relational exchanges that occur with their suppliers, and
satisfaction reflects the overall feeling that customers derive from
the perceived value (Woodruff, 1997). More specifically, satisfaction
refers to the perceived discrepancy between prior expectation and
perceived performance after consumption — when performance
differs from expectation, dissatisfaction occurs (Oliver, 1980). A
large body of empirical evidence shows that customer-perceived

---

**Fig. 1.** The conceptual model.
value has a positive effect on customer satisfaction with a service provider (Chen, 2008; Chen & Chen, 2010; Chen & Tsai, 2008; Yang & Peterson, 2004). In the context of self-service technologies, the ability to customize the service offering is a leading factor that generates customer satisfaction (Meuter et al., 2000). Since customer participation could lead to the enjoyment, economic and relational values discussed above, we postulate that all three types of values act as determinants of customer satisfaction with self-service technologies. Taking an airline online check-in system as an example, this provides customized services for users, such as early seat selection and meal ordering. Positive consumption emotions, such as delight and happiness, have a positive impact on evaluations of satisfaction (Phillips & Baumgartner, 2002). A friendly and enjoyable relationship adds value for the customer, and thus enhances satisfaction. Enjoyment value, such as a desire for fun, can also affect customer satisfaction, as it is a motivational force to encourage consumers to participate in co-production (Yim et al., 2012). Therefore, we propose the following hypotheses:

H2. Co-created values are positively related to system satisfaction.

H2a. Enjoyment value is positively related to system satisfaction.

H2b. Economic value is positively related to system satisfaction.

H2c. Relational value is positively related to system satisfaction.

2.3. System satisfaction and company satisfaction

Different types of customer satisfaction can be differentiated, based on the context being considered. For example, system satisfaction, which is often used in information system research, is defined as the extent to which a user believes the information system available to them meets their informational requirements (Ives, Olson, & Baroudi, 1983). In other words, system satisfaction is the level of customer satisfaction with the system itself. Since the system might be just one of service features a company provides, customer satisfaction with the system is important, but does represent satisfaction with the company as a whole. The airline consumption experience, for instance, consists of not only of the check-in process but also the on-board travel experience. In fact, the check-in experience is a peripheral service, and the on-board experience is the core service. However, if a passenger feels dissatisfied with the check-in experience, then this is likely to have a negative effect on their satisfaction with the airline. To distinguish the two types of customer satisfaction in the current study, a higher level of satisfaction with the online check-in system is hypothesized to relate to a higher level of satisfaction with company, as follows:

H3. System satisfaction is positively related to company satisfaction.

2.4. Customer satisfaction and customer loyalty

Customer loyalty is an important goal in the consumer marketing community, as it is a key component for a company's long-term viability (Chen & Chen, 2010). Retaining existing customers and strengthening customer loyalty are thus crucial tasks for service providers aiming to gain a competitive advantage (Chan et al., 2010). The positive impact of satisfaction on loyalty has been widely noted in previous studies on both services and SSTs (Bitner et al., 2002; Chen & Chen, 2010; Dabhokar & Bagozzi, 2002; Lin & Hsieh, 2007; Meuter et al., 2000; Yang & Peterson, 2004). Satisfied customers are more likely to have a stronger repurchase intention and to recommend the product/service to their acquaintances (Zeithaml, Berry, & Parasuraman, 1996). Since we distinguish customer satisfaction with respect to both the system itself and company as a whole in our study, we believe both types of customer satisfaction would enhance customer loyalty. Therefore, we propose the following two hypotheses:

H4. System satisfaction is positively related to customer loyalty.

H5. Company satisfaction is positively related to customer loyalty.

3. Method

3.1. Sample and procedures

A self-administered questionnaire survey was used to collect empirical data from air travelers who had used the online check-in system at two major airports in Taiwan, based on a convenience sampling method. The questions in the survey were designed based on a review of the literature and the specific characteristics of an online check-in system. Potential participants were first asked if they had ever used an airline online check-in system. If they responded “yes”, then after being briefly informed of our research purpose they were invited to participate and complete the survey questionnaire on the spot. Of the 350 questionnaires distributed, we received 313 usable responses after removing incomplete ones, yielding a response rate of 89.4%. The sample included 179 men (57.2%) and 134 women (42.8%). The majority of the respondents worked in the business and service sector (40.9%), followed by the public sector (23.3%) and manufacturing sector (12.8%). Around 75.7% of the respondents reported that they had airline memberships.

3.2. Measures

To establish content validity, we adopted measures and constructs from existing scales, modified to suit the context of the current work. All constructs were measured using a five-point Likert-type scale (1 = “strongly disagree” and 5 = “strongly agree”). We used five items to measure customer participation (Yim et al., 2012). To capture the perceptions of co-created value, enjoyment value, economic value and relational value were measured by four, three and three items, respectively (Yim et al. 2012). We used three items each for system satisfaction and company satisfaction (Yim et al. 2012), while two items captured attitudinal customer loyalty (Chen, 2008). The original construct items were prepared in English and then translated into Chinese using standard back translation (Brislin, 1980) for distribution in Taiwan.

3.3. Data analysis

Following Anderson and Gerbing (1988) two-step approach, we performed Confirmatory Factor Analysis (CFA) on the conceptual model to assess the adequacy of all the constructs, and SEM was used to estimate the model fitness and to test for causal relationships. The fit of the conceptual models to the empirical data is assessed with the chi-squared ($\chi^2$) statistics, the goodness-of-fit index (GFI), the normed fit index (NFI), the comparative fit index (CFI), and the root mean square of approximation (RMSEA). For each of these statistics, values of 0.9 or higher indicate acceptability, except for the RMSEA, for which values up to 0.08 indicate an acceptable fit to the data (Hair, Black, Babin, Anderson, & Tatham, 2006).

4. Results

The means, standard deviations, internal consistencies
(Cronbach’s α coefficients) and zero-order correlations among the study variables are in Table 1. The α values for all the scales were greater than 0.70, indicating reasonable to good reliability (Hair et al., 2006).

4.1. Measurement model

We conducted CFA to check the convergent validity of the constructs in our measurement model and assessed model adequacy using fit indices (Hair et al., 2006). According to the goodness-of-fit indices from the CFA results, the measurement model was deemed parsimonious (Table 2). Specifically, the chi-square statistic ($\chi^2 = 495.08$, d.f. = 209) was significant, the ratio of the chi-square to the degrees of freedom ($\chi^2$/d.f. = 2.37) was less than the cut-off value of 3 (Bagozzi and Yi, 1988), and all CRs were greater than 0.7, indicating good reliability. In addition, all AVEs were greater than the suggested value of 0.5. Overall, these results indicate that the measurement model attained good convergent validity.

We assessed discriminant validity by comparing the AVE of each individual construct with the shared variances between it and all other constructs. A higher AVE of the individual construct with the shared variances between it and all other constructs would lead to customer satisfaction and loyalty with the use of SSTs. The results support all the hypotheses. Customer participation was found to be positively and significantly related to enjoyment value ($\gamma_{1a} = 0.75$, $t = 12.17$), economic value ($\gamma_{1b} = 0.79$, $t = 9.84$) and relational value ($\gamma_{1c} = 0.70$, $t = 10.94$), and thus $H1a$–$H1c$ are supported. All three values were also found to be positively related to system satisfaction, namely enjoyment ($\gamma_{2a} = 0.29$, $t = 3.05$); economic value ($\gamma_{2b} = 0.27$, $t = 3.74$) and relational value ($\gamma_{2c} = 0.21$, $t = 2.66$). System satisfaction is positively associated with both company satisfaction ($\gamma_{3} = 0.65$, $t = 9.61$) and customer loyalty ($\gamma_{4} = 0.14$, $t = 2.01$), indicating $H3$ and $H4$ are supported.

To sum up, the results confirm the path of “customer participation → value → satisfaction → loyalty” in the airline industry. Customer participation results in positive perception of the values (enjoyment, economic and relational) co-created through the airline online check-in system. The positive perception of these values then leads to customer satisfaction with respect to the online check-in system itself. The positive effect of system satisfaction then leads to customer satisfaction with respect to the company (airline) as a whole, and this then increases customer loyalty.

5. Discussion and conclusion

This research provides empirical evidence in support of the importance of customer participation in value co-creation, which is seen as a prerequisite for the success of a firm’s strategic efforts to improve customer satisfaction and loyalty with the use of SSTs. The key findings of this study are discussed in more detail, below.

First, our results indicate that when customers participate in using an airline online check-in system they can create both
extrinsic (e.g. economic, relational) and intrinsic (e.g. enjoyment) values. From a learning perspective, customer participation could create enjoyment for customers due to the substantial time and effort invested and experiences learned (Yim et al., 2012). Therefore, creating an enjoyable participation experience for customers is critical for value co-creation (Payne et al., 2008). Our results confirm the important role of the intrinsic value of customer participation in the experience of consumption in general and in the context of self-service technologies in particular. Among the three co-created values of interest in our study, while the effect of customer participation on economic value appears to be the largest, its impact on enjoyment value is also considerable. This implies that in order to encourage customers to participate in service coproduction, both their hedonic and utilitarian motivations should be taken into account when designing the mechanism or platform that customers will use to coproduce the service. Online check-in system includes four main steps: login the website, enter passport information, check-in and select a seat, finally print boarding pass. Apart from providing an easy to use check-in service and strengthening the relational bonds that exist with airline members and general customers, airlines might consider how to add psychological elements such as fun, pleasure and enjoyment into this process, in order to encourage more customers to use them. These psychological elements could be used to produce a state of “flow” (Csikszentmihalyi, 1975), which describes an experiential state characterized by the enjoyment or experience of an activity as intrinsically rewarding. Enjoyable activities offer an experience that the people performing them will enjoy for their own sake, try to maintain, and strive to repeat (Yim et al., 2012), and thus such

### Table 2
CFA results of the measurement model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>Factor loading</th>
<th>Error variance</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer participation (CP)</td>
<td>CP1</td>
<td>0.63</td>
<td>0.60</td>
<td>0.81</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>CP2</td>
<td>0.58</td>
<td>0.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP3</td>
<td>0.62</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP4</td>
<td>0.78</td>
<td>0.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CP5</td>
<td>0.76</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment value (EV)</td>
<td>CPE1</td>
<td>0.8</td>
<td>0.35</td>
<td>0.91</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>CPE2</td>
<td>0.73</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPE3</td>
<td>0.92</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CPE4</td>
<td>0.92</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic value (ECV)</td>
<td>CEV1</td>
<td>0.65</td>
<td>0.57</td>
<td>0.77</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>CEV2</td>
<td>0.77</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CEV3</td>
<td>0.76</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational value (RV)</td>
<td>CRV1</td>
<td>0.83</td>
<td>0.31</td>
<td>0.83</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>CRV2</td>
<td>0.73</td>
<td>0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CRV3</td>
<td>0.81</td>
<td>0.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System satisfaction (SS)</td>
<td>SS1</td>
<td>0.82</td>
<td>0.33</td>
<td>0.79</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>SS2</td>
<td>0.65</td>
<td>0.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SS3</td>
<td>0.76</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company satisfaction (CS)</td>
<td>CS1</td>
<td>0.90</td>
<td>0.19</td>
<td>0.92</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>CS2</td>
<td>0.90</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CS3</td>
<td>0.91</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer loyalty (CL)</td>
<td>CL1</td>
<td>0.88</td>
<td>0.18</td>
<td>0.87</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>CL2</td>
<td>0.81</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: The values in the diagonal are the square roots of AVE. Notes: p < 0.1; ** p < 0.05.*

### Table 3
Discriminant validity for the model.

<table>
<thead>
<tr>
<th></th>
<th>CP</th>
<th>EV</th>
<th>ECV</th>
<th>RV</th>
<th>SS</th>
<th>CS</th>
<th>CL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EV</td>
<td>0.61</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECV</td>
<td>0.56</td>
<td>0.55</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RV</td>
<td>0.48</td>
<td>0.47</td>
<td>0.61</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>0.43</td>
<td>0.49</td>
<td>0.44</td>
<td>0.38</td>
<td>0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>0.37</td>
<td>0.44</td>
<td>0.38</td>
<td>0.39</td>
<td>0.52</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>CL</td>
<td>0.36</td>
<td>0.41</td>
<td>0.36</td>
<td>0.39</td>
<td>0.74</td>
<td>0.46</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Note: The values in the diagonal are the square roots of AVE. Notes: *p < 0.1; ** p < 0.05; Numbers in parenthesis are t-values.

Fig. 2. The estimated model.
activities can provide more co-created value through customer participation. Our results show that enjoyment value appears to have the biggest effect on system satisfaction among the three co-created values, echoing the findings of previous works on the significant role that enjoyable activities play in encouraging customer participation, and thus producing customer satisfaction. For example, Phillips and Baumgartner (2002) in their consumption emotions study provide that consumption emotion has a positive impact on satisfaction. Also, in the context of interactive technology and online communities, enjoyment is found being a critical intrinsic benefit that enhance users’ positive attitudes toward technology adoption (Yang & Lai, 2010; Yu, Lu, & Liu, 2010).

Secondly, our results also reveal that the values perceived by customers through customer participation positively affect satisfaction with respect to system as well as company, and thus have an impact on customer loyalty. Our results confirm that customer participation can deliver value to both customers and firms, as shown in previous studies (Auh et al. 2007; Chan et al., 2010; Dong et al., 2008; Yim et al., 2012), and provide empirical evidence for the role of customer participation in value co-creation that is rooted in the service-dominant logic. Through participation in an online check-in system, for example, customers create values in terms of economic, relational and enjoyment benefits, and airlines can gain the benefits of customer satisfaction and loyalty, which are seen as key competitive advantages (Payne et al., 2008; Vargo & Lusch, 2004). Therefore, how to create a positive experience in participation that can positively affect customer satisfaction and other consequential outcomes is especially important in practice. Furthermore, to successfully involve customers in participation in the online self-service context, managers should explore opportunities for creating not only hedonic but also experiential values, and ascertain the contributions of values co-created to customer satisfaction as a result of their participation in the service process (Yim et al., 2012).

Thirdly, although the positive effect of customer satisfaction on customer loyalty, as our results reveal, has been widely accepted in the literature, customer satisfaction in our study is differentiated into two types: satisfaction with respect to the (online check-in) system and with respect to the company (airline). This is important in the online check-in context, since the system is one component related to the consumption process, instead of the core of consumption experience (in this case, the onboard service experience). Therefore, customer satisfaction with respect to the system might directly affect but not represent customer satisfaction with respect to company. From our results, system satisfaction appears to positively affect company satisfaction as customer loyalty, indicating that it has a spillover effect on the values companies pursue. Therefore, designing and providing a self-service system with customer-focused functions, such as the greater provision of economic, relational and enjoyment values, works as an important channel to link customers to the company’s equity through participation in the system itself.

6. Limitations and future research

Customer participation is context-specific, and the current study only focuses on the self-service aspect of the smart service interactivity matrix proposed by Wünderlich et al., (2013), although the success of other types of smart services (e.g., interactive service, machine-to-machine and provider active services) also depend to a significant degree on the level of customer participation. To gain a more comprehensive understanding of the issues raised in this work, additional studies could continue to investigate the effects of customer participation in value co-creation in the broader domain of smart services. Given the important role of customer participation in the value co-creation process, identifying the antecedents of customer participation and their potential moderators could provide further insights into customer participation behaviors, and suggest more effective service strategies that can be used to enhance customer experience. We thus encourage studies that investigate the antecedents of customer participation and identify potential moderators of the relationship between customer participation and their antecedents. Last but not least, the present study explores the customer participation behavior on self-service technologies by merely selecting a specific air passenger segment with having use experience of on-line check-in services. Although the findings of this study enhance our understanding of customer participation in air transport sector specifically, it does not suggest to directly apply the findings to the whole customer base of airlines, in particular those who do not use the on-line check-in services. Given the co-creation values driven from customer participation in on-line check-in services, future studies on how to switch air passengers from traditional check-in channels to use online check-in services are worthy of investigation.

Acknowledgements

The authors gratefully acknowledge financial support from the Ministry of Science & Technology, R.O.C. (MOST 102-2410-H-006-089 and MOST 104-2410-H-006-075).

Appendix

Measures

Customer participation (CP)

CP1: Spending a lot of time sharing information about my needs and opinions with the system during the process.
CP2: Putting a lot of effort into expressing my personal needs to the system during the process.
CP3: Always providing suggestions to the system for improving the service outcome.
CP4: Having a high level of participation in the service process.
CP5: Being very much involved in deciding how the services should be provided.

Enjoyment value (EV)

EV1: I enjoy the service process with my participation very much.
EV2: The service process with my participation is very enjoyable.
EV3: The service process with my participation can be described as fun.
EV4: I take great pleasure in the service process with my participation.

Economic value (ECV)

ECV1: Higher quality services.
ECV2: More customized services.
ECV3: More control over the services quality.

Relational value (RV)

RV1: build a better relationship with the service provider.
RV2: receive relational approval from the service provider
RV3: connect better with the service provider.

System satisfaction (SS)
SS1: I am satisfied with the services provided by the system.
SS2: This system is a good system to do business with.
SS3: The service of this system meets my expectations.

Company satisfaction (CS)
CS1: I am satisfied with the services provided by the airline.
CS2: This airline is a good bank to do business with.
CS3: The services of this airline meet my expectations.

Customer loyalty (CL)
CL1: Overall, I am satisfied with this airline’s service.
CL2: I would recommend this airline to others.

References
Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: algebra and statistics. Journal of Marketing Research, 18(1), 382–388.