

Using registered traveler biometric systems to co-create value in air travel: Development of a conceptual model

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Abstract

The need for heightened air travel security facilitated the deployment of a number of biometric identity management systems (BIMS). Among them, several voluntary register traveller biometric systems (RTBS) have been offered to air travellers to enhance travel security while providing benefits to users. The RTBS facilitate the development of an ecosystem rich in interactions among air travellers, airlines, and security/border control agencies, which results in newly created value for all stakeholders. Grounded in the principles of value co-creation within the service–dominant logic paradigm, this research proposes a conceptual model that explains how value can be co-created by the interactions among air travel stakeholders mediated by biometric technology. The model includes a number of propositions and offers implications for scholars and decision-makers.

Keywords: biometric systems, service-dominant logic, value co-creation, air travel

1 Background

Today's national security/border control agencies rely heavily on biometric identity management systems (BIMS) for their authentication/verification tasks (Morosan, 2011). Many BIMS took the form of registered (or trusted) traveler biometric systems (RTBS) (e.g., Clear, Global Entry, TSA Pre-Check), aiming to optimize the mandatory security checks. Travelers using BIMS have opportunities to interact more deeply with the travel system, thus engaging in value co-creation (Vargo & Lusch, 2012). Value co-creation reflects the S-D logic paradigm, which purports that consumers no longer represent passive receivers of the value propositions offered by organizations, but rather participate actively in the service design, delivery, and evaluation (Durugbo & Pawar, 2014). The body of knowledge addressing co-creation in travel is increasing (e.g., Prebensen, Vittersø, & Dahl (2013); Rihova, Buhalis, Moital, & Gouthro (2014), as the industry appears to be characterized by mechanisms that are appropriate for value co-creation (Grissemann & Stokburger-Sauer, 2012). However, to date, there has been no conceptualization of value co-creation using BIMS. Yet, understanding how consumers interact with the air travel system and co-create value using BIMS could lead to improvements in the design, delivery and consumption of air travel, and thus placing all stakeholders in a better position to appropriate value. Addressing this major conceptual shortcoming, this research proposes a conceptual model that explains how value is co-created by stakeholders using BIMS, specifically RTBS.

2 Theoretical foundations and model development

Generally, value co-creation has been defined as the result of the common activities of stakeholders being in direct interaction, with the scope of developing and appropriating value for some or all stakeholders (Grönroos & Voima, 2012). Adopting the perspectives advanced by Grönroos and Voima (2012) and others, value co-creation in the context of air travel reflects the processes facilitating mutual value creation by travelers, airlines (and other service providers) and security/border control organizations, as stakeholders interacting within the envelope of a travel experience. Accordingly, travelers are viewed as an integral part of the value chain (Gebauer, Fuller, & Pezzeri, 2013) and thus, as co-participants to the development of multilateral information flows resulting from their interactions, which stay of the foundation of value (Grönroos & Ravald, 2011). Of particular interest for this research are the interactions within air travel via RTBS (Fig. 1).

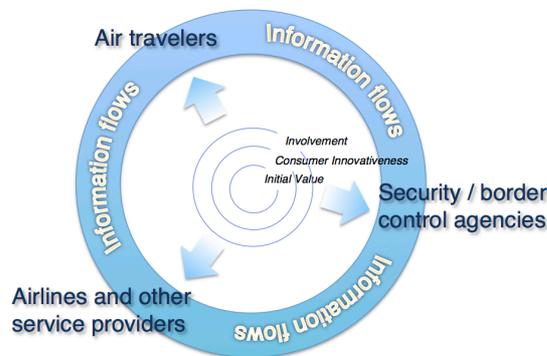


Fig 1. Conceptual model of value co-creation

The process of value co-creation involves three factors: (1) the stakeholders, (2) the involvement sequence originating in the initial value proposition, and (3) the resulting information flows conducive of value (Durugbo & Pawar, 2014). There are three categories of stakeholders: (1) air travelers, (2) supplier firms (e.g., airlines, online travel agencies), and (3) the government/security and border control agencies. As co-creation requires voluntary participation (Füller, Hutter, & Faullant, 2011), the stakeholders most critical to the engagement with all the others in the co-creation of value are the air travelers, as consumers (Durugbo & Pawar, 2014). Generally, air travelers become involved with the initial value propositions offered by suppliers (e.g., airlines and other service providers) (Nambisan & Baron, 2009). Driven by internal characteristics (e.g., novelty seeking, information system use habits) (Venkatesh, Thong, & Xu, 2012), and through involvement with the other stakeholders (Prebensen et al., 2013), they enhance the overall value proposition constitutive of the service experience (Zhang, Marsden, & Chen, 2012). While such interactions resulting in multilateral information flows can exist in all phases of air travel, increasing the value of the overall travel experience by expediting and enhancing the security of the air travel system is fundamental to all stakeholders.

2.1 The initial value proposition

The scholars recognize the role of the existing initial value proposition as a facilitating factor in value co-creation (Durugbo & Pawar, 2014). Viewed as

fundamental to the initial value proposition, the current security procedures could be improved by using RTBS. As registered (low risk) travelers use dedicated lanes leading to their mandatory security procedures, the regular security check, border crossing, the aircraft boarding gates destined for use by travelers could face less congestion and faster traveler flows, thus increasing the value of their air travel experience. By recognizing the potential value resulting from air travelers' participation to RTBS, airlines started to stimulate such participation. Also, the security/border control agencies can appropriate a higher value by taking advantage of the self-separation of consumers into the two risk categories: lower/higher risk (Morosan, 2011) and redeploy their resources more efficiently, by relocating them from the processing of lower to the higher-risk travelers. Thus, the common value denominator for all stakeholders is the increased security of the travel system (Morosan, 2011). In this context, the following proposition was developed:

P1. The initial value proposition of the air travel experience will have an influence on consumers' involvement in RTBS.

2.2 Consumers' innovativeness

Consumer innovativeness has been viewed as the characteristic of individuals that can be used to distinguish segments of consumers based on the manner in which they approach new products, services or technologies (Hoffmann & Broekhuizen, 2010). The early literature examined the "global" innovativeness, while the most recent literature emphasized the "domain specific" innovativeness, as reflecting consumers' preferences toward specific domain-based products or experiences (Morosan, 2010). Most literature in information systems discusses the domain specific innovativeness, conceptualized as personal innovativeness toward IT (Lu, Yao, & Yu, 2005). In many contexts in e- and m-commerce, innovativeness has been viewed as a factor driving consumers toward the use of new technologies (Beldona, Lin, & Yoo, 2012). In the context of RTBS in air travel, consumers characterized by a high level of innovativeness are likely to use such systems (Morosan, 2011), as they generally represent early adopters of novel technologies, products and services (Jackson, Yi, & Park, 2013). In this context, the following proposition was developed:

P2. Consumers' innovativeness toward IT will have an influence on consumers' involvement in RTBS.

2.3 Involvement

Involvement has been viewed to be critical to co-creation processes, as it stays at the foundation of generating the necessary information flows among stakeholders (Prebensen et al., 2013). For example, consumers' involvement with service providers in highly experiential settings (e.g., healthcare) could lead to co-creation of value (Prahalad & Ramaswamy, 2004). While security/border control agencies deployed mandatory BIMS, a principal way to become involved with the travel system and further enhance its security is to participate in voluntary RTBS. Such participation can enhance the value of the travel experience by allowing consumers to receive value beyond the existing value propositions (Durugbo & Pawar, 2014). Importantly, the value resulting from involvement with RTBS offers value to organizational stakeholders. For example, from the rollout of the Global Entry program until 2012, a

total of 50,000 Customs and Border Protection (CBP) officer hours have been saved (U.S. Customs and Border Protection, 2012). Moreover, as RTBS such as Global Entry allow members to exchange benefits with other participating systems/countries (Kosner, 2013), the value appropriated by organizational stakeholders can extend beyond the national setting of the RTBS. Thus, based on the grounds discussed above, the following proposition was developed:

P3. Consumers' involvement in RTBS will enhance the multilateral information flows among stakeholders, increasing the resulting value.

2.4 Information flows

As air travelers use RTBS, the resulting information flows can enhance the security of air travel for several reasons. First, given that most RTBS members are frequent travelers, thus highly valuable consumers for airlines, the airlines are able to eventually predict their travel/consumption patterns. As such, they can enhance the existing value propositions by providing ways for them to interact with the service offerings of the airline. Second, by using the RTBS, travelers can enhance the flow of information going to the security/border control agencies. Such information can assist decision-makers in assessing the vulnerabilities of the travel system, produce accurate estimates of travel patterns, and therefore deploy resources efficiently and effectively to enhance security. Third, organizational stakeholders can exchange information pertaining to the travel system and travelers, and this way together they can collaborate to enhance the security of the travel system. Moreover, within the same horizontal, airlines can collaborate, while security and border control agencies can collaborate with their counterparts by exchanging information that could strengthen the security of air travel at the global scale. In this context, the following proposition was formulated:

P4. The information flows resulting from the interactions among stakeholders mediated by the RTBS enhance the value of all stakeholders.

3 Conclusions and implications

Given its experiential nature, the current air travel ecosystem consists of opportunities for co-creating value for all stakeholders. Critical to this ecosystem are that air travelers, as their involvement can increase the value way beyond the initial value proposition. Moreover, serving as catalysts for the interactions conducive of value, the biometric systems assume roles beyond their traditional security-enhancing roles, by contributing to enhancing the value and improving other aspects of the travel experience. Given the difficulty of conceptualizing value co-creation, this research marks an important step forward by developing a model that takes into account the factors that facilitate consumers' involvement in value co-creation while considering the holistic dimensions of the value co-creation ecosystem in air travel. In sum, this research represents a part of the initial foundation of the study of biometric systems within the context of S-D logic in travel.

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