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Innovative framework for self-service kiosks: Integrating customer value knowledge

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ABSTRACT

This study reveals different types of self-service kiosk customer value and synthesizes the self-service kiosk customer value framework, which includes four value groups and three types of customer value elements. The study also reveals gaps which stem from the inconsistency and fragmented nature of previous research on customer value in self-service kiosks. Based on the review of relevant literature and analysis of the systematically selected articles, the findings provide a basis for future investigations into service science and support manager decision making during the stages of consideration, implementation, and improvement of self-service kiosk networks. This study provides a comprehensive inventory of self-service kiosk customer value and its elements.

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Introduction

Self-service technologies (SSTs), such as ATMs, online banking, mobile scanning, and ticketing machines, have become a separate branch in research, a source of competitive advantage for service providers, and a part of consumers' everyday lives. The global non-internet based SST market is expected to garner \$31.75 billion by 2020 (AMR, 2016) as demand for, and interest in SSTs grows continuously and users become more fluent and comfortable in interactions with consumer technology (Lin & Hsieh, 2011). For decades, service providers have been using various self-service delivery tools, such as interactive voice response systems, internet-based services, interactive kiosks, mobile self-services, and individual health care devices (Meuter, Ostrom, Roundtree, & Bitner, 2000), which create value for both the consumer and the service provider (Scherer, Wunderlich, & Wangenheim, 2015). Consumer receives improved experience, convenience, ease of use, increased customization and reduced waiting time, while service providers benefit from greater control over service delivery, service standardization, smooth demand fluctuation, reduced labor costs and expanded opportunities for deliveries (Considine & Cormican, 2017). Seeking the self-service benefits, businesses adopt various forms of SSTs to their service algorithms.

Self-service kiosks (SSKs) appear as one of the most diverse technological form of SSTs. Various industries have successfully adopted ATMs, parcel lockers, self-checkout stations in grocery stores and libraries, as well as other types of SSKs. At the same time, the amount of research dedicated to SSKs has been growing continually. Despite this trend, no comprehensive framework is currently available to guide practical applications and to orient customer value research on SSKs. Instead, current research classifies the customer perception of services and SST implementation (Ostrom et al., 2002; Wang, Harris, & Patterson, 2013), which does not provide a holistic view of customer value. This notion may be partly explained by the diversity of technologies and service setups which lead to a variety of results and theoretical perspectives. As a result, while technology increasingly influences our everyday life, no consensus exists among scholars regarding customer value in SSKs. Furthermore, widely studied SSTs and various forms of SSKs have brought research to a point where the kiosks are to be accepted as a separate branch in SST research. Studies which treat SSKs as SSTs allow generalization in the sense that measurements of SSK value are applicable to SST customer value. However, given the growing variety of SSK types, we cannot assume every general SST value to be applicable to every type of SSK. For instance, indices of technology anxiety and technology readiness may provide different results if compared between ATM and M-commerce purchasing options. Likewise, queueing time will not be a suitable value measurement when applied to internet-based self-services. Consequently, findings based on one type of SST might not be generalizable to other types of SST. This suggests a need to shift toward

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differentiating between SST and SSK in research to make findings more applicable. Finally, the available research findings have yet to be assessed in a systematic manner from a SSK perspective.

The practical challenges in SSK network implementation and management, and the wide body of relevant research suggest the need for a rigorous review to provide a holistic overview of the available literature. A framework of customer value in SSKs can potentially provide research with the grounds for future deeper investigations and testing. Moreover, because organizations seem to lack knowledge about how SSTs affect consumer behavior (Fernandes & Pedroso, 2016; Kaushik & Rahman, 2015), a model of customer value in SSKs can provide useful knowledge for practitioners from various industries, such as retail, logistics, tourism, E-commerce, and other fields. This knowledge can equip service providers with a new customer service algorithm and provide a source for competitive advantage development (Robertson, McDonald, Leckie, & McQuilken, 2016; Zhu, Nakata, Sivakumar, & Grewal, 2013).

This study aims to identify customer value in SSKs and synthesize these findings into a framework that serves as a ground for future customer value SSK studies and customer value management in SSK networks. The self-service kiosk customer value framework provides support for managers in their decision-making processes. This is valid in industries which are faced with growing numbers of self-service solutions and increasing level of customer expectations. This study contributes to field practices and to research into the investigation and creation of customer value in SSKs, thereby improving customer SSK experience. Moreover, the conclusions address the research challenges which stem from the growing conceptual complexity, the shift toward customer orientation in services, the growing demand for implementation schemes (Ramaseshan, Kingshott, & Stein, 2015), and the growing volume of knowledge.

The article is organized as follows. The next section reviews SST and SSK in particular, as well as briefly reviewing customer value perspective in SST studies. Thereafter, the review of the relevant customer value literature is provided, which forms the conceptual base for the new framework. The following section describes the methodology for systematic data collection and analysis. The content analysis suggested the synthesis of the available research findings into a framework of customer value in SSKs. The final section provides conclusions, managerial applications, limitations of the study, and future research suggestions.

Customer value

Customer value elements

Research suggests various customer value elements based on different stages of customer value creation. In support of the emerging analysis dimension, the element-based perspective of customer value appears beneficial for understanding consumer responses during the different stages of consumption (Gardial, Clemons, Woodruff, Schumann, & Burns, 1994). Moreover, the approach allows the conceptualization of common consumption events and of the consumer's mixed feelings, because the consumer can be simultaneously satisfied and dissatisfied with different features of a single product (Mittal, Ross, & Baldasare, 1998). In line with the discussed element dimension, the framework recognizes customer value as "a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the consumer's goals and purposes in use situations" (Woodruff, 1997, p. 142). The framework thus incorporates the suggested customer value elements: attributes, attribute performances, and consequences. Attributes

represent the direct qualities of the product, attribute performances represent the indirect qualities of the product which are created by its attributes (Mittal et al., 1998), and consequences are the consumer outcomes created by the attributes and their performances. Furthermore, the framework accepts the facilitators (i.e., value creators) and blockers (i.e., value destructors) of customer goal achievement, as the definition suggests.

Types of customer value

Content analysis of the selected articles suggests customer value elements of differing natures. The elements identified point at different dimensions of the customer value creation. The perceived service experience and actual service practices thereby provide elements which seem to create different types of customer value. In addition, certain elements stand out controversially against the nature of value creation, which implies the existence of value-destructive practices within the SSK customer value creation process. To provide a cohesive view, the elements are classified into four value groups: functional/instrumental value, experiential/hedonic value, symbolic/expressive value, and cost/sacrifice value (Smith & Colgate, 2007). These four value groups are defined and elaborated further in this report. This classification is in line with many similar approaches in customer value investigations. For example, Sheth, Newman, and Gross (1991) suggest a framework with functional, social, emotional, epistemic, and conditional values, which follows the logic of the theory of consumption values. Another example is Woodall (2003), who identifies human/personal value, utilitarian value, intrinsic value, use and exchange value, and benefits and sacrifices as analogies to value creators and value destructors, where benefits are separated into attributes and outcomes. Woodall's view of a customer value framework incorporates value elements similar to those accepted for the framework in this study. The accepted classification is built upon the customer value framework suggested by Smith and Colgate (2007). Through such classification, the 76 analyzed articles provide insight into customer value groups and elements which are presented in the form of an SSK customer value framework.

The functional/instrumental value group is characterized by the capacity of the service or the goods for functional, utilitarian, or physical performance (Sheth et al., 1991). This group includes four value types: functional value, use value, utilitarian value, and material value (Smith & Colgate, 2007). In economics, *functional value* represents the core driver of customer behavior, which is consistent with utility theory (Stigler, 1950). More recent studies attach functional value to the functional attributes of a product or service, such as price, durability, or service support (Ferber, 1973; Sheth et al., 1991; Smith & Colgate, 2007). *Use value* is the beneficial outcome of the customer-product interaction (Woodall, 2003). *Utilitarian value* represents a combination of symbolic value and use value, in addition to sacrifice (Woodall, 2003). Consequently, utilitarian value is more customer- and situation-dependent. *Material value* is tied to possession and individual use (Richins, 1994).

The experiential/hedonic value group includes value types associated with the customer's experiences, feelings, and emotions (Smith & Colgate, 2007). Dichter (1947) argues that psychological experience and unconscious motives should be considered as triggers of consumer behavior. Furthermore, research suggests that emotional response is to be seen as a source of value (Zajonc, 1968) and as a marketing tool (Kotler, 1973). This value group includes various value types. *Sensory value* is created by the product's impact on customer sensations (e.g., esthetics, ambience, or aromas) (Smith & Colgate, 2007). *Emotional value* is created by products which arouse customer feeling or affective states, such as happiness, fear, or comfort (Sheth et al., 1991). *Social/relational value* is created by association with specific social groups based

on demographic, socioeconomic, cultural, and other dimensions (Sheth et al., 1991). Value is thus created as one experiences a sense of belonging to a given desired group (Veblen, 2009). *Epistemic value* is the customer's perceived utility created by a product's capacity to arouse curiosity and creativity, provide novelty, and/or satisfy a desire for knowledge (Berlyne, 1970; Hansen, 1972; Hirschman, 1980).

The *symbolic/expressive value group* includes value types which are created by associating the product with certain desired attributes on individual and group levels (Smith & Colgate, 2007; Veblen, 2009). The value types are created by means of *self-identity/worth*, such as the luxurious or exclusive qualities of a product which appeals to a consumer's self-identity or self-worth and make the consumer feel good about himself; *personal meaning*, which consumers develop based on personal association with the product or its attributes; *self-expression*, because the product can support the consumer in expressing personal tastes and personality; and *social meaning*, which creates value by enabling consumers to make a social statement with the help of the product (Smith & Colgate, 2007). Furthermore, this value group includes *conditional value*, which is defined as the utility created under a specific set of circumstances (Sheth et al., 1991) and which in turn affects customer choices (Howard & Sheth, 1969).

The *cost/sacrifice value group* is related to transaction costs (Smith & Colgate, 2007) and tends to be minimized by consumers and organizations (Woodall, 2003). Whereas the functional/instrumental, experiential/hedonic, and symbolic/expressive value groups are associated with value creation, the cost/sacrifice value elements are typically associated with value destruction (Echeverri & Skalen, 2011). *Economic cost* is a consumer's net financial loss associated with the product (Horton, 1976). *Psychological cost* is ego- and social-related individual loss associated with the product (Horton, 1976). *Personal investment* includes time, energy, and effort which the consumer provides in exchange for the goods or service (Smith & Colgate, 2007). *Risk* is defined as the subjective expectation of loss, which may appear in various forms, such as financial or performance risk (Sweeney, Soutar, & Johnson, 1999).

Customer value in self-service technologies

The appearance of new technologies on the market leads to the appearance of new “elements” in service business and in service science, such as SST which becomes a new tool for value creation (Hsieh, 2005). SSTs are recognized as a source of value for both the consumer and the service provider (Scherer et al., 2015; Schröder, 2007). The appearance of SSTs shapes relationships between organizations and consumers, as well as potentially leading to a new set of perceived consumer values. Meuter et al. (2000) define SST as “technological interfaces that enable customers to produce a service independent of direct service employee involvement.” As a result, the customer is assigned the role of value creator by conducting most of the service himself (Hsieh, Yen, & Chin, 2004; Mills, Chase, & Margulies, 1984; Vargo & Lusch, 2004). Customer involvement in service coproduction by SST reduces costs, increases customer satisfaction and loyalty, and accesses new customer segments (Bitner, Ostrom, & Meuter, 2002). The research suggests that SST implementation does not come without challenges, many of which are linked to customer perspective (Dabholkar & Bagozzi, 2002; Zhu et al., 2013). Multiple studies have attempted to identify SST customer value (Bateson, 1985; Liu, 2012; Robertson et al., 2016), while no consensus has been reached so far due to the variety of approaches and technological forms of self-service tools.

SSTs appear in various forms. One of the commonly accepted SST classifications suggests to categorize SSTs by the type of

interface – telephone/interactive voice response (e.g., information telephone lines), online/internet (e.g., internet information search and distance learning) or interactive kiosks (e.g., ATM and hotel check-out) (Meuter et al., 2000). With customer value perspectives and recent technological advances, this classification can be accepted but requires further separation into branches based on the type of interface and functions that the technology serves to the consumer. Thus, rapid growth of E-commerce (Gomez-Herrera, Martens, & Turlea, 2014) has led to advancements in use of various technologies for self-service. Internet-based self-services are no longer limited to personal computers, as customers are now equipped with electronic pads and smartphones, which tend to provide different types of customer value while both appearing as SST. Furthermore, recent studies have demonstrated a tendency toward conceptualization of kiosks as SSK instead of the traditional interactive kiosks (Günay & Erbuğ, 2014; Kim & Qu, 2014). A collective definition, based on approaches of Meuter et al. (2000) and Rowley and Slack (2007), describes SSK as a SST station which is intended for public use, is interactive, and can process information. As a result, SSKs cover a wide range of SSTs and supposedly carry a distinctive set of customer value and its elements.

It is apparent that different types of SSTs lead to different customer-technology relationships and service outcomes. It is then fair to conclude that different types of SSTs generate different types/level of customer value. Recent studies examine customer value at an individual technology level, while SSKs are understudied as an entity. Moreover, SSK customer value studies adopt conceptual perspectives which treat SSK as SST. This approach implies a high degree of generalization and delay in conceptual separation of SSK customer value from the SST notion. This article treats SST as an umbrella for various technological service tools, one of which is SSK.

Search methodology

The authors have conducted a systematic literature search following a methodology suggested by Tranfield, Denyer, and Smart (2003) in order to identify articles containing knowledge regarding customer value in SSKs. The systematic approach was chosen to increase the study's objectivity and replicability (Denyer & Tranfield, 2009).

The initial article search was conducted in March 2018 in the following databases: Science Direct, Web of Science, Scopus and EBSCOhost. Key word search comprised (consumer* OR customer* OR user*) AND (value*) AND (self-service* OR SST OR kiosk*), resulting in 906 articles that were published in peer-reviewed journals, with English as the main language. Further exclusion of duplicates and scan of titles and abstracts for relevance led to the acceptance of 151 articles for content scan. Applying inclusion (original research; identification of customer value and/or its elements) and exclusion (using unspecified or unclear specified type of SST; studying SSK in a mix with other non-SSK technologies or services) criteria yielded 56 articles to be included for the analysis of SSK customer value and its elements. Finally, the bibliography search among 52 selected articles provided 35 additional manuscripts that met the inclusion criteria, thus resulting in a total of 87 articles (see Appendix). These studies were carefully studied by the authors and served as a base for developing the knowledge regarding the SSK customer value and its elements that became the core of the SSK customer value framework.

Self-service kiosk customer value framework

The review of the relevant literature and analysis of the systematically selected articles led to synthesis of the self-service

kiosk customer value framework. The identified value attributes, attribute performances, and consequences are classified into four customer value groups. According to the adopted perspective, attribute performances originate from the value attributes, whereas consequences appear as the combination of customer-centered outcomes of value attributes and their performances. Further analysis of the systematically selected articles allowed completion of the framework with the SSK customer value elements. Any of the identified elements may have high or low weight, which means that any of the elements may trigger value creation and/or value destruction, regardless of the value group. We now provide the framework of customer value in SSKs.

Functional/instrumental value

The value group includes multiple value attributes (see Table 1), such as SSK height, function variety (variety of functions, options, or products provided), number of SSKs, location, facilitating conditions of the kiosk (i.e., atmosphere, the cleanliness of the surrounding area and of the kiosk itself), service availability (i.e., time access, distance to SSK, proximity to customer's rout), SSK accessibility, servicescape (i.e., the physical surroundings of the service point), employee presence (i.e., support or help provided by the service representative and employee availability), physical service speed (i.e., processing time), customization level (i.e., degree of customization or personalization), and kiosk responsiveness, leading to attribute performances: total service time, time efficiency, problem resolution (i.e., procedures for resolving issues during the service), and service efficiency. In combination, these attributes and performances lead to customer outcomes such as the actual use of the SSK and customer retention (i.e., the customer returns for future use).

Experiential/hedonic value

In this value group, sensory value is represented by SSK design (i.e., visual hardware or software design such as colors or voice tone) (see Table 1). Emotional value is represented by attributes such as enjoyment (i.e., SSK enjoyment or attractiveness), fun, and delight. Social/relational value includes attributes such as fairness, human interaction desire during service and human interaction avoidance, service reliability, interactivity, and privacy. Epistemic value includes the clarity with which the service is conducted, novelty seeking (i.e., seeking innovation or variety), expectation, familiarity, and optimism. The identified attributes lead to attribute performances such as enjoyment (i.e., service enjoyment or attractiveness), technology readiness, and attitude, which combines SSK attitude, use attitude, service provider (or retailer) attitude, and employee attitude. Trust and satisfaction are the consequences within this value group.

Symbolic/expressive value

In this value group self-identity/worth is represented by demographic attributes, such as gender and education or age, and by customer attributes such as tolerance of waiting and customer innovativeness (see Table 1). Personal meaning includes SSK experience (i.e., previous use or training), use frequency, and habit (also referred as integrated motivation, behavioral norm or subjective norm) attributes. Self-expression is characterized by self-efficacy (i.e., competence or confidence) and the innovativeness of the service or technology. Social meaning includes safety (i.e., use security), social acceptance (i.e., image, social influence, opinion of others), and independence (i.e., of employee or authority). Conditional meaning is characterized by awareness (i.e., level of information perceived), situational factors such as product-related

factors (such as the sum of assets or the number and type of items), companions, crowdedness and service need, information provided to the consumer, forced use, perceived service environment, and time pressure. The performance of these attributes takes the form of perceived control, customer-role ability, service fit (i.e., compatibility), perceived ease of use (PEOU), perceived usefulness (PU), service quality (i.e., service level), retail service quality, and convenience. The consequences are customer loyalty (i.e., retail patronage), recommendation intention, use intention, reuse intention and positive or negative word-of-mouth intention.

Cost/sacrifice value

In this value group, studies with economic costs do not demonstrate a variety of attributes (see Table 1), including only service cost. Psychological costs include attributes such as discomfort, complexity, insecurity, perceived queueing time, and perceived service time. Personal investment includes attributes such as effort (i.e., work), physical service time, and customer involvement (i.e., participation). The risk subgroup includes attributes such as personal risk, social risk, financial risk, and performance risk, which is represented by service failure. The attribute performances are customer participation implementation gap, information gap, capability gap, satisfaction gap, design gap, perception gap, stress related to customer role, and technology anxiety in the form of uncertainty and resistance to innovation. The attributes and performances create change intention (i.e. switching the service provider and/or switching to another service option), non-use intention and regret.

Element interaction

The content analysis shows that interaction between the elements goes beyond a vertical interaction. The classification of the elements into four value groups does not signify that the consequences from any given value group are created exclusively by attributes and performances from the same value group. For example, forced use (symbolic/expressive attribute) and technology anxiety (cost/sacrifice performance) can affect trust (experiential/hedonic consequence) (Liu, 2012). Likewise, human interaction (experiential/hedonic attribute) affects use intention (symbolic/expressive consequence) (Oh, Jeong, & Baloglu, 2013). Furthermore, the studies suggest that elements at the same level influence each other between groups and within the same group. For example, satisfaction (experiential/hedonic consequence) influences customer loyalty (symbolic/expressive consequence) (Orel & Kara, 2014) or perceived ease of use (symbolic/expressive attribute performance) affects perceived usefulness (symbolic/expressive attribute performance) (Kim & Qu, 2014). Some elements can create values which belong to different groups in the classification provided. For instance, enjoyment appears as an emotional value attribute and as performance, because it assumes different roles in the studies analyzed. Furthermore, design (an experiential/hedonic value attribute) creates multiple types of functional value for consumers.

The studies identified provide a complex network of relationships between value elements. As stated above, the attributes from one group can lead to attribute performances and consequences from other value groups. Some studies suggest a correlation between elements within the same value element level. For example, cost/sacrifice attributes are generally associated with value destruction (Echeverri & Skalen, 2011) and are to be minimized according to the original framework (Smith & Colgate, 2007). However, some of the attributes, such as monetary costs, can create value for consumers through association with status. Thus, elements of the cost/sacrifice value group can lead simultaneously to

positive- and negative-value outputs. Additionally, consequences are formed by attributes and performances from different value groups. Change intention, for instance, can be triggered by performances and attributes from the cost/sacrifice group and by epistemic attributes such as novelty seeking, supporting conclusions from earlier research (Hansen, 1972).

Conclusions

The framework contributes to research in a number of ways. First of all, it suggests a new perspective on SSK customer value which includes attributes, attribute performance, and consequences as customer value elements. In addition, a new set of customer value dimensions is adopted herein to comprehend knowledge from existing research, which reveals different types of customer value. The framework includes four core customer value groups: functional/instrumental value, experiential/hedonic value, symbolic/expressive value, and cost/sacrifice value. More importantly, this study provides a cohesive overview of measures and elements of customer value in SSKs extracted from a broad body of available knowledge. Thus, the self-service kiosk customer value framework provides a sound basis for future in-depth analysis of customer value in SSKs as a concept, and for dedicated investigations into existing and innovative types of kiosks. The literature review and analysis of systematically extracted studies are conducted to contribute to research into customer value and service studies, as well as to equip service providers with an evaluation and measurement tool which provides them with a basis for improving the customer self-service experience. While synthesizing a cohesive view of SSK customer value, this study raises new questions which should be addressed in further studies. We hope that this article provides inspiration for deeper and broader SSK investigations, and that it stimulates future studies to treat SSKs as a separate conceptual entity.

Theoretical and managerial implications

Customer value should be seen as a source of value for service organizations (Ahn & Rho, 2014). Three main managerial implications are identified from the research findings:

First, the value elements identified and their arrangement within the framework serve to measure customer value for organizations. Managers now have a tool for developing a measurement system and evaluating customer value creation processes; this tool should be used for market research and further decision making. With the help of the framework provided, SSK network performance should be measured and evaluated at both pre-implementation and post-implementation stages. The measurement and evaluation results are a source of improvement for SSK network performance, because they highlight the weak links in customer value creation processes.

Second, the framework enables managers to enhance service specifications and optimize customer relations. In other words, it allows managers to clearly define the market niche for the SSK network and to identify the network's strengths in order to further develop and promote those among customers. This means that applying the framework for performance analysis can help organizations gain customer trust and the loyalty of existing customers, in addition to attracting new customers. As a result, the framework functions as a tool for developing competitive advantage for organizations and for customer relationship management. However, some of the service attributes, such as situational factors, leave a margin for uncertainty in customer value analysis.

Third, the framework enables managers to identify new value creation opportunities. Managers are therefore provided with a tool to identify new sources of competitive advantage and can incorporate these findings into the organization's market strategy and customer relationship strategies. Organizations with SSK networks are now capable of clearly defining their/a value creation strategy and incorporating a clear vision of the process of customer value creation in their business models. All in all, a bridge to new value creation opportunities provides prospects for organizations to optimize their SSK network performance and, ultimately, to increase their profit margins.

Ultimately, this study is aimed at contribution to the theoretical base of SST research domain in the area of SSK customer value, by offering an integrated framework, underpinned by an extensive previous literature review, in which a holistic view of value attributes, performance, and potential consequences are provided with respect to four identified value groups. The developed integrated framework is aimed at unification of existing theoretical lenses which until now were discrete, hence contains potential theoretical promises for further pertinent researches.

Limitations

This study identifies and attempts to address the research limitations, while accepting potential flaws as opportunities for further investigation. First, the accepted customer view may include limitation, because various groups of consumers can treat SSTs differently, thus perceiving SST value differently (Yen, 2005). For instance, the attitude toward SST may differ between various consumer groups (Dean, 2008), whereas this study accepts consumers as one group in order to provide a holistic view. The second limitation is related to the framework's applicability to various technologies. In other words, the identified value types and their elements may be assumed to not necessarily apply to all types of SSKs, which means that the framework requires testing for each type of SSK. In addition, some conclusions within the studies reviewed depend on particular conditions being satisfied, such as mass use of a particular SST and freedom of failure. The third limitation is value related and suggests that many of the studies identified perceive value only as value created, without taking into account the value destruction process. Moreover, many studies do not refer to extracted variables as value types or value attributes and adopt different definitions of value. Finally, the existing literature may contain an incomplete picture of the customer value elements in SSKs. Additionally, potential methodology design flaws could have caused a failure in identification of relevant articles due to a wide variety of technological forms of SSK in research. This limitation is addressed through thorough bibliography search at the last selection stage. In such scenarios, the framework can be missing some value attributes, attribute performances, or consequences. This case calls for additional investigations to complete the framework and potentially gain an opportunity to improve the customer SSK experience.

Future research

This study provides an inventory of research on customer value in SSKs and identifies gaps in current research, and directions for future investigations. The potential findings can support developing industries and newly introduced or understudied technologies and can provide grounds for improving the customer self-service experience. From the theoretical perspective, filling the highlighted gaps will allow a multidimensional perspective on customer value creation to be developed in this newly forming research field.

The content analysis provides findings and raises questions regarding SSK customer value itself and its elements. The analysis reveals the degree to which customer value groups are studied. While functional/instrumental value elements are fairly represented in research, experiential/hedonic and symbolic/expressive value groups are studied extensively. The elements from the cost/sacrifice value group are the least studied of the four framework groups, which means that future investigations should address the gap in the SSK customer value destruction context associated with the cost/sacrifice value group. Studies of this and other value groups may provide additional customer value elements which are potentially missing from existing research. Furthermore, the analysis shows that the research lacks investigations at the higher value levels; namely, value type, value group, and customer value itself. This means that future research should focus on higher hierarchical levels in the SSK customer value framework to develop a deeper understanding of value, value groups, and their interrelations. Finally, the framework serves as a base for developing SSK customer value models intended for actual measurement and testing of customer value in SSKs.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.jik.2019.06.001](https://doi.org/10.1016/j.jik.2019.06.001).

References

- AMR. (2016). *Self service technologies market by type – Global opportunity analysis and industry forecast, 2014–2020*. Allied Market Research Report.
- Ahn, J., & Rho, T. (2014). Influence of customer–firm relationships on customer participation in the service industry. *Service Business*, 10(1), 113–133.
- Bateson, J. E. (1985). Self-service consumer: An exploratory study. *Journal of Retailing*, 61(3), 49–76.
- Berlyne, D. E. (1970). Novelty, complexity, and hedonic value. *Perception and Psychophysics*, 8(5), 279–286.
- Bitner, M. J., Ostrom, A. L., & Meuter, M. L. (2002). Implementing successful self-service technologies. *Academy of Management Executive*, 16(4), 96–108.
- Considine, E., & Cormican, K. (2017). The rise of the prosumer: An analysis of self-service technology adoption in a corporate context. *International Journal of Information Systems and Project Management*, 5(2), 25–39.
- Dabholkar, P. A., & Bagozzi, R. P. (2002). An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, 30(3), 184–201.
- Dean, D. H. (2008). Shopper age and the use of self-service technologies. *Managing Service Quality*, 18(3), 225–238.
- Denyer, D., & Tranfield, D. (2009). Producing a systematic review. In D. A. Buchanan, & A. Bryman (Eds.), *The SAGE Handbook of Organizational Research Methods* (pp. 671–689). London: SAGE Publications Ltd.
- Dichter, E. (1947). Psychology in market research. *Harvard Business Review*, 25(4), 432–443.
- Echeverri, P., & Skalen, P. (2011). Co-creation and co-destruction: A practice-theory based study of interactive value formation. *Marketing Theory*, 11(3), 351–373.
- Ferber, R. (1973). Consumer economics, a survey. *Journal of Economic Literature*, 11(4), 1303–1342.
- Fernandes, T., & Pedrosa, R. (2016). The effect of self-checkout quality on customer satisfaction and repatronage in a retail context. *Service Business*, 1(1), 69–92.
- Gardial, S. F., Clemons, D. S., Woodruff, R. B., Schumann, D. W., & Burns, M. J. (1994). Comparing consumers' recall of prepurchase and postpurchase product evaluation experiences. *Journal of Consumer Research*, 20(4), 548–560.
- Gomez-Herrera, E., Martens, B., & Turllea, G. (2014). The drivers and impediments for cross-border e-commerce in the EU. *Information Economics and Policy*, 28(1), 83–96.
- Günay, A., & Erbuğ, Ç. (2014). Eliciting positive user experiences with self-service kiosks: Pursuing possibilities. *Behaviour & Information Technology*, 34(1), 81–93.
- Hansen, F. (1972). *Consumer choice behavior: A cognitive theory*. New York: The Free Press.
- Hirschman, E. C. (1980). Innovativeness, novelty seeking, and consumer creativity. *Journal of Consumer Research*, 7(3), 283–295.
- Horton, R. L. (1976). The structure of perceived risk: Some further progress. *Journal of the Academy of Marketing Science*, 4(4), 694–706.
- Howard, J. A., & Sheth, J. N. (1969). *The theory of buyer behavior*. New York: John Wiley and Sons.
- Hsieh, A. T., Yen, C. H., & Chin, K. C. (2004). Participative customers as partial employees and service provider workload. *International Journal of Service Industry Management*, 15(2), 187–199.
- Hsieh, C. T. (2005). Implementing self-service technology to gain competitive advantages. *Communications of the IIMA*, 5(1), 77–83.
- Kaushik, A. K., & Rahman, Z. (2015). Self-service innovativeness scale: Introduction, development, and validation of scale. *Service Business*, 10(4), 799–822.
- Kim, M., & Qu, H. L. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. *International Journal of Contemporary Hospital Management*, 26(2), 225–245.
- Kotler, P. (1973). Atmospherics as a marketing tool. *Journal of Retailing*, 49(4), 48–64.
- Lin, J. S. C., & Hsieh, P. L. (2011). Assessing the self-service technology encounters: Development and validation of SSTQUAL scale. *Journal of Retailing*, 87(2), 194–206.
- Liu, S. (2012). The impact of forced use on customer adoption of self-service technologies. *Computers in Human Behaviour*, 28(4), 1194–1201.
- Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 64(3), 50–64.
- Mills, P. K., Chase, R. B., & Margulies, N. (1984). Motivating the client/employee system as a service production strategy. *Journal of Library Administration*, 5(1), 97–112.
- Mittal, V., Ross, W. T., & Baldasare, P. M. (1998, January). The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions. *Journal of Marketing*, 62, 33–47.
- Oh, H., Jeong, M., & Baloglu, S. (2013). Tourists' adoption of self-service technologies at resort hotels. *Journal of Business Research*, 66(6), 692–699.
- Orel, F. D., & Kara, A. (2014). Supermarket self-checkout service quality, customer satisfaction, and loyalty: Empirical evidence from an emerging market. *Journal of Retailing and Consumer Services*, 21(2), 118–129.
- Ostrom, A. L., Bitner, M. J., & Meuter, M. L. (2002). Self-Service Technologies. In R. T. Rust, & K. T. Kannan (Eds.), *e-Service: New Directions in Theory and Practice* (p. p). NY: Sharpe.
- Ramaseshan, B., Kingshott, R. P., & Stein, A. (2015). Firm self-service technology readiness. *Journal of Service Management*, 26(5), 751–776.
- Richins, M. L. (1994). Special possessions and the expression of material values. *Journal of Consumer Research*, 21(3), 522–533.
- Robertson, N., McDonald, H., Leckie, C., & McQuilken, L. (2016). Examining customer evaluations across different self-service technologies. *Journal of Services Marketing*, 30(1), 88–102.
- Rowley, J., & Slack, F. (2007). Information kiosks: A taxonomy. *Journal of Documentation*, 63(6), 879–897.
- Scherer, A., Wunderlich, N. V., & Wangenheim, F. (2015). The value of self-service: Long-term effects of technology-based self-service usage on customer retention. *Management Information Systems Quarterly*, 39(1), 177–200.
- Schröder, T. F. (2007). Profitability of SST options: Efficiency gains through the implementation of self-service technologies Doctoral dissertation. University of St. Gallen.
- Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of Business Research*, 22(2), 159–170.
- Smith, J., & Colgate, M. (2007). Customer value creation: A practical framework. *Journal of Marketing Theory and Practice*, 15(1), 7–23.
- Stigler, G. J. (1950). The development of utility theory. II. *Journal of Political Economy*, 58(5), 373–396.
- Sweeney, J. C., Soutar, G. N., & Johnson, L. W. (1999). The role of perceived risk in the quality-value relationship: A study in a retail environment. *Journal of Retailing*, 75(1), 77–105.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3), 207–222.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17.
- Veblen, T. (2009). *The theory of the leisure class, 1899*. NY: Oxford University Press.
- Wang, C., Harris, J., & Patterson, P. (2013). The roles of habit self-efficacy, and satisfaction in driving continued use of self-service technologies: A longitudinal study. *Journal of Service Research*, 16(3), 400–414.

- Woodall, T. (2003). Conceptualising 'value for the customer': An attributional, structural and dispositional analysis. *Academy of Marketing Science Review*, 2003(1), 1–42.
- Woodruff, R. B. (1997). Customer Value: The Next Source for Competitive Advantage. *Journal of the Academy of Marketing Science*, 25(2), 139–153.
- Yen, H. B. (2005). An attribute-based model of quality satisfaction for Internet self-service technology. *Service Industries Journal*, 25(5), 641–659.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, 9(2), 1–27.
- Zhu, Z., Nakata, C., Sivakumar, K., & Grewal, D. (2013). Fix it or leave it? customer recovery from self-service technology failures. *Journal of Retailing*, 89(1), 15–29.