Impact of Customer Perception of Value Co-Creation for Personalization in Online Shopping

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ABSTRACT

Electronic commerce firms adopt advanced technologies to provide personalization of marketing-mix with data for personalization co-created by consumers. This study explores customer's perception of value co-creation and how it impacts intention to co-create value. Customer perception of value co-creation for personalization in an e-commerce context was operationalized as second order construct comprising of fulfilment, service recovery, price perception, algorithmic fairness, personalization benefits, security, and privacy. Survey results of 638 respondents analyzed using AMOS showed that process quality and relationship quality mediate the relationship between customer's perception of value co-creation and intention to co-create value with relationship quality showing stronger effect. Thus, this study contributes to marketing value co-creation literature and provides implications for practicing managers.

KEYWORDS

Algorithmic Fairness, Co-Creation, E-Commerce, Perception, Personalization, Price Perception, Process Quality, Relationship Quality

INTRODUCTION

Digital revolution and technology-based platforms drive sharing economy. In a sharing economy, customers are co-creators of value in addition to value created by firms. The impressive growth of sharing economy has attracted many researchers in this domain. Research on value co-creation in sharing economy firms like Airbnb, Uber, or Zipcar has been widely studied. Extant literature on value co-creation specifically in e-commerce firms is narrow and warrants more research to understand changing customer perceptions (MSI, 2020; Agrawal & Rahman, 2015). Online shopping is growing continuously and comprises users from different socio-economic levels, demographics, and varied technical expertise. E-commerce firms implement advanced technologies for improved sales and higher profits. But, the implementation of personalization strategies for marketing-mix like personalized offers and recommendations are a concern for marketing managers. They pose difficulty in monitoring accountability and ethicality of implementing algorithms for personalization

of marketing mix. Even though the practice of technology intervention for personalization may be legal, the implementation of algorithms may be difficult to monitor to check whether they fall within the ethical boundary (Seele et al., 2019; Davenport et al., 2020). Ethical concerns include privacy and data breach, security, and fairness perception that are difficult for firms to monitor (Laczniak & Murphy, 2019; Zhang et al., 2018; Zhang et al., 2021). The success of any personalization strategy depends on consumers' acceptance of such practices. Hence, for marketing managers to ensure the success of the implementation of personalization practices, it is essential to understand customer intention to co-create value in the form of consumer online data for personalization. This forms the main focus of this research. It also aims to provide significant insights to marketing managers when implementing personalization strategies. Theoretically, we add to the value co-creation literature by studying customer perception of value co-creation for personalization reflected in terms of algorithmic fairness and personalization benefits of recommendation systems which have not been explored in detail in previous studies (J.A.K & Gotmare, 2021; Nadeem & Al-Imamy, 2020; Seele et al., 2019; Davenport et al., 2018).

LITERATURE REVIEW

Online consumers co-create value by leaving a long digital trail of their transaction, preferential and behavioral data. Firms collect individual consumer data based on what an internet user view, compare, read, purchase on e-commerce websites, and post on social media. Firms process these large volumes of data comprising customer transactions, customer attributes, and preferences, information from social media or data brokers through Artificial Intelligence (AI) to segment and target customers in real-time (Davenport et al., 2020). AI plays a significant role in e-commerce firms in predicting what customers want to buy, at what price, and what price promotion must be offered based on the value (data) co-created by consumers (Shankar, 2018). On every visit to the e-commerce platform, a consumer share data that is crucial for the firm to create value. Firms implement AI techniques, only with the data created by customer's (Davenport et al., 2020).

E-commerce firms provide recommendations comprising suggestions of products and offers, reviews of consumers, and their rating using data. This is made possible by analyzing customer data through algorithms and presenting personalized recommendations of products, pricing offers, and discounts. Algorithmic fairness and recommender systems play a role in creating customer perception and positive affect towards e-commerce firms. When consumers perceive that value co-created by sharing information results in advantage and fair treatment, it creates trust and loyalty towards the e-commerce platforms (Gonzalez-Padron, 2017). A firm's success in adopting personalization practices is highly dependent on customer's perception of such strategies. However, the extant literature on factors influencing customer perception of value co-creation in personalization strategies of marketing mix and intention to co-create is largely fragmented, mixed, inconclusive, and remains controversial. Customer perception on creating value in the e-commerce context requires further examination by building upon existing literature (Paredes et al., 2014). Impact on relationship quality and process quality when e-commerce platforms implement advanced technologies is not widely studied and warrants further research (Barrutia et al., 2016). Hence in this study, we focus on factors that influence customer perception of value co-creation in personalization strategies by e-commerce firms, whether relationship quality and process quality impact on customer intention to co-create value. The study explores the following research questions:

RQ1: What factors influence customer perception of value co-creation for personalization of marketing-mix?
RQ2: Whether process quality mediate the relationship between customer value co-creation perception and intention to co-create value?

RQ3: Whether relationship quality mediate the relationship between customer value co-creation perception and intention to co-create value?

This paper provides a comprehensive view on customer perception of value creation in an e-commerce context considering multiple antecedents and consequences. The rest of the article comprises the following sections: proposed conceptual model, discusses the extant literature grounding followed by hypothesis development, description of data collection approach, metrics and results. Finally, conclusions, implications, limitations, and scope for future research are presented.

CONCEPTUAL MODEL

Following section presents conceptualization of model and description of each components based on extant literature review. The study draws upon Service-Dominant logic (SDL) (Vargo & Lusch, 2008) and Stimulus–Organism–Response (S–O–R) (Belk, 1975) to conceptualize the model. According to SDL, value can be created through integration of resources. Value realized depends on a specific context and integrating resources of firm. According to SDL, actors include consumers and firms as value creators for improving their well-being and situations (Vargo & Lusch, 2008, 2011). Consumers uniquely create value while firms are value facilitators when there is interaction between firms and consumers. Firms and consumers through service-by-service exchange integrate new resources with pre-existing resource. Drawing parallel to e-commerce setting, the study focus on personalized data from consumers which represent value co-creation from consumers and firms technologies as resource integration in the service-by-service exchange (Ramaswamy & Ozcan, 2018).

Thus building the conceptual model on SDL help understand the components that impact consumers' perception of value co-creation in the online shopping context and its impact on consumer behavior. The following gives an overview of algorithms that are the resource integrators in the service-by-service exchange. Algorithms process data to build profiles for individual consumers' personalization. E-commerce firms mine data from varied pieces of customer individual data and connect them to create user profiles. This information is used to predict online behavior (Botta & Wiedemann, 2019).

E-commerce platforms target customers through personalized product recommendations or by presenting personalized dynamic price based on demand in real time (Yeung, 2018). More importantly, through recommendation systems e-commerce platforms can persuade consumers through special discounts for individual customers. This phenomenon of personalized pricing and recommendations are possible through algorithms and data mining (Yeung, 2018). For this customers provide data and customer data is considered as customer resources in this study that contribute to value co-creation for firms in marketing function of segmentation, targeting and pricing strategies.

To understand the behavioral outcomes of value co-creation in e-commerce research setting, we also draw upon Stimulus–Organism–Response (S–O–R) framework by Belk (1975). Where giving a stimulus that online users can contribute to value co-creation that may result in personalized recommendation of products, offers and discount. Here, we consider seven sub-dimensions such as fulfillment, service recovery, price perception, algorithmic fairness, privacy, security and personalization benefits derived from extant literature to understand how consumers perceive value co-creation. Process quality and relationship quality corresponds to organism in the SOR framework. These are the two crucial concepts that determine customer behavioral outcome of customer intention to co-create value which is central and influence customer decision in the relationship with the firm as whether to strengthen, sutain or withdraw from the service setting (Hajli et al., 2017; Skålén et al., 2015). Each of the components derived from the extant literature are explained in the following section.

The study operationalize customer perception of value co-creation in an e-commerce context as a second order construct comprising fulfillment, service recovery, price perception, algorithmic fairness, personalization benefits, security and privacy. Next, we study the mediating role of process

quality (second order construct comprising of efficiency, design and information) and relationship quality (second order construct comprising of commitment, trust and satisfaction) between the antecedents of customer perception of value co-creation and consumer intention to co-create value. Figure 1 depicts the conceptual model.

HYPOTHESIS DEVELOPMENT

Customer Perception of Value Co-Creation

Customer perception of value co-creation in e-commerce setting is operationalized as a second order construct. This study adapts customer perception of value co-creation measures reflected in terms of fulfillment, service recovery, price perception, privacy and security from extant literature (Roman, 2007; Kuo & Wu, 2012; Xia et al., 2004; Agag et al., 2016; Cheng et al., 2014) and advances existing knowledge by including algorithmic fairness (Wang et al., 2020) and personalization benefits of recommendation system (Lee & Rha, 2016) by drawing from SDL where customer perception of firms resource integrators (algorithms and recommendation system) are vital in influencing consumer intention to co-create value.

Fulfillment

Fulfillment is an important aspect on customer perception on value co-creation. Firms use advanced AI capabilities (data, algorithms, resources) in forecasting, order picking, order packaging, address existing issues, automate storing, augment fulfillment process, reduced man power in order fulfillment and transform delivery (Zhang et al., 2021; Roman, 2007). Fulfillment corresponds to processing of consumer orders placed promptly and effectively, for with an effective and problem free experience (Parasuraman et al., 2005). Consumers develop perception of value co-creation in ecommerce platform through the fulfillment obligation by the e-commerce firm.

Figure 1. Conceptual model
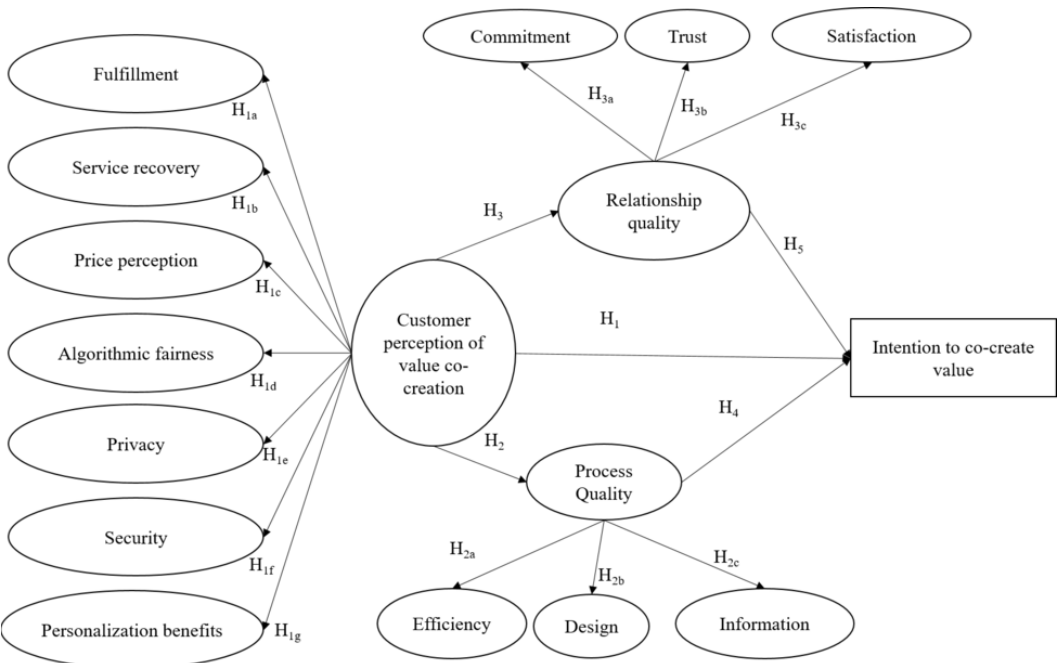
Service Recovery

Service recovery is consumers perceptions of e-commerce firm's efforts that to rectify the problems or loss of a consumer (Kuo & Wu, 2012). During service failure, the willingness of the e-commerce firm to deal proactively on the issue and prevent loss to the consumer influence consumer perception (Ramaswamy & Ozcan, 2018). This study focus service recovery during interaction of consumer with the platform.

Price Perception

Differential pricing strategies such as personalized pricing are implemented by online retailers (Botta & Wiedemann, 2019). Large volume of individual consumer data are collected and analyzed with algorithms and data mining for personalized offers (Yeung, 2018). Even though pricing at an individual level has technology implementation challenges, different forms of personalized price differentiations such as steering, decoys, drip pricing, re-offers and fake special offers can be offered to consumers (Mishra, 2020). These forms of differential pricing can affect consumers price perception in an ecommerce platform. In this paper, we define price perception as "judgment of whether an outcome and/or the process to reach an outcome are reasonable, acceptable, or just" (Xia et al., 2004).

Algorithmic Fairness

Algorithmic decision-making systems are widely used by e-commerce platforms and substantial focus is given on building fair algorithms. Consumers concerns over algorithm fairness and biases can impact the adoption of such strategies (Wang et al., 2020). Algorithmic outcomes that are favorable and unbiased affect algorithmic fairness perception and impact consumer decision making. Consumers are increasingly aware of use of algorithms in decision making. In this context, firms provide information on algorithms to increase transparency. As a result, consumers can evaluate the process to be just and fair (Wang et al., 2020; Xia et al., 2004). Hence, we study the aspect of consumer perception of algorithmic fairness in value co-creation.

Privacy

As we operationalize customer perception as a multi-dimensional construct, we include privacy as well because it protects consumer's personal information, access e-commerce platform free from malware and help easy installation of application (Agag et al., 2016). Though consumers provide information to e-commerce firms, consumers may feel their privacy can be invaded. Hence, consumers by providing information online, put them in a vulnerable position where customer information is subject to be tapped by unauthorized and unwanted sources that deter future use of e-commerce platforms (Bandara et al., 2020; Zorotheos & Kafeza, 2009). Concerns arise due to privacy, trade security, deception in online transactions, phishing and identity theft in e-commerce setting (Cheng et al., 2021). Extant literature finds that privacy has a strong effect on purchase intention and trust in e-commerce (Barrutia et al., 2016). Building upon the existing literature, we study privacy as a dimension in customer value co-creation perception.

Security

Security refers to the extent to which customers feel the transaction with e-commerce platform is safe, secure and risk free from financial loss. Security breach pose a major threat among consumers (ArifHassan et al., 2021; Cheng et al., 2014). Hence, studying the influence of security in an e-commerce platform and its importance in forming customer value co-creation perception is relevant.

Personalization Benefits of Recommendation System

E-commerce platforms offer a huge assortment of products, but consumers can be benefitted from search for appropriate products only when they are supported by a system that helps consumers

to identify products that match their preferences (Gai & Klesse, 2019; Lee & Rha, 2016). Hence, recommendation system play a vital role in firms' resources in e-commerce context. Recommendation system can modify consumers' additional consumption and substitution by providing attractive recommendations to specific customers. These tools analyze customer's product purchase history and collaborative filtering used by customers to find out similarities among customers, to provide personalized offers and product (Ansari et al., 2000). As, recommendation systems play a vital role in search and presenting products and offers fitting customer preferences we have consider the personalization benefit aspect in creating customer perception of value co-creation in e-commerce.

Multi-dimensionality of customer perception has been acknowledged by researchers and found to have impacted behavioral positive outcomes (Cheng et al., 2014). Therefore, consumers' perceptions of value co-creation for personalization of marketing mix can be reflected through (a) fulfillment, (b) service recovery, (c) price perception, (d) algorithmic fairness, (e)privacy, (f)security and (g) personalization benefits.

Value Co-Creation Intention

In a value co-creation context, design, ideation and development of products and services are co-created by firm and consumer (Prahalad & Ramaswamy, 2004). Building upon the extant literature, we define value co-creation in personalization of marketing mix as consumers creating value through interaction with e-commerce platform eco-system to provide personalized recommendation on products, offers and discounts based on consumer co-view, preferential data and browsing characteristics (Tajvidi et al., 2020; Torkzadeh et al., 2020). Further, building on the foundation of Vargo and Lusch (2004) concept of value co-creation consumers are not passive recipient but active creators of unique value. Moreover, e-commerce firms can be successful in personalization of marketing-mix by integrating their resources (for eg: AI enabled recommendation system and algorithms) with consumer value creations (Chandler & Lusch, 2014; Pandey & Kumar, 2020; Zhang et al., 2020). This co-created value help e-commerce firms to identify and personalize marketing-mix according to consumers' needs and wants exactly. Based on this notion, we infer that consumers using e-commerce platforms collaborate actively and co-create exclusive information on their browsing characteristics, preferential data and experiences to others, in addition to encouraging other consumers to co-create value and make purchases (Gensler et al., 2013). Ultimately, value is co-created. Adapting the existing literature for operationalization of value co-creation, this study measures consumer intention to co-create value as an outcome variable (Nadeem & Al-Imamy, 2020; Nambisan & Baron, 2009). The study investigates the relationship between customer perception of value co-creation for personalization of marketing-mix and consumer intention to co-create value. Hence, we posit:

H₁: Consumers' perceptions of value co-creation for personalization of marketing-mix reflected as fulfillment, service recovery, price perception, algorithmic fairness, privacy, security, and personalization benefits have a positive effect on consumer intention to co-create value in an e-commerce setting.

Process Quality

Process quality is extend to which the e-commerce platform is fast, easy to use, with complete intelligent information, updated offers and well-designed (Parasuraman et al., 2005). The quality of e-commerce platform plays a significant role in differentiating an online retailer from another and attract customers (Bilkova & Kopackova, 2013). Quality of the platform can influence the perception of consumers towards the products and offers recommended. They also impact formation of behavioral outcomes towards the e-commerce platforms (Hsu & Tsou, 2011). Presently, most of the e-commerce platforms sell similar products from various manufacturers, product offering does not impact customer perception, and hence differentiation can be ensured

through e-commerce platform process quality (Bilkova & Kopackova, 2013). E-commerce platforms adopt cutting-edge technologies like AI, ML, big data analytics, IoT, chatbots, recommender system, 3D simulations, Image Interactivity Technology (IIT) and so on into their platforms to ensure easy use, faster updation, best-in-class design and complete information for consumers (Shankar, 2018). Extend literature argue that process quality as an indicator for differentiation (Hsu & Tsou, 2011) and a tool to influence customer in an online platform. The building blocks of process quality are efficiency, design and information (Parasuraman et al., 2005; Barrutia et al., 2016). Efficiency is the extent to which the e-commerce platform can be used with ease and accessed speedily (Parasuraman et al. 2005). Design is the extent to which information and options displayed are clear in an e-commerce platform (Fassnacht & Koese, 2006). Information is the extent to which updated, complete and intelligible information is presented in the e-commerce platform (Fassnacht & Koese, 2006). This study adapts and uses the same measures of process quality and treat it as a multidimensional construct in line with extant literature. Hence, we posit:

H$_2$: e-commerce platform process quality mediates the relationship between customer perception of value co-creation for personalization and customer intention to co-create value.

Relationship Quality

Relationship quality signifies consumers' willingness to continue in a business relationship and explores the impact on consumer behavioral responses (Palmatier et al., 2006). It is vital to investigate role of relationship quality between customer value co-creation perceptions and intention for value co-creation. When a consumer perceive value co-creation advantageous and fair, it leads to retention and intent to co-create value (Hajli et al., 2017; Guzel et al., 2020). Relationship quality denotes intensity and closeness of the relationship that are crucial in influencing consumer behavioral outcomes (Palmatier et al., 2006). It is central to strengthen, continue, or withdraw decisions by consumers pertaining to the relationship (Hajli et al., 2017). Commitment, trust and satisfaction are building blocks of relationship quality (Liang et al., 2011; Palmatier et al., 2006). Commitment is important to build successful long term relationship (Hajli et al., 2017). In a sharing economy context, commitment is the willingness to participate in co-creation and remain as a user of e-commerce platform. Consumers exhibiting high commitment are high likely to participate in value co-creation in e-commerce platform, remain an active shopper with repetitive purchase behavior and promote stability in relationship (Iglesias et al., 2018). Extant literature provides proof that commitment significantly influence long term relationship between consumer and e-commerce platform provider (Nadeem et al., 2020). Trust is the second dimension of relationship quality and denote willingness and confidence of a consumer to rely on the e-commerce platform provider. In an online context, trust enhances willingness to co-create in an anonymous setting like internet and e-commerce platform and result in long lasting relationship with the e-commerce platform provider. Without trust in e-commerce platform, consumers do not participate (Liang et al., 2011; Bleier et al., 2018). Hence, trust is crucial in relationship quality. Finally, the third dimension of relationship quality is satisfaction and it consists of emotional evaluation of value co-creation, performance of service or product and post consumption (Gustafsson et al., 2005). Satisfaction with e-commerce platform service provider result in developing positive attitude towards the provider and lead to long term relationship (Hajli et al., 2017). The study adapts the same measures of relationship quality and operationalize it as multi-dimensional construct comprising commitment, trust, and satisfaction. This study adds to the extant literature by studying the role of relationship quality in mediating the relationship between customer perception of value co-creation in personalization of marketing-mix and consumer value co-creation intention. Hence, we posit:

H₃: e-commerce platform relationship quality mediates the relationship between customer perception of value co-creation for personalization and customer intention to co-create value.

Process Quality and Value Co-Creation Intention

Consumers interact with the e-commerce platform while shopping online, the process quality of the platform in terms of efficiency, design and the information presented in the platform impact consumer intention to co-create value. Previous literatures have shown a positive process quality to result in positive behavioral outcome among consumers (Barrutia et al., 2016; Nadeem & Al-Imamy, 2020). Hence, we posit:

H₄: Process quality has a positive effect on customer value co-creation intention.

Relationship Quality and Value Co-Creation Intention

When an online consumer interacts with an e-commerce platform, the relationship quality of the platform in terms of commitment, trust and satisfaction from the platform impact consumer intention to co-create value. Previous literatures have shown a positive relationship quality to result in positive behavioral outcome among consumers (Palmatier et al., 2006; Hajli et al., 2017). Relationship quality is crucial and influence consumer response that can be vital to build or withdraw co-creation intention. Hence, we posit:

H₅: Relationship quality has a positive effect on customer value co-creation intention.

METHODOLOGY

Data Collection and Measurement

An online survey and pen and paper method was used to collect data from users using e-commerce shopping platforms (comprising m-commerce and websites). In the participant information sheet circulated during the survey, a brief description about the study was given that read 'When an online shopper browses for a product, the e-commerce platform can capture and store data pertaining to the number of visits to a product page, browse history, search history, purchase history, return history based on which personalized offers and recommendations can be provided. Thus, online shoppers are involved in personalization for themselves by providing data'. After which, a question on whether consumers were aware of this aspect was asked. About 647 respondents out of the 753 responses responded they were aware that their online data can be used for personalization.

Respondents were asked to respond based on their shopping experience. The online shopping experience of the respondents are given in Table 1. All the respondents used an e-commerce shopping platforms. Data were collected from students and actual online shoppers. Students consisted of 16% of the entire sample and 43% of respondents in the 18 to 25 years age category. Student samples were not considered for entire data collection deliberately as they are criticized on how representative of the actual consumers (Peterson & Merunka, 2014). Data were collected from a leading metropolitan city and students of a large university in India. Questionnaire were circulated among students and residents of 5 residential apartments consisting of two-250, 300, 500, and 750 households through their apartment association social media groups like Whatsapp, Telegram, and Signal. We received 753 responses circulated among online shoppers, only 638 responses were usable while rest comprised of invalid and incomplete responses. The demographic profile of the sample size

Table 1. Respondent's profile

Variable	Percentage
Gender	
Male	67.7%
Female	32.2%
Age	
18 to 25 years	38%
26 to 35 years	47%
36 to 45 years	6%
46 to 60 years	7%
Above 60 years	2%
Income per month	
Less than Rs. 10,000	5%
Rs. 10,001 – Rs. 30,000	35%
Rs. 30,001 – Rs. 60,000	38%
Rs. 60,000 and above	22%
Experience (How long have you been using an e-commerce platform for shopping)	
Less than 1 year	6%
2 years	24%
3 years	28%
4 years	18%
5 years	13%
More than 5 years	11%

(638) comprised of 67.7% male and 32.2% female respondents; 97% had a college level education or above. 38% of respondents belonged to the age group of 18 to 25 years; 47% respondents belonged to 26 to 35 years, 36 to 45 years were 6%, 46 years to 60 years were 7% and above 60 years were 2% of the respondents. The measures and items were adapted from existing literature. The measures and source of item given in Table 2 were adapted and modified from existing literature. A five-point likert scale (1 – strongly disagree - 5 strongly agree) were used.

Data Normality and Measurement Validation

Maximum Likelihood (ML) estimation was used to assess normality. The kurtosis lie between -1.037 to 1.243. Skewness lie between -1.009 to 1.003. The values were within acceptable range of $\pm$ 1.96 (Bollen and Stine, 1992). 62 responses were deleted that consists of 28 incomplete responses, 34 respondents with same response for all questions. Mahalanobis distance test showed there were 53 outliers and were removed from the dataset ($P<0.001$). The data were checked for multi-collinearity, and the results were within threshold level of 3. All these tests enabled to confirm data was normal and can be used for further analysis. Totally, 638 cases were used for analyses.

Common Method Bias

As data was collected from same population and same time, common method bias might cause validity issues (Podsakoff et al., 2003). Harman's single factor test was conducted using exploratory factor analysis to obtain un-rotated solutions by constraining factor scores to 1. The results showed maximum variance by 1 factor is 34.648. Hence, data does not have common method bias and the value was well below the threshold level of 50%. The correlation values were below 0.9 and correlation between constructs were 0.85 that were well within the limit (Pavlou et al., 2007). Thus, the data does not have validity and common method bias problem.

Table 2. Constructs and measurement items

S No	Construct	Items	Factor loadings (λ)	Cronbach alpha (α)	Composite Reliability	AVE
1	Fulfillment	I receive correct products/ services and quantities ordered online.	0.823	0.873	0.902	0.657
		I receive products/services ordered, matching description online.	0.845			
		The e-commerce platform (e-CP) guarantees that products/services ordered online are authentic and not imitations.	0.876			
		The products/services pricing on e-CP is consistent with the bill.	0.879			
		The products/services ordered online are delivered on time.	0.854			
		I can check the order-fulfillment processes online at any time.	0.859			
2	Service recovery	The e-CP shows interest in my problem	0.837	0.876	0.915	0.593
		The e-CP does everything possible to solve my problem	0.706			
		The e-CP is honest when dealing with my problem	0.876			
		The e-CP proved able and sufficiently competent to solve the problem	0.879			
		The e-CP deals with me courteously when solving the problem	0.678			
		The e-CP shows interest in being fair when solving the problem	0.798			
3	Price perception	The price displayed in e-CP is just.	0.838	0.854	0.879	0.767
		The price displayed in e-CP is acceptable.	0.882			
		The price displayed in e-CP is fair.	0.891			
4	Algorithm fairness	The decision-making algorithm provide favourable outcome to me.	0.834	0.865	0.838	0.657
		The decision making algorithm provide transparent description	0.843			
		Algorithm provides unbiased outcomes.	0.876			
5	Personalisation benefits of recommendation system	Through recommender system,		0.867	0.835	0.896
		I can get personalized product recommendations and price discounts/offers tailored to my interests and needs.	0.856			
		I can get personalized recommendations on product and price tailored to my activity contexts.	0.845			
		I can get personalized recommendations on product and price tailored to my shopping patterns.	0.867			
		I can reduce my time and effort in finding the shopping information I need.	0.897			
		I can get shopping information more easily and conveniently.	0.837			

Table 2. Continued

S No	Construct	Items	Factor loadings (λ)	Cronbach alpha (α)	Composite Reliability	AVE
6	Privacy	E-CP clearly explains how information provided by consumers is used.	0.878	0.835	0.897	0.789
		E-CP collects personal information with the consent of consumers.	0.901			
		Without the consent of consumers, E-CP will not use personal information for purposes other than for the original transactions.	0.878			
7	Security	E-CP guarantees that personal information of consumers will be handled in accordance with a third party's privacy-protection regulations and has acquired authentication knowledge.	0.892	0.983	0.889	0.91
		E-CP will not apply special technology to collect and analyze the internet behavior and shopping habits of consumers without their consent.	0.798			
		E-CP guarantees that they observe a third-party's transactional security-protection regulations and has acquired authentication.	0.894			
		E-CP guarantees that transmission of transactional data will be protected without any unauthorized modification or sabotage.	0.837			
		E-CP has a transactional security policy that consumers can understand easily	0.79			
		E-CP guides consumers to correct and safe payment steps.	0.897			
8	Process Quality Efficiency	The e-commerce platform is simple to use	0.895	0.876	0.879	0.644
		Enables me to get on to it quickly	0.876			
		The e-commerce platform is well organized	0.874			
		It loads its pages fast	0.878			
9	Design	Symbols/icons are readily identifiable	0.845	0.897	0.878	0.768
		Everything is clearly arranged	0.838			
		Layout enables the user to find important things at first sight	0.833			
10	Information	E-CP provides up-to-date information about prices	0.835	0.879	0.809	0.873
		This e-commerce platform provides all the information necessary	0.867			
		Information provided is easy to understand	0.856			
11	Relationship quality - Commitment	I am proud to be a consumer of the e-CP	0.834	0.902	0.806	0.687
		I feel a sense of belonging to the e-CP	0.891			
		I care about the long-term success the e-CP	0.845			
		I am loyal patron of the e-CP	0.876			

Table 2. Continued

S No	Construct	Items	Factor loadings (λ)	Cronbach alpha (α)	Composite Reliability	AVE
12	Trust	The e-CP is competent and effective in providing its services	0.833	0.897	0.897	0.638
		I would characterize the e-CP as honest.	0.843			
		The e-CP is trustworthy.	0.878			
13	Satisfaction	Overall I am satisfied with the e-CP	0.856	0.856	0.848	0.765
		The last use of the e-CP fulfilled my expectations.	0.877			
		This e-CP I use represents the ideal version of the e-commerce platform.	0.903			
14	Intention to co-create value	I am willing to provide my experiences and suggestions through my favorite e-CP when my friends want my advice on buying something from a e-CP.	0.857	0.893	0.898	0.879
		I am willing to buy the products/services of e-CP recommended by my friends through my favorite platform.	0.803			
		I will consider the buying experiences of my friends through my favorite e-CP when I want to go for a purchase/service in a e-CP.	0.878			

Data Analysis

AMOS version 26 and SPSS 20 were used to analyze the data and test measurement model and causal and mediation models. Figure 2 shows structural model with results. To examine the reliability and validity of constructs exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed (Anderson & Gerbing, 1988; Fornell & Larcker, 1981). Analysis of the items in the model showed good fit. The items used in analysis are shown in Table 2. The measurement scales showed high reliability with Cronbach's Alpha values above the threshold level of 0.70 (Nunnally & Bernstein, 2010). The measurement model had good fit. The goodness of fit is illustrated in Table 3. All the items loaded positively and loadings were above the recommended acceptable threshold level of 0.7 for convergent validity. In the factor correlation matrix, there were no high cross loadings among constructs and no loadings greater than 0.7. The average value extracted (AVE) were above the recommended range of 0.5. Thus providing excellent discriminant validity. Table 4 shows discriminant validity.

RESULTS AND DISCUSSIONS

Hypotheses Tests and Structural Model With Results

The hypotheses were tested using a causal model. The results revealed consumer's intention for value co-creation is influenced by consumer's perception of value co-creation. Consumers perceive value co-creation positively reflected in fulfillment, service recovery, price perception, algorithmic fairness, personalization benefits, security and privacy dimensions and mediated by relationship quality and process quality to positively influence customer value co-creation intention. The results are presented in Table 5. In the dependent variables, the percentage of variance is explained through R^2 and it also explains the predictive power of independent variable on dependent variables. The study indicates, 65% of variance in customer perception of value co-creation, 73% of variance in relationship quality,
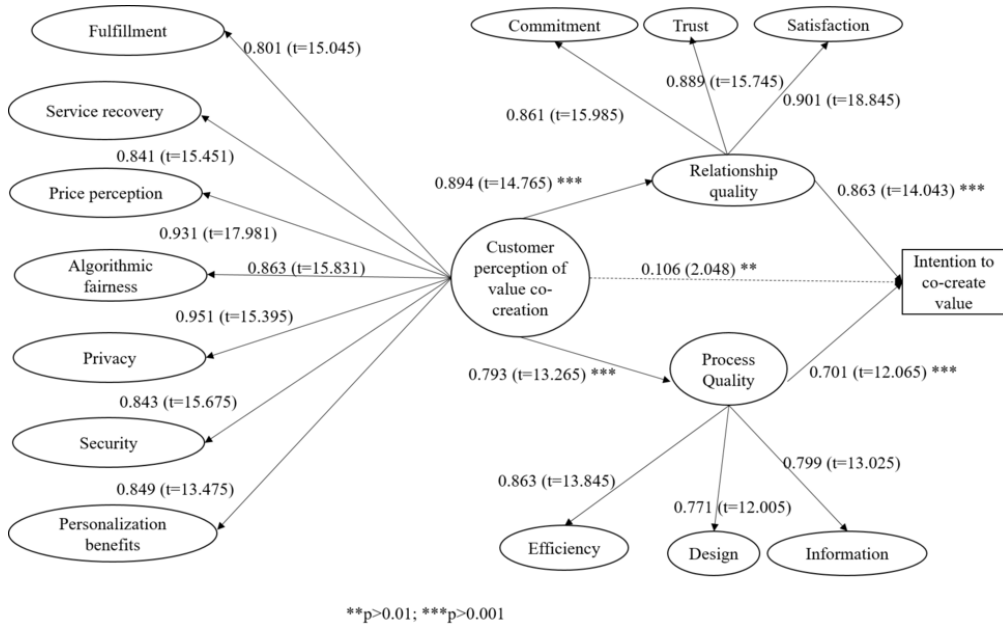
Figure 2. Structural model with results

**p>0.01; ***p>0.001

Table 3. Goodness of fit indices

SRMR	NFI	CFI	GFI	P-close	Chi-square	df	p-value	RMSEA
0.053	0.93	0.972	0.809	0.001	1208.098	178	0.000	0.053

Table 4. Discriminant validity

	CPVC	PQ	RQ	ICV
CPVC	**0.758**			
PQ	0.710	**0.812**		
RQ	0.417	0.703	**0.736**	
ICV	0.601	0.559	0.713	**0.771**

CPVC – Customer perception value co-creation for personalization; PQ – Process Quality; RQ – Relationship Quality; ICV – Intention to co-create value

Table 5. Hypotheses and results

Hypotheses	Path coefficient	t-value	Result
H_1: CPVC → ICV	0.106**	2.048	Supported
H_2: CPCV → PQ	0.793 ***	13.265	Supported
H_3: CPVC → RQ	0.894 ***	14.765	Supported
H_4: PQ → ICV	0.701 ***	12.065	Supported
H_5: RQ → ICV	0.863 ***	14.043	Supported

**p>0.01; ***p>0.001

61% of variance in process quality, 45% of variance in intention to co-create value. The results show that process quality has stronger mediation effect than relationship quality on consumer value co-creation intention and customer perception of value co-creation for personalization of marketing-mix. Hypotheses test results shows, customer perception of value co-creation positively and significantly impact consumer intention to co-create value ($\beta = 0.106$, p<0.01) and hence H_1 is supported. Customer perception of value co-creation positively and significantly influence process quality ($\beta = 0.793$, p<0.001) and H_2 is supported. Furthermore, intention to co-create value is positively and significantly influenced by process quality ($\beta = 0.701$, p<0.001) and H_3 is supported. The model showed positive and significant influence of customer perception of value co-creation and relationship quality ($\beta = 0.894$, p<0.001) and H_4 is supported. Furthermore, relationship quality significantly and positively influence intention to co-create value ($\beta = 0.863$, p<0.001) and H_5 is supported. Influence of control variables such as age ($\beta = 0.019$, p < 0.376), experience ($\beta = 0.047$, p < 0.653) and income ($\beta = 0.038$, p < 0.029) were insignificant and not supported.

Mediation Tests

The direct effect of consumer's perception of value co-creation on the intention of value co-creation was positive but not strongly significant. However, the indirect effect of customer perception of value co-creation mediated by process quality and relationship quality showed a stronger significant and positive effect. Thus, it can be established that the relationship between customer perception of value co-creation and value co-creation intention is mediated by process quality and relationship quality. Specifically, the mediation test results are shown in table 6.

The study attempted to find the influence of customer's perception of value co-creation for personalization in an e-commerce setting and its impact on customer value co-creation intention. The study addressed recent area concerning how consumers behave and perceive value co-creation in sharing economy platforms (Eggert et al., 2018). It builds upon the existing research on customer perception of value co-creation by studying the impact of algorithm fairness and recommendation system personalization benefits on its impact on customer perception of value co-creation for personalization of marketing mix in an e-commerce setting. Existing research shows that customer perception of value co-creation is multidimensional and a key aspect impacting customer purchase intention in value creation process (Zietsman et al., 2020). Building on the existing studies the current study has provided evidence that customer perception of value co-creation is multi-dimensional construct comprising fulfillment, service recovery, price perception, algorithmic fairness, personalization benefits, security and privacy. This study includes algorithmic fairness, price perception and personalization benefits to the multidimensionality of value co-creation perception construct. Further, customer perception of value co-creation impact and play vital role in behavioral outcomes such as value co-creation intention (Eggert et al., 2018). Among the constructs, customer

Table 6. Mediation results

Path tested	Standardized estimates	Indirect effect confidence level		p-value	Conclusion
		Lower	Upper		
CPVC × PQ × ICV	0.595	0.398	0.705	0.001	Process quality mediates customer perception of value co-creation and intention to co-create value
CPVC × RQ × ICV	0.675	0.402	0.843	0.001	Relationship quality mediates customer perception of value co-creation and intention to co-create value

perception of value co-creation is strongly reflected in customer price perception which is evident from higher t value when compared with other dimensions. It can be interpreted that when consumers co-create data for personalization, they want the price displayed to be fair, just and reasonable. As consumer value co-creation for personalization was studied in an online shopping context, constructs such as fulfilment, service recovery, algorithmic fairness, privacy and security are considered equally important which is evident from similar t values (ranging from 15.045 -15.813). Personalization benefits reflect customer perception the least among the dimensions. Thus this study advances the understanding of multi-dimensional construct of customer perception of value co-creation for personalization in the marketing and pricing literature. In addition, we also found sub-dimensions of relationship quality such as commitment, trust and satisfaction to load positively and significantly in consistent to earlier studies (Fernandes & Calamote, 2016; Lii & Sy, 2009). As in an e-commerce setting, customer value co-creation towards personalization of marketing mix, result in differential pricing among consumers and can influence their perception of value co-creation and impact co-creation intention. For e-commerce firm to provide best quality of services, process quality play a vital role. The study provides evidence that process quality is multi-dimensional construct in an e-commerce setting consistent with previous studies (Barrutia et al., 2016) consisting of sub dimensions like design, efficiency and information significantly and positively loaded to process quality. As, predicted customer perception of value co-creation directly impact co-creation intention. The study also found the relationship between customer perception of value co-creation and co-creation intention is fully mediated by process quality and relationship quality. Thus, it can be inferred from the study that consumers perceive value co-creation for personalization to be advantageous and developing long term relationship and create value co-creation intention towards e-commerce firm. Overall, the results highlight that customer perception of value co-creation for personalization of marketing-mix includes sub dimensions such as fulfillment, service recovery, price perception, algorithmic fairness, personalization benefits, security and privacy and contribute to customer purchase intention mediated by process quality and relationship quality.

Theoretical Implications

The study contributes and advances extant literature in many ways. First, the paper measures consumer perception of value co-creation taking care of widely focused traditional concerns like price perception, privacy and security, in addition to algorithmic fairness and personalization benefits. The results confirms the outcomes of existing literature that e-commerce firms must not only focus on price perception, privacy and security (Nadeem & Al-Imamy, 2020; Hajli et al., 2017; Guzel et al., 2020) but also acknowledge and address several other aspects like fulfillment, service recovery, algorithmic fairness, and personalization benefits to enhance intention to co-create value. In other words, taking timely and mitigating actions during service failure, providing personalized recommendations and offers based on preferences, prompt fulfillment, fair pricing while maintaining the privacy of data and security of transactions. Third, the study explains the mediating role of relationship quality and process quality in creating an empirically valid conceptual framework to understand customer intention to co-create value in an e-commerce setting. By building upon the SDL, SOR theory, and value co-creation literature, this study advances and expands the current body of knowledge by explaining the role of price perception and algorithmic fairness perception in intention to co-create value in online shopping, which has been strongly recommended by several authors for further exploration (Barrutia et al., 2016; Eggert et al., 2018; Zietsman et al., 2020).

Managerial Implications

First, the study provides significant insights to marketing managers to monitor and track accountability and ethicality of algorithms when implementing advanced technologies using algorithms for marketing-mix. It can be understood that customer fairness perception of price, algorithms, and

personalization benefits result in positive intention to co-create value while shopping, which can be interpreted by managers that consumers accept such personalization strategies and perceive them fair and reasonable. Marketers must also ensure consumer personal data are safe and secure in the e-commerce platform. Second, the study shows that relationship quality and process quality play a significant role in intention to co-create value. It can be interpreted that managers should focus on ensuring process quality and better relationship quality by minimizing risk and optimizing efficient use of technology. Even though, relationship quality and process quality exhibit mediating effect, the significance of these factors should not be underestimated by practitioners when implementing personalization of marketing-mix strategies. Finally, we highlight managers must optimize technology to monetize on consumer perception of value co-creation in e-commerce platform holistically by providing prompt fulfillment, compensating service failure, fair, unbiased algorithm price and personalized recommendation in addition to privacy and security while using their platforms. Using consumer data, managers can provide personalization of marketing mix to develop a positive attitude towards e-commerce platforms. Thus, focusing on customer perception of value co-creation in an online environment is important to enhance and sustain good relations with consumers.

LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The present study has its limitations. First, the study did not focus on the impact of value co-creation and customer loyalty. Second, this study examines consumers who are aware of value co-creation and personalization in e-commerce platforms leaving out consumers who are unaware of value co-creation in an online setting. Further study can be done to understand how consumers who are unaware of value co-creation perceive value creation and its impact on purchase intention. Third, the role of sustainability and corporate social responsibility can be examined in future research.

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CONFLICT OF INTEREST STATEMENT

The authors of this publication declare there is no conflict of interest.

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