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Emotional Bonds with Technology: The Impact of Customer Readiness on Upgrade Intention, Brand Loyalty, and Affective Commitment through Mediation Impact of Customer Value

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Abstract

Drawing upon the Theory of Consumption Value, this empirical study developed a readiness-value model and examined the direct effect of customer readiness on customer value types and the mediation impact of perceived emotional and functional value toward products being used in the relationship between customer readiness and customers' upgrade intention, customers' loyalty intention toward the brands they are currently using and customers' affective commitment toward their current service providers. Surveys obtained from 174 adult respondents were analyzed, and they show that customer readiness directly and significantly impacts all types of value: emotional, functional, social, monetary and epistemic. Perceived emotional value toward products in use acts as a complementary mediator and perceived functional value toward the products in use acts as a competitive mediator for the impact of customer readiness and customers' upgrade intention. Additionally, perceived emotional value acts as a competitive mediator for the effect of customer readiness on customers' affective commitment toward their service providers. Perceived functional value toward products being used fully mediates the effect of customer readiness on customers' loyalty intention toward the brands they are using.

Keywords: Smart product, Upgrade intention, Customer readiness, Customer value, Commitment, Loyalty

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1 Introduction

Technology has become woven into the fabric of our daily lives, primarily as the result of significant advances in interactive technology and artificial intelligence. We find this advanced technology in such smart products that help people with daily tasks such as smart watches, smart TVs, smart refrigerators, smartphones, Apple Siri, Microsoft Cortana, Alexa, home Google assistant, and so on. To keep up with this trend, individuals must stay current with the technology; otherwise, they quickly drop behind. In the midst of this onslaught of technology, individuals can either adopt a smart product or upgrade their smart product to a newer version. Either way, they must learn to use their smart products.

What do owners do when their smartphones become damaged or lost? They may have three choices. First, they can buy the same brand and the same model. Second, they may buy a newer model of the same brand. Third, they can switch to a different model from another brand. And at the same time, they may consider staying with their current service providers or switch to other ones. To make the best decision, they may contemplate all these alternatives and evaluate the pros and cons of each. To evaluate the quality of each alternative, this study applies the Theory of Consumption Value, which asserts that different types of customer value are the main drivers of consumer choice and determine customers' purchase decisions [22], [68].

Prior studies have applied the Theory of Reasoned Action [30], Extended Technology Acceptance Model [12], and perceived value [35] to explain customers' adoption decision. A few research studies have paid attention to post-adoption decisions such as upgrading [58]. Some studies suggest that perceived value is the major factor encouraging such post-adoption behavior as upgrade intention [58], [70].

This study developed a conceptual model based on customer readiness and value consumption theory to explain customers' post-adoption behaviors. Customer readiness is related to consumption situations such as adoption (e.g., [50]) and post-adoption [42], [43], [44]. Adoption refers to consumer's decision to use or buy innovative products for the first time [60]. Further, it argues that customer readiness is inevitable and customers are able to capture different types of product value when they are capable of taking full advantage of products' technology.

A few studies have shed some light on the importance of customer readiness in triggering customer value (e.g., [28]). This study examines customer readiness as a key construct that directly impacts customers' value and indirectly influences customers' post-adoption behavior such as their upgrade intention toward smart products, loyalty intention toward the brands they are currently using, and affective commitment toward their current service providers. This study assumes that customer readiness directly and significantly enhances five types of customer value. Additionally, this study examines the mediation effect of perceived functional value and emotional value on the relationship between customer readiness and their post-adoption behavior. This study addresses three objectives:

Objective 1: To examine how customer readiness enhances and impacts five types of customer value.

Objective 2: To investigate how and why different types of customer value toward the products currently in use impact customers' post-adoption behavior such as their upgrade intention toward smart products, their loyalty intention toward the brands they are currently using, and their affective commitment toward their current service providers.

Objective 3: To examine how perceived functional value mediates the effect of customer readiness on customers' upgrade intention toward smart products and customers' loyalty intention toward the brands they are currently using. This study also examines if perceived emotional value mediates the effect of customer readiness on customers' upgrade intention toward smart products and customers' affective commitment toward their current service providers.

Many studies have focused on adoption decisions, but little research has attended to post-adoption decisions. The literature examines how customer readiness influences customer participation (e.g., [14], [40]), perceived customer value [11], service quality [28], [34], customer satisfaction [8], behavioral intention [36], [72] and adoption behavior [50]. However, the literature has yet to address how perceived functional value and emotional value mediate the effect of customer readiness on customers' post-adoption behavior.

The structure of the paper is as follows. First, the literature on customer readiness and customer value is reviewed. Second, we discuss the impact of customer readiness on each of five value types. The impact of the five types of customer value on upgrade intention, loyalty intention, and affective commitment is also discussed. Finally, this study explains the methodology, analysis, results, discussion, theoretical contributions, managerial implications, study limitations, and offers suggestions for further research.

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2 Literature Review

This section elaborates on the relevant literature for the concept of customer readiness and its association with customer value.

2.1 Customer Readiness and Customer Value

Customer readiness has attracted attention in studies of technology adoption such as self-service technology (SST) or automated teller machine (ATM) [50]. Customer readiness refers to the "condition or state in which a consumer is prepared and likely to use an innovation for the first time". [50], p. 64, and it has been defined as a person's tendency to use new technologies [42]. This study defines customer readiness as customers' willingness to become ready to use a product. Customer readiness is a second-order construct [28] and has three dimensions: role clarity, ability, and motivation [40]. Role clarity refers to the expectation of performing a task; ability refers to performing a task as expected; and motivation refers to the benefits of performing a task. Customer readiness is an essential factor influencing adoption behavior of electronic services [1].

Customer readiness impacts technology consumption situations such as adoption (e.g., [50]) and post-adoption [44], [42]. Although smart products such as Fitbit and smartphones are now integral to our daily lives, some people may not be able to embrace smart products easily because of insecurity, discomfort, fear [44], or lack of readiness. Customers with technology expertise are able to accept new technology, whereas customers with insufficient technology expertise find it difficult to embrace new technology.

Customer value refers to the trade-off between what customers sacrifice and what they gain [49], [74]. The traditional view of customer value evaluates cognitive aspects of customer value (e.g., [7], [74]) such as functional value [47] while neglecting the emotional aspects [63]. Later studies, however, have captured both the cognitive and emotive aspects of customer value (e.g., [6]). The literature has identified different aspects of customer value including functional, emotional, social, epistemic, conditional [67], and monetary value [69].

Today, advanced technologies provide all individuals an opportunity to socialize and interact with others frequently and easily in order to enhance their self-concepts or social desirability [39], [69]. In other words, social value refers to the social aspects of a product. Functional value refers to such cognitive aspects of value as the practical features of a product [69], [71]. In other words, functional value refers to how well products' features satisfy customers' utilitarian needs [6]. Emotional value refers to the feelings customers experience from the perceived utility of a product [66], [67]. Monetary value refers to product costs (i.e., money, time, or effort) associated with consumption [7], [69]. Epistemic value refers to curiosity, novelty, or knowledge gained through using a new product [66], [67]. Conditional value refers to the features of a product that create temporary functional or social value in a particular situation. The literature shows that perceived value is the major factor motivating consumers' post-adoption behavior such as upgrade intention [70] and loyalty intention [73].

3 Theoretical Framework and Hypotheses

This study applied the concept of customer readiness to discover how it directly enhances customer value and indirectly influences upgrade intention toward smart products, customers' loyalty intention toward the brands they are currently using, and customers' affective commitment toward their service provider.

Basing its approach on the work of Sheth et al. (1991) and Sweeney and Soutar (2001), this study applies five value types related to smart products. The Theory of Consumption Value [66], [67] proposes that customer value consists of five types of value: emotional, functional, social, conditional, and epistemic. This study excludes conditional value because of its irrelevance to the study, although monetary value was included. Conditional value is eliminated because smart products are not used for temporary situations. Following the lead of Sweeney and Soutar (2001), monetary value was included in the model because smart products are expensive and customers pay attention to price. Consistent with the literature, this study argues that customer readiness directly and significantly influences each of these value types, thus customer readiness and customer value are associated. When customers become ready, they are able to use the different features of a product, so they are better able to perceive higher value. For example, technology savvy users are able to connect such interactive devices as Google Home Robot or Google Assistant to other smart devices at home that receive tasks via voice command. Users can command the device to set the temperature in the house, turn on lights, or turn them down. A world with smart products is like a fantasy world for those ready to use these products, and by using them, users come to perceive the real value of a product.

By the same token, users who are not technology savvy are unable to perceive higher value because they can't use all a product's features [46]. As customer readiness increases, customers become more enthusiastic about using smart products [28]. Based on the product's features, customer readiness is able to trigger different types of customer value. Figure 1 shows the proposed relationships among customer readiness, the five value types, customer's upgrade intention toward smart product, customers' loyalty intention toward the brands they are currently using, and customers'

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affective commitment toward their current service providers. All hypotheses except H9, H11, H15 and H17 are shown in Figure 1.

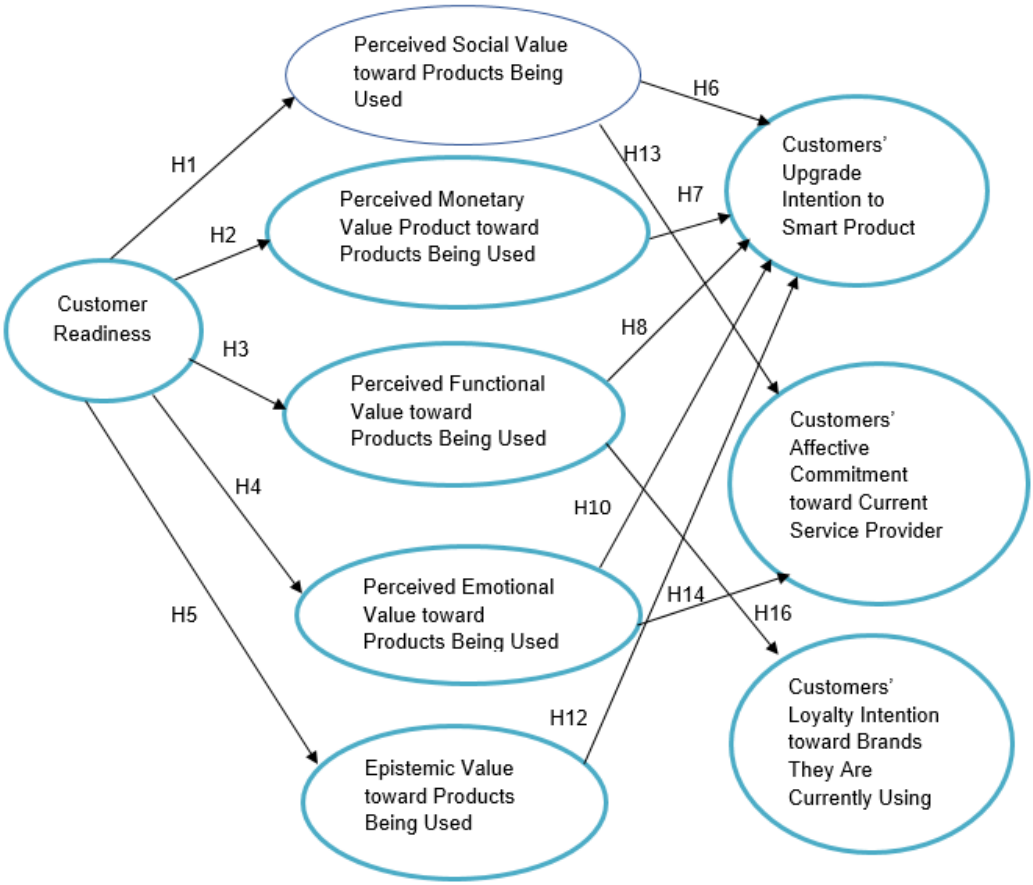

Figure 1: Conceptual model -The mediating impact of customer value on upgrade intention, loyalty intention and affective commitment

3.1 Antecedents of Customer Value Types

The present section elaborates on the relevant literature and hypothesizes the effect of customer readiness on five value types.

3.1.1 Customer Readiness and Perceived Social Value toward Products Being Used

A variety of social activities can generate social value: information distribution [60], [61] such as posting a thread on Facebook that communicates within a social group [36]; receiving others' responses from members of a group [29]; and socializing in a virtual community [71]. Products with social features facilitate social interaction with others, and users take advantage of a product's social features because they desire to use social networks such as Facebook [39]. Social desirability along with social features of a product creates social value. Using the social features of product, of course, requires that users know how to use it. For example, a smartphone with Facebook, Viber, or Tango applications allows smartphone users to stay connected with other people, but before they can become connected, they must know how to download the applications and use them. Thus, being motivated, becoming familiar with a smart product, and knowing how to use its social features is desirable and creates social value. In other words, using smart products creates social value when users become ready to use them.

H1: Customer readiness positively and significantly impacts social value when customers use smart products.

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3.1.2 Customer Readiness and Perceived Monetary Value toward Products Being Used

Customers who are ready to use smart products expend little effort using them, perceive more monetary value than those who are not ready. Technology savvy customers and those who know how to use smart products perceive higher monetary value than those customers who have little or no knowledge about using smart products. Ready customers perceive high monetary value when using smart products because they know how to use them.

H2: Customer readiness positively and significantly impacts monetary value when customers use smart products.

3.1.3 Customer Readiness and Perceived Functional Value toward Products Being Used

Since smart products include high technology features, customer readiness is becoming a precondition for using these products; customers must become ready to use them. The Apple iPhone features Siri, which can be best used by customers who know how to use it. Users of smart glasses such as Google Glass or users of smart refrigerators can perceive functional value when they have sufficient knowledge and ability to use the product. Users of smart product are able to perceive functional value when they are able to use all the product's features.

H3: Customer readiness positively and significantly impacts functional value when customers use smart products.

3.1.4 Customer Readiness and Perceived Emotional Value toward Products Being Used

Ready customers are able to perceive emotional value of using smart products. Because smart products are interactive and entertain customers, using them reveals their emotional value to those prepared to use them. The entertaining features of mobile applications such as Instagram or Face App, for example, evoke emotional value by allowing the customers to interact with digital content such as pictures, videos, and other content, and they can send and receive virtual emotion icons such as emoji.

H4: Customer readiness positively and significantly impacts emotional value when customers use smart products.

3.1.5 Customer Readiness and Perceived Epistemic Value toward Products Being Used

Some products have many novel and fantastic features such as gesture or face recognition. As the level of customer readiness increases, customers perceived less epistemic value while interacting with products. Customers with less degree of readiness are interested in using the novel features when interacting with smart products so that they perceive epistemic value associated with product use. However, customers with a high degree of readiness already know about the unique and novel features of product, so that they are less likely to perceive epistemic value. In other word, customer readiness is inversely associated with perceived epistemic value.

H5: Customer readiness negatively and significantly impacts epistemic value when customers use smart products.

3.2 Consequences of Customer Value Types

This study examines three effects customer value types have on customers' post-adoption behavior: customers' upgrade intention toward smart products, their loyalty intention toward the brands customers are using, and their affective commitment toward their current service providers.

Customers' upgrade intention towards smart products refers to customers' tendency to upgrade or replace the smart or non-smart products they are currently using with a smart product or a new version of the smart product they already own.

This study assumes that two types of value perceived impact customers' upgrade intention toward smart products and mediate the relationship between customer readiness and customers' upgrade intention. The more value customers perceive, the more they are willing to upgrade the product they are currently using. Smart products have a variety of features that enable users to engage in activities that are social, functional, entertaining, and so on. Customers perceive different types of value based on their experience using the different features integrated into these products.

Affective commitment refers to "an emotional attachment to, identification with and involvement in the organization" [51], p. 67, that results in a long-term relationship [17], [25]. This commitment stems from identification, shared values, and belongingness that are manifested in personal involvement, and together they result in a long-term [21], strong, and trusted relationship [23].

Affective commitment toward service providers can be impacted by perceived value (e.g., [21], [27], [31], [57]. The impact of social and emotional values on affective commitment has not received much attention in the literature (e.g., [57]). To fill this gap, this study examines the impact of perceived emotional and social value on affective commitment toward current service providers. Additionally, this study hypothesizes that perceived social value and emotional value mediate the relationship between customer readiness and customers' affective commitment toward their current service provider.

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Customer loyalty refers to customers' commitment to repurchase a specific product or continuing to repurchase that product [53]. Customer satisfaction may influence customer loyalty, but it is not the only variable affecting it [56]. Perceived value also impacts customers' loyalty intention positively and significantly [31], [57], [62]. As perceived value increases, customers' loyalty intention also increases [73]. Among the five value types, this study proposes that perceived functional value toward the products currently being used impacts customers' loyalty intention toward the brands they are using. Additionally, this study hypothesizes that perceived functional value toward products in use mediates the relationship between customer readiness and customers' loyalty intention toward the brands they are currently using.

3.2.1 Perceived Social Value toward Products Being Used and Customers' Upgrade Intention toward Smart Product

Smart products with social benefit features may motivate customers' willingness to upgrade current products, perhaps because they lack the features that enable social activities, and thus these products are less socially desirable. Smart products with social features empower customers to be socially acceptable and desirable to others. Products with novel social features also facilitate communication and interaction with other individuals belonging to a virtual community. Smartphones enable customers to download mobile applications such as Instagram and interact with other individuals belonging to the same community. So, smart products imbue customers with a sense of social desirability and having relationships with other members of the community. However, customers are more likely to be willing to upgrade when smart products offer social features and desirability. Perceived social value created by using a product might motivate customers' upgrade intention. Thus.

H6: Perceived social value toward products being used positively and significantly impacts customers' upgrade intention toward smart products.

3.2.2 Perceived Monetary Value toward Products Being Used and Customers' Upgrade Intention toward Smart Products

The literature shows the impact of monetary value on customers' willingness to purchase [45]. Generally, their purchase intention is based on the perceived trade-off between price and value [16]. Since newly launched smart products are usually expensive, perceived monetary value toward the products being used may negatively affect customers' upgrade intention toward smart products.

H7: Perceived monetary value toward products being used negatively and significantly impacts customers' upgrade intention toward smart products.

3.2.3 Perceived Functional Value toward Products Being Used and Customer's Upgrade Intention toward Smart Product

Perceived functional value is the main driver of adoption decisions [68], [69]. Similarly, perceived functional value (e.g., such product utilities as efficiency, capacity, and performance) [45] gained from the products customers are using can drive customers' upgrade intention negatively when the products in use satisfy their functional needs. On the other hand, the failure of their current products to meet their functional needs-performance, quality, and so on-enhances customer's upgrade intention toward smart products. Perceived functional value shows an essential mediating impact on customers' purchase decision [37], [38], [41]. Since perceived functional value toward products being used has already been recognized by the customers, it may mediate the effect of customer readiness on customers' upgrade intention. Therefore, this study hypothesizes that perceived functional value mediates the relationship between customer readiness and customers' upgrade intention.

H8: Perceived functional value toward products being used negatively and significantly impacts customers' upgrade intention toward smart products.

H9: Perceived functional value toward products being used mediates the effect of customer readiness on customers' upgrade intention toward smart products.

3.2.4 Perceived Emotional Value toward Products Being Used and Customers' Upgrade Intention toward Smart Products

Product qualities may arouse customers' feelings [68], [69] and other emotional responses [45], which in turn drive adoption decisions [69] and such post-adoption decisions as upgrading. Smart products have interactive and novel features that entertain customers. The Kuri robot, for instance, is one example of a small home robot that has a lovable personality. Interactive features, the element of smart products that makes them smart, make interacting with this robot hugely entertaining. With its emotive eyes, the Kuri robot inspires and entertains users while it performs requested tasks. Smart products with features that are emotionally appealing and entertaining create emotional bonds with customers who use the products, and these bonds motivate customers' willingness to upgrade.

Previous studies have also shown that perceived emotional value mediates the effect of technology features such as website personalization on such consumers' responses as purchase intention in online shopping [54]. Perceived

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emotional value mediates the effect of customers' belief on customers' adoption behavior [37], so this study hypothesizes that perceived emotional value mediates the relationship between customer readiness and customers' upgrade intention toward smart products.

H10: Perceived emotional value toward products being used positively and significantly impacts customers' upgrade intention toward smart products.

H11: Perceived emotional value toward products being used mediates the effect of customer readiness on customers' upgrade intention toward smart products.

3.2.5 Perceived Epistemic Value toward Products Being Used and Customers' Upgrade Intention toward Smart Product

Perceived epistemic value may also influence customers' upgrade intention toward smart products. Upgrade intention might occur if customers are bored with the products they are using [6]. It might also occur when customers' sense of curiosity motivates their upgrade intention. Apple, for instance, plans to launch iPhone 8 with such novel and special features as facial expression and augmented reality. So, curious customers may be waiting to upgrade their smartphones to iPhone 10 as soon as the new product becomes available because their current smart products do not satisfy their curiosity needs. However, if customers' current products do meet their curiosity needs, they are less likely to be interested in upgrading their products. As perceived epistemic value toward current smart products is enhanced, customers are less likely to be willing to upgrade their smart products, unless their current smart products are unable to meet their epistemic needs. The findings of this study are consistent with those of prior studies [57]: epistemic value toward products being used is negatively associated with customers' upgrade intention.

H12: Perceived epistemic value toward products being used negatively and significantly impacts customers' upgrade intention toward smart products.

3.2.6 Perceived Social Value toward Products Being Used and Customers' Affective Commitment toward Their Service Providers

Smart products such as smartphones or smart TVs cannot work without service providers like AT&T and Spectrum, and these providers bundle products and services so they can deliver desirable services to customers. For example, a laptop must receive Internet service from a provider to stay connected to the world-wide web. Social value is developed through social interaction and influential personal relationships [9], [10], and it increases affective commitment [9], [27] toward the service provider. Customers perceiving a strong social bond with their service providers become affectively committed to the provider [9], and they enjoy interacting and working with the service [20]. Extending social relationships with the assistance of a service provider may enhance affective commitment toward that provider.

H13: Perceived social value toward products being used positively and significantly impacts customers' affective commitment toward their service providers.

3.2.7 Perceived Emotional Value toward Products Being Used and Customers' Affective Commitment toward Service Providers

The literature shows that relationships exist between emotion-satisfaction [44], emotion-loyalty [64], and emotion-commitment [57]. Satisfied consumers have positive experiences, emotional ties [15], and experience pleasure and emotional value [55]. That is, emotional attachment to service providers results in customers' continuing to work with their current providers [2]. Since positive emotional ties influence customers' affective commitment [24], these emotions may evoke customers' feelings toward their service providers. A few studies investigated the mediation role of emotional value on customers' responses [4], [37], [41], [54]. This study hypothesizes that perceived emotional value mediates the effect of customer readiness on customers' affective commitment toward their service providers.

H14: Perceived emotional value toward products being used positively and significantly impacts customers' affective commitment toward their service providers.

H15: Perceived emotional value toward products being used mediates the effect of customer readiness on customers' affective commitment toward their service providers.

3.2.8 Perceived Functional Value toward Products Being Used and Customers Loyalty Intention toward the Brands They Are Currently Using

Research shows the impact functional value has on customers' loyalty intention [73], which is achieved through customer satisfaction [62]. Perceived functional value motivates customers to upgrade their products with other products of the same brand.

A few studies have been able to identify the mediation effect of customer value between customer readiness and customers' intention to continue using technology products [28], since perceived functional value is the main driver of

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consumers' decisions [22] [68]. Additionally, a few research studies have identified the mediation effect of perceived functional value on the relationship between customers' belief and customers' responses toward technology [37]. This study hypothesizes that perceived functional value mediates the impact of customer readiness on customers' loyalty intention.

H16: Perceived functional value toward products being used positively and significantly impacts customers' loyalty intention toward the brands they are currently using.

H17: Perceived functional value toward products being used mediates the effect of customer readiness on customers' loyalty intention toward the brands they are currently using.

4 Methodology

This study used quantitative research to obtain data and was conducted in a South Western Metropolitan Area in the U.S. It utilized purposive sampling of 174 young adults. At the beginning of the study, the researcher explained the purpose of the research to participants: to understand the impact of customer readiness on customers' upgrade intention, loyalty, and commitment as an effect of customer value. Second, 174 questionnaires were distributed to smartphone owners. All were returned and used in the analyses. Missing data was under 5%. Male and female respondents were evenly divided at 48.9% of the sample, and 2.2% of the respondents did not indicate their gender. The majority of the respondents had diplomas (45%) and college degrees (55%). The age of the respondents ranged from 18 to 46 years. Only respondents who owned smartphone were recruited for the study, and no incentive was offered for participation. Of the respondents, 43.7% had an annual income below $35,000, 51.1% earned between $50,000 to $ 135,000, and 5.2% earned above $140,000 annually. The questionnaire was two pages long, and it took about five months to collect the data.

Forty-seven items were borrowed from previous studies and adapted for this study. The scales used are as follow: customer readiness-role clarity (4 items), ability (5 items), extrinsic motivation (4 items), all from Meuter et al., (2005); emotional value (4 items) and social value (4 items), both from Sweeney and Soutar (2001) and Sheth et al., (1991); epistemic value (3 items) from Finch et al., (1998) [18]; functional value (7 items), monetary value (5 items), all from Sweeney and Soutar (2001) and Sheth et al., (1991); customers' upgrade intention toward smart products (3 items) from Lacovou et al., (1995) [32] and Wang and Tsai (2002) [75]; customers' loyalty intention toward the brands they are currently using (4 items) from Johnson et al., (2006) [33]; and customers' affective commitment toward their current service providers (4 items) also from Johnson et al., (2006) [33].

When the instrument was completed, two researchers familiar with the topic evaluated the content validity of the adapted measures and offered open-ended comments that resulted in several modifications in wording and formatting. Each construct was measured using a seven-point Likert scale, with 1 and 7 signifying *strongly disagree* and *strongly agree* endpoints.

5 Analysis and Results

First, SPSS was applied to check the internal consistencies using Cronbach's alpha. Ten of forty-seven items were eliminated from the original scales because they exhibited a low amount of item-total correlations. The deleted items were lower than the suggested threshold of .3 [52]. Cronbach's Alphas ranged from .642 to .967, which shows internal consistencies (Table 1). This study retained perceived epistemic value, which had a Cronbach's alpha close to .7 [13]. Ten items were eliminated due to their low level of Cronbach's alpha. After the reliability test, exploratory factor analysis (EFA) was applied to the thirty-seven items using the principal components method and Varimax rotation to ensure unidimensionality of the constructs. The results demonstrate that the data set was factorable (Kaiser-Meyer-Olkin measure of sampling adequacy = .836 and Bartlet test of sphericity: $\chi 2$ = 5,645; $p<.001$). No item was eliminated as a result of the EFA. The range of the factor loadings was from .476 to .976 (see Table 1). All factor loadings were higher than the minimal level, which is .3. As expected, eleven factors emerged with acceptable eigenvalues; the scree plot declined sharply after the eleventh factor. Additionally, based on Harman's single factor test [26], this study also examined common method bias variance to ensure a single construct explained 23.87 % of total variance, which is less than 50%.

The thirty-seven retained items were treated as an a priori model, and a confirmatory factor analysis (CFA) was conducted using AMOS software (Analysis of A Moment Structures) [3] to confirm the results of the EFA and test the convergent and discriminant validities of the eleven constructs. No item was eliminated in the CFA. The CFA results (see Table 1) confirmed the hypothesized underlying structure and construct validity [3]. The model fit the data well: $\chi 2$=928.434; degree of freedom = 623; p = 0.00; comparative-fit index (CFI) = .94; incremental fit index (IFI) = .94; (TLI) =.94; root mean square error of approximation (RMSEA) = .053; normed chi-square (N $\chi 2$=1.5). The standard loadings ranged from 0.50 to 0.98, and the average variance extracted (AVE) in each factor ranges from .538 to .919. Inter-factor correlations ranged from .008 to .77 (see Table 2). To test the convergent validity, factor loading and average variance extracted (AVE) were checked. Since the loadings and the average variances extracted were all above recommended thresholds of 0.5, the factors demonstrate acceptable convergent validity [48]. To examine the

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discriminant validity for the constructs, squared inter-factor correlations were compared with the average variances extracted [15], [19]. The results demonstrate that all constructs in this study fulfilled both convergent and discriminant validity. Table 2 shows the correlation between all the constructs, the means (M), and the standard deviations (SD).

Results were consistent with those of previous studies [28]: customer readiness is a reflective second-order construct [27] derived from ability (β=.804, p<.001), role clarity (β= .585, p<.001), and motivation (β=.661, p<.001). Customer readiness as a second-order construct in the model showed a better fit (CFI= .94, IFI= .94, TLI= .94, RMSEA= .05) compared with a model including ability, role clarity, and motivation as first-order constructs (CFI= .93, IFI= .93, TLI= .93, RMSEA= .05). Therefore, customer readiness is a second-order construct deriving from ability, role clarity, and motivation. Except for customer readiness, all other constructs are first order constructs. Table 1 shows the results for all the constructs of the reliability test (Cronbach's Alpha), the average variance extracted (AVE), the exploratory factor analysis (EFA), and the confirmatory factor analysis (CFA).

Table 1: Results of EFA, CFA, cronbach alpha and AVE

	EFA	**CFA**
Customer Readiness: Role Clarity (α= .678, AVE=.569)		
I am NOT sure how to use smartphones properly.(RC)	.865	.568
The steps required to use applications in smartphones are clear to me.	.790	.903
Customer Readiness: Ability (α= .865, AVE=.651)		
I am fully capable of using smartphones.	.879	.822
Using smartphones is well within the scope of my abilities.	.881	.822
I have confidence in my abilities regarding the use of smartphones.	.820	.776
Customer Readiness: Motivation (α= .677, AVE= .503)		
I like smartphones because they move me closer to advanced technology.	.882	.635
I like smartphones because they have many applications.	.476	.777
Perceived Emotional Value toward the Currently Using Product (α= .829, AVE=.618)		
Having a smartphone makes me feel relaxed.	.802	.700
It's been a pleasure to be an owner of my smartphone.	.709	.798
Owning a smartphone makes me feel good.	.745	.854
Perceived Social Value toward the Currently Using Product (α=.922, AVE=.751)		
Owning a smartphone makes me feel more acceptable to others.	.832	.859
Owning a smartphone makes me socially desirable.	.900	.939
Owning a smartphone makes a good impression on others.	.907	.876
Owning a smartphone improves the way I am perceived by others.	.874	.788
Perceived Epistemic Value toward the Currently Using Product (α=.642, AVE= .538)		
Using a smartphone satisfies my curiosity.	.773	.721
I like the experience of using my smartphone.	.751	.747
Perceived Functional Value toward the Currently Using Product (α=.918, AVE=.699)		
My smartphone is reliable.	.730	.704
My smartphone is well made.	.874	.890
My smartphone is a high quality product.	.884	.880
My smartphone performs consistently.	.876	.866
My smartphone fulfills my needs.	.836	.829
Perceived Monetary Value toward the Currently Using Product (α= .899, AVE=.651)		
My smartphone is reasonably priced.	.804	.709
My smartphone offers value for the money I paid for it.	.786	.829
My smartphone is worth the costs I incur.	.776	.820
Buying my smartphone was an economically sound decision.	.783	.747
My smartphone is a good purchase for the price.	.893	.916
Customers' Upgrade Intention toward Smart Product (α= .967, AVE= .910)		
I plan to upgrade to a more advanced smartphone in near future.	.966	.949
I intend to purchase a better smartphone in near future.	.976	.987
I predict I would buy a more powerful smartphone in near future.	.953	.925
Customers' Affective Commitment toward the Current Service Provider (α= .887, AVE= .731)		
I would like to continue my relationship with my current service provider.	.882	.906
If my current service provider were a person, I'd like to have him or her as a friend.	.897	.941
I genuinely enjoy my relationship with my current service provider.	.898	.836
I'd be very disappointed if I had to switch to another service provider.	.819	.723
Customers' Loyalty Intention toward Brands They Are Currently Using (α= .916, AVE=.698)		
Next time I need a smartphone, I will buy the same brand.	.878	.856
If I lose my smartphone, I will definitely buy the same brand again.	.823	.811
If I got any smartphone for free, I would choose the same brand.	.873	.939
I am very disappointed if I had to switch to a different brand of smartphones.	.789	.723

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Table 2: Correlation matrix, means (M) and standard deviations (SD)

	CR	EV	SV	EPV	FV	MV	UP	LO	AC	M	SD
Customer Readiness (CR)	.87									6.0	.8
Perceived Emotional Value toward Products Being Used (EV)	.42	.79								5.7	1.1
Perceived Social Value toward Products Being Used (SV)	.25	.45	.85							3.7	1.8
Perceived Epistemic Value toward Products Being Used (EPV)	.35	.64	.40	.64						5.8	1.1
Perceived Functional Value toward Products Being Used (FV)	.49	.57	.20	.47	.82					5.8	1.0
Perceived Monetary Value toward Products Being Used (MV)	.37	.29	.12	.31	.53	.79				5.2	1.3
Customers' Upgrade Intention toward Smart Product(UP)	.07	.21	.10	.08	.008	.07	.95			5.5	1.8
Customers' Loyalty Intention toward Brands They Are Currently Using (LO)	.20	.30	.15	.17	.50	.30	-.01	.85		5.3	1.6
Customers' Affective commitment toward Their Current Service Provider (AC)	.11	.14	.02	.05	.38	.35	.07	.29	.81	4.2	1.7

Note: Square root of AVE are reported on the diagonal; all correlation are significant at the 0.01 level.

5.1 Test of the Structural Model

The hypotheses were tested through structural equation modeling (SEM) using AMOS 18.0. The structural model showed a good fit to the data, suggesting that the research model was well developed. The test confirmed prior factor loading patterns, and overall model fit indices were within recommended ranges: $\chi 2$= 1046.45; CFI=.92; TLI=.91; IFI=.92; RMSEA=.060 [59]. Customer readiness is significantly (α = .001) and positively associated with its five hypothesized perceived customer value types, including functional (β = .572; p < .001), social (β = .501; p<.001), emotional (β = .921; p<.001), monetary (β = .405; p<.001), and epistemic value (β = .936; p < .001). As expected, the first five hypotheses, H1 through H5, are supported. Among the five different value types, only perceived functional value (β = -.328; p < .001) and perceived emotional value (β = .553; p<.01) significantly impact customer's upgrade intention toward smart products. The negative sign represents the proposition that when perceived functional value is too high, customers are unwilling to upgrade the products they are using. Hypotheses H6, H7, and H12 are not supported; however, H8 and H10 are. As predicted by H14, the path from perceived emotional value to customers' affective commitment toward their current service providers is positive and significant (β = .273; p < .01). In relation to the effect of perceived functional value and customers' loyalty intention toward their current brands, this study shows that perceived functional value (β = .553; p < .001) has a significant impact on customers' loyalty intention toward the brands they are currently using, which means that H16 is supported. Table 3 provides a summary of path coefficients and results of the hypotheses. This study also controlled the impact of variables age (β = .037; p > .1), income (β = .011; p > .1), sex (β = .032; p >.1), and education (β = .035; p >.1) on customers' upgrade intention.

Table 3: Hypothesis testing with SEM (structural model)

Path	Hypothesis	Path Coefficient	Significance Level	Results
Customer readiness-→Perceived social value toward products being used	H1	.501	p< .001	Supported
Customer readiness-→ Perceived monetary value toward products being used	H2	.405	p< .001	Supported
Customer readiness-→ Perceived functional value toward products being used	H3	.572	p< .001	Supported
Customer readiness-→ Perceived emotional value toward products being used	H4	.921	p< .001	Supported
Customer readiness-→ Perceived epistemic value toward products being used	H5	-.936	p<.001	Supported

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Table 3: continuation				
Perceived social value toward products being used →Customers' upgrade intention toward smart product	H6	-.108	p> .1	Not Supported
Perceived monetary value toward products being used →Customers' upgrade intention toward smart product	H7	.082	p> .1	Not Supported
Perceived functional value toward products being used →Customers' upgrade intention toward smart product	H8	-.328	p< .001	Supported
Perceived emotional value toward products being used →Customers' upgrade intention toward smart product	H10	.553	p< .01	Supported
Perceived epistemic value toward products being used →Customers' upgrade intention toward smart product	H12	.090	p> .1	Not Supported
Perceived social value toward products being used →Customers' affective commitment toward their current service provider	H13	-.870	p > 01	Not Supported
Perceived emotional value toward products being used →Customers' affective commitment toward their current service provider	H14	.273	p < .01	Supported
Perceived functional value toward products being used →Customers' loyalty intention toward brands they are currently using	H16	.553	p < .001	Supported

$\chi 2$ = 1046.45; CFI=.92; TLI=.91; IFI=.92; RMSEA=.060

To examine H9, H11, H15, and H17, the procedure suggested by Zhao et al. (2010) was followed. AMOS with bootstraps analysis specifying a bias-corrected 95% confidence interval (CI) 5000 subsamples was conducted [76].

Perceived functional value toward products being used acts as a competitive mediator in the relationship between customer readiness and customers' upgrade intention with a positive significant direct effect (β = .404; p =.02, CI= 95%) and a negative and significant indirect effect (β = -.143; p = .024, CI= 95%) [68]. The effect of customer readiness on customers' upgrade intention is mediated by perceived functional value, which means H9 is supported. Perceived emotional value toward products being used is a complementary mediator, or it partially mediates the effect of customer readiness on customers' upgrade intention, with a positive and significant indirect effect (β = .236; p = .009, CI= 95%). Therefore, H11 is supported. The mediation results also show that perceived emotional value toward smart products is a competitive mediator in the relationship between customer readiness and customers' affective commitment toward their current service providers, with a positive significant direct effect (β = .844; p = .01, CI= 95%) and an indirect effect (β = -.599; p = .04, CI= 95%), which means H15 is supported. The results also confirm that perceived functional value fully mediates the effect of customer readiness on customers' loyalty intention toward the brands they are currently using, with a positive significant indirect effect (β = .333; p = .000) and a non-significant negative direct effect (β = -.060, p > .1, CI= 95%). Therefore, H17 is supported. Table 4 shows indirect, direct and total effects.

Table 4: Results of mediation test: Indirect, direct and total effects

Path	Hypothesis	Indirect Effect	Direct Effect	Total Effect	Results
The Mediation effect of functional value →Customers' upgrade intention toward smart product	H9	β=-.134 p= 02	β=.404 p= .02	β =.315 p=.01	Competitive mediation
The Mediation effect of emotional value→ Customers' upgrade intention toward smart product	H11	β=.236 p=.009	β=. 404 p = .02	β =313 p=.03	Complementary mediation
The Mediation effect of emotional value→ Customers' affective commitment toward their current service provider	H15	β=-.599 p=.04	β=.844 p= .01	β=.278 p=.02	Competitive mediation
The Mediation effect of perceived functional value→Customers' loyalty intention toward brands they are currently using	H17	β =.333 p=.000	β= -.06 p > .1	β=.266 p=.03	Full mediation

6 Discussion and Conclusion

This study shows that customer readiness, a key concept, is able to evoke positively all five types of customer value: functional, emotional, social, monetary, and negative epistemic value. For instance, smart TVs have novel qualities that enable customers to cast a movie or music to other devices such as an iPhone, and they enable customers to

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download applications such as Pandora, Netflix, and so on. All these functional, social, and entertainment features are enjoyable for customers if they know how to use them. As customers become knowledgeable about using smart products, their sense of curiosity about interacting with the product's novel features with which they are familiar diminishes. Smartphones are used frequently because they are interactive and entertaining as long as customers know how to use all their features.

Interestingly, this study did not find any significant impact arising from perceived social value, monetary value, and epistemic value on customer's upgrade intention toward smart products. The results of this study are consistent with those of previous studies (e.g., [57]): epistemic value toward products being used does not influence customers' upgrade intention. Contrary to Pura et al. (2005), this study did not find any significant impact of perceived monetary value toward products being used on customers' upgrade intention. This lack of impact might be attributed to the fact that newer models of smart products are expensive, so price sensitive customers may be unwilling to buy them. Also consistent with Pura et al. (2005), epistemic value toward products being used does not impact customers' upgrade intention toward smart products. The literature shows that perceived epistemic value may drive customers' adoption decisions (e.g., [57]), but this study did not find any significant impact on customers' upgrade intention. The failure might be related to the extent to which smart products meet customers' needs. If the products being used satisfy customers' social needs and sense of curiosity needs, they are unwilling to upgrade their current products with new ones. It seems social, monetary and epistemic values are not what customers' desire; emotional and functional values are. Interestingly, the results indicate that perceived emotional value acts as a complementary mediator, and perceived functional value acts as a competitive mediator in the relationship between customer readiness and customers' upgrade intention. Perceived emotional value is a significant mediator in the relationship between customer readiness and customer's upgrade intention as well as customers' affective commitment toward their service providers.

Through interaction with service providers, perceived emotional value stimulates customers' affective commitment to stay with the same provider even if they upgrade their products. Consistent with prior research, this study found that perceived emotional value triggers customers' sense of affiliation with service providers [2], [57]. Affective commitment is based on emotional ties, and customers become affiliated or attached to their service providers [31]. The insignificant impact of perceived social value on customers' affective commitment toward their service providers is consistent with that of Pura (2005). This lack of impact might be related to the fact that many people who use smart products such as smartphones do not contact their service provider unless they have a problem with their product, so perceived social value generated by the product does not motivate customers to build an affective commitment toward their current service provider.

Moreover this study demonstrates the full mediation of perceived functional value in the relationship between customer readiness and customers' loyalty intention toward the brands they are using. Finally, also, and consistent with the literature, perceived functional value has the most significant impact on customers' loyalty intention toward the brands they are already using (e.g., [62]). Customers expect their products to function properly; otherwise, they are not likely to be willing to repurchase the same brands of products. Perceived functional value is a main indicator of customers' loyalty intention toward brand. Further, although rational customers are price sensitive (e.g., mobile services, [57]), price does not seem to influence customers to maintain their relationships with a brand. Results demonstrate that the perceived functional value of a product being used strongly motivates customers' loyalty intention toward the brand they are currently using. Strong emotional ties with the brands are created toward product use when customers perceive functional value.

This study sheds light on the competitive mediation impact of perceived functional value and the complementary mediation impact of emotional value in the relationship between customer readiness and customers' upgrade intention. The results indicate that as perceived functional value increases, customers' upgrade intention decreases. On the other hand, as customer readiness increases, customers' upgrade intention also increases unless customers' perceived functional value interferes with this relationship. As customer readiness increases, perceived functional value increases because the existing product meets customer's needs. Therefore, customers are less likely to upgrade their products when the products meet their expectations.

Perceived emotional value acts in the opposite direction. Perceived emotional value had the most significant impact on customers' upgrade intention toward smart products because an emotional bond was created through product use. What actually occurs is that customers establish emotional ties with a product's technology rather than the physical product. As customers become ready to use a product, they perceive emotional value and thus are more likely to upgrade their products. Perceived emotional value associated with product use encourages customers to upgrade, whereas customers are less likely to upgrade products when the products satisfy customers' expectation of functional value. It is not mainly perceived functional value that motivates customers to upgrade their products when their products meet their needs. As functional value associated with product use satisfies customer's needs, they are less likely to be interested in upgrading; however, emotional bonds with technology associated with smart products do encourage customers to upgrade their products. Customers who become attached to technology and build an emotional bond with it are more willing to upgrade their products when a newer model becomes available.

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7 Theoretical Contribution

The important role of emotion on information processing as well as the mediation role of emotion on customers' responses has been identified in the literature [5]. Consumers' emotional feelings influence the processing of information regarding product evaluation and judgment [5]. Emotion may drive and mediate consumers' responses by motivating them to act or by inhibiting an act [5], [54], [65]. This study contributes to the literature by showing the interesting impact of perceived functional and emotional value formed through product use on customers' post-adoption behavior. The results indicate that emotional value is a significant mediator on the relationship between customer readiness and consumers' upgrade intention toward smart products as well as customers' affective commitment toward their service providers. That is, ready customers perceive more emotional value toward products and technology. When they become technologically savvy and are more likely to know how to handle problems created by product use, they have less affective commitment toward their service providers. Customers that have strong emotional bonds with technology are usually more innovative and less likely to commit toward service providers. On the other hand, customers with less technological knowledge and weaker emotional ties with technology develop more emotional bonds with their service providers. Customers' affective commitment toward service providers is based on their emotional ties to technology. Customers with weaker emotional ties to technology are motivated to continue receiving services from their current providers. Technologically savvy customers with strong emotional ties to technology, on the other hand, have less affective commitment toward service providers.

This study also sheds light on the complementary mediation effect of emotional value and the competitive mediation effect of functional value on the relationship between customer readiness and customers' upgrade intention. Customers build emotional ties with a product's technology. Smart products involve interactive features that keep customers entertained, and, subsequently, emotional bonds are constructed through an interaction with a product's technology. In fact, it is a product's technology, not the product per se, that empowers customers and forges strong emotional bonds with products. Customers can become attached to a product's technology, and if it functions properly, they are likely to be strongly motivated to upgrade their products.

Moreover, products with functional benefits trigger brand loyalty. Perceived functional value toward products being used motivates customers' loyalty intention toward the brands they are using. When products satisfy customers' functional needs, they are less likely to be willing to upgrade their products because the products they are using meet their functional needs and expectations. On the other hand, when products being used fail to meet customers' functional needs and expectations, they are more likely to be willing to upgrade their products. Perceived functional value is inversely associated with customers' upgrade intention toward smart products.

In sum, emotional ties are built upon services offered by providers as well as a product's technology. Customers' emotional desires toward products they are using are not bounded, whereas customers' functional needs are bounded. Customers are more likely to be willing to upgrade their products to acquire more emotional value. In fact, perceived emotional value stimulates customers' intention to upgrade, as they desire more relaxing moments and pleasure. Perceived emotional value generated by using a product motivates consumers not only to upgrade their products but also to remain with the same service provider. That is, consumers' upgrade intention toward smart products is formed as consumers' emotional ties with a product's technology are established. Perceived emotional value is a major factor motivating consumers to upgrade their products as well as retain their service provider.

Nowadays, consumers spend considerable time using their smart products, smartphones in particular. As the results indicate, consumers perceive emotional value toward a product's technology rather than the physical product. Smart products have a screen, and without the proper technology, these products do not function well. Therefore, it is a product's technology that entertains customers, enables them to stay connected, to be knowledgeable, and interactive. These technological features are what motivate customers to establish emotional ties with technology rather than physical products.

As technology advances, consumers become more dependent on their smart products and increase the time spent interacting with digital content. Customers want and expect their smart products to entertain them and to function properly. When the products they are using satisfy customers' needs, they are not likely to be interested in upgrading their products. But perceived emotional value generated by using a product strongly motivates customers to purchase a new version and remain with their current service providers.

8 Managerial Implications

This study has important implications for companies that produce and market smart products. First, companies can use perceived emotional value and functional value to segment their target market. Customer retention is a challenge, especially when technology advances so quickly. Sometimes customers are overwhelmed by too many technology-based choices because each smart product may require special instructions. Hence, the development of effective products to satisfy customers' needs and desires becomes necessary so that customers can readily discover the real value of using a company's smart product. Therefore, retailers must train customers on using their products. By

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engaging in this training, customers experience all five types of value because they will be guided as they use smart products.

This study's results also show that perceived functional and emotional value have the most impact on customers' upgrade intention. Companies should make it a point to develop products with reasonable functional quality if they care about customer loyalty. The results indicate the full mediation effect of perceived functional value on the relationship between customer readiness and customers' upgrade intention, so developing products that deliver high functional quality connects with customers and while also building and maintaining customer loyalty.

Interestingly, emotional value is a competitive mediator in the relationship between customer readiness and customers' affective commitment [41] and a complementary mediator on the relationship between customer readiness and customers' upgrade intention. When product designers develop a new product with minor functional attributes, it becomes necessary to consider such emotional product attributes as aesthetics and/or beauty and the entertainment attributes that can attract customers' attention and motivate their upgrade intention.

Perceived emotional value in smart products motivates customers to continue receiving service from their current providers even if the customers have alternatives [22]. To drive emotional value, smart products might include highly interactive features that facilitate communication with customers and entertain them while they use the products.

Since perceived emotional value encourages customers to upgrade their products, designing products with interactive and novel features that engage customers with a product's technology is imperative. For instance, smartphones supporting augmented reality features empower customers to engage with a product's technology and brand. The technology not only entertains customers, it also forges emotional ties between the technology and the customers. Product designers must pay attention to customers' functional needs and emotional desires when they launch a new product.

9 Limitation and Future Research

This study has some limitations. First, it used only the smartphone as a smart product because it is widely used. New interactive smart products such as Fitbit, Google Glass, smart refrigerator, or Amazon's Alexa might be used for future research. Second, the sample size was small. For future research, more interactive and advanced products such as home robots like Kuri might be investigated. Because smart products request users' information, fully understanding how these products violate customers' information privacy and how they respond to violations of their privacy is crucial. Additionally, it might be interesting to understand how such moderating variables as the level of interactivity with smart products, personality traits, or personal innovativeness might strengthen or weaken the hypothesized relationships.

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