EFFECT OF PRODUCT QUALITY CONFORMANCE AND AESTHETICS ON CUSTOMER SATISFACTION OF ELECTRONIC PRODUCTS IN ABUJA, NIGERIA

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Abstract
This study investigates the relationship between product quality and customer satisfaction in the context of electronic products in Abuja, Nigeria. In today's modern and globalized business world, companies strive to provide high-quality products and services to gain a competitive advantage, achieve customer satisfaction, and foster customer loyalty. The survey research design employed in this study targets users of electronic products such as Air-conditioners, refrigerators, washing machine, gas burners, television, micro waves. The sample size of 384 respondents was determined using the infinite population formula, and primary data was collected through structured questionnaires utilizing a five-point Likert scale. The data analysis was conducted using partial least squares-structural equation modeling (PLS-SEM). The study focuses on two dimensions of product quality: conformance and aesthetics, and their impact on customer satisfaction. The findings reveal that aesthetic has a positive and significant influence on customer satisfaction, indicating that higher levels of aesthetics contribute to greater customer satisfaction. On the other hand; conformance does not have a significant effect on customer satisfaction, indicating potential deficiencies in the conformance levels of electronic products in Abuja. Based on these conclusions, recommendations are provided to enhance customer satisfaction in the electronic product industry. It is recommended that producers and marketers focus on how to change conformance levels through measures such as strict enforcement of standards, quality control, and certification programs. Additionally, investing in aesthetics practices is crucial, and strategies such as collaboration with designers, market research, consistency, and customer feedback should be implemented to enhance aesthetics.
Keywords*: Product Conformance, Product Aesthetics, Customer Satisfaction, Electronic Products, Abuja, Nigeria*

INTRODUCTION

In today's modern, competitive, and globalized business world, the key point to sustain a competitive advantage lies in the quality of product or service that companies could provide, which in turn will result in effective customer satisfaction and retention. What is more, a winning strategy entails the necessity to build positive relationship with target customers and delivering superior value over competitors (Kotler, 2009; Nguyen, 2021). Consumer loyalty to a company is reflected in the consumer's habits to see the quality of the product and service, so consumers make ongoing purchase. The consumer is an asset that is not biased for a product or service business. This is because the consumer is a party that needs the product or service offered by the company. Good product or service quality will make consumers like the products offered by the company. Meanwhile product and Service quality and customer satisfaction have been widely recognized as fundamental drivers in the formation of purchase intentions (Nguyen, 2021). The concepts are important for companies to gain long-term competitive advantage and retain customers. Several scholars suggest that there is a critical relationship between these variables, which is also a critical determint of brand equity and customer loyalty.

Quality is a complex and multifaceted concept. In its broadest sense, product quality is the ability of a product to meet or exceed customer's or user's expectations (Waters &Waters, 2008). The most common operational definition posits quality as the customer's perception of product and service excellence. In today's competitive environment, quality is the key to an organization's success and survival. Intense global competition has highlighted the increasing importance of quality. Superior quality no longer differentiates competitors; instead, it validates the worthiness of a company to compete (Giffi et al., 1990). Fundamentally, product quality is a whole of the characteristics of the product that affects its ability to satisfy the expressed or implied needs (Olise & Ojiaku, 2018). Product quality according to Lupiyoadi and Hamdani (2013) is the extent to which the product meets its specifications. The criteria for assessing a product of good quality are relative, meaning that everyone will have different ratings. The quality of a product can be proven by

comparing the quality of similar products with different brands by testing them in some aspects of its ease of maintenance (Daultani et al., 2020).

Similarly, in a product setting, the attributes of product quality such as conformance and aesthetics (Garvin, 1984) were vital in obtaining customer satisfaction (Jaafar et al., 2012). From the perspective of electronics, the success of any product is judged from the value derivable from it. For instance, conformance which addresses the precision with which the product or service meets the specified standards is a vital element defining the quality of a project. This quality is associated with the suitability of the products with their industry standards. The conformity of a product in the form of electronic perspective is measured from the level of accuracy and completion of time including calculation of errors, unanticipated delays and some other errors.

On the other hand, aesthetics which is the most subjective measurement dimension are seen through how a product is heard by consumers, how to look beyond product, taste, and smell. So, the aesthetics are obviously the valuation and reflection felt by consumers. The outward beauty that a product portrays in the eyes of the consumers and how that attracts such consumers leading to satisfaction and loyalty.

The quality of a product can contribute to the success of a company reviewed from customer satisfaction, employee satisfaction, and company profitability. Quality service products play an essential role in establishing customer satisfaction (Kotler & Armstrong, 1996). The more qualified the product provided, the higher the customer satisfaction. When customer satisfaction is higher, it can generate profit for the business entity.

Global competition has forced various industries to produce quality products that are not only functional but also customized, easy to use and service, economical and environmentally-friendly. Satisfaction has consistently been a source of concern to clients, stakeholders and customers globally. Now companies must satisfy every customer needs and aspirations by consistently producing products that meet expectations. Also, customer satisfaction is an important fact in appreciating a firm's performance, since it turns out to be an output in running a flourishing business. This is because, in current times, better performance is a priceless vigor to press forward a firm's profit and sustainable development (Harcourt & Ikegwuru, 2020). It also develops into the most imperative focal point for global businesses. Specifically, sustainable customer satisfaction ought to be within reach, but as luck would have it, it is not the case in the Nigerian electronic merchandize industry.

The set back is that the level of customer satisfaction recorded by these firms in terms of repeat purchase, loyalty, and advocacy is abysmal. Worst still, customers move to other brands and this can have long-term consequences on company's image (Nair, 2013). It is quite possible that this worrisome situation could be abated if firms enthusiastically pursue product quality in their business operations. Not just that, given the peculiar nature of the industry as it is imperative to provide high quality products to users during and after sales to retain customer's confidence. The observation is that customers in this industry move from one brand to other not just due to dwindling in quality but other sales services not provided adequately and efficiently as well as at the disposal of customers making repeat purchases difficult.

Empirically, previous studies have been carried out on the nexus between product quality and customer satisfaction and loyalty (Zygiaris et al., 2022; Pradnyadewi & Giantari, 2022; Adhi & Usman, 2021; Bashir et al., 2020; Muafa et al., 2020; Bae 2012; Khan, 2012; Senthilkumar, 2012; Cruz 2015) in foreign countries. Unfortunately, these studies were conducted in other economies and as such their findings cannot be used for effective decision in the Nigerian context due to ontological, methodological and behavioural complexities. Hence, the need for this current study.

In Nigeria, some studies (Ejika & Ukpata, 2022; Uwabor et al., 2021; Harcourt & Didia, 2020; Opele et al., 2020; Aremu et al., 2018; Olise & Ojiaku, 2018; Obunno, 2016) researched on the influence of product quality and service quality on either customer satisfaction or customer loyalty in the automotive, curtain, banking, consumer goods, detergent, transportation industry, telecommunication, food and service industry. This study dwelt on mostly durables and services to customers with no study to the researcher's knowledge and as literature reveals focusing on product quality of the different brands of electronic merchandise in Nigerian context. The outcome of these studies also presented mixed findings with others presenting positive, negative and inconclusive findings leaving this area amenable for further studies. The objective of this study is to bridge these research gaps by examining two dimensions of product quality conformance and aesthetics to determine whether each dimension has significant effects on customer satisfaction for electronic products in Nigeria.

The following hypotheses were stated for the study**:**

Ho_1: Conformance has no significant effect on customer satisfaction of electronic products in Abuja, Nigeria

Ho_2: Aesthetics has no significant effect on customer satisfaction of electronic products in Abuja, Nigeria.

LITERATURE REVIEW

Concept of Product Quality

According to Wiseman (1996), product quality is a dynamic condition related to products, services, people, processes and environments that meet or exceed expectations. Meanwhile, according to Kotler and Armstrong (2012) product quality is "the ability of a product in performing its function, it includes overall durability, reliability, accuracy, ease of operation conformance and aesthetics". Furthermore, Mustafa (2011) states that customers will be satisfied if their evaluation results show that the products, they use are qualified. Kotler and Armstrong (2012), Product quality is the whole feature and of a product or service on the ability to satisfy the stated/implied needs. Furthermore, Mutum and Ghazali (2010) argue that the product is the result of production to be thrown to the customer for distribution and use by

Conformance

Conformance refers to the degree to which a product or service meets established standards, specifications, or customer requirements (Juran & Godfrey, 1999). It signifies the alignment of the characteristics, features, and performance of the product or service with the predetermined criteria. Conformance is crucial for achieving consistency and meeting customer expectations by ensuring that the product or service adheres to quality standards.

Conformance, as described by Harrington (2005), refers to the degree to which processes, activities, or operations comply with established standards, procedures, or regulations. It focuses on consistently following prescribed guidelines and meeting required criteria in organizational operations. Conformance is essential for achieving efficiency, effectiveness, and compliance within organizations.

Feigenbaum (1961) defines conformance as the extent to which a product or service meets established standards and specifications. It involves ensuring that the product or service conforms to the desired requirements and meets the predetermined criteria for quality. Conformance is essential for delivering consistent and reliable products or services to meet customer expectations.

Aesthetics

According to Berlyne (1974), aesthetics is potentially an important measurement for consumers to evaluate and differentiate among product offerings and to make purchasing decisions (Meyers-Levy & Zhu 2010). Aesthetics is used in reference to either sensitivity to beauty or to the branch of philosophy that provides a theory of the beautiful and the fine arts (Venkatesh & Meamber 2006). Throughout much of the work conducted in disciplines that have focused on aesthetics, a 'philosophy of art' definition has been linked

with the term aesthetics, which has resulted in some debate among consumer researchers regarding a suitable definition of the aesthetic aspect of consumption. Some in the field prefer to apply aesthetic experience only to so-called 'artistic' or 'cultural' products, while others acknowledge that virtually any product can be appreciated in an aesthetic sense (Holbrook 1981; Olson 1981).

Leder et al. (2004) define aesthetics as the psychological and perceptual processes underlying the experience of beauty and visual appeal. It explores the interplay between sensory information, cognitive processes, and emotional responses when individuals engage with aesthetic stimuli. Aesthetics encompasses factors such as the organization of visual elements, the use of color and light, and the presence of aesthetic qualities that evoke positive emotions. Understanding aesthetics is essential in various fields, including design, marketing, and the arts, as it provides insights into creating visually appealing and engaging experiences that enhance customer satisfaction and enjoyment.

According to Cupchik (2002), aesthetics involves the psychological and perceptual processes that occur during the experience of art and other aesthetic phenomena. It explores how individuals interpret and derive meaning from aesthetic stimuli, such as paintings, sculptures, literature, or performances. Aesthetics encompasses cognitive processes, emotional responses, and the overall subjective experience when engaging with artistic expressions. Understanding aesthetics in the context of art allows researchers to investigate the factors that contribute to individuals' aesthetic preferences, interpretations, and satisfaction.

Customer Satisfaction

Rust and Oliver (1994) suggest that customer satisfaction or dissatisfaction is a cognitive or affective reaction which emerges as a response to a single or prolonged set of service encounters. In the words of Giese and Cote (2000), consumer satisfaction comprises three basic components including the type of response (cognitive, affective or conative); the centre of interest or the subject on which the response is focused; and the moment in time at which the evaluation is made. But Anderson and Fornell (1994) are of the view that the literature is not very clear about the distinction between quality and satisfaction. Satisfaction is a post consumption experience which compares perceived quality with expected quality. As expressed by Levesque and McDougall (1996), satisfaction is conceptualized as an overall, customer attitude towards a service provider. Also, customer satisfaction has been described as an effective response, focused on product performance compared to some pre purchase standard during or after consumption (Halstea et al., 1994). Mano and Oliver (1993) establish that satisfaction is an attitude or evaluative judgment varying along the hedonic continuum focused on the product or service, which is evaluated after consumption. This was reechoed by Fornell (1992), when he identified satisfaction as an overall evaluation based on the total purchase and consumption expectations overtime. Customer satisfaction is the result of a comparison between customer purchase of the expected performance with actual performance and perceived and payment expenses.

Empirical Review

Conformance and Customer Satisfaction

Garcia et al. (2019) conducted a survey-based quantitative study in Spain to investigate the impact of conformance on customer satisfaction in the service industry. Participants were asked to rate their perceptions of service delivery conformance and their overall satisfaction with the services received. The findings indicated a significant positive relationship between conformance and customer satisfaction. Customers who experienced higher levels of conformance in service delivery reported greater satisfaction. However, the study relied on self-reported data, and the results may be influenced by subjective interpretations of conformance and satisfaction.

Nguyen et al. (2020) conducted a mixed-methods study in Vietnam, combining surveys and interviews, to explore the relationship between conformance and customer satisfaction in the food industry. Surveys were administered to customers, and interviews were conducted with restaurant managers. The findings revealed

that customers' perceptions of conformance to food quality and safety standards significantly influenced their satisfaction levels. Customers who perceived high levels of conformance reported higher satisfaction with the food they consumed. However, the study had a limited sample size and focused on a specific industry, which may affect the generalizability of the findings.
Martinez and Lopez (2020) conducted a cross-sectional study in Mexico to examine the impact of conformance on customer satisfaction in the telecommunications industry. They collected data through online surveys administered to customers, assessing their perceptions of service reliability and conformance to service level agreements. The findings demonstrated a positive relationship between conformance and customer satisfaction. Customers who perceived a high level of conformance to service agreements reported higher satisfaction levels. However, the study relied on self-reported data, which may be influenced by recall biases or subjective interpretations of conformance.

Chen and Liu (2021) conducted a quantitative study in China to investigate the impact of conformance on customer satisfaction in the financial services industry. Using surveys, they collected data from banking customers, assessing their perceptions of service quality and conformance to banking regulations. The findings revealed a positive relationship between conformance and customer satisfaction. Customers who perceived a higher level of conformance to regulations reported higher satisfaction with the financial services they received. However, the study was limited to a specific industry and relied on self-reported data, which may introduce biases or inaccuracies.

Aesthetics and Customer Satisfaction
Lee et al. (2018) conducted a quantitative study in South Korea, investigating the relationship between aesthetic design and customer satisfaction in the smartphone industry. Data were collected through surveys administered to smartphone users, assessing their perceptions of aesthetic attributes such as device appearance, user interface design, and overall visual appeal. The results showed a positive correlation between aesthetic design and customer satisfaction. Smartphone users who perceived higher aesthetic quality reported higher levels of satisfaction with their devices. However, the study relied on self-reported data, which may be influenced by subjective interpretations or biases.

Park and Kim (2020) conducted a quantitative study in South Korea, examining the impact of aesthetic design on customer satisfaction in the restaurant industry. They collected data through surveys administered to restaurant patrons, assessing their perceptions of aesthetic elements such as interior decor, table settings, and plating presentation. The results demonstrated a positive association between aesthetic design and customer satisfaction. Patrons who perceived higher aesthetic quality in the restaurant environment reported higher levels of satisfaction with their dining experience. However, the study was limited to a specific cultural context and may not fully capture the broader restaurant industry.

Park and Hong (2021) conducted a quantitative study in South Korea, examining the impact of aesthetic design on customer satisfaction in the retail store environment. They collected data through surveys administered to retail store shoppers, assessing their perceptions of aesthetic elements such as store layout, visual merchandising, and overall atmosphere. The results revealed a positive relationship between aesthetic design and customer satisfaction. Shoppers who perceived higher aesthetic quality in the retail environment reported higher levels of satisfaction with their shopping experience. However, the study was limited to a specific cultural context and may not fully generalize to other regions.

Theory of Effort-Satisfaction theory
This theory of effort-satisfaction by Hanna and Wagle (1989) holds that a relationship exists between the effort expended by a customer in purchasing a product and the experienced satisfaction from the use of such product. Championed by Hanna and Wagle (1989), these authors sought to discover why different customers who had expended the required (baseline) effort for a given product, experience different levels of satisfaction. The authors Hanna and Wagle (1989) introduced the Optimal Stimulation level (OSL) which

indicates that different stimulation or excitement levels exist for different people for a particular product or service. Adopted from the optimal stimulation theory, which states that "every individual seeks an optimal stimulation level (Hanna and Wagle 1989), the authors identified that there exist different things that are of interest, stimulate and excite people with respect to a particular product or service, such as the quality, price, availability, aftersales maintenance, etc. Hanna and Wagle (1989) in conclusion showed through their studies that the OSL greatly influences the effort expended by an individual with respect to the level of satisfaction experienced.

METHODOLOGY

This study will adopt a survey research design. The population of this study covers the users of electronic products in Abuja such as air conditioners, Televisions, refrigerators, Washing machines, gas burners and micro waves within Abuja of Nigeria. These are products with life expectancy of five years and above. Population of this kind are undeterminable. This is because the exact number of those who use these products cannot be ascertained, as data for such is not available. This condition therefore relegates the researcher to adopting the infinite population and sampling determination.Therefore, the infinite formula for determining sample size used to determine a sample size for this study. The sample formula is by Cochran (1971).

$$SS = \frac{Z^2 * (p) * (1-p)}{C^2}$$

Where SS = Sample Size, Z = the Z-values, P= Proportion, C= margin of error
Z- value at 95% confidence internal = 1.96; P = 0.5; Margin of error = +/-0.05

$$SS = \frac{1.96^2 * (0.5)}{0.05^2} * (0.5) = 385$$

Therefore, the sample size of the study was a minimum of 384 respondents. The respondents were selected purposively according to criteria specific to this study that the respondents should be resident in Abuja and must have used or are using electronics products in Abuja. Primary data was used for this study and was sourced using structured questionnaire. The questionnaire contained only closed-ended questions structured on a five-point Likert Scale ranging from: 5 =strongly agree 4=agree 3=undecided 2=disagree 1=strongly disagree. This study utilized partial least square-structural equation modeling (PLS-SEM) for data analysis. The hypothesized partial least square-structural equation model (PLS-SEM) for this study is presented below, where CS= Customer Satisfaction, CON=Conformance, AES= Aesthetics:

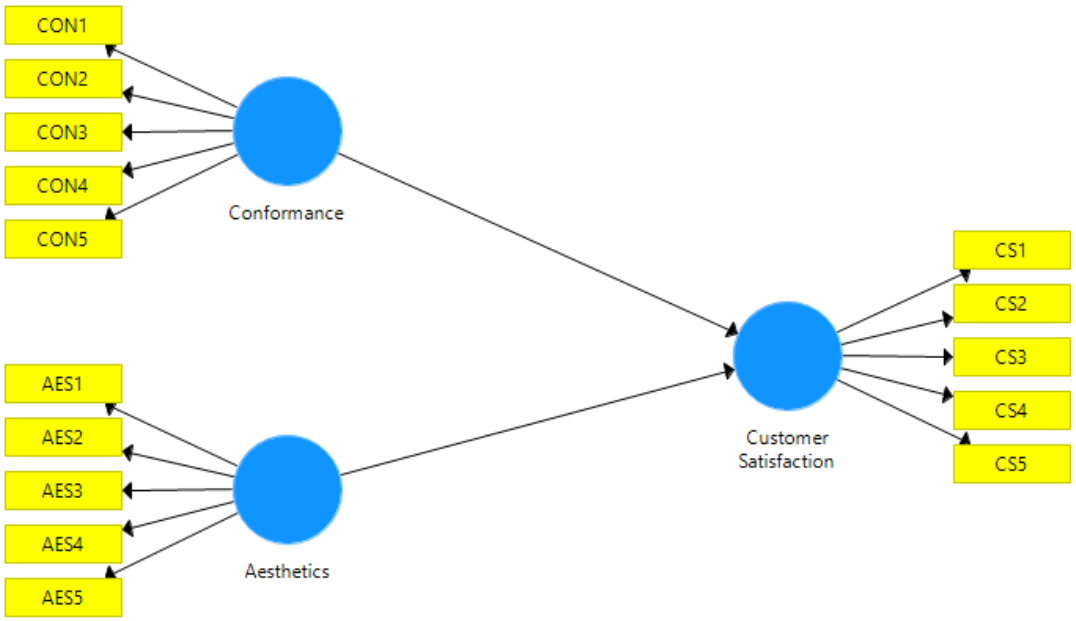

Figure 3.1: Hypothesized Structural Model for the Variables of the Study
Source: Researcher's Development in SmartPLS (2023)

RESULTS AND DISCUSSION

The study collected data on product quality and customer satisfaction of electronic products in Abuja, Nigeria. The data was collected electronically using Google Forms data collection tool. The study collected responses from three hundred and eighty-four (384) respondents in line with the recommended sample size of the study. The data was analyzed using structural equation modelling (SEM) in SmartPLS statistical software. The PLS Algorithm, Bootstrapping and PLS Predict calculations were conducted to arrive at the needed components required to meet the analysis objectives and requirements of the study. Table 1 shows the descriptive statistics of the measurement variables of the data collected. A total of twenty (15) questions were set in the questionnaire, out of which all loaded correctly after the factor analysis. No questionnaire items were removed from further analysis. The questionnaire responses were based on 5-point Likert scales of Strongly Disagreed, Disagreed, Undecided, Agreed and Strongly Agreed. These scales were coded as 1, 2, 3, 4, and 5 respectively.

Table 1 showed the mean responses to each of the question for all the respondents, the median, the minimum, the maximum, and the standard deviation of the responses. The median is an appropriate measure of the average in this instance because of outliers. Although, from the minimum and maximum values, there is no sign of outliers, but it is still necessary to state that the best measure of average for an ordinal response is median. Furthermore, the table also showed that there were no missing values for all the responses.

Table 1: Summary Statistics of the Measurement Variables for the Study

Item	Measurement Factor	Missing	Mean	Median	Min	Max	Standard Deviation
CON1	Quality of goods reflect the suitability of the products with their industry standards	0	4.192	5	1	5	1.029
CON2	Electronic products in the market today have a high measured level of accuracy	0	4.265	5	1	5	0.966
CON3	Electronic products today meet the perceived specifications of the customers	0	4.273	5	1	5	1.015
CON4	Lack of conformance is creating a situation of non-repeating customers in the market	0	4.288	5	1	5	0.955
CON5	The conformity of an electronic product in the market is measured from the level of accuracy	0	4.047	4	1	5	0.974
AES1	Electronic companies are sensitivity to the beauty of their products	0	3.799	4	1	5	1.069
AES2	Aesthetic has a role in consumer buying behaviour	0	3.529	4	1	5	1.083
AES3	Aesthetics is based personal judgment and a reflection of customer preference	0	3.732	4	1	5	1.054
AES4	Aesthetics is a major distinguishing attribute of products from their competitors	0	3.735	4	1	5	1.033
AES5	Products with higher aesthetics are priced higher than those with lesser aesthetics	0	4.062	4	1	5	1.022
CS1	Electronic Products these days are of high quality	0	3.901	4	1	5	0.937
CS2	The products meet the required needs	0	3.631	4	1	5	0.990
CS3	The quality of electronic products today prompt repurchase behavior	0	3.958	4	1	5	0.888
CS4	The value for money on electronic products in the money to day is high	0	3.683	4	1	5	0.998
CS5	Customers of electronic companies today are satisfied with their products	0	3.847	4	1	5	0.940

***Source**: Researcher's computation in SmartPLS (2023)*

The assessment of Partial Least Squares Structural Equation Modelling (PLS-SEM) results involves a two-step approach: (1) the evaluation of the measurement models and (2) the assessment of the structural model (Chin, 2020; Hair et al., 2016). The measurement model assessment involves the evaluation of construct measures' reliability and validity. This assessment draws on different measures, depending on whether a construct is measured reflectively or formatively.

Evaluation of Reflective Measurement Models

Indicator Reliability

The indicator loadings should be larger than 0.7 to ensure indicator reliability. Table 2 shows that all item loadings exceeded the recommended value of 0.7 (Chin, et al, 2018). This indicates that the construct explains more than 50 percent of the indicator's variance, thus providing acceptable item reliability.

Table 2: Reliability of the Indicators

	Aesthetics	Conformance	Customer Satisfaction	Durability	Reliability	Serviceability
AES1	0.825					
AES2	0.858					
AES3	0.856					
AES4	0.786					
AES5	0.722					
CON1		0.737				
CON2		0.771				
CON3		0.846				
CON4		0.881				
CON5		0.823				
CS1			0.808			
CS2			0.718			
CS3			0.795			
CS4			0.789			
CS5			0.713			

***Source**: Researcher's computation in SmartPLS (2023)*

Construct Reliability and Convergent Validity

To establish internal consistency reliability of the construct, Cronbach's alpha and composite reliability (CR) should be higher than the threshold of 0.7. It is clear from Table 3 that all the latent indicators are reliable since their values are higher than the threshold value of 0.7. As an alternative to Cronbach's alpha and composite reliability, Dijkstra and Henseler (2015) proposed rho_A as an approximately exact measure of construct reliability, which usually lies between Cronbach's alpha and the composite reliability. Hence, rho_A may represent a good compromise if one assumes that the factor model is correct. Convergent validity is the extent to which the construct converges in order to explain the variance of its items. To assess convergent validity, the average variance extracted (AVE) should be larger than 0.5. In Table 3, all the constructs value of the average variance extracted AVE are larger than 0.5 which shows that the constructs of the study satisfied the condition of convergent validity. It also indicates that all the construct explains 50 percent or more of the variance of the items that make up the construct.

Table 3: Construct Reliability and Validity of the Indicators

Indicators	Cronbach (a)	rho_a	CR	AVE
Aesthetics	0.869	0.872	0.905	0.658
Conformance	0.871	0.872	0.907	0.661
Customer Satisfaction	0.783	0.813	0.848	0.531

***Source**: Researcher's computation in SmartPLS (2023)*

In summary, the composite reliability values, which depict the degree to which the construct indicators indicate the latent construct, exceeded the recommended value of 0.7 while average variance extracted, which reflects the overall amount of variance in the indicators accounted for by the latent construct, exceeded the recommended value of 0.5 (Hair et al., 2013). Also, the Cronbach alpha internal consistency reliability values are also all above the recommended 0.7 (Chin et al, 2018). This is supported by the rho_A internal consistency reliability values that are also all above the recommended 0.7 (Ringle, et al, 2015).

Discriminant Validity

Discriminant validity is the extent to which a construct is empirically distinct from other constructs in the structural model. There are many traditional methods for discriminant validity assessment, such as cross loadings and the Fornell-Larcker criterion (Fornell & Larcker, 1981), but researchers are advised to apply the Heterotrait-Monotrait (HTMT) criterion (Henseler et al., 2014). This is because traditional methods fail to indicate a lack of discriminant validity, even when two constructs are perfectly correlated, rendering this criterion's use ineffective for empirical research. For this thesis, Table 4 shows the HTMT criterion for all the latent constructs. The discriminant validity of the construct is valid if the upper bound of the 95% confidence interval of HTMT is lower than 0.9. From Table 4, this condition is satisfied.

Table 4: Discriminant Validity (Heterotrait-Monotrait Ratio [HTMT])

	AES	CON	CS
AES			
CON	0.647		
CS	0.769	0.639	

***Source**: Researcher's computation in SmartPLS (2023)*

Assessment of the Structural Model

Collinearity Test

Before assessing the structural relationships, collinearity was examined to make sure it does not bias the regression results. This was done using the Variance Inflation Factor (VIF). VIF values above 5 are indicative of probable collinearity issues among the predictor constructs, but collinearity problems can also occur at lower VIF values of 3 to 5 (Mason & Perreault 1991; Becker et al. 2013). Ideally, the VIF values should be close to 3 and lower (Hair et al., 2016).

Table 5: VIF Collinearity Statistics

Items	VIF
AES1	2.418
AES2	3.096
AES3	2.678
AES4	1.891
AES5	1.377
CON1	1.738
CON2	1.887
CON3	3.181
CON4	3.658
CON5	2.258
CS1	1.609
CS2	1.516
CS3	1.638
CS4	1.465
CS5	1.647

***Source**: Researcher's computation in SmartPLS (2023)*

From Table 5 above, none of the VIF values are close to 5 which shows that they are no indication of probable collinearity issues among the predictor constructs for this thesis. In summary, the study tested for possible Multicollinearity problems with the data using Variance Inflator Factor (VIF) Test and Table 5 shows the collinearity between the items are all below the recommended 3.3 (Ringle, et al, 2015), which shows that there is no multicollinearity problem with the data of the study. This means that all the items used are unique and not replicated.

To assess the structural model, Hair et al. (2013) suggested looking at the R^2, beta, and corresponding t-values via bootstrapping procedure with a resample of 5000. The resample of bootstrapping procedure was done using 5000. The bootstrapping procedure was done in order to have p-values and t-statistics that can be used to test the hypotheses of the study in order to reject the null hypotheses of the study or otherwise. Hair et al. (2013) also suggested that, in addition to these basic measures, researchers should also report the predictive relevance (Q^2). Figure 5 showed the structural model results, the loadings and the R^2 values for product quality and customer satisfaction. The model below shows the calculated relationships and path coefficients. The p-values from the bootstrap analysis are displayed on the model beside the path coefficients for the inner models of latent variables. For the outer models, the t-statistics of the individual measurement items were displayed on the estimated structural model.

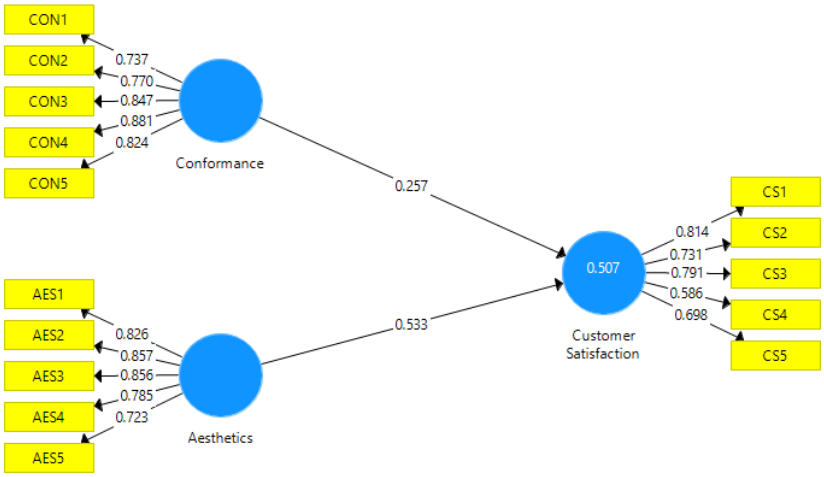

Figure 4.1: Estimated Structural Model for the Variables of the Study
Source: Researcher's Development in SmartPLS (2021)

Path Coefficients

This section shows the path coefficients of the regression results using SmartPLS 3.2. The path coefficient results are used for testing the hypotheses of the study.

H_{01} Conformance has no significant effect on customer satisfaction of electronic products in Abuja, Nigeria.

Table 6: Path Coefficient Results Extract for Hypothesis Three

Hypothesis	Coefficient	T- Stats	P-Values
Conformance -> Customer satisfaction	-0.040	0.621	0.534

Source: Researcher's computation in SmartPLS (2023)

The results in Table 6 shows that the coefficient for the effect of Conformance on Customer satisfaction is -0.040 with a p-value of 0.534 which is less than the acceptable 5% significance level showing that there is sufficient statistical evidence to reject the null hypothesis three (H_{03}), so the study adopts the corresponding alternative hypothesis. This means that there is a negative and insignificant effect of Conformance on customer satisfaction of electronic products in Abuja, Nigeria. This implies that Durability has made

favourable contributions to the customer satisfaction of electronic products in Abuja, Nigeria. This finding is inconsistent with that of Garcia et al. (2019) who conducted a quantitative study in Spain, employing a survey-based approach to investigate the relationship between durability and customer satisfaction in the electronics industry. The findings of Garcia et al. (2019) revealed a positive correlation between durability and customer satisfaction, suggesting that more durable electronic devices lead to higher customer satisfaction levels.

H_{02} Aesthetics has no significant effect on customer satisfaction of electronic products in Abuja, Nigeria.

Table 7: Path Coefficient Results Extract for Hypothesis Five

Hypothesis	Coefficient	T- Stats	P-Values
Aesthetics -> Customer satisfaction	0.425	9.921	0.000

Source: Researcher's computation in SmartPLS (2023)

The results in Table 7 shows that the coefficient for the effect of Aesthetics on Customer satisfaction is 0.425 with a p-value of 0.000 which is less than the acceptable 5% significance level showing that there is sufficient statistical evidence to reject the null hypothesis five (H_{05}) and adopt the corresponding alternative hypothesis. This means that there is a positive and significant effect of Aesthetics on customer satisfaction of electronic products in Abuja, Nigeria. This implies that Aesthetics has made favourable contributions to the customer satisfaction of electronic products in Abuja. These findings are consistent with that of Lee et al. (2018) who conducted a quantitative study in South Korea, investigating the relationship between aesthetic design and customer satisfaction in the smartphone industry. Their results showed a positive correlation between aesthetic design and customer satisfaction. Smartphone users who perceived higher aesthetic quality reported higher levels of satisfaction with their devices.

R^2 and Predictive Power of the Model

Table 8: R^2 and Predictive Power of Model Using R^2 and Q^2 Predict

	R^2	Q^2_predict
Customer satisfaction	0.549	0.530

***Source**: Researcher's computation in SmartPLS (2023)*

The r-square statistics shows the level of determinism of the outcome and mediating variables by the independent variables of the study. The r-square values for the study both have moderate strengths and are higher than the recommended 40% according to Chin *et al*, (2018). Table 8 shows that the study has an r-square value of 0.549 for Customer satisfaction which indicates that the independent variables used for the study account for about 54.9% of the variability in the outcome variable (Customer satisfaction). Other factors not captured in the model may account for the remaining 45.1%. Furthermore, the Q^2 values corroborate the assertions of the R^2 results with 53% predictive power for customer satisfaction. The Q^2 predict is a measure for predictive power of models that goes beyond determinism of R^2 to accuracy of predictive power and is more recent and gaining increasing popularity with PLS-SEM researchers who argue that the Q^2 is presently the most efficient measure of predictive power of models (Ringle, et al, 2015). The Q^2 is usually computed in PLS-SEM analysis using PLS-predict analysis function in SmartPLS software as was done in this study.

CONCLUSION AND RECOMMENDATIONS

Arising from the findings of the study, the research has reached the following conclusions that the level of Aesthetics has been good to customer satisfaction of electronic products. On the other hand, Conformance in electronic products has not been advantageous since the cause-effect relationship was insignificant. The study concludes that due to the insignificant results, those electronic products in Abuja, Nigeria probably

do not have the right levels of Conformance. The study concludes that among the variables tested, suboptimal levels of Conformance may be the possible causes of the low customer satisfaction problem of electronic products in Abuja. Drawing from the findings and conclusions of this study, the following recommendations are made to the producers and marketers of electronic products in Abuja, Nigeria, with a view to improving their customer satisfaction:

i. Conformance of electronic products in Abuja, Nigeria should be change since the current effect is insignificant. Enhancing the conformance of electronic products in Abuja, Nigeria requires strict enforcement of standards, increased awareness, rigorous quality control, certification programs, and robust market surveillance to ensure compliance and protect consumer interests.
ii. Electronic products producers and marketers in Abuja, Nigeria should uphold their Aesthetics practices since the effect is already positive and significant. To maintain their aesthetics practices, electronic product producers and marketers in Abuja, Nigeria should continue to invest in design and aesthetics, collaborate with designers, conduct market research, ensure consistency, and seek customer feedback to create visually appealing products that align with consumer preferences and enhance the overall user experience.

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