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## DIRECT AND INDIRECT IMPACT OF AESTHETICS ON INTENTION TO BUY SMARTPHONES

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### ABSTRACT

This study aims to measure the direct and indirect impact of aesthetics on consumers' intention to buy smartphones through perceived value in the context of research in Vietnam. The research data conducted through three surveys: The first one is expert survey and group discussions to explore and adjust the scales. The second one is that the authors conducted a pilot study with 100 customers in Ho Chi Minh City to evaluate the reliability of scales, the last one is that the authors survey directly 200 customers and send 100 online surveys. And 275 valid observations with Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM) were conducted to find a direct and indirect impact on the intention to buy smartphones. The main results show that aesthetic has a direct and indirect impact on the intention to buy smartphones. The strongest influence is the indirect impact of aesthetics on the intention to purchase through social value; the second strong impact is the direct impact of aesthetics on the intention to buy, the two weakest indirect effects is through functional value and emotional value respectively. Based on the research results, the product developer can adjust the properties of aesthetics, and at the same time looking the ways to increase the perceived value of customers; thereby increasing revenue in selling smartphones.

**Keywords:** Aesthetics; perceived value; functional value; emotional value; social value



## 1. INTRODUCTION

According to Nielsen Vietnam Report about Behavior of Smartphone Users (Smartphone) in 2017, the number of smartphone users compared to the number of regular phone users accounts for 84% in 2017; there is an increase of 6% compared to 2016 (78%). In secondary cities, 71% of people use smartphones in 93% of mobile phone users. More notably, in rural areas, while 89% of the population uses mobile phones, 68% of them own a smartphone. Through the above statistics, it can be seen that smartphones are no longer a new phenomenon for the Vietnam market.

The smartphone's hardware is gradually becoming saturated, and there is not much difference in the same price range, the external design will undoubtedly be one of the critical factors to impress, persuade users to make buying decisions. It can be said that the basic principles of aesthetics commonly used in the design of personal communication devices, entertainment and technology (SWILLEY, 2012; CHARTERS, 2006).

However, according to Toufani et al. (2017), the aesthetic factors of the product and the evaluation of the product's aesthetics may lead to unclear intentions to buy from individuals. Compared to the research on factors affecting the evaluation of the aesthetics of a product (HOYER; STOKBURGER-SAUER, 2012), studies on aesthetics can affect buying decisions are a few (TUREL et al., 2010). Besides, smartphones are described as a cultural artifact and expanding the social relations of users (SHIN, 2012).

Therefore, there is the debate that feeling interest and social practices are becoming more important to feel the usefulness in influencing the intention to buy (LIN; BHATTACHERJEE, 2010). Moreover, the research results of Toufani et al. (2017) found that aesthetics has a direct effect on the intention to buy, but is weaker than the aesthetics affecting indirectly the intention to buy through perceived value. The reason is that the nature of digital products is the product that customers need to spend much time, cost and effort (LI; GERY, 2000) so they carefully evaluate the value that they Can gain from the aesthetics of smartphones before they intend to buy.

It can be said that the aesthetics and perceived value of customers are increasingly concerned, leading to a high level of competition in the smartphone market. When the hardware war has almost no effect as before, the breakthrough design is vital for manufacturers to conquer consumers. In this situation, the aesthetic and perceived value measured from the customer's point of view becomes essential to get a competitive advantage, and as a result, they



increase the intention of purchasing potential customers. Therefore, the study "Direct and indirectly impact of aesthetics on intention to buy smartphones" will help researchers understand the real mechanism of factors affecting buying intention.

## **2. LITERATURE REVIEW**

### **2.1. Aesthetics**

Aesthetics can be narrowly defined as the theory of beauty, or more broadly, the philosophy of art. Previously, the philosophy of aesthetics was not recognized until the early eighteenth century, Alexander Gottlieb Baumgarten - "father of aesthetics" introduced the meaning of aesthetics terms, in his research, which is derived from the Greek epistêmê aisthetikê, is also known as the science of what is perceived and imagined - "The Science of Consciousness". (BAUMGARTEN, 1735). Besides, the Oxford dictionary translates that aesthetics is the nature of a thing related to beauty or beauty enhancement; brought or designed to create joy and satisfaction through superficial beauty.

The aesthetics of the product (such as design) can significantly affect consumer behavior (VERYZER, 1993). An eye-catching product is described as a communication thing between the designer and the consumer (KRIPPENDORFF; BUTTER, 1984; MONÖ, 1997; CRILLY et al., 2004). Considering the way to approach eye-catching products in the form of text, the writer is the designer, and the reader is the consumer.

Product designers are thought of in such a way as to evoke the relationship between the product and the consumer's intentions that may or may not correspond to their original intent to communicate. Also, aesthetics also refers to the concepts of harmony, beauty and order in the physical world (WHITE, 1996) with the evaluation of an object's aesthetics as a perception. Conscious (VERYZER, 1993). Thus, it is not only about appearance, but aesthetics are also related to other senses (SWILLEY, 2012); these senses act as stimuli for both sensory and emotional reactions (WANG et al., 2013). Exploiting and delving creating a preference for the product.

### **2.2. Buying intention**

The intention to purchase can be defined as a pre-planned plan to purchase some goods or services in the future, which may not always lead to implementation because it is affected by performance (WARSHAW; DAVIS, 1985). In other words, what consumers think will buy in their minds represents the intention to buy (BLACKWELL et al., 2001).



In addition, the intention to buy can also determine the ability to lead to the actual purchase of the customer, and through the determination of the intensity of the intention to buy, the ability to buy certain products will be stronger when intention to buy more strongly (DODDS et al., 1991; SCHIFFMAN; KANUK, 2000). The intention to buy shows that consumers will follow the buying decision process: perceiving demand, seeking information, evaluating alternatives, purchasing decisions and evaluating after purchasing (ZEITHAML, 1988; DODDS et al., 1991; SCHIFFMAN; KANUK, 2000).

Furthermore, the effort required to acquire smartphones and consumer understanding of the benefits of using smartphones is also two factors that have a significant effect on the intention to buy (IBRAHIM et al., 2013). Perceptual value is one of the factors that can stimulate the intention to buy; perceived value comes from relative advantages and product compatibility compared to the effort required to get a product. Efforts could be product prices and search times leading to purchasing actions (MONROE; KRISHNAN, 1985; ZEITHAML, 1988).

Moreover, the intention to purchase can also be considered as a measure to predict consumer purchasing behavior (BONNIE et al., 2007). Besides, the intention to purchase is known as consumer trends for an audience; it is often measured by the intention to buy (KIM; KIM, 2004). The idea of purchasing intent for specific products or services is the final decision step in the decision-making process about buying intent, which is agreed by most previous researchers. (AGARWAL; TEAS, 2002; EREVELLES, 1993; FISHBEIN, 1967; HAN, 1990; PECOTICH et al., 1996).

Also, manufacturers are often interested in buying intentions, because it can help them segment the market and at the same time support their decision-making as to where the product should be introduced (SEWALL, 1978; SILK; URBAN, 1978). Unlike that, the intention to purchase can be used to predict future demand (ARMSTRONG et al., 2000). Finally, there is a positive relationship between advantages, prices, social impacts and product compatibility to purchase (JONGEPIER et al., 2011; JUHA, 2008; YUE; STUART, 2011).

### **2.3. Perceived value**

#### **2.3.1. Concepts of perceived value**

Although there are many different views of researchers about the relationship between perceived value and customer choice or intention to buy, in general, perceived value will affect



customer behavior. In this study, the group applied three aspects of perceived value according to Sweeny and Soutar (2001) through three dimensions as follows:

### **2.3.2. Functional value**

Functional values are related to the benefits associated with product ownership. According to Sheth et al. (1991), functional values are evaluated by reasons for the purchase and use of products based on the physical attributes and actual needs of users. Functional values are measured by a table describing the selected properties; in which reliability and durability are considered properties with functional values (SHETH et al., 1991).

### **2.3.3. Social value**

Defined as a sense of usefulness from an individual's association with one or more specific social groups (SHETH et al., 1991), the social value can enhance individuals' value (SWEENEY; SOUTAR, 2001) based on the perception of social product assessment (CALLARISA et al., 2011). Customers may prefer to buy a product due to the social image that the product conveys (GIMPEL, 2011).

### **2.3.4. Emotional value**

Emotional value is a sense of usefulness from the ability of emotional arousal or emotional state (SHETH et al., 1991). The aesthetic characteristics of an object can create emotional reactions (FRIJDA; SCHRAM, 1995) with product design used as a way of attracting consumers' attention and providing products information and increasing the feelings of beauty (TRACTINSKY et al., 2000). Gimpel (2011) claims that aesthetics, such as beauty and art, can add to the emotional value of a product.

## **3. HYPOTHESES DEVELOPMENT**

Figure 1 describes an object's aesthetic connection with different sensing values, and these values continue to affect the intention to buy smartphones. The multi-dimensional model of perceived value is chosen because in some cases, the perceived usefulness or perceived function may be less relevant when the technology products have strong emotional attractions. (TUREL et al., 2010). Therefore, the multi-dimensional approach about sensory value can capture the perception of both the value of the feature and the emotional value of an object.

Recognizing the aesthetics becomes more and more important in consumer marketing, Wang et al. (2013) suggested that the aesthetic factors that are visual stimuli affect behavior reactions via SOR model (Stimulus - Organism - Response), these stimuli evoke both cognitive

and emotional behavioral responses (JACOBY, 2002). Cue theory (RICHARDSON et al., 1994; LEE; LOU, 1995; LEE; LOU, 1996) confirmed the influence of these stimulating factors on consumer perceived values and the product is described as a series of external and internal signals. While external signals related to attributes that are not part of the physical product (such as brand name, packaging, and price), internal signals are associated with inherent properties of a product (such as its material, design, and appearance) and they have a close relationship with the product's aesthetic assessment and can increase consumer perceived value for the product.

In order to determine whether aesthetics can affect a buyer's decision through three different aspects of perceived value, it is necessary to check whether each aspect influences the intention to purchase, due to that perceived value cannot be considered a quadratic scale consisting of three aspects. Some studies confirm that consumer perceived value has a direct impact on buying intent or willingness to buy, for both products and services (CHEN; DUBINSKY, 2003; ASHTON et al., 2010; LEELAKULTHANT HONGCHARU, 2012).

Although this is the expected direction, aesthetic principles are used in designing new technology products; the goal is to satisfy customers directly through the experience of beauty and appearance (KUMAR GARG, 2010). As a result, there is the possibility that aesthetics can create a positive feeling directly leading to the intention of the buyer to purchase the product.

Aesthetics can directly or indirectly affect the intention to purchase (TOUFANI et al., 2017). Aesthetics can indirectly link to the intention of purchasing goods through factors that determine the adoption of technology (VAN DER HEIJDEN, 2003). As an aspect of overall value, Turel et al. (2010) show that the indirect linkages of aesthetics intended to use virtual artifacts such as ringtones.

Gallarza and Gil Saura (2006) applied aesthetics to understand how it affects satisfaction and intention to purchase in tourism. Aesthetics are also used to measure its impact on customer decisions when shopping online (MATHWICK et al., 2001). Also, aesthetics are directly related to purchasing intentions (LEE; KOUBEK, 2010; TZOU; LU, 2009). Therefore, hypothesis H1 is:

- ***H1: Aesthetics has a positive effect directly on intention to buy smartphones.***

Contrary to the aesthetics view that may hinder usefulness, Tractinsky et al. (2000) argue that the sense of beauty affects the sense of usefulness and Tractinsky (2004) claims to have set “a beautiful phrase” that can be used to confirm Tractinsky et al. (2000) ’s research.



Similarly, Shin (2012) argues that usefulness and aesthetics are interdependent, the research finds that customers feel the more beautiful smartphones, the more useful than devices with higher performance but lower aesthetics.

Aesthetics affected consumer decisions through functional attributes of products in different information system contexts such as using websites (VAN DER HEIJDEN, 2003), the interaction between people - computers (TUCH et al., 2012) and mobile commerce (CYR et al., 2006). Although customers can assume that products with attractive designs have superior functions (CHAIKEN; MAHESWARAN, 1994), there are very few studies in the field of mobile devices that study the relationship between aesthetics and functional properties (SHIN, 2012) to validate the influence of aesthetics on functional values. Therefore, hypothesis H2 is:

- ***H2: Aesthetics has a positive effect on the functional value of smartphones.***

According to consumer value theory of Sheth et al. (1991), social value is choosing images with clearly visible products such as clothing, cars, and jewelry, ... Those things towards their image. An evaluation of an object's aesthetics can be made through interaction with society (LEDER et al., 2004). In other words, the satisfaction of aesthetics affects social value (MORTON et al., 2013). Therefore, hypothesis H3 is:

- ***H3: Aesthetics has a positive effect on the social value of smartphones.***

The aesthetic characteristics of a product can stimulate positive emotional reactions that lead to an emotional connection (SÁNCHEZ-FERNÁNDEZ; INIESTA-BONILLO, 2007; NANDA et al., 2008). Emotional values can become popular among individuals who value beauty because the beauty of an object can convey the feeling that they can meet their needs (HOLBROOK, 1999). Therefore, hypothesis H4 is:

- ***H4: Aesthetics has a positive effect on the emotional value of smartphones.***

Functional values relate to consumer perception of the quality and function of products or services (YANG; JOLLY, 2009; CALLARISA et al., 2011). There is support for consumers' perception (CALLARISA et al., 2009) on functional values that have a strongly positive relationship with the intention to purchase (BHASKARAN SUKUMARAN, 2007) and the use of a product (BUTLER et al., 2016). According to Sheth et al. (1991), consumer choice is a function of many independent consumer values, including functional values. Therefore, the hypothesis H5 is:



- **H5: The functional value has a positive effect on the intention to buy smartphones.**

Social values derive from a product's ability to reinforce the social concept (SWEENEY; SOUTAR, 2001). People often prefer to buy products that are accepted by social groups or follow social rules (WANG, 2010; LEE, 2014). A positive sense of social value leads to stronger purchasing intentions (VIGNERON; JOHNSON, 1999; KIM et al., 2013). While many studies have examined the role of social value in purchasing decisions (SWEENEY; SOUTAR, 2001; CALLARISA et al., 2009), there has been little research to find out whether the target has aesthetics can create a sense that it has social value and then will affect the decision to purchase. Therefore, the hypothesis H6 is:

- **H6: Social value has a positive effect on the intention to buy smartphones.**

Emotional value has been identified as an essential influence when purchasing goods (VAN DER HEIJDEN, 2003). The more positive in the emotion, the more likely it is that the intention to purchase will happen (TZOU; LU, 2009). An attractive aesthetic audience that can create emotional values, and an emotional connection with a product (LEE KOUBEK, 2010) can lead to purchasing intentions (HSIAO, 2013 ). Therefore, the hypothesis H7 is:

- **H7: Emotional value has a positive effect on the intention to buy smartphones.**

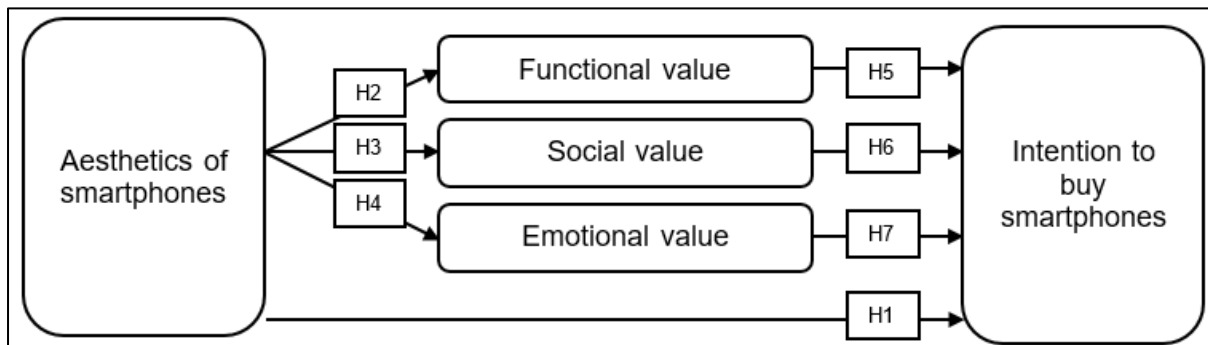


Figure 1: Proposal conceptual model

#### 4. METHODOLOGY

The authors use mix method including qualitative research method to explore the scale and quantitative research methods to find the direct and indirect relationship between aesthetic and intention to buy smartphones.

This research uses the qualitative research method via group discussions and expert discussions to build research models, scales, questionnaires, and preliminary surveys to complete research models before issuing the questionnaire. The authors surveyed the chairman



of Vietnam Association of consumer goods development (VACOD) and surveyed seven members of the Executive Committee of VACOD to complete the group discussion.

The authors do the quantitative research method based on information collected from customers of many cellphone companies in Ho Chi Minh City. Likert scale with five levels, namely strongly disagree, disagree, neutral, agree and strongly agree is used to measure the impact of factors affecting employee satisfaction, and this research uses the convenient sampling method.

Hair et al. (2014) pointed out that when the study uses Likert scale five levels with the  $n$  variables, the study should ensure a minimum sample size of  $5 \times n = 5n$ . To ensure the quality of the sample, the authors decided to survey two times. The first time is the pilot survey with 100 questionnaires, and authors do Cronbach's Alpha and Exploratory Factor Analysis to adjust the final scales distribute. The second time is that the author conducts the final survey with a total of 200 questionnaires directly and 100 questionnaires online.

In particular, this research surveyed ten prestigious and reputable companies which sell cellphones in Ho Chi Minh City such as FPT shop, Viettel Store, The Gioi Di Dong, Mai Nguyen, Bach Long mobile, Hnammobile, Vien Thong A, CellphoneS, TechOne, MacCenter. For each company, the author team directly distributed the survey questionnaires and the number of questionnaires for each company was 20.

Besides, this research send 100 questionnaires via online by using google forms. So after screening data, there were a total of 275 valid questionnaires to be used in the quantitative analysis (accounting for 91.67%). In quantitative research, the authors use descriptive statistical methods, assessed for reliability through Cronbach's Alpha coefficients, do Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM) method to find the relationship between aesthetics and intention to buy smartphones.

## **5. ANALYSIS AND RESULTS**

The research runs Cronbach's Alpha and EFA for the final survey with a total of 275 valid questionnaires.

### **5.1. Reliability test: Cronbach's Alpha**



**Table 1: Constructs, corrected item – total correlation and Cronbach Alpha**

Items	Constructs	Corrected Item – Total Correlation	Cronbach's Alpha if item deleted
<b>AESTHETICS OF SMARTPHONES</b>			
Color - Cronbach's Alpha = 0.770			
CL1	Smartphone should have many different color options.	0.571	0.727
CL3	The color of the smartphone I own should be the limited edition.	0.670	0.615
CL4	Smartphone colors are essential to me when deciding to buy products.	0.572	0.725
Design - Cronbach's Alpha = 0.861			
DS1	I appreciate it if the smartphone has an excellent design.	0.750	0.792
DS2	My smartphone design should attract attention.	0.783	0.760
DS4	Smartphone weight is significant to me when deciding to buy the product.	0.679	0.856
Touch/Material - Cronbach's Alpha = 0.854			
TS1	The feeling of touching the smartphone surface (such as sensitivity) is essential to me.	0.703	0.825
TS2	Smartphone material is vital for me when deciding to buy products.	0.750	0.779
TS3	The feeling of holding smartphones is fundamental to me.	0.736	0.786
Beauty - Cronbach's Alpha = 0.869			
BT1	Smartphone aesthetics makes much sense to me like its technology.	0.775	0.795
BT2	Smartphone beauty is more important than its durability.	0.766	0.804
BT3	Smartphone beauty is essential to me when deciding to buy products.	0.717	0.852
Style - Cronbach's Alpha = 0.834			
ST1	I like the style (square, softly rounded corners) my smartphone.	0.616	0.844
ST2	The style of the smartphone should be just right.	0.743	0.722
ST3	Smartphone's design is crucial to me when deciding to buy the product.	0.736	0.729
Overall appearance - Cronbach's Alpha = 0.784			
OA1	The smartphone's appearance can be outdated quickly (style, weight and screen size).	0.685	0.638
OA2	I am more concerned with smartphone performance than it looks.	0.591	0.743
OA3	The overall appearance of smartphones is essential to me when deciding to buy products.	0.596	0.736
<b>PERCEIVED VALUE</b>			
Functional value - Cronbach's Alpha = 0.861			
FV1	I want a smartphone with high-tech features.	0.757	0.786
FV2	I want a highly reliable smartphone (with little error during use).	0.769	0.773
FV3	I want a durable smartphone (in terms of damage or battery life)	0.689	0.848
Social value - Cronbach's Alpha = 0.814			
SV1	I seek support for smartphone purchases from family, friends, and colleagues	0.676	0.745
SV2	I want to impress my family, friends, or colleagues by buying the smartphone I want.	0.740	0.718
SV3	I look to buy a smartphone that my family, friends or colleagues recommend.	0.533	0.814
SV4	I look to buy a smartphone that can express myself.	0.597	0.783
Emotional value - Cronbach's Alpha = 0.882			

EV2	I feel better when my smartphone is more advanced than other smartphones.	0.814	0.794
EV3	I feel my life is better since I bought a smartphone.	0.845	0.765
EV4	Being noticed by others when using smartphones is essential to me.	0.664	0.922
Intention to buy smartphones - Cronbach's Alpha = 0.893			
IB1	I will buy the smartphone that I think is ideal if it is available.	0.800	0.838
IB2	I will consider buying my ideal smartphone.	0.787	0.850
IB3	I will recommend, encourage relatives, friends or colleagues to buy smartphones that I think is ideal.	0.783	0.854

The smartphone aesthetics factor has six scales, namely color, design, grip, beauty, style, overall appearance and Cronbach's Alpha coefficient of each scale is greater than 0.6. Furthermore, the correlation coefficients of the observed variables in the six scales of aesthetics are greater than 0.3; so all scales ensure reliability. The functional value, social value, emotional value which has Cronbach's Alpha coefficient of three scales is greater than 0.6.

However, variable EV1 in the emotional value which has a total correlation coefficient is lower than 0.276 and EV1 is eliminated. The correlation coefficients of the observed variables in the three scales of the factor of perceived value are greater than 0.3. Also, the intention factor has a Cronbach's Alpha coefficient of 0.893; the observed variables in this factor have a correlation coefficient that meets the requirement (is greater than 0.783). Therefore, the purchase intention, aesthetics and perceived value can be used in Exploratory Factor Analysis.

## 5.2. Exploratory Factor Analysis (EFA)

After meeting the requirements of scale reliability, the results of EFA are described as follows:

Table 2: KMO, Bartlett's Test, Eigenvalue KMO Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.792
Bartlett's Test of Sphericity	Approx. Chi-Square	4381.168
	df	465
	Sig.	.000
	Eigenvalue	1.005
Total Variance Explained		77.253

Table 3: Results of EFA Rotated Component Matrixa

	Component									
	1	2	3	4	5	6	7	8	9	10
SV1	.831									
SV2	.830									
SV4	.752									
SV3	.508									
EV3		.919								

EV2	.912
EV4	.785
IB1	.836
IB3	.814
IB2	.784
BT1	.875
BT2	.839
BT3	.819
FV2	.870
FV1	.859
FV3	.791
DS1	.888
DS2	.873
DS3	.811
TS3	.836
TS1	.835
TS2	.787
ST2	.826
ST3	.824
ST1	.786
OA1	.838
OA3	.769
OA2	.766
CL3	.845
CL1	.809
CL4	.744

Barlett's test has sig which equals 0.000 <0.05; it means that the observed variables in factor analysis are correlated in the overall. Also, KMO coefficient (Kaiser-Meyer-Olkin) has the value = 0.792 > 0.5, so factor analysis is appropriate to the research data. All observed variables have Factor Loading factor > 0.5. Therefore all factors meet the requirement.

### 5.3. Confirmatory Factor Analysis (CFA)

The results of confirmatory factor analysis (CFA) presented in Figure 2. The analysis results in Figure 2 show that there are 389 degrees of freedom and this model is suitable for market data (Chi-square / df = 1,749 <3; CFI = 0,929 > 0.9; TLI = 0.915 > 0.9 and RMSEA = 0.055 <0.08).

There is no correlation between all scales and errors, so the observed variables achieve uni-directional. The standardized weights of observed variables fluctuate between 0.7 and 1.50, and they were satisfactory (greater than 0.5), and the unstandardized weights were statistically significant (P = 0.00) with 95% confidence, so observed variables are used to measure concepts that achieve convergent values.

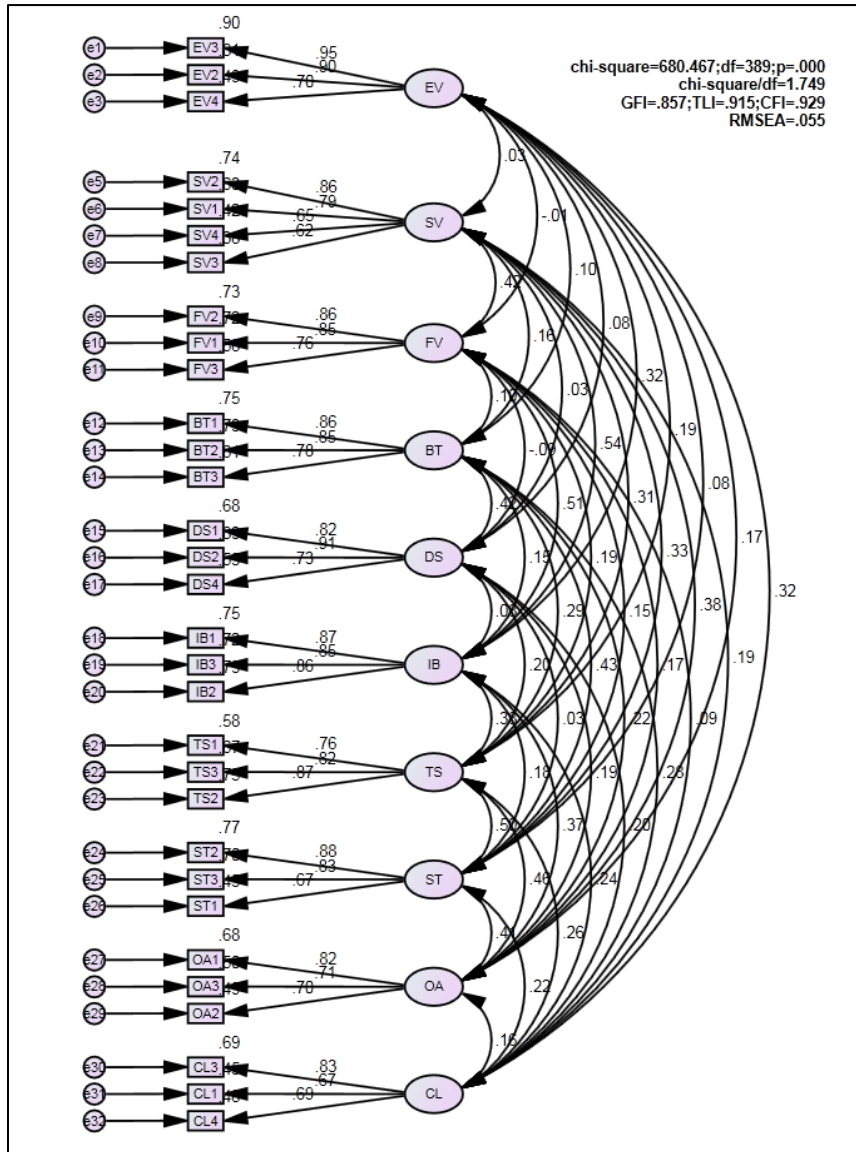


Figure 2: CFA (standardized model)

Moreover, the results for testing the reliability and variance extracted from the concepts show that Cronbach's Alpha reliability and reliability of all components are greater than 0.6 and variance extracted over 50%. Thus, all scales have high reliability.

#### 5.4. Structural Equation Modeling (SEM)

After obtaining the test results of the fitness of the model, the authors put all the observed and potential variables into the model to test the hypotheses as shown in Figure 3.

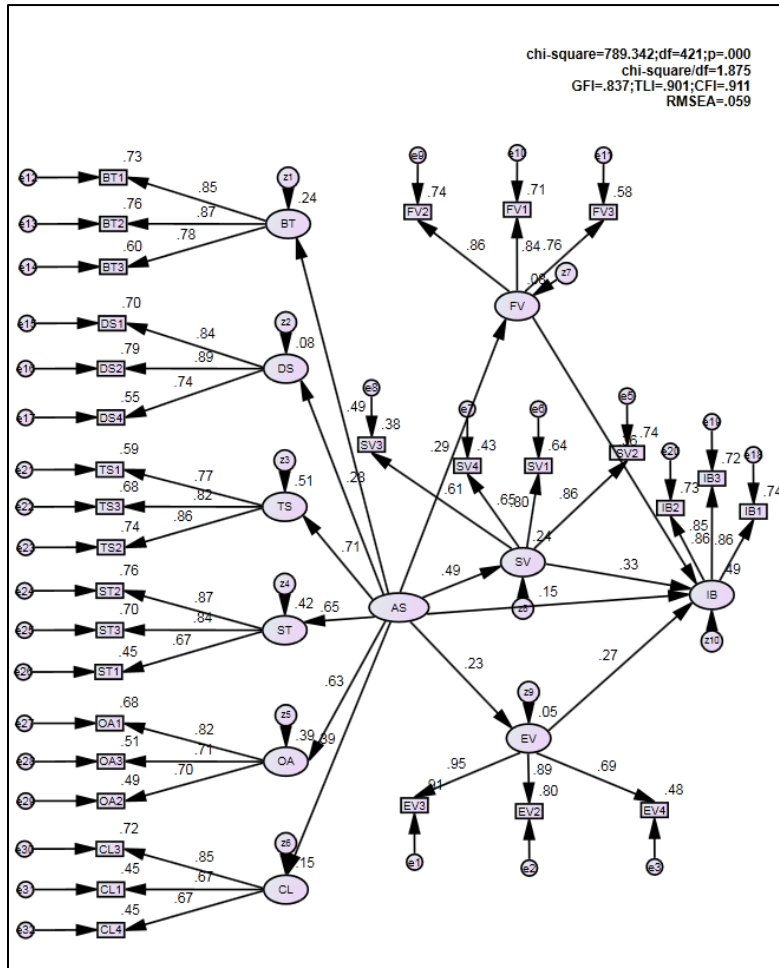


Figure 3: The results of SEM (standardized)

The Chi-Square / df, CFI, RMSEA indices met the model's fit conditions (Chi-square / df = 1.878 < 3; CFI = 0.910 > 0.9; RMSEA = 0.057 ≤ 0.08).

**5.5. Hypothesis testing:**

The results of hypothesis testing are shown in the tables as Table of regression weights and Table of standardized regression weights.

Table 4: Regression weights

		Estimate	S.E.	C.R.	P		Estimate	S.E.	C.R.	P	
FV	<--- AS	0.538	0.167	3.221	***	FV3	<--- FV	0.805	0.061	13.13	***
SV	<--- AS	0.775	0.167	4.643	***	BT1	<--- BT	1.000			***
EV	<--- AS	0.464	0.168	2.761	***	BT2	<--- BT	1.001	0.066	15.07	***
BT	<--- AS	1.000				BT3	<--- BT	0.996	0.073	13.61	***
DS	<--- AS	0.542	0.171	3.172	***	DS1	<--- DS	1.000			***
TS	<--- AS	1.207	0.226	5.346	***	DS2	<--- DS	1.056	0.074	14.22	***
ST	<--- AS	1.213	0.229	5.295	***	DS4	<--- DS	0.853	0.068	12.59	***
OA	<--- AS	0.979	0.191	5.122	***	IB1	<--- IB	1.000			***
CL	<--- AS	0.719	0.183	3.932	***	IB3	<--- IB	1.042	0.064	16.23	***
IB	<--- AS	0.217	0.121	1.787	**	IB2	<--- IB	0.989	0.060	16.5	***
IB	<--- SV	0.296	0.065	4.514	***	TS1	<--- TS	1.000			***
IB	<--- FV	0.269	0.047	5.672	***	TS3	<--- TS	0.962	0.075	12.79	***
IB	<--- EV	0.187	0.040	4.679	***	TS2	<--- TS	0.941	0.072	13.15	***



EV3	<---	EV	1.000							ST2	<---	ST	1.000							
EV2	<---	EV	0.942	0.049	19.411	***				ST3	<---	ST	0.952	0.070	13.58	***				
EV4	<---	EV	0.685	0.052	13.201	***				ST1	<---	ST	0.682	0.062	11.02	***				
SV2	<---	SV	1.000							OA1	<---	OA	1.000							
SV1	<---	SV	1.034	0.079	13.157	***				OA3	<---	OA	0.822	0.083	9.951	***				
SV4	<---	SV	0.776	0.073	10.574	***				OA2	<---	OA	0.865	0.088	9.811	***				
SV3	<---	SV	0.785	0.080	9.797	***				CL3	<---	CL	1.000							
FV2	<---	FV	1.000							CL1	<---	CL	0.817	0.094	8.724	***				
FV1	<---	FV	1.005	0.070	14.370	***				CL4	<---	CL	0.793	0.091	8.727	***				

Note: \*\*\*: Significant at 1%, \*\*: Significant at 5%

Table 4 shows that the testing of hypotheses includes aesthetics (AS) factors (CL, DS, TS, ST, BT, OA), which affects IB with 95% of statistical significance. In particular, FV, SV, and EV factors also affect IB with statistical significance with  $P < 0.05$ . Thus, research hypotheses including H1, H2, H3, H4, H5, H6 and H7 are accepted.

Table 5 (standardized regression weights) indicates normalized regression weights, whereby all coefficients are positive, indicating that the effect of all factors is positive. However, the impact level of the AS to IB factor is relatively weak.

Table 5: Standardized regression weights

		Estimate		Estimate			
FV	<---	AS	0.288	FV3	<---	FV	0.765
SV	<---	AS	0.495	BT1	<---	BT	0.854
EV	<---	AS	0.229	BT2	<---	BT	0.869
BT	<---	AS	0.492	BT3	<---	BT	0.775
DS	<---	AS	0.281	DS1	<---	DS	0.837
TS	<---	AS	0.714	DS2	<---	DS	0.889
ST	<---	AS	0.645	DS4	<---	DS	0.741
OA	<---	AS	0.628	IB1	<---	IB	0.863
CL	<---	AS	0.391	IB3	<---	IB	0.846
IB	<---	AS	0.153	IB2	<---	IB	0.857
IB	<---	SV	0.327	TS1	<---	TS	0.768
IB	<---	FV	0.355	TS3	<---	TS	0.822
IB	<---	EV	0.268	TS2	<---	TS	0.860
EV3	<---	EV	0.955	ST2	<---	ST	0.869
EV2	<---	EV	0.895	ST3	<---	ST	0.839
EV4	<---	EV	0.694	ST1	<---	ST	0.671
SV2	<---	SV	0.858	OA1	<---	OA	0.822
SV1	<---	SV	0.800	OA3	<---	OA	0.712
SV4	<---	SV	0.654	OA2	<---	OA	0.697
SV3	<---	SV	0.613	CL3	<---	CL	0.847
FV2	<---	FV	0.859	CL1	<---	CL	0.671
FV1	<---	FV	0.845	CL4	<---	CL	0.671

Table 6 shows that the aesthetic impacts indirectly on the intention to buy through social value are the strongest and through emotional value is the weakest. In particular, aesthetics directly affects the intention to buy, and aesthetics indirectly affects the intention to buy through functional values are rank at position two and three respectively.

Table 6: Results of direct and indirect relationship

	Estimate
AS ---> IB	0.153
AS ---> FV ---> IB	0.102
AS ---> SV ---> IB	0.161
AS ---> EV ---> IB	0.061

## 6. CONCLUSION, MANAGERIAL IMPLICATION AND LIMITATIONS

Based on previous studies, the authors built a relationship model between aesthetics, perceived value and intention to purchase the smartphone. These hypotheses of aesthetics have a positive impact directly on the intention to purchase; besides, the hypotheses of functional values, social values, emotional values that are intermediate between aesthetics and purchase intentions are acceptable. The research results show that six color factors (eliminate CL2), design (eliminate DS3), feeling, beauty, style, overall appearance can measure the aesthetic; while perceived value scales include 3 factors of functional value, social value, emotional value (eliminate EV1) are also accepted; and the scale of purchase intention is highly reliable.

In this study, the aesthetics have the most impact on social values (standardized coefficient of beta = 0.495), followed by functional values (standardized coefficient of beta = 0.288) and finally values emotion (standardized coefficient of beta = 0.229). On the other hand, functional values affect the intention to buy most strongly (standardized coefficient of beta = 0.355), followed by social value and emotional value with the standardized coefficient of beta that equal 0.327 and 0.268 respectively, finally the aesthetic (standardized coefficient of beta = 0.153).

The research results show that the intention to buy smartphones in Ho Chi Minh City area is most affected by aesthetics through social value (standardized coefficient of beta = 0.161). Also, the intention to buy is also significantly affected by aesthetics through functional values and emotional values with a standardized coefficient of beta that equals 0.102 and 0.061 respectively. In conclusion, in Ho Chi Minh City, the indirect effect of aesthetics on the intention of buying through social value is higher than the indirect effect of that.

Previous studies showed that the aesthetics powerful effect on user preferences in different contexts (YAMAMOTO; LAMBERT, 1994; LEE; KOUBEK, 2010). At the same time, the analysis results show that all four factors aesthetics, functional value, social value, and emotional value have significant influence on the intention to buy smartphones; therefore, in order to increase the intention to buy smartphones from customers, smartphone companies need to focus on the aesthetics, functional value, social value, and emotional value.



About aesthetics: By connecting the results of assessing the aesthetics of smartphones, directly and indirectly, to purchase through perceived values, administrators need to carefully consider the properties of relevant factors to benefit product development, promotion, positioning and choose the most appropriate strategy for the business. In particular, considering the factors of aesthetics, businesses can design more personalized products, allowing companies to capture the value of customers through unique visual (KARJALAINEN; SNELDERS, 2009).

According to Moon et al. (2013), successful product development focused on a unique visual design can also reduce advertising costs. The company should focus on the properties of aesthetics that strongly affect the intention to buy smartphones to facilitate the promotion and selection of business strategies. So, when the company creates advertising strategies, they should pay attention to the different relationships between the elements of aesthetics and the intention to buy smartphones.

About functional value: Smartphone users create perceived value by their usage habits, in which the functional attributes of the product play an essential role (FINNILÄ, 2011). Research results show that functional values strongly influence the intention to buy smartphones, so businesses should capture the technology development trend of the smartphone industry to create optimal products that can meet customer needs.

About social value: The results of SEM analysis also reflect the strong impact of social value on the intention to buy. In fact, in countries with high smartphone penetration rates, customers are more likely to be connected with friends, family and reference groups that are likely to increase psychological dependence with their friends (WALSH et al., 2009; WEI; LO, 2006), so the importance of social values in advertising campaigns is essential. For example, developing more software to increase the ability to connect with family, friends, colleagues.

About emotional value: Further research on the emotional meaning is that aesthetic has elicited the product and the value of these emotional connections (LOJACONO; ZACCAI, 2012) and the aesthetic can create more effective advertising strategies. Specifically, businesses need to enhance the value of the emotional connection between users and smartphones and have more interested in the experience of customers.

Due to the limitation of the time to study the research, the authors only surveyed the research subjects in an overview, so it is impossible to check and study specific aspects of each observed variable. For example, designs of smartphones may have different forms, such as



squares, circles, ovals; even smartphone designs may vary based on customer preferences. Aesthetics is a new research category in Vietnam, so there are not many scientific studies on this issue. Future research can expand the scope of exploring personal factors such as lifestyle, income, ... and link to the intention to purchase smartphones.

Examining the possibility of other variables not mentioned in the study can also affect the aesthetics of a product. For example: According to Shin (2012), in different cultures also affect the way of evaluating the aesthetics of people; besides, some lifestyle factors can control many consumer decisions (HAWKINS; MOTHERSBAUGH, 2010), and what is more, how people value aesthetics through motivation and personal experience (MOTHERSILL, 1984).

This research only specifically studies products as smartphones, so the future research can use the research model above to test the impact of aesthetics on other technological devices, such as tablets, desktop, laptop or other smart devices. Further studies should conduct the impact direction of functional values, social values, emotional values to the intention of buying technology products. Due to the limitation of budget, time and resources, the authors have not yet studied the direction of impact whether the values in perceived value which include functional value, social value, and emotional value affect each other before the customers have an intention to buy the smartphone.

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