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## Faculty of Business Economics

Master of Management

### **Master's thesis**

***Perceived value of smartphone and its impact on satisfaction and loyalty - an investigation on student market in Belgium***

#### **Jun Zeng**

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization International Marketing Strategy

#### **SUPERVISOR :**

Prof. dr. Alexandra STREUKENS



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**2018**



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## **Preface**

This thesis is submitted in fulfilment of the requirements for a Master of Management in International Marketing Strategy. I have finalised this thesis with the help of several individuals. First and foremost, I would like to express my gratitude and appreciation to Prof. Dr. Sandra Streukens for her support over the course of the thesis. Because of her years of expertise in marketing, I found her feedback thoughtful and intelligent. Without her knowledge and commitment, this thesis could not have brought to fruition. I would also like to thank my friends and others who have supported me up by offering their help and particularly by filling out the survey. Their support cannot be understated. Furthermore, I would like to thank my family for their love and support.

Jun Zeng

University of Hasselt 2018

## **Summary**

Every business seeks to fulfil and cultivate value for the customer in pursuit of higher satisfaction and loyalty. Thus, the central topic of this thesis is on value-satisfaction-loyalty.

Today, almost every student has a smartphone. The student market can be highly lucrative because of their great spending power. Moreover, their brand loyalty is low because their minds are open to change. During the research of the literature, I did not find any study on this specific market. Therefore, the research question of this thesis was formulated as, ‘exploring the influencing factors that affect the level of satisfaction and loyalty among students with regard to their smartphone in a Belgium context.’

Based on Holbrook’s value typology, five value types were extracted, namely, efficiency, excellence, social value, play, and aesthetics. A questionnaire was adapted from a variety of studies. Data were collected from 431 Belgium students by using an online survey tool (Qualtrics). The data were then analysed by using both SPSS and the partial least square approach to structural equation modelling.

The results show that the value in efficiency, excellence, and aesthetics have positive effects on student satisfaction, while social and play value are insignificant. Value also influences loyalty.

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# Chapter 1

## 1.1 Introduction

Business begins with value creation. It is one of the most strategic imperatives for any organisation. Albrecht (1992) contends that, “the only thing that matters in the new world of quality is delivering customer value.” In the pursuit of a thriving business, creating customer value has now become a topic of considerable interest and is embedded in the organization’s mission statement and objectives. It is seen as the key to long-term success. A value-based approach is often at the core of a firm’s management strategies. Many studies have demonstrated the correlation between customer value and behavioural outcomes, satisfaction, and loyalty (Baker, Parasuraman, Grewal, & Voss, 2002; Dabholkar & Sheng, 2012; Guenzi & Troilo, 2007; Leroi-Werelds, Streukens, Brady, & Swinnen, 2014). Although the links between them seem obvious, the challenge for marketers is how to create value for their customers and fulfil their changing needs.

The focus of this study is on creating value in the context of the smartphone market in Belgium. The smartphone, a product of the technology era, is more than a means of communication. It has completely redefined the way people interact. Apart from texting and calling, people can also use it for surfing the internet, reading emails, playing games, and experiencing other entertainment. The number of smartphones sold worldwide has tripled from 2011-2015 from nearly 472 million to 1,423.9 million units respectively (Statista, 2015). The development of the mobile app markets and mobile commerce are the two major factors contributing to the evolution of smartphone adoption (Shin, 2015).

While the smartphone market is blooming, the competition is also intensifying. Many businesses are struggling with this. A survey carried out by the International Data Corporation (IDC) revealed that Blackberry continued to decline in growth, with a market share of 4.9%, 2.8%, 0.5%, 0.3% from 2012 to 2015, respectively. The drop-in market share is consistent with its financial performance. According to Blackberry’s financial statements, it reported \$11,073 million US in revenue in fiscal 2013, as compared to \$2,160 million US in fiscal



2016. This is a striking downturn, which also signals a message to marketers that they should pay much more attention to the changing needs of customers to survive the competition.

In the Belgium smartphone market, the research company iVOX conducted a survey and found that, in Belgium, 85% of the youth between the ages of 18 and 34, owned a smartphone, which is 18% greater than the penetration rate in Belgium. According to International Telecommunication Union 's analysis, among smartphone owners, nearly 79% are between the ages of 15 and 23. These figures indicate the potential of the student smartphone market in Belgium. Although at present, this segment may not be profitable, they are likely to have significant income after graduation (Michaela, 2014). Therefore, it is wise to target this group and maintain their loyalty to the brand.

Although the student market in Belgium has potential for the long-term, both in terms of size and purchasing power, no study has been undertaken to examine students' perception concerning their smartphones in the Belgium market. Therefore, the purposes of this thesis are to identify perceived value and its dimensions in this domain, to conceptualize a model integrating perceived value, satisfaction, and loyalty, and to provide insights for marketers into this segment to achieve greater financial outcomes and more specifically, understanding and creating value that best suits college students' needs and expectations, so students remain loyal to the brand. Therefore, the research question of this thesis is developed as following:  
**\*RQ:** To understand what drives Belgian college students' value perceptions regarding smartphones and its impact on satisfaction (and loyalty).

Based on that central question, two sub-questions are as follows:

**\*SQ:** What is perceived value and what are the existing approaches to measuring value?

**\*SQ:** How are perceived value and behavioural outcomes, satisfaction, and loyalty related?

The remainder of the thesis consists of four chapters. The first section is based on a literature review and presenting the conceptual model and hypotheses of the study. Subsequently, the methodology of the study will be presented, followed by the analysis of the study. Finally, implications and limitations will be discussed in the concluding chapter.

## Chapter 2 Literature review

### 2.1 Perceived Customer Value

In the contemporary business environment, the concept of perceived value has taken centre stage in discussions of business strategy. It is seen as the key to long-term success by many organisations. In academia, the most commonly accepted definition of perceived value is proposed by Zeithaml (1988) as a “consumer’s overall assessment of the utility of a product (or service) based on perceptions of what is perceived and what is given”. Here, the utility of a product (or service) in the perception of the consumer may be evaluated based on a comparison of the gains and costs that the customer can obtain and give through the usage of the product (or service).

In accordance with this definition, there are a number of notable characteristics. First, customer value is perceived by the customer, and therefore, is defined by the customer, not the supplier (Leroi-Werelds et al., 2014; Vargo & Lusch, 2004). Second, customer value is very subjective (Leroi-Werelds et al., 2014). This means that consumers evaluate the utility of a product (or service) based on their own purchase and use experience. Their judgments about the utility of a product (service) come from their subjective feelings. Third, customer value is situation-specific (Leroi-Werelds et al., 2014). This implies that the value perceived by the customer is built upon circumstances, time frames, or location (Woodruff, 1997). Fourth, customer value entails the synergy between a subject (the customer) and an object ( a product/service/store) (Leroi-Werelds et al., 2014). This characteristic also distinguishes customer value from customer values, which are the customer’s core beliefs, purposes, and goals in life. Although each concept has its own peculiarities, they are also intimately related. Customer value can affect perceived value, yet customer value can be a means to achieve customer values.

A better understanding of customer value would help managers improve their mental model for customers and add more appealing value to attract more customers. The value a firm conveys serves as a great advantage for winning loyal customers and achieving financial

goals. Giving enough thought to customer perceived value when making marketing strategies is well acknowledged by retailers (Sweeney & Soutar, 2001).

## **2.2 Customer Value Operationalisation**

In terms of customer value operationalisation, there are two main approaches in academia: a one-dimensional approach and a multi-dimensional approach (Leroi-Werelds et al., 2014). The one-dimensional approach to customer value portrays value as “a single overall concept that can be measured by a self-reported item (or set of items) that evaluates the consumer’s perception of value” (Sánchez-Fernández & Iniesta-Bonillo, 2007). Dodds, Monroe, and Grewal (1991) developed a one-dimensional approach to measure customer value based upon the trade-off between perceived quality and sacrifice. In this approach, value is measured by five questions regarding the overall value of the product or service. The advantage of this approach lies in its simplicity and ease of implementation (Ling, 2004). However, it often neglects the complexity of the value construct. Conversely, a multi-dimensional approach evaluates value in a more sophisticated way. This method defines value as a construct consisting of distinct interrelated components or dimensions (Sánchez-Fernández & Iniesta-Bonillo, 2007). One of the drawbacks of this method is its complexity of implementation (Leroi-Werelds et al., 2014; Sánchez-Fernández & Iniesta-Bonillo, 2007), given that value dimensions are inter-related (Sweeney & Soutar, 2001).

Holbrook’s multi-dimensional approach is considered “the most comprehensive approach to the value construct because it captures more potential sources of value than do other conceptualizations” (Sánchez-Fernández, Angeles Iniesta-Bonillo, & Holbrook, 2009). Moreover, Holbrook’s typology incorporates other measurement methods (Leroi-Werelds et al., 2014). According to Holbrook (1996) original model, perceived customer value has eight dimensions: efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality (c.f., Table 2.1). The classification of these eight dimensions is based on three criteria, i.e., self-oriented versus other-oriented, extrinsic versus intrinsic, and active versus reactive (Holbrook, 1999). Extrinsic value is obtained from the function and effectiveness of a product

(or service) in meeting its goal or purpose, and intrinsic value is obtained from the experience of the consumers. Moreover, self-oriented value refers to the customer’s self-evaluation and appreciation of the consumption, while other-oriented value is about how the consumption process influences someone or something else. In addition, active dimension indicates that the consumer is in an active control status in the product or service consumption process, and reactive dimension indicates that value is obtained when the customer plays a passive role in the product or service consumption process.

(Holbrook, 1999) pointed out that “some of the value types in [his] framework are related in such a way that it is extremely difficult to operationalise them separately”. For example, they said that it is difficult to distinguish status and esteem, so that further research after Holbrook (Holbrook, 1999) is suggested to combine these two into a new dimension, called social value. Hence, the dimension of social value instead of status and esteem will be used in this research. In addition, the last two dimensions (ethics and spirituality) are not frequently applied in an analysis of the value for mobile phone consumers ((Richins, 1999); (Solomon, 1999). Hence, the remaining five dimensions will be used in this research (i.e., efficiency, excellence, social value, play, and aesthetics).

*Table 2.1- Holbrook's Typology of Consumer Value (Smith, 1999, p. 149)*

		<b>Extrinsic</b>		<b>Intrinsic</b>	
<b>Self-Oriented</b>	<b>Active</b>	Efficiency		Play	
	<b>Reactive</b>	Excellence		Aesthetics	
<b>Other-Oriented</b>	<b>Active</b>	Status	Social Value	Ethics	
	<b>Reactive</b>	Esteem		Spirituality	

***Holbrook’s Dimension One: Efficiency***

According to the Holbrook typology, efficiency is about the economic value of the products (e.g., price and costs) (Holbrook, 1996). (Sweeney & Soutar, 2001) defined efficiency as “the utility derived from the product due to the reduction of its perceived short term and longer term costs”. (Lim, Widdows, & Park, 2006) further pointed out that efficiency value among

mobile service consumers is about perceived economic benefits of the product (service) in relation to its monetary costs. In addition, the importance of efficiency value among smartphone users is also supported by (Hooi Ting, Fong Lim, Siuly Patanmacia, Gie Low, & Chuan Ker, 2011), who found the importance of the consumer's value in reasonable and affordable pricing.

### ***Holbrook's Dimension Two: Excellence***

In the typology of Holbrook's model, excellence is about consumers' perceived quality of the product (or service). (Sweeney & Soutar, 2001) defined that quality is "the utility derived from the perceived quality and expected performance of the product". The quality of the product (or service) is important. (Aulia, Sukati, & Sulaiman, 2016) pointed out that customers perceived products as "either to solve the problem of the customer or to make the task of the customer easier". For example, the perceived customer value in battery life and performance is suggested to influence their purchase willingness and loyalty (Bakon & Hassan, 2013). Hence, the smartphones with poor quality in battery life might lead to complaints from customers and low value assigned. In addition, customers of smartphone users also consider the important roles of other utilitarian attributes of the products, such as the camera, speed, connectivity, screen display, and durability (Bakon & Hassan, 2013).

Other attributes of smartphones that can improve emotional value include the ease of use (i.e., the convenience, usefulness, and user-friendliness) of the product (Chung & Chun, 2011) In addition, some studies suggest that customers also purchase smartphones as a result of the perceived innovative features of the products, such as new mobile functions, which is driven by curiosity (Bakon & Hassan, 2013).

### ***Holbrook's Dimension Three: Social Value***

Another dimension of Holbrook's model is social value, which is a combination of status and esteem (Leroi-Werelds et al., 2014). It is assumed that customers tend to want to improve their "good impression in the society" (Aulia et al., 2016). Social value plays an important

role in customer perceived value (Eroglu, Machleit, & Barr, 2005). Social value is defined as, “the utility derived from the product’s ability to enhance social self-concept” (Sweeney & Soutar, 2001). It is also referred to as feelings of belonging in some particular social groups (Lim et al., 2006). This is because the possession of some items might help customers to create certain perceived social images (e.g., the symbol of elite social position) (Bakon & Hassan, 2013). Lim et al. (2006) pointed out that social value is important in the mobile phone industry where the product (service) is driven by technology. So, possessing these high-tech devices can reflect social status.

Lu, Yu, Liu, and Yao (2003) suggested that the use of mobile phones can help a person change how they are perceived by other people. For smartphone users, the phones are a representation of the latest trends and leaders in technology fields (Bakon & Hassan, 2013). Hence, perceived social image has a great influence on the decision-making of consumers for mobile phones. Ling (2004) pointed out that mobile phones are intermediaries where users can establish social contacts and have mutual communication with each other, which is also supported by Lim et al. (2006). Smartphones help customers establish social networking with others (e.g., using email, SMS, etc.) (Bakon & Hassan, 2013). So the use of smartphones is associated with the social influence of the customers (Hooi Ting et al., 2011).

***Holbrook Dimension Four: Play***

Play is an emotional value of consumers, which includes factors such as fun, enjoyment, relaxation, and pleasure. (Holbrook, 1996). Emotional value is defined as “the utility derived from the feelings or affective states that a product generates”, and it is found to be the most influential value construct for consumers’ purchase intentions (Sweeney & Soutar, 2001). The playfulness of the product can bring enjoyment to the customers (Kim & Han, 2009).

***Holbrook Dimension Five: Aesthetics***

Examples of aesthetics include the beauty and physical design of the products (Bakon & Hassan, 2013). It is the aesthetic and symbolic value of the consumers toward the appearance of the products (Marielle, Creusen, & Schoormans, 2004). This aesthetic value is thought to have some influence on the satisfaction and loyalty of the customers toward the product.

## **2.2 Customer Satisfaction**

Satisfaction is a commonly used item to evaluate the post-purchase or post-use experience of customers towards the product (service) (Oliver, 1981). In this research, the definition of customer satisfaction is based on the view of Anderson and Sullivan (1993), who defined customer satisfaction as the emotional reaction to or contentment of customers toward their past purchase or use experience in comparison with their expectations. This means that satisfaction is usually evaluated after the product (service) has been used. This view is supported by Yang and Peterson (2004), as they explained further that customer satisfaction is a reflection of “customers’ cumulative impression of a firm’s service performance”. In other words, customer satisfaction is “a pleasurable level of consumption-related fulfilment” (Ariff, Fen, and Ismail (2012). It can be measured based on a one-dimensional construct of the hedonic continuum varying from most to least favourable (Westbrook and Oliver (1991). Hence, customer satisfaction is a reflection of the overall fulfilment, attitude, feeling state, or judgment of the customer toward the product (service), which varies from negative to positive (Levesque & McDougall, 1996).

It is a practical certainty that satisfaction is of dominant advantage in marketing, as it cultivates loyal fans and increases the likelihood of repurchase (Yannis, Dimitris, Athanasios, George, & Athanasios, 2014). Satisfied consumer are willing to recommend the products (Sweeney & Soutar, 2001) and they are less likely to switch to other product or service providers.

## **2.3 Customer Loyalty**

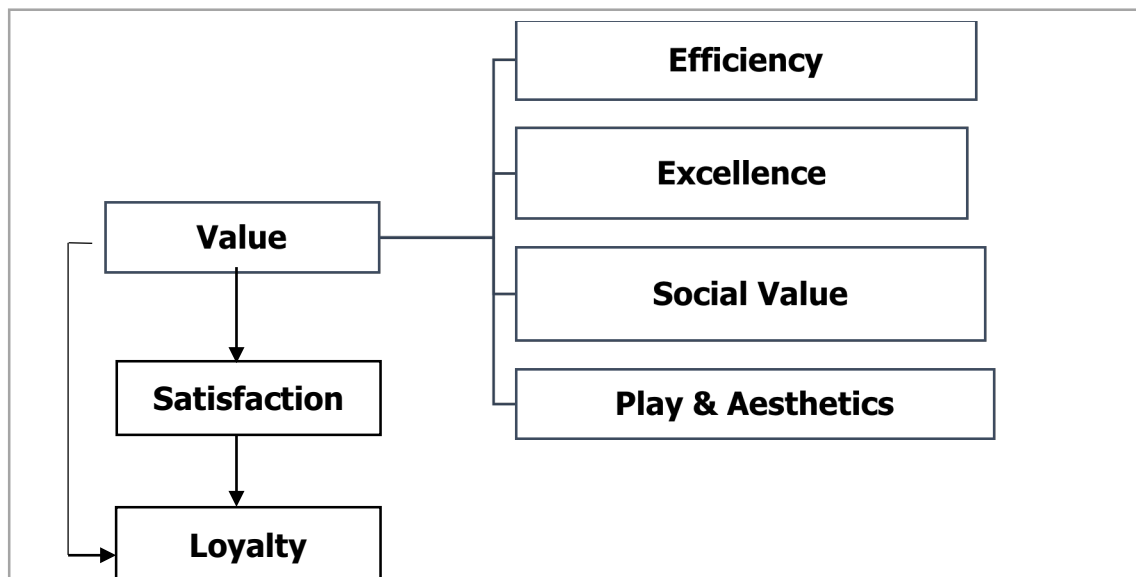
The second outcome is loyalty. Customer loyalty is important as it is directly related with the survival and growth of a company (Kim, Park, & Jeong, 2004). Hence, it is a strong asset of a company (Olsen, 2002). In the industry of mobile products (services) where there is an increasing churn rate, customer loyalty is especially important (Kim et al., 2004). The definition of customer loyalty in this research is based on the view of Lim et al. (2006), who defined loyalty as the attachment (or commitment) of customers toward the product (service). Specifically, it is the tendency that a customer might choose a certain brand, business, or

product (service) to satisfy their requirements (Ariff et al., 2012). This means that customers have a preference and attachment toward one brand (or business, product, service) than others, so they may actively select one brand (or business, product, service) exclusively.

## 2.4 Value-Satisfaction-Loyalty

The framework of this research is based on the conceptual B-A-I framework that was developed by Froehle & Roth (2004), the belief-attitude-intention model. This relationship between belief, product satisfaction, and behavioural intention is also supported by empirical research (e.g., Yoshida & James, 2010). Hence, the relationship between perceived customer value, satisfaction, and loyalty is assumed to be based on the conceptual framework of B-A-I (value-satisfaction-loyalty) in this research (c.f. **Figure 2-1**).

*Figure 2.1- Value-Satisfaction-Loyalty*



It presents the relationship between perceived customer value, customer satisfaction, and customer loyalty. The perceived value of customers includes, efficiency, excellence, social value, play, and aesthetics, which is based on Holbrook's model. These perceived values are assumed to have a positive relationship with customer satisfaction. Moreover, a positive relationship is assumed between customer satisfaction and loyalty. This means that customer



satisfaction has a mediating role in the value-loyalty relationship. These assumptions will be discussed in later sub-sections in accordance with the previous literature.

## **2.5 Relationship Between Customer Value and Satisfaction**

According to previous literature, there is a positive relationship between perceived customer value and satisfaction. For example, De Ruyter, Wetzels, Lemmink, and Mattson (1997) carried out a study to analyse the influence of customer perceived value in the hotel industry and found a positive relationship between value and customer satisfaction. McDougall and Levesque (2000) used regression analysis to show that customer perceived value contributes to 43.6% of satisfaction and re-purchase willingness in the car repair industry. Ajzen and Fishbein (1975) pointed out that cognition (i.e., customer perceived value) has a substantial influence on affect (i.e., customer satisfaction). Dodds and Monroe (1985) pointed out that there is direct link between customer perceived value and their purchase willingness. Improvement in providing customer value is associated with the improvement in customer satisfaction (Ariff et al., 2012). The assumption regarding the relationship between different perceived customer value and satisfaction is discussed in detail below.

### ***Value in Efficiency and Satisfaction:***

The influential role of customer monetary value on their future satisfaction and purchasing decisions has been found by McDougall and Levesque (2000). This finding is also supported by Bakon and Hassan (2013), who found a positive relationship between functional (price) value and customer satisfaction with purchasing intentions. Another empirical study from the United States also supports the strong positive relationship between economic value and customer satisfaction (Lim et al., 2006).

**Assumption 1:** Perceived customer value in efficiency has a positive influence on satisfaction.

### ***Value in Excellence and Satisfaction:***

After data analysis from seven major sectors in the United States, Fornell, Johnson, Anderson, Cha, and Bryant (1996) found that satisfaction is driven most by quality than by price. In

addition, Olsen (2002) also found the predicting effects of product (service) quality on customer satisfaction and feeling states, and future purchasing intentions and behaviours.

**Assumption 2:** Perceived customer value in excellence has a positive influence on satisfaction.

***Value in Social Value and Satisfaction:***

Lee, Kim, Lee, and Kim (2002) found from empirical studies carried out in Korea and Japan that there is a positive relationship between perceived social value and customer satisfaction in the industry of mobile products (services). However, after a comparison of situations in South Korea and Japan, Chae, Kim, Kim, and Ryu (2002) found that in the mobile product (service) industry, the influence of social value on customer satisfaction is different in various cultural contexts. Also, Lim et al. (2006) found that in the US mobile service industry, the influence of social value on customer satisfaction is not as strong as the impacts of efficiency value. (Ariff et al., 2012) found that there is a strong relationship between social value and customer satisfaction (and loyalty) among teenagers as mobile users, which identified the important role of social value among this specific group.

**Assumption 3:** Perceived customer value in social value has a positive influence on satisfaction.

***Value in Play and Satisfaction:***

Chung and Chun (2011) found that the perceived value of customers in the fun of smartphones is positively related with their satisfaction and the intention to purchase the products. In fact, if the customers feel enjoyment in the smartphones, they are more likely to have an emotional attachment to the product (You, Lee, & Park, 2011).

**Assumption 4:** Perceived customer value in play has a positive influence on satisfaction.

***Value in Aesthetics and Satisfaction:***

The positive relationship between emotional value (aesthetics) and satisfaction is supported by Eroglu et al. (2005). This strong positive influence of emotional value on customer satisfaction is also supported by empirical studies from the US (Lim et al., 2006). Moreover, another empirical study consisting of 270 questionnaire surveys from mobile phone users in

Malaysia found a substantial positive influence of customer perceived emotional value on their satisfaction (Ariff et al., 2012).

**Assumption 5:** Perceived customer value in aesthetics has a positive influence on satisfaction.

## **2.6 Relationship Between Satisfaction and Loyalty**

It is assumed that there is a positive relationship between satisfaction and loyalty. Gallarza and Saura (2006) report that customer satisfaction has a positive effect on customer loyalty. Hallowell (1996) has also proved the positive relationship of customer satisfaction to customer loyalty based on data collected from a bank. Cronin, Brady, and Hult (2000) synthesized marketing theories to conclude that satisfaction is directly related to the behavioural intentions of customers. The positive relationship between customer satisfaction and loyalty is also supported by Söderlund (1998) from an empirical study that was carried out in Stockholm, Sweden. Olsen (2002) also found a positive relationship between satisfaction and loyalty, but the magnitude depended on the types of product (service).

Using survey data from 22,300 customers in Sweden, Anderson and Sullivan (1993) concluded that high customer satisfaction can help a company win a long-term reputation, and thus, has positive influence on the repurchase intention of customers. Kim et al. (2004) identified a close relationship between satisfaction and customer loyalty in the Korean mobile telecommunication services industry. They considered “satisfaction functions as an antecedent of customer loyalty” (Kim et al., 2004) and “customers experiencing a high level of satisfaction are likely to remain with their existing providers and maintain their subscription” (Kim et al., 2004).

**Assumption 6:** The level of satisfaction will have a positive influence on loyalty intention.

**Assumption 7:** Perceived customer value will have a positive influence on loyalty intention.

## Chapter 3 Data Collection

### 3.1 Data Collection Plan

The population of this study were Belgium students who have a current purchasing experience of smartphones. A sampling method was used by the University of Hasselt. The sampling method used in the research is a simple random sampling, where each student in the university has the same probability of being selected. The questionnaire will be distributed through university emails to all students at the university.

### 3.2 Questionnaire

A questionnaire was used as the survey method to collect primary data from university students. The questionnaire was used to collect measurements about the customers' perceived value, satisfaction, and loyalty toward smartphones among students at the selected university. The first section is about the collection of measurement items regarding the students' perceived value of the smartphone and their satisfaction, as well as loyalty. The second section is the collection of the demographic profiles of the students. Table 3.2 presents an overview of the constructed measurements.

*Table 3.2 - Overview of Questionnaire Measurements*

<b>Variables</b>	<b>Resources</b>	<b>Statements</b>
<b>Efficiency</b>	Leroi-Werelds et al. (2014)	<ol style="list-style-type: none"><li>1. The price of this smartphone is high.</li><li>2. This smartphone is easy to use.</li><li>3. This smartphone makes my life easier.</li><li>4. This smartphone has made me much more</li></ol>

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		productive, saving me a lot of time.
<b>Excellence</b>	Munnukka and Järvi (2012)	<ol style="list-style-type: none"> <li>1. This smartphone has an image of high quality and excellence.</li> <li>2. This smartphone represents the top brand.</li> <li>3. The manufacturer of this smartphone is a top expert in the field.</li> </ol>
<b>Social value</b>	Sweeney and Soutar (2001)	<ol style="list-style-type: none"> <li>1. This smartphone helps me to feel acceptable.</li> <li>2. This smartphone improves the way I am perceived.</li> <li>3. This smartphone makes good impression on other people.</li> <li>4. This smartphone gives me social approval.</li> </ol>
<b>Play</b>	Petrick (2002)	<ol style="list-style-type: none"> <li>1. This smartphone makes me feel good</li> <li>2. This smartphone gives me pleasure</li> </ol>

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<b>Aesthetics</b>	Maghnati, Ling, and Nasermodeli (2012)	<ul style="list-style-type: none"> <li>3. This smartphone gives me a sense of joy.</li> <li>4. This smartphone makes me feel delighted.</li> <li>5. This smartphone gives me happiness.</li> <li>1. I think this smartphone is beautiful.</li> <li>2. I like the design of this smartphone.</li> </ul>
<b>Customer satisfaction</b>	Leroi-Werelds et al. (2014)	Please indicate how satisfied or dissatisfied you are with this smartphone
<b>Customer loyalty</b>	Leroi-Werelds et al. (2014)	<p>Please indicate how likely it is that you would</p> <ul style="list-style-type: none"> <li>1. Say positive things about your smartphone to other people</li> <li>2. recommend your smartphone to someone who seeks your advice.</li> <li>3. Encourage friends and relatives to buy this smartphone.</li> </ul>

---

- 
4. Consider this  
smartphone your  
first choice when  
you need a new  
smartphone
  5. Buy this smartphone  
again when you  
need a new  
smartphone
  6. Doubt about buying  
this smartphone  
again.
-

## Chapter 4 Findings

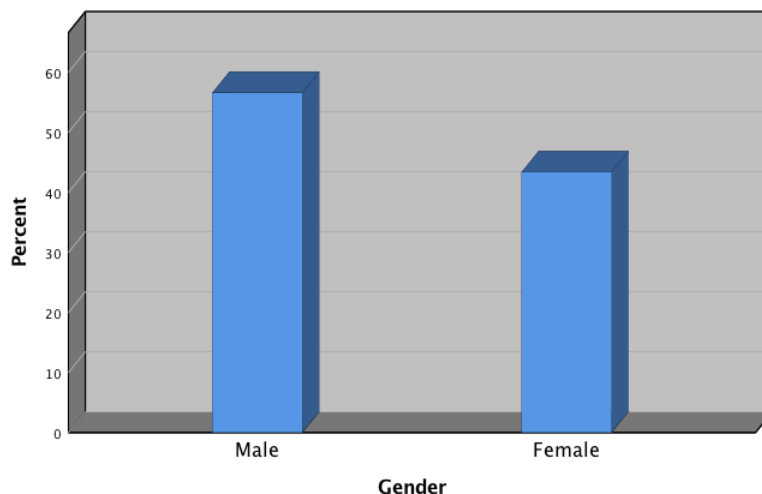
The previous chapter presented the methodology adopted for this research, while this chapter discusses the statistical analysis of the data and the most significant findings from the 431 questionnaires completed by the students. SmartPLS software was used for PLS path model analysis of the study. The justification for using PLS over SEM was based on two facts. First, formative measurement was incorporated in the modelling. Since formative items are multidimensional in nature, the SEM estimates could be invalid or problematic. Second, a benefit of using PLS is that the sample size requirements are much smaller than are required for SEM (Chin & Newsted, 1999). Demographics were analysed using SPSS 25.

### 4.1 Demographics.

Online questionnaires were distributed to students by email. In total, 509 entries were collected. Of the 509, 78 responses were eliminated due to an excess of missing information. The respondent profile is composed of gender, age, field of study, operation system of smartphone, and smartphone brand.

#### Respondent profile

*Figure 4.2 - Gender*



The above figure 4.2 indicates the gender of respondents who participated in the survey. The results show that more than half (57%) were males, whereas about 43% were females.



Table 4.3 - Age

<b>What is your age?</b>			
	Frequency	Percent	Cumulative Percent
<b>Below 18</b>	2	.5	.4
<b>18-22</b>	282	65.4	64.4
<b>22-25</b>	89	20.6	85.7
<b>25-30</b>	34	7.9	93.5
<b>Above 30</b>	24	5.6	100.0
<b>Total</b>	<b>431</b>	<b>100.0</b>	

Since this study is focused on the student market, it is not surprising that out of the total respondents investigated for this study, more than 65% of the respondents were in the 18-22-year age group, followed by those in the 22-25 years age, and the least were 18 years or younger (0.4%) (see Table 4.3)

Figure 4.3 - Field of Study

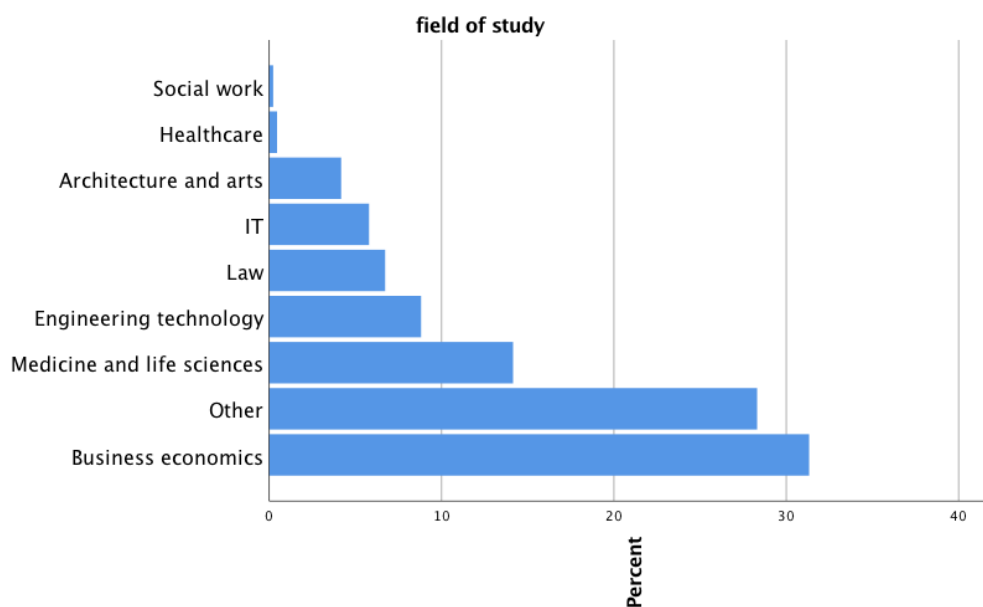
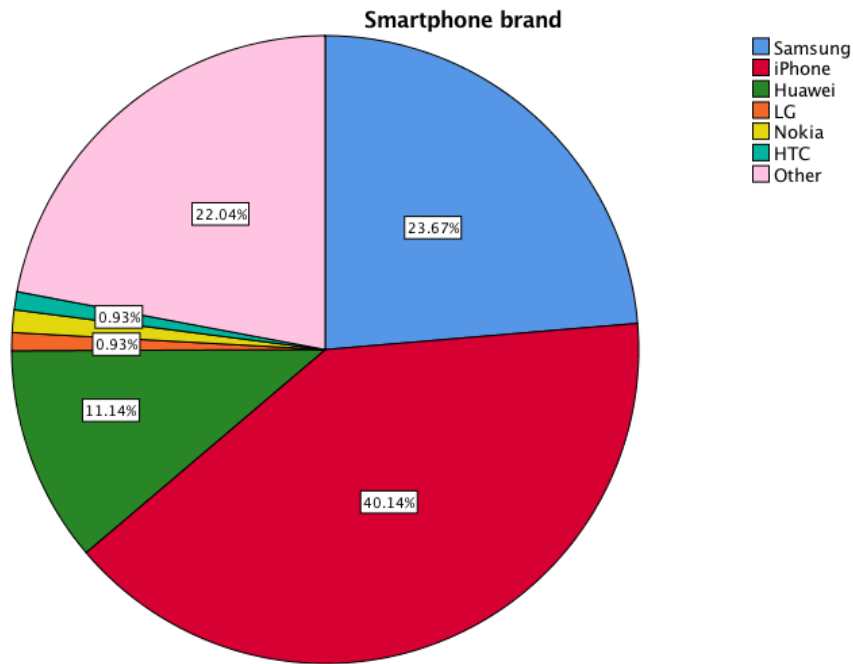


Figure 4.3 presents the study majors of the respondents. It was found that one third (31%) of the students were majoring in Business Economics.

Figure 4.4 - Smartphone Brand



The distribution of the respondents by smartphone brands have presented in figure 3.it can be seen that the iPhone (40%) was the most popular smartphone among students followed by Samsung (24%). Other (22%) was the third largest group (see Figure 4.4).

#### 4.2 Descriptive Statistics of Variables

An overview of the descriptive outputs and the correlations for dependent and independent variables in this study is given in Table 4.4. All variables were measured on a scale from 1 to 7. All the variables that scored above the midpoint (3.5) can be considered as positive. It seemed respondents did not appreciate the social value of their smartphones. Play also scored relatively low (mean=4). The table also indicates that all the correlations produced are positive and significant.

Table 4.4- Descriptive Statistics and Correlation Matrix

	Scale	Mean	SD	1	2	3	4	5	6	7
1	Aesthetics	1-7	5.7	1.19						
2	Efficiency	1-7	5.6	0.94	.57**					
3	Excellence	1-7	5	1.37	.47**	.42**				
4	Social	1-7	3.4	1.41	.68**	.61**	.69**			
5	Play	1-7	4	1.3	.59**	.53**	.58**	.63**		
6	Satisfaction	1-7	5.7	1	.53**	.48**	.52**	.55**	.50**	
7	Loyalty	1-7	4.9	1.33	.56**	.53**	.59**	.63**	.60**	.71**

Note. N=431. \*\*p< .01

### 4.3 Measurement Model Assessment

Prior to a structural model assessment, it is critical to examine the measurement of the model. The reliability and validity of the item measures used should be checked. The logic is that if the measurements are not adequate, there is no reason to test the structural model. Evaluation of the measurement model is carried out by an assessment of both reflective measurements and formative measurements. In this study, efficacy is a 4-item formative construct. Other variables are reflective. Table 4.5 presents an outline of the assessments.

Table 4.5 - Measurement Model Assessment Overview

Reflective	Formative
Unidimensional	Multicollinearity
Reliability	
<ul style="list-style-type: none"> <li>• Indicator reliability</li> <li>• Convergent reliability</li> <li>• Composite reliability</li> </ul>	
Validity	
<ul style="list-style-type: none"> <li>• Item validity</li> <li>• Convergent validity</li> <li>• Discriminant validity</li> </ul> <p><i>Cross loading criterion</i></p> <p><i>Fornell and Larcker criterion</i></p>	<ul style="list-style-type: none"> <li>• Item validity</li> <li>• Discriminant validity</li> </ul>

#### 4.3.1 Reflective measurements

For reflective measurements, the direction of causality is from the latent variable to the indicators. Meaning that all the indicators are reflective to a latent variable, thus items are

highly correlated and interchangeable. The evaluation is focused on both reliability and validity.

### Unidimensional

Unidimensional examines whether an assessment is designed to measure only one construct. That is to say, all the items in the assessment belong to just one construct. This should be validated prior to reliability and validity.

The eigenvalues for all the reflective constructs are presented in Table 4.6 by using a statistical analysis program. Satisfaction is not included in this analysis because it is only one item. It is shown that each  $\lambda_1$  is greater than one, while each  $\lambda_2$  is smaller than one. Hence, unidimensional assumption is satisfied.

Table 4.6 - Unidimensionality

<b>Reflective Constructs</b>	<b>First Eigenvalue <math>\lambda_1</math></b>	<b>Second Eigenvalue <math>\lambda_2</math></b>
<b>Aesthetics</b>	1.728	0.218
<b>Excellence</b>	2.299	0.466
<b>Social</b>	3	0.424
<b>Play</b>	3.729	0.518
<b>loyalty</b>	4.112	0.843

### Reliability

The test evaluates the reliability assumption by proving whether the measurement produces the same results on repeated trials. This can be checked by composite reliability. Results are presented in Table 4.7. Composite reliability ranged from 1 to 0, with 1 being perfectly estimated. In this study, all constructs scored higher than 0.6, which is an adequate level for exploratory purposes (Chin, 1998).

Table 4.7 - Composite Reliability

<b>Constructs</b>	<b>Composite Reliability</b>
<b>Aesthetics</b>	0.942
<b>Excellence</b>	0.766
<b>Social</b>	0.75
<b>Play</b>	0.746
<b>Loyalty</b>	0.685
<b>Satisfaction</b>	1

Validity

Validity is checked by item for convergent and discriminate validity.

Item validity reported in Table 4.8 assesses to which extent the items represent the construct. It was found that all the measurement loadings exceeded the minimum criterion value (0.70) (Ringle, 2006).

Table 4.8 - Item Loadings

<b>Construct</b>	<b>Items</b>	<b>Item Loadings</b>	<b>Confidence Interval 95%</b>
<b>Aesthetics</b>	aesthetics1	0.946	(0.929;0.985)
	aesthetics2	0.942	(0.920;0.956)
<b>Excellence</b>	excellence1	0.832	(0.794;0.863)
	excellence2	0.91	(0.887;0.926)
	excellence3	0.882	(0.856;0.903)
<b>Social</b>	social1	0.85	(0.822;0.874)
	social2	0.917	(0.901;0.931)
	social3	0.829	(0.789;0.861)
	social4	0.865	(0.840;0.886)
<b>Play</b>	play1	0.827	(0.792;0.856)
	play2	0.766	(0.791;0.803)
	play3	0.922	(0.905;0.935)

	play4	0.911	(0.890;0.927)
	play5	0.881	(0.857;0.900)
<b>Loyalty</b>	loyalty1	0.816	(0.722;0.851)
	loyalty2	0.87	(0.842;0.892)
	loyalty3	0.848	(0.817;0.872)
	loyalty4	0.873	(0.846;0.893)
	loyalty5	0.828	(0.791;0.858)
	loyalty6	0.72	(0.666;0.763)

Convergent validity is evaluated by Average Variance Extracted. AVE shows the average communality for each latent factor in a reflective model. As a rule of thumb, it should be greater than 0.5 (Chin, 1998). Table 4.9 shows that all the AVE exceeded 0.5 for all reflective constructs, thus indicating convergent validity.

*Table 4.9 - Average Variance Extracted*

<b>Construct</b>	<b>AVE</b>
<b>Aesthetics</b>	0.891
<b>Excellence</b>	0.766
<b>Social</b>	0.75
<b>Play</b>	0.746
<b>Loyalty</b>	0.685
<b>Satisfaction</b>	1

Discriminant validity, also known as vertical collinearity, is the subjective independence of every indicator on its latent variable. In other words, it shows to which extent the indicator items in the questionnaire actually measures the latent variable that it is supposed to measure. This is checked by two criteria:

- Crossing loading, as shown in Table 4.10

By looking at the cross-loading criterion, which are subjectively independent, can help reduce the presence of multicollinearity among the latent variable, denoting that the average variance

extracted (ave) of a latent variable should be higher than the squared correlations between the latent variable and all other variables.

- Fornell and Larcker criterion, as shown in Table 4.11

The diagonals are the square root of the ave of the latent variables and indicate the highest in any column or row, providing further evidence of discriminant validity.



Table 4.5 - Indicator Items Cross Loading

	<b>Aesthetics</b>	<b>Efficiency</b>	<b>Excellence</b>	<b>Loyalty</b>	<b>Play</b>	<b>Satisfaction</b>	<b>Social</b>
<b>aesthetics1</b>	<b>0.946</b>	0.579	0.458	0.521	0.561	0.506	0.637
<b>aesthetics2</b>	<b>0.942</b>	0.574	0.443	0.535	0.556	0.489	0.641
<b>efficiency1</b>	0.288	<b>0.534</b>	0.245	0.337	0.297	0.268	0.358
<b>efficiency2</b>	0.563	<b>0.855</b>	0.383	0.456	0.443	0.429	0.522
<b>efficiency3</b>	0.488	<b>0.846</b>	0.374	0.438	0.468	0.425	0.536
<b>efficiency4</b>	0.416	<b>0.722</b>	0.292	0.396	0.402	0.363	0.461
<b>excellence1</b>	0.513	0.461	<b>0.832</b>	0.526	0.53	0.452	0.641
<b>excellence2</b>	0.39	0.372	<b>0.91</b>	0.532	0.521	0.468	0.604
<b>excellence3</b>	0.349	0.312	<b>0.882</b>	0.477	0.467	0.44	0.561
<b>loyalty1</b>	0.442	0.426	0.435	<b>0.816</b>	0.457	0.578	0.453
<b>loyalty2</b>	0.446	0.444	0.466	<b>0.87</b>	0.458	0.571	0.471
<b>loyalty3</b>	0.461	0.413	0.487	<b>0.848</b>	0.498	0.57	0.487
<b>loyalty4</b>	0.481	0.469	0.528	<b>0.873</b>	0.547	0.61	0.553
<b>loyalty5</b>	0.497	0.438	0.499	<b>0.828</b>	0.532	0.612	0.571
<b>loyalty6</b>	0.443	0.443	0.483	<b>0.72</b>	0.485	0.568	0.555
<b>play1</b>	0.501	0.469	0.506	0.522	<b>0.827</b>	0.441	0.551
<b>play2</b>	0.386	0.379	0.412	0.433	<b>0.766</b>	0.358	0.402
<b>play3</b>	0.542	0.509	0.519	0.55	<b>0.922</b>	0.467	0.562
<b>play4</b>	0.555	0.478	0.527	0.535	<b>0.911</b>	0.436	0.593
<b>play5</b>	0.552	0.48	0.524	0.545	<b>0.881</b>	0.457	0.604
<b>satisfaction8</b>	0.528	0.502	0.518	0.708	0.502	<b>1</b>	0.551
<b>social1</b>	0.577	0.503	0.568	0.531	0.538	0.477	<b>0.85</b>
<b>social2</b>	0.611	0.583	0.63	0.57	0.586	0.506	<b>0.917</b>
<b>social3</b>	0.562	0.522	0.571	0.521	0.527	0.454	<b>0.829</b>
<b>social4</b>	0.594	0.555	0.614	0.539	0.541	0.469	<b>0.865</b>

Table 4.6- Discriminant Validity (Fornell and Larcker Criterion)

	<b>Aesthetics</b>	<b>Efficiency</b>	<b>Excellence</b>	<b>Loyalty</b>	<b>Play</b>	<b>Satisfaction</b>	<b>Social</b>
<b>Aesthetics</b>	<b>0.944</b>						
<b>Efficiency</b>	0.61						
<b>Excellence</b>	0.477	0.437	<b>0.875</b>				
<b>Loyalty</b>	0.559	0.531	0.585	<b>0.828</b>			
<b>Play</b>	0.592	0.539	0.579	0.602	<b>0.863</b>		
<b>Satisfaction</b>	0.528	0.502	0.518	0.708	0.502	<b>1</b>	
<b>Social</b>	0.677	0.625	0.688	0.624	0.633	0.551	<b>0.866</b>

### 4.3.2 Formative Measurements

Formative measurements are multidimensional in nature, denoting items that are not interchangeable, and each individual item has a specific meaning and all are contributing to the latent variable. The assessment of formative constructs requires a different approach than reflective measurements and should only be evaluated by means of their item and discriminant validity (Leroi-Werelds et al., 2014). However, it is also worthwhile checking the multicollinearity of the indicator. According to Hair Jr, Hult, Ringle, and Sarstedt (2016), a well-fitting formative measure should not show excessive multicollinearity. This can be checked by the Variance Inflation Factor (VIF). Table 4.12 indicates VIF for all items below the cut-off value of 4.

*Table 4.12 - Variance Inflation Factor Formative Construct*

<b>Formative Construct</b>	<b>Items</b>	<b>VIF</b>
<b>Efficiency</b>	Efficiency1	1.402
	Efficiency2	1.553
	Efficiency3	1.768
	Efficiency4	1.424

Item validity is captured by the significance of the path from the indicator to the latent variable(Leroi-Werelds et al., 2014). Table 4.13 shows the test results. weights of efficiency1 is found not significant. however, the corresponding loading is high (more than 0.50), the indicator should not be removed and can be treated as absolutely important (Dwivedi et al., 2018; Hair Jr et al., 2016). A possible explanation is that the question was formulated in a negative direction compared to other items.

Table 4.13 - Item Validity Formative Construct

Variable	Items	Path Weights	Loadings	T-value
Efficiency	Efficiency1	0.015	0.677	0.141
	Efficiency2	0.492	0.809	4.905**
	Efficiency3	0.437	0.840	4.021**
	Efficiency4	0.279	0.740	3.061**

Note \*\* $p < .01$

Discriminant validity of the formative construct can be checked by testing whether the constructs are less than perfectly correlated (Leroi-Werelds et al., 2014). This denotes examining whether an absolute value of one falls within two standard errors of the latent variable correlations (MacKenzie, Podsakoff, & Jarvis, 2005).

Table 4.14 below indicates the variable correlation coefficients do not exceed 0.5, while at the same time the upper level of the confidence intervals stays below 0.5. This implies that the value of 1 never falls into the confidence intervals. Hence, it is confidence to say that the formative construct is discriminant valid.

Table 4.14 - Discriminant Validity Formative Construct

	Variables	Correlation Coefficient	95% Confidence Interval	
			Lower	Upper
Efficiency	Aesthetics	0.191	0.070	0.231
	Excellence	-0.109	-0.146	-0.004
	Social	0.343	0.147	0.306
	Play	0.139	0.027	0.174
	Satisfaction	0.097	-0.006	0.188
	Loyalty	0.120	0.004	0.165

#### 4.4 Structural Model Assessment

The assessment of the structural model consists of:

- a. the coefficient of determination, denoted  $R^2$
- b. the significance and relevance of the structural model relationships

based on hypotheses, two structural models are modelled. model 1 (see Figure 4.5) contains the five value dimensions, satisfaction and loyalty. To check the relationships between value and loyalty, the average score of the items per value dimensions were calculated to yield five new variables. This was done by SPSS via TRANSFORM>COMPUTE VARIABLE. Then the five new variables were incorporated into the second structural model (see Figure 4.6).

Figure 4.5- Structural Model 1

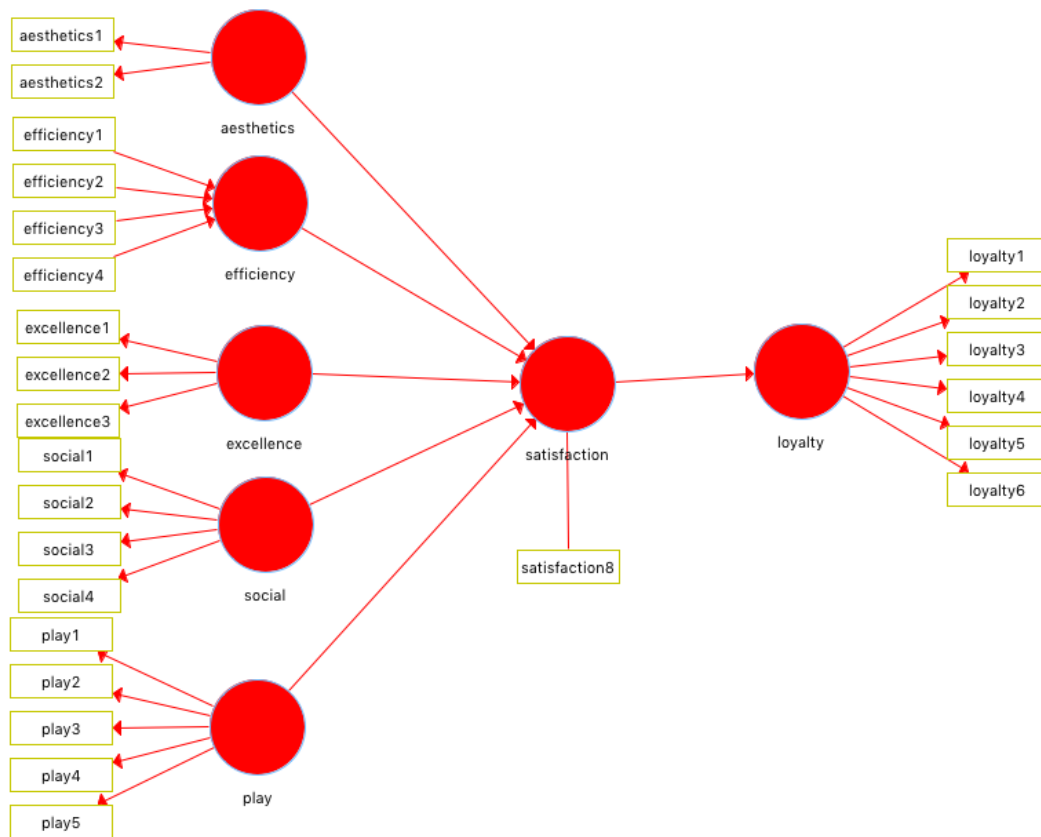


Figure 4.6 - Structural Model 2

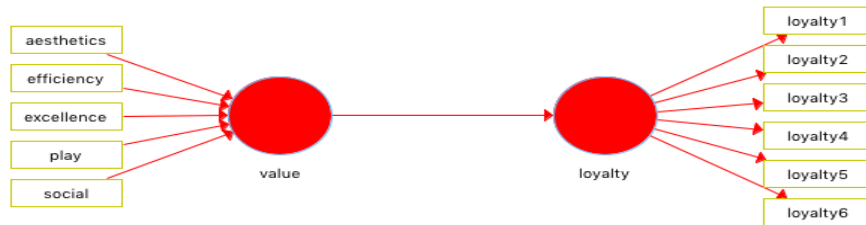


Table 4.15 shows the testing results. The coefficient of determination ( $R^2$  values) of the endogenous constructs are listed in the last column (see Table 4.15). It shows the structural model's predictive accuracy. The  $R^2$  value ranges (zero to one) and value close to one indicates high predictive accuracy. According to Chin (1998), the  $R^2$  values for model 1 and model 2 are all above moderate level ( $R^2 > 0.33$ ).

Table 4.15 below also represents an overview of the results of hypothesis testing. There are 7 proposed hypotheses. Bootstrapping analysis is used to evaluate the direct effects of all the hypothesized relationships. Bootstrap estimates the spread shape and bias of the sampling distribution of the population from which the sample under study is drawn from, the observed sample is treated as if it represents the population. Bootstrap creates a large, pre-specified number of samples and every time sampling happens in bootstrap the same number of cases as the original sample will be analysed. It helps us to overcome the problem of non-normality.

Bootstrapping calculation output (5000 subsamples) shows the strength of the relationships and t-value for verifying whether the relation is statistically significant. It is found that except for H4 and H5, the rest of hypotheses are all supported. That is to say, value in Aesthetics, efficiency, and excellence do influence satisfaction positively, while the influence of social and play on satisfaction are not significant. H6 and H7 are also supported with a path coefficient of 0.708 and 0.717 respectively.

Table 4.7 - Hypothesis Testing Bootstrapping Direct Effect Results

Hypothesis	Relationship	Std Beta	Std Error	t-value	Decision	95%CL LL	95%CL UL	R <sup>2</sup>
H1	Aesthetics -> Satisfaction	0.188	0.186	3.394**	Supported	0.095	0.276	0.408
H2	Efficiency -> Satisfaction	0.172	0.179	3.271**	Supported	0.09	0.265	
<b>Model 1</b>	H3 Excellence -> Satisfaction	0.228	0.229	4.742**	Supported	0.148	0.306	
H4	Social -> Satisfaction	0.089	0.089	1.153	Rejected	-0.039	0.215	
H5	Play -> Satisfaction	0.109	0.108	1.838	Rejected	0.015	0.211	
H6	Satisfaction -> Loyalty	0.708	0.709	17.443**	Supported	0.64	0.773	0.502
<b>Model 2</b>	H7 Value-> Loyalty	0.717	0.037	19.229**	Supported	0.433	0.608	0.514

## Chapter 5

### 5.1 Conclusions

The objective of this study is to find the factors that affect the level of satisfaction and loyalty among students in Belgium. The central research question is to understand what drives Belgian college students' value perceptions regarding smartphones and its impact on satisfaction and loyalty?

A sequential mixed strategy was employed with both qualitative and quantitative methods. In phase one of the study, a research model was built based on an exploratory qualitative method. In phase two, a quantitative method was used to validate the hypotheses with a large sample.

The software SmartPLS was used to test the hypotheses of this study after the following two factors were considered: the complexity of the model and if the construct consists of formative and reflective constructs, as well as the sample size, which is relatively small. According to the results of path analysis from SmartPLS, five of the seven hypotheses of this study have been verified. The value in efficiency, excellence, and aesthetics have a significant influence on customer satisfaction. This study found that the impact of smartphone satisfaction on loyalty is very significant with the value of beta at 0.708. This research has also confirmed that loyalty is affected by customer value as well (beta =0.717).

### 5.2 Implications

The findings of this study could provide implications for the development strategy of the smartphone industry, which could help companies improve customer satisfaction with smartphones and cope with the fierce competition in the market. Based on the testing results, the implications of this study are as follows:

1. This study has confirmed the positive relationship between aesthetics and satisfaction. It is crucial for marketers to understand industrial design, independent intellectual property rights and innovation are of great importance for smart phone brands. Mobile phone



appearance plays an important role in customers' purchasing decisions and affects customers' satisfaction significantly. Imitation of foreign products and product homogenization are the very common issues in the current mobile phone market. Imitation could save the cost and time spent on product development, but at the same time product homogenization and lack of brand awareness and innovation are detrimental to consumer satisfaction. For the mobile phone market, the consumer group of university students has large buying power. Also, they tend to pursue fashionable design and would like to accept new products. Therefore, manufacturers should place a lot of emphasis on industrial design to achieve innovation and unique mobile phone appearance.

2. The positive relationship between value in excellence and satisfaction found in this study also indicates Technological research development should be put at the first place in order to improve the manufacturing process, improve product quality and service quality. As excellence is all about consumers' perceived quality of the product/service, investment in the research and development of key technologies is necessary for the manufacturers. Independent core intellectual property rights, improved manufacturing process, and high-quality materials could result in the improvement in product quality, which will finally contribute to a high level of customer satisfaction and win more loyal customers.

3. The findings of this research also reveal that efficiency can influence consumer satisfaction positively which entails that proper market positioning and pricing strategies are necessary. Since value in efficiency is reflected by product price directly. Therefore, mobile phone manufacturers should find the position of their products in the market and identify the suitable price and target consumers for their products.

In conclusion, in the increasingly saturated mobile phone market where there are many powerful competitors, mobile phone manufacturers should consider the above three points and differentiate their products and services from other brands in the market. The increase in the customer value of mobile phone could improve customer satisfaction, which will help the

manufacturer to win loyal customers thereby. All these could increase market share, reduce operating costs, and contribute to the profit of the company significantly.

### **5.3 Limitations**

Although some measures were taken to create a rigorous study, it is still subject to various limitations.

1. Time. The questionnaire was delivered during the period of final exams for university students and the questionnaire was sent to students' emails. As students were busy with exams during that time, many of them were unable to complete the questionnaire in time.
2. Due to limited knowledge in this field, some challenges were encountered during the research. However, with tutorial and internet assistance, these challenges were met and resolved.
3. The study focused on Belgium university students who are influenced by unique factors, such as their unique culture, hence, the findings of this research may not apply to other ethnicities

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