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Measuring Brand Equity in the Smartphone industry: An approach through Aaker's Model

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Abstract

Brands have become nowadays one of the most valuable assets a company can have. But the intangible nature of them has made measuring brand's values a remarkably difficult task. This has been an incredibly important issue for managers and companies that can't correctly measure the results of their efforts to build brand equity, or that simply want to compare how their own brand stands out against competitors.

Facing this situation, the goal of this project has been to approach the concept of brand equity and how to measure it both from a theoretical and practical perspective, focusing on the smartphone market. First, an introduction to the concept of the smartphone is made, detailing the evolution of the market since the early years leading up to the present. Following that, the concept of *Brand Equity* is presented, along with the theoretical foundations, developed by the main authors in the area, upon which its variables are supported. The practical fragment of the project has been based on Aaker's model, to which three additional variables have been added.

For it, an online survey was conducted with consumers mainly from the Spanish and US markets. The goal was to determine which variables from Aaker's model affected brand equity the most, as well as to find out if the three additional variables proved to be a consequence of it.

The results report that Aaker's proposed model is adequate when measuring brand equity in the smartphone market. The variables analyzed showed to have a positive effect on brand equity, with loyalty as the most relevant variable, while brand awareness did not show a significant influence, as initially expected. Regarding the brand equity consequences, our findings report that brand equity positively influences both customer satisfaction and purchase intention.

Keywords: *Brand, Brand Equity, Aaker, Smartphones, Marketing*

Word count: 11.155.

Resumen

Las marcas se han convertido en uno de los activos más valiosos que una compañía puede tener. Pero su naturaleza intangible ha convertido la medición del valor de marca en una tarea complicada. Este ha sido gran problema para los managers y compañías que no pueden medir correctamente los resultados de sus esfuerzos en crear valor de marca, o que simplemente quieres saber cómo se compara su marca frente a la de competidores.

Frente a esta situación, el objetivo de este proyecto ha sido enfocar el concepto de valor de marca y cómo medirlo tanto de un punto de vista teórico como práctico, centrándose en el mercado de los teléfonos móviles inteligentes o smartphones. Primero, se realiza una introducción al concepto de smartphone, detallando la evolución del mercado desde sus primeros años hasta el presente. A continuación, se presenta el concepto de valor de marca, así como los fundamentos teóricos, desarrollados por los principales autores en la materia, sobre los cuales sus variables se soportan. El fragmento práctico del proyecto se basa en el modelo de Aaker, al cual tres variables adicionales han sido añadidas.

Para él se ha realizado una encuesta a consumidores principalmente de los mercados de España y Estados Unidos. El objetivo era determinar qué variables del modelo de Aaker afectan más al valor de marca, así como averiguar si las tres variables adicionales propuestas son una consecuencia de éste.

Los resultados muestran que el modelo de Aaker propuesto es adecuado midiendo el valor de marca dentro del marcado de los smartphones. Las variables analizadas demostraron tener un efecto positivo en el valor de marca, siendo lealtad la que mostró mayor influencia, mientras que notoriedad no mostró una influencia significativa, como inicialmente se esperaba. Sobre las consecuencias introducidas, nuestros resultados muestran que el valor de marca influencia positivamente a la satisfacción del consumidor y la intención de compra.

Palabras clave: *Marca, Valor de marca, Aaker, Smartphones, Marketing*

Número de palabras: 11.155.

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Introduction

The following work presents a study on the measurement of brand equity for the smartphone industry. The decision to focus on this market was motivated by a big personal interest on the technological world.

Brands were first conceived as methods of differentiation from competitors that also provided legal protection to the owners. Since then, brands have evolved becoming more valuable and playing a much more important role. This is why measuring and comparing brand equity has become a big goal for many companies through the past years. For this, knowing what variables influence it is key.

The objective of this work is to study which are the main variables affecting brand equity on the smartphone market. For this, Aaker's (1991) Brand Equity model was chosen as the basis of the project. In addition, three additional variables have been included as possible consequences of brand equity.

The project starts with a brief introduction to the concept of the smartphone and the evolution of the market through the years. Next, the theoretical foundations of Aaker's model are introduced, defining each one of its variables as well as the additional ones. Following that, an investigation on the described variables is conducted, detailing the objective of the research as well as the methodology. The results are then introduced followed by an analysis on them. To end, conclusions on the findings are presented.

1. The global smartphone market

1.1 The introduction of smartphones into the market

The smartphone market has been incrementally growing for the past decade, from a relatively small industry to reaching operator revenues of more than $1 trillion in 2015 (GSMA, 2016)**.** Today, more than 50% of the worldwide population owns a mobile phone, and when it comes to developed or high-income countries most of these mobile devices have internet available; being commonly known as *smartphone*s (GSMA, 2016). More precisely, a smartphone can be defined as a mobile phone capable of running an *operating system* (OS), with the possibility of installing different apps that allow to perform various tasks and work with a big quantity of data, connect to the internet, take pictures, make videos and so on (Vargas L., Rodríguez R., Rojano A., Medina L., & Rivera R., 2012, p. 7).

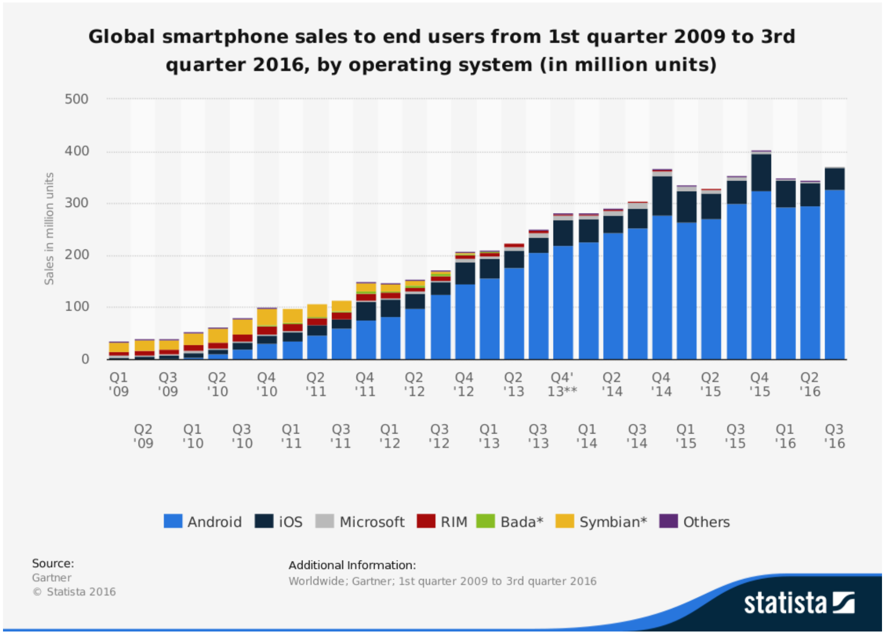
The origin of this device was grounded in the first mobile phone, designed and launched by Motorola in 1973. Later, improvements in technology allowed for smaller and cheaper cell phones, making them more widespread in the late 80s and early 90s. Around this time, PDAs (Personal Digital Assistants) began to become more popular too, as they were able to connect to the internet, access e-mail or store media (Ogunsanwo, 2012), but they still lacked the capability of making phone calls, which meant that some users needed to carry two different devices in their pockets (Ogunsanwo, 2012). In 1992, IBM introduced "Simon", a hybrid between a PDA and a cell phone capable of accessing the internet and making phone calls, which can be considered the first smartphone into the market. It was also fitted with a calendar, a calculator, an address book, a note pad and various games (Cromar, 2010). But unlike smartphones nowadays, Simon was far from portable, since the device weighted more than half a kilo. Due to this fact and its expensive price the DynaTAC did not become a popular device (Anh, 2016).

It was not until 1997, that the first widely adopted smartphone came to the market (Nokia, 1996) (Cromar, 2010). The N9000 was produced by Nokia and it was the first of a wide an assortment line of smartphones that were to come in the following years. The N9000 was the size of a regular cell phone whilst keeping all the functionalities from IBM's device; and given to its portability and more affordable price, Nokia paved the way for the future of the smartphone (Cromar, 2010). The next company to join Nokia in the smartphone industry was RIM (Research In Motion), with the introduction of the BlackBerry in 2001. This device focused on the business market, targeting professional customers, which made it very popular (RIM, 2006).

Other related concept, which has gained an increasing importance in the smartphone industry is the so-called "*operating systems*". Following Silberschatz and Galvin (1994), an operating system can be defined as "a *program that acts as an intermediary between a user of a computer and the computer hardware*", with the goal of executing programs and solving the user's needs. More precisely, it can be highlighted that operating systems can be developed in three forms; namely, *proprietary*, *licensable* and *open source* (Cromar, 2010). Proprietary operating systems are developed exclusively for a specific smartphone manufacturer, allowing for a better integration of this system with the hardware and for the company in order to differentiate their product. Downside to this is the high cost, both monetary and time affordability that comes with developing an operating system. Second, the *licensable* operating systems can be utilized by any manufacturer for given cost; thus, being a great option for mobile communication devices companies, since it's not only cheaper than a proprietary operating system, but also allows the manufacturer to reach users who are already familiar with the operating system (Cromar, 2010). However, the differentiation offered by the company is minimal, and often comes through the manufacturer's hardware. Finally, the *open source* operating system gives the manufacturers the freedom of using and customizing an existing operating system for free. This means that manufacturers already have an operating system available to be used, and further can differentiate themselves by modifying it whenever they wish (Cromar, 2010).

As depicted in Figure 1, total smartphone sales have increased progressively during every quarter since 2009; thus, representing an increasing competitive market.

Table 1. Global smartphone sales to end users from 1st quarter 2009 to 3rd quarter 2016, by operating system (in million units)



Source: (Gartner, 2016)

Symbian, the proprietary Operative System by the company Nokia, sales have increased slightly through 2009 and 2010; and after that, they started dropping until becoming almost nonexistent by 2013. Similar situation happened with RIM. On the other hand, Apple has managed to increase the sales of iPhone devices' operating systems since their release in 2007. Nevertheless, the operating system that managed to capitalize the most on the growth of the market has been by far Android, selling more than 300 million units just in year 2016 (Gartner, 2016).

1.2 An approach to the companies competing in the market

In the year 2007, both Nokia and Blackberry were leaders in the mobile device global market (Canalys, 2008). In this year, Apple launched their particular version of the smartphone –the so-called iPhone-, which ran on Apple's own operating system -the iOS-. Similarly, Google and their partners announced the development of an open source operating system, Android, which was finally launched into the market in 2008 with the HTC Dream, a smartphone developed by the manufacturer HTC (Apple, 2007) (Open Handset Alliance, 2007).

Nevertheless, in the last years the mobile devices' market landscape has changed dramatically. On one hand, Nokia and Blackberry are no longer the market leaders. On the other hand, the open source nature of Android has been a key factor in the fierce competition developed to dominate the marketplace, which is proven by the dominating market share of the system (Gartner, 2016).

On the contrary, the Nokia's and RIM's operative systems progressively disappeared from the market; while Apple has been the only company able to maintain their market share through the last years, and is now in a highly comfortable second market position with their own operating system. (Gartner, 2016)

The mobile devices' industry has been growing, and in year 2015 it generated 4.2% of global Gross Domestic Product (GDP); while employing almost 17 million people across the world (GSMA, 2016). Additionally, nowadays more than 50% of the population uses at least one mobile device, and analysts predict that mobile devices' adoption will surpass the 60% of penetration rate by 2018; thus, highlighting a market that will be expanding at a slower pace (eMarketer, 2016). In the next decades, this market growth will come mostly from undeveloped or developing markets, due to the fact that the market in developed or high-income countries has become saturated. The unique subscriber growth has ranged between the 1.5% and 3% from year 2010 to 2015 both in Europe and in North America, while regions such as the Sub-Saharan

Africa and Asia Pacific experienced growth rates of 13% and 10% respectively (GSMA, 2016).

Regarding the smartphones, in year 2015 they accounted for the 74% of the total number of mobile devices in North America, and for 59% in Europe. However, in undeveloped countries, smartphones made up 40% of the total number of mobile devices, and that number is expected to surpass the 60% by 2020 (GSMA, 2016, p. 14). This growth will mostly come from India and China, which is already the largest smartphone market today. Local smartphone manufacturers are the key factor in this growth rate, with Xiaomi, Huawei, Gionee and OnePlus driving sales in China, and Micromax in India. The reason is that these smartphone companies manage to provide a wide assortment of mobile devices targeted to the specific needs of the local consumers at an affordable price (GSMA, 2016).

In addition, this global increase in smartphone sales has also been influenced by the high demand and high penetration rate of mobile internet today, caused by the rise of messaging and texting services like WhatsApp and internet social networks like Facebook. These communication media have become essential in the everyday life and daily routines of great part of the population, and partially is due to the fact that they are free of charge or cheaper than the traditional calls or text messages done through cell phones (eMarketer, 2016).

2. Theoretical foundations

2.1 Brand equity: concept

The concept of *brand equity* was first established in the early 1990s. Its focus was to recognize brands as financial assets which included not only the value of the brand, but other proprietary technologies, patents, assets and intangibles. This first conceptualization represents the concept of brand equity from a financial standpoint. However, in a broader sense marketing has a more prominent conceptualization of the term brand equity. In this line, Aaker (1991) defined the concept of brand equity as "a *set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customer*". This is a customer-based definition that highlights brand equity as being capable of adding value to a product or service as a result from prior investments in the brand and marketing actions in order to manage the brand. This *added value* allows companies to increase their profit margins, differentiate their products from others of the competition, or to subsequently achieve a stronger position when dealing with retailers (Keller, 1993; Aaker 1996; Kotler et al., 2008).

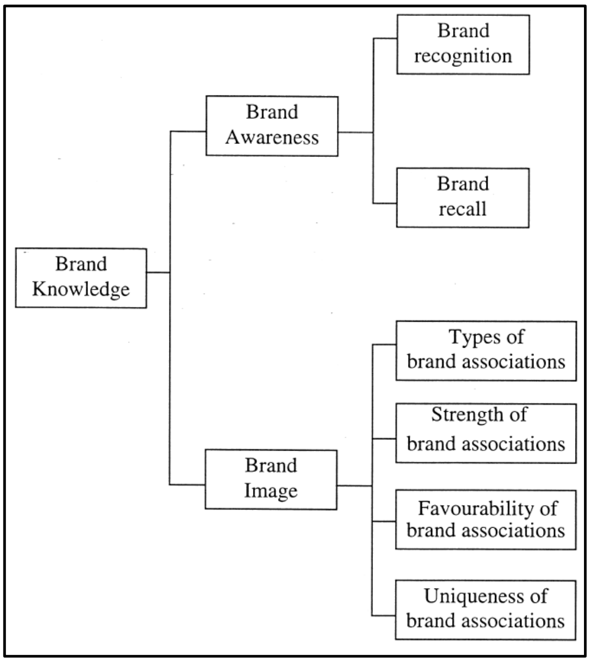
Later, Kotler (1994) defined a brand as a "*name, term, sign, symbol, or design, or a combination of them intended to identify the goods or services of one seller from among a group of sellers and to differentiate them from those of the competitors*". Unlike patents and copyrights, the seller holds exclusive rights to the brand in perpetuity (Aaker, 1996). This allows companies to create associations or images for the brand, and to develop them over time in a long-term basis. When marketers are successful at achieving this task, the customer will perceive unique added values attached to the brand targeting to their personal needs (Tuominen, 1999).

Nevertheless, there is no a consensus on the definition of *brand equity*, since it will be a different conceptualization depending on whether it is regarded as a financial asset, conceptualized from the marketing standpoint, or even approached from the consumer's viewpoint (Aaker, 1991; 1996). From the consumers' viewpoint, brand equity arises from the differences in the perception of a product or brand, based on their previous knowledge and experiences with the brand or product (Keller, 1993; Aaker, 1996). In addition, in order for these differences to take place, consumers need to "*be aware"* or be conscious of the brand. In some situations, consumers will not develop a different response to the brand after being aware of it; and in these situations, the brand can be considered a *generic brand* or the product could be considered as a *commodity* (Aaker, 1991). Likewise, a positive response to the brand, highlights that consumers have positive associations linked to the brand; whereas a negative association or image would mean the opposite. These differences derive in consumers' preferences, as well as in their perceptions and consumption behavior. Therefore, brand equity will be influenced by the subjective perceptions and preferences of consumers (Tuominen, 1999).

In order to create *consumer-based brand equity* the first step is to create or develop *brand knowledge*. Following brand knowledge can be defined "*in terms of two components, brand awareness and brand image*" (Keller, 1993). Brand awareness relates to the ability of the consumer to recognize and identify the brand (Keller, 1993); while brand image refers to the different associations or images that the consumer links to the brand (Aaker, 1996) (Keller, 1993). Similarly, *brand awareness* can be further divided into brand recognition, which is defined as the ability to recognize the brand (Keller, 1993); and *brand recall*, which refers to the ability to remind the brand when given a specific product category or market (Keller, 1993; Kotler et al., 2008).

Brand image is a more complex concept, since it is composed by four different attributes of associations: type, strength, favorability and uniqueness (Aaker, 1996). According to Tuominen (1999) brand associations could be defined as "*informational nodes linked to the brand node in memory and contain the meaning of the brand for consumers*". These associations can be related (or not) to the product's attributes, benefits or attitudes as they vary in their type. In order to become strong associations in the consumer's mind, these images or associations should be presented consistently with appropriate information (Tuominen, 1999). Finally, associations are considered favorable and unique when they relate to the specific needs of the consumer and not shared with other competing brands (Aaker, 1996, Kotler et al., 2008).

Figure 1: *Brand knowledge dimensions (Tuominen, 1999).*



Source: (Tuominen, 1999)

Achieving a strong *customer-based brand equity* can help the company in many areas. First, it helps to increase growth rates, since it can help to attract new customers as well as to create higher entry barriers to the market (Kotler, Armstrong, Wong, & Saunders, 2008). Second, consumers will develop brand loyalty and will be willing to pay a premium price for their products or services, allowing for higher profit margins (Netemeyer, et al., 2004). And finally, it can be stated that a favorable customer-based brand equity can help to attract better staff for the company, as well as new investors.

Consequently, a strong brand equity can help the company differentiate its products and brands from the ones of its competitors, help in achieving a better image and prevent consumer switching intention caused by new threats in the market (Kotler, Armstrong, Wong, & Saunders, 2008).

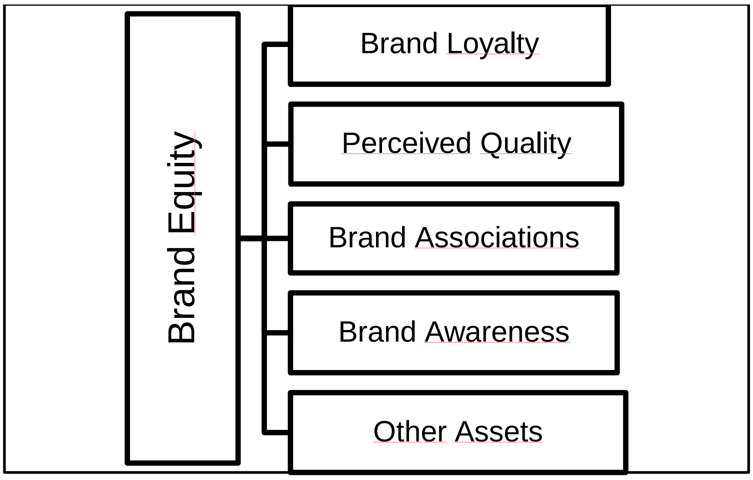
2.2 The brand equity model proposed by Aaker

Many companies need to manage different brands across numerous markets. If these brands are managed individually -and not as a whole-, the resource allocation made by the company might not be appropriate. To achieve a model of brand measure is then required by companies. However, financial brand measures might provide relevant information in the short term and they are not useful when trying to evaluate long-term brand building (Aaker, 1996).

In this context, Aaker (1996) aimed to solve this issue by creating a model capable of measuring brand equity across different products and markets; thus, allowing to compare different brands' value. These measures should reflect brand equity. That is, the measure of the brand value should include the asset value of the brand and its advantages compared to competing brands, be associated to the elements that drive the market, and be responsive to changes in the brand equity (Aaker, 1996). Finally, these measures should be suited to different products or markets.

Following these guidelines, Aaker (1991, 1996) developed a set of measures divided into five main dimensions, which are commonly known as the "*brand equity dimensions*", namely brand loyalty, perceived quality, brand associations –or brand image-, brand awareness and other industrial assets related to the brand (Aaker, 1991; 1996). The first four dimensions focus on the customer's perception of the brand, while the latter is related to brand assets such as patents or trademarks related to the brand name.

Figure 2: *Dimensions of the Brand Equity Model (Aaker, 1991; 1996)*.



Source: *Own elaboration from* (Aaker, 1996)

2.2.1 Brand loyalty

Loyalty is one of the main elements of brand equity. Such is the extend, that other measures like associations or perceived quality can be evaluated on their ability to influence it (Aaker, 1996). Aaker (1996) also stated that having a loyal customer based can act as a barrier of entry for new competitors and give the company time to react to innovations in the market. For example, in the light of a new company bringing an innovative product to the market that carries a better value proposition that the one of an already established brand, consumers who are loyal to it might be reluctant to switch over and try it out. This will give the company time to react and improve their product or service on time before losing its customers.

2.2.2 Perceived quality

Aaker (1991) defined perceived quality as the "*customer's perception of the overall quality or superiority of a product or service relative to alternatives*". Aaker (1996) also regarded it as one of the most relevant variables of brand equity. He considered it to be associated with price premiums and elasticities, brand usage, and also stock return.

2.2.3 Brand associations or brand image

Associations, of differentiations, can be seen as mental linkages to the brand (Aaker, 1991). Aaker (1996) categorized them from three different points of view, "the brand-as-product (value), the brand-as-person (brand personality) and the brand-as-organization (organizational associations). The brand as a value refers to the brand's value proposition, this is, the functional benefits that brand provides considering also the monetary cost. Brand personality can provide a link to the brand's *"emotional and self-expressive"* benefits (Aaker, 1996). Finally, the organizational associations can show a brand transcending from just the products or services they offer.

2.2.4 Brand awareness

Brand awareness, as described by Aaker (1996), is capable of affecting the perceptions and attitudes from consumers towards a brand. It is determined by the ability of the consumer to recognize or recall the brand (Aaker, 1991). He also deconstructed awareness into different levels: recognition, recall, top-of-mind, brand dominance, brand knowledge and brand opinion. (Aaker, 1996)

2.2.5 Other brand assets

Brand assets are a useful way of protecting a customer base against competitors. For example, a trademark will prevent competitors from using the same name in an attempt to trick customers, and a patent can secure certain differential features of a product. Therefore, it is important that these assets are directly tied or linked to the brand – instead of being linked to the company-; because otherwise they might become irrelevant. In addition, in situations where the value of one patent can be easily transferred to different brand names, the company should assume that its contribution to brand equity is low (Kombrabail, 2011).

This variable will not be taken into account for the study, because although these elements provide value to the company, the direct effect they have on smartphone consumers is little. Thus, it is not very relevant when studying customer-based brand equity on this market

2.3 The brand equity model proposed by Keller

In a similar way to Aaker, Keller also defined brand equity from the customer perspective, focusing on the effects the brand has over the individual consumer (Keller, 1993). Further, Keller (1993) described customer-based brand equity as the "differential effect of brand knowledge on consumer response to the marketing of the brand". This means if consumers react positively to the product, price, promotion or distribution of the brand it's said to have positive brand equity (Keller, 1993).

Brand Awareness is a key element of this definition and it is brand associations, their favorability, strength and uniqueness, that ultimately determine the differential response from the consumer (Keller, 1993). Different types of customer-based brand equity can be created depending on which marketing mix element is under consideration and the associations the consumer holds to it. For Keller (1993), loyalty was created when favorable beliefs and attitudes resulted in repeat buying behavior. Some of these may reflect an objective truth but others can be a direct manifestation of favorable, strong and unique associations that reside outside an objective reality. (Park, 1992).

Price, distribution and promotion activities also benefit from high levels of brand awareness and a positive brand image (Keller, 1993). A positive image will result in a favorable brand attitude, meaning consumers will be willing to pay more allowing for larger margins and a more inelastic response to price hikes. It will also result in consumers more willing of seeking new distribution channels for the product. As for promotion activities, having a positive image can increase marketing and communication effectiveness since it will affect the consumer's response to advertising and promotion (Keller, 1993).

Making a comparison with Aaker's model, we can see a clear difference in the dimensions represented by the two. Whilst Aaker took into account brand loyalty, perceived quality, brand awareness and brand associations, Keller focused on brand awareness and brand image alone. Being the favorable perceptions of these two the main reason for customer-based brand equity to occur (Farjam & Hongyi, 2015)

2.4 Brand equity and brand value

Raggio and Leone (2005) suggested that brand equity is only a portion of a bigger framework that contains both brand and consumer equity, in addition to brand value. Their framework is based on the notion that while brand equity holds a customer-based perspective, brand value has a company-based one, and within it customer equity resides. (Raggio & Leone, 2005)

This scenario is clearly explained in the following example. In a situation when two firms are bidding to acquire a brand from a third one, all three should determine a specific value they attribute to the brand in question. Said value will vary depending on the capabilities and resources each firm has available to invest on that brand, as well as their expected results. This is why these figures probably won't be the same between firms, and for the transaction to take place, the one from the bidding firm should be higher than the one of the owner (Barwise, Higson, Likierman, & Marsh, 1990). Yet in this situation, at the moment of transfer, brand equity doesn't immediately increase. Actually, it will depend on the actions of the new owners whether it increases or decreases (Raggio & Leone, 2005).

This means brand equity and brand value are not directly related, in fact, some scenarios can show the complete opposite. For example, a company selling a premium brand for a very exclusive group. If that company decides to take that brand and market it for the general public, making it available for a bigger crowd, they might find themselves with higher revenues that derive in an increased value for their brand. Still, for many consumers brand equity will be decreasing as a direct result of that move. The reason for this is that brand equity resides within each consumer whilst brand value represents what it means for the company. Thus, equating market outcomes with brand equity can be a big mistake since changes on consumers are not being taken into account (Raggio & Leone, 2005).

Brand value can be conceived then as *"the sale or replacement value of a brand"* (Raggio & Leone, 2005), and it will vary depending on the owner. Brands can also provide value to firms in a way they can't for consumers. This is the case of well-established brands with a positive image that attract better employees, sometimes even willing to work for a lower salary if it means doing so for the brand in question. In addition to this, brands can also help improve the firm's relationships with capital markets or governments, and even make an impact on shareholder value (Raggio & Leone, 2005).

Considering all of the above, equating brand equity and brand value is a common misconception. Brand equity has a customer-based focus and resides within the consumer. It is one of the variables that affects brand value, the sale or replacement value of the brand as previously defined. Which is a broader term that includes many constructs (Raggio & Leone, 2005).

2.5 Research hypotheses development

2.5.1 Brand loyalty

Loyalty can be considered one of the most relevant dimensions of brand equity. However, marketing scholars have great difficulty in reaching a consensus on its conceptualization, and therefore numerous approaches have been provided over time, from both behavioral and cognitive perspectives. The *behavioral* approach understands consumer loyalty as "*the repeated purchase of one brand over time*" (Oliver & Swan, 1989). This commitment to one brand can be defined as brand loyalty, but this definition is not suitable to every scenario. There may be consumption situations where the consumer repeatedly chooses one brand because it is the cheaper option; and in this case a slight price increase can make the consumer immediately switch to a different brand, thus revealing a lack of brand loyalty (Tuominen, 1999)**.** This is the reason why the *cognitive approach* to loyalty became important, since from the cognitive viewpoint brand loyalty might not be exclusively reflected in a repeated purchase behavior (Tuominen, 1999).

Aaker (1991) followed the cognitive standpoint when defining brand loyalty. More specifically, he established two main indicators of brand equity: price premium and consumer satisfaction. The *price premium* represents "*the extra that a customer is willing to pay for a desired brand over a similar product from the competition*" (Netemeyer, et al., 2004). Similarly, the *premium price* can also be negative, when a particular brand is compared to a higher-priced competing brand. However, this price comparison is preferably made with a clearly specified set of competitors. That is, comparing a brand with a single competitor can be risky, since a reduction in its brand equity can solely reflect a high increase in the price premium of the brand; which might not be representative, since the rest of the market is not being taken into account (Netemeyer, et al., 2004). This fact may become an issue in large markets where many "*price premiums"* are set by different companies. Nevertheless, price premium is one of the best indicators of brand equity, since a change in any of the variables affecting brand equity will eventually be reflected in the price premium of the brand (Netemeyer, et al., 2004).

The second indicator of brand equity is consumer satisfaction. That is, whenever a customer reaches a certain level of satisfaction with a particular brand he/she might repeatedly continue to purchase it, thus becoming loyal (Matthews, Junghwa, & Kittichai, 2014). Thus, satisfaction is a really useful indicator in the service industry, since customer satisfaction is related to the consumer choosing the same company in the future. According to Oliver (1997) customer satisfaction could be defined as *"the consumer's fulfillment response, based upon a judgment that a product or service feature has provided a pleasurable level of consumption*". However, this conceptualization comprises one important limitation, which is that it does not apply to non-customers; and therefore, only provides information from the customer base. (Matthews, Junghwa, & Kittichai, 2014)

Later, Oliver (1999) defined brand loyalty as "a *deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior*". So, loyalty could be considered one of the key dimensions of brand equity, given that a loyal set of customers will act as an entry barrier for new companies (Aaker, 1991; 1996; Kotler et al., 2008), providing the company with enough time to adapt to emerging threats –loyal customers might not be likely to switch quickly to a new brand-, and helping the company to promote the brand through the development of brand awareness (Aaker, 1991; 1996).

Alhaddad (2014) studied the effect of brand loyalty on brand equity with a research on the soft drink industry. He conducted this project with a survey on 230 university students. The results of it showed that brand loyalty has a significant effect on brand equity. A similar study was conducted by Lökken, Nayar and Runering (2012), but this time on the Swedish smartphone market. Their sample was made up of 100 respondents, both working professionals and students. Their results not only showed that loyalty influenced brand equity, but that it is also closely related to purchase intention. Considering the brands under research, Apple achieved the highest levels of loyalty and brand equity overall (Lökken, Nayar, & Runering, 2012). Therefore, in the present study the following research hypothesis is posed:
$H_{1:}$ The customer brand loyalty has a positive influence on Smartphone brand equity

2.5.2 Perceived quality

Following Zeithaml (1988) perceived quality could be defined as the "*consumer's judgment about a product's overall excellence or superiority*". However, it should be remarked that the customer's perception of quality is not an objective one, but a subjective perception. On the other hand, the objective quality could be characterized as the "*measurable verifiable superiority*" (Zeithaml, 1988).

Therefore, we can state that subjective or "humanistic" quality is a relative perception, which can vary between consumers. So, perceived quality can be considered as emerging from the discrepancy between the consumers' perceptions and their expectations about the product or brand performance (Zeithaml, 1988).

In addition, perceived quality is one of the main dimensions or variables of brand equity, being the main reason why one specific brand is included in the "*range of options*" considered by the consumer in the purchasing decision set (Keller, 1993). Moreover, a high perceived quality can allow the company to charge a *premium price* for the brand, and achieve higher margins (Netemeyer, et al., 2004). Furthermore, perceived quality could also benefit the company when dealing with the large retailing and distributors, as large retailers will only carry well-known brands. Finally, a high perceived quality aims the company in reaching new product categories, which will be an easier task when offering a high-quality perceived brand (Tuominen, 1999).

In this context, Aaker (1991) defined perceived quality as the "*customer's perception of the overall quality or superiority of a product or service relative to alternatives*". Similarly, Aaker (1996) identified some issues that might arise when measuring perceived quality: perceived quality may vary between different product categories with the same brand, it may be sensitive to different loyalty segments, and it might not be influenced by the communication events developed by the company (Aaker, 1996).

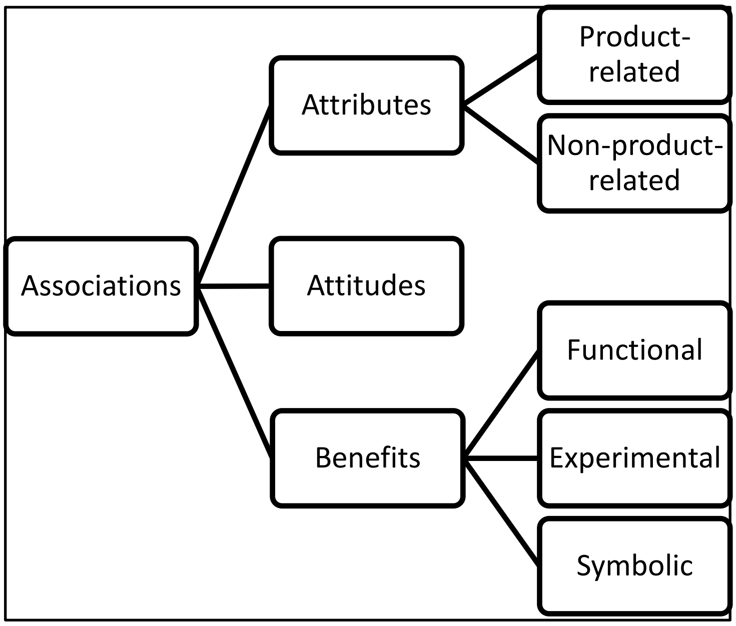
Thanh (2012) set out to study the relation between brand equity and the different variables that compose it, including perceived quality, for the biggest milk brand in Vietnam. The survey she conducted managed to gather a sample of 400 respondents across different regions of the country. Its results confirmed that perceived quality does indeed affect brand equity positively. Likewise, and regarding the smartphone market, we can look back at the previously mentioned study by Lökken, Nayar and Runering (2012). Their findings not only showed that brand loyalty has a positive effect on brand equity, perceived quality as well. Consequently, the following research hypothesis is presented:

$H_{2:}$ The customer brand perceived quality has a positive influence on Smartphone brand equity

2.5.3 Brand associations or brand image

According to Keller (1993), brand associations or brand image could be conceptualized as “*informational nodes linked to the brand node in memory containing the meaning of the brand for consumers*”. So, brand associations are deeply linked to brand image and directly affect the way in which the consumer processes the information related to the brand; being sometimes able to develop emotions, affect or attitudes; thus, providing a reason to purchase the brand. Moreover, brand associations can be classified into three different categories, based on their level of abstraction: attributes, benefits and attitudes (Keller, 1993).

Figure 3: *Brand associations’ categories based on the level of abstraction (Keller, 1993).*



Source: *Own elaboration from* (Keller, 1993)

The *brand attributes* consist of the features of a product or service (Keller, 1993). The brand attributes can also be divided into two types, namely, *product-related* attributes and *non-product-related* attributes. The *product-related* attributes consist on attributes that are connected to the products or services’ primary function; while the *non-product-related* attributes refer to the external attributes of the brand (Keller, 1993; Kotler et al., 2008). These elements may influence the purchasing or consumption process, but do not have an impact in the performance of the product itself. The most relevant non-product-related attribute is the price, since it does not have an impact on the product's performance, while being a compulsory step on the purchasing process for all consumers (Keller, 1993).

Similarly, *brand benefits* are related to the personal value that consumers attach to a product or service; or in other words, what the consumers believe that the product can do for them. These benefits can be functional, experimental or symbolic (Keller, 1993). *Functional benefits* are linked to product-related attributes and are related to the consumer desire of having a problem solved. *Experiential benefits* are related to what the consumer feels and experiences when using a product or service; and therefore, they can tap into both product-related and non-product-related attributes. Finally, the *symbolic benefits* are the most abstract ones, as they are linked to non-product-related attributes, and connect to the need for social approval or personal expression (Keller, 1993).

Finally, *brand attitudes* can be considered the customer's overall evaluations of the brand and the foundation of customers' behavior towards a brand (Keller, 1993). The consumer's perception of attributes and benefits derived from both product and non-product attributes contribute to the creation and development of brand attitudes. Favorable brand associations will make consumers believe that the brand will satisfy their specific needs; thus, developing a positive brand attitude (Tuominen, 1999).

The strength of brand associations may rely on how the information is received by the consumer (Keller, 1993). In this vein, personally relevant information concerning the individual presented constantly over time may have the highest impact. Additionally, direct experiences will drive the strongest associations. Brands also need to be presented as specifically targeted to the needs of the consumer (Kotler, Armstrong, Wong, & Saunders, 2008), so that these associations could be considered favorable. Finally, the *uniqueness* of these associations can be highly beneficial, since they can provide a reason to the consumer for choosing one brand over other competing brands (Keller, 2013). However, uniqueness of associations is extremely difficult to achieve, unless when companies are facing no competition in the marketplace; being the main reason why most brands share associations with their competitors. Similarly, a product category is formed when a group of competing brands share various associations; and some brands will often be linked with particular associations for belonging to a particular product category (Keller, 1993). In some circumstances, consumers may even consider some of these associations to be essential for the specific product category under consideration (Keller, 2013).

In order to measure *brand associations*, Aaker (1996) proposed three different perspectives related to the brand: the brand value, the brand personality and the organizational associations.

The *brand value* focuses on the value proposition of the brand. That is, a brand will be successful in achieving brand value depending on whether it is able to offer value-for-money, or to provide a reason to buy over the competition. Nevertheless, brand familiarity with the brand is the previous step to measure perceived quality. Aaker reported that while perceived quality is highly related to the reputation or prestige of a brand, the perceived value is highly associated to the functional benefits of the brand (Aaker, 1996).

The brand *personality,* which could be defined as "*the brand as a self-expressive person"* (Keller, 1993). This brand characteristic is crucial in the relationship between the brand and the consumer. More precisely, brands with a strong personality can differentiate themselves from competitors in the marketplace, especially when they are consumed in social settings. Finally, the *organizational associations* are related to the values of the organization behind the brand. These organizational associations can go beyond the brand, products or services offered by the company, and develop long-term image of the brand, making it more difficult to be altered (Aaker, 1996).

One previous research developing the brand equity model proposed by Aaker (1991; 1996) was focused on the *banking sector*. The objective of this research was to examine the empirical application of Aaker's customer based brand equity model from the bank customers' standpoint. Their main conclusions reported that solid and unique *brand associations* are crucial in order to obtain a loyal customer base that grants competitive advantages (Umar, Kamariah, Tahir, & Alekam, 2012).

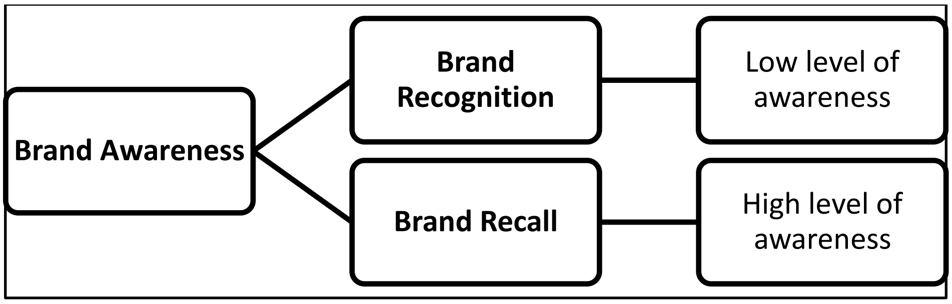
Regarding the *smarthpone market*, we should highlight the study developed by Remedios and Nathwani (2014), comparing the Apple and Samsung brand preferences between students, through the measurement of brand equity and the variables that compose it. The sample of the study consisted on 214 college students. Results showed that brand image was the predominant element of bran equity, with Apple once more leading in that area. They also determined that students chose brands that reflected their personality, this is why building a positive brand image with strong associations is so important. (Remedios & Nathwani, 2014)**.** Therefore, the following research hypothesis is posed:

$H_{3:}$ The customer brand image has a positive influence on Smartphone brand equity

2.5.4 Brand awareness

Brand awareness could be defined as "*the ability of a potential buyer to recognise or recall that a brand is a member of a certain product category.*" (Tuominen, 1999). This link can be created in two different ways, namely *brand recognition* and *brand recall* (Keller, 1993; Aaker, 1996). On one hand, *brand recognition* is defined as the ability to "*correctly discriminate the brand as having been seen or heard previously*" (Keller, 1993). More precisely, this could be considered as the lowest level of brand awareness, given that the consumer needs to be familiar with the brand in order to create such link. On the other hand, the *brand recall* could be conceptualized as the "*consumers' ability to retrieve the brand when given the product category, the needs fulfilled by the category, or some other type of probe as a cue*" (Keller, 1993). This is the strongest type of brand awareness, since the consumer is able to retrieve the brand given a certain cue. The first brand arising when the consumer faces a brand cue is considered to be the leader in mind awareness. (Tuominen, 1999). This brand is called "*top of mind*" brand (Kotler, Armstrong, Wong, & Saunders, 2008).

Figure 4: *Dimensions of brand awareness (Keller, 1993).*



Source: *Own elaboration from* (Tuominen, 1999)

Whether it is more important for a brand to achieve strong brand recognition or a brand recall relies on the context where the product is usually purchased (Keller, 1993). Considering products for which consumers tend to take a purchase decision in the point-of-sale, the brand recognition could be an important variable. However, when the consumer takes a purchase decision before going to the store, the brand recall is a crucial variable, since that person may not necessarily be exposed to the brand inside the store. In addition, we can state that brand recognition is important for new brands or niche brands; while brand recall is more relevant for well-established brand names (Aaker, 1996).

Brand awareness can be also categorized in terms of depth and breadth. The awareness *depth* relates to the likelihood that the brand will come to the mind of consumers; whereas, the awareness *breadth* relates to the range of different contexts or purchase situations where the brand will come up (Tuominen, 1999).

Brand awareness increases brand equity mainly due to the creation of a sense of familiarity with the brand, and by providing a platform for associations which allows the linkage of the brand (Tuominen, 1999). In addition, brand awareness is major component in the consumer's decision-making process. So, increasing brand awareness will drive an increase in the likelihood of the consumer brand recall, when considering a particular product category or need to be fulfilled, allowing the brand to be included into the "*range of options*" considered by the consumer (Tuominen, 1999, p. 82). Finally, we can state that brand awareness may strengthen the brand associations, as well as helps to create them (Keller, 1993)

The model proposed by Aaker (1991, 1996) has been empirically tested in many marketing studies and in different sectors and countries, with the purpose of examining and measuring brand equity. In this context, we should highlight the research conducted by Lee and Leh (2011) with the objective of developing a valid and reliable model of the Malaysian brand equity. These authors reported that most of the Malasyan brands present this asian country were not recognized by the consumers, and that Malasyan customers prefer international brands to their own domestic brands. So, the authors recommended that changes in brand knowledge should be accomplished, since they would influence company sales, and that the success of long-term marketing programs would be also strongly affected by brand knowledge (Lee & Leh, 2011).

Focusing on the smartphone market, the study developed by Remedios and Nathwani (2014) previously discussed serves as another example of brand awareness affecting brand equity. Apple showed to be ahead of Samsung also in this area, since most of Samsung users think of iPhone when "smartphone" is mentioned (Remedios & Nathwani, 2014). Hence, considering the previous statements, the next hypothesis is presented:

$H_{4:}$ The customer brand awareness has a positive influence on Smartphone brand equity

2.5.5 Consequences of brand equity

2.5.5.1 Customer satisfaction

Consumer satisfaction has to be defined. Following Parasuraman, Zeithaml and Berry (1988) and Oliver (1981) consumer satisfaction could be defined as a "*summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience*". Oliver (1981) also makes a distinction between consumer *attitude* and consumer satisfaction. On one side, the consumer attitude refers to the orientation of the consumer to a particular brand; while on the other side, consumer satisfaction is related to a positive reaction to a particular experience. This distinction is quite useful in the marketing area, since it helps differentiate consumer satisfaction from similar related terms such as service quality.

For example, one consumer can experience a positive transaction, but still not be pleased –or even delighted- with the overall service quality delivered or with the product quality offered. In order to influence in customer satisfaction, companies need to deliver consistent satisfactory transactions, which may eventually result in a positive service quality perception. In addition, and as explained above, repeated and consistent positive transactions over time will lead to a loyal customer; thus, proving consumer satisfaction is a crucial factor in order to create brand equity.

Similarly, Bilal and Malik (2014) studied the effect of brand equity on customer satisfaction for retailing brands. The sample consisted of 220 questionnaires each with 23 questions using a Likert-type scale. Results showed that brand equity positively affected customer satisfaction. Thus, concluding one way to increase customer satisfaction is by creating positive brand equity (Bilal & Malik, 2014).

Regarding the smartphone market, Ahmad and Sherwani (2015) conducted a study on the effect of brand equity on customer satisfaction. The proposed model for their work was also based on Aaker's (1991, 1996) work. The study was based in India and the sample consisted of 205 students. The analysis showed that customer satisfaction was being positively affected by brand equity. Contemplating the results, they further concluded that in order to build satisfaction through brand equity, managers should focus on brand loyalty as it was one of the main factors contributing to the creation of brand equity (Ahmad & Sherwani, 2015). Therefore, considering the previous statements, the next hypothesis is presented:
$H_{5:}$ The smartphone brand equity has a positive influence on customer satisfaction

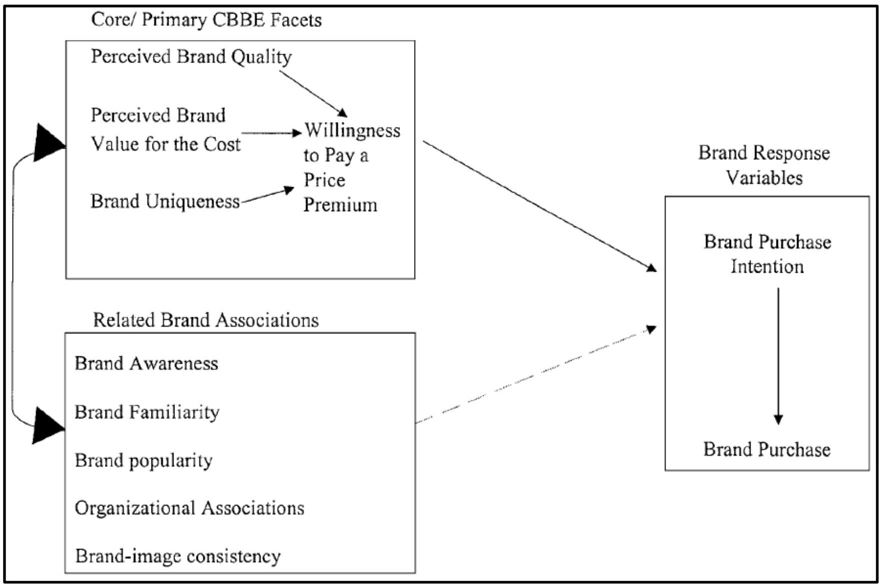
2.5.5.2 Customer purchase intention

The second variable which will be included in the model of brand equity proposed in the present study is the purchase intention. The purchase intention can be defined as "*the attitude of the consumer that shows an aim to acquire a product*" (Roozy, Arastoo, & Vazifehdust, 2014). In order to better understand the process leading to a purchase decision, Engel, Blackwell and Miniard (1995) described the process in five steps: problem recognition, the information search, evaluation of alternatives, the purchase decision; and finally, the post-purchase behavior.

Brand equity will influence the consumer at every stage of the purchasing process (Brunello, 2014). For example, brand loyalty will make consumers reluctant to switch to a different brand; and in turn, they will greatly reduce the search for information on new brands, influencing them the in the later stages of the purchasing process (Brunello, 2014).

Keller (1993) considered the core dimensions of brand equity to be perceived brand quality, perceived value for the cost and brand uniqueness. This means they are main influences in creating an *"added value"* consumer. It is this *"added value"* that results in consumers being willing to pay a *premium price*. Thus, the *premium price*, being affected by them, becomes the main indicator of brand purchase intention, as depicted in Figure 5 (Netemeyer, et al., 2004).

Figure 5: *Potential relationships with "Consumer Based Brand Equity" dimensions.*



Source: (Netemeyer, et al., 2004)

The influence of brand equity in customer purchase intention has been studied by Mahfooz (2015) with a research on the automobile industry. The data analyzed consisted on a sample of 216 respondents. Results confirmed the hypothesis that an increase in brand equity will result in an increased purchase intention for that brand. Roozy, Arasoo and Vazifehdust (2014) also studied this relation, in this case, on the food industry. The results obtained concluded that in order to create purchase intention, it is crucial that the consumer recognizes the brand. In the evaluation stage, during the buying process, a high level of brand equity could be the deciding factor in the consumer leaning over that particular brand (Mahfooz, 2015).

Looking at the smartphone market, Anosh, Naqvi and Ghulam (2014) conducted a similar study. The objective was to investigate the factors driving purchase intention, and research was conducted through close ended questionnaires. The analysis determined that brand equity positively influenced customer purchase intention (Anosh, Naqvi & Ghulam, 2014). Later, Gunawardane (2015) carried out a research on the mobile telecommunications sector, showing that brands with stronger levels of awareness, perceived quality, loyalty and associations had a higher purchase intention among consumers. In addition, this author reported perceived quality as the most relevant variable in the creation of purchase intention (Gunawardane, 2015). As explained before, all of these variables are indicators of brand equity, in the case of perceived quality one of the core ones, proving purchase intention as one of its main consequences. Therefore, considering the previous statements, the next hypothesis is presented:

$H_{6:}$ The smartphone brand equity has a positive influence on customer purchase intention.

2.5.5.3 The willingness to pay a premium price

As explained by Keller (1993) above, *premium price* is one of the main consequences of brand equity. The willingness to pay a price premium can be defined as the *"amount a customer is willing to pay for his/her preferred brand over comparable/lesser brands of the same package size/quantity"* (Netemeyer, et al., 2004). Aaker (1996) also stated that loyalty, and consequently brand equity, are basic indicators of the extra amount customers are willing to pay for one brand in comparison with another offering similar benefits. However, Aaker (1996) also reported that this *price premium* could result to be negative as well, such as for example when a brand is compared to a higher priced one.

The reason why perceived quality and perceived value are highly relevant for the cost of the product is based on *price premium* associations. Brand associations influence the response the consumer gives to a particular brand, including the willingness to pay a premium price. These two variables create brand associations derived from a direct experience; thus, becoming stronger and more easily retrievable than other variables (Netemeyer, et al., 2004)

The studies conducted by Netemeyer et al. (2004) on brands across different markets concluded that, for most customers, the "*core*" elements of brand equity as defined by Keller (2013) positively affect the willingness to pay a price premium. In addition, they highlighted that uniqueness and the brand's differentiation level are also directly related with it (Netemeyer, et al., 2004).

Finally, Azzawi and Ezeh (2012) studied how the different elements of brand equity affected student's preferences between the Apple and Samsung brands. Apple showed to have higher perceived quality than Samsung, and this element in particular also affected consumers in the sense that they were more willing to pay a *premium price* for Apple's products compared to Samsung's.

This variable wasn't part of Aaker's model, and in order to avoid an over extended analysis section, and to keep the questionnaire short, it was finally not included in the research model.

3. Research development

3.1 Research objective

The focus of this study is to analyze and compare brand equity in the smartphone devices sector. This study will be based on Aaker’s (1991; 1996) own brand equity model. In addition to the variables described above, two new brand equity consequences are incorporated into the model, namely, consumer satisfaction and purchase intention.

3.2 Methodology

3.2.1 Sampling and fieldwork

To obtain the necessary data, a survey based on each user’s experience with their particular smartphone brand has been developed. The survey was sent out in November 2016 and has been distributed among consumers worldwide through the “Google Forms” platform through an online questionnaire. Thus, respondents were able to fill in the form and submit it from various electronic devices (computer, smartphone, tablet…) at any moment. This method of data gathering was selected because smartphones are used worldwide and an online survey is the most practical method of reaching the largest number of respondents.

In order to develop the survey different platforms were used. The link to the Google Form was posted on the student’s Twitter and Facebook profiles, were it also became subsequently shared by other members helping reach more participants. In addition to social networks, the survey was posted on NeoGAF, an online forum focused on gaming and technology. The links were active for two weeks after which the survey was taken down.

The survey consisted on 14 items related to each of the variables previously discussed. These affirmations were ranked on a 5-point Likert scale, to measure the level of agreement, or disagreement regarding each one of the items under research. The gathered data comprised the variables proposed by Aaker, as well as the two proposed consequences, consumer satisfaction and purchase intention. In addition to these 14 items, the survey included 5 additional questions with the goal of identifying the socio-demographic characteristics of each respondent. Finally, a total amount of 245 valid surveys were obtained.

3.2.2 Sample description

A summary of the sample is shown in Table 2, where the following variables are detailed: gender, age, country, level of studies, household income level and smartphone brand.

Table 2: Sample Description

Variables	Indicators	Frequency	Percentage
Gender	Male	150	61,2%
	Female	95	38,8%
	Total	**245**	**100%**
Age	<20	13	5,3%
	20-25	128	52,2%
	26-30	58	23,7%
	31-40	40	16,3%
	>40	6	2,4%
	Total	**245**	**100%**
Country	Spain	155	63,3%
	USA	53	21,6%
	Canada	10	4,1%
	UK	9	3,7%
	Other Countries	18	7,3%
	Total	**245**	**100%**

Level of Studies	Doctorate	14	5,7%
	Four-year College/University	172	70,2%
	Two-year College	46	18,8%
	Secondary studies	12	4,9%
	Primary studies	1	0,4%
	Total	**245**	**100%**
Household Income Level	Less than 12.000 €/year	30	12,2%
	12.000-20.000 €/year	59	24,1%
	20.000-30.000 €/year	59	24,1%
	30.000-50.000 €/year	45	18,4%
	More than 50.000 €/year	52	21,2%
	Total	**245**	**100%**
Smartphone Brand	Apple	61	24,9%
	Samsung	39	15,9%
	Sony	17	6,9%
	Xiaomi	17	6,9%
	Other Brands	111	45,3%
	Total	**245**	**100%**

Source: *Own elaboration*

The table shows most of the respondents are men (61,2%), compared to women (32,8%). These percentages are due to a bigger predisposition from men to answer the survey compared to women.

Regarding the age of the respondents, the vast majority of the participants have ages between 20 and 30 years old, and more precisely, the 20-25 years old range obtained a percentage of 52,2%, compared to the 23,7% for the 26-30 range. The explanation to this results is that may be young users are more prone to spend time in social media and online forums, places where the survey was conducted.

Regarding the place of residence, most of the participants (63,3%) reside in Spain, followed by the USA with a percentage of 21,6%. Other countries were Canada (4,1%) and the UK (3,7%), which have a representation lower than 5%. Considering the level of studies, there is a clear majority of University students and graduates, with a percentage of 70,2%, followed after the two-year college participants with an 18,8% representation.

Regarding to the household income level, the majority of the respondents have a year income that ranges from 12.000-20.000 €/year, followed by users with an income ranging from 20.000 to 30.000 €/year. The smaller percentage of participants have an annual income lower than 12.000 €/year. Finally, the participants were asked about their smartphone brands. In this vein, Apple (24,9%) and Samsung (15,9%) were the brands more represented in the sample, despite the brands obtained were quite varied, with a total of 24 different brands among participants. In summary, the majority of the participants are male, Spanish, University students or graduates in their twenties, with varied household income levels as well as smartphones of choice.

3.2.3 Variables and measurement scale

In order to gather the information, a semi-structured questionnaire was developed consisting on 14 items grouped in each one of the variables studied, namely awareness, associations or brand image, perceived quality and loyalty, as well as the two additional ones, purchase intent and satisfaction. The questionnaire also included two items related to brand equity. Table 3 shows these items and variables.

Table 3: Variables and items

Variables	Code	Item
Awareness	AWA1	The brand X sounds familiar/known to me
	AWA2	I can easily recognize the brand X
Perceived Quality	PEQ1	X's phones have a good quality
	PEQ2	X's phones have an excellent quality
Associations or Brand Image	ASO1	The brand X has a positive image
	ASO2	The brand X has personality
Loyalty	LOY1	I'm loyal to the brand X
	LOY2	I'll recommend to my friends and family the brand X
Satisfaction	SAT1	I'm satisfied with the brand X
	SAT2	The brand X delivers the benefits I expect

Purchase Intent	PIN1	I'll consider the brand X when I have to change my smartphone
	PIN2	I intend to look for the brand X when changing smartphones
Brand Equity	BEQ1	It makes sense to buy a smartphone from the brand X, even if there are similar brands at the point of sale
	BEQ2	It makes sense to buy a smartphone from the brand X, even if there are cheaper brands at the point of sale

Source: *Own elaboration*

Statements were made simple and clear in order to reach coherent answers. Respondents were asked to rate on a 5 point Likert scale each one of the presented items, ranging from 1 being "*Totally Disagree*" to 5 being "*Totally Agree*". This procedure, developed by Likert (1932) has been widely adopted through the years thanks to its ability to transform qualitative elements into quantitative data for analysis purposes (Boone & Boone, 2012).

3.2.4 Data analysis

A two-step analysis was conducted with all the gathered data. First, it was analyzed with the statistics program SPSS. Then, the statistical software AMOS 18.0. was used with the goal of studying the relationships between variables, based on the analysis of the structure of covariances. This two-step process allows to study the influences and relations among the selected variables.

4. Results

4.1 Descriptive analysis

The means and standard deviations from all the analyzed items are included in Table 4.

Table 4: Means and standard deviations for all items

Variables	Code	Item	Mean	SD
Awareness	AWA1	The brand X sounds familiar/known to me	4,57	0,864
	AWA2	I can easily recognize the brand X	4,50	0,890
Perceived Quality	PEQ1	X's phones have a good quality	4,37	0,766
	PEQ2	X's phones have an excellent quality	3,96	0,938
Associations or Brand Image	ASO1	The brand X has a positive image	3,93	0,925
	ASO2	The brand X has personality	3,69	1,102
Loyalty	LOY1	I'm loyal to the brand X	2,86	1,430
	LOY2	I'll recommend to my friends and family the brand X	3,78	1,110
Satisfaction	SAT1	I'm satisfied with the brand X	4,29	0,807
	SAT2	The brand X delivers the benefits I expect	4,22	0,883
Purchase Intent	PIN1	I'll consider the brand X when I have to change my smartphone	3,94	1,107
	PIN2	I intend to look for the brand X when changing smartphones	3,71	1,218
Brand Equity	BEQ1	It makes sense to buy a smartphone from the brand X, even if there are similar brands at the point of sale	3,83	1,080

	BEQ2	It makes sense to buy a smartphone from the brand X, even if there are cheaper brands at the point of sale	3,44	1,268

Source: *Own elaboration.*

As the Table 4 shows, the items with the higher means, AWA1 (Mean=4,57 and SD=0,864) and AWA2 (Mean=4,50 and SD=0,890), belong to the first considered variable awareness. This result is coherent, since most of the brands that appeared in the survey are well known, especially among young consumers. Second, the variable satisfaction also reached high values, since SAT1 (Mean=4,29 and SD=0,807) and SAT2 (Mean=4,22 and SD=0,883), show means close to the previous ones. This can be explained since consumers could easily switch brands when they come out with a very unsatisfactory experience. On the other side, the variable with the lower mean values is loyalty: LOY1 (Mean=2,86 and SD=1,430) and LOY2 (Mean=3,78 and SD=1,110). These values show that even though most consumers would recommend the brand, the majority of them do not consider themselves to be loyal to it.

Among the other variables, perceived quality stands out with the higher means, PEQ1 (Mean=4,37 and SD=0,766) and PEQ2 (Mean=3,96 and SD=0,938). This results could be explained by the fact that most consumers consider the quality of their product to be almost excellent. In terms of associations, ASO1 (Mean=3,93 and SD=0,925) and ASO2 (Mean=3,69 and SD=1,102) also reach high values, and the reason may be that consumers tend to think that their brand holds a good image and personality. Finally, regarding the purchase intention, the items also reach high values: PIN1 (Mean=3,94 and SD=1,107) and PIN2 (Mean=3,71 and SD=1,218). The potential explanation could be that most consumers seem favorable about continuing with their current brand when they come up with the need to change their smartphone.

The last items on Table 4 are related to the brand equity variable, BEQ1 (Mean=3,83 and SD=1,218) and BEQ2 (Mean=3,44 and SD=1,218). These results show that most respondents value positively their current brand, and would choose it over similar or cheaper products at the point of sale.

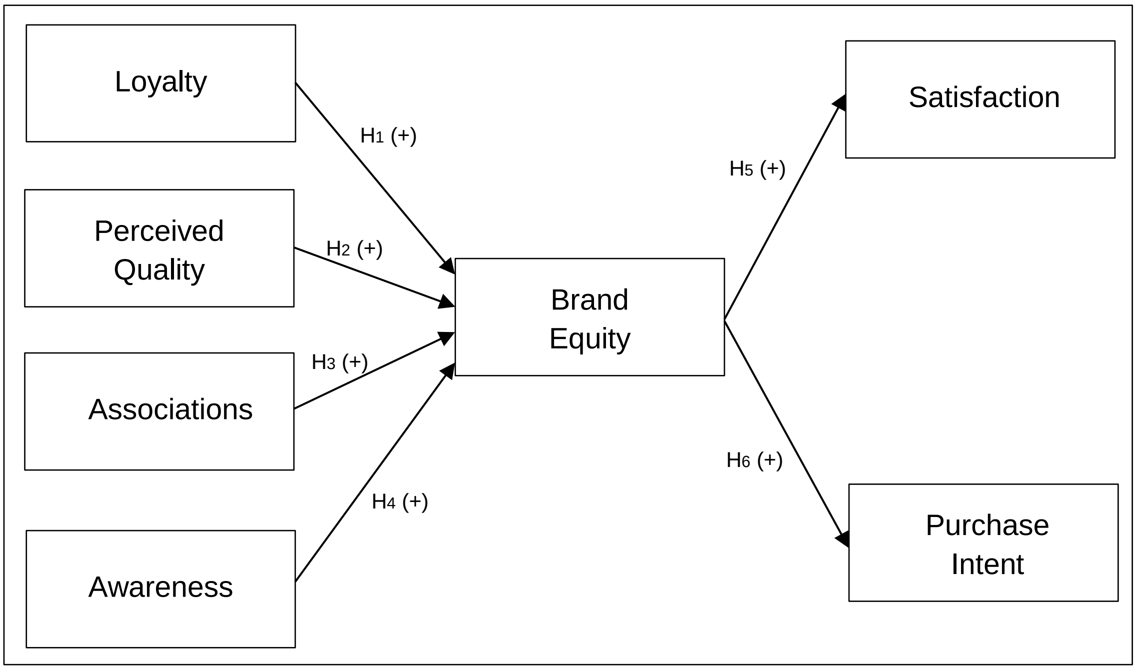
4.2 Analysis of relations between variables

In this section, the previously stated hypothesis will be studied with the analysis of the gathered data. These proposed research hypotheses are the following:

$H_{1:}$ The customer brand loyalty has a positive influence on smartphone brand equity
$H_{2:}$ The customer brand perceived quality has a positive influence on smartphone brand equity
$H_{3:}$ The customer brand image has a positive influence on smartphone brand equity
$H_{4:}$ The customer brand awareness has a positive influence on smartphone brand equity
$H_{5:}$ The smartphone brand equity has a positive influence on customer satisfaction
$H_{6:}$ The smartphone brand equity has a positive influence on customer purchase intention.

Figure 6 depicts a visual representation of these hypothesis and how the different variables relate with each other following Aaker's model, including the two additional ones.

Figure 6: Hypothesis



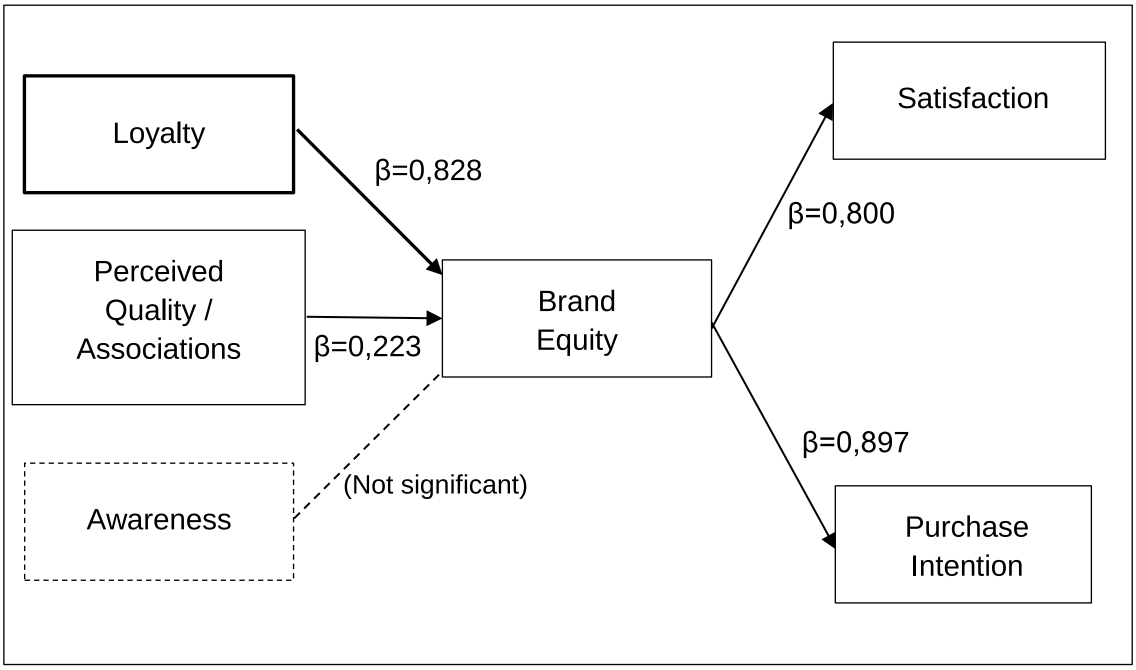
Source: *Own elaboration*

The first step of the process is testing the model and relationships between variables (Hair et al., 2010). After analyzing these relations, our findings showed a high correlation between "*brand image*" and "*perceived quality*". Facing the impossibility of developing and conducting a modified survey due to the lack of time, after much consideration a decision was made to merge brand image or brand associations and perceived quality into one variable.

Then, in order to test the model two indicators are considered (Hair et al., 2010). The statistical significance (p), which should have a value below p≤0,05 (Esbensen, Guyot, Westad, & Houmoller, 2002), and the CFI (Comparative Fix Index), which following Hu and Bentler (1999) studies, should reach higher values than 0,950. The results obtained for the proposed model were adequate, showing a good model fit: CFI=0,965 and p=0,000.

Figure 7 shows the relationships between the different analyzed variables in the Aaker's model.

Figure 7: Standardized coefficients and relationships among variables.



Source: *Own elaboration*

The different regression coefficients (β) are showed over each arrow indicating the effect that each one of the variables have on another. These standardized coefficients range from 0 to 1, indicating a bigger influence the larger the value, when below 0,2 the effect can be considered negligible (Esbensen, Guyot, Westad, & Houmoller, 2002).

That is the case of brand awareness, our findings did not show a significant influence on brand equity. For this reason, it is not possible to confirm that brand awareness has an influence on brand equity. This could be explained considering the fact that most of the brands included in the sample a very well know. When all brands show a high level of awareness, it is difficult for that variable to make a difference on brand equity.

On the other hand, our findings show that purchase intention exerts the highest influence on brand equity (β=0,897), followed closely by satisfaction (β=0,800). These two values show that brand equity has a positive and significant effect on both satisfaction and purchase intention, as initially expected. That is, smartphone users that value their brands positively, show higher levels of satisfaction and are more prone to purchase these brands in the future.

In summary, the variable that influences the most in the creation of brand equity is loyalty (β=0,828), which proves that loyal consumers tend to value their smartphone brands positively. This result is in line with Aaker's model, since he highlighted that that loyalty is one of the key elements of brand equity. Another variable that contributes to the smartphone brand equity is perceived quality and brand image or brand associations, and although the standardized coefficient is not high, it shows a positive and significant effect. The Table 5 displays a summary of the research hypothesis.

Table 5: Relationships among variables and hypotheses test.

Relationships	**Standardized coefficients (β)**	**Hypotheses test**
Loyalty → Brand Equity	β =0,828	H_1: Supported
Awareness → Brand Equity	β =-0,048	H_4: No Supported
Brand Equity → Satisfaction	β =0,800	H_5: Supported
Brand E. → Purchase Intent	β =0,897	H_6: Supported
Perceived Quality / Associations → Brand Equity	β =0,223	H_7: Supported

Source: Own elaboration

Conclusions

This study aimed to examine the concept of brand equity and the variables that constitute it, and further to develop an empirical study of the creation of brand equity on the smartphone industry. For this purpose, a theoretical review of the concept of brand equity was developed, to then carry out an empirical analysis.

First established in the early 90s, this concept has been intensively studied through the years, as it allows companies to create an "*added value*" that can result in higher profit margins, product differentiation, or simply help in achieving a positioning in the marketplace. This study tried to analyze, through the Aaker's *Brand Equity model*, which variables have a bigger impact in creating brand equity on the smartphone industry, as well as some of the major consequences of brand equity, namely the consumer satisfaction and the purchase intention.

After studying the variables from this model, our findings show that customer loyalty, as well brand associations and brand perceived quality have a positive influence on brand equity. However, our findings do not report a significant influence of brand awareness on brand equity, contrary to our initial expectations.

One potential explanation for the obtained results could be the type of brands collected in the sample. More precisely, the vast majority of the smartphone brands examined enjoy high levels of awareness, especially among the younger users, who are more prone to be interested in technology and smartphones devices. Therefore, companies could find trouble in highlighting one specific brand.

In addition, brand associations and perceived quality did show to have a positive influence on brand equity. More precisely, participants perceived their brands as having personality and a good image, as well as being perceived as quality products. Furthermore, loyalty is the variable that showed the biggest effect on the smartphone brand equity, proving Aaker's theory; since according to Aaker (1991; 1996) brand loyalty is one of the key elements and one of the main dimensions of brand equity. As previously discussed, loyalty can also be considered to have a high impact on consumer satisfaction and purchase intention.

This influence is remarkable, and our findings report the high influence of the two variables introduced into the model. That is, both satisfaction and purchase intention showed to be consequences of brand equity; proving that consumers who value positively their brand tend to be satisfied and are more likely of choosing that brand again in the future.

For managers and companies trying to build brand equity in the smartphone market, our findings report that they should focus on creating and enhancing brand loyalty, as it is one of the main dimensions of brand equity, and subsequently of customer satisfaction and purchase intention.

To conclude, there were some limitations encountered during the study. The small sample size is one of the main limitations of the study. Second, the range of brands included in the sample is another limitation, since not all brands are being considered. For this reason, obtaining a more diverse sample of brands could be useful when approaching the analysis of this variable. Finally, we should note that some relevant marketing variables are not considered in the present study, such as price or perceived value, that could help to get a *whole picture* of brand equity. Solving all these limitations would be interesting in order to develop future researches on the topic.

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