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The Future of Smartwatches – A case on the current status and expected category evolution on the Portuguese market

Sara Cristina Nunes de Melo

Dissertation written under the supervision of Prof. Nuno Crispim

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"*They always say time changes things, but you actually have to change them yourself*."

- Andy Warhol

ABSTRACT

Title: The Future of Smartwatches – A case on the current status and expected category evolution on the Portuguese market

Author: Sara Cristina Nunes de Melo

The introduction of new technologies and development of tools that facilitate everyday consumers' life is part of the reality we are living. And whereas some innovations might be of slighter importance and distinctiveness, others might imply a significant change in the consumer behaviour, totally redefining the marketplace expectations. On the latter, and considering its high level of uncertainty, consumer acceptance plays a key role that companies must be aware of and consider in their strategy, in order to mitigate any barriers it might bring.

The aim of this dissertation is to provide insights on how is the smartwatches category evolving in the Portuguese market and how is it possible to leverage its growth, by assessing in detail the current status of the market globally and locally, as well as retrieving insightful quantitative data on Portuguese consumer preferences towards this category.

The methodology used concerns qualitative data retrieved from group interviews to 3 smartwatch owners and 4 non-owners, as well as quantitative data obtained through a survey conveyed to 258 valid respondents. All supported with an extensive literature review on both diffusion of innovation theory, as well as smartwatch definition, update on current status and foreseen evolution.

The main findings suggest that, currently, smartwatches are at the *chasm* stage of the product lifecycle with a need of developing strategies to cross from the early adopter to the mainstream market. These same strategies are proposed in this dissertation, taking as base both literature insights as well as consumer quantitative contribution.

Keywords: Smartwatch; Wearables; Innovation Acceptance; Adopter Category; Product Life Cycle; Chasm.

RESUMO

Título: O Futuro dos Smartwatches – Caso sobre o estado atual e evolução esperada da categoria no mercado português.

Autor: Sara Cristina Nunes de Melo

A introdução de novas tecnologias e desenvolvimento de ferramentas facilitadoras do dia-a-dia do consumidor fazem parte da realidade atual. E enquanto algumas inovações podem ser de menor importância ou distinção, outras implicam uma mudança significativa do comportamento do consumidor, redefinindo totalmente as expectativas do mercado. No último caso, e considerando o seu alto nível de incerteza, a aceitação do consumidor desempenha um papel-chave para as empresas, devendo considerá-la na sua estratégia e mitigar potenciais barreiras que possa trazer.

O objetivo desta dissertação é assim, proporcionar conhecimento na evolução da categoria de smartwatches em Portugal assim como entender de que forma alavancar o seu crescimento, ao analisar em detalhe o estado atual do mercado global e local, recolhendo dados quantitativos relevantes das preferências do consumidor Português relativas à categoria.

A metodologia utilizada inclui dados qualitativos recolhidos através de entrevistas de grupo a 3 detentores de smartwatch e 4 não-detentores, assim como dados quantitativos recolhidos num inquérito distribuído a 258 inquiridos válidos. Suportado por uma extensiva revisão bibliográfica sobre teoria da difusão de inovação, assim como na definição e descrição do estado atual do mercado de smartwatches e sua expectável evolução.

As principais conclusões sugerem que atualmente os smartwatches se encontram na fase de *chasm* do ciclo de vida do produto, com necessidade de desenvolver estratégias que os passem do mercado de pioneiros para o comercial. Estas mesmas estratégias são propostas nesta dissertação, tomando como base os conhecimentos retirados da revisão literária assim como da contribuição de dados quantitativos de consumidor.

Palavras-Chave: Smartwatch; *Wearables*; Aceitação de Inovação; Categorias de Adotantes; Ciclo de Vida do Produto; *Chasm*.

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Finally, I must express my most profound gratitude to my parents, Cristina and Sérgio, my whole family and to my greatest friends Carlota and Joana, for providing me with unfailing support and unceasing encouragement throughout my years of study and through the process of researching and writing this thesis. This is the end of a cycle. Thank you!

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CHAPTER 1 – INTRODUCTION

1.1.Background

Back in the 15th century, when watches were introduced, they served as a portable device to tell time. As years went by, this role evolved and watches started becoming pieces of jewellery and a symbol of status. And in the 21st century, when almost everybody owns a cell phone that displays time digitally, wristwatches are increasingly at stake to lose its utilitarian function.

In the beginning of the century, a new innovation arose, the smartwatch – a new type of device that combines the functionalities and capabilities of a smartphone, in the form of a wristwatch. And just as the introduction of wristwatches in the market led to the almost disappearance of pocket watches in the 20th century, *could the smartwatch soon replace a traditional wristwatch?*

In fact, in its first years, the smartwatch appeared to be succeeding and growing steadily, especially in 2015, with the launch of the Apple watch, that the category awareness and sales have rocketed (about 205% sales increase vs. previous year). However since 2016, that smartwatch category growth has been decelerating (in 1Q17, YoY growth was only 14%), which is particularly curious to a new innovation to lose traction after a well succeeded launch.

1.2.Problem Statement

Thus, this thesis starting point problem is on the deceleration of the smartwatches category over time, and it strives to understand the reasons behind this deceleration and how to revamp it. This will be possible by analysing and extensively describing the actual context of the smartwatches category in the Portuguese market, as well as its expected evolution, taking in consideration literature and theory on diffusion of innovation.

Hence, I was able to define the problem statement of this research as:

"What is the current status and expected evolution of the smartwatches category in the Portuguese market?"

1.3.Aim of the Research

The ultimate goal of this thesis is to provide insights on how is the smartwatches category evolving and how is it possible to leverage its growth, both through the conceptions of academics with previous experiences in launching innovation, but also, taking into account consumer preferences. Thus, the research questions to be addressed by this study are the following:

RQ1: What type of innovation are smartwatches?

RQ2: At what stage of the product lifecycle are smartwatches?

RQ3: Which drivers better explain consumer purchase intention of smartwatches?

RQ4: Which drivers better explain consumer satisfaction with smartwatches?

RQ5: What are the areas of development for smartwatches to meet consumers' needs?

1.4.Research Method

This thesis' methodology was led by three purposes: exploratory, descriptive and explanatory. Primary data was retrieved from qualitative group interviews of two groups of people – smartwatch owners and non-owners –, and from quantitative online survey, administered to a sample of Portuguese population.

In order to support the primary data, secondary data was collected for the literature review, comprising two central topics – a theoretical framework on diffusion of innovation, as well as general and detailed information on the wearables (particularly smartwatches) market.

1.5.Academic and Managerial Relevance

To the best of my knowledge, there hasn't been any study that actually looked at the market status and expected evolution of smartwatches in the future, taking in consideration consumer preferences.

Despite its validity and necessity, several studies have looked at very particular scenarios, not considering everyday use. Bieber, Haescher, & Vahl (2013) studied software and hardware improvement of smartwatches, particularly within activity sensor recognition. Migicovsky, Durumeric, Ringenberg, & Halderman (2014) looked into privacy and security issues of smartwatches applied to the academic context, whereas Giang, Hoekstra-Atwood, & Donmez (2014) explored the implications of its usage while driving. Lastly, Bernaerts, Druwé, Steensels, Vermeulen, & Schöning (2014) studied the application of these devices to the business environment. The closest research found – of Cecchinato, Bird, & Cox (2015) – report's findings on *why* and *how* people use smartwatches in real life, though conducting it via exploratory interviews, and not taking in consideration quantitative data. Moreover, it doesn't explore a particular market, as this study whose scope relies on the Portuguese market.

Thus, this research expects to further develop the study of smartwatches applied to the everyday use, in the particular context of the Portuguese market, providing insightful conclusions both for the academic context – regarding diffusion of innovation literature – as well as the business context, by contributing to the knowledge on consumer behaviour towards these devices and by proposing a series of recommendations on how to leverage this new category in the market.

1.6.Dissertation Outline

This thesis presents five main chapters. The first one provides an overview of the research topic as well as its relevance for the study, comprising the problem statement and respective research questions. The second chapter regards to a literary review on the theoretical and practical topics associated to this research, such as Innovation and Smartwatches market. In chapter 3, there is an extensive description of the methodology used in this research as well as followed procedures for sample selection, data collection and used measures. Chapter 4 includes the discussion of results obtained from the research, concerning both primary as secondary data, supported by statistical analysis. Lastly, chapter 5 closes the dissertation by presenting main conclusions, recommendations, as well as limitations and suggestions for further research.

CHAPTER 2 – LITERATURE REVIEW

2.1. INNOVATION

While many authors broadly define innovation as technology, Bass (1969) refers to it as a "broad range of distinctive new generic classes of products". Rogers (1962), though, considers it as an "idea, practice, or object that is perceived as new by an individual". Thus, for the later, it doesn't matter whether or not this idea/practice/object is "objectively" new, but rather if it is perceived as new – this perceived newness is what determines an individual's reaction to the innovation.

2.1.1. Types of Innovation

Two types of innovation have been defined by Bower & Christensen (1995): *sustaining* (or continuous) and *disruptive* (or discontinuous).

The first – *sustaining innovation* – tends to maintain a rate of improvement, providing the customer with improvements or new functionalities in the attributes they already value. Most product and service innovations as we know are sustaining (Bower & Christensen, 1995; Christensen, Bauman, Ruggles, & Sadtler, 2006)

Contrastingly, *disruptive innovation* introduces a very different set of attributes that customers typically value, often underperforming in one or two dimensions that are particularly important to those customers (Bower & Christensen, 1995). Backed on this theory, Nagy, Schuessler, & Dubinsky (2016) then redefine this concept as "an innovation with radical functionality, discontinuous technical standards, and/or new forms of ownership that redefine marketplace expectations"

In short, Moore (1991) describes *disruptive innovation* as a product that requires a change in the behaviour of the consumer (For example: a new car that requires electricity instead of gasoline). Reason why he also defends that people's attitude toward technology adoption becomes significant when a *discontinuous innovation* product is introduced.

2.1.2. Diffusion of Innovation

According to Rogers (1962), diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system". This author highlights that this is a special type of communication, as the messages are concerned with new ideas.

However, innovation is not diffused equally, nor adopted simultaneously by all members of a social system. Instead, since the establishment of the first innovation diffusion models in the

70's, that a pattern was described, suffering minor developments over time in what regards introduction of variables or generalization to different areas (Meade & Islam, 2006).

Hence, the cumulative number of innovation adopters over time is modelled as an S-shaped curve. With only few adopters in the launching stage, soon beginning to climb as more individuals adopt it, and lastly beginning to level off.

Bass (1969) suggests that the reason for innovation diffusion to take this S-shaped curve is explained by the fact that individuals' purchase of new products are influenced by the *desire of innovating* (coefficient of innovation *p*) and the *desire of imitating* (coefficient of imitation *q*). Hence, the model describes that the probability of purchase depends linearly on the number of previous buyers.

2.1.3. Innovation-Decision Process

Yet, no diffusion of innovation occurs if there isn't an individual or a decision-making unit to allow it. Thus, it implies a decision-making process, in this case the so called Innovation-Decision Process – which distinguishes itself from other types of decision-making processes by "the perceived newness of the innovation and the uncertainty associated with this newness" (Rogers, 1962).

Hence, the Innovation-Decision Process is described as "a series of actions and choices over time through which an individual or organization evaluates a new idea and decides whether or not to incorporate the new idea into ongoing practice" (Rogers, 1962). According to Rogers (1962), this process implies different stages:

1) **Knowledge** – when an individual is exposed to the innovation's existence and gains some understanding of how it functions. Here, the mental activity is mainly cognitive (knowing).
2) **Persuasion** – when an individual forms a favourable/unfavourable attitude toward the innovation. At this stage, the type of thinking plays a more affective (feeling) role. Also, it entails the active search of information about the new idea, as well as the need for social reinforcement of the individual's attitude toward it.
3) **Decision** – when an individual engages in activities that lead to a choice to adopt/reject the innovation.
4) **Implementation** – when an individual puts an innovation into use.

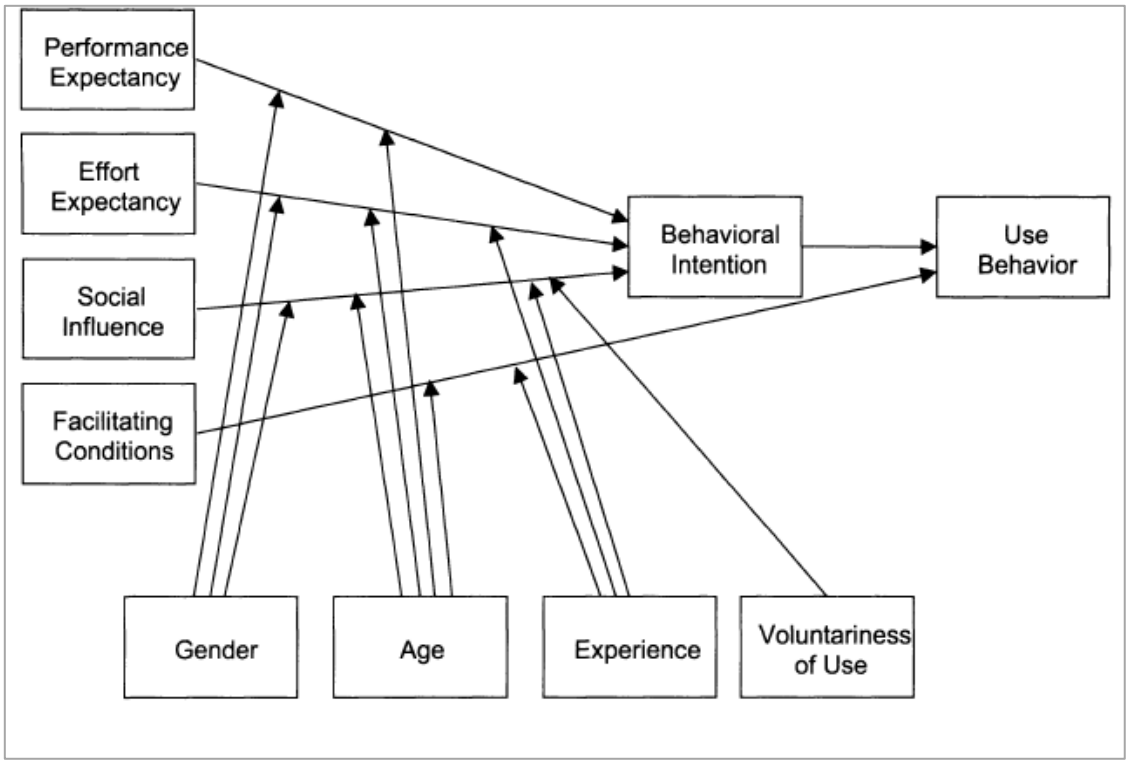
5) **Confirmation** – when an individual seeks reinforcement of an innovation-decision already made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation.

2.1.4. Innovation Acceptance Determinants

In the previous section we've seen *how* individuals act when deciding whether or not to adopt a certain innovation. Now, we will understand *why* these individuals intend to accept and thus, adopt these new ideas.

Venkatesh, Morris, Davis & Davis (2003) have reviewed and discussed literature on eight prominent models on information technology acceptance, then formulated a unified model integrating elements from the eight models – Unified Theory of Acceptance and Use of Technology (UTAUT) – and subsequently, have empirically validated this unified model.

Figure 1 - Unified Theory of Acceptance and Use of Technology - Research Model



Source: Venkatesh, Morris, Davis & Davis (2003)

The UTAUT explains as much as 70 percent of the variance in intention, and within their research (**Figure 1**), Venkatesh et al. (2003) construe four determinants of user intention and behaviour – 1) performance expectancy, 2) effort expectancy, 3) social influence and 4) facilitating conditions –, as well as four key moderators of these same determinants – 1) gender, 2) age, 3) experience and 4) voluntariness of use – which will be described below:

Determinants of Intention and Behaviour:

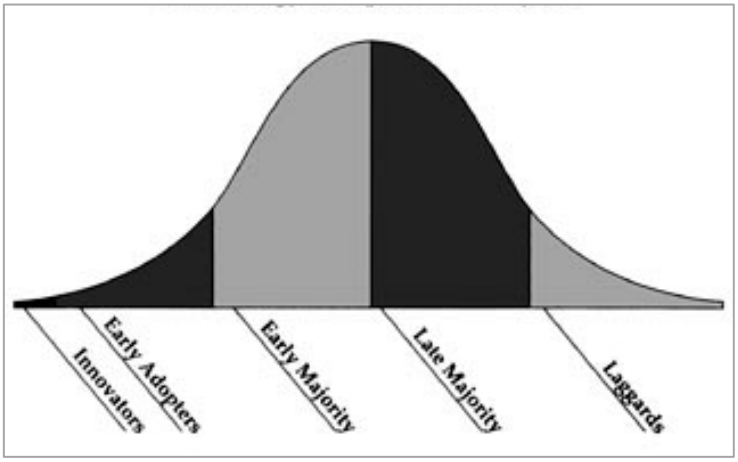
1) **Performance Expectancy** – "the degree to which an individual believes that using the system will help him or her attain gains in job performance" (Venkatesh et al., 2003). This is described by the authors as the strongest determinants of intention. Nonetheless, it is expected to be moderated by gender and age, such that the effect will be more significant for men and young workers.
2) **Effort Expectancy** – is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). This element is moderated by gender, age and experience, such that it has a stronger effect on women and older workers, whose effects decrease with experience.
3) **Social Influence** – is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003). On this construct lies an explicit notion on how the individual's behaviour is influenced by others. Hence, it is moderated across all variables (gender, age, experience and voluntariness of use) in such manner that the authors found "social influence" to be insignificant without the inclusion of the moderators.
4) **Facilitating Conditions** – "the degree to which and individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). This determinant was only found significant with the moderating effects of age and experience, such that it is only salient for older workers in later stages of experience.

2.1.5. Technology Acceptance Life Cycle and Adopter Categories

While in most industries *discontinuous innovations* are only introduced occasionally, in high-tech industries these introductions are a constant. Thus, the Technology Acceptance Life Cycle (TALC) model becomes key to the entire sector's approach to marketing. This model described by Moore (1991) illustrates the market penetration progress of any new technology product, throughout its useful life, as well as the types of individuals it attracts – **Figure 2**.

Each group differentiates from another by their unique profile defined by psychological and demographic criteria, which influences their distinctive response to a *discontinuous innovation* product, supports Moore (1991). And while certain authors have only distinguished two groups of *early adopters (or innovators)* and *late adopters (or imitators)* (Bass, 1969; Peres, Muller, & Mahajan, 2010), Rogers (1962) and Moore (1991) conceptualize five types of individuals.

Figure 2 - The Technology Adoption Life Cycle



Source: *Moore (1991)*

The adopters' curve follows a normal distribution, and it is composed by *Innovators* (2.5%), *Early Adopters* (13.5%), *Early Majority* (34%), *Late Majority* (34%), *and Laggards* (16%). The first two groups compose the Early Market (16%) and the remaining three constitute the Mainstream Market. (84%).

These adopter groups' detailed descriptions can be found on **Appendix I**.

3.1.5.1. The High-Tech Marketing Model

The TALC comes as the very foundation of the High-Tech Marketing Model that states that the way to develop a high-tech market is to work the curve left to right (Moore, 1991), starting by the development and growth of the market, stage by stage, i.e. Innovators, then Early Adopters, and so on. This same author advocates that the endorsement of the previous group is key to develop a credible pitch and "capture" the following group of adopters, within a smooth process unfolding through all stages of TALC. Reason why it is important to keep the *momentum*, in order to keep a bandwagon effect that makes it natural for the next group to want to buy in (Moore, 1991).

Once a company keeps the *momentum*, it may also be leveraging an advantage towards the competition. By "catching the curve" first then its competition and "conquering" the Early Majority, there is a promise of virtual monopoly of the category and the "ownership" of a highly profitable market for a very long time.

3.1.5.2.The Chasm or Saddle

However, there might be some barriers to the smooth progression over the High-Tech Marketing Model. These handicaps rely on virtual gaps between groups of adopters. Moore (1991) defends these gaps as symbols for dissociation between groups, i.e. the difficulty any

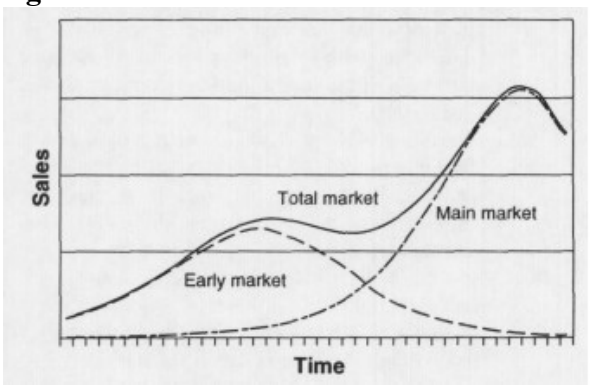
group will have in accepting a new product if presented in the same way as it was to the group to its immediate left. Hence, the gaps may represent a chance for either winning or losing the *momentum* and earn or win the transition to the following stage (Moore, 1991).

Goldenberg, Libai, and Muller (2002) also build on this theory, mentioning a very common phenomenon within electronic durable goods called *saddle*, which they define as pattern wherein "an initial peak predates a trough of sufficient depth and duration, followed by sales that eventually exceed the initial peak". According to them, this *saddle* could be explained by stockpiling, changes in technology, industry performance or macroeconomic events. However, considering the average saddle time of 5,1 years reported in this paper – based on a data set compiled by Consumer Electronics Association of 32 innovations –, it is questionable to what degree these causes explain this phenomenon.

Hence, Goldenberg et al. (2002)'s model highlights that the main reason behind this event can be better explained by the dual-market phenomenon that differentiates the early market adopter from the main market adopter – that adopt at different rates. If the difference between this rates is pronounced, then a visible temporary decline of sales is exhibited at the intermediate stage between them – **Figure 3**.

Consistent with this theory, Moore (1991) refers a critical crack in the TALC as the *chasm* – between the Early Adopters and the Early Majority – that represents the major transition of a business, as it dictates whether an innovation will be playing on a mainstream market and thus, leverage the most profit out of it.

Figure 3 - The Dual-Model Case: The Saddle



Source: Goldenberg, Libai, and Muller (2002)

3.1.5.3.Crossing the Chasm

The *chasm* is a very distressing place for a business to stand – It entangles an increasing saturation of the Early Adopters' market, at the same time it settles in a moment where

Mainstream adopters are still not comfortable to buy. If we add this constraints to the entrance of new competitors, this becomes an even less sustainable picture for the firm's financials.

Thus, to cross the *chasm* and get established in the mainstream market, the key is to target a very specific niche market where you can dominate from the outset, force your competitors out of the market niche, and then use it as a base for broader operations (Moore, 1991). The author adds up that the reason why most companies tend to fail this operation is within the loss of focus when confronted with the immensity of opportunity represented by a mainstream market.

Moore (1991) states that once this niche market is defined, it is key to:

1. **Capture a referenceable customer base that can open business to other mainstream prospects.** Seeding communication and word-of-mouth is a crucial meaning of gaining mainstream adopters.
2. **Ensure the delivery of the whole product and services needed to achieve the desired result.** Though whole product commitments might by expensive, companies should be able to grasp the major market opportunities and leverage the product commitments that strategically reach one or two niches in the most sustainable way.
3. **Achieve market leadership.** Linked to their pragmatic nature, Mainstream Adopters aspire to take the right decision, reason why they aim at buying from the market leader, which inevitably and unconsciously will give them higher reliability.

Nevertheless, the main goal is to dominate the mainstream market. Thus, the key to moving beyond the initial target niche is to select strategic target market segments that, by virtue of its other connections, creates an entry point into a larger segment (Moore, 1991).

2.2.WEARABLES

"Wearable electronic devices", "wearable technology" or even "wearables" are words that all refer to the same type of technology – "any electronics that can be worn on the body, either as an accessory or as part of material used in clothing" (Investopedia, 2017). Generally, the major feature to be considered a wearable is it connectivity – either the ability to connect to the Internet or another device, by allowing the exchange of data between both.

These devices have been gaining ground extensively in this last couple years. Examples of current wearable devices include: head-mounted displays (such as VR headsets and smart glasses); smart clothing (like biometric shirts and contactless payment jackets, etc.); smart jewellery; implantables (such as contraceptive devices or insulin pumps); and of course, smartwatches (Sung, 2015).

In general, smartwatches comprise some of the same features of smartphones or laptops, with an edge on other capabilities not typically seen in these first devices, such as biofeedback and tracking of physiological function. Hence, these ultimate type of innovation can have important implications in "the fields of health and medicine, fitness, aging, disabilities, education, transportation, enterprise, finance, gaming and music" (Wearable Devices, 2016)

2.2.1. Smartwatches

A smartwatch "is a wearable computing device worn on a user's wrist that offers functionality and capabilities similar to those of a smartphone*"* (Webopedia, 2017).

In line with the same source, these devices should work either on their own or paired with a smartphone, thus enabling to provide features like "connecting to the internet, running mobile apps, making calls, messaging via text or video, checking caller ID, accessing stock and weather updates, providing fitness monitoring capabilities, offering GPS coordinates and location directions, and more" (Webopedia, 2017).

According to a study from 2015 developed by Allied Market Research, we can segment the smartwatches by application or context as: Personal Assistance; Wellness/Fitness; Sports/Adventure; and Medical/Health.

Regarding Wellness/Fitness category, it is important to mention that usually it entails a specific device that might not be a watch but rather a smart wristband, also called by "fitness tracker" or "activity tracker". These devices' features usually include the same as regular smartwatches in what regards fitness monitoring, but present a more discrete appearance (more similar to a wristband) and may or may not have a display.

On **Table 1** are summarized the main features each segment generally provides, as well as brand/model examples attributed to each segment and respective average price.

Table 1 - Types of Smartwatches

Types of Smartwatches				
Segment	**Personal Assistance**	**Fitness/Wellness**	**Sports/Adventure**	**Medical/Health**
General Characteristics	- Clock/Time - Make/receive calls, texts - Check caller ID - Calendar - E-mail - Mobile Apps	- Steps, calories, distance - Heart rate - Sleep track - **Optional**: clock/time, message notifications, music control	- Fitness monitoring - Outdoor activities features (swimming, golf, cycling) - GPS and routes' storage	- Nervous system, heart rate, sleep track - Emergency/Inactivity alerts - Medication and task reminders
Brand Example	**Apple iWatch** **Samsung Gear**	**Fitbit** **Xiaomi**	**Garmin** **TomTom**	**Empatica Embrace** **CleverCare**
Average Price	400€ - 1000€	20€ - 250€	150€ - 500€	250€ - 400€
				

Besides the already mentioned segments, there is also a rising trend for hybrid smartwatches. These devices look like classical timepieces that combine the look and functionalities of a traditional watch – usually analogic – with features available in today's smartwatches (Maslakovic, 2017), and will be later described on "Main Players" section.

On **Appendix II** can be found a short section on the history and evolution of smartwatches over time.

2.2.2. The Wearables Market Worldwide

According to the International Data Corporation (IDC) Worldwide Quarterly Wearable Device Tracker, in 2016 were shipped about 102.4 million wearable devices worldwide, as new vendors have been entering the market – a 29.6% growth with regard to 2015 shipments (**Table 2**).

Since 2014 that a rapid growth is notable in this market, especially in 2015, when shipments grew by 174% in relation to the previous year, fuelled by the growing popularity of fitness bands and the launch of Apple in 2Q15. It was also in 2015, by 4Q15, when smartwatches[1] overtook Swiss wristwatches for the first time, in terms of total units: 8.1 million smartwatches were shipped, compared to 7.9 million Swiss watches, according to the latest research from Strategy Analytics (Mawston, 2016).

[1] NOTE: Mawston (2016) refers to "smartwatch" by disregarding "wrist bands".

Table 2 - Wearable Shipments Worldwide Evolution

	2014	2015	2016
Shipments (million units)	28.8	79.0	102.4
Growth YoY (%)	-	174.3%	29,6%

Source: IDC Worldwide Quarterly Wearable Device Tracker, March 2, 2017
& IDC Worldwide Quarterly Wearable Device Tracker, February 23, 2016

IDC breaks down the Wearables category into 5 segments: Watch; Wristband; Eyewear; Clothing; and Others. Nonetheless, we note on **Table 3** that virtually all the market – 91,5% – refers to smartwatches per se (Watch + Wristband). For that reason we may analyse the smartwatches segment evolution by considering the total wearable shipments.

Table 3 - Top Wearable Products with Shipments, Market Share and 5-Year CAGR (shipments in millions)

Product	2015 Shipments	2015 Market Share	2016 Shipments	2016* Market Share	2020* Shipments	2020* Market Share	2016-2020 CAGR
Watch	31.9	40.4%	41.8	41.0%	111.3	52.1%	27.8%
Wristband	39.6	50.2%	51.4	50.2%	60.8	28.5%	4.3%
Watch+Wristband	71.5	90.6%	93.2	91.0%	172.1	80.6%	16.5%
Eyewear	0.1	0.2%	0.2	0.2%	18.8	8.8%	201.2%
Clothing	0.4	0.6%	2.2	2.1%	15.6	7.3%	62.6%
Others	6.8	8.7%	6.7	6.5%	7.1	3.3%	3.5%
Total	**79.0**	**100.0%**	**102.4**	**100,00%**	**213.6**	**100.0%**	**20.3%**

Source: IDC Worldwide Quarterly Wearable Device Tracker, June 15, 2016
* Forecast Figures

Adding up to all this, we need however a base for comparison of this market. Thus, when we compare the smartwatch category to the total volume of wristwatches sold worldwide, we realize how niche this market is – the 42 million smartwatches (disregarding wristbands) sold in 2016 compared to the average annual sales of wristwatches of 1.2 billion units, makes this category represent about a 3,5% of total watch market. Even Swiss watches shipments 2016 represented only a 2.5% of the total market – **Table 4**.

Table 4 - Total Watches Market vs. Smartwatches and Swiss Watches

Market	Sales (millions of units)	% of Total Watches Market
Wristwatches Annual Sales	1.200	-
Smartwatches Sales 2016	42	3,5%
Swiss Watches Sales 2016	29	2,5%

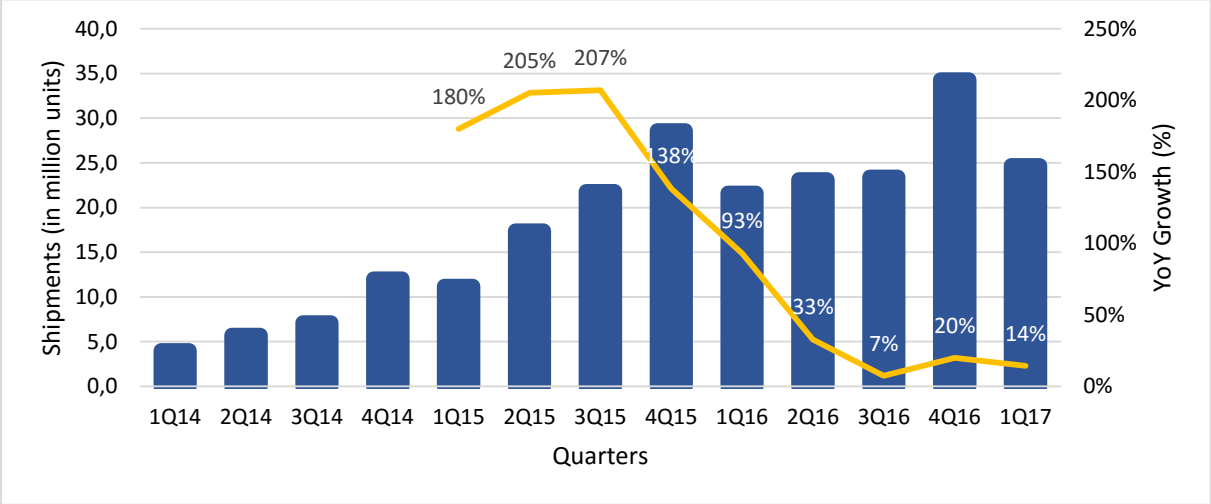
Source: Adapted from Statistic Brand, 2016 & IDC Worldwide Quarterly Wearable Device Tracker

2.2.2.1. The Evolution of the Wearables Market

In what regards evolution trends, the worldwide wearables market has been maintaining an upward trajectory, with a higher propensity for sales during the last quarter of the year – influenced by Christmas season – followed by a usual decline in sales in 1Q.

However, over 2016 and the first quarter of 2017, market growth has been decelerating as exhibited on **Figure 4** – on 1Q17, YoY growth was only 14% vs. 1Q16 (93%) and 1Q15 (180%).

Figure 4 - Wearables Worldwide Shipments from 2014 to 1Q17 (in million units)



Source: Adapted from IDC Worldwide Quarterly Wearable Device Tracker

There are many reasons that may be behind this deceleration in growth of the market. One of the most probable factors that Choi & Kim (2016) mention as affecting the smartwatches' performance are the positioning and marketing challenges that this product implies – by converging into both a technological device and a wristwatch. If on one hand, as a tech device entails a short life cycle, as a wristwatch, people are seeking values such as aesthetic pleasure, brand reputation and long-lasting durability – which leads into a value proposition conflict.

And this has been representing not only a major issue when attracting consumers, but also in retaining them. According to a consumer survey made by Gartner, in December 2016, the abandonment rate of smartwatches is 29%, since people "do not find them useful, they get bored of them or they break" (Gartner, 2016). Reason why the Research Director at Gartner - Angela McIntyre defends that "to offer a compelling enough value proposition, the uses for wearable devices need to be distinct from what smartphones typically provide."

2.2.2.2. Main Players

The next section describes the main competitors playing in this category, as summarized in **Table 5.** It is notable how Fitbit has been able to maintain its market leadership over the years, though slightly declining to the current 22% share, mainly focusing on the wristband segment. The second most important player is Xiaomi – also mainly driven by wristbands –, which has rocketed in 2015 (from 4% share in 2014) and maintained its 16% share over 2015 and 2016. Apple watch was launched in 2015, and since then it's the 3rd biggest player in the category. Afterwards is Garmin with 6% share and Samsung with 4%.

Besides the main players stated, there are many other brands producing this type of devices. Amongst them, is important to highlight the luxury and designer brands that generally play in this market with a specific type of smartwatch already mentioned in this study – the hybrids – which allow the combination of the traditional analogue design with simple smartwatch features that upgrade timeless pieces to today's reality. This segment represents already 7% of the total smartwatch category and is expected to grow 77%, by the end of 2017.

More detailed information on the main players can be found in **Appendix III**.

Table 5 - Wearables Worldwide Main Players' Shipments and Market Shares

Main Players	Shipments (in million units)			Market Share		
	2014	2015	2016	2014	2015	2016
Fitbit	11	21,4	22,4	38%	27%	22%
Xiaomi	1,1	12	15,9	4%	15%	16%
Apple	0	8,9	9,7	0%	11%	9%
Garmin	1,9	7,6	5,9	7%	10%	6%
Samsung	1,9	2,6	3,6	7%	3%	4%
Others	12,9	26,5	44,9	45%	34%	44%
Total	**28,8**	**79**	**102,4**	**100%**	**100%**	**100%**

Source: Adapted from IDC Worldwide Quarterly Wearable Device Tracker

2.2.2.3. The Future of Wearables

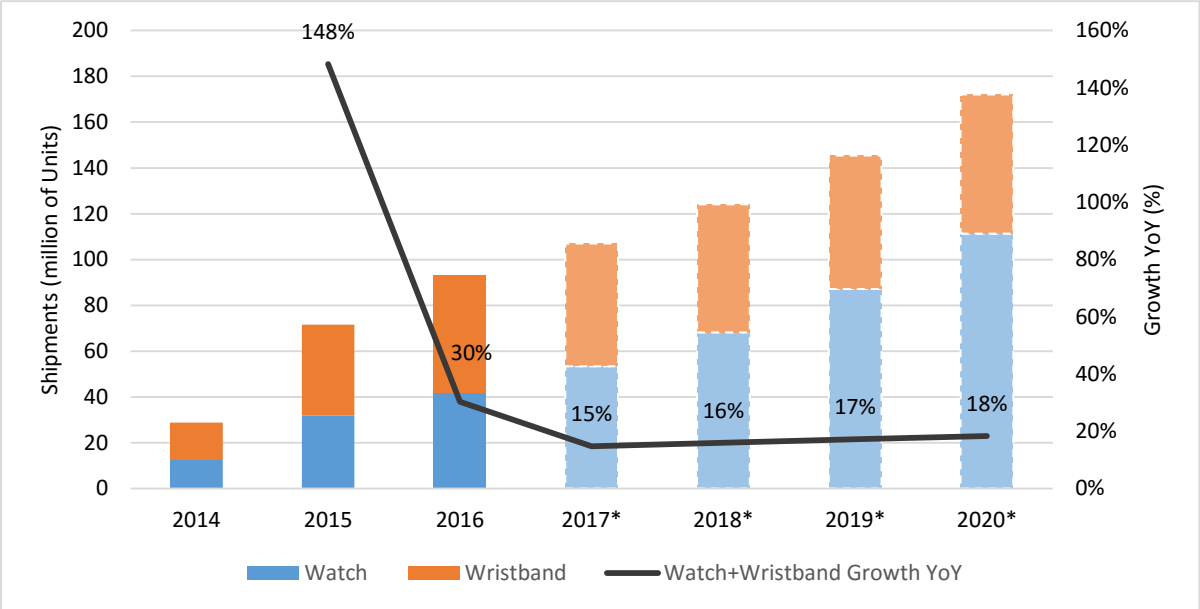
IDC's forecasts refer that the wearables market will experience a CAGR of 20,3%, reaching 213.6 million units shipped by 2020 (**Table 3**). Looking into segments, Watch + Wristbands will continue to grow popularity, though losing share within the market and giving space to the growth of other wearables – particularly Eyewear that is expected to deliver new capabilities and experiences accompanied by a CAGR or 201,2%.

Though smartwatches are expected to grow at a lower CAGR (16,5%) than total wearables category, they are foreseen to reach 172.1 million shipped devices by 2020. This growth will

be particularly driven by Watches – which are expected to increase from 41% share to 52,1% of total wearables shipments in 2020 (**Table 3** and **Figure 5**) – but not from all watches. According to IDC, future growth will come from basic watches that provide some sort of fitness/sleep tracking with no need for further sophistication in terms of third party applications. Also, Counterpoint Technology Market Research (2017) estimates hybrids to grow 77%, by 2017, taking the penetration to 12% of the total smartwatch category in volume. Hence, this type of development in the market will be mainly compelled by luxury/designer brands (such as Fossil) and health/fitness companies (like Fitbit).

On the other hand, Wristbands that once dominated the market, are expected to lose share in the segment, from 51,4% to an expected 28,5% by 2020, as well as a CAGR of 4,3%, reaching 60.8 million devices sold in 2020 (**Table 3** and **Figure 5**). IDC expects this segment to be driven by low cost vendors like Xiaomi and giants like Fitbit, though its dominance is being challenged by watches as many vendors become incorporating basic fitness features into their products.

Figure 5 - Smartwatch (Watch+Wristband) Shipments and Forecast until 2020



Source: Adapted from IDC Worldwide Quarterly Wearable Device Tracker

*Forecast Values

To sum up, considering the forecasted volume for 2020 of smartwatches (disregarding wristbands) of 113.3 million units, and that the annual sales of total wristwatches remain at around 1.2 billion, it is estimated that by that year smartwatches value about 9,2% of the wristwatch market vs. the actual 3.5%.

2.2.3. Smartwatches Market in Portugal

In Portugal, in 2015, were sold 117.000 wearable devices, from which 70% were wristbands, growing at 256% vs. YA, and the remaining 30% were smartwatches, growing 334% vs. 2014.

According to IDC's European Research Director Francisco Jerónimo (2016), "the Portuguese wearables market is still very incipient" as wearables sales in 2015 have only represented about 4% of total smartphones sales. These low values can be explained by the limited portfolio offer as well as consumer unawareness of these devices features.

The same institute also forecasts an increase of the market value by 2016 – predicting wearable sales in Portugal should reach 170.000 units, about 46% growth vs. 2015. And despite smartwatches' low share vs. wristbands, IDC estimates a huge potential on this segment of about 68% growth vs. 2015. According to them, Apple was estimated to become market leader in Portugal by 2016, with 24% market share.

CHAPTER 3 – METHODOLOGY

3.1. Research Approach and Design

There are three most often referred research approaches in the research methods' literatures, classified as: exploratory, descriptive and explanatory (Saunders, Lewis, & Thornhil, 2009).

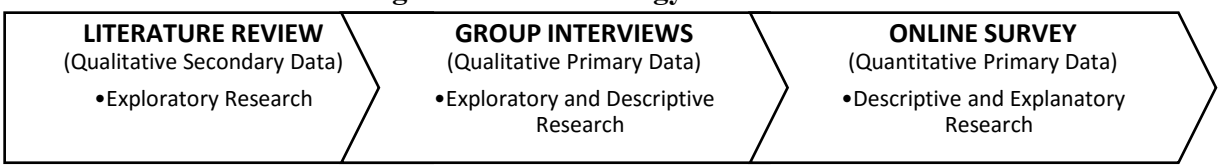
The exploratory research aims at finding new ideas and perceptions regarding a phenomena, providing a better comprehension of the topic. It is characterized by its flexibility and versatility, since it doesn't require formal research procedures or protocol, and it is often the starting point of the entire research conception (Malhotra, 2006). According to Saunders et al. (2009) the main ways of conducting this type of research comprise the search of literature, interviews to experts in the subject and conduction of focus groups.

Descriptive research's main goal is to describe something – usually, characteristics or functions of a market. Unlike the exploratory, the descriptive research is defined by a clear formulation of the problem, as well as specific hypothesis and the need of detailed information. It is usually adopted for market studies that describe the market size, consumer profile and purchase power, as well as sales analysis studies, image studies, etc. (Malhotra, 2006). This kind of study can be an extension of, or a precursor to, a part of exploratory research (Saunders et al., 2009), and entails the use of secondary data, panels and observational data (Malhotra, 2006).

Lastly, the explanatory research is used to determine cause-effect relationship evidences, by manipulating variables through experiments. Hence, just as the descriptive, the explanatory research entails a planned and structured conception (Malhotra, 2006).

Since this research aims at studying the actual context of smartwatches in the Portuguese market, as well as its expected evolution which, logically, complies with some level of uncertainty, the three purposes were applied: the exploratory research, the descriptive research and the explanatory research. Furthermore, in order to comply with the each of the referred purposes, the following methods were used: Literature Review, Group Interviews and Online Survey.

Figure 6 - Methodology Framework



3.1.1. Literature Review: Exploratory Research

The literature review was used as a preliminary search to help generate and refine research ideas, as well as critically review the topic (Saunders et al., 2009).

The collection of this data comprised two central topics – on one hand, a theoretical framework on innovation, and on another hand, general and detailed information regarding the wearables (most specifically smartwatches) market. This information was collected from published data, such as various authors' academic articles from respectable journals, and online published data, used to complement and better understand the previously approached authors.

3.1.2. Group Interviews: Exploratory and Descriptive Research

Afterwards, a non-standardised one-to-many group interview was conducted. This methodology was selected since it allows the opportunity to probe answers from interviewees, enabling discussions into areas that may have not been previously considered but that are significant for the research understanding, and that help addressing the research questions and objectives (Saunders et al., 2009).

Thus, two group interviews were conducted with two different groups of people: one composed by three smartwatch owners, and another composed by four smartwatch non-owners. Both were demographically heterogenic groups, comprised by both genders, different ages and by both satisfied/aspiring smartwatch owners and well as unsatisfied/non-aspiring smartwatch owners.

Both interviews followed a similar structure, consisting of a first introductory part aiming at describing each participants' profile, followed by a section focused on the decision-process as it follows: (1) identification of the need; (2) gathering of information; (3) identifying alternatives; (4) weighting evidences, based on the determinants of intention and behaviour described by Venkatesh et al. (2003); (5) taking action; (6) reviewing the decision – The complete interview script as well as a summary of main conclusions taken from them can be found on **Appendix IV**. Furthermore, the main conclusions on this part of the research will be later discussed in Chapter 4.

3.1.3. Online Survey: Descriptive and Explanatory Research

From the literature review and the semi-structured group interviews, arose the structured questionnaire which was deployed via the online platform Qualtrics. The advantages of this online data collection relies on its agility – allowing the respondents to participate at the convenience of their desired time and place – and rapidity of answers. However, it entails as well some limitations, as the non-representativeness of all the population, and the difficulty in verifying if participants are actually answering correctly to the survey (Malhotra, 2006). The

quantitative research was conveyed by applying the research instruments that will be described below.

3.1.3.1.Population of the Study

Population is defined by Malhotra (1999) as the aggregate of all the elements that share various common set of characteristics, comprising the universe for the purpose of the research problem. Thus, the population of this research comprises all Portuguese individuals, of both genders, and of all ages, that either own or not a smartwatch.

3.1.3.2.Sample of the Study

Malhotra (1999) describes sample as the subgroup of the elements of the population selected to participate in a study. According to Saunders et al. (2009), for a ten million people population (the total rough population of Portugal) and a confidence level of 95%, sample should be around 384 participants. Thus, for this study, due to financial and time constrains, a non-probabilistic convenience sample was used, aimed at a minimum of 350 respondents.

3.1.3.3.The Survey

As previously stated, an online self-administered questionnaire, designed and distributed through Qualtrics platform, was selected as method for data collection. The main reasons behind this decision rely on financial and time constraints, but also on the benefits it allows, such as design efficacy, easiness of diffusion and data extraction. A pre-test was conducted before the launch of the final questionnaire, in order to identify and eliminate any potential problems (Malhotra, 2006). The survey was then launched from the 21st of June, 2017 until the 4th of July, 2017, and was distributed across social network platforms (Facebook and Linkedin) and by e-mail.

The questionnaire was composed by eight sections. The first comprised questions designed to appraise respondents' unaided perceptions and knowledge about smartwatches. After this, participants were exposed to a short definition of smartwatch and a summary of main existing segments in the market and its respective characteristics. Based on this, were asked to estimate the average price of each segment smartwatch. On the third section, the real average price was presented to participants, followed by a series of questions on their perceptions about the product and price. The fourth section was composed by a filter question that split the sample into two groups (the smartwatch owners and the non-owners).

From this point beyond, survey flow split into section five (only aimed at smartwatch owners) and section six (aimed at non-owners). Section five (owners), was designed to understand all the steps in the decision-making process, such as the smartwatch brand, search of information,

desired and actual context of use, desired and actually used features, critical decision factors, as well as a subsection composed by Likert scaled questions aimed at evaluating Venkatesh's constructs of performance expectancy, effort expectancy, social influence and facilitating conditions. Section six (non-owners) intended to understand respondents smartwatch purchase intentions, as well as a subsection similar to the one used on section six, used to comprehend the same Venkatesh's constructs and how they affect consumer purchase intentions, from the point of view of a non-owner.

Finally, the seventh section is aimed again at all respondents and is designed to evaluate participants' perceptions on the main problems they find in smartwatches (price, features, design, value, none). And lastly, section eight provides the definition of respondent's profile based on socio-demographic questions. The detailed questionnaire can be found on **Appendix V**.

3.1.3.4. The Measures

The measures considered and analysed in this research were based on constructs developed in previous studies and past literature, afterwards adapted to fit this study.

Hence, two multi-item scales were used: one adapted from Venkatesh et al. (2003), measuring the determinants of intention and behaviour; and another adapted from Rogers (1962), to measure the adopters categories, in particular, to distinguish early adopters from later adopters.

Regarding the adopter categories scale, Rogers (1962) summarizes the immense research literature about variables related to innovativeness in a total of 27 generalizations that distinguish Early Market adopters from Mainstream (or Late) Market adopters. And from these 27 generalizations (**Appendix VI**), in this dissertation, we will focus on the 13 ones that comply with two conditions: 1) Having a considerable number of research studies on the generalization (≥ 20 supporting studies); 2) Most of the research studies must be supporting the generalization ($\geq$70% of research studies supporting the generalization). Thus, the refined generalizations that describe the Early Adopters, and the respective used scale, can be found in **Appendix VI**.

Within these two previously mentioned scales, questions were measured using Likert rating scale, where participants indicated their degree of concordance or discordance with each statement of a series (Malhotra, 2006), on a five-point scale (1 – Strongly Disagree, 2 – Somewhat Disagree, 3 – Neither Agree, Neither Disagree, 4 – Somewhat Agree, 5 – Strongly Agree). The multi-item scales and respective constructs can be found on **Appendix VI.**

CHAPTER 4 – RESULT ANALYSIS

4.1. Qualitative Research – Interviews

As already mentioned, a series of two group interviews were conducted which main results can be found on **Appendix IV**. Nonetheless, there were some more relevant insights which will be highlighted in this section. Thus, from the group interviews, there were three main messages extracted that had not been hypothesised before and which served as important topics to be tested in the quantitative research. They were:

1) The negative impact of social influence on smartwatch users – As smartwatch users mentioned to sometimes feel stigmatized by some of their peers, in what regards the spent amount of money on the device. Carolina stated "People with whom I talked to, told me I was crazy to be willing to spend 800€ on this.", whereas Fernando stated "Sometimes if people comment it negatively, mostly on how much it cost, etc., I see it as an evidence of envy for it."
2) The problem in battery life – Since smartwatches derive from watches, which are timepieces with a considerable battery life, it revealed to be an inherent characteristic to technology difficult for both owners and potential smartwatch owners to accept in this category of devices. Thus, for some of the interviewees, longer battery life was expressed as a crucial feature to take into account, as mentioned by João (ex-owner) "While they don't fix the battery for lasting at least 2 weeks, I won't buy it. And if it was be possible to charge it wirelessly, it would be perfect!".
3) The value perception of non-owners – As many of them don't seem to perceive an added-value on smartwatches vs. their smartphone. In reality, some of the interviewees agreed on the fact that they didn't want to become too attached to technology on their wrist, for the constant attention to notifications it implies. Ana mentioned "A watch is to see what time it is, and for all the rest I use my cell phone", whereas Mafalda referred "I wouldn't like to be having lunch right now and receiving e-mails on my wrist".

4.2. Quantitative Research

4.2.1. Preliminary Analysis

4.2.1.1. Data Collection and Analysis

The online survey was distributed and available online from 21st of June, 2017 until the 4th of July, 2017, collecting a sample of 326 respondents. Across the survey, a set of three control questions were used in order to avoid response bias and filter honest respondents. Thus, after

excluding all the respondents who didn't pass the control tests, only 258 were considered valid and used for analysis of this study.

In order to gather insights and understand this research's problem statement, the collected data was then analysed with the statistical software IBM SPSS Statistics 22.

4.2.1.2. Sample Characterization

In order to accurately portray the profile of the respondents of this study, a set of socio-demographic questions were made, leading to the following sample characterization:

From the 258 analysed individuals, 46,1% are men and 53,9% are women. Regarding age, the largest answering group is aged between [18-24] years old (45%), followed by [45-54] y.o. (20,9%). In what regards occupation, the majority sample is composed by employed people (57,4%), followed by students (26%). Concerning academic qualifications, half of the respondents stated they have obtained a Bachelor degree (50%), followed by 24,4% who have attained a High School degree and 24% who have a Master degree. If we look into marital status, 56,6% of the respondents are single and 38,8% married or living with partner. Regarding household size and income, 31% of respondents' household is composed by four people, followed by 24% composed by three people, and the majority of the sample (51,9%) has a monthly net income of [1001€-3000€]. Moreover, from this sample only 13,2% own a smartwatch.

Since a crucial part of this research implied the distinction of two different adopter categories – the Early Market Adopters and the Mainstream Market Adopters –, a K-Mean Cluster Analysis was done in order to extract these two categories of adopters. This analysis took as base the variables described and acknowledged previously in the literature – **Appendix VI**, **Table 10**.

Thus, two clusters emerged – one (C1) composed by 113 cases and another (C2) composed by 145 cases. After analysing the final cluster centers (**Appendix VII - Table 11**) and each cluster's means (**Appendix VII** – **Table 14)**, it was possible to understand that C2 exhibited a clear Early Adopter profile, according to Rogers (1962), with higher levels of agreement on all considered variables: "first buying innovation" (μ_{C2}=3,23 vs. μ_{C1}=1,68) ; "entrepreneurial spirit" (μ_{C2}=4,10 vs. μ_{C1}=3,01) ; "comfortable with change" (μ_{C2}=4,38 vs. μ_{C1}=3,63) ; "comfortable with uncertainty" (μ_{C2}=3,49 vs. μ_{C1}=2,65); "faith over science (reverse scale)" (μ_{C2}=1,92 vs. μ_{C1}=2,42); "leadership aspiration" (μ_{C2}=4,18 vs. μ_{C1}=2,96); "money aspiration" (μ_{C2}=4,15 vs. μ_{C1}=3,19);"high education aspiration" (μ_{C2}=4,37 vs. μ_{C1}=3,63); "people

networks" (μ_{C2}=4,39 vs. μ_{C1}=3,90); "travel" (μ_{C2}=3,94 vs. μ_{C1}=2,82); "innovation awareness" (μ_{C2}=4,05 vs. μ_{C1}=2,72); "recommendation to friends" (μ_{C2}=3,61 vs. μ_{C1}=1,86); "highest academic qualification" (μ_{C2}=3,21 vs. μ_{C1}=2,79).

Hence, cluster C2 was considered the Early Market Adopter (EMA) cluster, with 56,2% of the sample included in it, and cluster C1 the Mainstream Market Adopters (MMA) with 43,7% of respondents. Except for the variable "Education importance" that exhibited a sig.=0.709, all variables used to define the clusters revealed to be statistically significant (**Appendix VII - Table 13)** with sig. = 0.000 < 0.05, which validates the model and supports the relevant existing differences between groups.

Afterwards, Crosstabs and Chi-Square Tests for Independence were ran, in order to characterize the research sample by distinguishing adopter categories. From this analysis, it is notable how some moderators are statistically significant for the definition of each profile, such as: gender, (asympt. sig.=0.000 < 0.05), with 70,6% of men being EMA and only 43,9% of women representing the same adopter category; highest academic qualification, (asympt sig.= 0.000 < 0.05), with 53,5% of Bachelor degree and 79% of Master degree respondents being EMA, and 61,9% of High-School degree respondents being MMA; people living in household (asympt. sig.=0.002 < 0.05), exhibiting that the less individuals live in the household, the more respondents' answers resemble the EMA profile (ex.: 82,5% of single living respondents are EMA, and 75% of the families > 5 people represent and MMA profile); household's disposable income (asympt. sig =0.034 < 0.05), demonstrating that the higher the income, the more the individuals belong to the EMA category (ex.: 80% of households with a monthly income above 5000€ are EMA, whereas 60% of households earning bellow 500€ are MMA); all the remaining socio-demographic variables revealed to be independent from adopter categories.

4.2.1.4. Data Reliability

Reliability means that a measure should consistently reflect the construct that it is measuring (Field, 2005). Thus, in order to determine data reliability, the Cronbach Alpha test was applied, but not without first taking into account the items with a reverse scale, that were reversed before applying the test.

Table 6 - Data Reliability Test

Construct	Type of Respondent	Initial Number of Items	Cronbach's Alpha	Alpha if item deleted	Item Deleted	Final No of items
Performance Expectancy	Owner	2	**0.877**	-	-	-
	Non Owner	2	**0.860**	-	-	-
Effort Expectancy	Owner	3	0.644	**0.678**	1	2
	Non Owner	3	0.629	**0.657**	1	2
Social Influence	Owner	5	0.743	**0.845**	2	3
	Non Owner	7	0.708	**0.793**	1	6
Facilitating Conditions	Owner	3	0.205	**0.401**	1	2
	Non Owner	3	0.421	**0.439**	1	2

As mentioned before, the four scales were applied in two different moments to each respondent type – the smartwatch owners and non-owners – and so, the Cronbach Reliability test was then applied for all the scales and two different respondent types. Moreover, some adjustment were made by deleting items in some constructs in order to enhance their *alpha* – **Table 6**.

Thus – and according to DeVellis (1991), that considers Cronbach's Alpha coefficient: below 0.60 as unacceptable; between 0.65 and 0.70 as minimally acceptable; between 0.70 and 0.80 as good; and finally, above 0.80 as very good –, it is possible to conclude that Performance Expectancy and Social Influence (in both respondent types) are constructs with a very good internal consistency – with *alphas* above 0.793 – whereas Effort Expectancy exhibits the minimally acceptable reliability – 0.678 and 0.657 – and lastly, Facilitating Conditions reveal totally unacceptable coefficients – 0.401 and 0.439.

4.2.1.5. Principal Component Analysis (PCA)

In order to assess the dimensionality of the used scales, a Principal Component Analysis (PCA) was performed. According to Field (2005), this analysis is concerned with establishing which linear components exist within the data and how a particular variable might contribute to that component. However, as PCA's reliability is dependent on sample size, it is important to consider this criteria. Comrey and Lee (1992) suggest a class of 300 as a good sample size, 100 as poor and 1000 as excellent, whereas Nunnally (1978) recommended having 10 times as many participants as variables. Taking this into account, and considering two scales were applied to two different samples – smartwatch owners and non-owners – it is possible to conclude that reliability levels for the PCA to the *smartwatch owners* sample of 34 respondents might not be as reliable as the PCA to the *smartwatch non-owners* sample of 224 respondents.

Therefore, the PCA was ran for both samples (owner and non-owners), taking only into account the reliable items derived from the Cronbach Alpha test.

Smartwatch Owners Scale

Within the *smartwatch owners* sample, the PCA analysis revealed the existence of four components with *Eigenvalues* higher than one, that explained 82,28% of the total variance (**Appendix VII, Table 16**). Thus, the number of components matched the number of constructs we were taking into account. When looking into the Rotated Component Matrix (**Appendix VII, Table 17)**, we see that all variables correlated highly with the respective factor component it was defined previously, except for "system compatibility with my lifestyle" that should have a higher correlation with Facilitating Conditions than Effort Expectancy. This, also explains the previous results on the Cronbach's alpha test on the low reliability for this construct.

The KMO Measure of Sampling Adequacy confirmed that the reliability for this sample wasn't indeed perfect. Thus, with a score of 0.577 on the KMO, sample adequacy revealed to be normal – according to Hutcheson and Sofroniou (1999) that considered KMO values: between 0.5 and 0.7 as normal; between 0.7 and 0.8 as good; between 0.8 and 0.9 as great; and all values above 0.9 as superb. Moreover, when considering the Bartlett's Test of Sphericity, it revealed a sig. of 0.000 < p-value = 0.05, certifying that the factorability of the correlation matrix is suitable – see **Appendix VII, Table 15**.

Smartwatch Non-Owners Scale

When looking into the *smartwatch non-owners* sample, the PCA analysis exhibits three components with *Eigenvalues* higher than one, that explain 56,82% of the total variance (**Appendix VII**, **Table 19**). In this case, the Rotated Component Matrix (**Appendix VII, Table 20**) exhibits that the items related with Social Influence and Effort Expectancy are all respectively correlated with each factor. However, there is only another factor that aggregated the items related with both Performance Expectancy and Facilitating Conditions – meaning this two constructs aren't significantly distinct from each other to this sample of respondents.

This sample scored 0.716 on the KMO test, confirming its good adequacy. Furthermore, the Bartlett's Test also revealed the factorability of the correlation matrix as suitable, with a sig. = 0.000, above p-value = 0.05 – see **Appendix VII, Table 18**.

In conclusion, from the PCA, factor scores were extracted and saved as variables in the form of regressions, with the coefficients exhibited on **Appendix VII, Table 17** and **Table 20.** From

this point on, we considered for further analysis the following constructs as determinants for behaviour and intention:

- **Smartwatch Owners sample**: Performance Expectancy; Effort Expectancy; Social Influence; Facilitating Conditions.
- **Smartwatch Non-Owners sample**: Performance Expectancy; Effort Expectancy; Social Influence; (withdrawing Facilitating Conditions as a non-significant construct for this sample, and considering its items within Performance Expectancy factor).

4.2.2. In-depth Analysis

In the following section, research questions will be statistically tested, by analysing the survey results and combining them with key insights collected both in the literature review and group interviews.

RQ1: What type of innovation are smartwatches?

Backed on the concept of disruptive innovation by Bower & Christensen (1995) and Nagy et al. (2006), which is the starting point for the further development of the main defended concepts throughout this research – such as the TALC and Chasm –, it is important to understand whether consumers consider this product as a discontinuous innovation – meaning, an innovation with a radical functionality vs. similar to other existing products in the market.

By analysing the questions on a Likert-scale (1- Strongly Disagree and 5 – Strongly Agree) "Smartwatches imply a radical change in consumer behaviour vs. *regular wristwatches*" and "Smartwatches imply a radical change in consumer behaviour vs. *smartphones*", we realize the following results: $\mu_{wristwatches}$= 3,17 with a negative skewness of -0.166; $\mu_{smartphones}$= 2,58 with a positive skewness of 0.185. Thus, this means for respondents, a smartwatch when compared to a smartphone is not considered as disruptive, whereas when compared to a regular wristwatch the opposite happens, rather being considered as discontinuous innovation. Hence, for this devices the TALC becomes a key model to take into consideration when forecasting the future.

RQ2: At what stage of the product lifecycle are smartwatches at?

To take conclusions for this research questions, we should start by understanding how many smartwatch owners are there in Portugal. It is important to acknowledge the fact that the survey sample may be biased and not representative of Portuguese consumers. Nonetheless, if we take it as good data, results indicate that about 13.2% of the sample owns a smartwatch, from which 70.6% exhibited an Early Market Adopter profile (sig=0.007<0.05). Thus, taking into account many of the authors who described the TALC Model and who defended that the Early Market

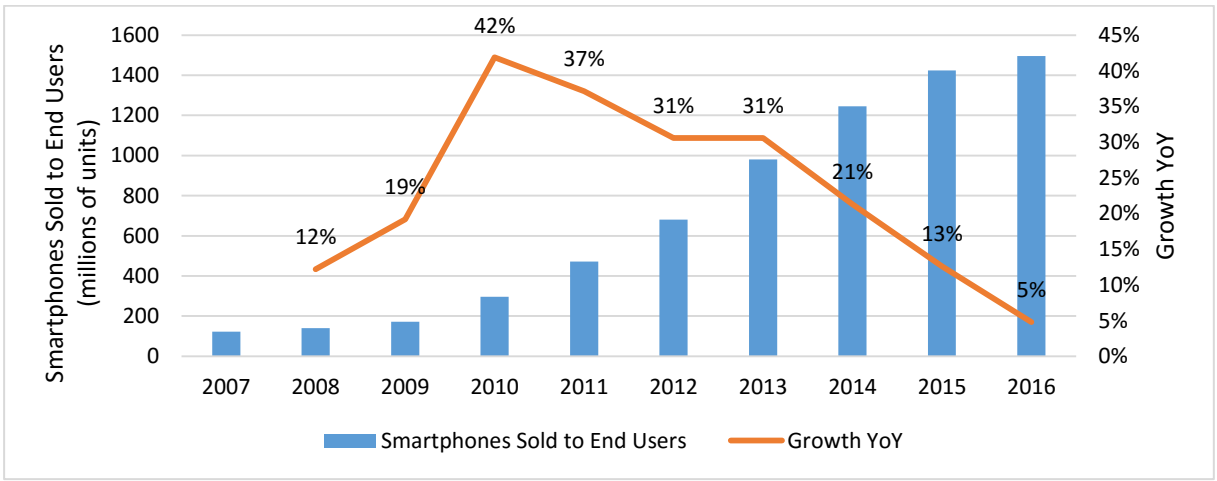
(Innovators and Early Adopters) was composed by 16% of the initial market, it is possible to assume from the sample that smartwatches are still in the Early Market stage – assuming the total population would be the target.

However, there is consequent question to this, which is: *How is the category going to evolve globally? And in Portugal?*

Looking into the global market, and considering the forecasted CAGR by IDC until 2020, that projects the category to reach 113.3 million units shipped, by then representing 9.2% of the total wristwatch market, we can conclude that in three years, by 2020, the global market will still be within the Early Market stage – assuming that smartwatches would achieve full market penetration when hitting 100% share of regular wristwatches.

Moreover, if we look at the smartphones' market evolution as comparison (see **Figure 7**), that we can now consider to have reached its maturity stage – with a forecasted CAGR of 3.8% over 2016-2021 (IDC, 2017) –, it is notable how the category in the first years was growing at very low levels, and how from 2009 to 2010 has rocketed. If we take 2016 as the total potential market volume, in 2009 volume goes from 12% of total to 20% in 2010, meaning this was the point at where smartphones successfully *crossed the chasm*, by passing the 16% mark that separates the Early Market from the Mainstream Market.

Figure 7 - Smartphone Worldwide Sales 2007 - 2016



Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Smartphones Sold to End Users	122,3	139,2	172,3	296,6	472,0	680,1	979,7	1244,7	1423,9	1495,6
Growth YoY		12%	19%	42%	37%	31%	31%	21%	13%	5%
% of 2016	8%	9%	**12%**	**20%**	32%	45%	66%	83%	95%	100%

Source: Statista, 2016

"CHASM"

Thus, whilst for the smartphones category, the *chasm* or *saddle* stage wasn't significant or nearly inexistent – since there wasn't any initial peak of sale followed by a depression, but rather a continuous progression of sales over time –, for smartwatches this seems to be the case. Since the launch of smartwatches, that 2015 revealed a high peak of sales (driven by the launch of the Apple Watch) that was then followed by a slump in the current and forecasted growth levels (see **Figure 5**).

Nonetheless, Goldenberg et al. (2002) defended an average saddle time of 5.1 years, which puts smartwatches within that timeframe so far, meaning there is still opportunity for smartwatches to rocket and gain the mainstream market. However, future is uncertain and even forecasts done from today in 3 years time can be questionable.

Hence, from my sensibility to the case, I would venture a guess on how the smartwatch category is currently within the *saddle stage*, with a period to build up on its substantial opportunities to improve either the product itself or other marketing-mix variables that may be affecting the consumer consideration and adoption of the device.

In what regards Portugal's status, it becomes considerably more difficult to retrieve conclusions, as the secondary data possible to collect is somewhat incipient when compared to global data. Nevertheless, exhibits lead into a similar direction of the global forecasted evolution of the category already mentioned.

Firstly, by looking into the forecasted evolution for the category by IDC, smartwatches were expected to have grown 46% in 2006 vs. 2015, thus a similar trend as the global one in the same year.

And later, in the survey, when trying to understand at what stage of the decision process respondents were, it was possible to understand that 44.6% are at the 1st one – Knowledge – meaning they are aware of its existence, but haven't got an opinion or attitude about it, whereas 31,4% are the following stage – Persuasion – meaning they have already formed an opinion or attitude about it, but have not taken any decision yet. Thus, this base of respondents at this two stages represent 76% of net potential adopters for the category – virtually the 84% who represent the mainstream market according to the TALC.

In conclusion, aligned with the projections for the evolution of the global smartwatch market, I would say that also in Portugal, the category is currently at the *chasm* phase, anticipating the cross for the mainstream market in about 5 to 6 years now. Thus, leveraging the opportunity of

this timeframe to further enhance the product and its strategies – mainly at a global context, but logically not disregarding local demands. These strategies will be later discussed on the Conclusions chapter.

RQ3: Which drivers better explain consumer purchase intention of smartwatches?

To learn which drivers better explain consumer purchase intention of smartwatches for non-smartwatch owners ("I would like to own a smartwatch" on a likert-scale of 5 points), a Multiple Linear Regression was ran, taking into account the factors based in Venkatesh et al. (2003) extracted previously.

The elicited model presented an Adjusted R^2 of 0.539 and a sig. of 0.01 < p-value, which means the model has explanatory power and the three factors account for 53,9% of the variation in purchase intention. The factors revealed to be significant: Social Influence (Standardized β = 0.239; sig. = 0.000); Performance Expectancy (Standardized β = 0.574; sig. = 0.000); Effort Expectancy (Standardized β = 0.398; sig. = 0.000). Thus, we can conclude that Performance Expectancy is the driver that most affect purchase intention, followed by Effort Expectancy and lastly Social Influence.

Smartwatch Purchase Intention *= 0.239*Social Influence + 0.574*Performance Expectancy + 0.0398*Effort Expectancy*

RQ4: Which drivers better explain consumer satisfaction with smartwatches?

In order to understand which drivers better explain satisfaction of actual smartwatches owners ("I'm happy with my smartwatch" on a likert-scale of 5 points), a Multiple Linear Regression was ran, taking into account the factors based in Venkatesh et al. (2003) extracted previously.

When considering the four factors – Social Influence , Performance Expectancy, Effort Expectancy and Facilitating Conditions –, it is notable how the model doesn't exhibit to be significant (sig. = 0.05). Thus, the two non-significant factors are removed, leaving only Performance Expectancy (Standardized β = 0.437; sig. = 0.005) and Effort Expectancy (Standardized β = 0.418; sig. = 0.007) which allows some enhancements in the model. Hence, with an Adjusted R^2 of 0.324 and a sig. of 0.01 < p-value, we conclude that the model has explanatory power and the two factors account for 32.1% of the variation in satisfaction, both with similar effect on consumer satisfaction.

Smartwatch Consumer Satisfaction *= 0.437*Performance Expectancy + 0.418*Effort Expectancy*

Moreover, if we look into the drivers respondents considered as more important in the moment of taking the decision, we realize Features (μ=4.56), Aspect (μ=4.29), Price (μ=4.26) and Battery life (μ=4.17) are the most relevant to take into account. As moderately important, we have Online Review (μ=3.77), Brand (μ=3,62) and Friend Review (μ=3.32), whereas the least important is the Store Assistant Review (μ=2.26).

By analysing the desired context of usage, it is notable how Daily-life and Fitness & Wellness are the most appealing contexts for respondents, respectively 71% and 61%. When comparing it vs. actual context of usage, it is possible to understand that most of the respondents who desired to use smartwatches in different contexts – such as business or fashion –, would end up actually using it and/or for daily life context (between 33% to 40%). The second most common use of those who desired to use it for daily-life was fitness/wellness (22%); and for those whose desired context to use was business, the second most common use revealed to be fashion (19%).

Looking into features, the most desired by respondents are: Fitness Monitoring (activity, steps, type of exercise, time) - about 65% of respondents: Answer/Make Calls (58%); Compatibility with phone (55%), though not necessarily the same brand as his phone (only 23% stated that feature as desired); O-clock (55%); and Send/Receive other type of messages such as Whastapp or Messenger (45%). Only 16% of respondents stated to desire wireless charging, probably because it is still a very recent technology, proving the insight retrieved from the qualitative interviews from João who stated "While they don't fix the battery for lasting at least 2 weeks, I won't buy it. And if it was be possible to charge it wirelessly, it would be perfect!", that this technology may still be very niche-oriented, though it can be considered for the future.

Another interesting insight on features comes from the fact that "Send/Receive SMS" was only desired by 39% of respondents, though it ended up actually used by 52% of them, whereas "Send/Receive other types of messages (Whatsapp, Messenger, etc." went from 45% who desired it to 41% who actually use it. Also, features of "Adventure (barometer, altimeter)" went from 19% who desired to 3% who actually used. This proofs how sending/receiving SMSs may be an underappreciated feature and, in contrast, how Adventure features may be overvalued, though in the end not exploited by the consumer.

RQ5: What are the areas of development for smartwatches to meet consumers' needs?

To analyse this question, the approach taken includes the evaluation of perception, firstly by evaluating awareness of the category by the sample, followed by the evaluation of performance

by both groups of smartwatch owners and non-owners of the sample, finishing with the main problems identified by the sample.

- ***Awareness***

In terms of awareness, 83,3% of the sample strongly agreed to be aware of smartwatches, whereas 51,5% agreed[2] to have voluntarily searched for information about it, meaning there is a base of potential buyer within these 51,5% that could potentially be retargeted through digital marketing campaigns. And by being impacted continuously, leverage their awareness and grow willingness to purchase, then inducing trial.

After being exposed to information about smartwatches and the different existing segments (**Table 1**), we come to the conclusion that most of the people isn't fully aware of the category particularities. Exhibits show that 52,7% of respondents weren't aware of all existing segments and 60% weren't aware of all the possible features. This proves how communication is not being effectively done, leading to a general unawareness of the product's potentialities.

Looking into pricing perceptions, there is some disparity of opinions with 32,2% agreeing that the price is fair, 33,3% not agreeing with price fairness and 34,5% with no opinion. Moreover, before being exposed to price, for 43% of respondents smartwatches are very expensive comparing to regular wristwatches, whereas after being exposed to the price of the different segments, this number grows to 48,8%.

Regarding their expectations of the category towards the future, opinions diverge with 48,5% agreeing that these devices will be part of the future and 48,1% thinking they are a trend that eventually will disappear. Also, 39% thinks smartwatches will eventually replace regular wristwatches, meaning there is a positive expectation from consumers for the category's growth, which may lead to a higher propensity to adopt the device. On one side, related to a social pressure issue – if more people have it, the more others will follow –, but also because a category growth implies the fastest development of the product itself as well as a set of accessories or extensions related to it.

- ***Smartwatch Owners***

In general, smartwatch owners seem positive about their smartwatches – 76,5% stating to be happy with their smartwatch – and the performance of the features provided – 75,8% agreed that the features it offers are enough to them. Also, 61,8% agreed to be using all the features they were looking for, which were mainly: fitness monitoring; o'clock, compatibility w/

[2] Agree concerns both answers in the Likert-scale comprising "Somewhat Agree" and "Strongly Agree"

smartphone; answer calls; send/receive other types of messages (Whatsapp, Messenger, etc.). Moreover, 51,6% said to have been surprised by new features they didn't know, such as: fitness monitoring; answer calls; health monitoring (heart rate, sleeping hours); send/receive SMSs.

In terms of usage, most of the owners wear smartwatches on a daily basis (47,1%), followed by 20,6% who wear them 2-4 times a week. When comparing the usage of smartwatches with regular wristwatches, exhibits show only 6,3% have completely stopped wearing their regular wristwatches, and 29,4% state to wear them in special occasions.

In terms of recommendation, 47,1% somewhat agree to recommend it to friends but only 8,8% strongly agree to recommend it.

- ***Smartwatch Non-Owners***

From the sample of non-owners, 52,7% said they would like to have a smartwatch. From these, 46,2% would prefer an Apple, followed by 17,9% who prefers Samsung, 12,2% who don't know, 6,8% with higher preference for Fitbit and 5,1% for Xiaomi.

Contrary to the expected, about 77% of respondents agreed to like smartwatches design plus 10% who strongly agreed to like it (from these, 50% would like to have an Apple watch and 20% a Samsung). This proofs how Apple has a strong role in the market, by differentiating itself from competition through a design appreciated by a majority of people.

Moreover, 58,5% of non-owners agreed that it offered them enough features and in 62% of the cases, they would buy a smartwatch for fitness/wellness, in other 61% of the cases for daily-life and 39% of the cases for business.

- ***Problems***

The biggest problem found in smartwatches is its price, as for 42,1% of respondents it is too expensive. The second biggest problem is the perception of its value proposition, as 26,4% of respondents simply don't value the product. With lower importance, people find problems in design (12,9%) and features (7,2%). About 6,6% of respondents are totally satisfied, as they mention not to find any problem, including non-owners potential buyers – 87,5% of these are non-owners.

Looking into pricing, we see that in the Personal Assistance and Medical Devices segments that have the highest market price are also the ones with highest average WTP, though below the market price. Whereas Fitness/Wellness and Sports/Adventure have a lower average WTP but still within the market price – **Table 7**.

Table 7 - Average Market Price vs. Consumer Average WTP

Segment	Average Market Price	Willingness to Pay – Average	Willingness to Pay – Std. Deviation
Personal Assistance	400-1000€	210 €	124,1
Fitness/Wellness	**20-250€**	**103 €**	73,3
Sports/Adventure	**150-500€**	**136 €**	90,1
Medical/Health	250-400€	181 €	158,5

Deep diving into the value problem, 56,3% state that smartwatches don't add any value vs. smartphone, 44,8% prefer to keep using their regular wristwatches, 28,1% don't even wear regularly wristwatches and 26% don't want to become so dependent on technology.

In what regards design, for 57,4% state that smartwatches aren't so similar to regular wristwatches; 53,2% refer its bulkiness, 38,3% mention that it's not generally designed for women, 29,8% prefer analogical display and 25,5% would prefer to use a smartwatch designed by their favourite wristwatch brands.

In terms of features, 53,8% state low battery life (asking for a reasonable average of 9 days of battery life, σ=6,08), 38,5% refer it still presents many software bugs and for 26,9% they still lack in precision for fitness monitoring.

In conclusion, the main areas of improvement found in smartwatches are: 1) General unawareness of the product's potentialities (despite the high awareness of the category); 2) Low recommendation levels by smartwatch owners; 3) High price according to consumer's WTP, also related with a problem in the value proposition perception.

CHAPTER 5 - CONCLUSIONS

5.1. Summary of Conclusions

In conclusion,

- Smartwatches can be considered as a disruptive innovation, which imply a radical change in consumer behaviour in order to adopt it. Thus, being this one of the reasons why its adoption rate is still at very low levels.
- In Portugal, the category is currently at the *chasm* phase of the product life cycle, with a need of developing strategies to cross for the mainstream market in the shortest possible period of time. Estimates retrieved from this study predict this cross to be in about 5 to 6 years now.
- Performance Expectancy is the driver that most affect purchase intention, followed by Effort Expectancy and lastly Social Influence. This proofs the need to emphasize in the communication strategy such attributes "life improver", "life simplifier" as well as social proof claims.
- Looking into consumer satisfaction, Performance Expectancy and Effort Expectancy exhibit to be the drivers that most affect it. Here, the quantitative research disregards Social Influence as significant factor.
- The category presents high levels of awareness (83% are aware), despite consumers not being aware of its particularities (existing segments and offered features).
- In general expectation for the future of smartwatches are positive, with 49% thinking they will be the future (vs. 19% who don't agree, and 32% who don't know), and 39% assuming they will replace regular wristwatches eventually (vs. 26% who don't agree, and 35% who don't know).
- Owners are happy with their devices (77%) and with the features it offers (76%). A great percentage of them is wearing them daily (47%), but only 6,3% have stopped wearing their regular wristwatches. Moreover, recommendation rate is not as high as expected – 56% of owners who usually recommend it to friends – considering the high level of happy consumers.
- About a half of those who don't own a smartwatch would like to have one (53%), of which 46% would prefer an Apple. Also, perceptions regarding design are quite positive, contrary to expected, with 87% of respondents who agreed to generally like smartwatches design. About 60% of respondents are happy with the current features offered by smartwatch manufacturers and in most of the cases they would use it for fitness/wellness, daily-life or business.

- Price was stated as the biggest problem of smartwatches, for both owners and non-owners – for 42,1% is too expensive and for 49% is very expensive when compared to regular wristwatches. This might be because: 1) this sample has a lower willingness to pay even to regular wristwatches; 2) because they are not aware of the smartwatches value proposition, in terms of features.
- Looking into segments, Fitness/Wellness and Sport/Adventure average WTP was more consonant with actual market price than Personal Assistance and Medical/Health (that have higher market prices). Moreover, knowing that there is a similar desire by potential smartwatch buyers to own it for Fitness/Wellness (62%) and Daily-life (61%), this represents a high need for Personal Assistance smartwatches to develop strategies to convert potential buyers, that leverage the value proposition, though having in mind their pricing constraints.
- Value was the second biggest problem stated by respondents – 26,4% of respondents (all non-owners) simply don't value smartwatches –, most of them referring how it doesn't add any value vs. their smartphone and how they would prefer keep using their regular wristwatches. This raises two problems: one already mentioned – the value proposition communication –; and another one – design.
- Design was the third mentioned problem (by 12,9% of respondents), in particular its lack of similarity to regular wristwatches and its bulkiness. Also, a percentage of respondents mentioned how they would prefer to use a smartwatch designed by a wristwatch brands. This opens a route to the potential growth of the hybrids segment (expected to grow by 77% globally in 2027), which resolves all the above stated problem.
- Features were the least stated criteria at bring problems (7,2%). However, from these, more than half stated the low battery life as a problem and referring as a reasonable average, a battery life of 9 days.

5.2. Recommendation Plan

Taking in considerations Moore's (1991) insights on how to *cross the chasm*, it reveals as key for manufacturers to channel their efforts into a very specific niche market, where they can dominate.

In this case, it could be a niche oriented to fitness and wellness, which is the segment with higher potential for attracting new consumers (according to quantitative data), despite the contrary market forecasts that foresee a marginal decrease of wristbands in relation to watches in the next 3 years. This also provides an opportunity for the fitness context to develop within

watches rather than wristbands, thus allowing an easier way to up-sell to the personal assistance segment.

Another possible niche to explore could be the "tech-geeks". By enhancing some features, as battery life (which was mentioned as underdeveloped), manufacturers could leverage advantages of first-mover, leading vs. competition in this particular feature, and thus allowing an increment on its consumer positive perception and brand equity towards an expanded network of potential buyers.

Hybrids are another segment worthy to explore, considering the high percentage of consumers who don't find a compelling value proposition in smartwatches vs. their smartphone, by instead proposing to provide them an upgrade to their wristwatch. In this case, is a matter of frame of reference – where manufacturers should start by specifying to consumers parity points, in order to frame the products' context (wristwatch) and then point out its differentiating and beneficial aspects (connectivity, fitness monitoring, etc.).

On a later stage, after carefully defining the niche where to direct, manufacturers should focus their efforts in a clear and concise communication strategy based on conveying particular messages with specific attributes that currently aren't evident for consumers, such as: "life improver" or "life simplifier" and which are key to enlighten these devices main benefits.

Furthermore, there is also a need to reinforce the mentioned traditional communication strategy with social proof messages that mitigate the issues of the most worried consumers' minds. It is commonly known, how the decision process entails some degree of anxiety in people. Thus, to dispel that anxiety, people resort to heuristics that facilitate the decision-making. Social proof is one of them, that when leveraged in the company's marketing strategy works as a powerful technique to improve reputation, increase influence and consequently boost sales.

Thus, in order to meet with the Early Majority's needs (the first adopter category in the mainstream market), one must be patient. For this type of consumer, promotion is key, and earning a reputation might not be as easy as it seems for manufacturers, but it will be crucial. In the long-term and on a later stage, to move on to the Late Majority, manufacturers must take into account how much this consumers are into single-function products, instead of a single product with lots of functions (Moore, 1991), giving opportunity to take into low-cost, trailing-edge technology components.

In conclusion, this should be the steps to take according to Moore (1991) in order to gain the mainstream market and *cross the chasm* successfully: start by defining a niche; then, ensure the delivery of the whole product and services needed; capture a referenceable customer base through word-of-mouth that can be used as base for broader operations; and step by step achieve market leadership that will provide invaluable reliability for the mainstream consumers.

5.3. Limitations and Future Research

This dissertation has made an important contribution to the empirical evidence on the Portuguese consumer preferences towards smartwatches, as well as its current condition, expected developments and recommendations to future next-steps for smartwatch manufacturers. However, some limitations have arisen in this study.

The first concerns the sampling, on one hand in terms of quantity, since the sample size (N=323) didn't reach the aimed 350 respondents, defended by Saunders et al. (2009) as optimal to the respective population size. On the other hand, it was also limited in terms of quality, since the non-probabilistic convenience sample procedure used might not be representative of the population heterogeneity, skewing results and affecting its reliability.

The second limitation perceived regards the possible existence of a social desirability bias, that may have affected the validity of the survey's findings, particularly in the cluster analysis, when reaching the conclusion that more than half of the sample represents an Early Market Adopter profile (should only be about 16% of the sample, to be representative of the population).

Lastly, the country scope of this research might also have revealed to limit results, considering the constraints in accessing to reliable and updated secondary data on the Portuguese market.

Hence, with the aim of further developing the object of study, next researches should include assurance on the sample quality, by applying a more reliable sample collection method that may reach a more reliable base of respondents.

In line with sample reliability, further studies should also review the used scales in this research – such as Venkatesh et al. (2003)'s Determinants of Intention and Behaviour Scales, and Rogers (1962)'s Early Adopters Scales –, applying new or improved ones. On the case of Venkatesh et al. (2003)'s, future studies should have in consideration the four key moderators mentioned by the same author for these determinants (gender, age, experience and voluntariness of use), which weren't taken into account in this research.

Also, it could be interesting to empirically test specific insights with consumers, such as the ones proposed in the recommendations section, in order to confirm its validity in the market. Moreover, assess the evolution of the market status for the next 5 to 6 years, thus validating the projected evolution extrapolated from this research.

CHAPTER 6 – APPENDICES

APPENDIX I – Adopter Categories

Innovators

These group of people, also called "technology enthusiasts" or "techies", are classically the first to adopt any new technology. They are the ones who firstly acknowledge the product design and architecture and thus, its added-value over the existing solutions in the market. As enthusiasts with a great sense of venturesomeness, they are easy to do business with and play a fundamental role as gatekeepers for any new technology (Rogers, 1962; Moore, 1991).

Early Adopters

The Early Adopters are the following group to adopt innovation. These so called "visionaries" by Moore (1991) are not looking for an improvement, rather than looking for a fundamental breakthrough. They are considered a more integrated part of the social system, opposite to Innovators, by carrying the highest degree of opinion leadership among the rest of the adopters. This is why many potential adopters look for advice and information from these Early Adopters before buying new products. Hence, "visionaries" are the key endorsers for the diffusion of innovation (Rogers, 1962; Moore, 1991).

Early Majority

The Early Majority type of adopters represent "the bulk of the market volume for any technology product" (Moore, 1991). Their positioning between the very early adopters and the relatively late adopters, constitutes them as a crucial link in the diffusion process. These "pragmatists" are a type of consumer very hard to win, but very loyal once won. Their risk-aversion behaviour causes them to seriously consider a series of criteria before buying a product, like its quality, infrastructure of supporting, system interfaces, etc. Thus, these adopters will commonly prefer to buy from market leaders, that have already proven-results and that may leverage product extensions from further vendors (Rogers, 1962; Moore, 1091). However, there is a catch 22 that arises: "Pragmatists won't buy from you until you are established, yet you can't get established until they buy from you" (Moore, 1991).

Late Majority

The fourth group of adopters, and one of the largest – representing about one third of the market – are the Late Majority. Moore (1991) describes them as "conservatives" who, in essence, are against discontinuous innovations, believing far more in tradition than progress. Generally, they stick to the technology it fits them, and will only change either for an economic need or to respond to network pressures. This is why they usually only invest when the product is reaching the end of the life cycle as a commodity, and consequently sold at lower prices. Moreover, this conservative marketplace represents a great opportunity for reducing costs by offering single-function systems for particular needs, as these adopters are high enthusiasts of simplicity (Rogers, 1962; Moore, 1991).

Laggards

Laggards are the last group of adopters, also referred as "skeptics". This group does "not participate in the high-tech market, except to block purchases (Moore, 1991). They have virtually no opinion leadership and are the last to adopt an innovation. Commonly, these adopters have lower economic power, causing them to be extremely cautious in adopting innovation and thus, requiring a relatively high level of certainty towards a new idea before affording to buy it (Rogers, 1962).

APPENDIX II - History of Smartwatches

The first digital electronic wristwatch was launched back in 1972 by Pulsar. This LED prototype wrapped in 18-carat gold was sold for $2.100 (which adjusted to 2016 inflation, would value $12.300 today). Back then, this device represented a main revolution in the field of watches, defining the path for its smart successors (Pothitos, 2016).

Soon, more companies started to attempt introducing more features and content:

In the 80's, Seiko launched the Seiko TV Watch – that allowed to display time and black and white TV – and later, Seiko Data 2000 – that could store memos and calendar entries, and also act as a calculator (Lamkin, Smartwatch timeline: The devices that paved the way for the Apple Watch, 2015).

In the 90's emerged the first watch capable of downloading data from a computer wirelessly – the Timex Datalink, co-developed by Microsoft. This watch was even employed by NASA in various missions (Pothitos, 2016).

In the same decade, Seiko introduced the Seiko Message Watch – one of the most similar devices to the smartwatches we know today. Besides displaying caller IDs (using FM sideband frequencies), it also displayed updates on many subjects, such as sports, stock prices or weather forecast (Lamkin, Smartwatch timeline: The devices that paved the way for the Apple Watch, 2015).

By the end of the millennium, in 1999, Samsung launched the SPH-WP10 which main feature was the ability of making calls – incorporating a monochrome LCD screen and a capability of 90 minutes of talk time (Pothitos, 2016).

In 2004, Microsoft attempts the introduction of Microsoft SPOT Watch, by partnering up with some main high-end watch manufacturers, such as Fossil, Suunto, Swatch, and even Tissot. This watch that was backed by MSN Direct Network, enabled the reception of instant messages from Windows Messenger, as well as notifications on news, stocks, weather etc. However, it has soon revealed to be a flop as it was launched at a time when "the first generation of smartphones were just starting to gain traction amongst the general population" and thus, too niche-directed (Mentor, 2013).

A jump into this current decade and we witness the introduction of the first fitness-oriented smartwatch – the Nike+ FuelBand. It tracked the user's steps and exchanged them for Fuel Point along the day (Lamkin, Smartwatch timeline: The devices that paved the way for the Apple Watch, 2015).

In 2012, it arises The Pebble – which Gibbs (2017) refers to be "the second coming of the smartwatch, after Microsoft's SPOT system, and (…) arguably the most influential in the last 10 years". This smartwatch successfully raised $10 million on Kickstarter, showing all the major tech companies the real demand for this object in the current decade (Pothitos, 2016), and was ready for launch in 2013, being sold-out in just five days (Punchkick Interactive, 2015)

In 2013, Samsung "invades" the market with the Galaxy Gear and a year later, it is already established in the market with four smartwatch models (Gear, Gear 2, Gear 2 Neo, Gear Fit), mainly competing against Sony and LG (Edwards, 2015).

Nevertheless, the big boom of smartwatches happened in 2015, with the launch of Apple's iWatch in April of that year. According to Canalys (2015), a technology market analyst firm, in Q2 of 2015, "Apple became the world's leading vendor of wearable bands (…) with 4.2 million shipments". Thus, the most sophisticated smartwatch to date easily overtook Fitbit, Xiaomi and other vendors, despite its significantly higher price.

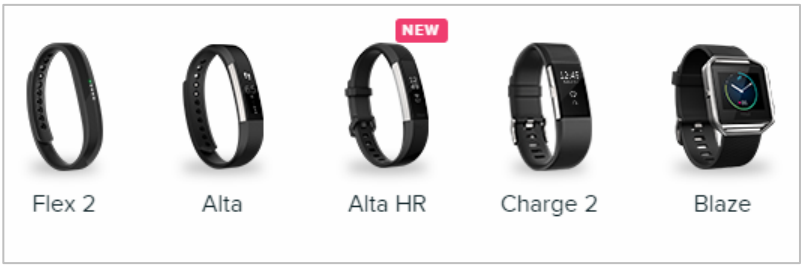
Since then, we have witnessed the evolution of this category much faster than ever before, with new launches of already existing players, as well as the entrance of new competitors in the market.

APPENDIX III – Main Players Detailed

- Fitbit

The market leader Fitbit is an American company that launched their first fitness tracker, by 2009, in the form of a clip attachable to anywhere in the user's body, shipping around 5.000 units on their first year. By 2013, they were then launching their first device in the format of a wristband – the Fitbit Flex – and since

then, for most people, the brand name even became synonym for the whole category, calling a fitness tracker by "Fitbit" even if not referring to the brand itself.



Currently, Fitbit's portfolio includes about five different wristbands, each with specific characteristics that differentiate them, priced from about 60€ until 290€[3]. From the Flex 2 (most suitable for swimmers), to the Surge (that with incorporated GPS is the best option for runners), whilst also offering Blaze (the most similar alternative to a smartwatch) or Alta HR (their most stylish yet simple tracker), Fitbit provides consumers with an extensive line of products designed to each profile's needs. And that's why since 2014, that Fitbit has consistently been winning market share and protect its leadership spot. By 2016, Fitbit has reached a 23% market share with 224 million devices shipped worldwide.

- Xiaomi

The Chinese company announced their first wristband in 2014 – the MiBand – a device that allowed to track fitness and sleep with a reported autonomy of 30 days. After this launch, by the first quarter of 2015, Xiaomi had already became the second largest player within the category, having shipped about 2.6 million units, and reaching 22,4% share, according to IDC.

Later in the beginning of 2016, Xiaomi announced an upgrade version of their first device – the MiBand 2 – with an enhanced pedometer algorithm and accuracy in heart tracking. In August of the same year, they launch the Amazafit – their first smartwatch, but still fitness-oriented – adding up to their regular wristband features such as a tactile screen, integrated GPS, and smartphone notifications.

Xiaomi's portfolio Goes from about 20€ (MiBand) until 170€ (Amazfit)[4], representing one the most affordable options for those who intend to enter this category. Still today, Xiaomi is the second largest player worldwide with 16% market share in 2016 and 15.9 million devices shipped in the same year.

- Apple

Apple launched the Apple Watch Series 1 back in 2015, and since then it has become the most popular smartwatch worldwide. The main characteristic of this device relies on its geometric design, with a rectangular display and changeable bracelets with different styles (some more classic, other sportier). It incorporates general features such as: make/receive calls, send/receive messages or e-mails, access to various apps (such as weather, news, maps, etc.), fitness and health tracking (accelerometer, heart rate monitor, sleep monitor), Wi-Fi and NFC connection, among others.

Later in 2016, Apple introduces the Apple Watch Series 2 – its most up-to-date smartwatch – very similar to the first series. There are however some extra features on this new version, such as: the integrated GPS; water resistant up to 50 meters; brighter display and consequent lower battery life; and of course a higher price (Series 1 – 379,99€ vs. Series 2 – 479,99€)[5]. With Series 2, Apple also offers two versions emerging from partnerships: a sporty version of the watch, partnered with Nike; and another high-end version with the fashion house Hermès. Moreover, it offers two possible sizes: 38 mm and a 42 mm.

[3] Prices checked at Fnac.pt website (30/06/2017).
[4] Prices checked at Fnac.pt website (30/06/2017).
[5] Price comparison of Apple Watch Series 1 (38mm) vs. Series 2 (38mm) at Fnac.pt website (28/06/2017).

The biggest limitation on Apple Watch might be its exclusive compatibility with iOS and incompatibility with Android. According to Graziano (2017), the loss of market share of Apple to other competitors, as Samsung or Garmin, might be on the constraint its operating system represents to the opportunity of a larger potential market. The author also defends that, just as other smartwatch manufacturers are working cross-platform devices, offering compatibility with both Android and iOS, Apple should consider this option – the same way in the Past they did, by expanding its opportunity with iTunes, by eventually bringing it to Windows.

Currently Apple is the third largest player in volume, having attained 9% market share in 2016, with their 9.7 million shipped devices. This growth was mainly felt by 4Q16, when the American company reached their highest ever shipped volume of about 4.6 million smartwatches. According to Canalys (2017) estimates, during this last quarter, Apple generated more than $2.6 billion in revenue, making up nearly 80% of total smartwatch revenue.

- Garmin

Garmin's first smartwatch as introduced back in 2003 – the Garmin Forerunner – that has been evolving into a large role of series until today. The truth is, Garmin must be one of the companies with the largest portfolio of smartwatches, with watches aimed at beginner runners to performance triathletes (Alger, 2017).

Garmin still today sells their Forerunner smartwatch: some entry level version as the 10, aimed at those who want to upgrade from their phone-based fitness app tracking, or the 35, more aimed at the lower end of the runners market; but also many other versions oriented differently at various sports or with different levels of features. Besides their entry-level watches, Garmin is also playing in the wristband segment with the Vivosmart HR+ and its successor Vivosmart 3, which represent great alternatives to regular smartwatches, starting at 180€[6]. Furthermore, Garmin also offers their high-end option – the Fenix 5 – which is one of their most powerful multisport watch (from hiking, to climbing, skiing, swimming, cycling), the Fenix 5 can virtually track all activities (despite underperforming in the running track), starting at 599€[4].

Aside from the companies broad product portfolio already described, Garmin has also entered the hybrids segment with the Vivomove watch – an analogue watch that enables users to count steps, estimate calorie burn and monitor sleep patterns, using a built-in accelerometer, within its one year battery lifetime. This watch is available in three options – classic, sport and premium – and starts at 169€[7].

Currently, Garmin is the fourth most shipped player with about 6% share and 5.9 million devices shipped in 2016.

- Samsung

Samsung's first smartwatch was launched in 2013 – the Samsung Galaxy Gear. This rectangular designed device ran on Android OS and was connected to the user's smartphone through Bluetooth. Additionally, it incorporated a tiny 1.9 megapixel camera on the strap that allowed to capture video. Later, in 2014, Samsung announces the Gear S, a pretty similar device to the previous one, adopting a curved AMOLED screen, now running on Tizen (a Linux open source operating system) and offering cellular connectivity so it could be used to make calls and send texts (Langley, 2016).

It was in October 2015, right after the Apple Watch release, that Samsung launched the Gear S2, its first circular smartwatch and most cheered by the public heretofore (Langley, 2016). This watch came in two

[6] Prices checked at Fnac.pt website (30/06/2017).
[7] Price checked at buy.garmin.com/pt (30/06/2017)

designs: the standard Gear S2 (stainless steel and plastic) and the upscale Gear S2 Classic (ridged bezel and leather strap). Its central feature is the rotating bezel, which besides granting it a more traditional wristwatch look, it also adds and intuitive and easy way of interacting with the system (Langley, 2016). So far, no other competitor had ever taken advantage of this feature. Furthermore, it includes the general features commonly found in most smartwatches: making and receiving calls or texts (only available in the 3G version), fitness monitoring (S Health[8], accelerometer, heart rate monitor, sleep monitor), access to apps (weather, calendar, alarm, music control, e-mail), among other.

In 2016, it arises the latest version of Samsung's smartwatch – the Gear S3 – that similarly to the previous version, it comes in two models: the Frontier (more sporty-looking) and the Classic – both version with changeable bracelets. Despite its wider display (46mm vs. 43 mm of the Gear S2), the Gear S3 still holds the circular design as well as the bezel so acclaimed in the previous launch. Moreover, this version comes with more RAM and battery life (up to 52% more), as well as in-built GPS. Most of the features weren't however updated, such as the water/dust resistance – it may be submerged in water up to 1.5m and no more than 30 minutes thus, not being a watch designed for water sports rather than surviving to a trip in the shower (Allison, 2017). The Gear S3 selling price starts at 339,99€ for the Classic, and 399,99€ for the Frontier (vs. Gear S2 at 259,99€)[9].

Despite Samsung's attempts of developing disruptive devices in the field of smartwatches by the large amount of patents filled so far, they seem more concerned with making a smartwatch that feels like a proper timepiece (Langley, 2016), at least by now. However, to Cheng (2016), size and bulkiness in Samsung's smartwatch design might still represent a problem. According to the company, the size is explained by both a technical need and a market trend – men, particularly early-adopters, are overwhelmingly buying more smartwatches than women – making the decision of designing a bigger watch more comfortable to take. Thereupon, women become more constrained of buying from Samsung. To Cheng (2016), the solution might be offering two sizes, just as Apple did (with the 38 mm. and the 42mm) and thus, providing more possibilities to potential consumers.

Currently Samsung holds the fifth position as player in the market, having a 5% market share in 2016, represented by 3.6 million units shipped the same year.

- Other Players: Luxury&Designer Brands & Hybrids

Regarding all other players, it is important to highlight luxury and designer brands that generally play in this market with hybrids. These devices allow the combination of the traditional analogue design – so particular of each classic/designer watch manufacturer – with simple smartwatch features that upgrade timeless pieces to today's reality. And brands such as Fossil Group, Tag Heuer or Citizen Group are betting on these new devices to win a share of the smartwatch pie, by leveraging their core competencies "design and craftsmanship" (Counterpoint Technology Market Research, 2017).

According to Counterpoint Research (2017), this segment represents already 7% of the total smartwatch category and is expected to grow 77%, by the end of 2017. The reason for this growth can be attributed to the two key pain points that traditional watchmakers are trying to address: 1) Aesthetics – by preserving its traditional design; 2) Battery life – by maximizing it, while still retaining meaningful smartwatch features (Counterpoint Technology Market Research, 2017).

The Fossil group reveals as a key player driving the growth of this segment, as in 2016 had already introduced 100 SKUs of wearables (including popular hybrid models like the Skagen Hagen Connected, Misfit Phase, Fossil Q series, Diesel, Michael Kors and Emporio Armani) and aim to launch 300 connected watch SKUs more (particularly hybrids), by the end of 2017.

Other brands playing in this segment are Tag Heur, Breitling and MontBlanc, clearly on a defensive strategy to the Swiss watch 10% declining sales in 2016, either with hybrids or smartwatches *per se*.

[8] S-Health – Samsung's health app, usually available on all the brand's smartphones.
[9] Prices checked at Fnac.pt website (30/06/2017).

To sum up, we are witnessing the growth of the hybrids segment, with numerous launches not only limited to traditional watchmakers or designer brands, but also technology brands like Samsung and Meizu who are also tapping into this potentially lucrative market, leading to a rise in collaborations between tech and luxury/designer brands (Singh, 2017).

APPENDIX IV – Interviews

- Group Interview Script

Participants:

- (A) Smartwatch Owners – person that owns or has ever owned a smartwatch
- (B) Smartwatch Non-Owners – person doesn't own a smartwatch

Respondent's Profile

- Introduce yourself – name, age, occupation, what have you studied
- What was the latest gadgets your bought?
- How long after being released?
- What led you to want to try that? (other people's influence, self-motivation)
- When did you last changes your mobile phone?
- Did you play Pokemon Go? For how long?
- (Dogmatism/Skepticism) Was there lately any trend that came out that you didn't enjoy so much? Which? Why?
- (Change, Uncertainty, Risk) What was the riskiest decision you have taken lately/in your life? Why?

Decision Process

(A) SMARTWATCH OWNERS

1. **Identify the Need**
- When have you realized you wanted a smartwatch?
- Why did you realized you wanted a smartwatch? What was your need?
- Where and how have you heard about smartwatches?

2. **Gather information**
   - What did you do next?
   - Where did you search for information? (online, friends, store)

3. **Identify Alternatives**
- What brands do you know?
- What brands/features have you considered?
- Were you in doubt between different alternatives?
- Was it straightforward?

4. **Weight Evidence**
- What criteria did you use to decide on which option to fall?
    - Performance Expectancy (increase user's job performance)
    - Effort Expectancy (degree of ease of use)
    - Social Influence (perception of importance to others)
    - Facilitating Conditions (organizational/technical infrastructure to support)

5. **Choose Among Alternatives**
- What major factor among these criteria made you take the decision?

6. **Take Action**
- Where did you buy?
- When did you boy?
- Were you with someone? Did this person help you in the decision?

- When you were buying was there something new (higher price than expected, new model available, store assistant influence) that might have made you change your mind?
- How long did it take since you identified your need until you took action?

7. Review Decision

- Finally, are you happy with the product you bought? Why?
    - Positive aspects
    - Negative aspects – what would you change?
- Now that you had the experience, how much do you think it is valued? Would you pay the same? How much?
- Did you end up using the product with the same purpose/features as firstly expected?
- Would you have bought another brand/product now that you have this?
- Did people realize you had it? What did they comment?
- Did they ask for your opinion/feedback/advice?
- Are you recommending it to your peers? Are people accepting it?
- Is there anything along you decision process that you would have changed?
- Considering this is a gadget constantly under development and potential to suffer upgrades, would you consider buying another smartwatch after this you just bought in the short/long-term? When?

(B) SMARTWATCH NON-OWNERS

1. Identify the Need

- Where and what have you heard about smartwatches?
- Have you realized you wanted a smartwatch? Why? What was your need?

2. Gather information

- Have you ever voluntarily searched about smartwatches? Why?
- Where did you search for information? (online, friends, store)

3. Identify Alternatives

- What brands do you know?
- What brand/feature have you considered?
- Were you in doubt between different alternatives?
- Was it straightforward?

4. Weight Evidence

- Have you ever considered buying one?
- What criteria did you use to decide on which option to fall?
    - Performance Expectancy (increase user's job performance)
    - Effort Expectancy (degree of ease of use)
    - Social Influence (perception of importance to others)
    - Facilitating Conditions (organizational/technical infrastructure to support)

5. Choose Among Alternatives

- What major factor among these criteria made you take the decision?
- If you were willing to buy a smartwatch, was there any alternative that better suited your needs? Why?

6. Take Action

- Why didn't you buy it?
- Are you planning on buying it soon?
- How long did it take since you identified your need until you realized you were not buying it?

7. Review Decision

- Finally, how do you feel for not having bought it? Why?
- What are for you the major failures on the product?
- What would you change?

- Group Interview Main Conclusions

(A) Smartwatch Owners

Description	Carolina	João	Fernando
Age	**26 y.o.**	**34 y.o.**	**28 y.o.**
Studies	**Civil Engineering**	**Mechanical Engineering**	**Business Administration**
Occupation	**Marketing**	**Sales**	**Sales**
New Gadgets	Lamp/Alarm Clock Kindle e-Book Smartwatch	Lamp/Alarm Clock Humidifier Smartwatch	Smartwatch Bike Odometer *"I'm in a moment of my life where I realized I have too much stuff, gadgets and etc. So I'm now very picky with what I'm buying"* *"But before I was buying very compulsively (…) and ended up no using that stuff for so long."*
Innovators		*"In general, I always buy stuff way before everybody else that I know. Also because I buy more weird or different thing."* *"In general, among my friends, I'm always the first in almost everything."*	*"Indeed, I realized that I had gadgets before other people."* *"For example, this watch I bought it without knowing other peers' opinion."* *"I trust in Internet reviews to buy my stuff, more than anything."*
Smartwatch	*Apple iWatch – 789€* *2 years to buy*	*FitBit – 250€* *1 month to buy*	*Garmin – 450€, (in promo 350€)* *3 weeks to buy*
1. Identify the Need	*"I'm a big fan of Apple. I like the innovation they bring and how they communicate them. (…) So in the end, if you're not in the online world, it's almost impossible not to realize these new launches"* *"In the beginning, [the smartwatch] it was something that seemed interesting to me but at the same time, not applied to my reality and daily life. But I had a big desire to have it, in the end for me to understand how to use it."*	*"Because I wanted to have more control on how it is my body, in terms of heartbeat, how many hours of sleep, etc."* *"I had bought a smartwatch first, that I lost on the gym, so I decided to buy a new one with better features"*	*"I had it clear, that I wanted a watch with the outdoors theme, that allowed me to do sports, ride the bicycle, go to the mountain (…) that had it all integrated."*
2. Gather Information	*"The more I read reviews or information about it, it was not the same as having it and living the experience."*	*"I don't like talking to store assistants about a product. Because they don't know so much about products, and sometimes they even say false stuff."* *"Read everything, the good and the bad, that people are writing in Amazon"*	*"I checked it all in the Internet, not only reading, but for me it is very important to watch videos online"*
3. Identify Alternatives	*"I liked it because of the brand and also due to the esthetical element. Unfortunately, most of the*		*"With the requirements I had, there were two possibilities: this Garmin and another one Suunto*

	smartwatches are still very masculine, and with iWatch I have the possibility to choose a smaller or a bigger screen (being the smaller, much more feminine). And also, you have the option of choosing different bracelet types, some less masculine.		
4. Weight Evidence	*"I was always postponing the purchase, since there was always some trip that came up that could be much more interesting than spending this money on a watch. I think it took more a less 2 year, since its launch until I finally bought it"* *"People with whom I talked to, told me I was crazy to be willing to spend 800€ on this. (…) They told me it was useless, I wouldn't take advantage of it, that I would use it for 3 days and leave it."*	*"I usually don't get scared in trying new things as I'm the type of person who always read the whole instruction manual, so I learn about the product very easily and extensively."*	*"For me is important the fact that it is connected to my mobile phone, because my personal mobile is usually in silence mode. And this way, if I get a call, I see it on my watch and if it is important I decide to whether take it or not."*
5. Choose Among Alternatives	*"I went to a store to see it physically, but I already knew I wanted this. It was just a matter of seeing it real, deciding on the bracelet and screen size, feel it on the wrist…. But then I realized my choice was falling into one of the most expensive combinations, reason why I had to postpone the decision of buying it"*		*"I chose the Garmin one because it allowed me to change bracelets. For example, this one I have is much more discreet – good for work –, while the other bracelets are too coloured and crazy.(…) Suunto, you couldn't change it"* *"Within Garmin, I had also the possibility of having a laser pulsometer which was very precise, but raised the price insanely. But I realized that as I was medical exams many times a year, I wouldn't need such feature."* *"I could also choose between sapphire crystal (more expensive) or reinforced crystal, but I read online that the sapphire one wouldn't bring such advantage, so went for the second option"*
6. Take Action	*"In November, my mother won a contest at El Corte Inglés, where she got a 5K offer card. So in this moment, I had the opportunity to buy anything I wanted and so I decided to finally invest in this watch I wanted for so long."* *"I was going to buy it anyway. Actually I had asked already a friend living in USA to check for prices there, but the combo I wanted was always out of stock. So I was just waiting for the right economic*		

	moment to buy the watch, in the version I really wanted"		
7. Review Decisions	*"I like to sleep with it, and in the morning feel it easier to wake up because it vibrates on the wrist"* *"I have it only for 3 weeks so far, so I'm still on test phase. I haven't started to add extra apps so far, but I'm getting used to it first and then I will start."* *"One of the most exciting feature of the iWatch when I was watching videos online about it, was to have the passbook here. But I have not tried it yet"* *"I was hoping for the product to surprise me a bit as well. That's why I haven't searched for it so much"* *"One of the features I like the most, is when I have my mobile phone charging in my bedroom, and I'm on the living room and get a call, I can decide to whether take it or not, without having to stand up and pick up the phone."* *"From the fit point of view, I also like the fact that iWatch reminds me to stand up every hour. Since I spend so many hour seated on my desk."* *"I'm happy with my iWatch so far"* *"If I knew what I know today, maybe I would have bought a cheaper version of the watch, and then buy a non-official bracelet ad-hoc that would be much cheaper than the original one"* *"If I have a wedding I would never bring this"* *"I was not a heavy user of regular watches, so I don't miss using it"* *"I have an old iPhone version, but I see much more benefit on buying a smartwatch than to change to a new phone"*	*"For me it is very important to know how much hours of sleep I'm having, and I see a big difficulty in having to take off the watch to charge it."* *"One day, while it was charging, it just turned off and never turned on again. So I took it to FNAC and they gave me the option to get a new watch or the money back."* *"I asked for the money back, since on my opinion this is still not the right moment to buy a smartwatch. Autonomy is still very weak, and technology is constantly developing. So, I prefer to wait until technology develops, in particular the battery feature, and then buy it in one year maybe."* *"While they don't fix the battery for lasting at least 2 weeks, I won't buy it. And if it was be possible to charge it wirelessly, it would be perfect!"* *"I only buy stuff that has the features I like and search for. So, in general, I will not find something new when I have the product."* *"I would like to buy and iWatch, also because I have and iPhone and it is nice to have connection between both, also the amount of apps I could download. But only one day when smartwatches have more battery life"*	*"The advantage given by the smartwatch is that during activities it doesn't bother you. Especially for me who is always used to take a watch with me, it's just changing one for the other."* *"I was tired of bringing my mobile phone every time I went to do sports. With this you can swim, even ski,… it's wonderful!".* *"It is very practical! To do sports it is much easier."* *"A mobile phone with GPS on has autonomy for 1h, the most, with this, is eternal – 5h easily!"* *"I thought it was going to be easier than it is though. I'm used to my iPhone which is very simple, and this is much more complex. (…) It takes time until you customize it your way."* *"Garmin has a lot of problems in terms of software and updates"* *"There are obviously some features too specific that I don't use, like related with sports that I don't do."* *"I would like to have something that doesn't exist. Which is basically this watch but with a thinner screen"* *"I have many traditional watches that now I don't use, because I bring this with me every day. And this is something I don't like."* *"This smartwatch has a clear flaw, when compared to a regular watch, in what regards elegance,…"* *"Sometimes if people comment it negatively, mostly on how much it cost, etc, I see it as an evidence of envy for it."* *"The added value this product gives is exactly what I needed and exactly what I wanted"* *"Since I have changed the bracelet, to this much more discreet, people don't notice it so much"* *"To people who spend a lot of time outdoors, I definitely recommend this watch. But most of people with this profile I know, it owns this one already"*

(B) Smartwatch Non-Owners

Description		Mafalda	Gustavo	Ana	António
Age		**25**	**23**	**22**	**51**
Studies		**Business Administration**	**Business Administration**	**Business Administration**	**Business Administration**
Occupation		**Marketing**	**Marketing**	**Marketing**	**Sales**
1. Identify the Need		*"I heard about it through Apple, in magazines, online"* *"I have a friend who is super fan of smartwatches also told me about it"*	*"I heard it online, in Facebook posts, in technology related webpages I follow"* *"The Apple iWatch didn't attract me, since I'm not a fan of the brand and I don't like their products in general"* *"I own a Xiaomi mobile phone"*	*"I heard about Apple iWatch launch on the TV and a lot on social networks. Plus, in Business Insider online I have read some articles on smartwatches"*	*"I read in the news and online, and it was typical article "The best gift for this year's Christmas". But I have not even considered it."*
2. Gather Information			*"I like technology and so I like to be up to date with the new trends. So I have searched for the purpose of use smartwatches, how to use them and then decide if it is interesting to me or not."*		
3. Identify Alternatives				*"When I think of smartwatches always visualize Apple iWatch in my head. I know that there are others, buy every time I think or talk about it, I always remember Apple at first"*	*"I think smartwatches can be a catalyser of people's habit change."*
4. Weight Evidence		*"For me it is interesting that it can track your sleep or the fitness features. But the truth is I have never searched so much about it, and these are basically the only uses I know for the smartwatches"*	*"But I have never bought it because the price we are paying for it now it's not the fair price for a product that it is still under development."*	*"I simply don't value smartwatches. With the same price I could buy a regular watch with a better design, but the technological features simply don't add me up any value."*	*"I find smartwatches still very expensive and then I have the problem – what am I gonna do with the watches I have now?"* *"Aesthetically they are ugly in comparison with a regular watch"*

		"I also know it allows you to make calls, but for me that doesn't represent such a benefit" *"I wouldn't like to be having lunch right now and receiving e-mails on my wrist"*	*"There are some smartwatches that have already a nice design, like the Moto360"* *"Smartwatches are still not so precise on the fitness data they return"*	*"Even with a nice design, I still prefer the classic. I don't like having a screen on my wrist"* *"For me, a watch is to see what time is it, and for all the rest I use my cell phone"* *"To do sports, I can see an advantage of having a smartwatch vs. a cell phone – to track calories spending, etc…"* *"I would never bring a smartwatch to my vacation in Indonesia. First, because I wouldn't have place to charge it. And second, because I would be afraid of being robbed"*	*"Us man, we usually don't change watch depending on our outfit so much."* *Smart*
5. Choose Among Alternatives			*"I have considered Moto360, Xiaomi, and some from Garmin and some more from sporty brands"*		
6. Take Action		*"If I bought a smartwatch, I would definitely buy an Apple, because I love the design."*	*"I may think on buying a smartwatch once that they become less expensive and technology becomes more precise"*		
7. Review Decisions		*"The thing about smartwatches is that no one realizes you have it."*			

APPENDIX V – Questionnaire

Smartwatches

Q1 Dear participant, This survey is being conducted within the scope of Sara Melo's Master Thesis in International Management, w/ Major in Marketing at CATÓLICA-Lisbon School of Business and Economics. The aim of this survey is to understand the Portuguese consumers' preferences towards Smartwatches. Your opinion is fundamental for me, and I expect you to answer honestly to all questions, as all the answers are anonymous and confidential. There are no right or wrong answers. This survey will take about 10 minutes. As a reward for your time, I will give-away a 20€ Gift Check on your favourite online store. For that I will only need your e-mail (asked at the end of the survey). If you don't provide your e-mail, you won't eligible for the give-away. Thank you!

Q2 Please select the answer that most suits your opinion:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I've heard about smartwatches before (1)	❍	❍	❍	❍	❍
I've voluntarily searched for information about smartwatches before (2)	❍	❍	❍	❍	❍
I consider to know a lot about smartwatches (3)	❍	❍	❍	❍	❍
Fitness bands are not smartwatches (4)	❍	❍	❍	❍	❍
Smartwatches are the future (5)	❍	❍	❍	❍	❍
Smartwatches are just a trend that eventually will disappear (12)	❍	❍	❍	❍	❍
Smartwatches will replace regular wristwatches (6)	❍	❍	❍	❍	❍
Smartwatches are very expensive comparing to regular wristwatches (7)	❍	❍	❍	❍	❍
Smartwatches imply a radical change in consumer behavior vs. regular wristwatches (10)	❍	❍	❍	❍	❍
Smartwatches imply a radical change in consumer behavior vs. smartphones (11)	❍	❍	❍	❍	❍

Q3 Please read carefully the following text: "A Smartwatch is a wearable computing device worn on a user's wrist that, either on their own or when paired with a smartphone, offers a series of functionalities and capabilities like described below:

Tipos de Smartwatches				
Segmento	**Assistência Pessoal**	**Fitness/ Bem-Estar**	**Desportos de Aventura**	**Médico / Saúde**
Características Gerais	- Relógio/Horas - Fazer/Receber chamadas, mensagens - Ver Caller ID - Calendário - E-mail - Aplicações móveis	- Passos, calorias, distância - Ritmo cardíaco - Horas de sono - **Opcional**: relógio/horas, mensagens, notificações, controlo de música	- Monitorização Fitness - Funcionalidades de atividades outdoors (natação, golf, bicicleta, mergulho, etc.) - GPS e armazenamento de rotas	- Sistema nervoso, ritmo cardíaco, horas de sono - Alertas de emergência/ inatividade - Lembretes de medicação/ tarefas
Exemplo de Marca	**Apple iWatch** **Samsung Gear**	**Fitbit** **Xiaomi**	**Garmin** **TomTom**	**Empatica Embrace** **CleverCare**
Preço Médio	———	———	———	———
				

Q6 What is your perception of the average price (€) of each segment of smartwatches:

_____ Personal Assistance (ex. Apple, Samsung) (1)
_____ Fitness/Wellness (ex. FitBit, Xiaomi) (5)
_____ Sports/Adventure (ex. Garmin, TomTom) (2)
_____ Medical/Health (Empatica, CleverCare) (3)

Q7 Here you can find the actual price range for each segment:

Tipos de Smartwatches				
Segmento	**Assistência Pessoal**	**Fitness/ Bem-Estar**	**Desportos de Aventura**	**Médico / Saúde**
Características Gerais	- Relógio/Horas - Fazer/Receber chamadas, mensagens - Ver Caller ID - Calendário - E-mail - Aplicações móveis	- Passos, calorias, distância - Ritmo cardíaco - Horas de sono - **Opcional**: relógio/horas, mensagens, notificações, controlo de música	- Monitorização Fitness - Funcionalidades de atividades outdoors (natação, golf, bicicleta, mergulho, etc.) - GPS e armazenamento de rotas	- Sistema nervoso, ritmo cardíaco, horas de sono - Alertas de emergência/ inatividade - Lembretes de medicação/ tarefas
Exemplo de Marca	**Apple iWatch** **Samsung Gear**	**Fitbit** **Xiaomi**	**Garmin** **TomTom**	**Empatica Embrace** **CleverCare**
Preço Médio	**400€ - 1000€**	**20€ - 250€**	**150€ - 500€**	**250€ - 400€**
				

Q9 Please select the answer that most suits your opinion:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I was aware of all the existing segments of smartwatches (1)	❍	❍	❍	❍	❍
I knew about all of their functionalities (2)	❍	❍	❍	❍	❍
There are many functionalities I wasn't aware of (3)	❍	❍	❍	❍	❍
I believe their functionalities are worth the price (4)	❍	❍	❍	❍	❍
I was not surprised by their actual price (5)	❍	❍	❍	❍	❍
Smartwatches are very expensive comparing to regular wristwatches (6)	❍	❍	❍	❍	❍
Smartwatches are cheaper than I thought (7)	❍	❍	❍	❍	❍
Smartwatches are more expensive than I thought (8)	❍	❍	❍	❍	❍

Q10 Do you own a smartwatch

❍ Yes (1)
❍ No (2)

Q11 More or less, how many people do you know who own a smartwatch?

_____ Smartwatch Owners (1)

Q12 Please, specify at which stage do you consider you are at, regarding smartwatches:

- 1 - I'm aware of its existence (1)
- 2 - I have an attitude/opinion about it, either positive or negative (2)
- 3 - I have decided to adopt/reject it (3)
- 4 - I have adopted it (still evaluating the experience) (4)
- 5 - I have adopt it and evaluated my experience with it (5)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q13 Which brand is your smartwatch?

- Samsung (1)
- Apple (2)
- Motorola (3)
- Huawei (4)
- Asus (5)
- LG (6)
- Alcatel (7)
- Sony (8)
- MyKronoz (9)
- Fitbit (10)
- Garmin (11)
- TomTom (12)
- Xiaomi (13)
- Other (14) _____

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q14 Please specify the model you own:

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q15 How long have you got it?

- More than 1 year ago (1)
- About 1 year ago (2)
- About 9 months ago (3)
- About 6 months ago (4)
- About 3 months ago (5)

Less than 3 months ago (6)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q16 How frequently do you use it?

- Daily (1)
- 4-6 times a week (2)
- 2-3 times a week (3)
- Once a week (4)
- Never (5)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q16 How frequently do you use it?

- ❍ Daily (1)
- ❍ 4-6 times a week (2)
- ❍ 2-3 times a week (3)
- ❍ Once a week (4)
- ❍ Never (5)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q17 Who bought it?

- ❍ Myself (1)
- ❍ It was a gift - I had already asked for it (2)
- ❍ It was a gift - I never mentioned I wanted one (3)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q18 Where have you heard about smartwatches? (Multiple Answer)

- ❑ A friend told me about it (1)
- ❑ A friend owned/owns a smartwatch (2)
- ❑ Media Article (TV, Newspaper, Radio) (3)
- ❑ Social Media (4)
- ❑ Advertisement (TV, Outdoors, Newspaper, Radio) (5)
- ❑ Web Advertisement (Banner, Sponsored Post) (6)
- ❑ Electronics Store (7)
- ❑ I haven't heard about it (8)
- ❑ Other (9) _____

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q19 Where did you search for information? (Multiple Answer)

- ❑ Asked store assistant's advice (1)
- ❑ Asked friend's advice (2)
- ❑ Searched online (3)
- ❑ Watched Video Tutorials/Reviews (4)
- ❑ Read Reviews online (5)
- ❑ Read Magazine article (6)
- ❑ I didn't search for any information (7)
- ❑ Other (8) _____

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q20 For what context/reason were you looking for to buy it? (Multiple Answer)In what context did you actually end up using? (Multiple Answer)

	Desired Context (1)	Actual Context (2)
Daily-Life (1)	❑	❑
Adventure Sports (2)	❑	❑
Fitness/Wellness (3)	❑	❑
Medical/Health (4)	❑	❑
Business (5)	❑	❑
Fashion (6)	❑	❑
None (7)	❑	❑
Other (8)	❑	❑

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q21 What features were you looking for to buy? (Multiple Answer)What features did you actually end up using? (Multiple Answer)

	Desired Feature (1)	Actually Used Feature (2)
Answer calls (1)	❑	❑
Send/Receive SMS (2)	❑	❑
Send/Receive e-mails (3)	❑	❑
Send/Receive other type of messages (Whatsapp, Messenger, etc.) (4)	❑	❑
Fitness monitoring (activity monitoring, steps, type of exercise, time) (5)	❑	❑
Health monitoring (heart rate, sleeping hours, etc.) (6)	❑	❑
Adventure functions (barometer, altimeter, etc) (7)	❑	❑
Water/Dust Resistance (8)	❑	❑
Wireless charge (9)	❑	❑
GPS (10)	❑	❑
Music Control (11)	❑	❑
Use apps (12)	❑	❑
O-clock (13)	❑	❑
Fashionable/Design (14)	❑	❑
Compatibility w/ my smartphone (15)	❑	❑
Same brand as my smartphone (16)	❑	❑
None (17)	❑	❑
Other (18)	❑	❑

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q22 Please, indicate the importance given to each of the following factors when deciding on which smartwatch to buy (being 1 Star - Not Important at All; and 5 Stars - Extremely Important):

_____ Brand (1)
_____ Price (2)
_____ Friend Review (3)
_____ Store Assistant Review (4)
_____ Online Review (5)
_____ Features (6)
_____ Battery Life (7)
_____ Aspect (8)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q23 How long did it take (more a less) from the moment you realized you wanted a smartwatch until you bought it?

- ❍ 1 week or less (1)
- ❍ 1 month or less (2)
- ❍ 3 months or less (3)
- ❍ 6 months or less (4)
- ❍ 1 Year or less (5)
- ❍ More than 1 Year (6)
- ❍ N/A (7)

Display This Question:

If Do you own a smartwatch Yes Is Selected

Q24 Please select the answer that most suits your opinion regarding your smartwatch:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I'm happy with my smartwatch (1)	❍	❍	❍	❍	❍
It has improved my life (2)	❍	❍	❍	❍	❍
It has made my life easier (3)	❍	❍	❍	❍	❍
I find it easy to use and understand (4)	❍	❍	❍	❍	❍
It took me some time to learn how to use it (5)	❍	❍	❍	❍	❍
My interaction with the system is clear and understandable (6)	❍	❍	❍	❍	❍
I use it because other people around me started using it (7)	❍	❍	❍	❍	❍
Having it is a symbol of status (8)	❍	❍	❍	❍	❍
I feel people look at me differently now (9)	❍	❍	❍	❍	❍
I feel I look better for other people now (10)	❍	❍	❍	❍	❍
I feel innovative using it (11)	❍	❍	❍	❍	❍
Specialized instruction and guidance concerning the system was available to me (12)	❍	❍	❍	❍	❍
The system is not compatible with other systems I use (13)	❍	❍	❍	❍	❍
Control Question: Select "Strongly disagree" (14)	❍	❍	❍	❍	❍
The system is compatible with my lifestyle (15)	❍	❍	❍	❍	❍
I'm using all the features I was looking for (16)	❍	❍	❍	❍	❍
I got surprised by new features I didn't know (17)	❍	❍	❍	❍	❍
The features it offers are enough to me (18)	❍	❍	❍	❍	❍
I still use my regular wrist watches (19)	❍	❍	❍	❍	❍

I only use my regular wrist watches in special occasions (special dinner, wedding, etc.) (20)	❍	❍	❍	❍	❍
I miss using my regular wrist watches (21)	❍	❍	❍	❍	❍
I usually recommend it to friends (22)	❍	❍	❍	❍	❍
I prefere to buy from my favorite brand, even if competition offers the same features for a lower price (23)	❍	❍	❍	❍	❍

Display This Question:

If Do you own a smartwatch No Is Selected

Q25 Would you like to have a smartwatch?

❍ Yes (1)

❍ No (2)

Display This Question:

If Do you own a smartwatch No Is Selected

Q26 Please select the answer that most suits your opinion regarding smartwatches:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I would like to own one (1)	❍	❍	❍	❍	❍
It would improve my life (2)	❍	❍	❍	❍	❍
It would make my life easier (3)	❍	❍	❍	❍	❍
I appears to be easy to use and understand (4)	❍	❍	❍	❍	❍
It would take me some time to learn how to use it (5)	❍	❍	❍	❍	❍
My interaction with the system would be clear and understandable (6)	❍	❍	❍	❍	❍
I would use it if other people around me started using it (7)	❍	❍	❍	❍	❍
Having it is a symbol of status (8)	❍	❍	❍	❍	❍
I think people look differently at smartwatch users (9)	❍	❍	❍	❍	❍
I think people have a better opinion about smartwatch users (10)	❍	❍	❍	❍	❍
I think people look at smartwatch users as more innovative (11)	❍	❍	❍	❍	❍
Smartwatch users look better to me (12)	❍	❍	❍	❍	❍
Smartwatch users look dumb to most people (13)	❍	❍	❍	❍	❍
Having specialized instruction and guidance concerning the system is important to me (14)	❍	❍	❍	❍	❍
Control Question: Select "Somewhat Disagree" (15)	❍	❍	❍	❍	❍
System compatibility with other systems I use is important to me (16)	❍	❍	❍	❍	❍
A smartwatch would not be compatible with my lifestyle (17)	❍	❍	❍	❍	❍

In general I like their design (18)	❍	❍	❍	❍	❍
The features they offer are enough to me (19)	❍	❍	❍	❍	❍
I would still use my old regular watches (20)	❍	❍	❍	❍	❍
They are very expensive (21)	❍	❍	❍	❍	❍
I would prefere to buy from my favorite brand, even if competition offered the same features for a lower price (22)	❍	❍	❍	❍	❍

Display This Question:

If Do you own a smartwatch No Is Selected

Q27 If I had a smartwatch I would like to use it in the following contexts:

- ❑ Daily-Life (1)
- ❑ Adventure Sports (2)
- ❑ Fitness/Wellness (3)
- ❑ Medical/Health (4)
- ❑ Fashion (5)
- ❑ Business (6)
- ❑ Other (7) _____

Display This Question:

If Would you like to have a smartwatch? Yes Is Selected

Q28 Which smartwatch brand would you like to have?

- ❍ Samsung (1)
- ❍ Apple (2)
- ❍ Motorola (3)
- ❍ Huawei (4)
- ❍ Asus (5)
- ❍ LG (6)
- ❍ Alcatel (7)
- ❍ Sony (8)
- ❍ MyKronoz (9)
- ❍ Fitbit (10)
- ❍ Garmin (11)
- ❍ TomTom (12)
- ❍ Xiaomi (13)
- ❍ I don't know (14)
- ❍ Other (15) _____

Q29 What are the main problems of smartwatches, for you?

- ❑ Price - Too expensive (1)
- ❑ Features - It doesn't have all the features I need/ Features are still under-performing (2)
- ❑ Design - I'm not satisfied with their design (3)
- ❑ I simply don't value this object (6)
- ❑ None (8)
- ❑ Other (4) _____

Display This Question:

If What are the main problems of smartwatches, for you? Price - Too expensive Is Selected

Q30 What would be the maximum fair Price (€) you would be willing to pay, attending the different segments of smartwatches:

_____ Personal Assistance (ex. Apple, Samsung) (1)
_____ Fitness/Wellness (ex. FitBit, Xiaomi) (2)
_____ Sports/Adventure (ex. Garmin, TomTom) (3)
_____ Medical/Health (Empatica, CleverCare) (4)

Display This Question:

If What are the main problems of smartwatches, for you? Features - It doesn't have all the features I need/ Features are still under-performing Is Selected

Q31 What Features' problems do you find in smartwatches?

- ❑ Low battery life (1)
- ❑ Lack of Precision in fitness monitoring (2)
- ❑ Lack of Camera (3)
- ❑ It requires a lot of updates (4)
- ❑ It still presents many software bugs (5)
- ❑ The display size represents a big limitation (6)
- ❑ Other (7) _____

Display This Question:

If What Features' problems do you find in smartwatches? Low battery life Is Selected

Q32 What would be a reasonable battery life (in days) for you?

_____ Days (1)

Display This Question:

If What are the main problems of smartwatches, for you? Design - I'm not satisfied with their design Is Selected

Q33 What Design problems do you find in smartwatches?

- ❑ They are too bulky (1)
- ❑ The display is too small (2)
- ❑ The display is too big (3)
- ❑ They are usually not designed for women (4)
- ❑ They don't look so similar to a regular wristwatch (5)
- ❑ I would prefer a smartwatch designed by my favorite wristwatch brand (Ex.: Tag Heur) (6)
- ❑ I would like to change bracelets according to my outfit (7)
- ❑ I prefer de analogical display (8)
- ❑ Other (9) _____

Display This Question:

If What are the main problems of smartwatches, for you? I simply don't value this object Is Selected

Q34 Why don't you Value this object?

- ❑ I prefer to keep using my regular wristwatches (1)
- ❑ I don't even usually wear a wristwatch (2)
- ❑ It doesn't add me any value vs. my smartphone (3)
- ❑ I don't want to become too dependent to technology (being constantly connected through my wrist) (4)
- ❑ Other (5) _____

Q36 Gender

- ❍ Male (1)
- ❍ Female (2)

Q37 Age

- ❍ Under 18 (1)
- ❍ 18 - 24 (2)
- ❍ 25 - 34 (3)
- ❍ 35 - 44 (4)
- ❍ 45 - 54 (5)
- ❍ 55 - 64 (6)
- ❍ 65 - 74 (7)
- ❍ 75 - 84 (8)
- ❍ 85 or older (9)

Q38 Occupation

- ❍ Student (1)
- ❍ Employed (2)
- ❍ Unemployed (3)
- ❍ Working student (4)

Q39 Highest Academic Qualification

- ❍ Primary School (1)
- ❍ High School (2)
- ❍ Bachelor (3)
- ❍ Masters (4)
- ❍ Doctorate/PHD (5)

Q40 Marital staus

- ❍ Single (1)
- ❍ Married/ living with partner (2)
- ❍ Divorce (3)
- ❍ Widowed (4)

Q41 People living in your household (including yourself)

- ❍ 1 (1)
- ❍ 2 (2)
- ❍ 3 (3)
- ❍ 4 (4)
- ❍ 5 (5)
- ❍ More than 5 (6)

Q42 Household's monthly disposable income after taxes

- ❍ Less than 500€ (1)
- ❍ 501€ - 1000€ (2)
- ❍ 1001€ - 3000€ (3)
- ❍ 3001€ - 5000€ (4)
- ❍ More than 5000€ (5

Q43 Please select the most suitable according to your personal opinion/self-evaluation.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Usually, among my friend I'm the first to buy innovation (1)	❍	❍	❍	❍	❍
I have entrepreneurial spirit (2)	❍	❍	❍	❍	❍
I'm comfortable with change (3)	❍	❍	❍	❍	❍
I'm comfortable with uncertainty (4)	❍	❍	❍	❍	❍
Education is very important (5)	❍	❍	❍	❍	❍
Faith over Science (6)	❍	❍	❍	❍	❍
I aspire to have a high leadership role (7)	❍	❍	❍	❍	❍
Control Question: Select "Strongly disagree" (8)	❍	❍	❍	❍	❍
I aspire to make a lot of money (9)	❍	❍	❍	❍	❍
I aspire to have a high education level (10)	❍	❍	❍	❍	❍
I hang out with different networks of people very often (11)	❍	❍	❍	❍	❍
I travel very often (12)	❍	❍	❍	❍	❍
I'm always aware of new innovations (13)	❍	❍	❍	❍	❍
My friends usually ask for my recommendation on gadgets/new restaurants/experiences (14)	❍	❍	❍	❍	❍

APPENDIX VI – Measures

Table 8 - Rogers (1962) Summary of the Research Evidence Supporting and Not Supporting Generalizations about the Characteristics of Adopter Categories

Generalization	Direction in which the Independent Variable Is Related to Innovativeness	Support for the Generalization (Number of Research Studies)		Percentage of Research Studies Supporting the Generalization
		Supporting	*Not Supporting*	
I. *Socioeconomic Characteristics*				
7-2	Age (not related)	108	120*	48
7-3	Education (positive)	203	72	74
7-4	Literacy (positive)	24	14	63
7-5	Higher social status (positive)	275	127	68
7-6	Upward social mobility (positive)	5	0	100
7-7	Larger-sized units (positive)	152	75	67
7-8	A commercial, rather than a subsistence, economic orientation (positive)	20	8	71
7-9	A more favorable attitude toward credit (positive)	19	6	76
7-10	More specialized operations (positive)	9	6	60
II. *Personality Variables*				
7-11	Empathy (positive)	9	5	64
7-12	Dogmatism (negative)	17	19	47
7-13	Ability to deal with abstractions (positive)	5	3	63
7-14	Rationality (positive)	11	3	79
7-15	Intelligence (positive)	5	0	100
7-16	A more favorable attitude toward change (positive)	43	14	75
7-17	Ability to cope with uncertainty (positive)	27	10	73
7-18	A more favorable attitude toward education (positive)	25	6	81
7-19	A more favorable attitude toward science (positive)	20	7	74
7-20	Fatalism (negative)	14	3	82
7-21	Achievement motivation (positive)	14	9	61
7-22	Higher aspirations for education, occupations, etc. (positive)	29	10	74
III. *Communication Behavior*				
7-23	Social participation (positive)	109	40	73
7-24	Interconnectedness with the social system (positive)	6	0	100
7-25	Cosmopoliteness (positive)	132	42	76
7-26	Change agent contact (positive)	135	21	87
7-27	Mass media exposure (positive)	80	36	69
7-28	Exposure to interpersonal communication channels (positive)	46	14	77
7-29	More active information seeking (positive)	12	2	86
7-30	Knowledge of innovations (positive)	61	19	76
7-31	Opinion Leadership (positive)	42	13	76
7-32	Belonging to highly interconnected systems (positive)	8	7	53

*Of these 120 studies, 44 show that earlier adopters are younger, and 76 show that earlier adopters are older.

Source: A content analysis of the approximately 900 empirical publications dealing with the diffusion of innovations available in July 1968 (Rogers with Shoemaker, 1971, pp. 352-376). While considerable further research has been conducted on the characteristics of adopter categories since 1968 (the total number of diffusion publications has approximately doubled), most of this investigation has followed the same directions as previously and my reading of all these studies suggests that the present conclusions would not be changed much if they were more up to date.

Source: Rogers (1962)

Table 9 - Determinants of Intention and Behaviour Constructs and Scales (Adapted from Venkatesh et al., 2003)

Construct	Survey Questions	
	Smartwatch Owners	**Smartwatch Non-Owners**
Performance Expectancy	- It has improved my life - It has made my life easier	- It would improve my life - It would make my life easier
Effort Expectancy	- I find it easy to use and understand - It took me some time to learn how to use (reverse scale) - My interaction with the system is simple and understandable	- It appears to be easy to use and understand - It would take me some time to learn how to use (reverse scale) - My interaction with the system would be simple and understandable
Social Influence	- I use it because other people around me started using it - Having it is a symbol of status - I feel people look differently at me now - I feel I look better for other people now - I feel innovative using it	- I would use it if other people around me started using it - Having it is a symbol of status - I think people look differently at smartwatch users - I think people have a better opinion about smartwatch users - I think people look at smartwatch users as more innovative - Smartwatch users look better to me - Smartwatch users look dumb to most people (reverse scale)
Facilitating Conditions	- Specialized instructions and guidance concerning the system was available to me - The system is not compatible with other systems I use (reverse scale) - The system is compatible with my lifestyle	- Having specialized instructions and guidance concerning the system is important to me - System compatibility with other systems I use is important to me - A smartwatch would not be compatible with my lifestyle (reverse scale)

Table 10 - Characterization of Early Adopters Scales (Adapted from Rogers, 1962)

Generalization	Survey Questions
Socioeconomic Characteristics	
1. Early adopters have more years of education than later adopters have	- Highest Academic Qualification (bachelor and above)
2. Early adopters are more likely to have a commercial (rather than a subsistence) economic orientation than are late adopters.	- I have entrepreneurial spirit
Personality Characteristics	
3. Early adopters have a more favourable attitude toward change than late adopters.	- I'm comfortable with change
4. Early adopters are more able to cope with uncertainty than late adopters.	- I'm comfortable with uncertainty
5. Early adopters have a more favourable attitude toward education than late adopters.	- Education is very important
6. Early adopters have a more favourable attitude toward science than late adopters.	- Faith over science (reverse scale)
7. Early adopters have higher aspirations (for education, occupations, and so on) than late adopters.	- I aspire to having a high leadership role - I aspire to make a lot of money - I aspire to having a high education level
Communication Behaviour	
8. Early adopters have more social participation than late adopters.	- I hang out with different networks of people very often
9. Early adopters are more cosmopolite than late adopters. ("The innovators' network are more likely to be outside, rather than within, their social system. They travel widely and are involved in matters beyond the boundaries of their local system")	- I travel very often
10. Early adopters have more change agent contact than late adopters.	-
11. Early adopters have greater exposure to interpersonal communication channels than late adopters.	-
12. Early adopters have a greater knowledge of innovations than late adopters.	- I'm always aware of new innovations
13. Early adopters have a higher degree of opinion leadership than late adopters.	- My friends usually ask for my recommendation on gadgets/ new restaurants/ experiences

APPENDIX VII – Result Analysis

- ***K-Mean Cluster Analysis***

Table 11 - Final Cluster Centers

	Cluster	
	1	2
-Usually, among my friend I'm the first to buy innovation	2	3
-I have entrepreneurial spirit	3	4
-I'm comfortable with change	4	4
-I'm comfortable with uncertainty	3	3
-Education is very important	5	5
-Faith over Science	2	2
-I aspire to have a high leadership role	3	4
-I aspire to make a lot of money	3	4
-I aspire to have a high education level	4	4
-I hang out with different networks of people very often	4	4
-I travel very often	3	4
-I'm always aware of new innovations	3	4
-My friends usually ask for my recommendation on gadgets/new restaurants/experiences	2	4
Highest Academic Qualification	3	3

Table 12 - Number of Cases in each Cluster

Cluster	1 – Mainstream Market Adopters	113,000
	2 – Early Adopters Market	145,000
Valid		258,000
Missing		,000

Table 13 - ANOVA Cluster Analysis

		Sum of Squares	df	Mean Square	F	Sig.
-Usually, among my friend I'm the first to buy innovation	Between Groups	153,182	1	153,182	157,768	,000
	Within Groups	248,559	256	,971		
	Total	401,740	257			
-I have entrepreneurial spirit	Between Groups	75,136	1	75,136	96,347	,000
	Within Groups	199,639	256	,780		
	Total	274,775	257			
-I'm comfortable with change	Between Groups	35,818	1	35,818	50,792	,000
	Within Groups	180,527	256	,705		
	Total	216,345	257			
-I'm comfortable with uncertainty	Between Groups	44,257	1	44,257	36,339	,000
	Within Groups	311,774	256	1,218		
	Total	356,031	257			
-Education is very important	Between Groups	,031	1	,031	,139	,709
	Within Groups	56,930	256	,222		
	Total	56,961	257			
-Faith over Science	Between Groups	16,359	1	16,359	12,223	,001
	Within Groups	342,618	256	1,338		
	Total	358,977	257			
-I aspire to have a high leadership role	Between Groups	95,077	1	95,077	78,995	,000
	Within Groups	308,117	256	1,204		
	Total	403,194	257			
-I aspire to make a lot of money	Between Groups	59,248	1	59,248	60,246	,000
	Within Groups	251,759	256	,983		
	Total	311,008	257			
-I aspire to have a high education level	Between Groups	35,163	1	35,163	39,433	,000
	Within Groups	228,279	256	,892		
	Total	263,442	257			
-I hang out with different networks of people very often	Between Groups	15,276	1	15,276	18,576	,000
	Within Groups	210,522	256	,822		
	Total	225,798	257			
-I travel very often	Between Groups	78,943	1	78,943	76,291	,000
	Within Groups	264,902	256	1,035		
	Total	343,845	257			

-I'm always aware of new innovations	Between Groups	112,586	1	112,586	136,210	,000
	Within Groups	211,600	256	,827		
	Total	324,186	257			
-My friends usually ask for my recommendation on gadgets/new restaurants/experiences	Between Groups	195,692	1	195,692	191,132	,000
	Within Groups	262,107	256	1,024		
	Total	457,798	257			
Highest Academic Qualification	Between Groups	11,535	1	11,535	22,842	,000
	Within Groups	129,275	256	,505		
	Total	140,810	257			

Table 14 - Cluster Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
-Usually, among my friend I'm the first to buy innovation	Mainstream Market Adopters	113	1,68	,879	,083	1,52	1,85
	Early Market Adopters	145	3,23	1,061	,088	3,06	3,41
	Total	258	2,55	1,250	,078	2,40	2,71
-I have entrepreneurial spirit	Mainstream Market Adopters	113	3,01	,968	,091	2,83	3,19
	Early Market Adopters	145	4,10	,811	,067	3,96	4,23
	Total	258	3,62	1,034	,064	3,49	3,75
-I'm comfortable with change	Mainstream Market Adopters	113	3,63	,993	,093	3,44	3,81
	Early Market Adopters	145	4,38	,698	,058	4,26	4,49
	Total	258	4,05	,918	,057	3,94	4,16
-I'm comfortable with uncertainty	Mainstream Market Adopters	113	2,65	1,075	,101	2,45	2,86
	Early Market Adopters	145	3,49	1,125	,093	3,30	3,67
	Total	258	3,12	1,177	,073	2,98	3,27
-Education is very important	Mainstream Market Adopters	113	4,79	,472	,044	4,70	4,88
	Early Market Adopters	145	4,77	,472	,039	4,69	4,84
	Total	258	4,78	,471	,029	4,72	4,83
-Faith over Science	Mainstream Market Adopters	113	2,42	1,252	,118	2,19	2,66
	Early Market Adopters	145	1,92	1,077	,089	1,74	2,09
	Total	258	2,14	1,182	,074	1,99	2,28
-I aspire to have a high leadership role	Mainstream Market Adopters	113	2,96	1,249	,118	2,72	3,19
	Early Market Adopters	145	4,18	,962	,080	4,02	4,34
	Total	258	3,64	1,253	,078	3,49	3,80
-I aspire to make a lot of money	Mainstream Market Adopters	113	3,19	1,154	,109	2,97	3,40
	Early Market Adopters	145	4,15	,844	,070	4,01	4,29
	Total	258	3,73	1,100	,068	3,59	3,86
-I aspire to have a high education level	Mainstream Market Adopters	113	3,63	1,104	,104	3,42	3,83
	Early Market Adopters	145	4,37	,799	,066	4,24	4,50
	Total	258	4,05	1,012	,063	3,92	4,17
-I hang out with different networks of people very often	Mainstream Market Adopters	113	3,90	1,000	,094	3,72	4,09
	Early Market Adopters	145	4,39	,827	,069	4,26	4,53
	Total	258	4,18	,937	,058	4,06	4,29
- I travel very often	Mainstream Market Adopters	113	2,82	1,144	,108	2,61	3,04
	Early Market Adopters	145	3,94	,907	,075	3,79	4,09
	Total	258	3,45	1,157	,072	3,31	3,59
- I'm always aware of new innovations	Mainstream Market Adopters	113	2,72	1,039	,098	2,52	2,91
	Early Market Adopters	145	4,05	,793	,066	3,92	4,18
	Total	258	3,47	1,123	,070	3,33	3,60
- My friends usually ask for my recommendation on gadgets/new restaurants/experiences	Mainstream Market Adopters	113	1,86	1,008	,095	1,67	2,05
	Early Market Adopters	145	3,61	1,015	,084	3,45	3,78
	Total	258	2,84	1,335	,083	2,68	3,01
Highest Academic Qualification	Mainstream Market Adopters	113	2,79	,674	,063	2,66	2,91
	Early Market Adopters	145	3,21	,738	,061	3,09	3,33
	Total	258	3,03	,740	,046	2,94	3,12

- ***Principal Component Analysis***

Table 15- KMO and Bartlett's Test (Smartwatch Owners)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,577
Bartlett's Test of Sphericity	Approx. Chi-Square	110,890
	df	36
	Sig.	,000

Table 16 - Total Variance Explained (Smartwatch Owners)

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,485	27,613	27,613	2,485	27,613	27,613	2,398	26,647	26,647
2	2,246	24,959	52,573	2,246	24,959	52,573	2,043	22,701	49,348
3	1,557	17,305	69,878	1,557	17,305	69,878	1,786	19,849	69,198
4	1,116	12,402	82,280	1,116	12,402	82,280	1,177	13,083	82,280
5	,459	5,096	87,377						
6	,421	4,676	92,053						
7	,361	4,008	96,060						
8	,228	2,532	98,592						
9	,127	1,408	100,000						

Extraction Method: Principal Component Analysis.

Table 17 - Rotated Component Matrix (Smartwatch Owners)

	Component			
	1 Social Influence	2 Perform. Expectancy	3 Effort. Expectancy	4 Facilit. Condit.
- I feel people look at me differently now	**,932**		-,158	
-I feel I look better for other people now	**,852**	,242	,144	
-Having it is a symbol of status	**,839**	-,181		,192
-It has improved my life		**,942**		
-It has made my life easier		**,907**		
-My interaction with the system is clear and understandable	,130	-,143	**,872**	
-I find it easy to use and understand	-,244	,166	**,830**	
-The system is compatible with my lifestyle	,141	,440	**,521**	,486
-Specialized instruction and guidance concerning the system was available to me				**,945**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Table 18 - KMO and Bartlett's Test (Smartwatch Non-Owners)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,716
Bartlett's Test of Sphericity	Approx. Chi-Square	808,176
	df	66
	Sig.	,000

Table 19 - Total Variance Explained (Smartwatch Non-Owners)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,450	28,753	28,753	3,450	28,753	28,753	3,042	25,348	25,348
2	2,016	16,802	45,555	2,016	16,802	45,555	1,965	16,372	41,720
3	1,352	11,268	56,823	1,352	11,268	56,823	1,812	15,103	56,823
4	,982	8,179	65,002						
5	,854	7,118	72,120						
6	,717	5,979	78,098						
7	,613	5,110	83,208						
8	,586	4,880	88,088						
9	,554	4,613	92,700						
10	,414	3,453	96,153						
11	,252	2,097	98,250						
12	,210	1,750	100,000						

Extraction Method: Principal Component Analysis.

Table 20 - Rotated Component Matrix (Smartwatch Non-Owners)

	Component		
	Social Influence 1	Perf. Expect. + Facilit. Condi. 2	Effort Expect. 3
-I think people have a better opinion about smartwatch users	**,816**		
-I think people look differently at smartwatch users	**,810**		
-I think people look at smartwatch users as more innovative	**,680**	,232	
-Smartwatch users look better to me	**,673**	,173	,226
-Having it is a symbol of status	**,630**		-,159
-I would use it if other people around me started using it	**,558**	,128	-,120
-It would make my life easier	,220	**,726**	,380
-System compatibility with other systems I use is important to me		**,672**	
-Having specialized instruction and guidance concerning the system is important to me		**,663**	-,238
-It would improve my life	,188	**,641**	,500
-My interaction with the system would be clear and understandable			**,797**
-I appears to be easy to use and understand		,122	**,786**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

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