

# Needs-based Segmentation of the German Smartphone Market and Its Implications for Profitable Product Design

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Abstract: This paper aims to develop a needs-based segmentation of the German smartphone market and to investigate business opportunities from greater product differentiation. In particular, the goal of this study was to prove the suitability of a device with longer battery life, even though the smartphone might increase considerably in its dimensions or weight. This is a promising consideration given that in recent years the smartphone market has become tremendously competitive and saturated, and manufacturers struggle to differentiate from each other. Furthermore, the desire for a longer battery life is becoming more and more prevalent and is a recurring topic of internet polls, blog entries and newspaper articles. The data for this research was collected through a choice-based conjoint analysis with more than half a thousand respondents, supplied by a German market research agency. The results demonstrate a strong desire for an improvement in battery lifetime and a subsequent cluster analysis reveals at least three significant market segments preferring a thicker and heavier smartphone with better endurance. Those segments offer an excellent opportunity for any manufacturer trying to escape the quality and price pressure within an undifferentiated and unprofitable market.

**Key words:** choice-based conjoint analysis; needs-based segmentation; German smartphone market; product differentiation; battery life

JEL codes: M31, L63

# **1. Introduction**

The first smartphone, the IBM Simon Personal Communicator, was released in 1992. It had a monochrome touch screen, a stylus, and charging base station. Although it fulfilled the requirements of a modern smartphone, it was never technically called a smartphone nor an overall success amongst mass consumers. Over a period of almost 15 years, several smartphone manufacturers and operating systems appeared, some, such as BlackBerry and Palm with notable success amongst business clients. However, this changed dramatically in 2007, when Apple introduced the iPhone at the 2007 Macworld in San Francisco. A handheld device that combined three products: a revolutionary mobile phone, a widescreen music player with touch controls, and a breakthrough Internet communications device with e-mail, web browser, search and maps (Martin, 2014; Apple Inc., 2007).

Apple had understood how to translate the traditional idea of the smartphone into something that the mass

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consumer would desire. Suddenly the former geeky toy or business tool had become the preferred replacement for a personal computer or even a digital camera for those on the go (McCarty, 2011; Froehlich, 2015).

The success of Apple tempted other companies and from behind the scenes, another operating system based on the Kernel of Linux and backed by Google appeared: Android. This open source product, released under the Apache 2.0 and GPLv2 License, promised to be both reliable and robust and could be installed on any number of devices and modified by and for the manufacturers. In 2008, the Taiwanese HTC Corporation signed to be the first company to build Android phones. Instantly other companies, including Samsung, LG, Motorola and many more followed. Today, the Android operating system is by far and away the leading mobile system, according to the International Data Corporation (2015) with more than 80% market share in the second quarter of 2015.

Over the following years, things progressed and consolidated. With the success of iOS and Android, most prior mobile operating system disappeared or lost importance, such as Windows Mobile. The same counts for almost all smartphone form factors and physical keyboards. Today the smartphone market is much the same, and it seems as if phone development had reached a plateau by the end of 2013. Devices are almost indistinguishable as the manufacturers settled on 5-inch, skinny rectangles running either Android or iOS (Martin, 2014; Westaway, 2015).

Although smartphone microchips benefit from Moore's Law, the growing functionality and increasing screen sizes of smartphones requires even more power to support its operation throughout the day. Unfortunately, Moore's Law does not apply to batteries, hence all the processing power, sensors, wireless technologies and feature sets are bottlenecked by the limitations imposed by today's batteries (Dey, Ferreira, & Kostakos, 2011; Deloitte, 2015). As battery life is a core aspect of user experience, manufacturers try to react to this imbalance by improving the efficiency of single parts, such as the processor, or by increasing the capacity of their batteries. However, progress in the battery field is difficult, and makers of smartphones struggle to increase the battery life in any significant way. According to Deloitte (2015) the current Li-On technology is one reason for these difficulties. A second even more evident reason is the trend to thinner smartphones and thus less space for batteries.

Smartphones have become crucially intertwined in people's daily life in recent years. Consumers are spending more time than ever using them. This intensive use means a shorter lifespan for the battery, and thus, customers crave for increased battery capacity. Some follow instructions on how to maximize battery life by adapting screen brightness or activating sensors only when necessary, for instance. Others go even further, using so-called power banks or battery cases with the capability to charge a phone, most likely doubling its battery life (Leather, 2013). Something that is apparently, for some users at least, worth more than the inconvenience of a thicker device or an additional item to carry around.

However, the growth of the global smartphone market is expected to slow down and even more drastic the Western mobile phone market declined in the past year. Manufacturers already find themselves under considerable pressure, and only Apple seems to be profitable. Considering those facts, it would seem reasonable to suggest that manufacturers should consider taking the risk and differentiate through smartphones with bigger battery capacity. A couple of surveys have already demonstrated there might be, even with Apple users, the desire for longer battery life, even though the thickness of a device would increase (The Huffington Post, 2015; 9 to 5 Mac., 2015).

With the above in mind, the purpose of this paper is to conduct a conjoint-based market research in Germany and to examine whether the results of the previously mentioned surveys correspond with German Smartphone users and hence that a market for a thicker smartphone with a longer battery life exists in Germany. Furthermore, a subsequent cluster analysis will help to quantify this opportunity.

# 2. Theoretical Framework and Methods and Procedures

This section is devoted to discuss the theoretical framework and the techniques used in this paper. As described in the introduction, the required data was collected through a nationwide, representative online survey, based on the methodology of a choice-based conjoint analysis (CBCA).

When assessing product or service alternatives and deciding to buy the most appealing, customers employ a variety of heuristics and make trade-offs among the attributes of the product or service. Conjoint analysis offers a toolset to determine customer preferences for product characteristics based on the customer's decision making.

The premise of CBCA is, that the total utility of a product is composed of part worth utilities for its attribute levels and that those parts worth utilities can be estimated from analyzing responses to adequately designed choice tasks as shown in Figure 1. A conjoint analysis utility function is typically additive, and the product attributes have a defined set of levels.



Figure 1 CBCA Choice Task

Source: Own illustration modified from Orme (2014).

While the traditional conjoint analysis asks the respondent to rate products separately and has its foundations in measurement theory, the CBCA respondents choose between choices under hypothetical scenarios that imitate the real world marketplace. Technically, CBCA is based on the behavioral theory of random utility maximization. As would be the case in the real world, respondents can choose not to purchase in a CBCA by selecting the "no choice" option (Orme, 2014, pp. 4, 45; Rao, 2014, pp. 5-6).

The decision towards choice-based conjoint analysis was made because of its considerable benefits, such as the ability to assess the utilities of product attributes and to quantify price sensitivity in a valid and reliable way.

One key idea of today's marketing is "target marketing". Often the entire market is very large and composed of highly heterogeneous groups of consumers. Thus, it is unlikely that companies will fulfill all given needs and wants with only one offering. By defining their target market, they can prioritize their marketing efforts solely towards those consumers that they have the best possibility of satisfying and thus tailor their offers selectively, thereby improving their competitiveness. Successful target marketing requires three phases, also known as segmentation, targeting and positioning (STP) (Runia, Wahl, Geyer, & Thewissen, 2007; Kotler & Keller, 2016):

(1) *Market Segmentation*: Determine distinct groups of potential customers, who vary in their needs and wants.

(2) Market Targeting: Choose one or more market segments to penetrate.

(3) *Market Positioning*: Establish, communicate and deliver the proper benefits of the company's products and services with each target segment.

The process of dividing markets into groups with similar needs and wants can be enhanced through a cluster analysis based on part worth utilities, a proven approach to identifying market segments quantitatively. A segment is a group of homogenous consumers. Whereas customers inside a particular segment share characteristic, they are very dissimilar to customers belonging to other segments. Hence, the aim of a cluster analysis is to identify groups of consumers seeking similar benefits or needs as indicated by the part worth utilities. There are several methods to form clusters, but the most relevant ones that were also used in this paper belong to the polythetic methods and are further distinguished between hierarchical and portioning cluster procedures (Mooi & Sarstedt, 2014).

## 3. Identification of a Differentiation Strategy

## 3.1 Design and Processual Realization of the Survey

Of 678 participants a total of 549 completed the survey. The first question, asking whether the participant is in possession of a smartphone, excluded 101 participants. The rest of the participants left during their session. However, when analyzing the data in detail, it became evident that some respondents did not take the necessary time to respond in a proper way. Hence, the decision was made to remove all participants with a survey completion time of less than 4.5 minutes and totally inconsistent answers. This approach reduced the total number of respondents by 19, down to a total of 530.

Apparently, a CBCA survey can easily take too long and, therefore, decrease the motivation of a participant. A typical suggestion is that up to 20 choice tasks are uncritical, while more may increase the random error (Orme & Johnson, 1996). The number of required choice tasks is typically dependent on the number of attributes and attribute levels which is why they have to be selected wisely. For this study, Table 1 shows the final set of attributes and their levels. It can be seen that each of the six attributes has four levels, apart from the brand attribute with five levels. Offering more than four manufacturers was decided mainly by the current market situation and Android's market share of approximately 75% in Germany. Based on the number of attributes and levels, the respondent faced 20 choice tasks with four choices per question (compare Figure 1).

Attributes		Levels						
Brand (Operating System)	Apple (iOS)	HTC (Android)	Microsoft (Windows)	Samsung (Android)	Sony (Android)			
Display size	Very small (4.0")	Rather small (4.5")	Rather large (5.0")	Very large (5.5")				
Thickness	Very thin (0.8 cm)	Rather thin (1.2 cm)	Rather thick (1.6 cm)	Very thick (2.0 cm)				
Weight	Very light (100 g)	Rather light (150 g)	Rather heavy (200 g)	Very heavy (250 g)				
Battery life	Very short (5 h)	Rather short (10 h)	Rather long (15 h)	Very long (20 h)				
Price	150 EUR	250 EUR	350 EUR	450 EUR				

Table 1 CBCA Attributes and Levels of the Survey

In addition to the choice tasks required for the CBCA, the survey, which is attached in the appendix, included other common types of survey questions, such as personal questions (e.g., gender, age) and habitual questions (e.g., frequency of recharging, use of protection case).

### 3.2 Quantitative Analysis of the Survey Results

As the total amount of 93 survey variables exceeds the purpose of this paper, only the most crucial statistics are going to be represented and explained in detail. However, the interested reader can contact the authors by e-mail for further information.

Clearly, the use of a smartphone has consequences for the effective battery life. As Figure 2 reveals, higher usage intensity results in a higher charging frequency, and most respondents charge their phone at least once a day. This becomes evident when comparing those using their smartphone as a classic phone with those regarding their smartphone as an integral part of life. Whereas the former's charging frequency is less than once a day, the latter have to charge their device at least once a day and even a quarter of them charge their device more than once a day.



righte 2 Connection between Usage Intensity and Frequency of Charging

However, it seems that a great number of smartphone users try to address the issue of daily charging by using an external battery. This is proven by Figure 3, showing that an increasing charging frequency results in the ownership of an external battery.



Figure 3 Connection between Charging Frequency and Ownership of an External Battery

A smartphone is often regarded as a precious device by its owner, which is undoubtedly proven by the share of respondents always using a case (69%) or using it frequently (11%). Furthermore, those figures demonstrate the general acceptance of thicker smartphones, since protection in most of the cases changes the dimensions of the device. However, the desire for protection depends heavily on the brand. Whereas the vast majority of Apple, LG

and Samsung owners use their case always or at least frequently, users of Microsoft, Sony or other brands care less. A reason for the latter could be the lower prices of such devices.

For the completed surveys, the CBCA also allows to measure the relative importance of each conjoint attribute (battery life, brand, display size, price, thickness, and weight) for each respondent. Each attribute can achieve an importance between zero (completely irrelevant) and one (solely important), but the total importance of all attributes has to be one. For instance, an individual importance score of 0.8 for the attribute brand leaves only 0.2 importance points to distribute amongst the other five attributes.

Comprehending the market structure and the requirements of possible segments requires that the aggregated importance of the attributes amongst all respondents be assessed. As the boxplots of Figure 4 illustrate, the market is somewhat homogeneous regarding attribute importance. Although there are outliers (represented by the dots in the boxplots), most respondents consider the brand, battery life and display size as most important. Compared with the latter, the device thickness and weight are relatively unimportant.

However, the aggregate ranking of battery life and brand depends on the emphasis on median (black horizontal line) or mean (white check). Considering the former, battery life is more important, whereas the latter implies that brand is on average more relevant. As the boxplot for battery life is comparatively shorter than the one for the brand, it can be assumed that there is amongst the respondents a higher level of agreement towards the importance of battery life than of brand.



Figure 4 Measured Importance for Conjoint Attributes

## 3.3 Identification and Characterization of the Segments

The clustering was solely based on the utilities as measured by the CBCA, and several types of clustering methods were explored to define the most reasonable segmentation. However, as hierarchical methods, such as average linkage and Ward, did not offer reliable and intelligible segments, the popular k-means method with a Euclidean proximity measureand an aimed five cluster solution was finally used.

The means of the utilities for each segment helped to identify typical need-based characteristics for each of the five segments. However, a further analysis of the segments revealed that it would be reasonable to split one segment, which was labeled "Brand Evangelist" consisting of 18% of the participants into three sub-segments: (1) Apple Fans, (2) Samsung Fans, and (3) Other Fans. The latter holds only ten respondents focusing on the Android System and wasneglected in the further analysis, but the Apple and Samsung fans show strong support for their brand. For them, choice behavior was clearly driven by their favorite brand.

The second segment identified by the k-means approach was the one representing the price conscious consumers, who chooseprimarily by looking at the price. For them, a lower price implies amassively higher total utility. However, this segment is still of a moderate size with 24% of all respondents.

Finally, three segments closely related to each other, holding 58% of the 530 respondents, were separated. Customers of these segments consider several product attributes when purchasing a smartphone. On paper, these segments were grouped as "Product Characteristics Focused" (PCF). The largest segment (30%), PCF 1, receives its greatest utility through a large display. The second biggest segment, PCF 2, half of the proportion of PCF 1, consists of consumer valuing longer battery life within light weighted devices. Customers of the smallest segment, PCF 3 (13%), receive their greatest utility by a device with long battery life, a large display, and a thin case. The final segmentation, consisting of seven segments, is illustrated in Figure 5.



Figure 5 Final Segmentation (with Proportions)

A further comparison demonstrates, even more, the similarities and dissimilarities between the clusters. The purpose of this paper was to discover whether smartphone users desire longer battery life and would accept a trade-off towards weight and thickness. As Figure 6 demonstrates, for the three PCF segments this is, to some extent, the case. Especially the two largest PCF segments, 1 and 2, rank battery life critical at 25% and 26% attribute importance respectively. Whereas PCF 3 still values the importance of a great battery life above 20%, the price conscious segment rates it as crucial as the brand.



Figure 6 Importance of Conjoint Attributes within Clusters

However, by comparing the segments through other variables (e.g., demographics), some more subtle characteristics were revealed. Consumers of segment PCF 3 seem to change their device more frequently than others, whereas a considerable proportion of Apple Fans and PCF 2 customers use devices that are older than three years. Despite the latter, three quarters of the Apple and PCF 3 clusters view their device as an integral part of their life, in contrast to the price conscious users with less than 50 percent. A few consumers using their smartphone mainly for business are distributed amongst Apple Fans, price conscious consumers and the respondents of PCF 1 and 2.

# 4. Conclusion

The smartphone market is a rapidly evolving one. Every year many new devices appear but the reality is that very few of them are profitable, and some companies are even struggling to survive. Looking at the biggest players, we see that Apple has been tremendously successful, leaving behind all competitors. However, even Samsung, the other major player, struggles to maintain profitability and is steadily losing ground to emerging companies, mainly from China and India. And all other smartphone manufacturers have lost money in 2015.

The variables that influence a person's choice of smartphone are many, and not all could be covered in this paper. However, it is apparent from this research that one critical variable that consumers do seek is a device with a longer battery life. Specifically, the majority of respondents would prefer a device that is almost twice as thick as the current average smartphone, if the additional space would just be filled with standard battery components.

Lately, Apple released the new iPhone model, the iPhone 6s. While this device is thicker than the previous version, its battery capacity stayed the same. Apple has achieved lower energy consumption in the 6s by enhancing the efficiency of its components, but this is not sufficient to truly increase battery life. The reality of contemporary battery technology means that battery capacity cannot be significantly increased without increasing the battery dimensions to achieve longer duration on one charge. This, of course, implies thicker or larger and heavier devices.

The quantitative evidence in this paper would seem to suggest that challenged companies, such as Microsoft or most Android manufacturers, need to differentiate themselves from Apple products by offering devices that stand out regarding battery lifetime, as well as satisfying all other consumer requirements. Such an approach would be a way out of declining competitiveness and market share in the highly competitive smartphone environment.

## References

9to5 Mac (2015). "Results: 60% want Apple to thicken the next iPhone to improve battery life", accessed 08 06, 2015, available online at: http://9to5mac.com/2015/02/25/results-users-want-apple-to-thicken-the-next-iphone-to-improve-battery.

Apple Inc. (2007). Apple Reinvents the Phone with iPhone, San Francisco: Apple Inc.

Deloitte (2015). Smartphone Batteries: Better But No Breakthrough, London: Deloitte Touche Tohmatsu Limited.

Dey A. K., Ferreira D. and Kostakos V. (2011). "Understanding human-smartphone concerns: A study of battery life", in: K. Lyons, J. Hightower, & E. Huang (Eds.), *Pervasive Computing*, Heidelberg: Springer Verlag, pp. 19-33.

Froehlich A. (2015). "Smartphone OS: A 22-year history", accessed 08 05, 2015, available online at: http://www.informationweek.com/mobile/mobile-applications/smartphone-os-a-22-year-history/d/d-id/1319495?image\_number=7. IDC (2015). Worldwide Quarterly Mobile Phone Tracker, Framingham: IDC Corporate USA.

Kotler P. and Keller K. L. (2016). Marketing Management (15th Global ed.), Harlow: Pearson Education Limited.

Leather A. (2013). "Why battery life should be the new smartphone battleground", accessed 08 13, 2015, available online at: http://www.forbes.com/sites/antonyleather/2013/12/13/why-battery-life-should-be-the-new-smartphone-battleground.

Martin T. (2014). "The evolution of the smartphone", accessed 08 10, 2015, available online at: http://pocketnow.com/2014/07/28/the-evolution-of-the-smartphone.

McCarty B. (2011). "The history of the smartphone", accessed 08 11, 2015, available online at: http://thenextweb.com/mobile/2011/12/06/the-history-of-the-smartphone.

Mooi E. and Sarstedt M. (2014). A Concise Guide to Market Research (2nd ed.), Heidelberg: Springer-Verlag Berlin Heidelberg.

Orme B. K. (2014). Getting Started With Conjoint Analysis (3rd ed.), Manhattan Beach: Research Publishers LLC.

Orme B. K. and Johnson B. M. (1996). *How Many Questions Should You Ask in Choice-Based Conjoint Studies?* Sequim: Sawtooth Software, Inc.

Rao V. R. (2014). Applied Conjoint Analysis (1st ed.), Berlin: Springer.

Runia P., Wahl F., Geyer O. and Thewissen C. (2007). *Marketing: Eineprozess- und praxisorientierte Einführung* (2.Ausg.), Munich: Oldenbourg.

The Huffington Post (2015, 03 02). "The Huffington Post", accessed 08 06, 2015, available online at: http://big.assets.huffingtonpost.com/toplines\_HP\_smartphone\_20150302.pdf.

Westaway L. (2015). "Smartphone innovation at MWC shows there's life in the old dog yet", accessed 08 06, 2015, available online at: http://www.cnet.com/news/smart-players-find-new-twist-on-the-smartphone-at-mwc-2015.

#### Appendix

Survey:

#### **Text 1: Introduction**

Question 1: Smartphone ownership

Do you own and use a smartphone currently?

(1) Yes (2) No (3) Not sure

#### Question 2: Brand of the current main smartphone

What is the brand of your current smartphone? If you possess more than one device, choose the brand of the most frequently used one. (1)  $A = \frac{1}{2} \sum_{i=1}^{n} \frac{1$ 

(1) Apple	(2) BlackBerry	(3) HTC	(4) L	.G	(5) Microsoft	
(6) Motorola	(7) Nokia	(8) Samsı	ıng	(9) Sony	(0) Other brand,	
Question 3: Peri	iod using the current s	martphone				
How long have y	ou been using your curr	rent Smartphone?	1			
(1) Since 2015	(2) Since 2014	(3) Since 2013		(4) Since 2	(5) Since 2011 or earlier	
Question 4: Sati	sfaction with the curre	ent Smartphone	(NPS s	scoring)		
How likely is it y	ou would recommend v	our smartphone	to a frie	end?		

 (0)
 (1)
 (2)
 (3)
 (4)
 (5)
 (6)
 (7)
 (8)
 (9)
 (10)

 Extremely unlikely

 Extremely unlikely

#### **Question 5: Smartphone usage intensity**

Which of the following statements describes your smartphone usage intensity best?

(1) My smartphone is an integral part of my life. I use a great variety of different functionalities.

(2) I use my phone mainly for phone calls and messages. Additional functionalities, such as emails and browsing, are supplementary.

(3) I use my smartphone likea cell phone. Most typical smartphone functionalities are not important tome.

Question 6: Frequency of use of several smartphone functionalities

How frequently do you use your smartphone for the following activities?

	Almost never	Almost monthly	Almost weekly	Almost daily	Several times a day	Do not know
Games	(1)	(2)	(3)	(4)	(5)	(6)
Browsing	(1)	(2)	(3)	(4)	(5)	(6)
Music or Videos	(1)	(2)	(3)	(4)	(5)	(6)
Navigation or Maps	(1)	(2)	(3)	(4)	(5)	(6)

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Messaging	(1)	(2)	(3)	(4)	(5)	(6)
Phone	(1)	(2)	(3)	(4)	(5)	(6)
Creating and modifying Pictures or Videos	(1)	(2)	(3)	(4)	(5)	(6)
Social Media	(1)	(2)	(3)	(4)	(5)	(6)

Text 2: Introduction Choice-based conjoint analysis

Text 2.1: Explanation of the attribute "screen size"

Text 2.2: Explanation of the attribute "thickness"

Text 2.3: Explanation of the attribute "weight"

Text 2.4: Explanation of the attribute "battery lifetime"

Text 2.5: Explanation of the attribute "price"

## **Conjoint-Rating Question 1: Brand**

Please rate the following attributes in terms of how desirable they are.

	Undesirable	Somewhat desirable	Very desirable	No Opinion
Apple (iOS)	(1)	(2)	(3)	(4)
HTC (Android)	(1)	(2)	(3)	(4)
Microsoft (Windows Phone)	(1)	(2)	(3)	(4)
Samsung (Android)	(1)	(2)	(3)	(4)
Sony (Android)	(1)	(2)	(3)	(4)

## **Conjoint-Rating Question 2: Screen size**

Please rate the following attributes in terms of how desirable they are.

	Undesirable	Somewhat desirable	Very desirable	No Opinion
Very small (4.0 ")	(1)	(2)	(3)	(4)
Rather small (4.5 ")	(1)	(2)	(3)	(4)
Rather large (5.0")	(1)	(2)	(3)	(4)
Very large (5.5")	(1)	(2)	(3)	(4)

## CBC Analysis (20 selection situations)

If you were in the market to purchase a smartphone today, and if these were your only alternatives, which would you choose?

Brand (Operating System)	Apple (iOS)	HTC (Android)	Microsoft (WP)	Apple (iOS)	
Display size	Very small (4.0")	Rather small (4.5")	Very large (5.5")	Very large (5.5")	
Thickness	Very thin (0.8 cm)	Rather thin (1.2 cm)	Rather thick (1.6 cm)	Very thick (2.0 cm)	choices, I'd defer my purchase.
Weight	Rather light (150 g)	Rather light (150 g)	Rather heavy (200 g)	Very heavy (250 g)	
Battery life	Very short (5 h)	very short (5 h)	Rather long (15 h)	Very long (20 h)	
Price	250 EUR	150 EUR	250 EUR	450 EUR	
	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	0

## **Question 7: Reason for smartphone usage**

For what purpose do you use your smartphone?

(1) Solely private (2) Predominantly private

(4) Predominately business (5) Solely business

**Question 8: Monthly smartphone budget** 

(3) Counterbalanced

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How much do you spend onyour smartphone over the course of one month? Please consider the costs for feasible contracts, apps and the smartphone itself. (1) Up to 10 EUR (2) 10 to 20 EUR (3) 20 to 30 EUR (4) 30 to 40 EUR (5) 40 to 50 EUR (6) More than 50 EUR (8) Don't know (7) Don't know, because someone else, for example employer, pays. Question 9: Frequency of recharging How often do you charge your smartphone on an ordinary day? (1) More than twice a day (2) Twice a day (3) Once a day (4) Less than daily Question 10: Ownership of an external battery Do you possess an external battery to charge your smartphone on the go? (1) Yes. (3) No, but I have the intention to purchase one. (2) No. (4) No, and I have no clue about external batteries. Question 11: Use of protection case Do you use a cover/case to protect your smartphone? (2) Yes, sometimes. (3) No. (1) Yes, always. **Question 12: Participant age** Please specify your age by selecting the appropriate age group. (3) 26 to 35 (4) 36 to 45 (5) 46 to 55 (1) Younger than 18 (2) 18 to 25 (6) 56 to 65 (7) Older than 65 (8) No answer **Question 13: Participant gender** Please specify your gender. (1) Female (3) No answer (2) Male **Question 14: Occupation** Please specify your occupation by selecting the appropriate option. (1) Student or apprentice (2) Employee (3) Manager (4) Self-employed (5) Civil servant (6) Housekeeper (7) Retiree (8) Job seeking (9) Other