THE POTENTIAL OF REFURBISHED SMARTPHONES - AN INVESTIGATION IN AUSTRIA

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Abstract. Short life cycle products as smartphones face high replacement rates pointing out the need of finding ways to reuse existing phones in order to combine sustainability and profitability. Refurbishment is known as an end-of-life strategy which allows prolongation of a mobile phone's lifespan. Since the acceptance of refurbished products in Austria is little explored yet, this research aims to gain valuable insights into Austrian customers' perceptions of refurbished smartphones by adopting a quantitative approach. Thus, the potential of selling those devices within the country should be investigated. This research maps drivers and barriers that consumers associate with refurbished smartphones. Besides, by testing the effectiveness of specific pre-selected incentives, marketers will be supported in setting measures to market refurbished smartphones in Austria.

Keywords: Refurbishing; Circular economy; Smartphones

1 INTRODUCTION

An enormous global quantity of e-waste is generated annually, in 2019 alone more than 53 million tons accrued, of which approximately 10 percent originated from smartphones [1]. Estimations show that the amount will exceed an alarming 74 million tons in 2030 whereas the recycling rate is not keeping up with the growth of e-waste [2].

In 2020, 83 percent of people over 15 years owned a smartphone in Austria [3]. This is one of the largest values in Europe compared to smartphone usage rates in other countries like Germany (77.6 percent) and the United Kingdom (78.4 percent) in the same year [4].

The Austrian chamber of labor published that mobile phones in Austria are used for approximately 18 to 24 months. This behavior is generated through controlled demand with mobile phone contracts where new phones of original equipment manufacturers are subsidized every second year [5]. But fast replacement rates due to market strategies are

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unsustainable and lead to avoidable waste [6]. From a climate change perspective, the lifespan should achieve at least 25 years to amortize ecologically [7].

Additionally, Weder, Hübner, & Voci [8] discovered that smartphones in Austria turned from being special to being a "normal" commodity. A broken display, a faulty battery or insufficient speed, as well as the lack of software-support, are by far the most important reasons for buying a new device.

Refurbishment is seen as a key strategy to extend the lifespan of a product [9]. Refurbished products are used products which are restored to a defined working condition before they are resold to consumers. In the refurbishing process, damaged components or parts which are close to failure get replaced in order to sell a product in a good working condition [10].

The high usage rate as well as the duration of smartphone usage in Austria, which must be extended in order to sustainably protect the environment, highlight it is vital to explore Austrian customers' perceived risks and benefits associated with refurbished smartphones.

Therefore, the following two research questions will be answered in this research:

1. Which risks and benefits do Austrians associate with refurbished smartphones?
2. How effective are specific pre-selected incentives to increase customers' purchase intention?

2 METHOD

Prior research of van Weelden et al. [11] is based on a semi-structured in-depth interview which provides information about individual perspectives and experiences of customers. Later, Mugge et al. [10] empirically tested selected incentives (which were identified by using the decision-making model and the theory of perceived risks and benefits) to face the difficulties in the customer´s decision-taking function. In order to test the validity of that study and to investigate customers in Austria, this paper aims to replicate the work of Mugge et al. [10].

To have comparable results, this research also relies on a quantitative method as in the study of Mugge et al. [10]. The quantitative method was identified as the ideal method as there is specific knowledge available due to prior research [12].

The aforementioned research questions are aimed to be answered with collected data through an online survey. The online survey is determined as the most suitable way to conduct the research as smartphone users are reached directly and quickly [12]. This method allows data collection from a large number of respondents and also applies for

reaching spatially dispersed people, which is essential in this study as it addresses people in different regions of Austria.

All smartphone-using Austrians in the age rage 18 to 65 are part of the target audience. The author aims to reach a sample of at least 150 to 300 respondents which is recommended by Berger-Grabner [13].

In order to achieve representative results, the method of quota sampling will be applied in this research. The target population will be divided into specific groups and an individual quota for each unit will be calculated based on relevant data. To enable representative statistical analyses, the author then ensures sufficient responses in each quota [14].

Based on census data published by Statistik Austria percentage quota on the population should be determined. The division of the intended sample into single quota shows how the return rate per defined group should be [15]. For this study the author applies the quotas age and gender.

As Saunders et al. [14] demonstrate, the language depends largely on the nature of the people the author is addressing. Hence, the survey in this study will be created in German.

The survey in this study will be divided into four sections which should give extensive insight into the following aspects:

1. The effects of awareness, risks, and benefits
2. The impact of proposed incentives
3. The individual personality differences
4. The demographics of respondents

The mentioned pre-selected incentives, which are tested on the population of Austria for the first time, are derived by Mugge et al. [10] from previous relevant literature.

After data collection the data evaluation takes place. At first, the author conducts univariate evaluation where every variable is examined individually. In this step, mean values and standard deviations should be analysed, after which a first overview of the data structure should be given [15].

In the second step, bivariate evaluation is implemented. In this step, correlations between variables are tested and hypotheses are checked [13]. Both the variance and regression analysis are identified as appropriate tools for this research.

Thirdly, all responses are assigned into clusters, whereby differences between customers can be investigated. Cluster descriptions should then give summarized information about

the customers assigned to the group. Based on those insights, companies can successfully set specific measures to address those different customer groups individually.

3 CONCLUSION

Little is known about consumer's acceptance of refurbished smartphones and circular products in general. Therefore, this research should fill the gap and give information about specific customer groups in Austria, based on quantitative data. The gained insights should support companies in decision making to fit consumer interests.

4 REFERENCES

[1] M. Chatterji, "Repairing – not recycling – is the first step to tackling e-waste from smartphones. Here's why," *World Economic Forum*, 2021. [Online]. Available: https://www.weforum.org/agenda/2021/07/repair-not-recycle-tackle-ewaste-circular-economy-smartphones/.

[2] V. Forti, R. Kuehr, G. Bel and C. P. Baldé, "The Global E-waste Monitor 2020 – Quantities, flows, and the circular economy potential," *E-waste Monitor*, 2020. [Online]. Available: https://ewastemonitor.info/gem-2020/.

[3] "Anteil der Smartphone-Besitzer sowie Nutzung von Mobile Commerce in Österreich von 2013 bis 2020," *Statista*, 2021. [Online]. Available: https://de.statista.com/statistik/daten/studie/568185/umfrage/smartphone-besitz-und-smartphone-nutzung-in-oesterreich/.

[4] "Global Mobile Market Report 2020," *Newzoo*, 2020. [Online]. Available: https://resources.newzoo.com/hubfs/Reports/2020_Free_Global_Mobile_Market_Report.pdf?utm_campaign=Global%20Mobile%20Market%20Report%202020&utm_medium=email&_hsmi=95373037&_hsenc=p2ANqtz-9sxcYn92z5AsVVFZqGH_v7zhlt1cXR_O2BJbz8kxvSlTDllHGv5l6Gzgv6Mso2G2csCNm

[5] "Handy-Lebensdauer," *Arbeiterkammer*, 2020. [Online]. Available: https://www.arbeiterkammer.at/interessenvertretung/umweltundverkehr/umwelt/abfall/Handy-Lebensdauer.html.

[6] "Is your phone really smart?," *UNEP*, 2019. [Online]. Available: https://www.unep.org/news-and-stories/story/your-phone-really-smart.

[7] "Coolproducts don't cost the Earth - Report.," *EEB - The European Environmental Bureau*. [Online]. 2019. Available: http://www.eeb.org/coolproducts-report.

[8] F. Weder, R. Hübner and D. Voci, “Ist nachhaltig "normal"?,” in *Reparieren, Selbermachen und Kreislaufwirtschaften*, Springer VS, 2021, pp. 151-173.

[9] T. S. Wallner, L. Magnier and R. Mugge, „An Exploration of the Value of Timeless Design Styles for the Consumer Acceptance of Refurbished Products,“ *Sustainability*, vol. 12, 1213, 2020.

[10] R. Mugge, B. Jockin and N. Bocken, “How to sell refurbished smartphones? An investigation of different customer groups and appropriate incentives,” *J. Clean. Prod.,* vol. 147, pp. 284 - 296, 2017.

[11] E. van Weelden, R. Mugge and C. Bakker, “Paving the way towards circular consumption: Exploring consumer acceptance of refurbished mobile phones in the Dutch market,” *J. Clean. Prod.*, vol. 113, pp. 743-754, 2016.

[12] H. Klandt and S. Heidenreich, *Empirische Forschungsmethoden in der Betriebswirtschaftslehre: Von der Forschungsfrage zum Untersuchungsdesign*, *eine Einführung*. De Gruyter Oldenburg, 2017.

[13] D. Berger-Grabner, *Wissenschaftliches Arbeiten in den Wirtschafts- und Sozialwissenschaften*, Wiesbaden: Springer Gabler, 2016.

[14] M. N. K. Saunders, P. Lewis and A. Thornhill, *Research Methods for Business Students*, New York: Pearson, 2019.

[15] J. Raithel, *Quantitative Forschung*, Wiesbaden: VS Verlag für Sozialwissenschaften, 2008.