


Article

# Decision-Making Process Regarding the Use of Mobile Phones in Romania Taking into Consideration Sustainability and Circular Economy

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**Abstract:** Nowadays, the use of smartphones has become essential for daily activities that have either a personal or professional purpose. A large number of resources is necessary for both the production and the use of these devices, which means that solutions in terms of sustainability are needed. The purpose of this research is to highlight the concept of sustainability when talking about smartphones, as well to underline the possibilities that exist for the consumers. This study examines the habits of young consumers in Romania, the reasons behind a mobile phone replacement, and the factors that influence the purchase decision. The methodology section follows quantitative and qualitative market research. An analysis was performed in order to have a deep understanding of trends in terms of mobile phone ownership and preferred brands. This study also provides a general view on the neglectfulness of the young population of Romania regarding the dangers to which the environment is exposed because of the purchasing habits that go against sustainability. For accomplishing this purpose, important results have been discovered through the analysis of the data obtained from self-administered questionnaires and interviews. The results show that people are usually using only one mobile phone at a time and they change it once every two years for sustainability and financial reasons. The same applies when it comes to choosing a certain brand. The reasons behind the purchase of a new phone and the decisions regarding an old one are based on healthy principles of the circular economy and sustainability. The preferences in terms of technology and design, and the decision process are correlated with incomes.

**Keywords:** mobile phones; technology; sustainability; usage patterns; end-of-life devices; awareness

## 1. Introduction

The use of the mobile phone in today's society is crucial. Its role goes beyond the simple need to communicate for a personal and professional purpose, as its users can be located anywhere in the world. In addition to this, there is a constant need to have immediate and very easy access to different applications, such as social networks, transport, online banking, dating applications, games, applications that track sports activities, and generally, any type of application that exists for each of the activities that people have during the day. In 2016, an online statistical database claimed that from the 80% of the people in the EU aged between 16 and 74 years who were using the Internet, almost 80% of them were going online via a mobile phone or a smartphone [1]. According to Statista [2], the usage rate of smartphones in Romania has increased from 34% in 2014 to 60% in 2017 [2]. Nowadays, the Global Media Intelligence Report 2019 emphasizes the fact that 95.4% of the Internet users in Romania aged between 16 and 64 years have had a smartphone in the first half of 2019 [3].

Mobile phones registered an acceptable retail volume growth in 2019 that was driven by smartphones. There is a change in how Romanians view their smartphones, which are no longer perceived as essentially communication devices, but rather as products used for internet browsing and multimedia. Meanwhile, professionals are increasingly using smartphones for business purposes; thus, 4G technology is also perceived as an indispensable feature. Premium models recorded the strongest growth in 2019.

Smartphones that have screens larger than 5.5 inches were in higher demand in 2019, as customers have a preference for larger screens when utilizing their smartphones as media devices to stream movies and other audio-visual content or simply to browse the Internet. As rapid Internet speeds continuously become more widely available and 5G is set to appear early in the forecast period, this type of usage of smartphones will undoubtedly increase, leading to an ever-stronger demand for larger screen sizes [4].

However, businesses are under pressure to develop the quality of their products, with a focus on cost reduction [5], to meet the demands of customers and remain profitable within a highly competitive environment [6]. Telecommunication companies were among the first firms to face significant challenges such as strong competition because of the ever-changing business environment [7,8]. This strong competition drives mobile service providers to introduce new services, offers, and packages to gain new customers and to achieve high levels of customer loyalty. In Romania, the number of mobile phone users is fast growing. According to Newzoo [9], the number of smartphone users was 10.5 million, which represents a 53.8% smartphone penetration rate. The brand attachment of the consumers with regard to their smartphones is important, and Romanian people usually care about the brand they are using. Furthermore, they are also more preoccupied with personalizing their mobile devices [10]. Samsung remained the well-established category brand leader in 2019, offering a wide portfolio comprised of low-, mid-, and high-priced terminals. Samsung mobile phones are intensely advertised, have good distribution, and are considered as “must-haves” by many consumers [11]. As learned in a previous study, Romanian people have a tendency to seek alternatives to similar products abroad and not buy local [12].

Apple’s iPhones recorded a strong growth in smartphones in 2019, as the company increased its presence in Romania by opening a subsidiary in the country and announcing its plans to open a new showroom/service center. The Huawei brand retained its second position in smartphones, although it is losing its share. The brand probably suffered from negative perceptions due to its issues with the US government, although it is attempting to counter this with aggressive advertising and increasing its distribution [13].

There is a growing process with regard to the evolution of the mobile market in Europe, while the rules assuring safety are not developing as fast as they should [14]. The production processes as well as the usage of different devices have more and more impact on our planet. A study conducted in many countries showed that the decision-making process is based more on economic and functionality reasons than on sustainability [15]. Romanian people should take the sustainability aspects more into consideration. According to Euromonitor International [16], Romania did not succeed regarding the collection of electrical waste. “The electronic equipment rates showed great differences between Romania and other countries, as only 1.6 kg of electrical waste per inhabitant was collected” while the average in the EU is 8.9 kg. This kind of waste is really dangerous for the environment [13]. The battery of the mobile phone is the most dangerous element in terms of materials, and by simply throwing it away, the groundwater, soil, and air get contaminated. The recycling of just one mobile phone means enough energy saving to charge a laptop for 44 h [17].

Globalization is driving a new form of economic environment, in which the modern digital economy is harmoniously integrated with the social responsibility of corporations for sustainable development [18]. Sustainability is a trend reflected nowadays both at the global level and at the European Union level [19]. The challenges brought about by globalization and the excessive pollution

of the environment that contemporary companies have had to face require the implementation of new business models and a rethinking of the strategic approach of their activities [20].

In the last two decades, there has been an increase in the consumption of equipment with a short life cycle such as mobiles [21]. The increasing importance of smartphones is also visible in Romania; they are generally used to access the Internet and multimedia. They are also very present in the business environment thanks to the 4G technology, which is considered a key factor. In 2019, a remarkable growth was seen in the number of sales for models considered premium thanks to different promotions linked to subscriptions or other factors: “Smartphones register 5% retail volume growth to reach 5.2 million units in 2019”. Meanwhile, the popularity of basic cell phones has continued to decrease, and they are now used by certain categories of the population, for example by older people: “feature phones record a 17% retail volume decline to reach 260,900 units in 2019” [16]. The same source mentions that people prefer to buy smartphones with larger screens in order for it to be easier to watch movies or other visual content.

A new Circular Economy Action Plan has been adopted by the European Commission. Its aim is to stop the waste and to eliminate the need to use resources in a continuous way. The new plan is encouraging the development of a sustainable Europe in order to preserve the resources as much as possible and manage every step in the lifecycle of a product. Sustainable products come with sustainable consumption. This initiative focuses on the economic segments that are using a lot of resources and on the products that have a big potential to be reused [22].

The introduction of the circular economy (CE) policies in the main regions of the global economy aroused interest in this concept. The CE concern has enhanced significantly in the last years [23]. For the European Union, it brings the opportunity of promoting environmental benefits, durable economic growth, job creation, and added value. Therefore, it aids all three pillars of sustainability simultaneously.

The circular economy conceives waste as an economic opportunity that has been widely overlooked by organizations and entrepreneurs. This negligence becomes more substantial every day as society grows, creating more and more concern about the environment [24].

The circular economy model recommends that waste should not just be reduced, but also cycled back into the manufacturing processes. Hence, studies of circular economy policies focus mainly on waste treatment, comprising production process-based ways to eliminate waste [25].

According to Vorosmarty and Dobos [26], one of the green purchasing practices is the collection and reuse of used materials or products, the reuse of defective products, the sale of excess inventory and materials, and the sale of scrap and used material. A study has been conducted by [27] including interviews with Dutch people in order to have an overview of consumers’ opinions on reconditioned mobile phones. Four major problems were against the popularity of refurbished mobile phones: people were not informed about this possibility; they believed phones may have technical problems; there is not an instant availability of this type of phone, which ensues too much effort; and there is a difference in the level of pleasure between buying a refurbished phone and a new one. Saving money was mentioned as a big advantage, while the environmental aspect was not given too much importance. Another interesting point is that the refurbished mobile phone has to be promoted at a correct price. A bigger price may be disadvantageous in comparison with a new mobile phone, while a price that is too small is translated as a lack of trust from the customer’s side [28].

From the point of view of the sustainability of a business, companies and entrepreneurs could implement the refurbishing of smartphones and sell them in stores or online among the other areas. A good example in Romania is a start-up called Fenix.eco that trades refurbished smartphones without affecting their quality level. Their goal is to provide the same benefits to customers as if they were purchasing new smartphones. These benefits include good experience, quality, and 12 months guarantee at secondhand prices. “The global market for secondhand smartphones is expected to surge from USD 27 billion in 2019 to USD 67 billion in 2023” [29]. However, there is a lack of legislative framework regarding green labeling that can affect this branch in the long term [30].

More consumers, entrepreneurs and companies should take into consideration the degree of sustainability at the same time with the development of technology. They have to not get carried away by aspects such as brand, design, or technical specifications of new smartphone models that offer the same features as the old ones. In order to be more sustainable, different components of the mobile phones could be easily changed with better ones. Instead of changing the entire phone, parts of it could simply be replaced with performant ones. Companies and entrepreneurs should implement these practices within their businesses by offering their employees refurbished smartphones, laptops, tablets and other necessary work gadgets and devices. Through the adoption of these practices, the smartphones' level of quality will be increased, being utterly unnecessary to change them in such a short time. [31] State that pricing is the sum of money paid for a product or service and often influences customer-buying decisions. [32] Propose that price is the monetary rate for a client to purchase services or products. Therefore, customers purchasing decisions are price dependent, particularly in the mobile phone sector [33]. Ref. [34] state that customers are highly motivated by the service price. Customers perceive the price value of different alternatives, as a basic determinant of their purchasing decision. As such, customers may choose their mobile phone service provider based on the perceived value for money [35]. They might also alter their service providers because of price related issues, such as if the price is considered very high, or because the pricing practice is deemed to be misleading [36].

Innovative technologies in cellular networks and telecommunication are the major controllers of the mobile businesses. Mobile service providers have grasped prospects associated with technological insurgency. The term "innovation" could refer to the foundation or the development of new products or services, likewise to the improved efficiency of those products in order to build up a valuable customer experience [37]. According to Kungu, Desta and Ngui [38], innovation is the practice whereby new thoughts and concepts are converted into sustainable value-creating outcomes. Recently, [39] maintain that innovation has three main dimensions, such as: new service ideas, new service processes, and new technological systems that proved to be useful in describing the diversity of service innovations. These dimensions can be employed as performance indicators regarding service innovations, and also suitable as performance measurement variables. Bearing this in mind, there is still a need to better understand the role of innovation as an important antecedent construct of service success [39,40].

## 2. Materials and Methods

The purpose of this research is to find out how many people are interested in adopting sustainable behaviors when purchasing or utilizing mobile phones. The present research answers the question: Are people open to sustainable habits in terms of decision-making process?

In order to find out, a quantitative and a qualitative research was conducted. For the quantitative research, a questionnaire with a random sampling of 1500 people was used, from whom 363 people responded. The research survey was self-administered, and respondents have chosen voluntarily to answer the total number of 12 questions. We shared the questionnaire online, on Facebook, WhatsApp and email, between the months of April and September 2020. The questions were addressed mainly to groups of people who spend considerable time online on social networks. For the qualitative research, an online interview was conducted on Skype. There were 15 participants selected from the questionnaire respondents, who participated voluntarily. The number of addressed questions were 3, and the duration of the interview was 60 min.

## 3. Results

This study was divided as follows: dependent variables and independent variables were prepared, two hypotheses were proposed in order to be refuted or co-confirmed based on the management of scientific research methods, and a survey methodology, i.e., questionnaire and interview, was used. The research objectives are presented as follows:

General objective: Studying the interest regarding sustainability when purchasing or utilizing mobile phones in the context of circular economy.

Objective 1: Observing consumers' behaviors and habits regarding procurement and usage of mobile phone devices.

Objective 2: Understanding the degree of sustainability that consumers apply with regards to mobile phones.

In order to realize the two hypotheses, the method of empiricism was indispensable, i.e., the study of the theory, and the schematization of the elements useful for delimiting the research field.

**Hypothesis 1:** *The more attracted consumers are to sustainability, the more their purchasing behavior will change in a sustainable way.*

**Hypothesis 2:** *Differences in gender, age, area, income, and professional status have a different impact on purchasing and usage behavior with regards to mobile phones.*

### 3.1. Description of the Utilized Data

The questionnaire is the most widely used research method because it has many advantages such as short data collection in terms of time.

The survey itself includes all the questions embedded as items, with numbers from 1 to 12. The structure of the survey was as follows: 1 question with a nominal scale, and 11 questions with an ordinal scale.

In order to calculate the sample size, the formula of Mureşan P. was used:

$$n = \frac{t^2 \times p(1-p) \times N}{t^2 \times p(1-p) + \Delta^2 \times N} \quad (1)$$

where  $n$  is the volume of the representative sample;  $t$  the coefficient of the significance test;  $p$  the incidence of the phenomenon;  $N$  statistical totality;  $\Delta$  maximum allowed error;  $1-p$  the incidence of the phenomenon [41].

In the present research, the 95% probability of guaranteeing the survey results, for which  $t = 1.95$ , and a margin of error of  $\pm 5\%$ , were taken into account. The value recorded for  $p$  is 0.7.  $N$  represents the resident population of Romania of 19 414 458 inhabitants, according to the National Institute of Statistics of Romania (INS). Taking into account this information, a sample size of 319 respondents was obtained, by applying Mureşan's formula:

$$n = \frac{1.95^2 \times 0.7(1-0.7) \times 19414458}{1.95^2 \times 0.7(1-0.7) + 0.05^2 \times 19414458} = \frac{15502930}{48537} = 319 \quad (2)$$

To be representative, the sample must have 319 respondents. As mentioned above, the questionnaire was distributed to 1500 people at random, of which 363 responded.

The sample is significant because it takes into account Mureşan's formula for  $n$  calculated at 319. The number of respondents is of 363 people.

According to the National Institute of Statistics [42], the total number of persons living in Romania is 19,414,458, from whom, 10,455,362 live in the urban area, 8,959,096 live in the rural area, 9,914,008 are women, and 9,500,450 are men [42]. The respondents' data are in concordance with the details provided by the NIS (The National Institute of Statistics in Romania).

Interpreting the structure of the research sample by gender according to Table 1, the respondents are distributed as follows: 53.2% belong to the female gender, 46.8% belong to the male gender, which indicates that both percentages are close to relatively 50%, with there being more female respondents. In numerical form, there were 193 responses from females and 170 responses from males.

**Table 1.** General information about the respondents.

Gender		Age	
Feminine	53.2%	<18 years	2.8%
Masculine	46.8%	Between 18–24 years	18.5%
		Between 25–34 years	55.4%
		Between 35–44 years	14.9%
		Between 45–54 years	5.8%
		Between 55–64 years	1.4%
		>64 years	1.4%
Area		Monthly average income	
Urban	93.1%	<2500 RON	18.2%
Rural	6.9%	2500.1–3000 RON	6.3%
		3000.1–3500 RON	8.5%
		3500.1–5000 RON	39.9%
		>5000 RON	27%
Professional status		Monthly average income	
Pupil/Student	16%	<2500 RON	18.2%
Employee	55.6%	2500.1–3000 RON	6.3%
Freelancer/Entrepreneur	24.8%	3000.1–3500 RON	8.5%
Unemployed	1.9%	3500.1–5000 RON	39.9%
Retired	1.7%	>5000 RON	27%

Source: Authors' own research

With regards to the distribution of the sample by age groups, the highest percentage of 55.4%, or 201 respondents is given by the category of persons aged 25–34 years, followed by persons aged 18–24 years, percentage of 18.5% or 67 respondents, followed by the respondents aged 35–44 years, with 14.9% or 54 respondents, followed by the ones aged 45–54 years, with 5.8% or 21 respondents, followed by the respondents aged under 18 years, percentage of 2.8% or 10 respondents, and followed by the ones aged 55–64 years and more than 64 years with an equal percentage of 1.4% or five respondents. The distribution of the respondents in the age sample groups did not respect a unitary structure of the Romanian population.

Analyzing the sample regarding the area of residence, the highest percentage is given by the urban area, 93.1%, or the numerical value of 338, with the rural area having a percentage of just 6.9%, or the numerical value of 25. This may be due to the migration from the rural to the urban areas where the diversity of the possibilities. Also, another reason could be the technological development and the dependence that people have on the urban environment.

Analyzing the sample regarding the professional status, it can be seen that the highest percentage, namely 5.6%, or the numerical value of 202 people, belongs to employees, followed by the freelancers/entrepreneurs, with 24.8% or 90 respondents, followed by pupils/students, with 16% or 58 respondents, followed by the unemployed, with 1.9% or seven respondents, and at the end the retired people, with 1.7% or six respondents.

Interpreting the sample with regards to the monthly average income, it can be noticed that the main percentage is held by the persons with an income between 3500.1–5000 RON, 39.9% or the numerical value of 145, followed by the ones with incomes over 5000 RON, with 27% or the numerical value of 98, followed by the persons with an income less than 2500 RON, with 18.2% or the numerical value of 66, followed by the respondents with an average income between 3000.1–3500 RON, with 8.5% or the numerical value of 31, and followed at the end by those with the income between 2500.1–3000 RON, with 6.3% or the numerical value of 23.

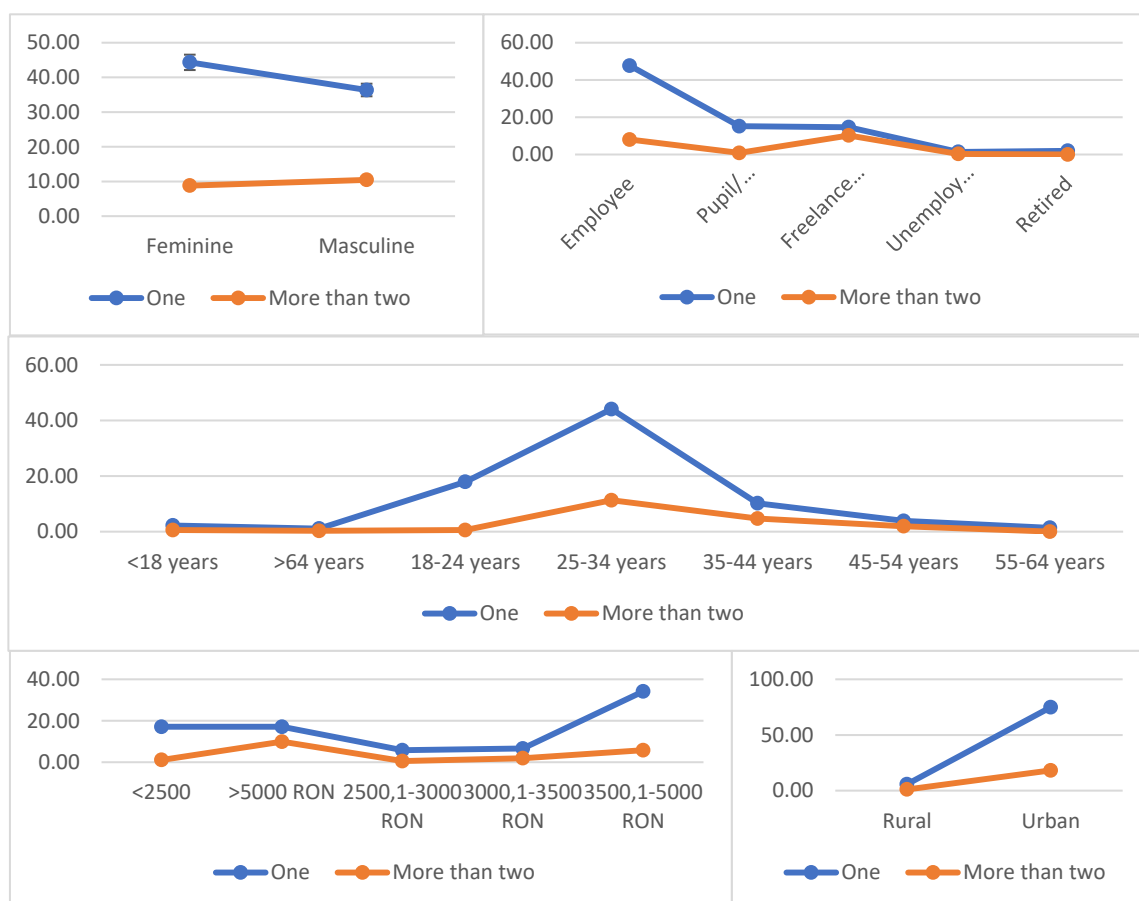
The majority of the respondents were women aged between 25–34 years, being employees. Most of them have a monthly average income of 3500.1–5000 RON and live in the urban area.

### 3.2. The Analysis of the Questionnaire Answers

The answers to the questions are presented below. A comparison between the independent variables (gender, professional status, age, monthly average income, and area) was done.

According to Figure 1, the respondents who own one mobile phone are 44.35% women, 36.36% men, 47.66% employees, 15.15% pupils/students, 14.60% freelancers/entrepreneurs, 1.38% unemployed,

and 1.93% retired. 2.20% have under 18 years, 1.10% more than 64 years, 17.91% are aged between 18–24 years, 44.08% are aged 25–34 years, 10.19% are aged 35–44 years, 3.86% are aged 45–54 years, and 1.38% are aged 55–64 years. Their average monthly income is less than 2500 RON for 17.08% of them, more than 5000 RON for 17.8%, between 2500.1–3000 RON for 5.79%, 3000.1–3500 RON for 6.61%, and 3500.1–5000 RON for 34.16% of them. Moreover, 5.79% of the respondents live in the rural area, and 74.93% in the urban one.



**Figure 1.** Number of owned mobile phones (%). Source: Authors' own research.

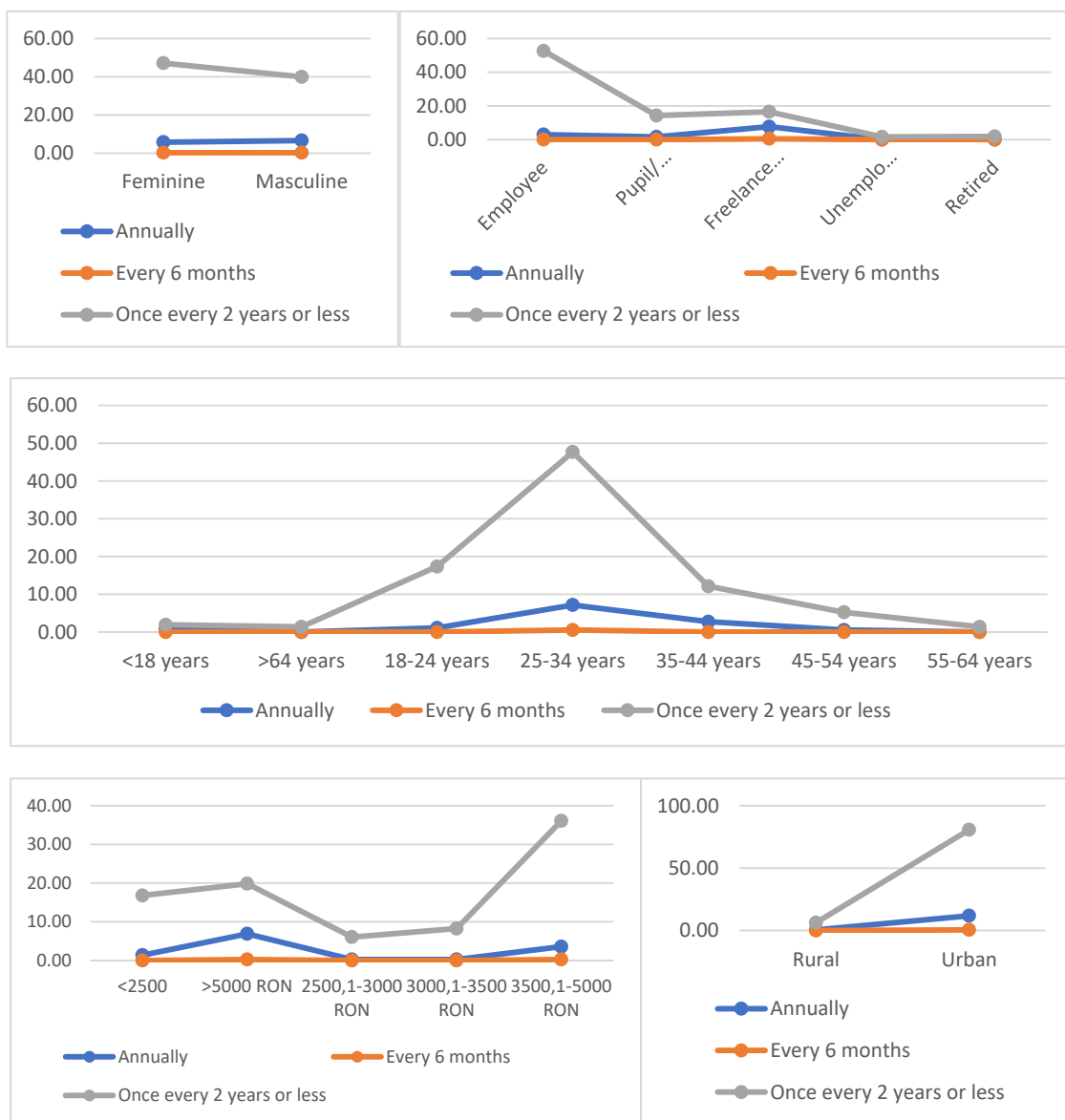
On the other hand, the respondents that own more than two mobile phones are 8.82% women, 10.47% men, 7.99% employees, 0.83% pupils/students, 10.19% freelancers/entrepreneurs, and 0.28% unemployed. Further, 0.55% have under 18 years, 0.28% more than 64 years, 0.55% are aged 18–24 years, 11.29% are aged 25–34 years, 4.68% are aged 35–44 years, and 1.93% are aged 45–54 years. There were no respondents aged 55–64 years for this category. Their average monthly income is less than 2500 RON for 1.10% of them, more than 5000 RON for 9.92%, between 2500.1 and 3000 RON for 0.55%, 3000.1–3500 RON for 1.93%, and 3500.1–5000 RON for 5.79% of them. Moreover, 1.10% of the respondents live in the rural area, and 18.18% in the urban one.

All percentages mentioned above are reported at 100%.

The number of predominant respondents were mostly women who own one mobile phone, who are employees, aged between 25–34 years, with a monthly average income between 3500, 1–5000 RON, and who live in the urban area. Most of the population migrated to the urban area due to the increased number of possibilities and better technological infrastructure. Mobile phones are the new trend because of their advantages, e.g., they incorporate all apps in one, being used for many things, resembling a personal secretary for each individual. The ones that own more than one mobile phone

are usually freelancers or entrepreneurs that use them for their businesses. Although, the majority prefer to be more sustainable by using just one.

Pursuant to Figure 2, the respondents who change their mobile phones annually are 5.79% women, 6.61% men, 3.03% employees, 1.65% pupils/students, and 7.71% freelancers/entrepreneurs. 0.83% have under 18 years, 1.10% are aged 18–24 years, 7.16% are aged 25–34 years, 2.75% are aged 35–44 years, and 0.55% are aged 45–54 years. Their average monthly income is less than 2500 RON for 1.38% of them, more than 5000 RON for 6.89%, between 2500.1–3000 RON for 0.28%, 3000.1–3500 RON for 0.28%, and 3500.1–5000 RON for 3.58% of them. 0.55% live in the rural area, and 11.85% live in the urban area.



**Figure 2.** How often respondents change their mobile phones (%). Source: Authors' own research.

The respondents who change their mobile phones every six months are 0.28% of women, 0.28% of men, and 0.55% of freelancers/entrepreneurs. They are aged 25–34 years, with 0.55%, and have an average monthly income of more than 5000 RON and between 3522.1 and 5000 RON, with an equal percentage of 0.28%. All 0.55% from this category live in the urban area.

On the other part, the respondents who change their mobile phones once every two years or less are 47.11% of women, 39.94% of men, 52.62% employees, 14.33% pupils/students,

16.53% freelancers/entrepreneurs, 1.65% unemployed and 1.93% retired. 1.93% have under 18 years, 1.38% more than 64 years, 17.36% are aged 18–24 years, 47.66% are aged 25–34 years, 12.12% are aged 35–44 years, 5.23% aged 45–54 years, and 1.38% are aged 55–64 years. Their average monthly income is less than 2500 RON for 16.80% of them, more than 5000 RON for 19.83%, between 2500.1–3000 RON for 6.06%, 3000.1–3500 RON for 8.26%, and 3500.1–5000 RON for 36.09% of them. 6.34% of the respondents live in the rural area, and 80.72% in the urban one.

All percentages mentioned above are reported at 100%.

The most respondents were women who change their phones once every two years or less, with the professional status of employee, aged 25–34 years, having an average monthly income between 3500.1 and 5000 RON, and living in the urban area. Again, the respondents from this category choose sustainability by changing their mobile phones rarely. As well, their level of income is medium, thus the possibility of changing their phones more often lessens.

According to Figure 3, the respondents that prefer iPhone are 24.79% of women, 22.04% of men, 25.62% of employees, 6.06% of pupils/students, 14.05% of freelancers/entrepreneurs, 0.83% of the unemployed, and 0.28% of the retired ones. 0.83% are aged under 18 years, 0.83% have more than 64 years, 7.16% are aged between 18–24 years, 28.37% are aged 25–34 years, 6.34% are aged 35–44 years, 2.75% are aged 45–54 years, and 0.55% are aged 55–64 years. Their average monthly income is less than 2500 RON for 6.06%, more than 5000 RON for 16.53%, 2500.1–3000 RON for 1.65%, 3000.1–3500 RON for 2.48%, and 3500.1–5000 RON for 20.11%. Moreover, 1.93% of the respondents live in the rural area, and 44.90% live in the urban one.

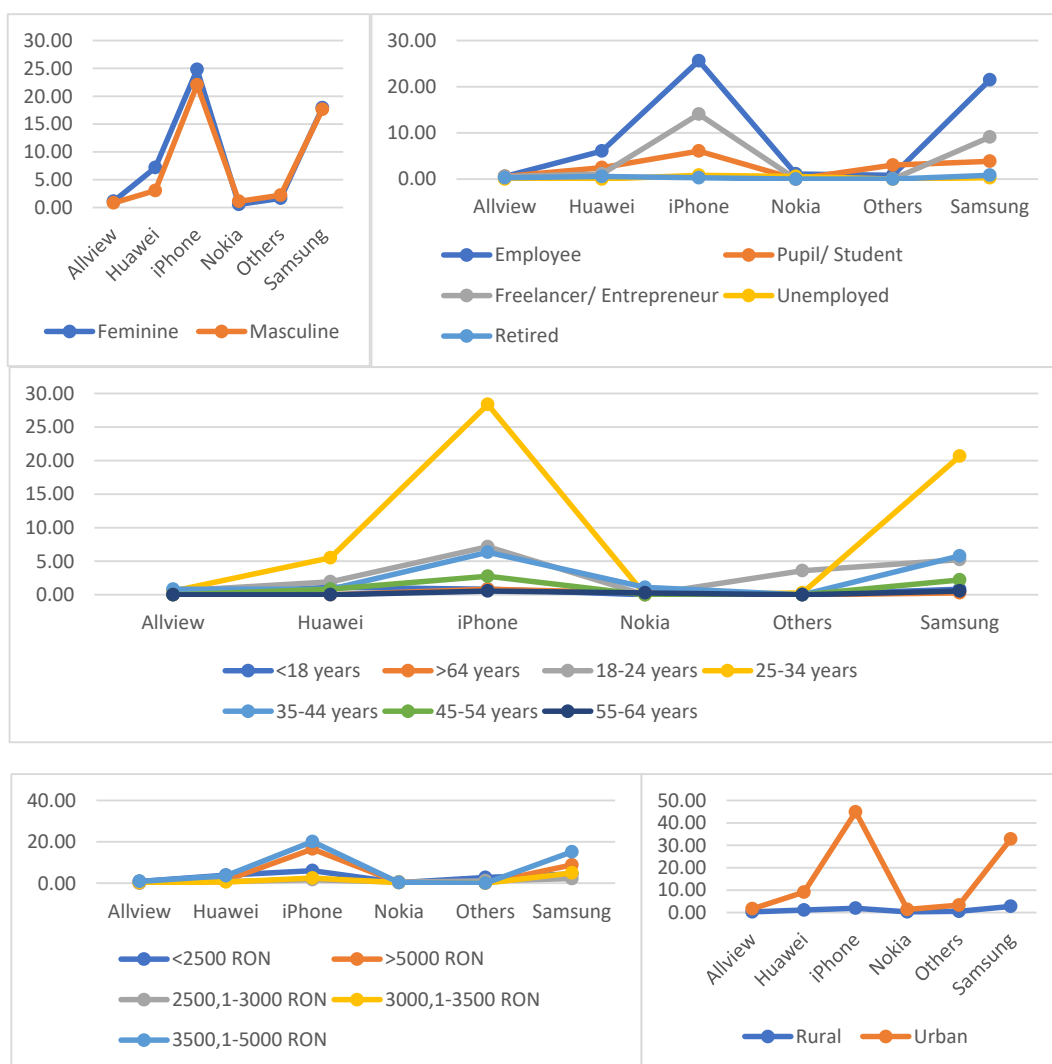
The respondents that prefer Samsung are 17.91% of women, 17.63% of men, 21.49% of employees, 3.86% of pupils/students, 9.09% of freelancers/entrepreneurs, 0.28 of the unemployed, and 0.83% of the retired. 0.83% are aged under 18 years, 0.28% are aged more than 65 years, 5.23% are aged 18–24 years, 20.66% are aged 25–34 years, 5.79% are aged 35–44 years, 2.20% are aged 45–54 years, and 0.55% are aged 55–64 years. Their average monthly income is less than 2500 RON for 4.41%, more than 5000 RON for 8.82%, 2500.1–3000 RON for 2.20%, 3000.1–3500 RON for 4.96%, and 3500.1–5000 RON for 15.15%. Moreover, 2.75% of the respondents live in the rural area, and 32.78% live in the urban one.

The respondents that prefer Huawei are 7.16% of women, 3.03% of men, 6.06% of employees, 2.48% of pupils/students, 1.10% of freelancers/entrepreneurs, and 0.55% of the retired. 1.10% are aged under 18 years, 1.93% are aged 18–24 years, 5.51% are aged 25–34 years, 0.83% are aged 35–44 years, and 0.83% are aged 45–54 years. Their average monthly income is less than 2500 RON for 3.86%, more than 5000 RON for 1.38%, 2500.1–3000 RON for 0.83%, 3000.1–3500 RON for 0.55%, and 3500.1–5000 RON for 3.58%. Moreover, 1.10% of the respondents live in the rural area, and 9.09% live in the urban one.

The respondents that prefer Nokia are 0.55% of women, 1.10% of men, 1.10% of employees, and 0.55% of the unemployed. 0.28% are aged more than 64 years, 1.10% are aged 35–44 years, and 0.28% are aged 55–64 years. Their average monthly income is less than 2500 RON for 0.28%, more than 5000 RON for 0.28%, 2500.1–3000 RON for 0.55%, 3000.1–3500 RON for 0.28%, and 3500.1–5000 RON for 0.28%. Moreover, 0.28% of the respondents live in the rural area, and 1.38% live in the urban one.

The respondents that prefer Allview are 1.10% of women, 0.83% of men, 0.55% of employees, 0.55% of pupils/students, 0.55% of freelancers/entrepreneurs, and 0.28% of the retired. 0.55% are aged 18–24 years, 0.55% are aged 25–34 years, and 0.83% are aged 35–44 years. Their average monthly income is less than 2500 RON for all 0.83%, 3000.1–3500 RON for 0.28%, and 3500.1–5000 RON for 0.83%. Moreover, 0.28% of the respondents live in the rural area, and 1.65% live in the urban one.

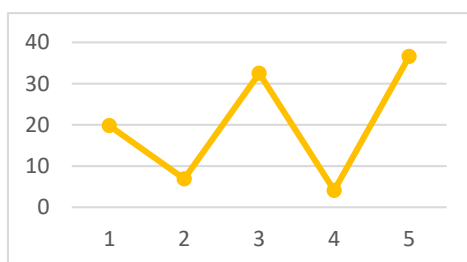
The respondents that prefer other mobile phones, such as Lenovo, Ihunt, Xiaomi, Doogee, Meizu, Myria, Cubot etc., are 1.65% of women, 2.20% of men, 0.83% of employees, and 3.03% of pupils/students. 3.58% are aged 18–24 years, and 0.28% are aged 25–34 years. Their average monthly income is less than 2500 RON for all 2.75%, and between 2500.1–3000 RON for 1.10%. Moreover, 0.55% of the respondents live in the rural area, and 3.31% in the urban area.



**Figure 3.** Preferred mobile phones (%). Source: Authors' own research.

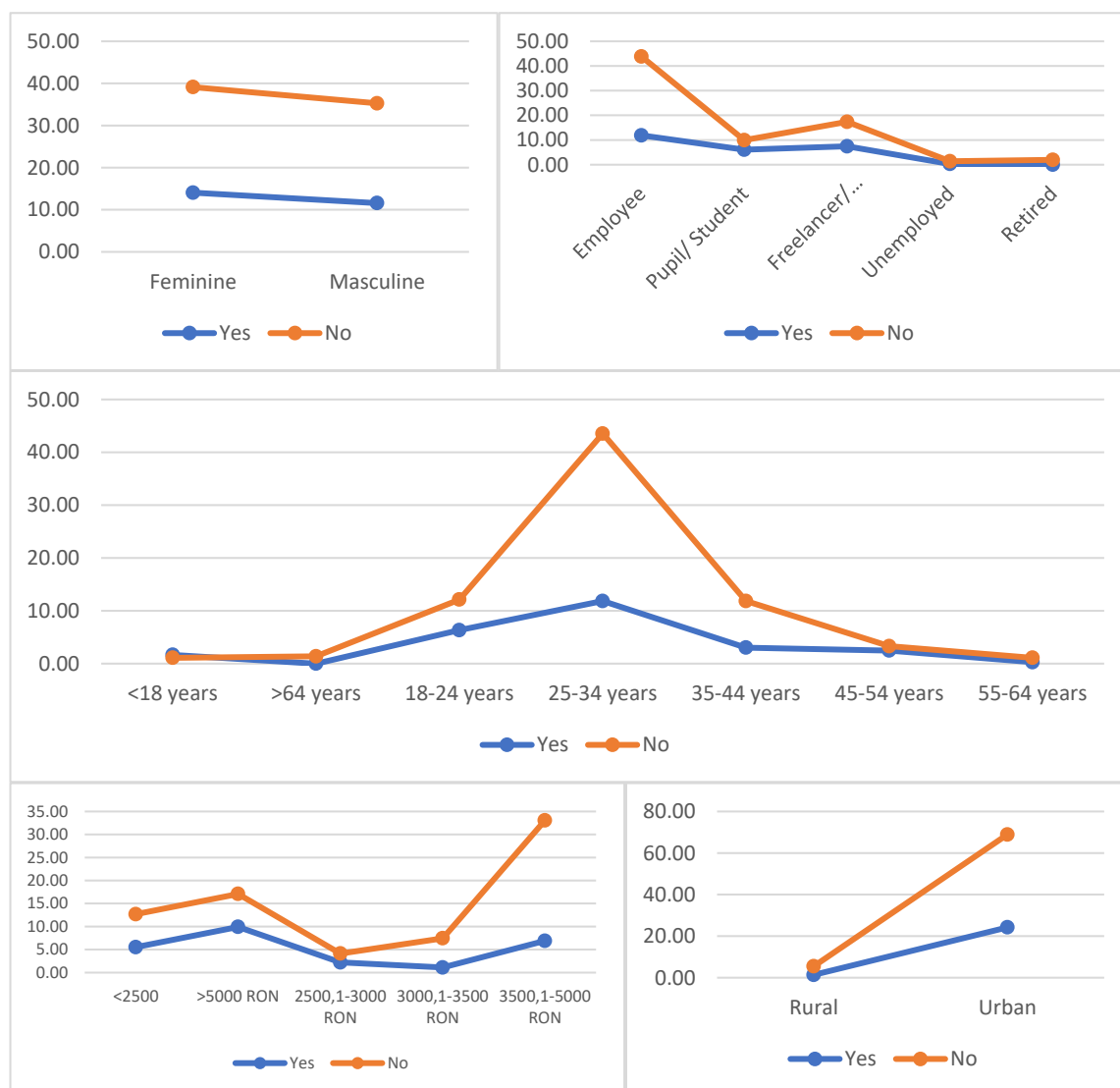
All percentages mentioned above are reported at 100%.

According to the values in Figure 4, the majority of the respondents, regardless of gender, professional status, age, monthly income, area, tend towards using iPhone, Samsung, and Huawei due to their popularity and performance. Also, the most respondents that have chosen iPhone were women, with the professional status of employee, aged 25–34 years, having an average monthly income between 3500.1–5000 RON, and living in the urban area. The iPhone is produced by Apple, and it is famous for its performance, security, and apps.



**Figure 4.** Opinions about purchasing second hand phones (%) (1-Total disagreement; 5-Total agreement). Source: Authors' own research.

According to Figure 5, the majority of the respondents, 36.6%, totally agree with purchasing second-hand phones, meaning that they tend towards sustainability. They are followed by the ones that are neutral, having a percentage of 32.5%, being indifferent, followed by the respondents who totally disagree, having a percentage of 19.8%. Last positions are occupied with those who disagree with 6.9%, followed by the ones who agree with 4.1%.



**Figure 5.** Buying a phone in the next 12 months (%). Source: Authors' own research.

All percentages mentioned above are reported at 100%.

The respondents that agree with the purchasing of second-hand mobile phone are predominant, followed by the ones which are neutral, opened to try. These results further accentuate the trend towards sustainability and responsibility. More and more people acknowledge that they can reuse certain things in order to preserve the environment and reduce some costs.

The respondents who want to buy a phone in the next 12 months are 14.05% of women, 11.57% of men, 11.85% of employees, 6.06% of pupils/students, 7.44% of freelancers/entrepreneurs, and 0.28% of the unemployed. 1.65% of them have less than 18 years, 6.34% are aged 18–24 years, 11.85% are aged 25–34 years, 3.03% are aged 35–44 years, 2.48% are aged 45–54 years, and 0.28% are aged 55–64%. Their average monthly income is less than 2500 RON for 5.51% of them, more than 5000 RON for 9.92%,

between 2500.1 and 3000 RON for 2.20%, 3000.1–3500 RON for 1.10%, and 3500.1–5000 RON for 6.89%. Moreover, 1.38% live in the rural area, and 24.24% in the urban one.

In the opposite direction, the respondents who do not want to buy a phone in the next 12 months are 39.12% of women, 35.26% of men, 43.80% of employees, 9.92% of pupils/students, 17.36% of freelancers/entrepreneurs, 1.38% of the unemployed, and 1.93% of the retired. 1.10% of them have less than 18 years, 1.38% of them have more than 64 years, 12.12% are aged 18–24 years, 43.53% are aged 25–34 years, 11.85% are aged 35–44 years, 3.31% are aged 45–54 years, and 1.10% are aged 55–64%. Their average monthly income is less than 2500 RON for 12.67% of them, more than 5000 RON for 17.08%, between 2500.1 and 3000 RON for 4.13%, 3000.1–3500 RON for 7.44%, and 3500.1–5000 RON for 33.06%. Moreover, 5.51% live in the rural area, and 68.87% in the urban one.

All percentages mentioned above are reported at 100%.

Most respondents do not think of buying a mobile phone in the next 12 months. The predominant values are among the employed women, aged 25–34 years, with an average monthly income between 3500.1–5000 RON, and who live in the urban area.

According to the values presented in Figure 6, the most utilized device is the mobile phone, preferred by 46.56% of women, 41.05% of men, 50.14% of employees, 15.98% of pupils/students, 19.01% of freelancers/entrepreneurs, 0.83% of the unemployed, and 1.65% of the retired people. 2.75% of the respondents in this category are less than 18 years old, 0.55% are more than 64 years old, 18.18% are 18–24 years old, 47.66% are 25–34 years old, 12.67% are 35–44 years old, 4.68% are 45–54 years old, and 1.10% of them are 55–64 years old. 17.91% earn less than 2500 RON, 22.31% earn more than 5000 RON, 5.79% earn between 2500.1 and 3000 RON, 7.44% earn between 3000.1–3500 RON, and 34.16% earn between 3500.1–5000 RON. Moreover, 6.06% live in the rural area, and 81.54% live in the urban area.

The respondents which are using the tablet are 2.48% women, 0.83% men, 1.65% employed and 1.65% freelancers/entrepreneurs. 0.28% are aged 18–24 years, 2.75% are aged 25–34 years, and 0.28% are aged 35–44 years. 1.10% earn more than 5000 RON, 0.28% earn between 3000.1–3500 RON, and 1.93% earn between 3500.1–5000 RON. All 3.31% from this category live in the urban area.

The respondents who use the laptop are 3.03% of women, 4.68% of men, 3.03% of employees, 3.86% of the freelancers/entrepreneurs, and 0.83% of the unemployed. 0.83% are aged more than 64 years, 4.68% are aged 25–34 years, 1.65% are aged 35–44 years, 0.28% are aged 45–54 years, and 0.28% are aged 55–64 years. 3.58% earn more than 5000 RON, 0.55% earn between 2500.1–3000 RON, 0.55% earn between 3000.1–3500 RON, and 3.03% earn between 3500.1 and 5000 RON. Moreover, 0.55% live in the rural area, and 1.10% live in the urban area.

The respondents who use the PC are 1.10% of women, 0.28% of men, 0.83% employed, 0.28% of the freelancers/entrepreneurs, and 0.28% of the retired. 0.28% are aged 25–34 years, 0.28% are aged 35–44 years, and 0.83% are aged 45–54 years. 0.28% earn less than 2500 RON, 0.28% earn between 3000.1 and 3500 RON, and 0.83% earn between 3500.1 and 5000 RON. Moreover, 0.28% live in the rural area, and 1.10% live in the urban area.

All percentages mentioned above are reported at 100%.

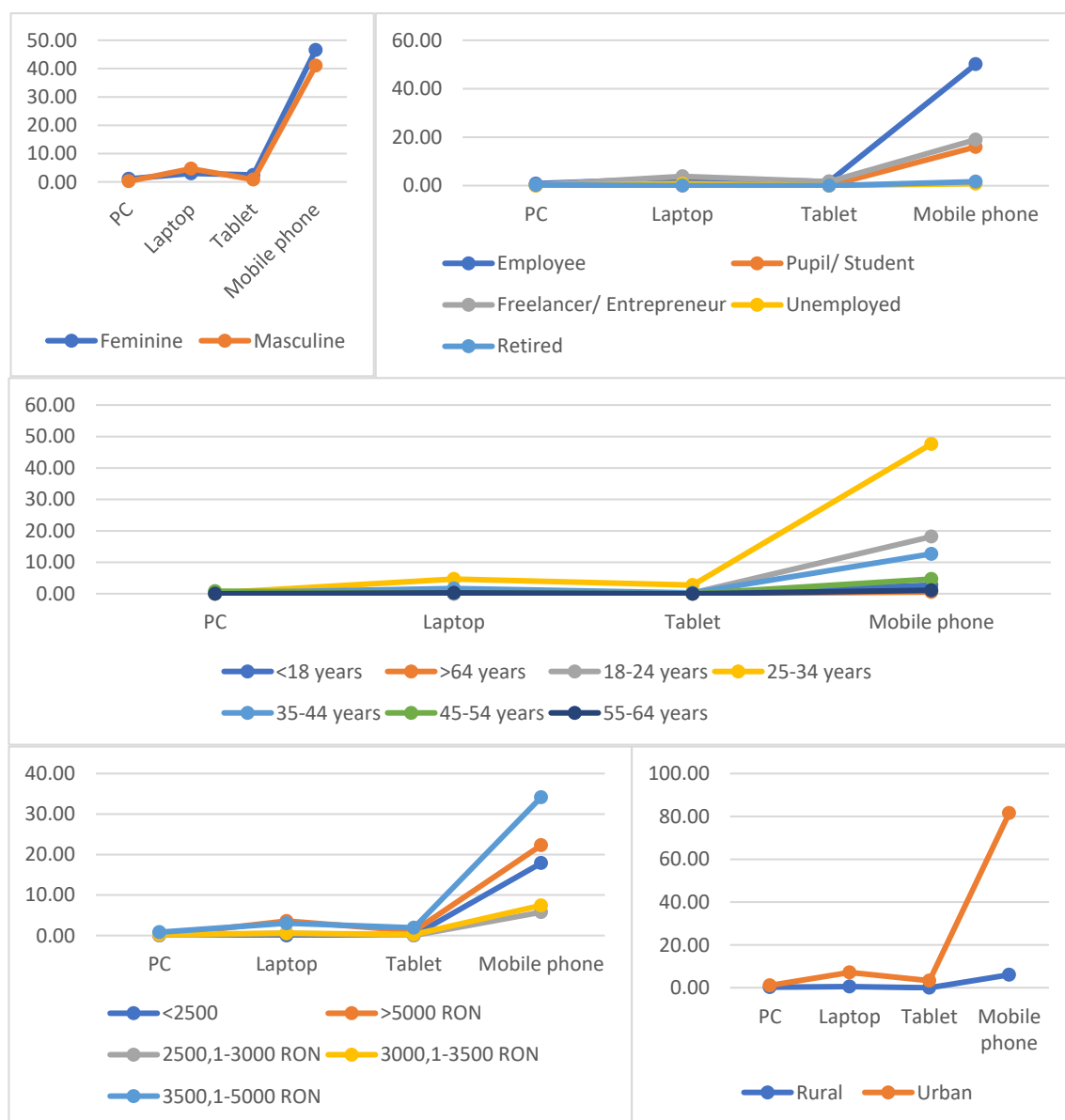
Most of the respondents prefer the mobile phones for accessing the social media networks due to the ease of use, and to the fact that they are at hand anytime. As well, the worldwide internet availability facilitates the usage of social media networks through mobile devices. Freelancers and entrepreneurs prefer the laptop because it is more facile for them to promote their business in this manner. On the other hand, the ones that have online businesses could easily advertise by accessing mobile phones from anywhere in the world, though maintaining a higher degree of sustainability because of the reduced energy consumption of the phones. In this case, most of the respondents are employed women and men, aged 25–34 years, with an average monthly income of 3500.1–5000 RON, living in the urban area.

The respondents which charge their phones once within 24h are 37.47% of employees, 7.71% of the pupils/students, 15.98% of the freelancers/entrepreneurs, 1.65% of the unemployed, and 1.10% of

the retired. 0.83% are less than 18 years old, 1.38% are more than 64 years old, 9.64% are 18–24 years old, 37.47% are 25–34 years old, 8.54% are 35–44 years old, 4.68% are 45–54 years old, and 1.38% are 55–64 years old. Moreover, 3.58% live in the rural area, and 60.33% live in the urban area.

The respondents which charge their phones many times within 24h are 7.99% of employees, 4.41% of the pupils/students, and 4.41% of the freelancers/entrepreneurs. Moreover, 1.10% have less than 18 years, 4.41% are 18–24 years old, 8.54% are 25–34 years old, 2.48% are 35–44 years old, and 0.28% are 45–54 years old. 0.55% live in the rural area, and 16.25% live in the urban area.

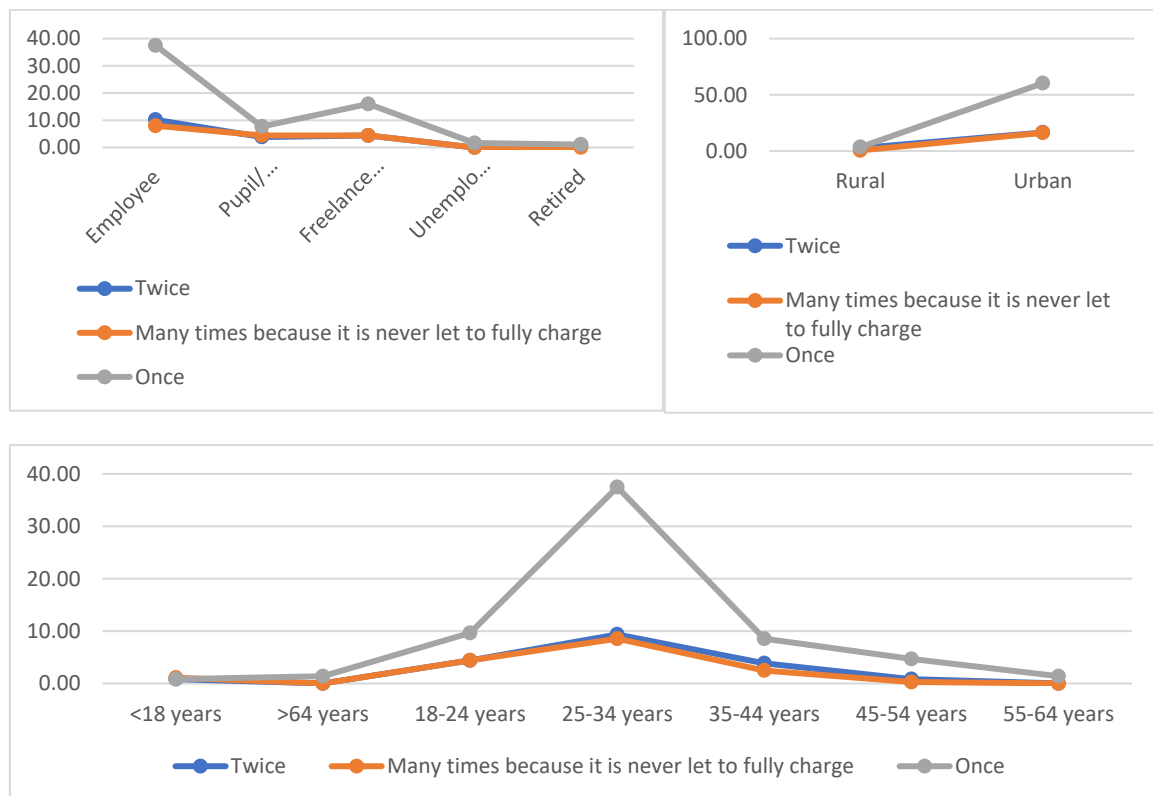
The respondents which charge their phones twice within 24h are 10.19% of employees, 3.86% of the pupils/students, 4.41% of the freelancers/entrepreneurs, and 0.83% of the retired. Further, 0.83% are less than 18 years old, 4.41% are 18–24 years old, 9.37% are 25–34 years old, 3.86% are 35–44 years old, and 0.83% are 45–54 years old. Moreover, 2.75% live in the rural area, and 16.53% live in the urban area.



**Figure 6.** Most often utilized device to access social media networks (%). Source: Authors' own research.

All percentages mentioned above are reported at 100%.

According to Figure 7, the majority of respondents were women and men which charge their phones once within 24h, most are employed, aged 25–34 years, with an average monthly income between 3500.1 and 5000 RON, and which live in the urban area.



**Figure 7.** How many times do the respondents charge their mobile phones within 24 h (%). Source: Authors' own research.

### 3.3. The Interview Answers

The following interview was created in order to complete the answers of the questionnaire and for more clarity.

The qualitative study measures the psychological phenomena that cannot be operationalized. In this sense, in order to accurately estimate how purchasing influences the environment in the context of sustainability, it was considered appropriate to use the qualitative research method of interview, by forming a focus group.

The qualitative analysis was first put into practice in the 1930s by Kurt Lewin to examine small groups. Robert Merton and Paul Lazarsfeld are the founders of the qualitative method. They applied the focus group to study the characteristics of propaganda and radio programs audience during World War II. The qualitative method has been increasingly used to examine people's behavior and attitudes in the 1950s. Since the 1970s, it has been fully accepted by researchers as a qualitative method [43]. The focus group has become the basic tool for marketing studies, being defined as a qualitative research, group interview where social information can be extracted, which cannot result from a quantitative analysis such as a survey. In this research, the focus group was applied to complete the quantitative research in order to remove possible errors and resume the hypotheses at the end of the study. Therefore, the working hypotheses are taken into account from a qualitative point of view. The organizers of the focus group must know very well the concepts and notions of the current stage of knowledge for the current topic of the three questions, have a good skill in communicating, and have knowledge about the dynamics of small groups.

The number of participants in the group was 15. They access the internet from their mobile phones on a daily basis for various purposes: to socialize, to find out about various topics of interest, to purchase products/services etc. The recruitment of the participants was carried out by selection, taking into account the relevant questions in the questionnaire about how many people are interested in adopting sustainable behaviors when purchasing or utilizing mobile phones.

The selection started from the type of device that people are using to access the internet, being chosen 35 people who marked the “mobile phone” parameter. Out of the 35 people, 15 people were selected following the answers to the questionnaire. The focus group participants range in age from 20 to 45 years. The interview was conducted online on Skype and was led by a moderator who previously exposed the participants to organizational training. They were informed that they would answer three open-ended questions about the purchasing and utilization of mobile phones with regards to sustainability. They were also specified the definition of the notions investigated in the interview. The focus group was conducted in August 2020. The duration of the interview was 60 min. In order to accommodate the participants, the moderator considered it useful to start the interview by self-presentation of each participant. For an increased degree of sincerity on the part of the participants, it was specified in the discussion that there are no right or wrong answers. The tool used to record the conversations was Camtasia. The detailed analysis of the answers of the interview is presented below. The answers provided below are the most relevant for this research.

**(a) What are the main reasons that determine you to change your mobile phone?**

The people we interviewed have different reasons when they decide to change their mobile phones. The main reasons concern things that may happen to the one they are currently possessing, like functionality problems or if it gets lost, but the general trend in this question was more linked to the practicability rather than to promote and or live in a sustainable way.

For instance, one of the participants responded that the main reason for changing his mobile phone is that it is no longer functional. “I am a practical person, I like to use things, especially devices till they don’t work anymore. I also expect that they have a longer degree of usage because I prefer better quality, in general. Also, the degree of sustainability is important to me.”, while other participant responded that “I want a better and newer model. I really like to be in trend with technology. I am aware that it evolves at rapid pace, but it does not bother me. I also use my mobile phone for business matters, it’s easier to advertise through the device in your pocket.” The same participant said that the new technologies have innovative features that help in terms of business. A good marketing strategy coming from a mobile supplier represents a reason as well to take into consideration the idea of changing the mobile phone, choosing the best offer even if it means that they should also change their number. There was however one participant who mentioned that he keeps his phones for long period of times and considers his behavior a sustainable one.

The majority of the participants mentioned that most of the times they get carried away by the beautiful commercials and offers that persuade them to make new smartphone purchases without actually needing them. The women admitted that family, friends, and acquaintances have a big influence, determining them to get newer and better smartphones in order not to feel inferior. They said that it’s like “being in some kind of competition, feeling the desire to stand out of the crowd and feed their self-esteem.” The men affirmed that they cannot refrain from the new technological improvements that are being presented in the commercials or offers, even though, in many cases there are no visible changes between newer and older models in terms of performance or novelty.

**(b) What exactly do you keep in mind when you want to buy a new mobile phone?**

The overall opinion on this subject was the fact that nowadays the quality of the phones it is not similar to the one that used to be, devices are made to last 2–3 years, so the technological characteristics, the notoriety of the brand, the design, the price, and sometimes the country of origin represent the main aspects which are taken into consideration by our participants.

Answering this question, most male participants referred to the technological features, performance, and costs. On the other hand, the majority of the women participants were committed to the design, aspect, and brand of the desired smartphones. Both genders mentioned that the quality level of the photos is important. A small part of the participants takes into account the companies' sustainability practices, but all get excited about sustainability and are more open towards it.

**(c) What is your approach with regards to an old phone that you will no longer use?**

The interviewed people answered that depending on the age of the phone and if it is still functioning, they will consider giving it to a close relative/friend or donate it in order to give their phone a new life. In other cases, if the quality of the phone is not so good anymore, they will first of all use it for a buyback program or sell it, or they might send it to a recycling center. Most of the interview participants have a sustainable approach when it comes to their old phones but not necessarily for the good reasons, only a small part of them are actually understanding the damage that their devices could do to the environment by throwing them away. Some of the participants just keep all their old phones without using them again or throw them away if they do not find any of the other options convenient.

#### 4. Conclusions

The study shows that the respondents are mostly young people, aged 18–34 years, living in the urban area where possibilities in terms of studies and work are wider. Many multinationals are located in big cities, having partnerships with important universities and offering interesting incomes which enhance the purchasing power of their employees.

In the present digital era, it is essential to stay connected. A mobile phone can be used for so many different things, which explains the increasing popularity. Users want to be informed about everything that is going on, especially during these difficult times, like the health crisis that came along with 2020. This crisis not only will remain in history for a long time but will also become an opportunity regarding the development of mobile phones as their role in medicine has been very important and continues to be in the way of helping to keep the social distancing and providing at the same time value when it comes to medical evaluation, diagnosis or monitoring the patients [44]. Nevertheless, there are many resources used in the production of phones and throwing them away once we won't use them anymore causes a lot of harm to the environment. This is why our research was focused on discovering the behavior of our respondents/interview participants when it comes to the usage of phones and also the degree of sustainability which is linked to their actions.

According to the analysis, people usually have just one device, however exceptions rise when a second one is needed. Especially in terms of work, in the case of employees, as well entrepreneurs or freelancers. In order to make the offers more attractive, operators are usually making discounts for the purchase of a second phone, or for every renewal of the contract. This fact could explain some of the replacement habits of people in terms of mobile phones. Of course, most people are changing their mobile phones when the devices won't function properly anymore, or when they get lost or stolen. But there are also other reasons that people have, such as new technologies (for example the new iPhone 12 which is compatible with the 5G technology). People find these new technologies useful for business reasons, so they decide to integrate them in their daily life. According to the participants in our research, devices as phones are not produced anymore in the way they used to be in terms of quality, therefore, people are starting to pay attention to the production processes, materials and sometimes sustainability. Based on our research, people have a tendency to practice sustainable actions when it comes to the purchase of a new phone and to decide whether to give a new life to an old device or not. However, their actions are not always linked to their beliefs in sustainability. The majority of them are supporting the circular economy by giving a new life to an old phone: giving it to a relative/friend, using buyback programs or recycling them. Some prefer to keep them instead of throwing them away, which is more beneficial for the environment. Vodafone stores (a well-known mobile operator) have collected over two tons of used phones and accessories in two years, without promotion and without

reward [45]. A research [46] conducted in Switzerland showed similar results. The main reasons for the participants to change their phone were: to have a new model, their subscription had expired and by renewing it they could get a new phone with a lower price, or their phone was broken, and they could not fix it. Also, the people we interviewed focus mainly on four things when buying a new phone, namely technical aspects, price, brand, and design.

Future papers could focus more on consumer awareness about the used processes for mobile phones production. This could also relate to the dangers that people expose themselves to by simply throwing the mobile phones away due to a lack of knowledge and information.

As future research, topics about the education of the population concerning sustainable alternatives would be of interest. At the same time, a study with regards to the openness of corporations in adopting and implementing the concept of refurbished devices as smartphones among their employees, and the opinion of the latter ones about this decision.

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