Mobile application monetization methods and user attitudes

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Abstract

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The purpose of this thesis is to gain insight on the attitudes and preferences of regular mobile device users towards mobile application monetization. The topic was chosen for the purpose of learning and gaining information for the researcher's future projects, and out of personal interest towards consumer behaviour.

The theoretical basis for the research is formed from two different parts. In the first part, a general overview about the existing mobile application monetization methods is given for the purpose of understanding the topic and the terminologies involved. This is then followed by a literature review that showcases some of the existing research on the topic of mobile application monetization attitudes.

A quantitative survey was conducted on regular mobile application users about their attitudes towards mobile application monetization methods. The survey also involved questions about attitudes towards different mobile advertisement formats, as well as questions about monetization-related causes for quitting and uninstalling mobile applications. The answers to the survey were collected from personal social groups and from online platforms.

A significant finding of the study was that the respondents had overall negative attitudes towards all mobile application monetization methods, with the only exception being premium/upfront monetization. It was also found that overall, the monetization methods that gave the users personal agency and the ability to make a choice were perceived more positively than those that did not involve personal agency of the application user.

Towards the end of the thesis, conclusions are made and reflected on the theory, reliability and validity of the results is assessed and discussed, which is then followed by recommendations for further studies.

This research thesis was carried out during the fall semester in 2023.

Key words
App monetization, Attitudes, Mobile apps, Monetization model

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1 Introduction

Smartphones have become an integral part of everyday life for the majority of people in the world. With widespread smartphone usage the topic of mobile applications also comes up, as they are an important part of any smartphone ecosystem. The various application stores that vary based on the smartphone's operating system, host millions of mobile applications of which many are monetized in one way or another.

This thesis focuses on the topic of mobile application monetization and attempts to gain insight into the average mobile application user's preferences and attitudes towards mobile application monetization.

Considering that most mobile applications are free to download, comprising 95.02% of the apps in the Apple App Store (42matters 2023a) and 96.87% of Google Play (42matters 2023b), the applications can utilize a wide variety of methods and techniques to make money from the free application users, either directly with methods such as advertisements, or by enticing the users to spend money on the application in some way, such as through restricting the application's functionalities. These sort of monetization methods commonly cause frustrations in people, which makes this a worthwhile topic to explore both for the application user and the application developer.

1.1 Research objectives and scope

The purpose of this research is to find out how regular smartphone mobile application users feel about the monetization methods utilized in the mobile applications that they use, and to gain insight on how this affects their mobile application usage.

The main research questions:

- How do mobile application users feel about the monetization methods used in mobile applications?

Sub-questions of the research:

- How do users feel about different mobile advertisement formats?
- Have application users uninstalled or stopped using an application after having frustrations with the application's monetization methods?

The scope of the research is limited to any and all mobile applications that are downloadable from any smartphone application store, or monetized applications that come with the smartphone itself. Any smartphone user that uses monetized applications is eligible to take part in the survey that will be conducted later in the research.

It should be noted for clarity that multi-platform applications and mobile games are included in the scope as long as they are downloadable from application stores.

1.2 Personal motivations and benefits of research

Consumer habits have always been a great interest of mine and I have personally used a wide variety of mobile applications in my lifetime. I've encountered monetization methods that on one hand have made me feel frustrated and caused me to uninstall the application, and on the other hand, I've also encountered monetization methods which I've felt are fair, respectable and which have eventually enticed me to spend money on the application.

Tangentially, I have also considered starting a mobile game or a mobile application project, which has increased my curiosity towards the topic of mobile application monetization. By conducting this research, I would like to learn more about people's attitudes towards mobile application monetization, which will then help me decide on an appropriate monetization method for any potential future project.

The results of this research could be utilized by any mobile application developer by providing them information about consumer attitudes and behaviour. This in turn could help the developer choose the right monetization model for their application, which could be a major component in determining the applications success or failure. Regular mobile application users can also utilize the results of the research by reflecting on their own habits as consumers, which in turn would help them make better and more informed decisions in terms of spending money and interacting with mobile application monetization methods.

1.3 Methodology and conducting the research

The following chapter will go through and explain the entire process of the research, including what research method was chosen, how and where the research survey was conducted and how the sample was obtained.

1.3.1 Research method

The research for this thesis will be done by conducting a survey that utilizes quantitative research methods. A survey with quantitative research methods was chosen because the research considers it to be the most appropriate and convenient method to answer the research questions that were previously raised in this thesis and allows us to reflect the results on previously conducted research.

In quantitative research, as opposed to qualitative research, the answers are represented as numbers, which is a great benefit of the quantitative method. Since the measured results are represented numerically, it makes it relatively effortless to process the results at the analysis stage of the research. (Nummenmaa, Holopainen & Pulkkinen 2016, 16)

1.3.2 Creating a questionnaire

The survey will be conducted via Google Forms, which is a free, online web application. It was chosen for conducting the survey because the researcher had previous experience with another free online alternative, Microsoft Forms, and found it to be lacking in features and customizability compared to Google Forms. Additionally, for the convenience of the research, Google Forms visualizes the survey results automatically and provides both an export feature to Google Sheets and a direct download feature, which makes processing the results very convenient.

The survey will be conducted in English for two main reasons. The first reason for conducting the survey in English is that the thesis associated with the survey is also in English. The second reason is that using English will allow for greater participation in the survey, as it is considered to be the dominant language for international and scientific communication.

1.3.3 Carrying out the research

The survey (Appendice 1) on Google Forms was finished ahead of schedule on 28.10. and the process of collecting answers was started on the same day.

Responses to the survey were collected by sharing around a link to the survey, and on many occasions, by collecting answers in-person. In some in-person survey cases the respondents didn't understand English well enough, so the researcher translated the questions for the respondents and assisted them in completing the survey form.

On top of collecting survey responses from personal and extended contacts, the survey was additionally shared multiple times on the social media platform reddit, and on a website called surveyswap where people answer each other's surveys through a virtual credit system.

1.3.4 Sampling

This study utilizes a convenience sampling method, which is a form of non-probability sampling. Convenience sampling refers to a method where the researcher selects the samples from the population because they are easily accessible and convenient to them. The advantage of this sampling method is that it is very fast and flexible, but it comes with the downside that it cannot accurately generalize a population. (Nummenmaa, Holopainen & Pulkkinen 2016, 33)

1.4 Structure of the thesis

The thesis will begin with a brief introduction to the topic of the research. This is then followed by introducing the research objectives and questions with the addition of defining and clarifying the scope of the project. It is then followed by a chapter that explains the personal motivations for the research, alongside of describing some of the benefits of the research and expressing how the results could be utilized.

The introductory chapter will also have a subchapter to explain the methodology of the research, where the research process is explained as a whole. It will look at how the research survey is created and how it is conducted. This includes explanation of the research methodology, creation of the research survey and how it is sampled.

After the introduction chapter the thesis continues by giving an overview of mobile application monetization methods, which will serve as the basis and as a part of the theoretical framework for the research.

With having the different mobile application monetization methods explained and defined, the thesis is then followed by a chapter that showcases and explains some of the related research that has been already done on the topic of mobile application monetization related opinions, attitudes and frustrations. Reviewing and showcasing some of the studies done on the topic will assist in understanding the phenomena better and allows this research to reflect its findings on it.

After the survey has been conducted and the theoretical framework has been introduced, the results of the research survey are going to be presented as-is with brief and concise explanations and observations.

Finally, the thesis wraps up in the final chapter where the results of the research are reflected upon, reliability and validity is assessed and conclusions are made from the collected answers.

2 Overview of mobile application monetization methods

To understand the topic of mobile application monetization better and to serve as the basis for the research that is to be conducted, this chapter will give a general overview of the various types of monetization methods utilized in the mobile application industry.

2.1 Advertisements

According to Grand View Research, “The global in-app advertising market size was valued at USD 151.1 billion in 2022” and this figure is forecasted to be 410.4 billion in 2030 (Grand View Research, 2022). This indicates that in-app advertisements are a very popular and a highly significant mobile monetization method.

Even though in-app advertisements are considered to be a single monetization method, they can still vary drastically based on the ad unit, the format and the type of ad in question. Since the advertisement formats can be very different from one another, it is important to highlight their differences as they can potentially affect the application user and their application usage in different ways.

The following section references Google’s mobile advertising subsidiary’s article called “Ad units, ad formats, & ad types” (Google Admob Help) to explain the differences between the main ad formats, which are banner advertisements, interstitial advertisements, rewarded advertisements and native advertisements.

Banner advertisements are an ad format, where the advertisement is displayed in the form of a banner that is located in the top or bottom part of the screen.

Interstitial advertisements on the other hand are full-screen ads that take place between breaks and transition points in the application, such as between game levels or after switching to another page.

Rewarded advertisements refer to a type of ad where the user is given something in the application in return for watching ad advertisement. For example, in a mobile gaming context, the user could receive a direct advantage in the game, if they decide to watch an advertisement.

Native advertisements mimic or try match with the look and content of the mobile application. A common example would be an ad on any social media platform, that looks like any other organic, user-generated post.

2.2 Freemium

Freemium is described as a monetization model that allows the user to use the application for free, while limiting the user's application usage and the application's features in various ways, which can be bypassed by paying money. (Fields 2014, 145).

Since the freemium model can vary a lot depending on the mobile application and based on how it is implemented, this chapter will highlight some of the different types of freemium models, which will be explained after this introduction.

Free trial freemium models refer to freemium models where the application user is allowed to use the full and unrestricted version of the mobile application for free, for a limited amount of time. This freemium model attempts to gain paying customers by hoping that the users will keep using the application after the free trial has ended, or by tying the trial to a subscription, which will start costing money and automatically bill the customer after the free trial has ended. (Alcanja 24.4.2019)

In limited feature freemium models on the other hand, the free application users get a restricted and limited version of the application's functionalities. Paying for the full version allows the user to access all of the application's contents. (Tariq 29.6.2023)

The advertisement-based freemium model includes ads in the free version of the application, which can be then removed by paying. (Tariq 29.6.2023)

Customer type -based freemium models are considered to be a less-common freemium model, where an application can choose to restrict the users based on what types of customers they are. As an example, an application might be free for students, but subsequently cost money for professionals and businesses. (Alcanja 24.4.2019)

2.3 Premium

Premium applications refer to mobile applications that have an up-front cost in the application store where they are available. A user enters their billing information in the application store or adds money to their account balance, completes the payment, and is then granted access to the mobile application with the account that they used to purchase the application. It is usually considered to be the traditional monetization method. (Fields 2014, 138-139).

It is worth nothing however, that in 2023, premium applications only account for a very small percentage of all available mobile applications, both in the Google Play Store and on the Apple App Store. In the Play Store they only account for 3.11% of all applications, and respectively 4.95% of the mobile applications in the App Store. (42matters, 2023c)

2.4 In-App Purchases

In-app purchases refer to a mobile application monetization method where the related purchases happen inside of the mobile application, while it is being used. The in-app monetization method is often seen and talked about in the context of mobile games, where purchases inside of the game can offer the player various benefits, such as gaining power in the game or removing advertisements. (Needleman 28.7.2016)

In-app purchases are considered to be one of the most popular mobile application monetization methods. It is estimated that 50% of non-game applications utilize in-app purchases. The percentage is even higher regarding mobile games, where it is estimated that 79% of them utilize in-app purchases. In total, in-app purchases make up 48% of the total money made by mobile applications. (Tafradzhiyski 16.10.2023)

2.5 Selling personal data

Mobile application developers can decide to collect personal data from the application users and sell it as a monetization strategy.

Although selling personal data is often considered to be a supplementing monetization strategy to complement the other more traditional monetization methods in the application, it can also be considered as its own monetization method as the data that is gathered can be very valuable and useful for the purposes of targeted advertising. (Cecere, Guel & Lefrere 2018, 7)

Aside from the data related to the application users' identities, the data that is collected also usually encompasses data pertaining to the user's habits, behaviours, needs and preferences, which in terms of data are a sought-after commodity, that can be sold to third parties such as data brokers and marketing companies. (Lambrecth & al. 2014, 6-7)

2.6 Combined methods

It is important to consider that most monetization methods are not used alone and isolation from one another. People like to spend money on different things, and they engage with mobile applications differently. Because of this many of the aforementioned monetization methods often work well together and it is usually sensible for the application developer to try and target different types of customers with different monetization methods. (Fields 2014, 153)

As these monetization methods are combined with each other, they can develop into their own, new defined terminologies. However, all these combinations don't necessarily have to be defined and outlined in the research, since they can still be broken down to their individual terms.

As an example of a combined monetization method, a method that merges paid, premium applications and in-app purchases is referred to as “paidmium”. This monetization model is often seen in map and navigation applications. (Tang 2016, 225)

3 Existing studies on attitudes towards monetization methods

A lot of research has been conducted related to different monetization methods, but the researcher still had struggles in finding similar research with the same scope and with the same idea of directly finding out about people's opinions and attitudes towards mobile application monetization as a general topic. This was with the exception of mobile advertisement attitude -related studies, which seemed to be plentiful. Aside from that, many of the studies were either somewhat dated, only partially relevant to this study or explored other research topics involving mobile application monetization. However, some relevant studies and findings were still managed to be discovered, which will be highlighted in this chapter. Additionally, this chapter gives the results of the research something to be reflected upon.

3.1 Fairness of in-app costs and premium monetization pricing

Some relevant findings related to premium monetization were found in a research thesis that was looking at the overall success of in-game purchases in free-to-play mobile games. Part of the research glossed over the consumer perception in pricing, where they found that the 84% of the respondents (n=156) considered the appropriate price for a one-time premium download to be 3 euros or less, and in terms of in-app purchases 80.9% of the respondents (n=110) thought that less than 4 euros was a fair price for a one time in-app/in-game purchase. These results demonstrated that mobile game users seem to be somewhat averse to paying for premium apps and in-app purchases, and that in general, they find the lowest price points to be the most fair. (Kananen 2014, 37-39)

3.2 Attitudes towards mobile advertising

In another study called "Attitudes Toward Mobile Advertising: A Study of Mobile Web Display and Mobile App Display Advertising" (Le & Nguyen, 2014) that was published in the Asian Academy of Management Journal, some interesting conclusions were made regarding mobile application advertisement attitudes. For one, the study found that mobile users in general don't have positive attitudes towards seeing mobile advertisements, but the users did still acknowledge that mobile ads provided some value to them in terms of helping them acquire information about various products, concluding that attitudes were relatively moderate. This meant that people feel more positively towards advertisements than was originally or commonly thought.

The study also made another relevant and interesting finding, which was that both the credibility and the entertainment value of the mobile advertisement were significant predictors of positive attitudes, whereas surprisingly, the informativeness of the advertisement and how irritating the ad is,

did not affect attitudes towards advertisements. Though they did state in the study, that “These results conflicted with the previous research that was in their literature view”, so the finding of irritation not being a factor in attitudes towards mobile advertisements could warrant some skepticism.

Another similar study was found in the Journal of Promotion Management (Sigurdsson & al. 2017), which explored behavioral intentions towards mobile advertisements. Some of their findings were similar in nature to Le & Nguyen (2014), but some results also differed and further added to the skepticism that was raised regarding the findings of irritation not being a factor in attitudes towards advertisements.

Sigurdsson & al. (2017) explored the effect of five different factors and their effect towards attitudes regarding in-app advertising. These factors were entertainment, informativeness, credibility, irritation and personalization.

Overall, the study found that the entertainment value of the advertisement was the single biggest factor that affected attitudes towards mobile advertisements, while informativeness and credibility only had a somewhat significant effect. On the other hand, ad personalization had no effect and irritation was found to have a negative effect. (Sigurdsson & al. 2017, 21)

3.3 Impact of freemium monetization on video game consumers

A bachelor’s thesis that was conducted and written in Finnish, explored the impact of freemium monetization methods on consumer behavior of people who play computer video games. While the study was not directly related mobile application monetization, some of the findings regarding freemium monetization are still somewhat indicative and related to this research, since the freemium monetization method exists and works the same way even outside of the context of mobile applications.

In the study the respondents (n=101) were asked if the pricing model had an effect on their purchasing decision and the answers were given on a 5-point scale where 1 represented “Completely disagree” and 5 represented “Completely” agree. The answers ended up averaging out at 3.7, meaning that in this case, “the monetization model had a very high impact on the consumer’s purchasing decision”. (Koponen 2017, 17-18)

In the next section of the same survey, the respondents (n=101) were again asked on the same 5-point scale, if they would prefer to play freemium games instead of traditional ones. The answers were heavily favored against freemium games, with 0 of the respondents answering “5” and only a 7 of them answered “4”, meaning that 94 of them were either neutral or disagreed with freemium monetization compared to traditional (premium, up-front) monetization. In specific, their answers

averaged out to 2.2, which shows significant adversity towards freemium monetization methods in video games when they are pitched again traditional ones. (Koponen 2017, 20)

With the results of this study in mind, it is important to remember and consider, that the dichotomy between freemium monetization and traditional monetization was a key theme in this research and it was not in the specific context of mobile application monetization. It could be possible that answers would vary, if the scope was isolated to just mobile applications and mobile games, since people could potentially hold different opinions and standards about freemium monetization on mobile platforms, where free applications are much more common.

3.4 Perceived aggressiveness of monetization

A research paper by Salehudin & Alpert (2021) that was published in The Journal of Research in Interactive Marketing collected 4092 unique user-generated comments from social media and mobile application review sites with the purpose of understanding what drives and affects mobile game application user's unwillingness to spend money.

The study mostly focused on fairness theory and on their concept of perceived aggressiveness of monetization (PAM) to explain mobile application users' unwillingness to spend money on in-app purchases and has both tangential and direct implications towards the topic of mobile application monetization attitudes.

Some of their findings demonstrated that badly managed and unfairly perceived mobile application monetization strategies can backlash on the application by increasing the users' unwillingness to spend money on the application and cause the application to be perceived negatively. The implication was that mobile application developers should avoid creating monetization methods that are perceived to be aggressive and overbearing by the users. (Salehudin & Alpert 2021, 14)

However, in the context of this research thesis, it should be noted that the study about the perceived aggressiveness of monetization was in the context of mobile games which are somewhat of a different landscape in terms of mobile application monetization, as they often involve competition and social factors which can exacerbate the application users' feelings of unfairness and negative attitudes. Nevertheless, perceived aggressiveness of monetization is both an interesting and relevant factor to be considered in the context of mobile application monetization attitudes.

4 Results and analysis

This chapter will present the results and findings of the research survey that was conducted. All results will be presented as-is, visualized by several different charts and diagrams that showcase the answers as numbers. The results will be presented in the same order as which they were collected in the survey form. Further discussion, analysis and conclusions will be reserved for another, following chapter.

The research survey that was created on google forms, gathered 34 responses in total, which came from mixed sources. These included personal and extended contacts, several survey -related online communities on the social media platform Reddit and a survey response exchange site called Surveyswap. Demographics of the respondents are mostly unknown, as they were not included in the research and the only criteria for partaking in the research was to be a mobile application user.

The research survey was carried out and shared online without the survey having any questions related to demographics, so the population of respondents can be deemed to be quite random and assumed to consist of somewhat younger people, as the platforms where the survey responses were gathered are usually considered to be favoured by younger people. As such, the results might not be generalizable to the entire population of mobile application users. There will be further additional discussion and insights related to the population and demographics of the survey in the discussion-chapter of the thesis.

4.1 Spending on mobile applications

The survey results show that 76.5% of the respondents had spent money on or towards mobile applications, whereas only 23.5% reported that they had not spent any money. Those 26 people who responded “Yes” to the question continued on to the next question, which asked about how much money they had spent and the people who answered “No” skipped over the next question.

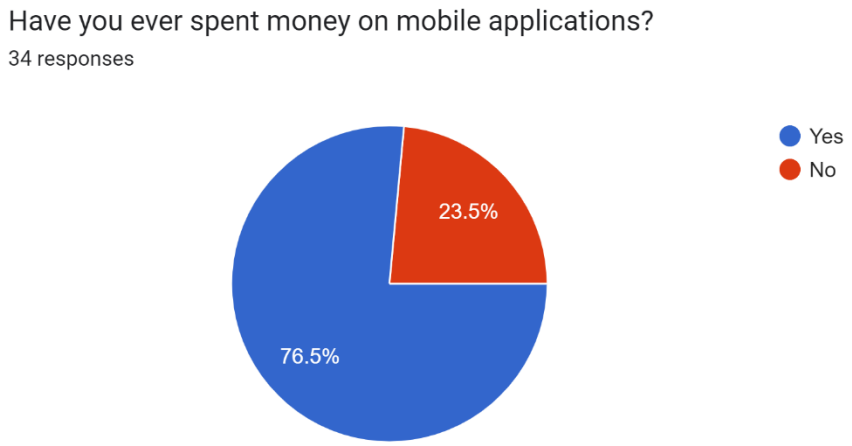

Figure 1. Have the respondents ever spent money on or towards mobile applications? (n = 34).

Out of the 26 respondents who continued on to the question shown in figure 2, 42.3% had spent less than 20€, 15.4% had spent 20-40€, 3.8% had spent 40-60€, 3.8% had spent 80-100€, 3.8% had spent 100-150€, 3.8% had spent 250-500€ and 26.9% had spent more than 500€. It should be noted that the percentages are rounded to one decimal point.

It is also noteworthy that most respondents gravitated more towards the extremities of the pricing categories, with 69.2% of respondents either choosing the lowest or the highest available spending category.

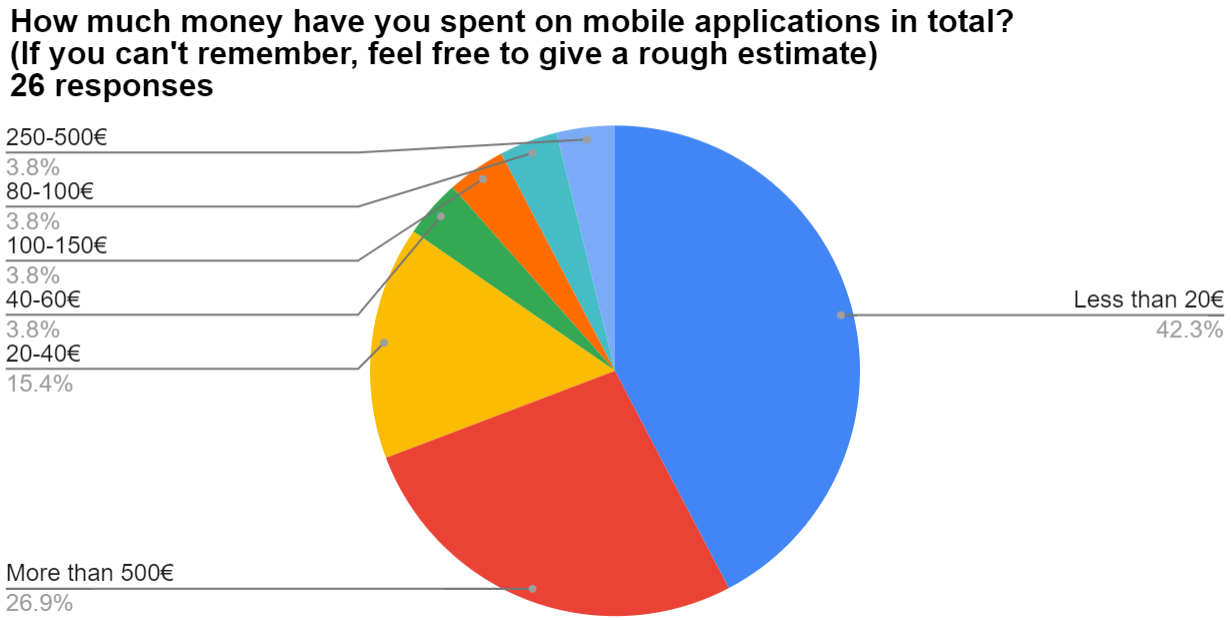

Figure 2. How much money have people spent on or towards mobile application on estimate? (n = 26).

4.2 Opinions and attitudes on monetization methods

In the figures ranging from 3 to 7 we can see what the respondents thought about different mobile application monetization methods. Participants were asked how they felt about each monetization method on a 5-point scale, where “1” indicated disliking and negative feelings, “3” represents neutral and “5” indicated liking and having positive feelings.

All of the questions were in the same section, under a header that asked, “On a scale from 1-5, how do you feel about the following monetization methods as a mobile application user?”.

Starting from Figure 3, in the case of mobile advertisements, the majority (52.9%) of the participants answered “1”, 38.2% answered “2” and 8.8% answered “3” on the scale from 1-5 (negative to positive). This indicates that the overall sentiments towards mobile application advertisements were highly negative. None of the respondents had any positive feelings towards advertisements, and at best, only a few had neutral feelings.

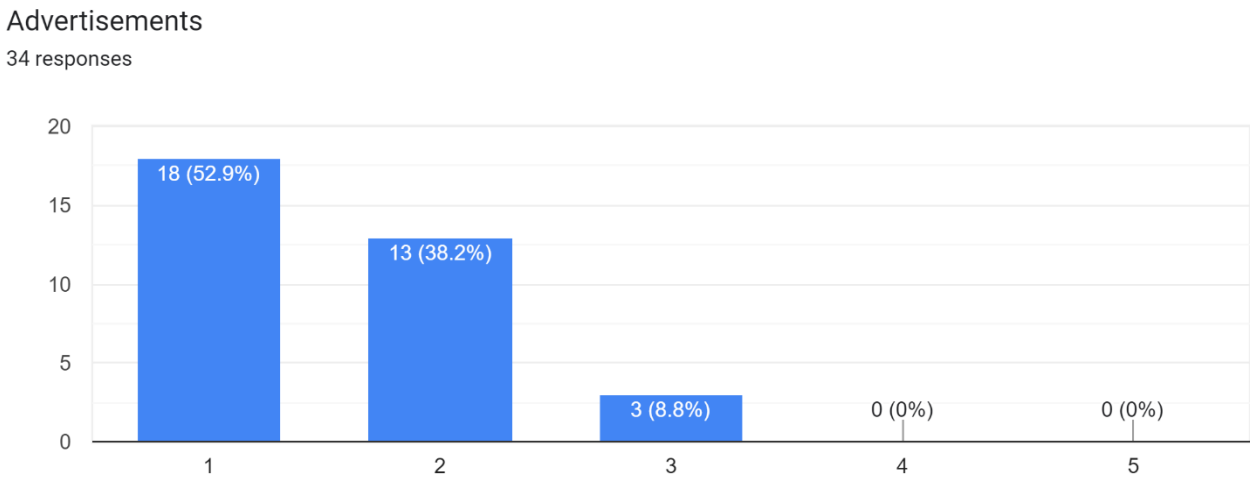

Figure 3. How do the respondents feel about advertisements on a scale from 1-5? (n = 34).

In regards to in-app purchases, the sentiments were still on the negative side, but there were many more neutral answers and even a few positive ones. This indicates that the respondents seem to have more favourable attitudes towards in-app purchases when compared to other monetization methods, even if the overall sentiments are still negative. In total, 20.6% of the participants answered “1”, 29.4% answered “2”, 35.3% answered “3” and 14.7% answered “4”.

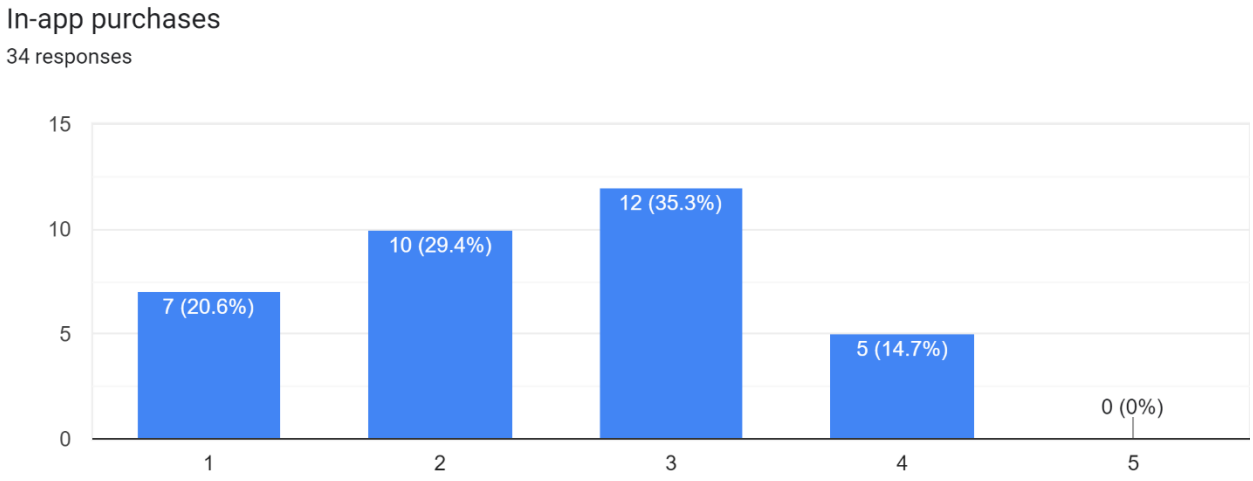

Figure 4. How do the respondents feel about in-app purchases on a scale from 1-5? (n = 34).

With subscriptions, the answers were somewhat divided, yet again negative leaning with 35.3% of the participants answering “1”, 26.5% answering “2”, another 26.5% answering “3” and finally 11.8% of the participants answered “4”. Both negative answer categories (answers “1” and “2”) gathered more than half of the total responses, so it can be observed that most people do not like subscriptions as a monetization method.

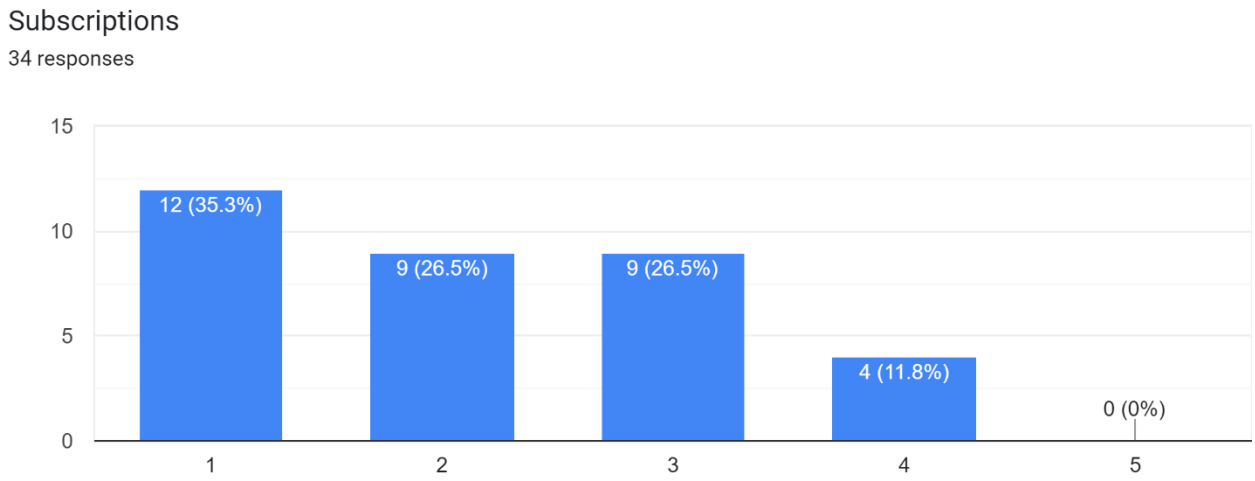

Figure 5. How do the respondents feel about subscriptions on a scale from 1-5? (n = 34).

Regarding selling and collecting data as a monetization method, the majority of the respondents indicated strong dislike towards said monetization method, with 67.6% answering “1”, 23.5% answering “2”, 2.9% answering “3” and 5.9% answering “4”.

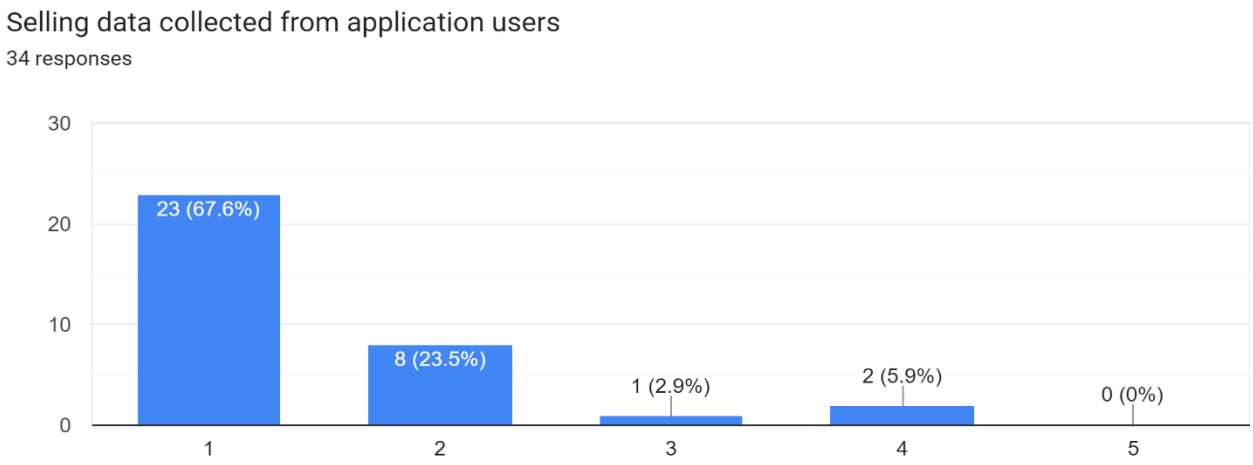

Figure 6. How do the respondents feel about collecting and selling data as a monetization model on a scale from 1-5? (n = 34).

Finally, the section about opinions and attitudes towards mobile monetization methods came to an end with the topic of up-front costs where 5.9% of the participants responded “1”, 11.8% responded "2”, 32.4% responded "3”, 44.1% responded "4” and 5.9% responded with “5”. Out of all the monetization methods, mobile applications with up-front costs were perceived most favourably by the respondents. In total, 17 of the survey responses were positive (answers “4” and “5”), which accounts for half of the answers.

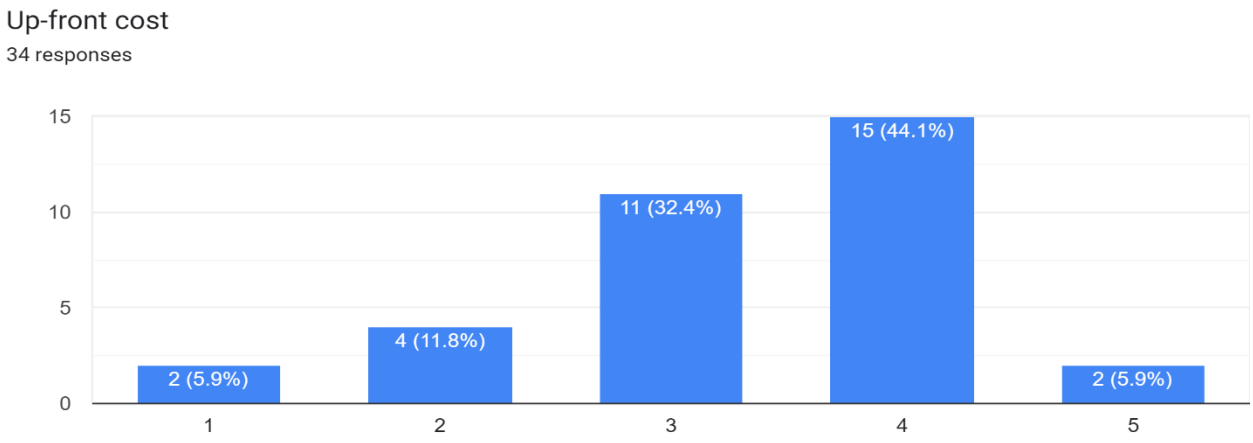

Figure 7. How do the respondents feel about up-front costs as a monetization method on a scale from 1-5? (n = 34).

4.3 Opinions on mobile advertisement formats

The next section of the survey (figures 8-11) was on the topic of mobile advertisement formats, and it followed the theme of the previous section, where the respondents were again asked to give their opinions on a 5-point scale. In the survey, 1 indicated disliking and negative feelings and 5 indicated liking and having positive feelings.

All of the questions were under a header that asked, “On a scale from 1-5, how do you feel about the following mobile advertisement formats?”.

This section of the survey started off with the topic of banner advertisements, where 17.6% of the respondents answered “1”, 35.3% of the respondents answered “2”, 29.4% of respondents answered “3” and 17.6% of respondents answered “4”.

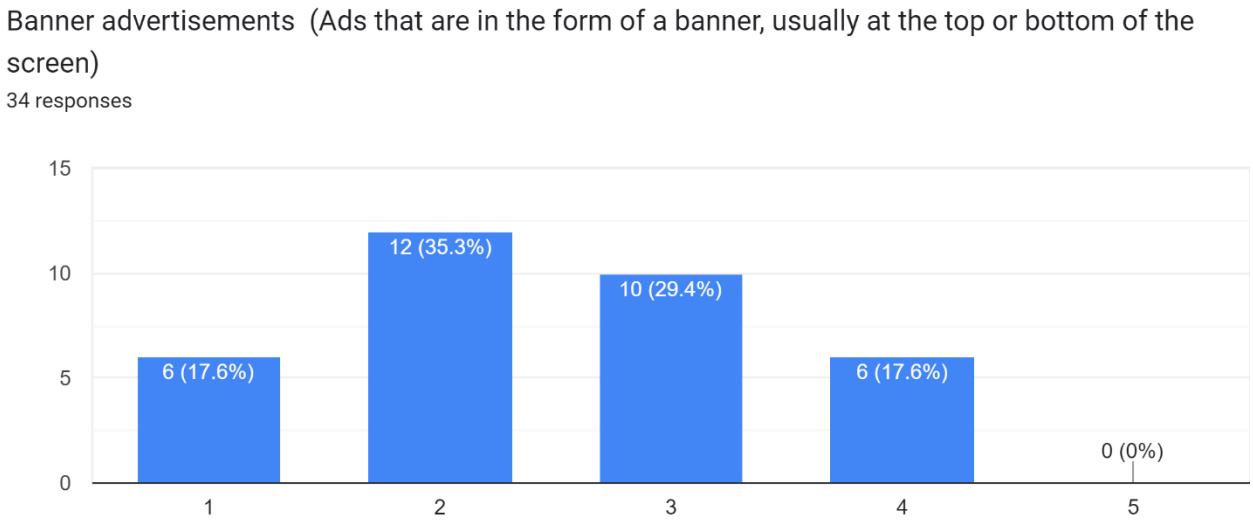

Figure 8. How do the respondents feel about banner advertisements on a scale from 1-5? (n = 34).

On the topic of native advertisements, the answers were more spread out with 26.5% of the participants answering “1”, 23.5% answering “2”, 29.4% answering "3”, 14.7% answering "4” and 5.95% answering "5”.

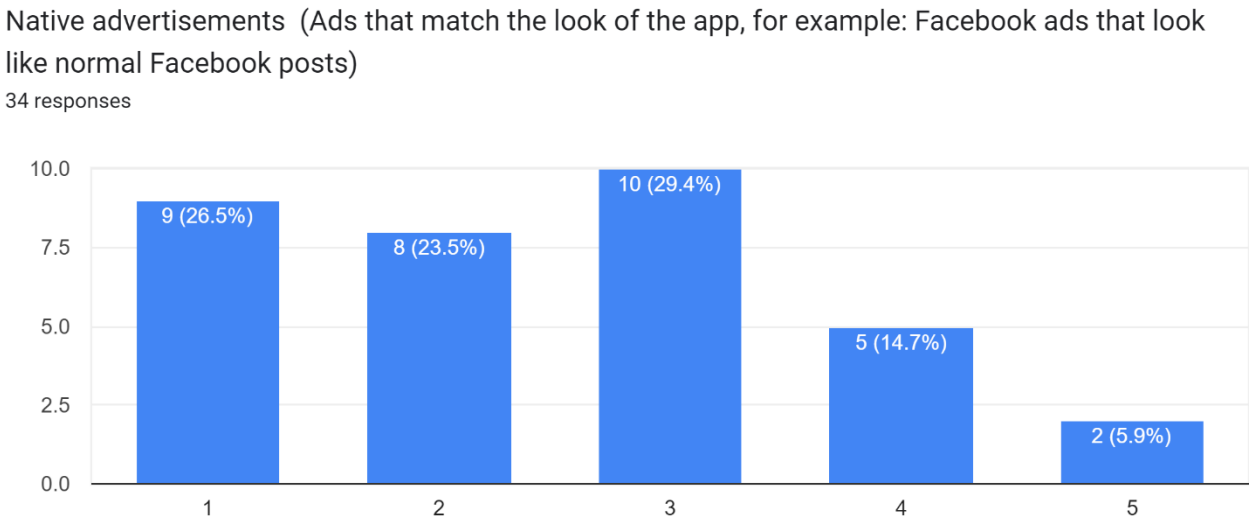

Figure 9. How do the respondents feel about native advertisements on a scale from 1-5? (n = 34).

Half (50%) of the participants responded very negatively towards interstitial advertisements by answering “1”, 14.7% answered “2”, 32.4% felt neutral and answered “3” and finally 2.9% answered “4”.

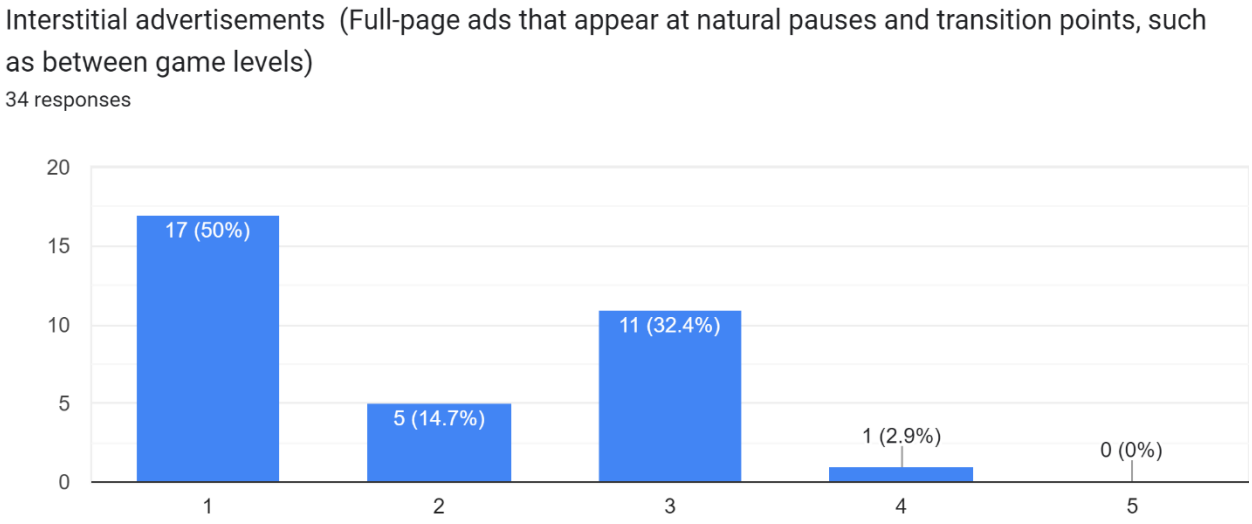

Figure 10. How do the respondents feel about interstitial advertisements on a scale from 1-5? (n = 34).

And finally, rewarded advertisements were the last advertisement format to be rated and the answers were relatively divided. Out of the 34 respondents, 14.7% answered “1”, 17.6% answered “2”, 38.2% answered "3”, 20.6% answered "4” and 8.8% answered “5”.

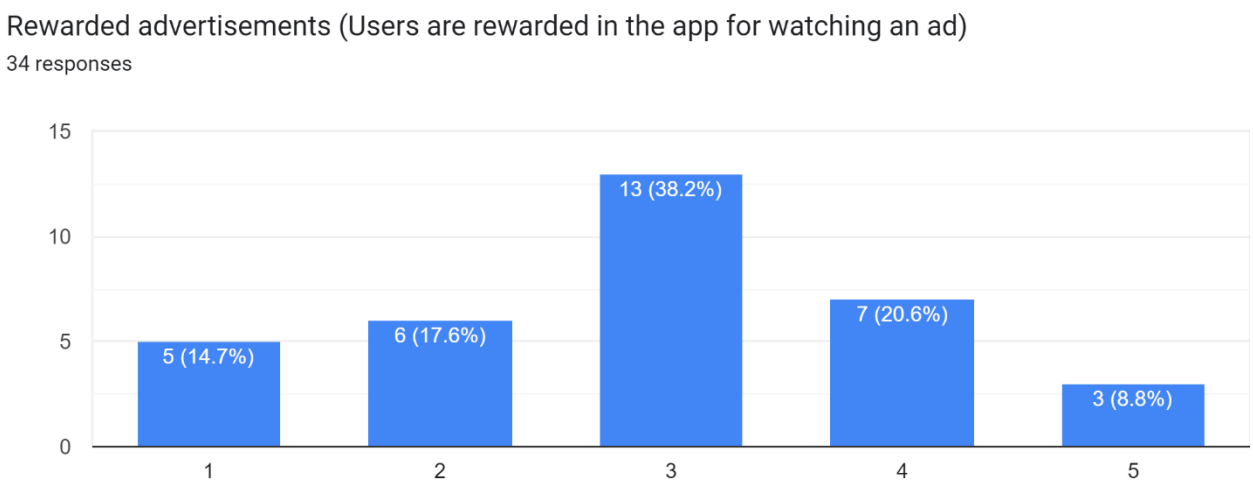

Figure 11. How do the respondents feel about rewarded advertisements on a scale from 1-5? (n = 34).

4.4 Frustrations with mobile application monetization

Nearing the end of the survey, the participants were asked if they had ever uninstalled or quit using a mobile application because of frustrations caused by the mobile application’s monetization choices (Figure 12). Those who answered “Yes” were directed to the final section of the survey and for those who answered “No”, the survey ended.

In total, 82.4% of three respondents answered “Yes” and 17.6% answered “No” to the question, indicating that most people had indeed experienced monetization-related frustrations which directly addresses the main research question and one of the sub-questions.

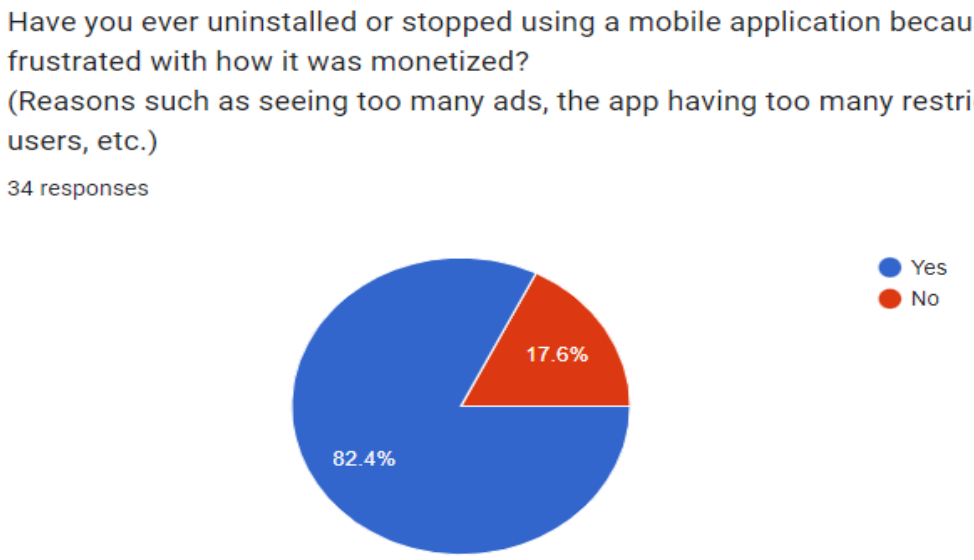

Figure 12. Have the respondents ever stopped using or uninstalled a mobile application because they were frustrated with how it was monetized? (n = 34)

Finally, the survey concluded with a multiple-choice checkbox question, where the respondents (n=28) were told to select which mobile application monetization related reasons had led them to quit or uninstall a mobile application (Figure 13).

According to the results, the most common reasons for quitting and uninstalling a mobile application were advertisement related. In total 20 respondents said they had uninstalled an application for having too many advertisements and 15 had uninstalled because of advertisements that were too annoying. In terms of quitting using an application, the number was nearly the same as with uninstalling, with 15 having temporarily quit because of frequent advertisements and 17 had temporarily quit because of annoying advertisements.

Another big reason for uninstalling was that the application was too restrictive on free/non-paying mobile application users. In total 19 respondents selected that as a reason for uninstalling and 11 selected it as a reason for temporarily quitting an application.

Regarding high mobile application costs, only 11 respondents had uninstalled an application with that as their reason and only 6 respondents had temporarily quit for the same reason.

Respondents also seemed somewhat averse to having their data collected by the mobile application, with 13 of the respondents selecting “I didn’t want the app to collect data from me” as a

reason for uninstalling, and nearly half as many having temporarily quit using an application for the same reason with 7 responses.

However, a less popular reason for uninstalling or quitting an application was “The app’s costs increased from before”, which only had 8 responses as the reason for uninstalling and 5 responses for quitting.

Finally, the respondents were also given the opportunity to choose “Other” as an option in both response categories, in case their mobile application monetization-related frustrations were not represented. Only 1 respondent had chosen “Other” as their option in both categories.

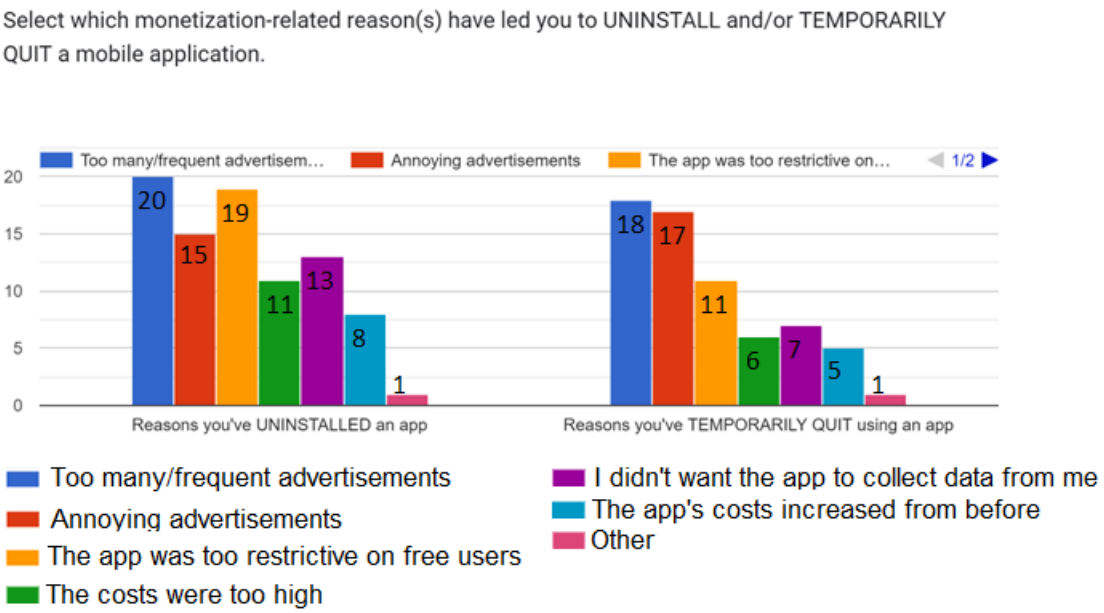

Figure 13. Which monetization-related reasons have led the respondents to uninstall and/or temporarily quit a mobile application? (n = 28).

4.5 Cross tabulation of results

Some of the results will be cross tabulated in this section to draw more insight from the collected results. In particular, the relationship between mobile application spending and attitudes towards mobile application monetization will be demonstrated. There will be two figures, one regarding mobile application monetization models and one in relation to mobile advertisement formats, both cross tabulated with mobile application spending categories.

In table 1 we can see how the respondents in their respective spending categories felt about each different mobile application monetization method. As was the case before, the score of “1” represents negativity and disliking and the score of “5” represented positivity and liking.

Total spending	Ads	In-app purchase	Subscription	Selling user data	Up-front costs
No answer (0€) (n = 8)	1.63	2.50	1.75	1.38	2.88
Less than 20€ (n = 11)	1.55	2.09	2.09	1.45	3.36
20-40€ (n = 4)	2.25	2.50	1.75	1.50	2.75
40-60€ (n = 1)	2.00	2.00	4.00	2.00	4.00
80-100€ (n = 1)	1.00	3.00	3.00	1.00	4.00
100-150€ (n = 1)	1.00	3.00	3.00	1.00	4.00
250-500€ (n = 1)	2.00	3.00	2.00	1.00	5.00
More than 500€ (n = 7)	1.14	2.71	2.43	1.71	3.57
Average scores:	1.56	2.44	2.15	1.47	3.32

Table 1. Cross tabulation of mobile application spending and average scores of attitudes towards mobile application monetization methods. (n = 34).

Before examining the results, two things should be noted. One, is that almost all of the respondents belonged to the categories of “No answer”, “Less than 20€” and “More than 500€”, which left many of the spending categories in between with only one or two respondents, meaning that not much can be derived from those results. And two, it should be noted that all of the values were already rounded up to two decimal points in Microsoft excel and then manually inserted into the word document, which may cause minor discrepancies in the averages.

Looking at the results, we find that all monetization methods are perceived negatively by the users except for up-front monetization, which had an above average score of 3.23, meaning that the respondents felt slightly positively about said method. Whereas the average for selling user data was 1.47 and 1.56 for advertisements, which were nearly tied in being the worst-perceived mobile application monetization methods. In-app purchases and subscriptions were also perceived negatively, with scores of 2.44 and 2.15 respectively, but not as much as the lowest-rated monetization methods.

Looking at the spending categories in relation to mobile application attitudes, the relationship between the highest paying respondent category and their attitudes towards advertisements was very noteworthy, as they gave an average score of 1.14, which is exceptionally low and signifies a very strong dislike towards advertisements.

It can also be observed that the highest spending category of respondents had more positive attitudes and perceptions towards monetization methods that cost money to the application user, compared to the no-paying category. The respondents who had spent over 500€ gave in-app purchases a score of 2.71, a score of 2.15 for subscriptions and 3.57 for applications with up-front costs, as opposed to the respondents who hadn't spent any money who gave the scores 2.50, 1.75 and 2.88 for each respective category in the same order.

From table 2 it is noticeable that that all advertisement formats were perceived negatively, with the closest one to neutral being "Rewarded advertisements" with a score of 2.92. Additionally, the interstitial advertisement format, that can be usually considered to be the most intrusive of the options in terms of taking the user's attention against their will, had the lowest overall score of 1.88.

Additionally, it can be also observed from table 2 that the category of respondents who had not spent any money towards mobile applications seemed to have more positive attitudes towards advertisements overall when they are compared to the respondents who had spent over 500€ towards mobile applications. The non-paying mobile application users gave native advertisements a score average of 3.13, a score of 1.75 for interstitial advertisements and 3.63 for rewarded advertisements, as opposed to the highest spenders who gave scores of 2.50, 1.57 and 2.14 for each respective ad format in the same order. The only exception to this was with banner advertisements, where the highest spenders rated the advertisement format as 2.86 in contrast to the non-paying respondents who gave it a score average of 2.63.

Total spending	Banner advertisements	Native advertisements	Interstitial advertisements	Rewarded advertisements
No answer (0€) (n = 8)	2.63	3.13	1.75	3.63
Less than 20€ (n = 11)	2.18	2.18	2.18	2.64
20-40€ (n = 4)	2.25	2.00	1.25	2.75
40-60€ (n = 1)	2.00	2.00	1.00	4.00
80-100€ (n = 1)	2.00	2.00	3.00	4.00
100-150€ (n = 1)	4.00	4.00	3.00	3.00
250-500€ (n = 1)	2.00	3.00	3.00	4.00
More than 500€ (n = 7)	2.86	2.43	1.57	2.14
Average	2.47	2.50	1.88	2.91

Table 2. Cross tabulation of mobile application spending and average scores of attitudes towards mobile advertisement formats (n = 34).

5 Discussion

In this chapter we will finalize the thesis by making conclusions on the results and see how they relate to some of the existing research that was highlighted previously. Additionally, there will be some reflecting on the survey process, examination and discussion about reliability and validity of the study, as well as recommendations for further research.

5.1 Conclusions

The research successfully collected information about mobile application users' attitudes towards mobile application methods and had some interesting findings and implications, that reflect and have some cross-over to the research which was highlighted in the theoretical part.

One of the main conclusions was that overall, all mobile application monetization methods are perceived negatively by mobile application users, with the only exception being up-front/premium monetization, towards which application users had slightly above average/neutral attitudes.

Even though the attitudes towards premium, up-front payments were perceived to be the most positive, it is reasonable to assume that the attitudes could change based on the price of the application itself. Previously it was observed in Kananen (2014) that a large majority of their respondents considered a 3€ or less to be a "fair" price for a mobile game, which in the context of this research implies that higher up-front costs could result in less perceived fairness and worse overall attitudes. It could be the case, that the respondents simply liked the idea behind the monetization method.

It was also evident from the results, that mobile application monetization methods that give the application users agency and the ability to make a decision on how to interact with the monetization method were perceived better than monetization methods that do not. This was observed from the fact, that advertisements and the monetization method of collecting and selling user data don't usually involve personal choice and agency. These two monetization methods happened to be the only ones that had average attitude scores of under 2 and the lowest overall attitude scores in general (Table 1). Every other monetization method involved personal agency and a choice to spend money, which subsequently weren't perceived as negatively.

The same phenomena regarding personal agency over mobile application monetization and attitudes could be observed in the attitudes towards different mobile advertisement formats, but to a lesser degree. Again, the highest average score was given to rewarded advertisements, which are usually completely optional to the application user and involve personal agency, and the lowest average score was given to the interstitial advertisement format, which was arguably the most intrusive, aggressive and attention-grabbing advertisement format introduced in the study.

The conclusion regarding advertisement formats also had some tie-ins to the theoretical basis, where the effect of perceived aggressiveness of monetization on in-app purchasing was explored (Salehudin & Alpert 2021). In this case, the results pointed towards a similar phenomenon outside of the context of in-app purchases, where the aggressiveness of the interstitial mobile advertisement format could have been the cause for being perceived significantly more negatively when compared to other advertisement formats.

In general, the advertisement attitude -related results were somewhat consistent with the research introduced in the “Attitudes towards mobile advertisement” chapter where Le & Nguyen (2014) found that users don’t generally have positive attitudes towards seeing advertisements, but they were still not perceived as badly as commonly thought. That is partially the same conclusion that can be made from the results of this research.

In this study, the overall attitudes towards advertisements were found to be very negative, but when the attitudes towards each different mobile advertisement format were surveyed individually, the attitudes were significantly more positive. One of the advertisement formats, which was rewarded advertisements, was even almost perceived neutrally.

Frustration as a cause for quitting and uninstalling mobile applications was also explored, and the conclusion could be made that the overall biggest reasons for quitting and uninstalling mobile applications were related to frequent and annoying advertisements and on the restrictions placed on non-paying mobile application users. The results regarding restrictions in mobile applications had again some tie-ins to the theoretical section where Koponen (2017) found that freemium monetization, which always involves some sort of restrictions on free users, is perceived negatively by the respondents.

5.2 Reflection on the survey

During the research the researcher had a lot of dilemmas with how the survey should be conducted and how the questions should be asked in the survey. On one hand the researcher had the goal of keeping the research as short as possible while addressing the established research questions as concisely as possible, but at the same time there were more questions that they would have liked to ask in the survey. However, the researcher perceived that adding more in-depth questions and topics would have run a higher risk of both boring and confusing the respondents, which could have led to less participation in the survey and ran the risk of lowering the overall quality of the survey responses.

As some survey responses were collected in face-to-face situations, it highlighted and exposed some weaknesses of the survey. For example, the researcher noticed that some of the older

respondents had weaker conceptual understanding of mobile application monetization as a whole. The older respondents had no problems with understanding some of the concepts when it was explained to them, but the whole topic was not as self-explanatory to them as it was to the many young adults that were surveyed, who didn't seem to have problems understanding any concept or terminology in the survey. In hindsight, asking about the age of the participants or by asking about their self-perceived level of technological understanding could have eliminated this problem.

5.3 Reliability and validity of the results

This chapter will examine and reflect on the reliability and validity of the results. In the context of research, reliability tells us if there is error and how much error there might be in the measured results. On the other hand, validity assesses if the measured results accurately described the concepts and phenomena they were meant to describe. (Nummenmaa, Holopainen & Pulkkinen 2016, 18)

The researcher took great care and consideration when creating the survey, so that all of the survey questions were as simple and straightforward as possible, meaning that the validity of the research survey itself should be relatively high. For ensuring validity during the creation of the survey, the researcher took notes from Kananen (2010, 93) and avoided negative wording in the survey questions, ensured that neutral options were available so that the respondents aren't forced to have an opinion, and made sure that the questions were in a logical, intuitive order. Additionally, the survey responses were examined individually to ensure they were answered seriously and with legitimate intentions by checking that no respondents had selected the same option for every answer in figures 3 to 11, which would be highly unlikely in a legitimate survey response.

However, the validity of the research still suffers for a few different reasons. For one, the number of answers to the survey was less than ideal, but still acceptable. On this basis alone, the answers might not be generalizable to the population. The second validity problem is caused by the fact, that the researcher gathered answers from platforms, social medias and groups that are usually favoured by younger people, meaning that older people are not necessarily represented in the research. As an example, the researchers' personal contacts that were surveyed were mostly young adults and only a few of them were over 50-years old. Some answers were also gathered on reddit, where 10% of the users are between the ages 50-64 and only 3% were older than 65 (Auxier & Anderson, 7.4.2021), meaning that the answers gathered from this platform were also most likely from younger people.

The researcher also believes that the part of the study that looked at mobile application spending categories (Figure 2) suffered both in terms of validity and reliability, as the answers indicated that

most people probably can't remember how much money they have spent on mobile applications. Even though this information is very important and valuable to know in regard to the research topic, this led to a situation where most of the answers congregated towards both extremes, meaning that people recalled spending either very little or too much to remember.

In the context of research, reliability on the other hand means that the results of the research can be reproduced, so that future research can arrive to the same results. (Kananen 2010, 128-129)

The reliability of this research suffers largely for the same reasons that caused problems with the validity, meaning that based on the sample size the results might not be generalizable to the population and that the research did not have access to older respondents, which represent a significant amount of mobile application users. For this reason, if the research was replicated with a larger sample size that had all age groups represented equally, the results could differ. However, it should be kept in mind, that attitudes towards mobile application monetization aren't necessarily affected by people's age.

Another issue that can pose issues for the reliability of the results are cultural and socioeconomical differences. It could be the case that people from different countries and cultures hold different attitudes, preferences, and opinions towards mobile application monetization, and especially so if their socioeconomic statuses are widely different. In other words, if the research was reproduced, the results of the research could vary based on the country of origin or the region of the respondents.

The effects of culture are a valid concern for the reliability of the research, since these cultural differences regarding monetization are already somewhat well known in the context of video game monetization between the east and the west, where usually western video game players are much more averse to in-game purchases and much more against the act of paying to win in games compared to their eastern counterparts. (Huang 30.5.2018)

The effect of culture on validity and reliability was also seen in one of the previously mentioned studies (Sigurdsson & al. 2017, 22-23) where they made the observation that there were some notable differences between India and the United Kingdom regarding mobile application advertisement attitudes.

5.4 Recommendations for further research

Learning from the successes and shortcomings of this research, there are a large number of studies that could be done on the topic of mobile application monetization. This area of research is relatively unexplored, or at the very least, not sufficiently explored, and could greatly benefit from a similar study to this one, that is more comprehensive and accounts for all age demographics,

socioeconomic statuses, and cultures, with a vastly larger sample size. Mobile application monetization methods affect every smart phone user in the world, and as such, researching the topic requires a very large amount of effort and resources to do comprehensively, which could be a research recommendation for larger institutions and researcher groups.

For smaller-scale studies such as bachelor's theses, the researcher recommends conducting studies that isolate one monetization method at a time, to comprehensively see how they affect mobile application users. This approach could lead to greater quality of research as opposed to lumping every monetization method together in one research. Furthermore, the researcher would like the research topic of monetization attitudes to move away from video games and mobile games, as he subjectively found that there was much more research on monetization in games than on monetization attitudes towards non-game applications.

Research of this kind would also greatly benefit from specific, actual data on people's lifetime spendings on mobile applications. This way the relationship between mobile application spending and mobile application monetization attitudes could be reliably explored, so that the survey respondents wouldn't be subjected to having to unreliably remember how much money they had spent, as was the case with this study.

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Appendices

Appendix 1. Survey form

Mobile application monetization spending & preferences

* Indicates required question

Thank you for taking interest in this short survey.
Your answers are an important part of my thesis about mobile application monetization.

This survey aims to explore your behavior and attitudes towards mobile application monetization and the impact it has on you as a regular mobile app user.

Your participation in the survey is completely anonymous.

Spending money on mobile applications (Part 1)

1. Have you ever spent money on mobile applications? *
   (Any money spent towards a mobile application counts, e.g. In-app purchases, subscriptions.)

   Mark only one oval.

   - ◯ Yes
   - ◯ No *Skip to question 3*

Spending money on mobile applications (Part 2)

2. How much money have you spent on mobile applications in total? *
   (If you can't remember, feel free to give a rough estimate)

   Mark only one oval.

   - ◯ Less than 20€
   - ◯ 20-40€
   - ◯ 40-60€
   - ◯ 60-80€
   - ◯ 80-100€
   - ◯ 100-150€
   - ◯ 150-250€
   - ◯ 250-500€
   - ◯ More than 500€

Opinions on mobile monetization (Part 1)

On a scale from 1-5, how do you feel about the following monetization methods as a mobile application user?
(Also think in terms of which monetization methods you are most likely to interact with.)

3. Advertisements *

Mark only one oval.

Negative/Dislike

1 ⬭
2 ⬭
3 ⬭
4 ⬭
5 ⬭

Positive/Like

4. In-app purchases *

Mark only one oval.

Negative/Dislike

1 ⬭
2 ⬭
3 ⬭
4 ⬭
5 ⬭

Positive/Like

5. Subscriptions *

Mark only one oval.

Negative/Dislike

1 ⬭
2 ⬭
3 ⬭
4 ⬭
5 ⬭

Positive/Like

6. Selling data collected from application users *

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

7. Up-front cost *

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

Opinions on mobile monetization (Part 2)

On a scale from 1-5, how do you feel about the following mobile advertisement formats?

8. Banner advertisements *
(Ads that are in the form of a banner, usually at the top or bottom of the screen)

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

9. Native advertisements *
(Ads that match the look of the app, for example: Facebook ads that look like normal Facebook posts)

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

10. Interstitial advertisements *
(Full-page ads that appear at natural pauses and transition points, such as between game levels)

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

11. Rewarded advertisements *
(Users are rewarded in the app for watching an ad)

Mark only one oval.

Negative/Dislike

1 ◯
2 ◯
3 ◯
4 ◯
5 ◯

Positive/Like

Frustrations with mobile application monetization (Part 1)

12. Have you ever uninstalled or stopped using a mobile application because you were frustrated with how it was monetized? *
(Reasons such as seeing too many ads, the app having too many restrictions for free users, etc.)

Mark only one oval.

◯ Yes
◯ No *Skip to section 8 ()*

Frustration with mobile app monetization (Part 2)

13. Select which monetization-related reason(s) have led you to UNINSTALL and/or TEMPORARILY QUIT a mobile application. *

Tick all that apply.

	Too many/frequent advertisements	Annoying advertisements	The app was too restrictive on free users	The costs were too high	I didn't want the app to collect data from me	The app's costs increased from before	Other
Reasons you've UNINSTALLED an app	☐	☐	☐	☐	☐	☐	☐
Reasons you've TEMPORARILY QUIT using an app	☐	☐	☐	☐	☐	☐	☐

Thank you for participating in the survey!