

# Investigating App Users

Creating personas for global applications

Cecilia Fagerros & Johan Mattsson

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## **Abstract**

There are over 1.5 million Android applications on the market available today. This makes it important for the developers to know their customers. Knowing what their customers want from the application will grant the developers insight in what features they should implement. This report will present different methods of finding users and their behaviours in a certain application. The users' behaviours will be divided into different patterns, which then are translated into user personas and presented to the developers as a result.

In order to find actual users, various methods were used. The different approaches were compared to each other in the aspects of their time consumption and value for the result. The most effective way to find users was through surveys posted in a app specific beta test channel that was set up by the developers for users to join voluntarily. The surveys gave information about the user behaviour when interacting with the app. The respondents were able to sign up to help the project even more by participating in interviews. The interviews were held with the users who provided their email address and these interviews gave personality traits that could be used to make the personas more lifelike. The surveys and the interviews combined gave sufficient information to create personas for the majority of the user base with an error margin of seven percent.

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# 1 Introduction

There are over 1.5 million available Android mobile applications on the market [1]. It is important that the companies responsible for these applications know what their customers want in order to fulfil these wishes. Understanding user needs and their behaviour can be advantageous and give developers the upper hand towards competitors. This is however easier said than done, especially if the user base is larger than 10 million people and all of them are anonymous. In this project different methods will be presented that can solve this problem and evaluate the usefulness from a smaller company's perspective. This is because the team that has arranged for this work has limited time, money and personnel resources as if it was a small company of let's say 10 people. The results from this project will therefore apply better to a smaller company than to a large company. A larger company could have entire departments working on getting to know their users with a larger amount of time and monetary aspects.

The larger company the team is located in has its impact on the study as well, since it gives an easier starting point for interviewing and getting into contact with people, but might be restrictive in other matters. The methods presented will therefore be more applicable for small companies with time and money restrictions trying to reach their customers rather than a large company where there can be entire squads dedicated to getting this information.

## 1.1 Background

Sony mobile communications is a company headquartered in Tokyo, Japan. The company's focus point is mobile communications with everything from manufacturing mobile phones to creating software. The mobile devices run on the Google owned open source operating system Android, although the Android version in Sony phones is customised from the original version.

Sony mobile communications has developed an application called Sketch. Sketch have started to grow with a lot of users around the world. The application is a drawing program with different painting tools and packages containing images which you can add as layers to the picture you are editing, called stickers. In order to further develop this application Sony mobile need information about the users' desires and which functions that are most used on different occasions.

Sony mobile communication would like to improve the user experience for users of the Sketch application. To be able to accomplish this it is necessary to understand what users like and do not like about the application, it would also help the team creating the application get an understanding of how the users use the application. It would be very useful for Sony mobile communications to understand their users and their needs. Sony mobile communications has presented a Master Thesis work for this project and help the Sketch team to get a better understanding of their end users.

## 1.2 Sketch

Sketch is a mobile application available on Google Play, the official application market for the Android operating system. Sketch have the functionality to create pictures, or sketches, by using coloured pencils or importing stickers and photos. Sketch also have a function to share creations, where the user can invite other people for co-operation, called Collaborations. The invited party can import the picture, edit it and then share it. The Collaborations is a feed of what changes has been done to the shared sketch, showing the new additions to every stage along the way paired with what user that made the changes. It is possible to add a complete background to a sketch with a background tool, which can be either a single colour or different patterns. There is also a text tool, which allows the user to add texts to the sketch. A Sketch session can be started with an empty canvas to fill with anything the user pleases or by importing an image or photo into the app to draw on. The major functions will be explained further with example images below. Pictures for the application in shown Figure 1.

### Stickers

The stickers are small images that be downloaded in different packs and added to sketches. They have various uses such as creating sketches with only stickers, adding stickers to a photo or decorating a painting with stickers to add additional element.

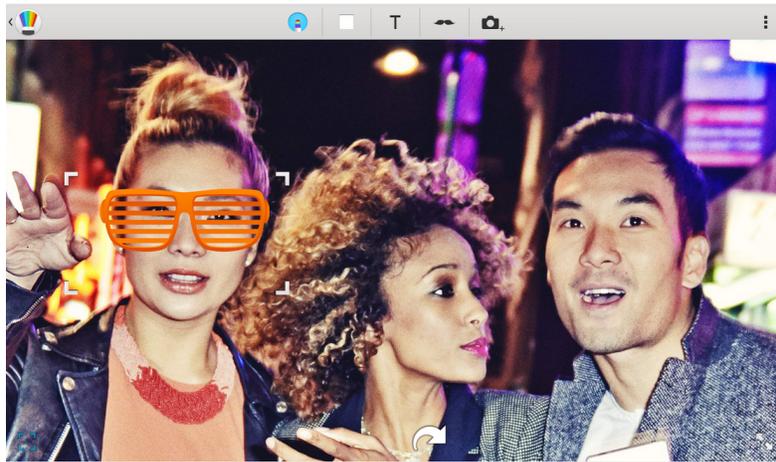


Figure 1: Example images of stickers usage. The top one is in the process of adding stickers to a photo while the bottom one is made almost solely with stickers.

### Painting

The painting tools are a representation of different artistic tools from real life. These can create different kinds of paintings with various styles and types paint. The painting tools are created for the artistic users. Pictures from the painting features is shown in Figure 2.

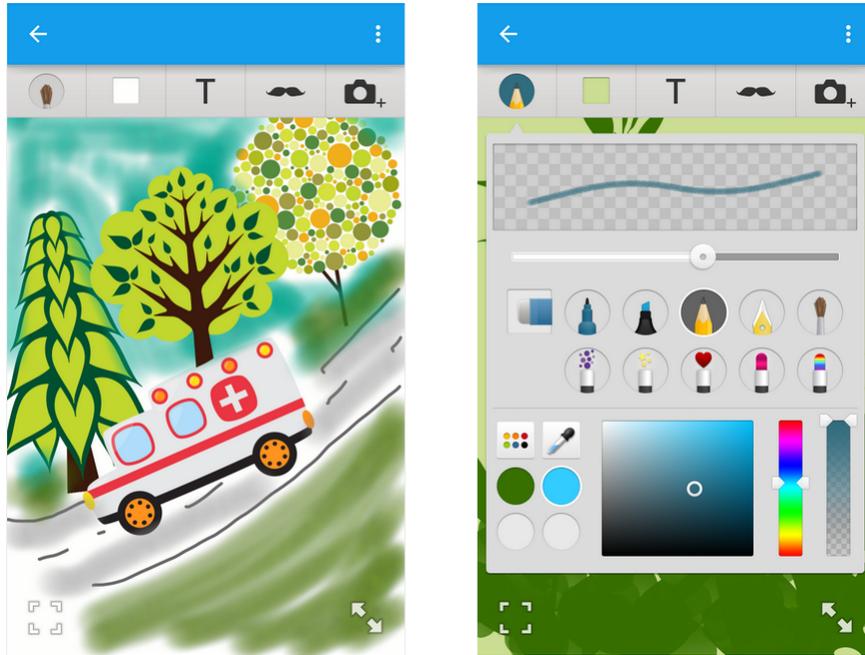


Figure 2: Example images of using the painting tool. To the left a painting created by the tools on the right.

### Collaborations

Collaborations is a feature for people to work on sketches together. Each addition to the sketch is illustrated by a new sketch showing up to the right of the previous version. Pictures from the collaborations features is shown in Figure 3.

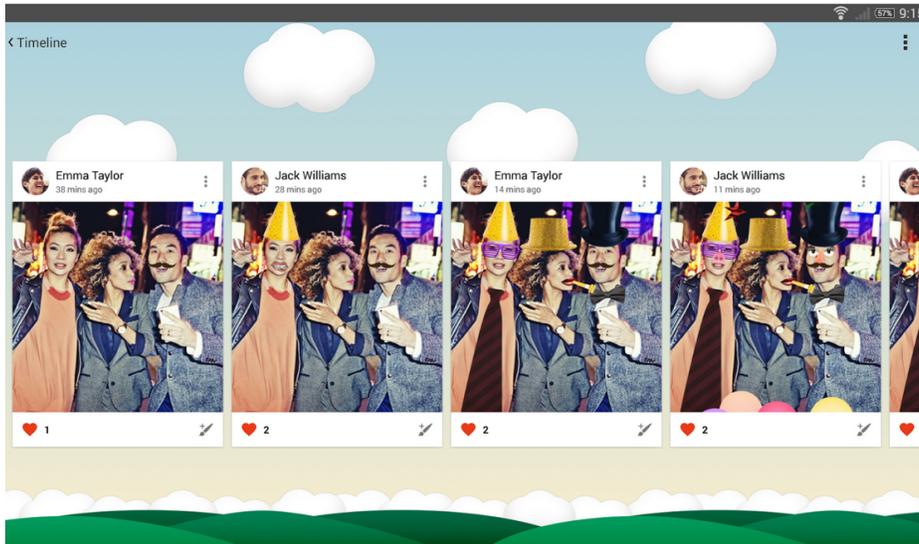


Figure 3: Example image of the collaboration feature. Shows the work flow of two different users collaborating on a single photo.

### 1.3 Project restrictions

This project is a master thesis work performed by two students at the Faculty of Engineering (LTH) in Lund, Sweden. LTH is part of Lunds University with mainly engineering-oriented educational programs. A master thesis spans over one semester and is equal to 30 credits which means a total of 20 weeks of work per student involved. The project also has limited resources in carrying out the user study, and travelling to other countries is not a viable option. An optimal persona process usually involves shadowing actual users for full days during a period of time to get a clear picture of how and when they use the application in question. Following the typical users may involve travelling to the country where the product is most popular and study how different ages, cultures and genders interact with the product. In this project not all this is possible, and 20 weeks is not enough time when it comes to properly creating personas [2].

### 1.4 Purpose

Sony have developed a few apps that come standard with their devices in order to create added value to their customers. When developing any technology it is important to create content that the users would like to use. A certain way of knowing what the users might like is to actually ask them and get the information from the source itself. By knowing what their customers wants it is much easier to customise the app to something that will be used. The purpose of this project is to gain this information from the users and present it in an appropriate manner to the team so they can use it in their development.

Creating a study of who the users are and what they like does not only produce a result in the form of user information, but also an evaluation if it is possible to gain such information under the circumstances of the project.

### **Ethics in the project**

To collect information about all users, users have to share some private information about their everyday life. This information has all been collected anonymously. In order to find users, they have anonymously answered a survey and if they wanted to help us even more they could enter their email address. This made it voluntary for the users to continue the to keep contact with us. In both the survey and the interviews there have been explanatory texts saying that it is okay to not answer questions if it feels uncomfortable or the user for any reason does not want to answer that question.

## 1.5 Definitions

QR-code or Quick Response code - A two-dimensional bar-code that is possible to scan with a camera, often using a mobile phone. This code can then, as in this project, be linked to a website.

A sketch - A sketch is an image created with the application Sketch.

Snowball sampling - When in contact with respondents in interviews and surveys, it is possible to ask if they know anyone else that would like to take part of the study. This is called snowball sampling and is very useful when there are only a few initial respondents, since the participation can expand exponentially.

Maximum variation - When conducting a study and choosing what selection out of the entire population is to take part in the study, making sure that all possible opinions and thoughts are accounted for means that the maximum variation is fulfilled.

Theoretical saturation - If the respondent data that is collected covers all possible answers, a state of theoretical saturation is reached.

operationalisation - Creating practical measuring points out of a concept or a theory, trying to recreate the concept in terms that are actually measurable. This could be to choose what aspects to look at when trying to validate a theory.

External and internal validation - External validation is when the results of a study in a certain population is applicable in populations other than population in the original study, where as with internal validation the results are only applicable within the same population as the study took place in.

Live User Testing (LUT) - A department at Sony that distributes devices to employees or family members of employees that volunteer for testing the device. Users that are in LUT are expected to leave feedback on features and answer surveys sent out by Sony.

## 2 Method

In this project different methods have been used for finding users, collecting data and create personas. The different methods are presented in this section.

There are quite a few ways in which to conduct studies, and they all got their positive and negative sides. The most suitable method is heavily depending on which kind of data that is most valuable for the study at hand. Some methods are specialised in gathering quantitative data, which is useful for statistics, and the others are gathering qualitative data which is of a more describing nature. The participants of the study will here be called respondents and the ones carrying out the study will be called researcher [3].

There are many different levels of detail when it comes to creating studies, most of these levels also have different categories within them. An early division can be splitting into respondent studies and informant studies. In respondent studies is the researcher interested in what the respondents opinions, thoughts and feelings about a certain situation or event. In this case it is quite important that the questions that the respondents answer are as similar as possible for each individual participating in the study. Informant studies are used when the researcher is trying to figure out exactly how an event happened, and the respondents are treated like witnesses. In this case the respondent all contribute with all the data they have in order to aid with creating one true story [3].

The respondent studies are the most suitable type of study for this project and can be divided into interviews and surveys. The main difference between these two types is that the surveys are questions asked from the researcher to the respondent and the interviews are more of a structured dialogue between the two parts. This allows a discussion about both the questions and answers if any uncertainties emerges [3].

### **Qualitative Studies**

Qualitative studies are best used when it comes to gathering information that is not purely statistical, but is aimed more towards the questions why and what instead of if and how many. Qualitative studies are in general preferred when it comes to understanding the respondents and not just when mapping different behavioural patterns.

### **Strategic selection**

When creating a study of how people, in this case users, behave in different situations it is important to make strategic selection of what people to include in the study. Some studies have the tendency to only incorporate data from users in a close geographical radius, mostly because it is much simpler. If the actual user group is not only located in the same country, but in other countries and

perhaps even other cultures and parts of the world, incorporating only residents of that country will yield unrepresentative results. Getting a matching result for users around the world by only studying users in one of the countries would be pure luck, and very hard to both accomplish and validate. Strategic selection will not grant data representative for the entire population in every detail. But through an analytic generalisation of the results that evolves into a theory is it possible to highlight universal aspects that can be expected to say something about other similar cases in the population [3].

### **Selection intensity**

When making a selection from the initial population it is very important to have a high intensity. This means that the researcher focus its interviews on the parts of the population that are most likely to give the most informative data. An example is a study that was carried out in Sweden with the goal to investigate gender differences in certain political committees. Women were overrepresented in committees regarding social issues and underrepresented in technical and economical issues. There was no point in asking all the 240 people that were in all kinds of committees when only a few of those were actually involved in the committees concerned by the study. The selection was intensified to only those who were in the two relevant committees, as they were the ones whose opinion the researcher valued the most [3].

### **Surveys**

Most surveys are conducted in a way that all the respondents get the same questions and each questions have a few predetermined answers to choose from. Although with a fixed set of possible answers the researcher only gets a quantitative measure of how many of the respondents choose which of the answers. The possible answers might not even be accurate to the user groups opinions, as they are set by the researcher. To get more qualitative answers it is possible to conduct open questions with no fixed alternatives to choose from, this lets the respondents answer whatever they want without being restricted by the imagination of the researcher. In order to get the most out of surveys there is often questions like “Is there anything else you would like to add to what you have already said?”. One of the large usages of surveys is for the researcher to get a better picture of how frequent certain answers are within a determined population, which is the same process as creating persona skeletons [3].

Surveys are best targeted at a random selection of the supposed population, with the hopes of making the results generalisable for the entire population. It is for this sake important that the respondents represent the different parts of the population, and that it is possible to achieve theoretical saturation with the respondents that take part in the study. There are two different ways to carry out surveys, field surveys and written surveys. The field surveys can be in person out on town, by telephone or in person in the respondents home. The written

survey is most often distributed either via post services or online. The different methods is almost equal in time cost per created and answered question, but the written survey, especially online, is vastly cheaper in the distribution. Geographical restrictions are also diminished by distributing the survey online. The field surveys have the advantage that the interviewer can clarify ambiguous questions, but has downsides with the interviewers psychological effects on the respondent, the respondent might feel that it should answer positively rather than truthfully [3].

### **Interviews**

As in surveys, interviews also have prepared questions ahead of the interviewing sessions that are supposed to fill the data needs of the researcher. But the order of the questions, as well as their content may vary depending on what information that may already have been covered from a discussion about a previous question. When choosing interviews as a data collection method, it is often to be able to map peoples perceptions in a certain area in order to develop expressions and define categories [3].

The interviews are also a great tool for when the researcher wants to dig deeper into the respondents thoughts and perceptions, which surveys have a hard time doing. An example could be to figure out how and why a respondent uses an app instead of just acquiring data on what features it uses. One of the disadvantages with having static pre-set answering options is that the respondents might not think outside these alternatives, and interviews have the possibility to gather unknown and more unexpected answers. Interviews are also superior when it comes to get rid of ambiguous questions, as it is possible for the respondent to ask for clarification if it does not understand the questions [3].

Interviews are great in the way that they can gather both informant data and respondent data about an event that have occurred, although in most cases it is recommended to only gather one kind. One of the best situations in which to use interviews is when the researcher wants to capture what meaning the respondents have given to certain events, e.g. why they operate in a certain way when they use an app. This helps the researcher to see the world from a respondents point of view, which is critical for the analysing part of the study [3]. The whole point of interviews is, as Streinar Kvale so elegantly puts it, to induce spontaneous descriptions which are based in the respondents own reality [4].

### **Interviewing on children**

Interviewing children can be hard, as they might move around a lot and can be shy. It can be useful to ask the child to show and describe what they have done rather than answering questions. At the end of the interview it can be good to explain for the child what he or she have contributed to the project. It

is also good to look over the questions so that they do not mislead the child. Writing down what children say communicates to them that one is taking them seriously [5].

### **Generalisation**

If a study is supposed to be generalisable to a larger population than the study's selection, it is a major methodological flaw to choose the case to study on any other base than external validation. Internal validation is to make reasonable assumptions based on the data that is collected from the respondents that took part in the study, and then generalising those assumptions to apply for the entire population studied. External validation is to generalise these results to other similar populations.

The generalisation process can be divided into two steps. The first step is to define the population of the study. The second step in the process is to make a selection out of the population where respondents are to give the most appropriate results, meaning the results that are most likely to yield a generalizable study. Either the whole population is to take part of study, or there has to be a selection process. The selection can be random or strategical [3]. There are some problems with whether to choose a random or strategic selection when creating a study. In the data collection aspect there are practical issues with costly data collection and more cognitive issues with processing all the information gathered in detailed analyses of a large number of respondents. If these problems were nonexistent there would be no doubt of what method to use, since most researchers would agree upon that a large in numbers random selection is superior in order to generalise the study.

In most cases researchers claim that internal validation is no guarantee for the same level of external validation. As an example, in this project internal validation would be a result that is generalisable on the population of all the app users of the beta channel, and external validation would be that the same results were also true about all the other Sketch users outside the channel.

A theory cannot be accepted as a generalisation until it has been tested multiple times. After multiple tests the theory will be acceptable to describe a larger number of similar environments. The cases in which the theory is tested can be either typical or critical, where typical cases are the most common and in which the outcome of the theory might be more predictable and critical cases might be worst case scenarios or similar. The critical cases can be divided into advantageous critical conditions or disadvantageous critical conditions. If advantageous critical conditions apply and the theory cannot get support, it is most likely that it will not get support in most other cases either. If the conditions are disadvantageous and the theory does get support, it is much more likely to also get support when conditions are better. It is of course always difficult to evaluate if conditions are advantageous or not for the theory that is being tested [3].

## Validation

There are three different ways of defining validation:

- The theoretical definition and the operational indicator matches.
- There are no systematical errors.
- That the study is measuring what it is supposed to measure.

The first two of the definitions can be grouped up and given the name concept validation and the third definition can be called result validation. A good concept validation together with high reliability indicates a good result validation, which means the absence of systematic errors and that the correct factors are measured [3].

## Concept validation

When conducting empirical studies it is vital that the theoretical concepts are translated into operational indicators, and that these translations (or operationalisations), are open to be questioned. There is always a possibility that the compliance between the theoretical concepts and the operationalisations is lack luster and this leads to the same systematical error recurring in every measurement, which goes against the second definition of validation. An example of this is if there was to be a study conducted in order to measure the level of democracy in a democratic country, and doing so by only taking the public and equal right to vote into account. The study would then have systematic errors by failing to include factors as if all parties have the same possibility to compete and if there is a chance for the people to form their own opinion. The systematical error in this case would be that not all the relevant data were collected and an askew view of the reality was obtained.

A rule of thumb in the science of validation is that the size of the error in validation expands along with the distance between the theoretical definition and the operationalisation. This means that the error is smaller in size when it comes to more simple theoretical concepts that are close to the measured aspect on the operational level. For instance, measuring how many people vote in elections by simply counting the total votes and compare it to the total population is an operationalisation that is often accepted. But when focusing of more complex questions like political power or democracy it is not possible to make such simple operationalisations and the validation problem increases [3]. In the same way is it easy to validate the users of an application by only viewing the data from different data collection services that can detect what functions or features are the most used. Although when it comes to how the users actually use the app and why they use different features in different ways, the operationalisation has to be more complex and cover additional factors [3].

There are different ways of creating the best possible operationalisation, either through reasoning or empirical studies. Validation through reasoning of an operationalisation is exactly what it sounds like, the researcher tries to choose which operationalisation is best by making arguments for both the positive and negative aspect for each operationalisation. There are obviously both good and bad aspects with this approach, and they both touch the same subject; that it is hard to do proper operationalisations. One of the perks of the reasoning method is that it is possible to copy and operationalisation from a similar study, without having to do any actual research. This also makes it easier to compare the results between the different studies, but it might backfire as there is no assurance that the chosen operationalisation is relevant for the researchers own study. Even though it is possible for a researcher to borrow operationalisations from other studies this is no excuse to not reflect over the relevance and quality of said operationalisation. It is always essential to go through the details of the borrowed operationalisation and validate that it is applicable, or if it has to be modified or maybe entirely rewritten. In short, the good thing is that it is possible to reuse other studies operationalisations, and the bad thing is that they might be inappropriate or badly made. The best form of validation through reasoning is the kind that distances itself from spontaneous and immediate decisions and is instead founded with proper argumentation. In order to convince other people that the operationalisation is proper, the researcher must first convinced herself of said fact [3].

Empirical validation is based on having different operational factors at all time, making them comparable to each other. If one or more of the factors is perceived as irrelevant or impossible to prove it will be taken out of the study. An example of this could be that a researcher would like to operationalize peoples socio-economical status by studying different factors such as education, income, line of work and state of living accommodations. If it were to show that the first three factors have strong connections but what state of living accommodations was irrelevant, this fourth factor will be deemed inappropriate and removed [3].

Apart from concept validation there is the other major part of complete validation, result validation, which is basically to see if the factors that the study set out to measure is the same as the ones it is actually measuring. To accomplish good result validation there are two important parts. The concept validation has to be well and the reliability has to be high. As stated earlier, a good concept validation means no systematic errors. The reliability however is a measurement of how many unsystematic, or random, errors there was in the study. High reliability means a low number of errors. Low reliability is often the result of carelessness in the data collection part and the data analysing part of studies. The errors that occur in the data collection part are often mistakes or misunderstandings, and the responsibility for this not to happen lies on the user of the measurement tool and not the tool itself; as it did in concept validation. As an example, take a 100 cm long ruler. If the ruler is in fact 95 cm or 105 cm but is classed, and used, as a 100 cm long ruler there will be a systematic error

with each measurement. This will lead to a study that measures a shifted reality and not the reality the researcher believes is measured. If instead the ruler actually is 100 cm but the measurements of it shows 97 cm or 102 cm there is an unsystematic error and low reliability. The errors caused by this carelessness is often more okay from a validation point of view, because it is measurements of the actual reality. It is often also the case that, if there is a large number of measurements, these measurements are as often too little as too large and will give a reasonable mean value [3].

## 2.1 Methods of data collection

A single method of collecting data will not cover all the aspects needed for the purpose of this thesis, hence a few different methods will be used and combined. Tamara Adlin thoroughly describes that when creating a persona, as much data as possible should be used [2]. There are a few different stages of data collection in the project which all require their own specific method to be of value.

The PDCA (plan–do–check–act) cycle, which is a iterative method for continuous improvement, will be used when creating the surveys and interviews [6]. Each iteration will generate a version of the surveys and interviews which will be evaluated and improved until they fulfil certain requirements. They have reached their goal when their questions covers all aspects that the study is interested in, and are able to gather enough data in order to produce personas. The first step is to plan what information that should be collected and what method that are suitable. The second step is do the design of the study, for an example make the question for the survey. After the design phase the study will be tried on test persons to gain feedback. The study will then be redesigned and adjusted according to the result. If the study is good enough to be used the cycle stops, otherwise another iteration follows. This data collection method is visualised in Figure 6.

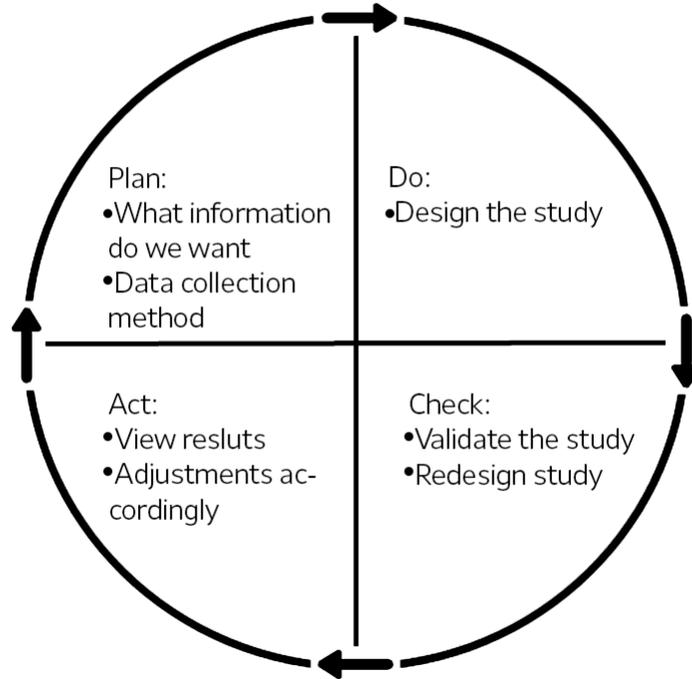


Figure 4: Persona information gathering process

### Literature reviews

Literature reviews are conducted in order to cover all possible methods that are available to use. It is also a way to get some knowledge of which methods that might suit the project at hand the best.

## 2.2 Why personas?

Personas are created from real user research data and represented as fake people in order to incorporate the user behaviours in the design process. The personas will also prevent self-referential thinking from the development team [7]. If you do not have a target in the development process it is hard to aim for it. The target might change depending on what feature is being developed and everyone in the development team might have their own idea of the target users. Without a clear definition of the target users, they can basically change depending on the person speaking at the time, to the ones he or she wants them to be. Personas solves these problems and makes the communication in the development team easier [8]. There are two studies on the effectiveness of personas that were incorporated in the project. One is by Christopher N. Chapman in 2008 [9] and one by Frank Long in 2009 [10]. Both with the conclusion that processes

that include personas will have a higher-quality and more successful designs [7].

We decided to make personas because it was well known concept at the company to describe a user group. Other departments had used it and there was a lot of knowledge about it at the office. This made it possible for us to also get some advice in the process. The positive effect on the design process was also a pro for the personas to be used. See 2.2. We knew the cons with personas and tried to keep them in mind though the process, to avoid any pitfalls. The main point of using personas is because the team wanted to know their users better are personas are just that, a representation of the end user.

### **Member checking**

In qualitative research member checking is a method to improve the accuracy of the study. By asking users if statements from earlier received information apply to them and seeing if they recognise themselves or their usage in these statements it is possible to validate the information as actual user behaviour [11].

### **User Journeys**

User Journeys are ways to describe scenarios in which a user might interact with a product, in this project the application Sketch. The journey is shown with a series of steps, normally 4-12. It can be demonstrating the current way users interact with the application or the way users could interact. In this project the user journeys will demonstrate the current ways that users interact with Sketch. The upside with User Journeys is helping the team to understand the user behaviours when they interact with the application and what they expect from it. A user journey should contain context, where the user are and what device they are using. But also what the emotional state of the user and what functionality the user is expecting [12].

## **2.3 Tools**

The tools that were used during the project to obtain data about the users, how they are used and what information they are able to provide.

### **Google Play Store**

Mobile applications are commonly distributed through platforms that are in casual terms called app stores, where as Apple has their AppStore, Google has their Play Store and Microsoft has their Windows Phone Store. These platforms are growing rapidly and register enormous amounts, with around a billion of downloads every month in just the AppStore. Most people only use the app stores for the aspect of downloading applications, and the platforms have additional features that are not as widely acknowledged. There are for instance features that allow users to rate applications and write reviews containing their

opinion on said application, and these will be for further reference be called app reviews. The app reviews can be read by anyone browsing for apps in the app stores, and serves as actual user gradings of the apps that other users can base their downloading decisions on. Apps are usually rated between one and five stars, and leaving an additional written review along with this rating is optional. The reviews are in some ways a one-way communication channel between the users and the developers since not only other users, but also the developers can read the reviews people write [13].

Since the users of android phones must have an account registered to Google and these accounts also represent a Google+ account, it is possible to acquire some data about the user who posted a review by looking at their Google+ page. How much information there is about a single user is of great variation and it is up to the owner of an account to determine how much of his or her information can be seen. In this project statistics will be gathered from Google Play. Google Play is a digital distribution platform operated by Google and can present statistics for developers.

### **Google analytics**

Google has developed a tool for getting data from apps that are on their play store. This tool can gather various kinds of data and is very useful for developers who want to see what parts of their applications are used the most. The tool is called Google Analytics and covers basic information as well as more advanced features. The basic information that is possible to get is for instance user ages, genders and residential country. The more advanced features can be tools that provide a chart of what screens in the app that are most visited and in what order most users visit the different screens. The tools can also be used to present data over how the users flow through the application. The purpose with Google Analytics is to receive statistics about the users and therefore give knowledge about the costumers and deliver this to the team working with the app, so they can use this information in further development [14].

### **Sony Select**

There is another system that collects data from the users of the application, which is Sony's own creation, called Sony select. Sony select's objective is gathering data from users that can be used in offering them recommended applications based on what applications they are using at the moment. This program gathers anonymous data only from the users that has allowed such data to be collected. The data available from this system that is interesting to this project is what applications other than Sketch the user has been using during the same time intervals. Sony Select can only collect information from Sony mobile devices and an application has to be running in the foreground more than 20 seconds to be determined as used. This means that users that click the application by mistake should not be in the statistics.

## **Posters**

In an attempt to collect data from both international and national current users of Sketch a poster was created with a link (accessible through a QR-code) to a survey with questions about Sketch. The poster was then placed in places with numerous people frequently passing by at the different institutions of Lund University, as those were the only locations with bulletin boards that were free to use. Posters were also put up in the dining area and at the different break areas at the office. By folding the paper, small posters could stand on the tables.

## **Google+ Sketch Beta test channel**

Google have a social network called Google+ where people can create profile pages and companies can create community pages. These community pages make it possible for companies to post updates, news and offers and the users can show their appreciation with ratings and reviews [15]. The Sketch team has set up a beta test channel where users can sign up to be part of beta testing the app. The beta channel testing had at the moment of the project over five thousand updated installs. The beta channel is created through a Google+ community that has sections for discussions about the app, bug reports, sharing sketches, events and frequently asked questions (FAQ). This is an attempt to get into contact with users easily and getting help with testing and bug finding at the same time. The fact that the community is located in Google+ means that the users must have a Google+ account, although that is not a problem considering all Android users must have a Google account to be able to use their device.

## 3 Theory

Most research techniques have been tested thousands of times and have appeared in different forms, qualities and relevance. In order to get the most out of the study in this project a few different methods were considered before making the final decisions. The decisions made in this project are based on the theory presented in this section.

### 3.1 Personas

A persona in the context of user experience design was introduced by Alan Cooper in his book "The inmates are running the asylum" published in 1999 [16]. A persona is a fictitious character created in order to help solve design questions and give the developers a better understanding of, and empathy for, the users. The most optimal personas are based on research [17], but less accurate ad-hoc personas can be made if there is a lack of resources or time to do the actual research. Ad-hoc personas success is depending on the quality of information that the creators possess, and may in some cases be very beneficial. The downside is though that they are based on assumptions and theories rather than actual data, and might not reflect the reality as well as data driven personas. This project's purpose is to create studies on which to base data driven personas, but ad-hoc personas might be used in smaller extent in the beginning of the development phase.

Personas can be prioritised into primary and secondary, which is directly related to how much spotlight they get in the development process with primary personas representing the users that the team should focus the most on. Creating a persona have five phases according to Tamara Adlin and John Pruitt in their book *The Essential Persona Lifecycle: Your Guide to Building and Using Personas*. The different phases are the following:

- Family planning: In this phase the problems to solve should be figured out and what material that will be able to use.
- Conception and gestation: Assumptions should be organised by turning data into information and information into personas.
- Birth and maturation: The persona is created and presented to the organisation.
- Adulthood: The persona is used to of help design, development, evaluation, and release of your product.
- Lifetime achievement and retirement: The extent of the personas success is measured. [2]

The last phase is out of reach of this project and will not be done. In this project the phases will be define with following tools:

- Family planning: Google analytics, Sony select and comments made on the application as data source. The problem to be solved is to find a persona to an application that have difficulty to get in contact with users.
- Conception and gestation: Interviews with team members and users to help organise assumptions. Assumptions will be supported by data resulting different groups of users and persona skeletons.
- Birth and maturation: Together with team members prioritise the different persona skeletons. But also have a session discussing how the persona can be used.
- Adulthood: Hopefully the persona will be used by the team and after a period of time it will be able to collect data on how success full the persona have been.

This projects phases are represented in Figure 5. The pyramid is representing the amount of information that will be sorted out for every step of the pyramid.

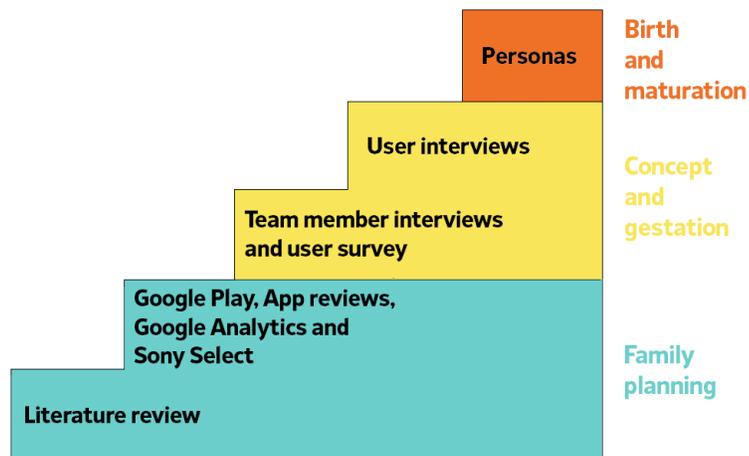


Figure 5: Persona stages methods

### Naming and illustrating personas

The name for a persona should be chosen wisely and not be the same name as famous people. This is because the developers using the persona should not have a previous relation to the person. The same goes with why a name of anyone of the team members should not be used. It is possible to consider a name that help people remember them or a tag line combination. For an example "The

Enthusiast Eddie” or ”Toby the Typical Teenager” [2]. A photo of the persona can help the team members to believe in the persona. By using a slick stock photo, they tend to look like professional models and it is not possible to control the models’ clothes, context or environment. It is therefore wisely to take own pictures when creating personas. It can also be an advantage to use illustrations as an alternative to photo. The person tend to be less real but the creator have lots of control over the picture [2].

### **3.2 User feedback**

There are a few things about user feedback that has been discovered in the age of the app stores. One of the things is that user reviews tend to spike after new releases and updates, and then decline steadily until the next update.

There are also a few different popular topics when it comes to user reviews, some are bug reports, some are user experience related and some are feature requests. Apps that are pre-installed on the phone and not possible to remove are often subject to reviews about that issue paired with a poor rating. The comments also differ in levels of helpfulness and intention. There are the ones with good intention and a low developmental factor such as ”Nice!” or ”Great app”, and then there are the ones with good intention and a high developmental factor where the user describes what functions or features they think are good or bad and in what way they would like them to change. The reviews with bad intentions are usually offensive comments with little to none developmental factor [13].

### **3.3 Statistical Validity**

Depending on the amount of users, a certain number of responses is needed to gain validity in the study. In this project the users are over ten million and therefore the number of answers should be 400 to gain a five percent margin of error and 100 for a ten percent margin of error [18]. If a study consists of interviews, interviews should be held as long as new information is received, i.e. until there is redundancy in the answers [3].

## 4 Persona creation process

The persona creation process was divided into different stages, each with their own data collection methods. The early stages focused on how to get into contact with users in order to get any data from them. When the different methods of contacting users were established the focus switched to getting relevant data for the personas. This data was then analysed and processed into representing the actual user groups. The overlaying structure of the entire project is explained below by Figure 6.

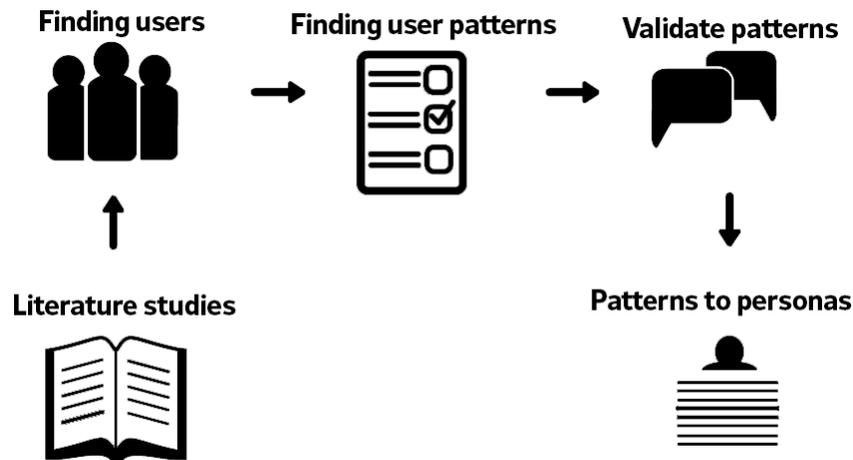


Figure 6: Phases for the project

This process is integrated into the persona life cycle, represented in figure 5.

### 4.1 Family planning

Family planning was the first phase of the entire project and consisted of formulating the problem, figuring out what methods to use and to see what tools were available. In a larger sense, the persona creation process comes down to creating patterns out of user-describing data and adding a personality. In order to accomplish this, the first step is to pin down what the main point of the project is and what ways there are to get there.

#### Formulating the problem

The problem which to solve in this project was presented as the need for a company to know it's customers. They suggested the method of personas as a result but had no restrictions of what ways to get there. It was important that the research was conducted on users that were already regularly using the app,

and not on potential users. This gave us an idea of the outline they wanted for the project but still plenty of freedom to explore different data collection methods and try a few various approaches. We decided to go with trying to collect enough information to be able to create personas, alternatively some sort of user grouping in a larger sense. At this stage there were no exact solutions on exactly how to present the results, or how we would even achieve these results. The next stage in the process was to establish the population of the study.

#### **4.1.1 Research population**

The population that this project was restricted to were regular users of the application Sketch. It is possible to take potential users into account when creating personas and it is in some cases even encouraged [2]. Although with the time and resource restrictions that are set up regarding a master thesis, it was not possible to include potential users into the study as it would have taken quite a lot more time to accomplish. This population was narrowed down further as it would be very hard to contact every user of the application considering that there are approximately ten million downloads. A large number of these downloads might even be by people not even using the application. The decision was then to select a smaller portion of the original population and generalise the results from them onto the large population. The chosen population was the users that signed up for the beta testing by joining the Google+ community, because they have shown interest in the application and are more likely to be regular users. This means that the targeted population that had access to answering the surveys was around 5000 instead of ten million, which makes it more manageable in the restricted time frame. After having figured out who we were going to study the next step was to explore possible methods of getting information from these users, which lead to literature reviews and see what tools were available.

#### **Literature reviews**

When the population for the study was determined, literature reviews were done to find out more information about this group of users. The intention of this was to give answers how different ages, genders and cultures uses their mobile phone and apps in general. The literature reviews did also cover how to properly gather information from a population and which methods were best in different situations. The literature reviews were not exclusively restricted to only be done in the beginning of the project, since new ideas and strategies would emerge throughout the project which needed new theoretical backgrounds. This means that even though the most intensive literature study was in the beginning when the methodology of the project was undecided, there were complementary literature reviews along the way. The literature reviews gave extensive information on which types of data collection methods were available and their strengths and weaknesses. We decided to try plenty of methods to get information about the users, which follows.

## **App Reviews**

In order to get a clear view of which users to target with surveys and interviews an introductory mapping of the current users was needed. This was done by investigating who had rated the application in the Google play store. Google play store is the platform that distributes Android apps where the application can be acquired (if not pre-installed on the device). Considering that we had never worked with, or even used, the app before we started working on this project it was also a way for us to get an initial view and a feel for what kinds of people used the application, and how they used it. We looked through the comments in a few various languages and tried to divide the users into roughly created groups of what tools they seemed to use the most. We also tried to get as much information about the ones who had written the reviews as possible, such as age and country of residency. The only source of information about them was from the Google account they posted from, and since it is voluntarily to post any information about yourself there at all, many users left it blank.

## **Google Analytics**

Google analytics is a tool that can be very useful when investigating what features are used the most in a certain application. It has features in all the different levels of detail, with everything from basic information like ages, genders, countries and types of devices to more complex information like which paths they usually take through the app. The basic information we acquired from this tool was compared to the statistics we collected when going through the app reviews in an attempt to discover any similarities. The more advanced features were very useful in a developing sense, but to us and our study they were very hard to apply in a logical manner. The information that we could get out of Google analytics was anonymous and therefore hard to connect to specific users which made it less valuable. The lack of connection to certain user types meant that the data could not be applied to parts of the user base, say a user pattern, but instead it was only applicable to the entirety of the users. This means that it is hard for us to incorporate in our project as we are looking to individualise the users and divide them into groups, not clump them together as a whole. An example of statics that can be received from Google analytics is shown in Figure 7.

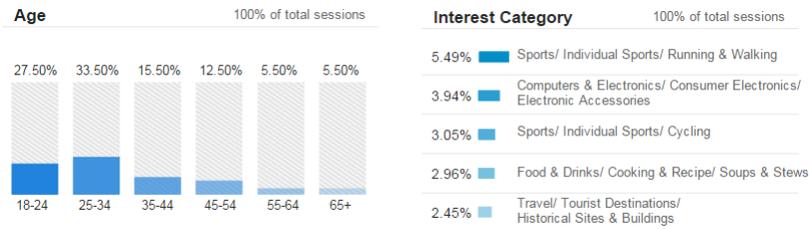


Figure 7: Generic example of data available through google analytics

## Sony Select

If a person has allowed anonymous data to be collected, Sony select will gather which apps they have used each day. To be counted as "used" the app must have been in the foreground for more than 20 seconds, to avoid counting apps that were started by mistake but still counting apps that are only used for a short while. It was possible to filter the data stream into only showing what apps certain users had used, for instance it was possible to filter out what other apps Sketch users had used during the same days as they were using sketch. We measured a week's worth of activities at two different points in time to make sure that we would not incorporate any irregularities. It was important to get all of the week's aspects with work hours, free time and weekends to be able to compare the results between the two weeks and calculate a mean value. If the first week's values were unusually high, due to a regional holiday somewhere or something similar, this would be noticed when comparing them to the second week's results. It was however difficult to translate this into actual data and to find patterns that were useful.

### 4.1.2 Creating the study

We deemed it too difficult to reach all the ten million users of the application with the time and resource restrictions that applied to the project. In an attempt to get as accurate results as possible we instead tried to use the smaller population of 6000 beta users and then generalise the results to the entire population. We decided that these users would get the most informative and appropriate results, as they were probably more inclined of expressing their opinion. The goal of this study is to create user representations that reflects the entire user base which would mean that the results should strive for external validation status.

The theories for this study was not created along with the start of the project, as there was little to no knowledge about the users beforehand. Instead were theories created after collecting enough data that patterns emerged. The theories were basically assumptions of what users might be like grouped up into categories depending on certain characteristics shared by the groups. We based

the theories on the initial app reviews along with the pilot survey and used the second survey and interviews to validate the theories. The theories were tested typical cases, with regular randomly selected users.

Translating these theories into operationalisations was no easy task though. An easy translation could be "Does the user use the app to socialise?", but the problem is how can we decide what counts as socialising? Is it just sharing the sketches with other people being social or does the sole purpose of using the app be that the content created works as a way of sending information to another party? This translating process is complex and the risk of errors is high, as it comes down to personal analysis. We had a few different tag words for every user type and read their answers to every survey question in order to have an as informed decision as possible. This would hopefully lead to the least possible distance between the theory and the operationalisation and reduce the magnitude of any systematic errors. The operationalisations that were chosen can be explained as the describing words that defined the personas which will be described further in.

To validate the operationalisations we used a mix of empirical validation and validation by reasoning. The operationalisations were created by analysing the data and making assumptions, basically by reasoning, hence the validation of them contained a fair share of reasoning. It is hard to pinpoint a certain user pattern from only a survey, especially if the answers are not very elaborate, so the entirety of the survey answer had to be analysed to get to a conclusion. The empirical aspects of our validation process is that from all the different describing words, or factors, we removed the ones that seemed irrelevant and only kept the ones that fit well together.

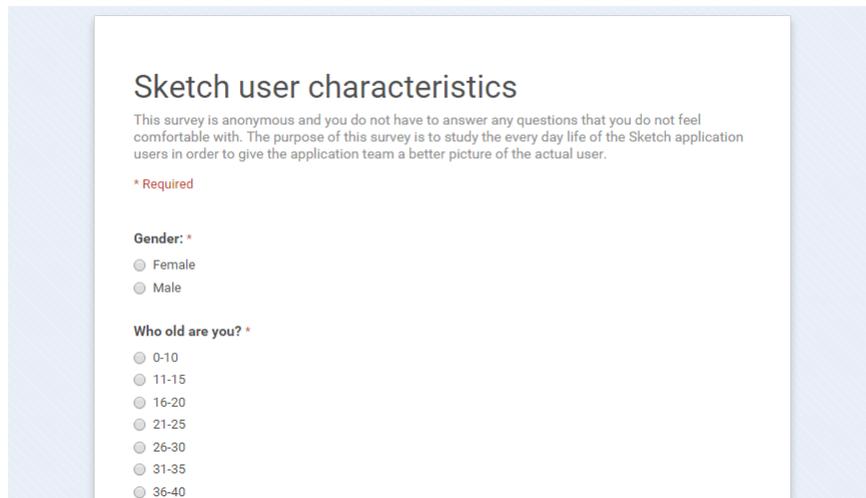
To accomplish the last part necessary for complete validation, result validation, we spent plenty of time to reduce the chance of systematic errors. Systematic errors are, as explained, reoccurring errors that give a skewed view of the reality and are harmful to the result of a study. In order to prevent such errors to be present in the surveys and interviews we held pilot interviews and created pilot surveys. This ironed out any uncertainties in the surveys or interviews and made sure that the questions were aimed at what we were actually investigating. Unsystematic errors, such as interpreting survey answers wrong, are harder to prevent as errors in judgement are hard to detect. By having two different people reviewing every survey answer we could at least remove some of these errors.

### **4.1.3 Surveys**

Surveys, especially distributed over the internet, are a quick way to reach plenty of people with little effort. By using programs like Google forms and Survey-monkey it was easy to create our own survey with enough logic to fill our needs. We created different paths for the users depending on how often they used the

application and what features they usually used. The feature dependant path selection was based on features that did not define a users characteristics but only on features that any of the types of users could be using. For instance, if the users answered that they usually use the collaboration feature, they would get a few follow up questions regarding that feature.

There were in total four different surveys in the project, distributed at three different points in time and with slightly different purposes. All of them were designed to gather data about the users of the app, but they specified in different areas. Two of the surveys were identical, but sent to different audiences. One of the surveys was oriented towards gathering data about the users personal lives instead of the app usage in order to give the personas more life and personality. The last survey was intended to be a pilot survey whose main purpose was to give information on which questions needed to be changed or clarified. To make it easier to tell the different surveys apart, the two identical surveys will be called Sketch usage surveys, the third survey will be called the personal information survey and the last one will be called the pilot survey. The pilot survey was posted in the Google+ Beta Channel as a sticky post, pinned to the top of the discussion thread. The Sketch usage surveys were distributed in two ways, one was sent to LUT users and one was accessed by a pop-up in the Beta version of the app. A picture of the survey is shown in Figure 8.



The image shows a survey interface with a white background and a light blue border. The title is "Sketch user characteristics" in a bold, dark blue font. Below the title is a paragraph of text: "This survey is anonymous and you do not have to answer any questions that you do not feel comfortable with. The purpose of this survey is to study the every day life of the Sketch application users in order to give the application team a better picture of the actual user." Below this text is a red asterisk followed by the word "Required". The first question is "Gender: \*" with two radio button options: "Female" and "Male". The second question is "Who old are you? \*" with seven radio button options representing age ranges: "0-10", "11-15", "16-20", "21-25", "26-30", "31-35", and "36-40".

Figure 8: How one of the surveys looked for the respondents

The creation process of the surveys was divided into different stages. The first stage was to determine what information was relevant for the study. After settling what was to be obtained, the next part was to create questions that would successfully gather this information. After creating the questions the next step was to evaluate and validate them to make sure that they were actually

fulfilling their purpose. The validation part consisted of consulting the supervisors of the project as well as sending it out to a small part of the beta channel community as a pilot survey. After the pilot was sent out the data gathered was evaluated in order to see if the questions were interpreted in the correct way. After the pilot the survey was refined and sent out to the LUT users and to other users in the beta channel.

To distribute the surveys we tried two different methods. First we tried putting up posters containing QR-codes with links to the surveys out on town and within the company. The poster is shown in Figure 9. The second, and more successful, way of distributing the surveys was to get admins of the beta test channel to pin a post in the discussion forum containing a link to the survey. This along with a text asking for help to develop the app further generated quite the response. We tried posting it ourselves twice but without the respect of the admins and not being able to pin the post to the top resulted in a lack of responses.

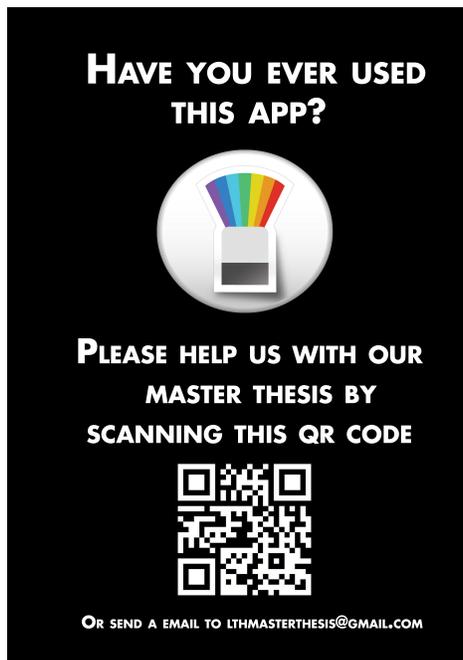


Figure 9: Design of the poster that was put up.

## 4.2 Conception and gestation

This phase is where all assumptions are gathered, both the thoughts of the developers and the assumptions we had gotten by analysing the data collection results we had acquired in the previous phase.

## Interviewing the developers

Tamara Adlin and John Pruitt recommends using interview questions directed at the developing team, either individually or through work shops. The purpose with the interviews is to get an idea of who the developers believe the users are when developing the application. It is more likely that the persona will be used if the developers are involved in the creation process. The interviews will provide useful information that can result in assumptions of how to process the data that has been collected as well as what direction to go in future work [2]. In this project an interview was made with all the team members and interview took about 15 minutes. See appendix A for questions to the team members. These assumptions are very useful for when the personas are actually created. Knowing what the developers expect to see can be very beneficial because then it is possible to lift aspects that support these assumptions forward and make the personas more attractive to use. We incorporated the teams opinions in surveys and interviews in a way that we had some questions targeted at validating or discrediting their prejudices.

### 4.2.1 Finding patterns in the data

After the app reviews done early in the project we had some rough estimates of what different user types existed in the population. Although without having any actual data strengthening these assumptions they would be useless. In order to successfully create personas, it is first necessary to find patterns in the data that is collected, as personas really are refined user patterns given a name.

We read through all the survey answers we had gotten with the different surveys and tried giving names to what we thought could be larger groups of users. These groups were formed around the different tools that can be found in the app, and could be for instance "painter" for users who used the brushes often. We had 11 initial words to describe users, entertainment, painter, social, photo editing, purpose, creative, utility, share, relaxing, all eater and unclear. As many of these were given to every respondent in order to categorise them as much as possible.

The answers from the surveys were stored in large data sheets, like excel, with each question on the survey along the x-axis and the respondents along the y-axis. It was a large task to go through all the answers and pin a label on every user, even though there were more defined user types at this stage than in the final personas. Although the respondents that did not answer with enough information to even give them one describing word were given unclear and did not get sorted into any category. A few examples of answers given to different questions that triggered certain categories follows.

Purpose example:

Male from India age: 21-25

Please describe an average session of using Sketch: *I am a scientist so i make use of sketch to explain diagrams or figures.*

Purpose example:

Male from Sweden age: 31-35

Please describe an average session of using Sketch: *Sketch beer label concepts.*

Creative example:

Female from UK age: 11-15

Please describe an average session of using Sketch: *Literally doodles.*

Creative example:

Male from India age: 36-40

Why do you use Sketch?: *Just for fun, artistic mind*

These 11, or 10 actually useful, categories were then reduced by merging similar groups together. Since "painter" and "creative" are very alike due to the tools they use, they were merged into just "creative" and "utility" and "purpose" were both describing people who used the app with a certain purpose, hence they were merged into just "purpose". "Entertainment" and "relaxing" did not seem to have any impact on how the different user types used the app, but seemed more to be personal preferences which had no impact on the personas and where therefore removed. "Share" users had very much in common with "Social" users which lead to a merge between the two into just social. The users labelled as all eaters where there were no clear direction usage would not be contributing anything to the result considering a persona that uses all functions is as useful as a persona that use none. After all this merging there were only four different categories left, purpose, creative, social and photo editing. In order to validate that these patterns were actually accurate to how the users actually used the application we set out to validate the patterns with interviews.

#### **4.2.2 Creating skeletons from the patterns**

To make it easier to handle the different categories of users that were established, we translated them into persona skeletons. A persona skeleton is an early version of a represented user group, with wide basic characteristics often supplemented by statistics. In other words, they are a grave simplification of the final person but possess the correct overlaying structure. They have the favourite tool set, what different tools they are most likely to use, the average age of the user group and a few other characteristics which that user group shared. To illustrate how a skeleton might look like an example follows. A part of the skeleton is visualised in Figure 10.

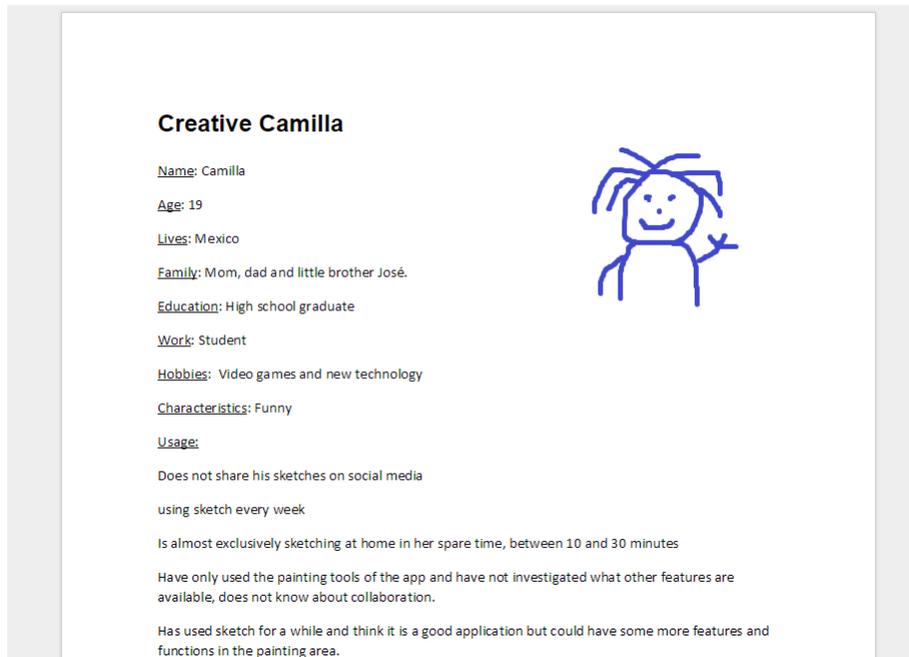


Figure 10: A persona skeleton for the creative type of user.

The name Camilla is chosen to create a catchy tag-line-like name that is easy to remember. The user is the only female persona out of the primary personas and is the representation of the low female part of the user base. She is 19 years old since that close to the average age of the user group as a whole. Her family is based on statistics of how large the mean family is in Mexico and the name of her brother is picked out of the top boy names in the country. Her occupation is based on statistics as well. The hobbies, characteristics and usage parts of the persona is based on the actual information from the users of the app though. At this stage the information is based solely on the surveys which can be seen by the strips of information that dwell under the usage section. This information is picked from the surveys and dumped into the personas until it is validated by the interviews and created into actual life stories.

### **Pilot interviews and survey validation**

As well as with the surveys, the interviews started out with a pilot interview to iron out any issues before interviewing the real users. The pilot interviews were held with employees, that were Sketch users, at Sony mobile communications. These interviewees were chosen because they were easily accessible and since they are employees at Sony, and might be biased, and would not be part of the actual interviews in the later stages they were perfect candidates for the pilot interviews. The pilot interview was beneficial in different ways, both for the

interviewers who got some practise interviewing actual users but in a known environment, but also for the interview questions. The questions were, after the pilot, revised and updated according to the results that were obtained so that the interview form would be in the best possible state before interviewing the actual users.

Not only did we do this to get much needed feedback on the interview, but it was also a chance for use to practise interviewing users and get a feel for it before interviewing users for the actual study. Even though the survey was mainly to harvest data in order to create persona skeletons in the ad-hoc persona process, we sent it to our supervisors both at Sony and at LTH to get feedback and validation.

### **4.2.3 Interviews**

Respondents from the survey had the possibility to leave their email addresses if they would consider an interview. This was one way for us to find actual users for interviews. The users were contacted by e-mail (that was acquired from the first survey) and asked for an interview, and if they did not want to do a interview they could instead answer a survey. If they wanted to do an interview, they were directed to [youcanbook.me](http://youcanbook.me), a booking software tool, where the users could choose which time zone they belong to and book any of the times that were set up as available [19]. The interview were held in the chat program Google Hangouts or Skype, a software that provides voice calls from computers or mobile devices over the internet [20]. The interview was recorded and then transcript first individually and then together. In a way to verify the interview, a summary was sent to the respondent so that he or she could confirm that they have been correctly interpreted [21].

The interviews with users were based on questions about their everyday life and personal facts. These interviews also got statements from the information earlier received to see how well the person matched our personas.

## **4.3 Birth and maturation**

When all data was collected and all assumptions were gathered the next step was to analyse the results and create the product of this work, the personas. The personas were then presented to the organisation ready to be used in development.

### **Analysing the interviews**

The survey was analysed and gave more basic statics, as country, age and gender for the different categories of users. From the surveys had we received a hint of usage but after the interview we got longer and more detailed answers. After an interview we did listing to the recorded version of the interview. All the

data was collected and sorted into the categories that should be a part of the persona. Users in the same category was compared and information that had been mention more the once was put into the finally persona.

#### **4.3.1 Creating the personas**

The personas were created by adding data to the persona skeletons. The skeletons represented the users in both gender and ethnicity. With there being so few female respondents only one of the four primary personas was created as female, and the user group with the highest female representation was chosen for this. The ethnicity of the skeletons was primarily chosen as the country with most respondents in each user group, but if two user groups would get the same ethnicity we chose the second highest. This was to make an attempt of visualising the fact that the respondents were from all parts of the world.

The four user groups that were found with surveys and interviews were translated into four primary personas. A secondary persona representing the child user base were created even though there was not much data about them. This was to illustrate that there are kids using the app but it was hard for us to get into contact with them.

#### **A complete persona**

Below there is a the complete persona of the creative user type. The basic information aspects in the complete personas are similar or identical to the skeletons, and the main difference is the usage and lifestyle aspects. The small strips of usage data has now been validated through interviews with actual users and turned into stories of how the persona usually uses the app. The placeholder image has been replaced with a picture of a real human being to increase empathy and make the persona more lifelike. A show summary of the essence of the persona is added to make it easier to quickly brush up on the persona if needed. A part of the persona is shown in Figure 11.

### Creative Camila

Camila is one of the creative people in this world. She wants an app that can support these needs of creating content on her own in different forms. She has a lot of tools for doing this without using technology, and would like a digital alternative.

**Name:** Camila

**Age:** 19

**Lives:** Guadalajara, Mexico

**Family:** Mom, dad and little brother José

**Education:** Currently studying

**Hobbies:** Reading, playing guitar, playing video games and volunteering

**Characteristics:** Fun, social and outgoing

**Lifestyle:**

Camila is a funny, social, interested in watching movies. She has a strong friendship with a smaller group of friends with similar interests. When she comes home after school she usually finishes any homework or chores she has to do. After that she hangs with her friends or play video games with her little brother. Before she goes to bed she usually checks her social media sites and sometimes sketches for a few minutes before falling asleep.

**Usage:**

Camila likes to draw. She often starts with a blank canvas and uses the painting tool. In a normal day goes Camila to school in the morning and comes home in the afternoon, then she goes and play or to



Figure 11: The birth of the Creative Persona

## 5 Results

The results of the project are presented here, with everything from how the several data collection methods panned out to the actual project result that is the personas.

### 5.1 Data collection

The various data collection methods that were used in the project all yielded some level of results. Not all of them were helpful in the aspect of creating personas but may be useful for developers in other senses.

#### App reviews

It was possible to find 132 people that had rated the application with enough information to determine country, age and gender. Out of these 132 people, 40 were from Sweden, Norway or Denmark. All the comments that were made by people under the age of 10 were girls, four was from Scandinavia and one from Peru. There was also noticeable that the most comments were made by men between 17 and 34 years old. A diagram over gender is shown in Figure 12.

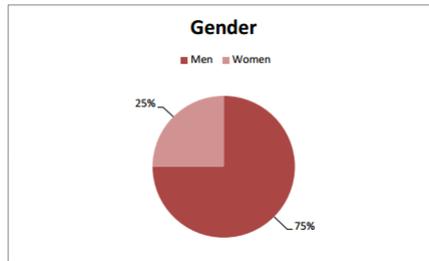


Figure 12: The genders of the people found through app reviews

### Google Analytics

From Google Analytics it was possible to obtain information that on average between 90 and 95 percent of the users are using the application on a phone, the rest uses a tablet. Here was also a slight increase of users during weekends. It is an increasing number of sessions when new stickers package is released.

### Interviewing team members

It was possible to notice that most of the team members had the same outlook of the average user. The two most frequently mentioned were a creative kid who likes to draw and a person that is young and artistic and uses sketch while commuting between home and work or school. These two groups of users were represented as personas, even though the child persona did not have as much data to support it as the others did. Here is a summarised up personas made from interviews with all of the team members:

<b>Curious and creative kid</b>	3 – 13 years old Use Sketch as a toy Makes images with stickers.
<b>Sketch as entertainment</b>	People who commutes Parents giving phone to bored and cranky kid.
<b>Create with goal</b>	Valentine cards Let kid do birthday card
<b>Creative person</b>	6-45 years old Artistic person Power users that leaves comments and requests features Might feel that Sketch is Lacking features.
<b>Share users</b>	12 – 60 years old Does joke pictures Takes a photo and put stickers on it Then share the picture on social media

## Surveys

Around 10 posters were put up around in Lund which gave next to no results. We put up small table posters in the dining and coffee areas at Sony mobile. The coffee area gave nine answers in total and the dinning area none. The post on the Google+ Beta Channel gave 143 answers. It was possible to see that the most represented countries were Mexico and India, and in these countries all respondents were male. A representation of the answers for different countries is shown in Figure 13. Information from the surveys was then put together to create persona skeletons. The different skeletons were characterised by the different behavioural patterns the users in them had. The first category was users with a purpose, these users used sketch with a task in mind. This could be to create a birthday card, explain a picture with text or circling something in order to highlight it. It could also be to take a quick note and write down a number or something that has to be remembered. Another was handwritten text users, who is those users that write text in Sketch as calligraphy. There were also a few users who used Sketch in their work for doodling concepts, with pictures that they sent to their colleagues or clients. The next category was social usage and these users are more likely to share their Sketches with other people. Another category was photo editing and users here edit their photo with stickers, drawings or other functions in Sketch. A few of the users edited the picture for social purposes, for example to add different hairstyles to a friend. A another group felt that playing with photos was the reason they used sketch, and doing this just for fun and to pass time. Some just wanted to crop a picture and used sketch for this purpose. The next category was creative painter, where users

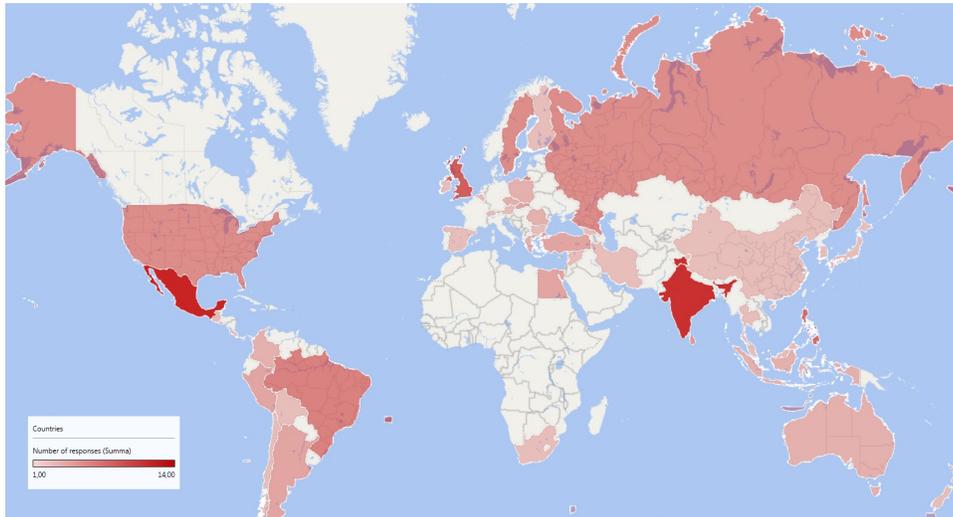


Figure 13: Answers from Beta channel displayed in a map of the world. The intensity of the colour shows the number of users with more intense meaning more users.

either start from a blank page or from a picture in order to paint was comes in mind. The last category was utility where users uses the tools in Sketch to make the everyday life easier. This category goes hand in hand with purpose users. If users had more then one usage with sketch they ended up in several categories and most of the categories overlap each other more or less. Here is a summarised version of the persona skeletons made from responses from the survey in the Google+ Beta channel:

<b>Overall</b>	137 number of users 17 % Females
<b>User with a purpose</b>	19 % of all users 15 % Female 35 % Explain pictures 12 % Takes a quick note 15 % Create cards 12 % Handwrite text 12 % Doodling with discussing concepts 15 % Picture editing
<b>Social usage</b>	14 % of all users 23 % Female 61 % Edit a picture and share it. 8 % Doodling with discussing concepts 23 % Handwrite messengers with picture
<b>Photo editing</b>	21 % of all users 17 % Females 14 % Social activities 48 % Likes stickers 34 % Playing with photos 28 % Purpose editing
<b>Creative painter</b>	19 % of all users 27 % Females 65 % Starts from a blank page 31 % Starts from a picture
<b>Utility</b>	9 % of all users 8 % Females 33 % Notes quickly 25 % Explain pictures

94 answers were received from the survey in the Beta application and including the 137 from Beta Channel there were in total 231 answers. The different groups is shown in Table 1.

The internal survey gave that almost 60 percent of the Sony employees had never used Sketch. There was more users that wrote that their kids use the application in the internal survey than in the external, 30 percent respectively 1 percent . With this information and the information from the team member interviews and the interview with a child of a Sony employee, a persona for kids were made.

Table 1: Result of survey answers grouped into categories in percent

Persona	Percent of answers
Creative	33,0 %
Purpose	17,4 %
Photo editing	25,2 %
Social	10,0 %
Kid	No data
Unknown	14,4 %

## 5.2 Personas

Totally was 13 interviews done and 15 answers to the survey about personality. This gave enough information to create personalities for the personas and user journeys. The number of interviews and survey responses for the different groups are shown in Table 2. We could for instance see from the responses that more purpose users had answered that they like new technology than the rest. We could also see that the photo editors all enjoyed music which lead to that being an interest for the photo editing persona. The personas were presented for the team members and the response was positive and they were surprised about the quantity of different users. Their perspective of two different but still similar user types was broadened to five users types with plenty of data to back them up. The complete personas can be seen in appendix Persona Appendix.

Table 2: Number of surveys and interviews for the different groups of users

Persona	Number of survey answers	Number of interviews
Creative	6	2
Purpose	4	2
Photo editing	1	3
Social	1	1
Kid	0	1
Other	3	4
Totally	15	13

## 5.3 Summary of results

Here is the results compared to time and relevance.

Table 3: Summarised results

Method	Responses	Countries represented	Time spent	Relevance	Statistical safety
App reviews	135	37	50 h	Gender, age and origin of those who have made a comment	135 out of 5000
Internal poster	12	2	30 h	Gave a hit on usage at the company	12 out of 800
External poster	0	0	4 h	None	0
Internal Survey	349, but only 146 were users	13	15 h	Since we are not looking for intern users, this survey lacked some relevance	146 out of 800
Beta Channel Survey	137	50	4 h	Short answers but some very informative	137 out of 7000
Beta App Survey	94	60	4 h	Short answers but some very informative	94 out of 9000
Team interviews	7	1	14	Team members should be a part of the process therefore very valuable	7 out of 7
User interviews	15	5	60 h	Very valuable	15 out of 10 millions
Google Analytics	No data	20	40 h	It was hard to see any patterns	Some users have not approved that Google can received data.
Sony Select	No data	No data	40 h	It was hard to see any patterns	Very high

## 5.4 Statistical Validity

We got redundancy in interviews which is the signal for having enough information to stop. 400 answers are needed for 95 percent statistical validity and 100 answers for 90 percent statistical validity. We had 231, that gives 93 percent.

## 6 Discussion

In this project we have been obliged to change survey questions and methods during the project. During the project we realised that some users use Sketch because they have to and not because they want to. This resulted in that we had to discuss the personas we want. Those who like to use the application, or those who use it for the moment there is no other fun installed on your phone.

### 6.1 Finding users

The first stage of getting information about users of a certain application is to actually find the users. A few different approaches were tested and are discussed here.

#### App reviews

In order to use an android phone there has to be a Google account connected to the device. This Google account is also the one that is used for the rating and commenting in the play store. An article investigating how country differences affect mobile app user behaviour has discovered that only about 47 per cent of app users say that they would rate an app they are using, as mentioned earlier. This means that going through the rating section of the app did not give a complete representation of the actual users, but it provided some information needed for the next steps of the study. The results of this study were some statistics of the users ages, geographical locations and genders and these lied as foundation for the targeted survey in the later stages.

#### Google+ Sketch Beta test channel

The test channel is a good way to get into contact with users that might not have given their opinion otherwise. Even though the awareness of this channel is not the greatest at the moment, it has potential to grow into a long lasting devoted fan base. We posted a comment in the discussion part of the channel where we asked if anyone would like to answer questions about their usage of the application. Primarily we would have liked interviews but we also included the survey in case some users would like to help more anonymously. We did three posts at the channel all containing a link to our survey, the posts was made every other week and the two first posts gave one response each and the last one gave 63 answers. The questionnaire was in English and that was a language barrier for some of the respondents. The respondents from Mexico also gave less information about their usage and many of their answers were in Spanish. The beta testing version of the application had at one point around 5000 updated versions, with the survey in a pop up window at that point we had 100 answers. This could be that the users updated the app and did not start it or they were just not interested in answering the survey. But a answer rate at one out of fifty is low.

## **Google Analytics**

A tool such as this seems to be a great way for developers to get a proper view of their users, and quite the ruin for personal integrity from a user point of view. But there are a few problems and restrictions that may influence the collected data. The first restriction is that only the devices that has allowed the data to be collected are shown in the statistics. In some countries there is a culture that information should not be shared. This is the case in some countries, e.g. Japan and Germany. The reason for not sharing this data is not always the same though, in Japan it's the mobile operators that do not allow Google Analytics, but in Germany it's the users that in general do not like to share their information. Even if it is completely anonymous. It is known from Google Play that 18 percent of the ones that upgraded the application are located in Japan. But according to Google Analytics only one per cent of the users are Japanese residents.

## **Sony Select**

The data that we could obtain from Sony select was which other applications besides Sketch that sketch users were using during the same day as they used Sketch. There was little to none information to gain from this though as it was very hard to see any consistent patterns. We concluded that is was easier to just add questions about app usage in the surveys and interviews instead and get the information from there. There were no indication in Sony select that the users were regulars either, so the data that was obtained from there might have been misleading.

## **Posters**

The posters that were put up in different areas proved to be very ineffective, and probably because of a few different reasons. One of the reasons, that we knew beforehand would be a limitation to the number of answers, was that we were only looking for active users and not potential users. This means that the person does not only have to see the poster we had put up, she also has to be a regular user of the app. Combining this with the lack of bulletin boards available and the odd placements of those who exists, leads to that not enough people who use the app will see the posters. Using a QR-code as the only way to access the survey might cause some people to not bother with trying to help because it is too much work, but it is the easiest way to distribute a link to mobile users through an analog medium.

## **Users**

We were surprised how many users that had left their email address in the surveys and when they answered a new the shorter survey, the answers were longer than we expected. Therefore if we where to do this study again, we would have more shorter surveys with the most relevant questions and send

out more surveys to users that wanted to help us. If the app would have been connected to a more widely used social media like facebook it might have been easier to gain information about the users from app reviews. This could have lied as foundation for the part of the personas that were focused around the people behind the users, and maybe removed the use for the extra survey asking about such information.

### **The benefits of a large company**

This project, as stated earlier, is carried out in a development team based in a larger company. The fact that it is the team who wants to know more about the users of their application and not the entire company that is behind the idea means that it is the resources of the team that decides what is possible to do. The team was very interested in our work and did very much to help us in our project, although it was not possible for us to shadow actual users of the app and monitor their behaviour.

The fact that the developing team is within a larger company comes with a few benefits though. A company that is established as well as Sony mobile communications is has their own testing department (LUT) with access to semi-regular people for testing new features and products. Semi-regular means that they are in some way connected to the company, including employees and their families. This might make them biased, but there might still be useful information to collect from them nonetheless. Their opinions about how they like different apps, and features within apps, will most probably be affected if they were forced to use the apps in question or if it was their own choice. Although how they use an app will probably be the same either way. It was also easy to get into contact with people at the company that were using the app that could be used for pilot interviews.

There was also another section within the company that had gone through the persona creation process that was interviewed and asked for tips. One of the big differences between their work and our was that their process took about a year to complete and we only had 20 weeks. They also employed an external company to help them through the process.

## **6.2 Collecting data**

When the users are identified the next step is to gain information about them to put into personas.

### **Data collection overall**

It is hard to collect the exact data from an application for different reasons. There have been parents who have said that they have kids who uses the application, but with the parent's devices, which of course is a problem. Connecting

a child's behaviour in the application with a parent's account might yield confusing results as this will not be shown in the statistics. With Google Analytics it is only possible to see the age of the one who owns the device, and not the actual user of the application. All statistics connected to Google accounts face the same problem, the user have to have an account to make a comment which a child usually does not have. They then either make a fake account with the wrong age, or use the account of someone they know, usually a parent or guardian.

Having both surveys and interviews gave plenty of data on which to base the personas and was a vital part of the project. Having only surveys would only have given statistics on which to base the personas, which would create very lifeless characters that would be hard to sympathise with. In order to make the personas more human we set out to get some actual users and ask them about their everyday life including field of work, hobbies and interests. This way the personas are based on actual users and not just statistical values from databases about how the person would most likely be like, which might make the developers more inclined to actually use them.

The best way of getting the most correct data of how a user interacts with a product and how they use it is to observe them in action. The problem with this project was that due to time and resource constricts it was not possible to observe a large number of users and from that extract all different user types. If there would have been defined user types before this study was made, it would have been easier to get into contact with some users of every category and observe their usage and interview them. This project however was to determine these user groups and create representations of them to be used for further development of the app. It is a first step in fully understanding the app's user base and using this knowledge to make the application more desirable to the current user base. The product from this project will give not only give a hint of what kinds of users are out there, but only by existing it will help developing the app further by making it easier to determine what features to focus on and which to pay less attention to.

The surveys and interviews were carried out in a way so that anyone in the selected population, the beta channel users, could volunteer to answer them. This was to have a random selection and making the results of the study internally validated and possible to generalise to the entire population.

The selected population for the study was the users of the Google beta channel. This restriction was because we deemed it more likely that users that had actively signed up to helping evaluating and giving feedback on an application would be more prone to answer questions about it. There was also a clear channel to get into contact with all of the users simultaneously, although there were no guarantee that everyone in the community would answer or even see the posted survey.

## **Creating the study**

Defining the population as the users that have signed up for the beta channel might give misleading results, since it is not the entire user base. Although any random selection might have yielded the same users, and this way it was easier to contact the users. The users of the beta channel have signed up for helping with trying out a beta version of an app, which means that they might be more prone to help even more by answering our study.

One of the most volatile part of the project, where errors would have the biggest impact on the result was creating the operationalisations from the theories. If the tag words we came up with to describe types of usage were not in line with the theories of what users there were, there would be systematical errors in the study. That would reduce the validity of the study and make the results less reliable.

## **Pilot Survey**

Making a pilot survey was very educational and helpful when creating a proper survey. The most educational part was the feedback that was acquired by reading the answers and figuring out which questions needed rephrasing or maybe even remaking or removing. The pilot survey was also a way to get input from the development team and the supervisors of the course. This lead to a larger survey than originally planned, with a few questions that were not vital for this study but were questions the team wanted answers to and were practical to send out simultaneously.

The pilot survey brought up a few new areas of information that we did not consider beforehand. One of the big differences between the pilot survey and the actual survey was the section for users who were new to the application, or had just used it a few times. These questions are good for the developing team but was not incorporated into our personas, due to the project restrictions that we set up. The purpose of those questions was to get an understanding of how the app is perceived by people who either have not used it at all, or has only brushed the surface of it's features. It might be important for the developing team to know if the first sight of the app sends the correct message, if it is clear what the app does just by looking at it or reading it's name. The questions in this area were mainly from the interviews we held with the team members, in which we asked if they would like to add any questions to our survey. Considering that it was possible to create answer dependent branches in the survey tool we chose it was easy to ask questions of completely different natures. This lead to the structure of the survey being two branches, the main branch that contained the questions for regular users, one branch for people who had only used it a few times.

## **Surveys**

Surveys have, as most other things, both positive and negative aspects in comparison with alternative methods. The prominent positive characteristic about surveys, especially the ones online, are that they are very easy to distribute. This was displayed by the fact that people from all over the world answered our survey during the same time period. The answers were also instantaneously which is a very preferable feature if the study is limited in time.

It is very hard to create the perfect survey though. It should not be too long so that the respondents lose interest but long enough to cover all the information that is needed. The questions should only be able to be interpreted in one way, which might be difficult to achieve when also trying to keep the questions as short as possible.

After analysing the results from the surveys we came to a conclusion that it might have been better to create shorter surveys and instead ask if the respondents would like to help out by answering more questions at the end of each one. The respondents that would go through all surveys would probably be lower, but the shorter surveys we sent out got longer and more elaborate answers than the longer ones.

## **Pilot interviews**

To be able to validate the interview we had created and were planning to use when speaking with actual users, we did pilot interviews with people at the company who we knew used to app frequently. The questions can be seen in the Appendices A.

Pilot interviews are a very good way to validate the questions that you want to ask the user group you are studying. The most accurate results will be obtained if the pilot interviews are aimed at the same type of users that the revised interview will target in the later stages. That is the reason why we chose to have out pilot interviews with users at the company, so that we would not waste any real interview targets. It was also easier to get into contact with users and booking interview times when targeting people at the own company. It is important that the interviewees at the company are the same kind of users that are in your study's population so that you can get accurate results. It is no user interviewing potential users at your own company if you are going to interview regular users in your study.

## **Interview with team members**

Unfortunately it was not possible to do all the interviews the same day which gave the team members the possibility to discuss the questions when only some of them had participated. This might have tampered with the result of the later

interviews as they might have already heard some of the questions being discussed by others and acknowledged their opinions on the matter. The interviews were held in private areas at the company away from the rest of the team members. All members were asked the same questions, but as stated earlier, in some cases part of the questions were modified or skipped due to being answered by an answer for another question. Many team members had the same picture of the user, therefore was it possible to notice that they have discussed their users at some point in their development process.

Interviewing the team members gave much information about the team's perception of the current user group, which is very valuable in the persona creation process. Knowing what the team members have in mind when developing is an important part when deciding on certain characteristics when creating the personas. The more alike the final product is to their own view of the users, the more likely the personas are going to be accepted as a true image of the users. With this said, personas are supposed to reflect the actual users and not the perceived image of the users, even if this does not coincide with the developing teams view. It is possible to manipulate minor details or interpretations to more satisfy the developers own image of the user.

## **Interviews**

The interviews held with the beta testers were very beneficial in the process of understanding the users of the application. Since we interviewed the same people that answered the survey it was easy to compare the answers they had given in the survey to the version of their usage they gave in the interview. These versions did not always overlap and the users were much more prone to give longer and more detailed answers when being interviewed. The interviews did not touch so much on what features they used the most, but instead on the surrounding factors. We were for instance interested in how they felt when using the app, which can be hard to explain through answering a survey. When interviewing people it is possible to see their reactions and hear if certain words are emphasised more than others which can make a difference when deciding what type of user the respondent might be. This is why we wanted to have the interviews over voice calls to not miss out on this aspect.

## **6.3 Presenting the result**

When all the information was gathered the next task was to translate the data into something that is easy for the developers to comprehend.

### **Finding Patterns**

Finding patterns in the app reviews, Google analytics and the surveys were all done by the judgement of us researchers which brings forth the aspect of human error. What categories the users fit into was based on our interpretation of the

answers they left in the surveys. It is possible that they did not explain their usage well enough for us to understand it the way they meant it. It is also possible that they use it in different ways than what they answered in the survey. There is also the aspect of us finding certain patterns because we wanted to find them, and failing to view the data objectively.

To avoid most of these errors we made certain that both of us formed their own opinion of each respondent before categorising them. This led to discussions if we were not on the same page which probably led to more accurate results.

### **Persona**

In order to create proper personas it is encouraged to follow the typical user around for days and monitor their behaviour. This was not possible in this project since there were not the needed resources available for this. After completing the project and seeing the amount of data that was obtainable with only the methods we used it is possible to say that it is possible to create data driven personas without actually meeting the users in person. How much impact the personas will have on the further development of the app however is yet to see.

The ethical aspects of creating a kids persona can be discussed. It will encourage the team to think of a kids perspective while developing the application, which is against Sony's policies. Because of this and the lack of information regarding kids using the app, this persona was created as a secondary persona. This will acknowledge that there are kids using the app, but that they are not priority in development and marketing.

it might have been better to use photographs of actual users to represent our personas, but since we never met anyone in person we went with pictures of people in the right age groups of friends or from stock photo sites. The interviewed persons were not always true to just one category but making an all eater category would make no sense so their usage got split up into different personas.

### **Personas impact on result**

The fact that we chose personas did affect the result of the study. If we were to have a broader categorisation and present the result in the form of user groups there would have been more time to focus on research the user characteristics further. The study was created with personas in mind so the impact the actual persona creation part had when all the data was gathered anyway, was quite small.

## **Statistical Validity**

In order to receive higher statistical validity there would need to be more respondents to the surveys. This can be achieved in a few different ways. The targeted population can be bigger with the same methods as used in this project or the methods of getting users to answer the surveys can be more aggressive. For instance having a pop-up window when opening the app might get more respondents, but it might also annoy the users and damage their view of the app.

### **6.3.1 Division of labour**

The workload was evenly distributed between the two writers. Johan did most of the interviews done by chat programs and Cecilia did most of the interviews done with voice over IP. Johan took more responsibility for the report, but the labour was overall evenly split.

## **6.4 For similar projects**

When conducting a similar project where the main goal is trying to identify current users, the best recommendations would be to try to gather users in some way. This can be done like in this project with a beta channel or beta test app, but other communities might work just as well. Interviews works much better than surveys when trying to acquire data from users, and it seemed like the ones that were interviewed took the task much more serious than the ones that answered the survey.

## **6.5 Future work**

The future work within the Sketch team is to use the personas in their development process and evaluate if they help the app to get more satisfied users. If they want to continue with further develop the personas the next thing could be to do qualitative studies by sending out the personas and letting the users identify themselves. This way the team could get a picture of if these really are the correct personas and exactly how large each user group is compared to the entire user base. To get more detailed information of the usage they can use the usage strains of the survey answers to formulate specific questions as in Figure 14.

**Do you use Sketch as way to express your creativity?**

Yes

No

**Do you use Sketch in order to highlight something on a photo?**

Yes

No

Figure 14: Example questions for future work with the persona process.

## 7 Conclusions

After reaching the goals of identifying the users of the application Sketch and creating corresponding personas accordingly, we have come to the following conclusions:

### 7.1 Finding and contacting Users

One of the perks of being stationed within a large corporation is that it was easy to find and get into contact with people who used the product. Even if they are biased and might not respond like real users it was a great start and a good environment for pilot surveys and pilot interviews. This is similar to using friends and relatives to answer surveys and interviews, and gives a skewed view of the reality, but it might be a good place to start.

The difficulty of finding users for a certain application is directly related how large the user base is and how main stream the application is. If you are researching an app that everyone uses it is easy to just go out on town and you will find people who you can interview or get to answer surveys. The same applies to if you are interested in how people who have never used the application would react to using it for the first time. If you, however, need to interview current users that use the application regularly and it is not acknowledged enough for you to be able to find users by approaching random people on the streets, it's a whole other story. Something that helped us very much during the entire project was the fact that there was a beta channel set up that users could join voluntarily. Through this medium it was quite easy to get into contact with people without being too pushy. The beta channel had around 6000 users when we posted our survey and we got about 230 answers. We decided to let the survey be free of choice by just posting it in the community's discussion forum. This probably gave fewer respondents than making a pop-up in the app itself, but we did not want to be too forward in our approach in respect to the people developing the app.

The best ways to get into contact with users was through the beta channel, and the least effective way was through posters. As a smaller organisation we would highly recommend conducting surveys and interviews over the internet as it saves time, distribution costs and reaches a large population. Going through a non mandatory channel of people who are eager to help, e.g. a beta test channel, is a great way to find interested members of the community.

### 7.2 Creating personas

We came to the conclusion that it is possible to create detailed personas along with user journeys without meeting any users in person. It is not the optimal way, but it works as a substitution if there is limited time and resources to carry out the project.

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## A Interview forms

The different interview forms that were used in the interviews.

### Interview questions with team members

- Can you describe one or two typical users of Sketch?
- Can you name and describe a person you know who is most similar to the types of people using Sketch?
- At what times of day do users use Sketch?
- Where do people use Sketch?
- Do users use Sketch because they like to or because they have to?
- Are we trying to attract different types of users with our Sketch? Who are they?
- What (besides using Sketch) do our users like to do?
- Is the person who owns the phone or tablet the same person who uses Sketch on a daily basis?

### Interview questions with users

- The last time you were using Sketch, what did you do?
- Is this what you normally do?
- Where do you use Sketch?
- How often do you use Sketch?
- Do you use Sketch in company with other people?
- Do you share your sketches on social media?
- Do you share sketches with the collaboration feature?
- Do you use any other application besides Sketch for similar purposes?
- If you were to recommend Sketch to one of your friends, how would you describe it?
- Is there any specific function(s) in Sketch that you do not use?
- Could you describe a normal day of your life? What you normally do at the different times of the day?
- Do you have any hobbies or interests?

- How would you describe yourself as a person?
- How would your friends describe you?
- In which direction would you like Sketch to develop? What features would you like to see?
- And finally, is there any questions you have for us, or something you would like us to forward to the Sketch team?

#### **Pilot questions**

- Can you describe a typical Sketch Session for you?
- Why do you use Sketch?
- At what times of day do you use Sketch?
- Where do you use Sketch?
- Do you share you Sketch?
- How often do you use Sketch?
- Is there any function you do not use?
- Is there any function you are missing?

#### **Finished version**

- Can you describe a typical Sketch Session for you?
- Why do you use Sketch?
- At what times of day do you use Sketch?
- Where do you use Sketch?
- Do you share you Sketch?
- How often do you use Sketch?
- Is there any function you do not use?
- Is there any function you are missing?
- Do you use any other applications similar till Sketch?
- What do you like to do on your spare time?

## **B Survey questions**

# Sketch User Survey

This is a survey to study current user behaviors in the application Sketch. The information collected in this survey is anonymous and will be used as part of a master thesis at Lunds University. If something is unclear do not hesitate to send an email to [lthmasterthesis@gmail.com](mailto:lthmasterthesis@gmail.com)

\* Required

## How often do you use Sketch? \*

Choose the most appropriate answer

- Every day
- Every week
- Every month
- Every other month

## At what time do you use sketch? \*

Choose the most appropriate answer

- During working hours
- In my spare time
- Both

## Where do you use sketch? \*

## Why do you use Sketch? \*

## What is your favourite feature in Sketch? \*

- Stickers
- Draw
- Timeline
- Text tool
- Painting tool
- Other:

**Is there any function in Sketch that you don't use? \***

- Stickers
- Draw
- Timeline
- Text tool
- Painting tool
- Other:

**Describe an average session of using Sketch, what do you do and why? \***

**Do you share your sketches on social media? \***

- Facebook
- Instagram
- Twitter
- Email
- Messaging services
- No, I do not share my sketches
- Other:

**Do you share pictures with the Timeline function? \***

Choose the most appropriate answer

- Yes
- No
- Only once or twice
- What is Timeline function?

**How old are you? \***

- 0-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- 61-65
- 65+

**Gender \***

- Female
- Male
- Other

**Would you like to help us even more and meet us for an interview? Please add you email.**

We will offer you a fika

**Submit**

# LUT Sketch User Survey Wk1511

This is a survey to study current user behaviors in the application Sketch. The information collected in this survey is anonymous and will be used as part of a master thesis at Lunds University. Some questions might have similar focus points, but we would greatly appreciate if you answered all of them anyways. If you do not use the application yourself but have close contact with someone who does (your children or close friends) it is okay to either let them fill in the survey or for you to fill it in for them. The survey is about 10-20 questions long and will not take more than 10 minutes to complete. If something is unclear do not hesitate to send an email to lthmasterthesis@gmail.com

## \*1. Please confirm your SoMC ID number.

## \*2. How often do you use Sketch?

### Choose the most appropriate answer

- Every day
- Every week
- Every month
- Every other month
- Only a few times
- Tried it but did not like it
- I have never used it
- I do not use it myself, but I can answer for a family member

## Family member

### 3. If the family member is a child, how does he/she start a Sketch session?

- Using their own device and start using Sketch themselves
- Given a device because they are bored
- Asks to borrow a device with the purpose of using Sketch

## Regular user

## 4. Where do you use Sketch?

- At home
- At work
- Out on town
- At get-togethers
- On public transportation
- Other (please specify)

## \*5. Why do you use Sketch?

## \*6. Is there any specific function(s) in Sketch that you do not use?

## \*7. Is there any specific function(s) in Sketch that you use more often than others?

## \*8. Please describe an average session of using Sketch.

**What do you do and why?**

## LUT Sketch User Survey Wk1511

**\*9. Do you use Sketch in company with other people?**

- Yes
- No
- Only once or twice

### In company with people (yes)

**\*10. What features do you usually use with others and why?**

### In company with people (no)

**\*11. Is there any specific reason why not?**

### Regular users (continued)

**\*12. Would you continue to use the app if it became more complex with more features?**

- Yes
- No
- Do not know

## \*13. Do you share your sketches on social media?

- Facebook
- Instagram
- Twitter
- E-mail
- Messaging services
- Google+
- No, I do not share my sketches
- Other (please specify)

## \*14. Do you share sketches with the collaboration feature?

- Always
- Mostly
- Not very often
- Only once or twice
- Never
- What is the collaboration feature?

## Everyone

## \*15. Do you use any other application besides Sketch for similar purposes?

- Yes
- No

## \*16. Is Sketch lacking any important features that others have?

Please name the other apps if possible.

# LUT Sketch User Survey Wk1511

**\*17. (if yes) Does Sketch have any functions which others lack that you like in particular?**

**\*18. What was it about Sketch that caught your attention?**

## Identification

**\*19. Which country are you from?**

**20. Gender**

- Male  
 Female

**21. How old are you?**

**22. Is there any other information you would like to share with the Sketch application team?**

**23. Would you like to help us even more and answer a few more questions? Please add your e-mail.**

**24. Do you know anyone else that are using Sketch and would like to answer a few questions? Please add their e-mail.**

### First time users

**25. What inspired you to use Sketch?**

**\*26. On first sight, what did you think was Sketch's main purpose?  
What seemed to be the main feature of the app?**

**\*27. Do you think Sketch is something you will continue to use in the future?**

- Yes
- No
- Don't know

### Thank you!

Thank you very much for participating in our survey, it is greatly appreciated and very valuable in the further development of the Sketch application.

## C Personas

## **Creative Camila**

Camila is one of the creative people in this world. She wants an app that can support these needs of creating content on her own in different forms. She has a lot of tools for doing this without using technology, and would like a digital alternative.

**Name:** Camila

**Age:** 19

**Lives:** Guadalajara, Mexico

**Family:** Mom, dad and little brother José

**Education:** Currently studying

**Hobbies:** Reading, playing guitar, playing video games and volunteering

**Characteristics:** Fun, social and outgoing

### **Lifestyle:**

Camila is a funny, social, interested in watching movies. She has a strong friendship with a smaller group of friends with similar interests. When she comes home after school she usually finishes any homework or chores she has to do. After that she hangs with her friends or play video games with her little brother. Before she goes to bed she usually checks her social media sites and sometimes sketches for a few minutes before falling asleep.

### **Usage:**

Camila likes to draw. She often starts with a blank canvas and uses the painting tool. In a normal day goes Camila to school in the morning and comes home in the afternoon, then she goes and play or to coaching class. In the evening she does her homework and when they are done she play video games or uses the Sketch for some drawing before going to bed.

Camila lives with her family in the suburbs and has to take the bus to school every day. The trip usually takes around 20-25 minutes and after checking her usual news and social media apps she often has time to spare. This is the perfect time for her to use sketch. Firstly she check her collaborations if there has been any update. She really likes the fact that other people can complete and continue paintings where she was not really sure what was missing. It is always interesting to see their take and interpretation of her work and make it their own. If there was no update in the collaborations she starts from a blank canvas and spends the next 10-20 minutes painting. How complete the painting gets varies from time to time, and if she deems it finished she often saves it to the device. It happens that she shows her paintings to her friends but she rarely shares them through social media. She has noticed that if she is to share her paintings through the collaboration feature it



is more beneficial the less complete the painting seems to be. After each painting session she decides if the painting is collaboration material or not, and save or share it accordingly.

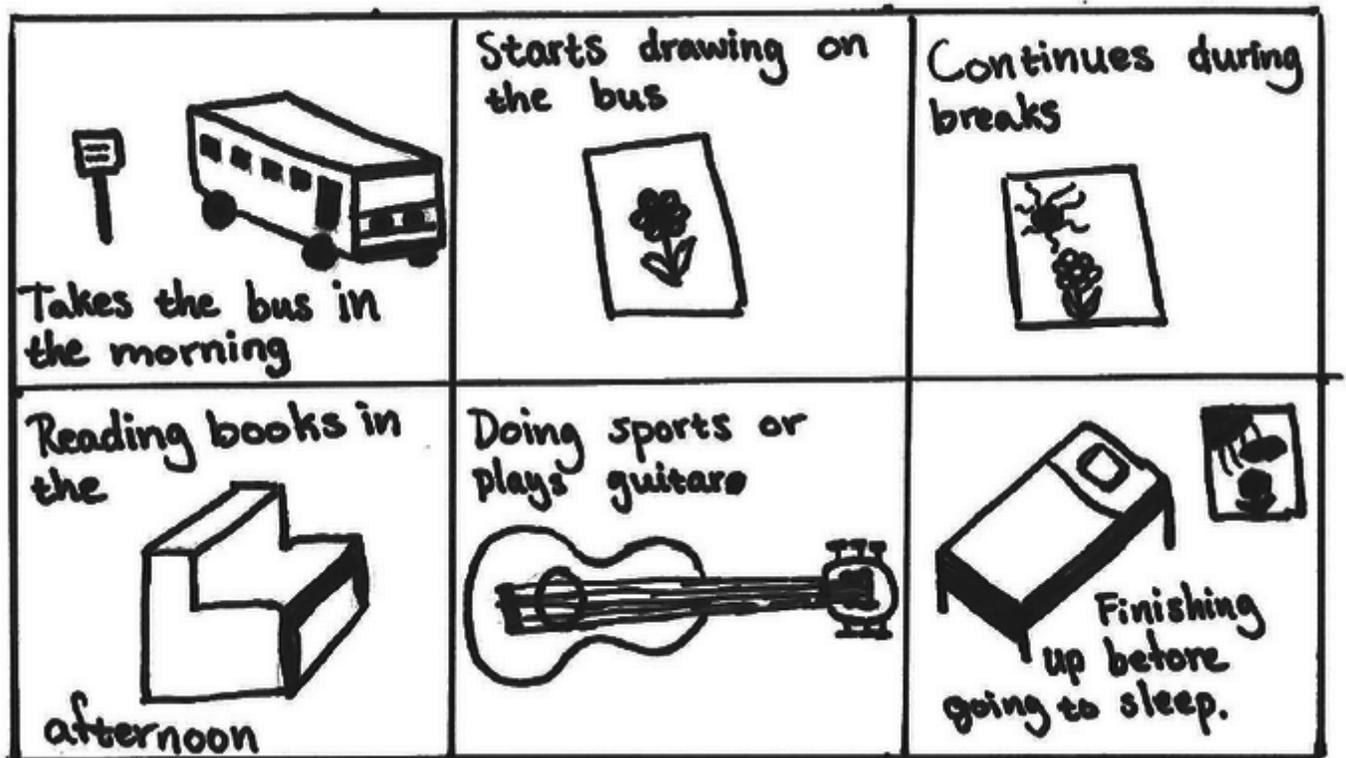
It happens that Camila pulls out her phone during boring lectures and continues the painting from the bus ride or just starts doodling. She also use Sketch while at home when she has spare time, mainly if she is bored with playing video games. She uses stickers once in a while as well, mostly to accompany an already created painting that could use something extra.

**Camila desires:**

Camila has a bit of a split focus when it comes to how she would like the app to develop. She has tried a few different apps for drawing but she has come to like Sketch very much, although she would like to have more painting features so that it becomes a bit more like the professional alternatives.

She is also a great fan of the collaboration feature, and would like to see this part developed further. She really likes the idea of creating a small community of friends that sit and doodle together, either enhancing each other's creative work, or just sending messages to one another.

Building on her interest of seeing other people finishing her own work, she is also interested in seeing their work and continue their paintings with her own interpretations. This would build another kind of community, more focused around the art itself and its meaning for different people.



## Purpose Paras

Paras is a busy family man with a lot happening in his life every day. When trying to fit all aspects together there is usually many things to remember and communicate to other people. Paras needs a tool in his life that can make the transition between analogue and digital in an effortless and fast way. This is to make it possible for him to have all the information he needs stored in his phone for easy access at any time.

**Age:** 31

**Lives:** India

**Family:** Wife and 3 year old daughter

**Education:** Master in computer science

**Work:** Programmer/Software developer

**Hobbies:** New technology, computers, watching movies, camping and an active lifestyle.

**Characteristics:** Active, talkative, funny, likes to be outdoors and loves technology.

### Lifestyle:

Paras has a high income and spends a lot of money on new technologies. He is open-minded, optimistic and confident with technology. He communicates with his friends through different mobile messenger services on his smart phone and uses his phone at least 2-3 hours every day. His smart phone is a source of entertainment and he expects fast information.

### Usage:

When Paras is at work he uses sketch mostly as a way to make his life easier. It is a tool used for quick snaps of information, either something he is sending to someone else or a memo for himself. He sometimes finds himself in situations where he needs to tell a coworker about something, let's say there's a strange error message in his code that he does not recognize. He then simple takes a snap of the screen and circles the lines of code that causes the error with the pen function. The snap is then sent to the coworker via whatsapp or some other messaging service.

When he is using the app for himself it is more for quick notes or memos that he needs to remember. This is a way to keep everything together in order to easier keep track of things and limit the number of papers he has to handle. It prevents him from losing a single note or memo, unless he loses the entire device without storing the information in cloud storage. He does not use the app for writing longer texts, just for quick and short messages. It is also possible that he just takes a photo of a paper containing information he needs to remember.



Paras is often out camping in the wild with his wife if they can find a baby sitter. Takes walks with his daughter in the local park and will bring her to the camping trips when she's a little bit older. When they are planning their camping trips Paras usually download a map of the area and uses Sketch to draw the route they should follow in advance. The fact that he can use the app without internet connection is great when he is out of cell service in the woods.

It has happened that he have created birthday cards for his friends birthdays or made a joke picture out of a photo of some of his friends in sketch. He then shared the picture with his friends.

**Paras Desires:**

Paras would like to increase options for the utility based tools, with focus on making it easier to highlight information in pictures he's taken. He uses the app as a tool to make his everyday life easier in a way much like how some people use paint in windows: cropping photos, circling information and censoring information by adding a layer of paint over them.

## Editing Edward

Edward, or Eddie as he likes to be called, has been editing photos since he cannot remember when. Edward likes to create fun pictures for his own delight, and to receive praise from his friends for his creations. What he wants is an application that allows him to use similar tools on-the-go as he can use at his pc at home.

**Age:** 18

**Lives:** Birmingham, United Kingdom

**Family:** Mom, dad and two siblings

**Education:** High School

**Work:** Still studying but earns some money on the side by helping younger students with math after school

**Hobbies:** Likes to play cricket and likes music (plays guitar), art and videogames.

**Characteristics:** Funny, easy going, intelligent, optimistic, a bit lazy and quite the philosopher.

### Lifestyle:

Edward gets up at around 6:30 in the morning and goes to School. He commutes there by train and if he has nothing to do on the train or see something fun he might make a sketch of it. When he is done with school for the day he usually helps younger students with their homework for a while before heading home. When he comes home he usually finish up his own homework and run a few errands. About every other day he goes out with friends, and it is mostly in their company he uses Sketch. He takes a photo of his friends and add a few stickers to create a fun picture.

### Usage:

Eddie uses Sketch to manipulate pictures that he has taken. It can be pictures of his friends, something important he needs to save, or something fun or strange he would like to share with others. The stickers are a very useful tool in his usage and he uses them in many different ways. Sometimes just adds a few stickers and possibly a handwritten text to something fun he saw on his commute to work, but most of the times it is to add stickers to his friends faces and make a fun picture. The comical versions of the original photo is then shown to the friends involved, shared in a common social media group or posted through his own social media profile. This type of usage is commonly when he is out with his friends or at some other get together, maybe a family meeting or similar.

Eddie sometimes makes collages by combining a few pictures and adding a fitting effect, or maybe a sticker or two. Almost every tool in Sketch are very useful to him, although not always in the same

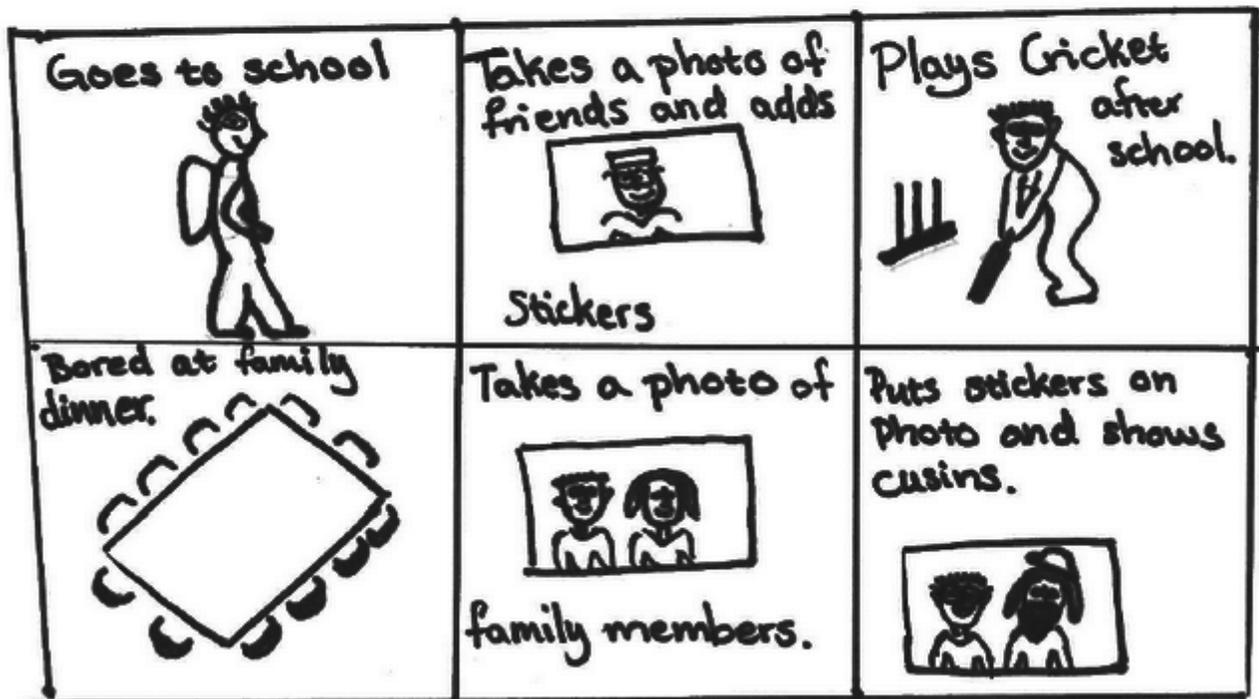


picture. For example, it is not always only stickers that covers his friends faces, there can also be hand drawn beards and “lavish amounts of makeup” which he draws freehand.

Eddie might also use the app when he has nothing to do, just messing around creating funny pictures. He has done a few birthday greeting cards with Sketch as well and will sometimes draw basic illustrations.

### Eddie's desires:

Since Eddie's main goal with this app is to edit photographs that he has taken the most of his needs are in the picture effects department. More fun stickers and maybe even other esthetical effects such as filters are things out of the top of his head. Another thing that he thought would be cool was to make animations, such as gifs or even short video clips. Maybe animated stickers could fill his desires for this. He would also like some more life-like effects, like transparency in stickers and making his picture editing easier by a layer to edit pick would also help. Eddie is a bit concerned with only being able to export resolutions up to 480p even when the original image was higher resolution. Since his pictures might be displayed on larger screens he want the best resolution possible.



## Social Shen

Shen's life revolves around his friends and his ability to socialize with other people in his surroundings. He is a frequent user of social media apps and has never missed to put his lunch on instagram. Shen wants an app that connects him with other people in a fun a creative way, and allows him to socialize in a different way than all the existing apps.

**Age:** 26

**Lives:** Beijing

**Family:** Single and lives in a collective apartment.

**Education:** Bachelor in Computer Science

**Work:** Internship at a large company

**Hobbies:** He likes watching movies, modding his smartphone and hanging out with his friends.

**Characteristics:** Mostly calm, outgoing, a bit silly, high sense of humor, talk non-stop and can be annoying at times.

### Lifestyle:

Shen is currently in an internship at a large company where he works from early morning until mid afternoon. During this time there is not time for anything but work, as he would really like to impress his boss so he can get a permanent employment there later. On his way home he often stops by at his friends' houses to drink a cup of coffee and chat. He sometimes goes out with his friends on the weekends to local pubs where they hang out together and have fun. It is in these two situations he most frequently uses sketch. At night during the week he often plays around with photoshop or plays games with his friends online.

### Usage:

Regularly during the day Shen uses Sketch to capture something fun or interesting he encounters in order to share this with his friends, maybe along with a short text or some stickers. This is a way to communicate with people he knows in way that is a bit more creative than the usual text messaging.

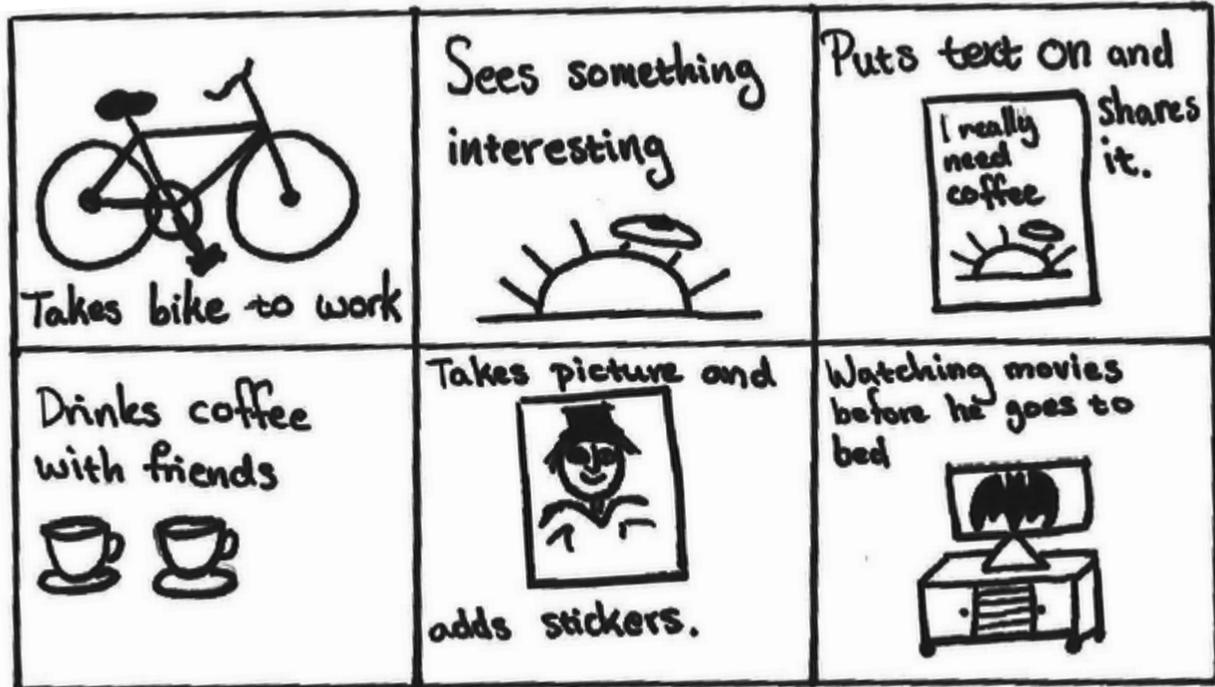
When Shen is out with his friends or hanging out with them at home he often take their picture and adds stickers to them. It happens that the pictures he creates are shared through a social media group shared by the involved members, and sometimes it's even shared on instagram/facebook.



He also often uses the application to just send text messages with different fonts or sometimes hand written.

**Shen's Desires:**

He would love to see different fonts for the texts or maybe some animated stickers.



## Klara the kid

Klara loathes being bored. It is literally the worst thing in the world, worse than homework. She is often looking for things to entertain her, and the TV is one of her favourites. However, there are times when the TV is not available and in these cases she often wants to draw something and create fun pictures.

**Age:** 7

**Lives:** Dortmund, Germany

**Family:** Mom, dad, little brother and their dog Milo

**Education:** Primary School

**Hobbies:** Playing, watching tv and gymnastics

**Characteristics:** Happy, outgoing, creative and interested

**Lifestyle:**

Klara is going to primary school. On her free time she is taken by her parents to the communal pool once a week to learn how to swim. She does gymnastics twice a week with a few of her friends from school. She often have playdates with her friends either at home or at the friend's house. She goes to primary school which means she has a fair amount of free time during the weekdays and weekends. When she comes home from school during the week she plays with the dog for a bit then does her homework if she has any. Sometimes she saves some of the homework for when her parents gets home if there is something that she does not understand.

**Usage:**

Klara likes to watch TV, but if there is nothing to see there or if it is in use by her parents, she likes to borrow one of their tablets to either play games or create pictures with Sketch. She uses sketch in the afternoons and evenings if she doesn't have plenty to do. Klara adores Sketch, it is much more fun to use than to draw on regular paper. She uses all the features and can easily spend 45 minutes on a single picture to make it perfect, although in some sessions she creates several images. She also has a habit of going back to older images she has saved and erasing elements in those pictures and adding new. The tablet she is using is not connected to internet, so that she does not share anything by mistake.

If she is not reopening an old picture, she often starts with a blank canvas. She then adds a background by photographing something, often herself, her dog or someone in her family. In order to make the background a bit more fun, she also adds a color to the photo to create some sort of filter effect. She often takes additional photographs and include them in the picture, kind of creating a photomontage. Klara also really likes the different special pencils, such as the rainbow, dotted, hearty,



starry and the color specific rainbow pencil. These are often used to circle the pictures, or to draw hearts around them. She doesn't really draw figures herself but does instead use stickers to include more characters. She also use the text feature to include both text to the characters in the picture and to add smileys, which act as characters as well.

At one time Klara and her dad had a long train trip and they then used Sketch to play hangman. Klara enjoyed it and dad feel that it was educating for Klara.

**Klaras Desires:**

Gold color and glitter pen.

**Klaras parents desires:**

A lock function so that Klara cannot access Internet by mistake.

