2017

Methodology of Interaction design: Final Report

GROUP 4

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Introduction

This report describes the design process of a mobile application for international students in Stockholm, called StockholME. During the process, brainstorming techniques, as well as semi-structured face to face interviews were applied in order to gather ideas and to do research on the target group to find a problem. After that, the data gathered was used to synthesize different personas to better understand the target group and their needs. Next to that, storyboard scenarios were developed to express the vision of a solution and its role in users' lives. When starting the sketching phase, a workshop was conducted with final users to gather some input to avoid self-referential design. With this input, researchers built different prototypes using parallel prototyping, opening the design space and getting different ideas to later integrate the best parts into one paper prototype to be developed and tested. Usability evaluation was conducted with final users both in an explorative way and in a task-oriented approach and both with the final paper prototype and with a higher fidelity digital one. The main goal of evaluation was to once again get feedback from the target group and check that assumptions and the vision made by designers was correctly understood and to check if the testers found the idea useful and usable.

Observation, bodystorming and brainstorming methods

Observational methods

Regarding the identification of a community to work with, a small discussion was held to exchange ideas and discuss availability. After considering five or six different ideas, how each group could be reached and the interest of designing from them could have, it was decided to have 'international students in Stockholm' as a target group.

At the beginning of the design process, informal unstructured interviews have been conducted with the target group, to find out which problems they might encounter during their stay in Stockholm. Stockholm is chosen as focus as this provides insights in what the city lacks in information, as this can differ amongst cities. These interviews had not any specific guide, more than the idea of trying to find problems in relation to their lives in the city, making the interviewer decide questions during the interview itself in relation to the answers given. This method is good to use as you give participants room to elaborate and express themselves without drawing conclusions yourself, as opposed to observational methods. The negative side of this method is that the interviewer could influence the responses through the way questions were formulated. This might have lead to confirmative behavior as most of the people interviewed in this stage were friends of the researchers. Another important reflection should be done around the chosen group: international students. As the researchers are international students themselves, they have bias and are prone to fall into self-referential design (Kelly, 2003). In hindsight, it might have been better to choose a target group which we were not part of. On the other hand, taking into consideration that in real life being part of the target group is not rare and changing the group to avoid it is not possible, it has been very interesting to try to deal with this fact and reflect on its impact on the design. Being aware of the fact that to completely avoid self-referential design is impossible, an effort has been done to conduct a participatory design process, integrating users in each step.

Brainstorming and interviews

During the brainstorming and bodystorming phase, two methods have been used to summarize findings from the informal interviews and to gain more in-depth information.

At first, the results from the informal interviews (different quotes) were put on post-its, and after reading them through, some topics were identified and the post-its were placed on the table, where proximity to a specific theme showed relevance to that theme. The themes used were: University, City, Social and Others (which included inputs which did not fall in any other category already defined). When this was done, the groups with the most post-its, City and Social, were used as starting point for questions for the semi-structured interviews. This method worked for us, as the thematic analysis showed the different aspects we could focus on further in our research. It might have also worked against us as we might have given too much weight to themes that had more post-its, while another theme, although less represented, might have been far more interesting to research.

As second method, semi-structured interviews and online surveys were held with twenty participants, all international students. Questions asked in the interviews can be found in Appendix A. As not all students had time to talk one-to-one for a semi-structured interview, these questions were also sent out to respond to some few participants through email. A positive point on this method was that more information was gathered and it was way less time-consuming. However, the answers got through mail were very short, lacked explanation for the response given and it was hard to know for sure if the respondent understood the questions correctly. In addition, concrete answers as number of times of going out a week were received but there was a clear lack of deeper insights or reflections, as well as spontaneous comments that in face-to-face interviews help to better understand and find their needs. It was also observed that the way the questions were asked is always essential, but especially in surveys where interviewers do not have the possibility of explaining them further. Results of the interviews were all reported together to easily analyze and compare the different answers.

Improvements

The brainstorming method could be improved by doing more structured interviews for finding an aspect to focus on. Examples might be to first name a few things they miss, and later on let them rank or give points to +/- 10 example categories with regard if they had any difficulties in that aspect. In this way, they consider more examples then they just remember or think of, which might give rise to new ideas. It could also be interesting to do some observations avoiding being intrusive, as it happens with interviews. Next to that, from the beginning it was envisioned to create some sort of application as it seemed the most natural and useful tool. As this has influenced the rest of the design process, it should have been better to open up the design space and not have ‘an application’ as baseline for the interview questions.

Personas and scenarios

Persona and scenarios

For the creation of personas, a process proposed by Cooper & Reimann (2003) was followed. The data from the semi-structured interviews was taken, and behavioral variables were selected among the questions which could be placed on a certain scale. For each participant, a data point was created on each scale, as seen in Figure 1, and when finished, it was tried to see patterns arising from all these different data points.

As it was nearly impossible due to the variety of questions to find a few distinctive patterns, the search for patterns was narrowed down to a few questions at a time. This brought some logical and causal relations which could be used for persona creation, such as that people tend to be more social and less digital when looking for places when they go out in bigger groups, or that people who do not go out often in Stockholm also do not go out that often in general, but people who regularly go out in Stockholm go out more often at home. Through these relations, roughly three groups could be identified of which one did not suit the target group for the envisioned application as they already knew where to go in the city. It was decided not to consider this third group during persona creation and thus during the design process. For the other two groups, and after defining their goals and adding other important information taken from interviews about interests of types of venues and characteristics of them, two personas were created: Marc and Sevil, which can be found in the Appendix B.

The process of making the different scales to find logical or causal relations helped us in a way that it provided a systematic, data-driven way to come up with grounded personas, as well as allowing us to better understand the data, by forcing to re-read it many times. A disadvantage was that it took a lot of effort, our questions were not always suited to put on a scale, and it was very hard to obtain any obvious patterns from the data.

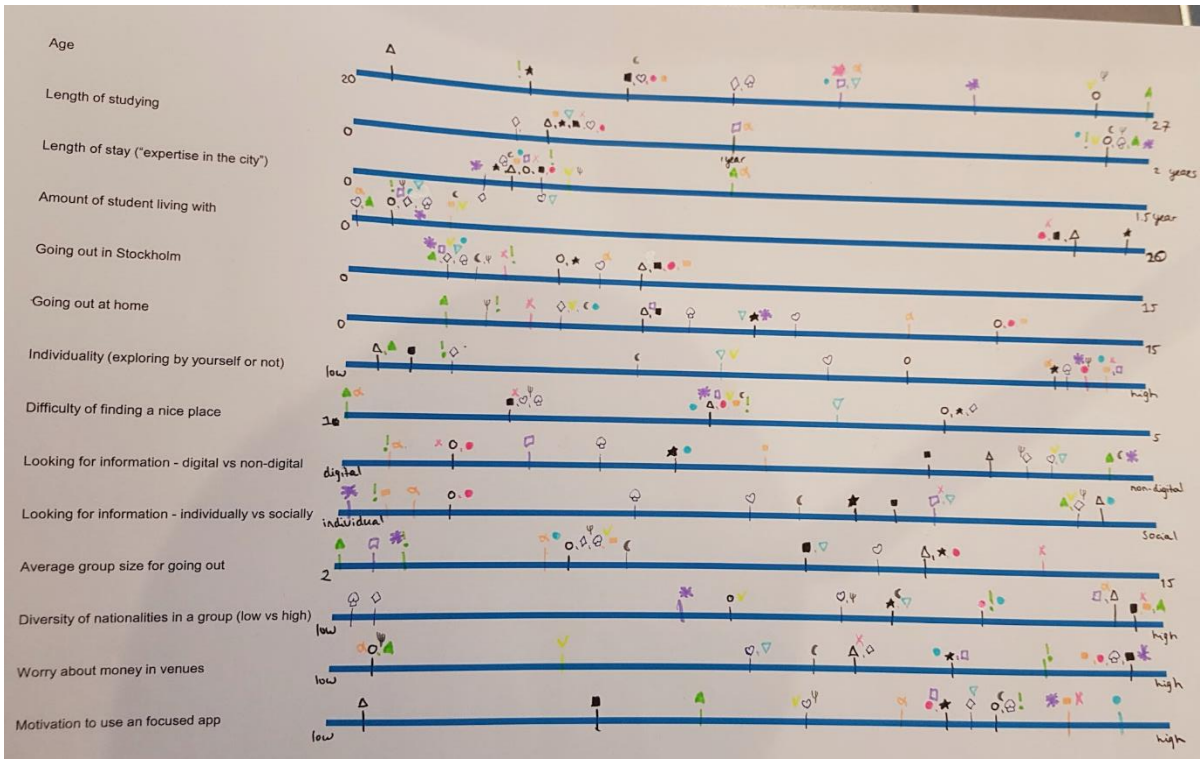

Figure 1: Answers of interviewees distributed over different scales

For scenario creation, two storyboards were used to show certain ways in which our vision could help international students with their problems in Stockholm. It was decided to use this instead of a narrative or a video as a storyboard is quick and easy interpretable (compared to narration) and also easy altered if needed (compared to video prototyping). A disadvantage of this method in our case was that too much detail was provided on how our vision would look like, such as the map drawn on the screen. This might have influenced the process in the following stadiums. Pictures of storyboards developed can be found in Appendix B.

Improvements

As it took a lot of effort and time, the method for creating personas could have been improved by having a tool which makes it easier to find patterns and/or to visualize it digitally in an easy way. Next to that, it would have been better to think about the extent to which questions can be 'scaled' during the semi-structured interviews, as not all questions lend themselves to do this. It might also be easier finding any patterns if the questions target the same aspect, as the questions used differed a lot in subject and might be too subjective to compare. Regarding the scenarios, they were thoughtfully designed to try to cover as much as possible situations in a simple and quick way, but it does not mean everything was included. Only satisfied users appear in them, but not any negative aspect, such as finding a review that is not valuable and be disappointed with a place. It could be interesting to design such a situation to generate a discussion and some ideas around that possible drawback.

Workshop, sketching and early prototyping method

Workshop

As the researchers were part of the target group, a workshop was held before beginning with sketching a first prototype. During the workshop, the six participants were asked to come up with a prototype in groups and explain them to the other groups. After a brief presentation and feedback, each group iterated on their own concept, and presented their final concept to the whole group. The ideas generated by this workshop can be found in Appendix C. An advantage was that it gave us a fresh start with new ideas, as we otherwise would have based our design on very little information the personas provided together with our own thoughts (self-referential design). A disadvantage might have been that the group consisted of familiar fellow international students. Knowing the participants is shown to have a negative influence on the output given by that group, also known as the Hawthorne effect (Jones, 1992). Another found disadvantage is that most of the results from the workshop were based on existing applications and not many creative ideas emerged, so basing the following process on this output could have been a problem preventing from designers imagination.

Sketching Process

After each of the researchers saw the output of the workshop, the method of parallel design was used to get three different prototypes. These prototypes were based on the output and remarks given during the workshop, the insights gathered by the interviews, and by the personas. Each researcher presented her design to the others and explained each function or design decision included. After everybody finished their turn, each idea was discussed regarding positive and negative points, related to comments from the workshop and (again) the interviews and personas. If some aspects were not covered during the workshop or interviews, the researchers chose the direction to go for a specific discussion. In this way, a final paper prototype was made which was used for user evaluation, and served as baseline to create a digital version.

In sketching, the most easy thing to do is to keep the design 'clear'. This means minimal use of colors and a very minimalistic design. An advantage of this method was that combining the three prototypes was easy as the functionalities were clear and no discussion on the look and feel arised, and the evaluation of the paper prototype focused mostly on the functionalities included. When this prototype is placed in the relationship triangle for prototypes suggested by Houde and Hill (1997), the prototype is focused on the 'role' side of the triangle, on the line towards the look and feel. The disadvantage was that there was little to no thought given on the color scheme, the visualization of buttons and pop-ups, and a few screens were not drawn (for example, a register page). These disadvantages make it harder to get the same feeling into the digital prototype.

Evaluation of paper prototype

As the feedback from three participants for the paper prototype evaluation focused mainly on the functionalities of the application, it was easy to integrate the different comments into the digital prototype. For example, the wording of some things that were not clear understood was changed and also new pages were created like the register page and the review page. The informal evaluation changed the design of the prototype in a very minimal way, as there were no real substantial comments given on it. Positive feedback on certain parts which gave some consolidation that parts of our design were intuitively understood. One point of improvement, apart from getting more participants as they could have been not representative enough, might have been the use of icons. Although results of evaluation were positive, maybe not all users instantly understood the meaning of them and they are crucial for the app navigation. This verification part might needed some more attention in hindsight.

Interactive prototyping and evaluation methods

Interactive prototyping

A digital prototype was developed using Axure (Axure, 2017), a professional program which allows designers to create a high-fidelity prototype in HTML format, share it and make remarks for specific places of the interface. The prototype was developed after having internal discussions about functionality, feel and layout. It was developed in parallel with the paper prototype evaluation, making it possible to detect problems and change them. Later on, the first version of the digital prototype was used for a similar user evaluation, which lead to more insights for the look and feel to change in the digital prototype. Some representative screenshots of the digital prototype can be found in Appendix E. When this prototype is put on the triangle for prototypes (Houde & Hill, 1997), this prototype will be at the middle of the line between 'role' and 'look and feel'. A clear advantage of this kind of prototype is that users had a better idea on how the application tested will look like, so aspects related to look and feel were better identified and explored in a deeper way (Sauer & Sonderegger, 2009). However, it made users to feel it as closer to a final product, so participants focused more on appearance without being so critical on the functionalities they needed. The final aspect of the prototype might have also made participants to feel obligated to give more positive answers, being more influenced by the Hawthorne effect (Jones, 1992).

Regarding the design of the prototype, it has been tried to integrate both standard features that will seem intuitive and well-recognized by users with innovative functionalities that will differentiate the app from other existing ones. Examples of standard features are the swiping function (like Tinder), the search bar or the main filters, while examples of original ideas are having specific tags to recognize venues based on students preferences, possibility of filtering by student discounts, prices of specific common products (beer and coffee) or the color and size coding used in the map to indicate opening

hours and rating average. Having easy recognizable features made the application more usable, as users did not have misunderstandings and learnability was easy after just a short exploration. On the other hand, having those new functionalities made it more useful, as nobody would use a product that does not provide any additional and special value. In hindsight, although some novelties were integrated, the developed prototype might have a lack of creativity in general, probably because of trying to base the interface too much on the workshop output and focusing on testing usability issues. The difference for a few exemplar screens for both the paper and the digital prototype can be found in Figure 2.

Figure 2: Same screens for both the paper prototype and the digital prototype

Evaluation of interactive prototype

The used method for evaluation was semi-guided. It consisted mainly in two parts: first, participants were given time to explore the application without any frames and after that, they were told some tasks to perform. Taking into consideration the big influence that framing participants can have for evaluation results (Brown Reeves and Sherwood, 2011), a change in wording was used when presenting the tasks: to some people in a general way, like "leave a review of a venue you have been to" and to others in a specific way that guided the user through the envisioned path of the researchers, like "Add this place to your visited list, and after that, leave a review about it". This way, different behaviours were observed in the participants and usability issues were detected being aware of the relation between the problem and the manner in which the task was described.

Eight different participants, all international students aged 20 to 26 who had not participated in other phases of the design, conducted the evaluation. It was tried to evaluate all the functionalities of the app, but there was a main focus on the key parts of it: list of venues with the swiping functionality, different filters and tags, map option and review option.

Regarding the results, a few examples of the comments which were given and helped to improve were: size of the tags should be small and not in capital letters, the filter bar should disappear when you are scrolling through venues in the landing page, there should be a warning before you delete a venue from the Wishlist or delete your account, and the edit button at the 'visited places' page was replaced to have its usage better understood. One functionality remark which was made was the ability to filter on tags, as they were in general detected as one of the favourite and original features of the application, which should be considered as a future addition.

Reflection

Evaluation has been crucial in the design process. First of all, having a prototype to test, no matter the level of fidelity, is needed to better understand what the vision of the product is, as ideas previously discussed become concrete at this point. In this project, a lot of issues that were not even thought of before emerged when designing the prototypes, which was really interesting to detect. After that, testing the prototypes with final users was also a key to find problems and iteratively refine the prototype, getting closer to a final product. In this particular case not many substantial changes were made after evaluation, probably due to the fact that most of the feedback got was positive, and that it was a quite standard design as it was based on ideas given by users in the workshop. There were mainly small comments to improve appearance or functionalities, but not essential critics for new functionalities.

Improvements

In hindsight, and without the restriction of time, it could have been a better idea not to start evaluating the high-fidelity prototype so early, focusing from the beginning in a unique version. Developing different paper prototypes, evaluating them with users using A/B testing might have lead to gain more insights about alternative designs and open the design space. Another consideration could be to try to base the evaluation more on usefulness and less on usability.

As last thing, it was assumed that certain icons and interaction methods would be naturally understood by the users, which was not grounded. In a new design process, more attention could be brought to this point of icon and interaction understanding.

Conclusion

Given the main aim of the course as to “implement HCI design methods in the design and development process of interactive systems”, this project helped us to get the feel of real time atmosphere of this field, apply methodologies learnt in a practical way and in depth understand some of the theoretical reflections done during the course. It should be remarked that the fact of being an academic project, as well as time-limits and guidelines, influenced the flow of the process that could have been different when done in a real context. The project was time and energy consuming, but clearly worth it to experience and learn practical knowledge into the methods used in the current field of Human Computer Interaction and its Designs.

During the whole process, from start to end and in order to deal with ‘self-referential design’, user inclusion and participation was used to get data and different opinions into the design. It was tried to get a representative sample of people, not deviating from the target group and taking different groups of people for each phase, trying to look for different backgrounds and behavioral patterns, even if it was not an easy task. Including users gave the designers a great deal of guidance, making them think of things they have assumed or not even focused on. Being critical and reflective during the whole process has also been determining, helping to change and guide it in a better way for next phases. Final critics and reflections collected in this report have helped in the learning process, with many improvements being proposed, such as the framing that the vision of a mobile application made from the beginning, among many others here explained and more that could, certainly, still be found.

To finish with a conclusion around the product produced, StockholME is an app created exclusively for international students to find the best suitable place of their taste. Being critical, it is true that the idea of showing places to visit is not something very unique or original, but should be pointed that what differentiates StockholME from others is its focus on a very specific and concrete group and that it is tailored specially for them, highlighting attractions based on their necessities gathered during the process. It is believed that this concreteness will be a key for a good acceptance of the product, but being a “standard” application makes that issues such as guaranteeing reliability, as well as facility to use, become more crucial for a future success. This app tries to cover some of target user group necessities, grounded with data, and it is hoped that, if implemented in the future, could really engage Stockholm’s international students’ community by helping them to make the most of their experience in the city.

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Appendix A: Questions of the semi-structured interview

Questions of the interview

Demography and background
1. Gender, Age and Nationality
2. Which program are you studying here?
3. How long are you staying?
4. How long have you been here already?
5. Did you come alone or with friends to Stockholm?
6. Where do you live here? (student dorm, private flat shared with students or not…)
7. Did you know the people you are living with before?

Behaviour (places in Stockholm)
1. How often do you go out (cafés, bars, restaurants, clubs, cinema)? (times per month)
2. How often do you usually go out in your home country? (times per month)
3. If your answers from 1 and 2 were very different, why?
4. Do you like to explore new areas in the city by yourself?
5. Do you find it difficult to find a nice new place to go out? (scale it from 1(very easy) to 5(very difficult))
6. What is your normal strategy to find such a place?
7. Did you learn specific information from locals?
8. If yes, what did you get? Was it valuable? (scale it from 1(not valuable) to 5(really valuable))

Behaviour (social relationships)
1. Do you have a group of friends with you hang out with often?
2. How many people do you usually go out with when you do it? (number)
3. How did you meet them?
4. Are they all from your native country? Are they swedish? Or different nationalities?
5. Did you all arrive at the same time? Could you get information from them?
6. Would you like to meet new people?
7. Will you be comfortable meeting up with new people to go out alone? And together with a few already existing friends?

App functionalities
1. Would you like an app to identify points of interest through the city, with focus on international students?
2. What kind of places would you like information about? (ideas if they don't know: bars, restaurants, supermarkets, clubs, parks, tourist attractions, student discount places…)
3. What classifications about venues would you like to have? (ideas: Average of prices, quality, price of a beer, price of a coffee, main attractives, locations)
4. Would you like a suggested place to meet new people (other internationals) each week?
5. Would you like to be matched to other people based on your interests?
6. Would you use it more if it's promoted or supported by KTH/THS? Why?
7. What additional value would this create in comparison to e.g. Facebook, Google, TripAdvisor etc.?
8. Would you also want to use such app to see where other friends (if they allow GPS tracking at that moment) are in the city to easily meet up? Would you mind sharing your location with them?
9. Prioritize these functionalities: map with suggested places rated and commented, connection to new people, meet with new people
10. Do you have other suggestions to add?

Appendix B: Personas and Scenarios

Persona 1

Marc Blanco

"It's not difficult to find a nice place, but to find a cheap place"

"Facebook offers a lot of information but it is hard to filter it"

Age: 24
Nationality: Spanish
Studies: Master in Applied Physics
Length of studies: 2 years
Length of stay: 3 months
Accommodation: Student dorm

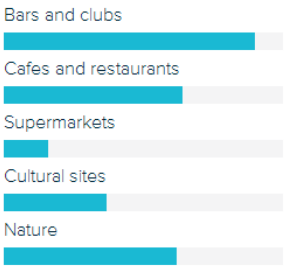
Profile

Marc Blanco is a Spanish international student in Stockholm. He arrived three months ago and he is doing his master here for two years.
He is friendly and a very open-minded person, so he loves meeting people from different cultures. In Stockholm he lives in a student dorm, what he finds really interesting as he is able to make close relationships with other students from different nationalities.
When going out he always asks his friends in the corridor to join, they are fifteen people that share the same kitchen, and all together decide some place in the city to go to. They are always a big group, and if others also invite extra friends, the group becomes even bigger, which is something cool from his point of view. They sometimes prefer to stay in the dorm, and hang out in the kitchen.
He loves drinking beer and going to pubs with his friends but thinks that Stockholm is too expensive, so he goes out once a week, less often than in Spain. He hardly ever goes to restaurants or cafes, mainly because they seem nice but expensive. As a student, he is really worried about expending too much money, so he thinks that the student discounts that exist in many places of the city are interesting. He used to live in a small town so he also finds Stockholm too big and usually prefers to go to nearby places not to waste too much time in the transport.
He thinks Stockholm has a lot of things to offer for students, and there are a lot of stimulating venues and events. However, he hardly ever checks the info online because it is hard to select what is actually valuable for him, so he prefers to ask people about it. He is fascinated about how well everybody speaks English but he also thinks that knowing Swedish is crucial to get to know the culture and the non-turistic way of the city, as most of the sites with cool insights are wrtitten in Swedish.

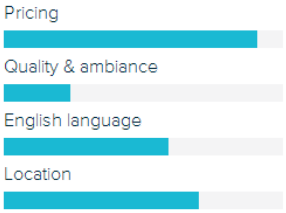
Goals

- He wants to know bars with cheap beer to go out often with his friends.
- He wants to discover affordable and nearby venues to eat out.
- He would like to access valuable information in English quickly.
- He wants to make the most of the experience of living in Stockholm.

Preferred Places



Preferred characteristics



Persona 2

Sevil Güler

*"After a long tiring day at college,
I just want to hang out with my boyfriend at different, nice restaurants"*

"I hate cooking and am constantly looking for places that offer variety of food"

Age: 22
Nationality: Russian
Studies: Exchange student
Length of studies: 6 months
Length of stay: 3.5 months
Accommodation: Private apartment shared with boyfriend

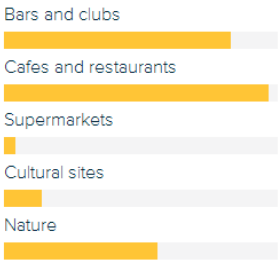
Profile

Sevil Güler is a Russian international exchange student in Stockholm. She arrived three and a half months ago and studies at KTH for six months.
She is a friendly and kind person, who has troubles with mingling with people fast. She loves meeting people from different cultures but is more comfortable with her own group of friends and her boyfriend. In Stockholm she lives in a private apartment shared with her boyfriend, which makes it a bit hard for her to meet other people from different cultures.
When going out she always checks Google to find the best places or just take a stroll, randomly exploring new places. She always goes out with the same small group of people, but she is interested in including more people to the group to make it merrier. She sometimes spontaneously dresses up to go out for a drink.
The pattern for going out does not differ that much from the pattern in Russia: she loves drinking coffee and going to variety of new restaurants to try out different cuisines with her friends but finds it difficult to find different restaurants within Stockholm. She cares about money, but trade-off between money and quality is more important to her.
Since she comes from a really big city, she doesn't mind travelling to far places if they are worthy enough, but these places are hard to find in Stockholm. Having options which are okay and in proximity might suit her better sometimes, as she spends a lot of time on studying.
Even though she uses online surfing to find good places and checks the reviews, the credibility of those are very low. She has had some bad experiences ending up in very nasty, distant, places, despite a good online review. In hindsight, this sometimes might be due to the fact that the reviews were aimed at a general audience.

Goals

- She wants to know romantic destinations where she can spend an evening with her boyfriend.
- She wants to discover a great, new, restaurant every week that has a different cuisine in and around Stockholm.
- She wants a platform where the reviews are credible and targeted to international students
- She wants to enjoy different places in Stockholm with her small circle of friends.

Preferred Places



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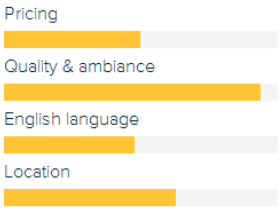
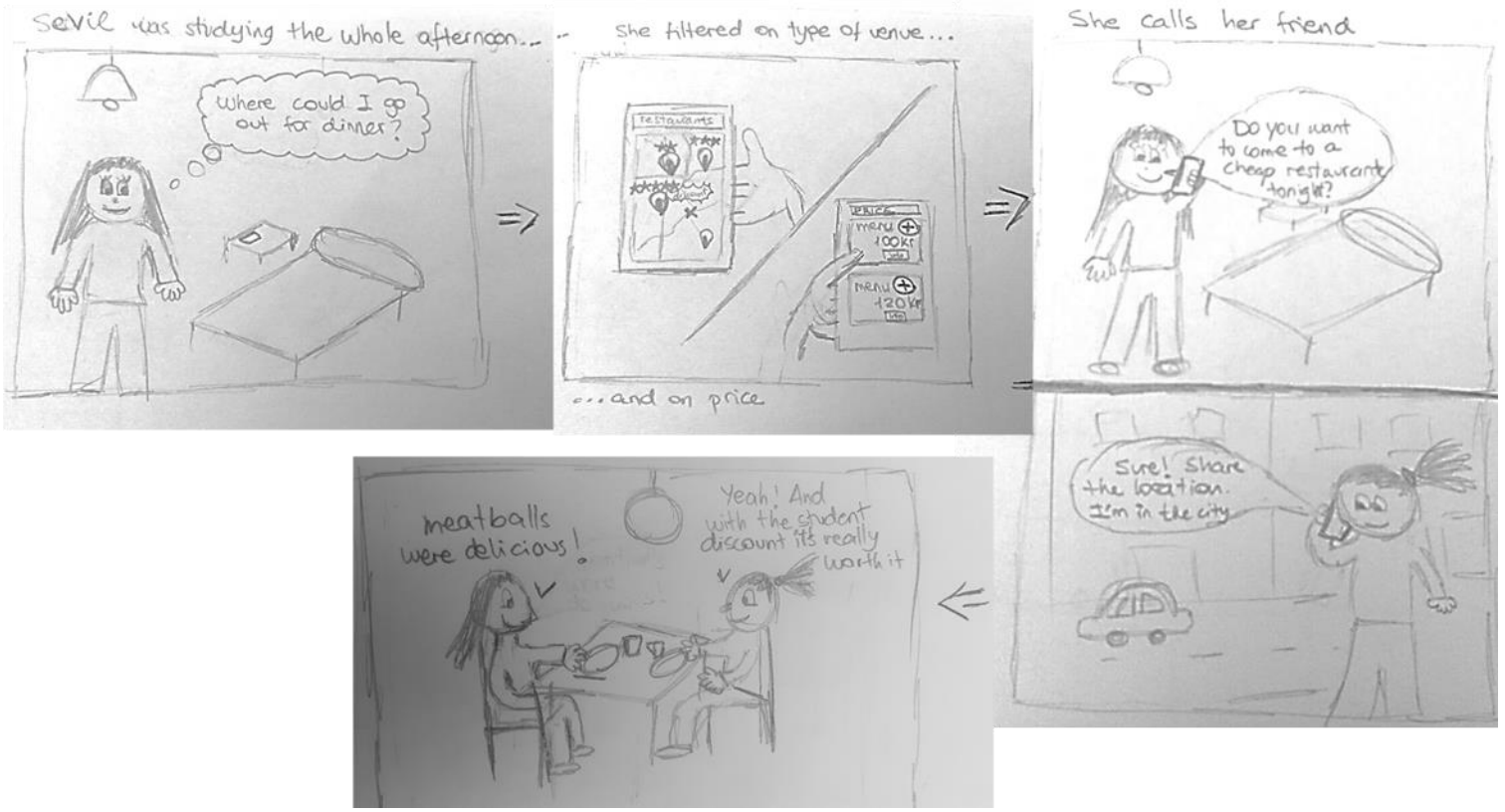
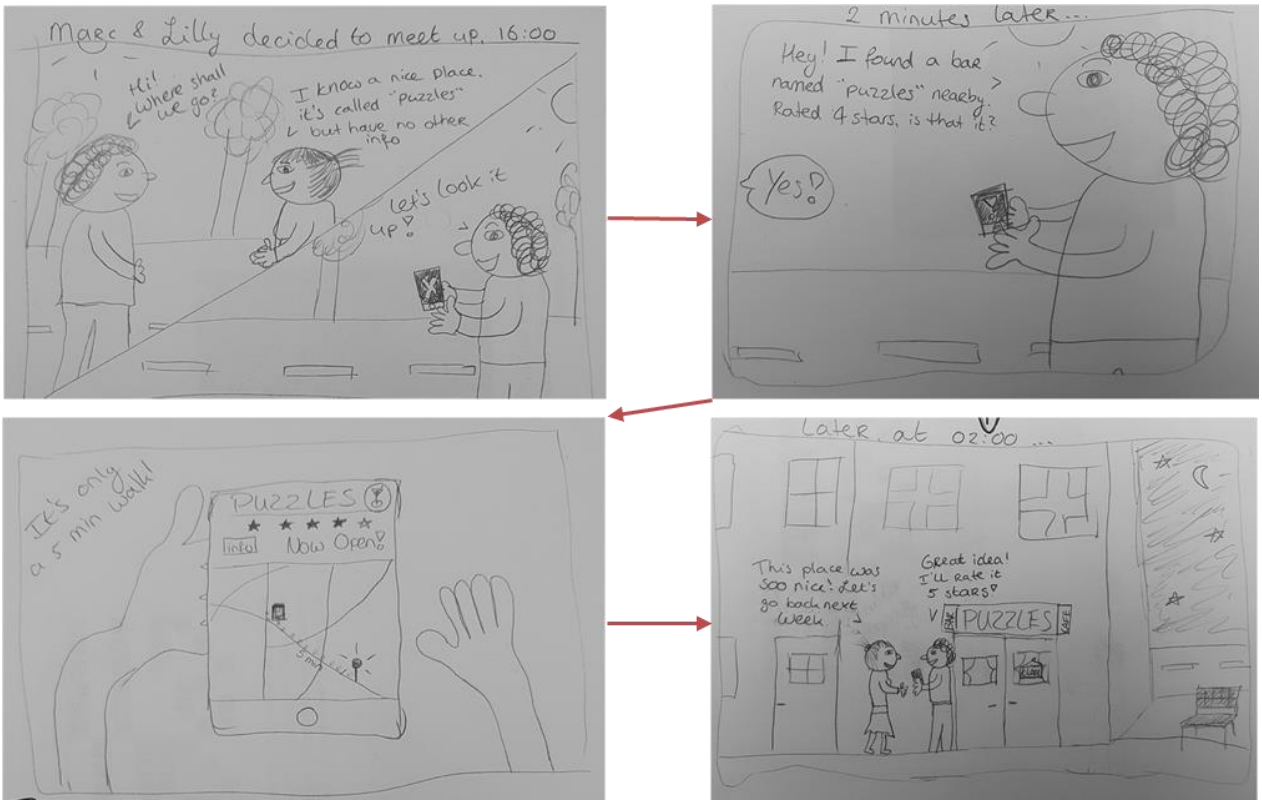


Scenario 1

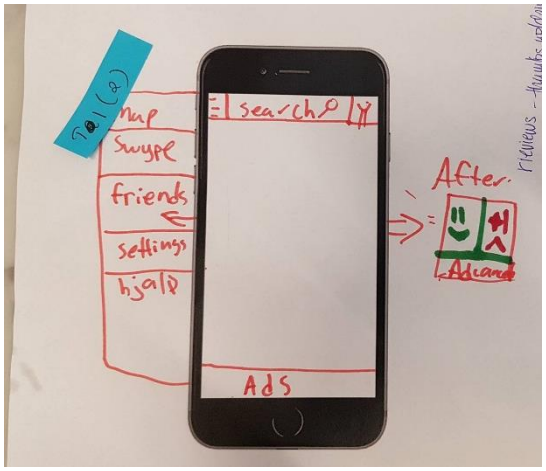


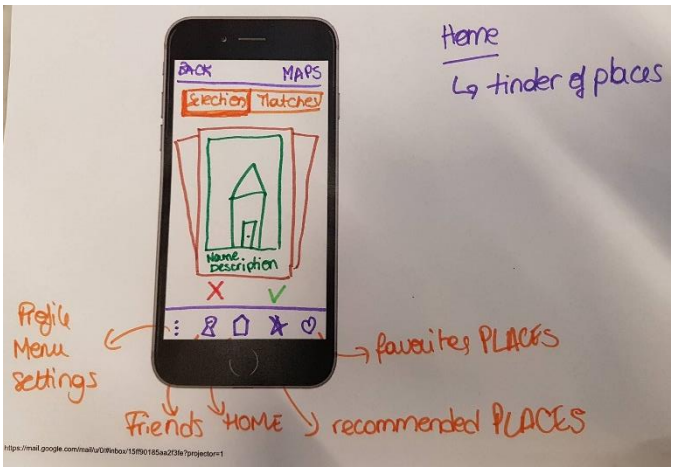
Scenario 2



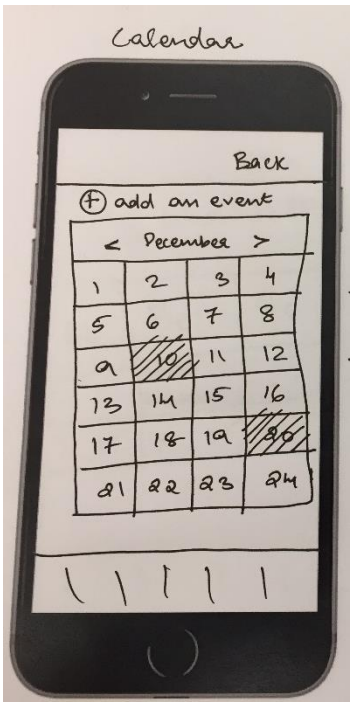
Appendix C: Paper prototype development

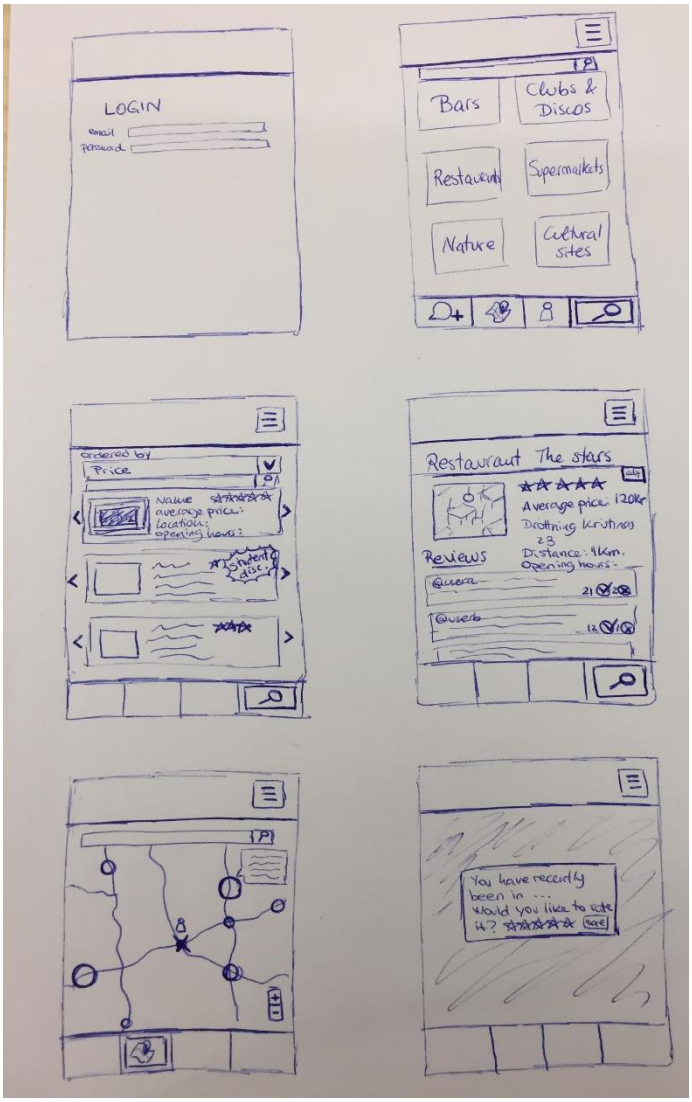
Some prototypes and ideas created by the participants of focus group workshop

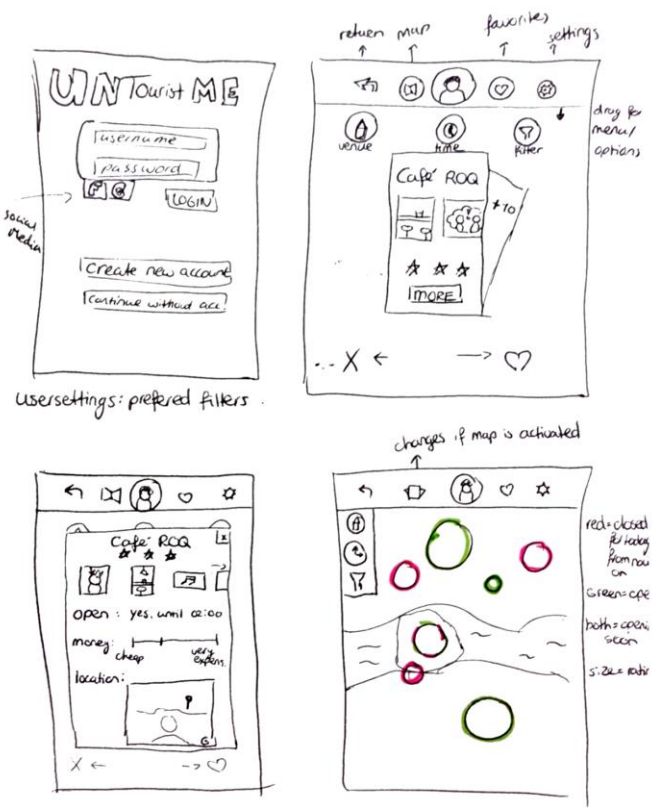




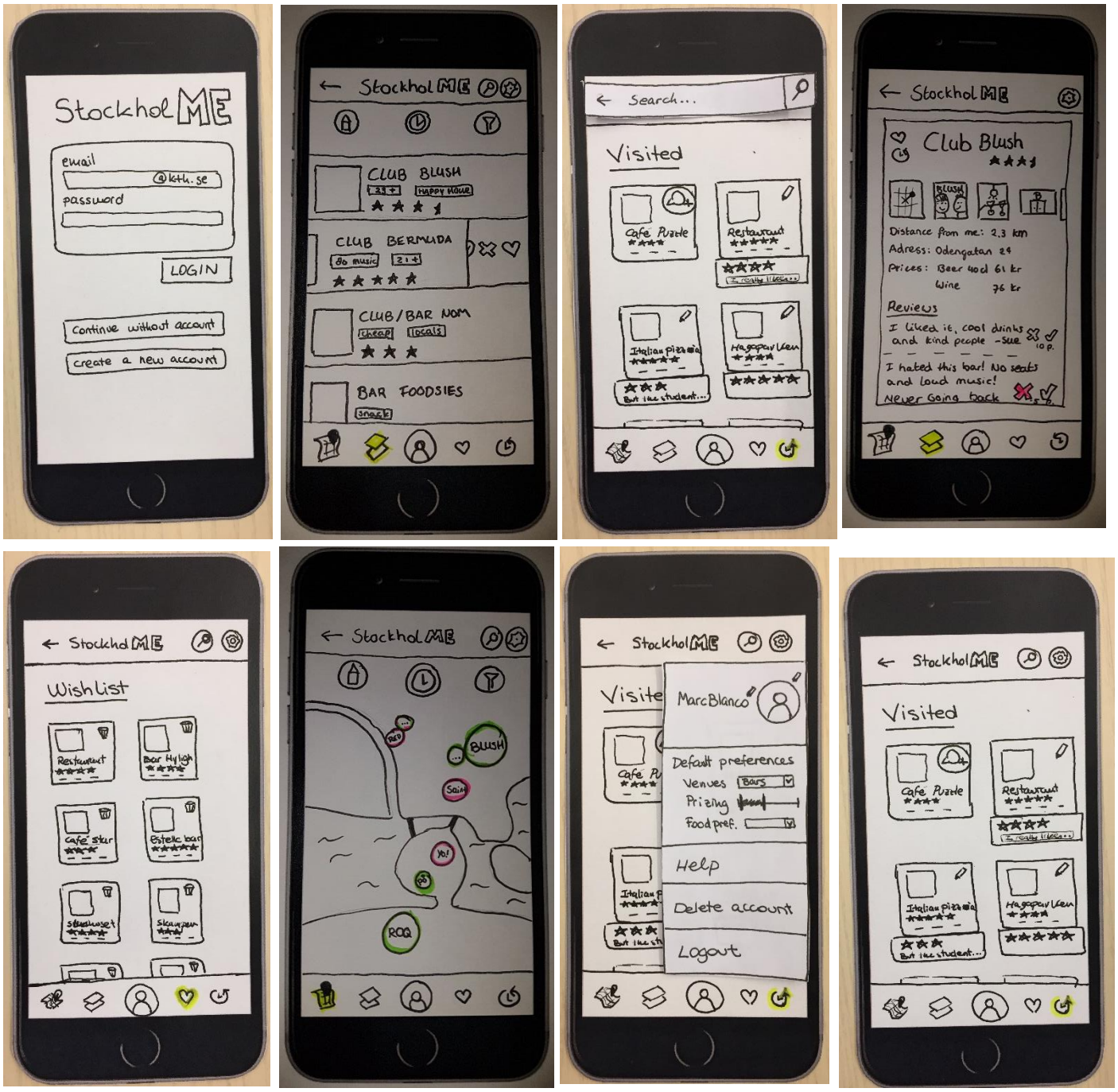
Three different first draft prototypes of the app by the group members




LOGIN
email
password
Bars
Clubs & Discos
Restaurant
Supermarkets
Nature
Cultural sites
ordered by
Price
Name
average price:
location:
opening hours:
Restaurant The stars
Average price: 120kr
Drottning kristinas
23
Distance: 9km.
Opening hours:-
Reviews
You have recently been in ...
Would you like to rate it?
save


UNTourist ME
username
password
LOGIN
social media
Create new account
Continue without acc
usersettings: prefered filters
return
map
favorites
settings
drag for menu/ options
venue
time
filter
Café ROA
MORE
Café ROA
open : yes, until 02:00
money:
cheap
very expen.
location:
changes if map is activated
red = closed
Green = ope
both = open
soon

Appendix D: Final paper prototype



Appendix E: Final digital prototype