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Results – context of use analysis

Human-Computer Interaction Project

Team 1

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Description of the work done

1.1. Summary of activities performed

For this analysis of the context of use we performed 9 interviews, conducted 3 contextual inquiries, and performed an ethnographic observation. The 9 interviews were conducted with five students, three remote workers, and two gastronomy managers. For all contextual inquiries we observed students performing tasks to research establishments that allow computer use and to check modalities and rules for the found places. For the ethnographic observation we observed multiple customers of a coffee shop in how they used the establishment for their remote work.

Session	**Date**	**Place**	**Type of session**	**Observed users**	**Interviewed users**
1	20.02.24	Imdea building, room 279	interview, contextual inquiry	2	3
2	21.02.24	Imdea building, room 279	interview	1	2
3	22.02.24	Imdea building, room 279	interview	1	1
4	23.02.24	Zoom	interview		1
5	25.02.24	Zoom	interview		1
6	29.02.2024	Urraca Cafe	ethnographic observation		
7	29.02.2024	Zoom	interview		1

1.2. Deviations

During the execution of the beforehand constructed plan we had to make some adjustments to respond to feedback and handle external circumstances. Some appointments for observations and interviews had to be adjusted according to the participants requirements. Additionally, we changed our protocol to include demographic questions and a more detailed description of our ethnographic observation.

Deviation	**Aspect**	**Explanation**
1	Added demographic questions	In the first iteration of the planning we didn't include demographic questions. (See Annex B for the complete questions).
2	Added participants to be interviewed	We wanted to get more insight after some interviews done with different students, because

Deviation	Aspect	Explanation
		not all of them actually go to places outside of home or school to work/study.
3	Detailed the observations' descriptions	We got more in detail about how we will perform the observations and what we want to get from them, in particular for the ethnographic observations.
4	Detailed the ethnographic observations' template	We enriched the template to organise better the information gathered and to get a more detailed one.
5	Detailed the contextual inquiry template	We enriched the template to organise better the information gathered along the contextual inquiries conducted because the previous template did not fit all the information given by the users.

1.3. Summary of observations

Contextual inquiry

- 2 out of 4 participants started their search with Google Maps, indicating its importance as a go-to tool for location-based searches. This was an expected behaviour given the task's nature. The other 50% opted for using a search engine tool, indicating a difference in approach possibly due to differing needs or experiences.
- A consistent step across participants was checking photos and reviews of potential places. This shows the importance of visual and social proof in decision-making. 2 out of 4 participants checked the images in Google Maps only, while the remaining 50% looked at those posted online. Only one participant (RemoteWorker03) inspected locations' instagram feeds to gain additional insights.
- All participants were concerned about a location's operating hours and peak times, which could affect their ability to study or work comfortably. One participant was even pleasantly surprised by a cafe's operating hours, showing that unexpected benefits can heavily influence choices, confirming our expectations
- 3 participants out of 4 sought more information on official websites, although not all found the details they needed. Although we were convinced users would go down this road, not finding enough information to make an informed decision online was quite a surprise.
- Only 2 participants out of 4 were notably influenced by environmental factors, such as the temperature in a library photo, indicating that comfort plays a significant role in decision-making. In the case of RemoteWorker03, photos showing products sold at one cafè in particular made her change idea about the place, which looked too much for coffee snobs. It really struck us how they paid

attention to details we thought would not account during decision making processes.
- We were surprised when one participant encountered misleading information on Google Maps about library closures, highlighting the challenge of outdated or inaccurate data.
- Every participant checked for policies regarding laptop use, indicating a common need among users to ensure their primary work tool is welcome. We expected places would miss out on providing users with clear policy statements, leading participants to engage in a filtered research through Google Maps reviews. The extent to which they would research laptop policies, even digging through reviews and social media, indicates a high level of concern for this aspect.
- Only one participant out of four experienced an app crash during research (a factor we did not take into consideration) that reminded us how technical issues can disrupt the user experience.

Ethnographic observation

With the ethnographic observation we observed 8 people among students and workers in a cafè where usually a lot of them go to study and work. Particularly, students and workers who utilise the space for both productivity and socialisation. Analysing the details, we can elicit a set of generalised needs and wants for similar environments:

- Adequate table space to accommodate laptops, notebooks, and other work materials.
- Sufficient power outlets to cater to the needs of users relying on electronic devices for extended periods.
- Wi-Fi connectivity with reliable internet access to facilitate various online activities, including video calls.
- Comfortable seating arrangements that support long periods of sitting, including options for both individual work and group discussions.
- Calm and inviting decorations, along with natural lighting, create a pleasant ambiance conducive to both concentration and relaxation.
- Controlled noise levels to balance the atmosphere, allowing for focused work without complete silence and enabling soft conversations.
- A variety of food and beverage options that cater to different preferences and dietary requirements, ideally at a reasonable price point.
- An environment that encourages not just individual work but also collaborative efforts, with space configurations that support small group interactions.
- Flexible policies regarding device usage and seating to accommodate peak times and different user groups without significantly impacting the work or social experience.
- Unique amenities or services that enhance the user experience, such as pet-friendly policies, variety in beverage options (e.g., different types of milk, matcha, chai), or the availability of water and snacks.

In summary, users seek a balance between functional work requirements and a comfortable, engaging social environment. The ideal space would offer the necessary infrastructure for productivity, such as reliable Wi-Fi and power access, while also fostering a welcoming and adaptable atmosphere that encourages both individual and collaborative engagements. Additional amenities and thoughtful services can further enhance the user experience, making the space a preferred choice for diverse activities.

Need 1: For users it is essential to have somewhere to be able to look for the offer of places.

Need 2: Users need to know what each place offers and their policies.

Need 3: Users want to know other people's opinion to be sure of what they are choosing.

Finding 1: Although users choose a place, if they see a review where they mention a bad thing about their primary requirements they may change their mind.

Finding 2: Even though in theory users only need to check information on the website, they might read on social media posts, reviews and other sources to find out if the offer is real and exactly what they say.

Finding 3: Although users want to always have the best choice they can find, sometimes with the lack of options or availability they don't really mind about the type of place they are looking for and can change to others like libraries or parks.

1.4. Summary of interviews

1.4.1. Demographics

1.4.1.1. Question 1: What is your age?

All of our participants were between 23 to 27 years old.

1.4.1.2. Question 2: What gender do you identify with?

Both managers interviewed were female. Out of the remote workers, two were female and one male. Out of the students three were male and one female.

1.4.1.3. Question 3: What is your country of origin?

Our participants were from various different countries. Of the managers one was from Germany and one from Mexico. Out of the remote workers, one was from Germany, one from Mexico and one from Bulgaria. Out of the students three were Italian and one was Spanish.

1.4.1.4. Question 4: How many hours per week do you work/study remotely?

The managers reported to work remotely respectively 15h and 20h. Two of the remote workers worked 40h remotely and one worked 16h remotely. The students reported to respectively study 4h, 15h, 20h, and 10h remotely.

1.4.1.5. Question 5: What is your screen time for Phone/Computer per day?

The participants reported to have a screentime of between 1.5h to 10h on their phone only and a screentime of 2h to 10h on their pc only. Some participants reported their screen time combined and reported to be between 8h and 12h.

1.4.2. Remote workers/Students

1.4.2.1. Question 1: What is your personal experience with working/studying remotely?

The RemoteWorkers reported various experiences with remote working. They had different amounts of experiences ranging from 2 ½ years to ½ year. One of them had the opportunity to work remotely, while the other two required to work remotely, because they were working in foreign countries and studying in Madrid. For one of them this meant working with a 8 hour time difference, which meant for her to work at night rather than in the morning. The two students reported that managing the working schedule and university schedule posed a significant challenge.

Three out of the four students reported to have worked remotely as well as studied remotely. Student02 reported that he preferred remote studying, because it is more individual and makes collaboration in teams easier. Student02 pointed out that they loved studying remotely, because they lived in a big city and could avoid losing time commuting.

1.4.2.2. Question 2: Can you walk me through a usual day of yours when working/studying remotely?

The interviewees had different routines when it came to working/studying remotely. The remote workers who studied, their work schedule would revolve around their university schedule. The full time remote worker explained that he engaged in a lot of meetings in the morning and never went to the office, because all meetings would be held online as some people are never in the office. At his international company he rarely meets anyone in person, except for 1v1 meetings. But those 1v1 meetings do not have to happen at the office. He reported to have done them in public places like cafes before. This implies requirements for those cafes to enable good communication. RemoteWorker03 explained that she mainly worked from the university, to use time most efficiently or from home only if she doesn't have classes.

The students reported very different habits for studying remotely. Two out of the four students reported that they went outside of their home to study. Student01 reported that they would use whatsapp, to make plans with friends on where to study. Students02 explained that changing locations helped them to motivate themselves to start studying. The other 2 students did not indicate that they used places outside their home to study, but focused on methods and routines they adopted for self-organisation and mental health.

1.4.2.3. Question 3: What advantages/challenges have you experienced working remotely?

Five out of seven participants indicated advantages and disadvantages they experienced when studying remotely. The other two were focused on challenges only.

Five out of the seven students and remote workers expressed that they benefited from the flexibility that working/studying remotely induced. The two working students indicated that working remotely benefitted their ability to manage their university and work schedule. Other benefits that were voiced by individuals included being able to cook or take a shower during the working day, enjoying the comfort of your own space, spatial flexibility of team members, the ability to study at the park or with friends, and being able to work at your own pace. Three out of seven participants voiced concerns about the fact that their apartments did not appropriately accommodate their needs, because of bad wi-fi or living situations with roommates that made concentrating challenging. Another three out of seven indicated a feeling of social isolation and loneliness they experienced when working remotely. Two added that working at home impaired their work-life balance, one of them expressed a feeling of working all day, because there were no external constraints when working from home. Other challenges pointed out included difficulties to assess modalities of places outside the home, working in a different time-zone, working policies of cafes interfering with their work, going to a place and not finding space, and having to scout for cafes that fulfil requirements.

1.4.2.4. Question 4: What device do you use to search for a place to study / work?

Three out of seven participants said that they would typically use their phone to search for places to study exclusively, while two indicated to use their laptop and 1 indicated to use both on occasion. One person did not indicate any device, but were among two people who said they used google maps for research.

1.4.2.5. Question 5: Do you regularly follow your occupation in places outside your home and work/university?

Six out of seven participants indicated that they regularly worked or studied outside the home. RemoteWorker02 said that she likes to work from the library, but cannot take meetings there. Student01 did not usually go to cafes, but used university related spaces as two other participants.

1.4.2.6. Question 6: Can you tell me how you find these places to work / study ?

The participants reported different habits to discover places to study. While all remote workers and two students used google maps or other search engines to find places to study or work, two participants said that they found places through wandering around, and three participants indicated to find places through recommendations of people they knew. Two participants found places through Blogs posts or social media of whom one person reported to actually call places he planned on visiting to find out more about policies and availability of space.

1.4.2.7. Question 7: What factors influence your choice of location?

Three out of the seven participants reported that a good wi-fi connection was among their priorities. Two people said that the place has to be close to their apartment. Two people said they required energy outlets. Another two said they wanted the space to be quiet such that you could do calls, while one person said they preferred it if it was a bit

lively. Individual factors included policy, good reviews, the right food/drinks, spaciousness.

1.4.2.8. Question 8: What specific amenities or facilities are important to you when selecting a location to work or study?

Seven out of seven participants said that the place needs to have wifi. Four out of seven participants said that they look for a level of comfort, they generally want to enjoy the place in general. Four participants also think it is nice if they have tasty drinks and food. Some participants could stay for quite some time so two of them mentioned a space to be able to rest apart from the study section. One of the participants mentioned the importance of the temperature of the place.

1.4.2.9. Question 9: Are you satisfied with your current selection? If not, what qualities are you missing?

Four of the seven participants indicated they were not entirely satisfied with their current selection. Out of the other three, one person said he had a big selection of appropriate places and another that he was happy with the space their university provided. Three participants indicated that places they used were too busy. Two added that especially on the weekend the places he liked didn't accommodate space for laptop users. One participant complained that the spaces his university provides do not always provide opportunities to eat. Another was bothered by the fact that he had to check places to see if there was space and had to go looking for another if it was too crowded. RemoteWorker01 indicated that he liked the places he was using, but would enjoy a Phone/Quiet booth that he could reserve for upcoming meetings.

1.4.2.10. Question 10: What are the biggest challenges you have faced when trying to find places outside your home/office to follow your occupation?

Three out of seven participants reported that they disliked commuting to places and only noticing there, that it was full. This would mean they would have to go through the process of finding a place again. Two participants complained that it was difficult to find places nearby. Individual participants remarked that they found it challenging to find out about opening times, found places too loud and had to resort to parks for work, feeling not welcome and having to pay for access.

1.4.2.11. Question 11: How do you typically access information about potential places to work or study?

Out of the 7 participants, 4 reported that they got information through word of mouth. Two used information provided by google maps. Two said they used articles to assess information and another two said they found information on instagram. Two went through their university to find out about places that the university provides. Only RemoteWorker01 said he would call, because the google reviews he checked often did not provide sufficient information about time the place gets busy and what the exact policies are. The waiters answering the phone could always provide detailed and accurate information. Further he explained that policies often prevented him from working, because the cafe struggled to monetize people working on laptops. This irritated him, because he would be willing to pay extra just to work. Some cafes he

found while travelling offered a premium service, where he would pay a one time free of 15 euros and would know he could spend the day and not bother anyone. He also remarked that cafes need better ways to communicate their specific expectations of customers.

1.4.2.12. Question 12:What is your interaction with other people in these places?

Out of the 7 participants, 4 indicated that they do not usually interact with people in the workspaces they study at. If they did, they would interact with the staff to inquire about wi-fi and laptop tables. Two of the students reported that they would only interact with the friends they met for studying, but not as much with the other customers of the establishment. Only Student02 reported that they liked to engage in small chats at the bar and have even made some friends through these interactions. They noted that the environment was important for this and that bars provided a better atmosphere for interaction. Students01 reported that they preferred having a separate table for working and to be more isolated from other customers.

1.4.3. Manager Questions

1.4.3.1. Question 1: Can you describe your establishment and what kind of services you provide?

The two managers we interviewed worked in a cafe/bar in Berlin and a hotel in Austin,TX. The Cafe in Berlin was focused on providing food and drinks for mainly regular customers and also provided a cultural space for concerts, reading, and private parties. The hotel in Texas is focused on providing americana international food for business people who it accommodated.

1.4.3.2. Question 2: What does your usual working day look like?

The two managers reported very different day to day activities. While the manager from Texas was focused on preparing the daily business and supporting customers with their individual wishes, the manager of the cafe was involved in more organisational tasks, such as checking emails, working on event leads, and preparing events.

1.4.3.3. Question 3: How would you describe the customers that your establishment serves?

The customer base the two managers reported to serve differed greatly. While the cafe in Berlin was serving mainly urban Berliners in their 20ies to 30ies with established jobs, the Hotel in Texas was mainly serving middle-class American workers and parents of students. Many of their customers were attending conventions at the nearby convention centre.

1.4.3.4. Question 4: Do you use the Internet to market your business? If so - how do you do it?

While the manager from Berlin reported to use Squarespace and Webflow for their website, they also wrote a newsletter and got referred through word of mouth. The manager from Austin reported that he was not as involved in the marketing of his business, but that they used reviews and comments of customers to make new arrangements. Their most important source for marketing was OpenTable.

1.4.3.5. Question 5: Do you use any social media accounts for this?

Both managers reported that their business utilised Instagram for social media marketing. The manager from Austin added that they build their own website to attract new customers.

1.4.3.6. Question 6: How do you feel about people working on their laptops here?

When asked about attitudes towards people working on laptops they gave differing answers. The manager from Berlin reported that people working on laptops were generally accepted and their establishment did not have any policy. Not too many customers used laptops, because the space didn't accommodate a lot of outlets and because the space is a bit hidden. But laptop users are not a target group, because they do not drive revenue. The manager from Austin reported negative encounters with customers, because they used their space to attend meetings. When disturbing them they were not happy. He kept an eye on them, but they would just have toast or a coffee. Generally his attitude towards people working on laptops did not seem to be good.

1.4.3.7. Question 7: How do you communicate the rules for working on laptops in this place?

Both establishments reported that they had no policy for laptop work. The manager from Austin reported that he had to throw out people, if their presence interfered with their ability to serve other customers. He would go up to them and tell them they couldn't stay.

1.4.3.8. Question 8: What factors do you believe contribute to the appeal of your coffee shop as a study/work space?

Other managers reported their spaces afforded working on a laptop, because they were quiet places. The cafe in Berlin was located in a park and the manager reported it to have a cosy vibe. However, she noted that the lack of outlets was a problem and did not accommodate many seats that could be used for remote work. The manager from Austin explained that their space was rather small and remote workers were not welcome to stay for too long.

1.4.3.9. Question 9: Are there specific times or days when the coffee shop is more conducive to study or remote work?

The manager from Berlin reported that they had more people working on laptops during the week than during the weekend. Their establishment only opened at 12:00 and most remote workers would stay between 2pm-6pm. The manager from Austin reported different times when their place was most busy. Their business was most filled during the high season, between September and December and least busy between December and March. On a day to day they had most laptop customers between 8am-11am and 6pm-8pm. There was no pattern he could recognize between different week days.

2. User analysis (personas)

We created three different user personas based on the targets we interviewed and ran the contextual analysis through: students, remote workers and bar owners.

2.1. Persona 1: Jason

The Persona	
Picture	
Name	Jason
Short descriptor	Jason is a student at a technical university. He likes to meet at cafes to do group work with his friends.
Actions, motivations, and pains	
What do I do?	I study and work on assignments in public bars. Because I study a technical subject I engage in a lot of independent study.
Why do I do it?	I struggle to focus at home and live in a shared apartment. Getting out of the house makes focusing easier.
What do I want?	I want a lively place, where I can study, but also have fun. I don't want to lose time while looking for a place to study.

What's stopping me?	Especially on the weekend places are busy and policies vary. Committing to going outside can lead to a long search for a place to study.
Values	
What convinces me?	Cheap prices, good food and a good atmosphere.
What or who informs me?	I get most of my information from peers, save places to google maps, and check their information once I am looking for a place to go.
Context	
Where am I?	Usually, I do work after my classes are finished, so I use my computer during class to research places that me and my friends go to later.
What's my day-to-day?	My life revolves around my hobbies and university. In the morning I create a to-do list for the day. My schedule is very inconsistent and every day is different. Most days I have classes, do some independent study, and meet friends for leisure activities. Some days I do sports. I use my free time on weekends to study.

2.2. Persona 2: Britney

The Persona	
Picture	
Name	Britney
Short descriptor	Britney is a working professional at a modern company. She enjoys working remotely because it gives her flexibility to work from anywhere and saves time.
Actions, motivations, and pains	
What do I do?	I work remotely from cafes and co-working places. I have to attend a lot of meetings.
Why do I do it?	I want to avoid wasting time commuting if I work from the PC anyways. But working at home can be dull and it is difficult not to get distracted if I don't change location.
What do I want?	I want a quiet place, where I can take meetings. I need a reliable workplace, because I have responsibilities and a tight schedule. Therefore, I am willing to pay extra for places that provide me with premium experiences.

What's stopping me?	Sometimes there is no space at working cafes. And sometimes cafes market themselves as co-working spaces, but get passive aggressive when you don't order regularly. But I can only drink so much coffee.
Values	
What convinces me?	A quiet place, that is reliable, has transparent policies and that gives me the feeling that I am welcome.
What or who informs me?	I research places on the internet, because I need a place close to my home. I find places through blog articles and check them out on google maps. If information is not readily available I call the place, because I cannot afford wasting time.
Context	
Where am I?	I am at home and check places out on my phone.
What's my day-to-day?	I work during the week(9-5) and spend my time on leisure activities on the weekend. I have a lot of meetings during the day.

2.3. Persona 3: Ahmed

The Persona	
Picture	
Name	Ahmed
Short descriptor	Ahmed owns a medium-sized coffee shop that sells coffee, pastries, and lunch. Since the pandemic, more people use it to work on laptops. This poses new challenges.
Actions, motivations, and pains	
What do I do?	I try to make my business as profitable as possible. We provide wifi and laptop tables for our customers, because all our competitors do it. We use the internet to communicate this.
Why do I do it?	Laptop users have become a large customer base for cafes. We do not want to miss out on that.
What do I want?	I want to maximise profits during peak times such as lunch and after work. At the same time, I want to make some money the rest of the day.
What's stopping me?	Outside of our peak times, we mainly have customers working on their computers. If they stay throughout lunchtime we miss out

	on our most profitable customers. However, I would like to fill my place outside of peak times, but struggle to monetize laptop customers and impose policies that constrain them.
Values	
What convinces me?	Anything that is good for my business. I want to make maximum profits during all times of the day, week, and year.
What or who informs me?	I compare my business to my competitors.
Context	
Where am I?	At work most of the time, managing stuff from my PC some of the time.
What's my day-to-day?	I spend some time in my cafe and the rest managing stuff using my PC. Paying bills, organising events, hiring staff, and so on. Sometimes we do events, which require a lot of preparation.

3. Task analysis

3.1. Task list

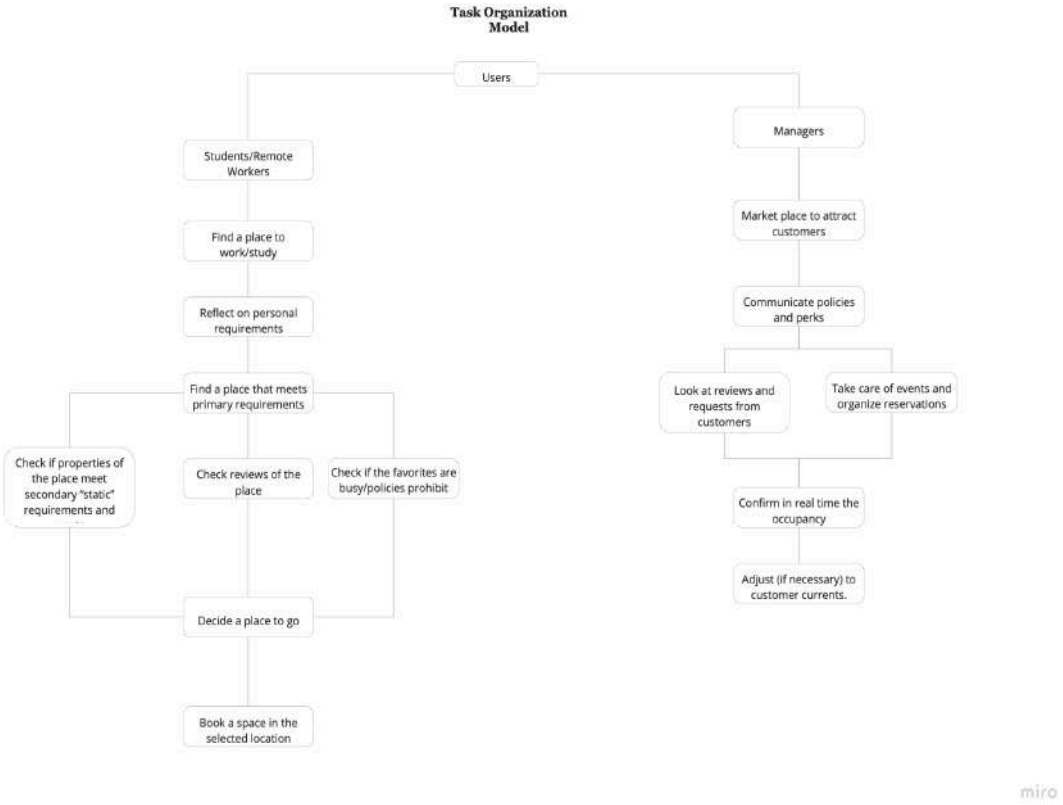
Task Students/Remote Workers	**Description**
Find a place to study/work	To find a place people need to decide which is the best way to look for something, is it social media, maps, call a friend, remember a recommendation, ask someone in the street?
Reflect on personal requirements	Before making a decision on where to go, the users need to think about what they are looking for. Is it a place that needs to be completely quiet, have food or just drinks, nearby, or does it matter?
Find a place that meets primary requirements	The primary requirements are everything that has to do with the general description of a place and the basic needs and wants of the user. Location, amenities, ambiance, quietness, cost, internet connectivity…
Check if properties of the place meet secondary “static” requirements and wants	After doing that first filter, users will have to select a place to go, but first they must select the one that aligns more with them in their personal preference. Food and drinks quality, seating preference, lighting, temperature, decoration, social interaction, personal experience…
Check reviews of the place	The reviews are a great place to see opinions of users that have been there recently and confirm the information given by the cafe. Mainly you can see the pictures taken by other users, filter the reviews to see if the policies they say are true and implemented, and dive deep into specifics.
Check if the favourites are busy/policies prohibit working (dynamic requirements)	Being able to check the availability is very important for users as that might determine if it is a good place to go or consider their needs at a certain time, day, or week.
Select a place to go	After searching lots of different places the users have to select one option, all of the previous factors will be considered and taken into account for the final decision.

Be able to book your space in the selected location	To prevent getting there and having to go back and repeat all the process done because there was no place available, booking a space for a certain time is a good way to secure your place.

Task Managers	**Description**
Marketing your place to attract customers	Managers are very interested in attracting more people to their business, they always try to reach more and more people by checking daily their mails, reviews, social media and anything upcoming regarding customers and events.
Communicate policies and perks(what makes the place good)	The policies regarding laptops are very important as not all cafes want people staying 2+ hours only consuming a coffee when they can have customers coming in for less time and more spending. When they are clear and efficiently communicate this, they don't need to confront people.
Adjust to customer currents (summer vs winter, lunch vs dinner) and time frames	There are always periods where business is super good or not as good, seasons have a great impact on that so being able to adjust the rules into what the customers are currently experiencing and communicating that effectively is a great skill.* (Opportunity to monetize in difficult times with workers/students)
Review changes and requests from customers	Listening to the customers is a great tool to have feedback and see what customers really think. When it's good it is beneficial but when enough bad ones appear, a plan can be made.
Confirm in real time the occupancy	Very important to communicate to customers when business is slow, not available (because of an event or reservation), or when it's full and harder to accept new customers.

3.2. Task organisation model

Task organisation model can be expected using the following link.



The task organisation model explains the general scope of tasks for each user, on the left side for students and remote workers that although they are different profiles looking for different things and have a mix of preferences, they are similar overall as customers.

For the managers it is not only about booking but it's also important to be able to reach their target sales and segment their customers for the overall goal of the business, as well as being able to take care of their daily tasks.

3.3. Task scenarios

Scenario 1 (Student) : Jason has a group project that has a due date for Sunday, it consists of doing a presentation for his class "Introduction to Design Methods" where they have to brainstorm a lot and debate between different ideas in order to choose one for their semester project. It is very important that they can meet Thursday or Friday to work on it. His team consists of four people and they will all have their computers with them so they can work on the presentation together and finish it. They want to search a place that is near the city centre as everyone lives in different areas and that is the middle location.As they plan to go after lunch and stay for a couple hours, they want to be able to have some drinks and snacks in the cafe and they don't want to spend more than 10 euros on this. They are also looking for a place that has wifi and big tables with plugs so they can sit together and talk about their project for a long time.

Scenario 2 (Worker) : Maria is looking for a new place to go as she is on vacation in Madrid for the next 2 weeks. She normally likes to have coffee and lunch, because she plans to stay a half or a full day of work in that place. She needs to have multiple meetings with clients from different countries so it's very important that she can hear them clearly and that whenever she answers the noise is minimal so the communication between them doesn't have any problems.

Scenario 3 (Manager) : Ahmed is looking to add new policies to his cafe regarding laptops on weekends, but he wants to make sure first what his competitors in the area are doing with this kind of policy. He is thinking that he could let laptop users work in the morning for a couple hours because the business has a slow flow during that time, but he doesn't want to miss out on the lunch customers as they are the most profitable ones. He wants to communicate this easily to the most people he can through different channels and wants people that come in to know the rules very well so the employees don't need to kick anyone out. He would also like to concentrate on the reviews and DM they have on social media so that he can fix the problems bad reviews mention for the different types of customers that go into his cafe.

4. Environment analysis

Social environment	From the user research, we know that 100% of the target users analysed, searching for a working/studying place individually. So our system is expected to be used only individually. We also know that people search for places to do group work, so users need to be able to research as a group while maintaining individual use. The users analysed put a strong emphasis on the importance of recommendations (reviews, word of mouth, social network, universities, friends). We know that 100% of our users found them very important. Also we found out that 43% of users enjoy meeting new people and friends in studying places. So, combining these two social aspects, we know that our users need precise feedback and recommendations about every place, creating a students and workers social network offering the possibility to exchange information about places and to connect with each other.
Operational risks	We consider an operational risk anything that impedes the users to complete their task of studying and working in public places. For the 100% of our interviewees it is important that the place is close to them and that it allows laptops and has Wi-Fi connection. In the contextual inquiries we saw for every user (100% of them) that it is not easy from the actual system to find this information (except from the distance, thanks to Google Maps). Another high

	operational risk, stated by 50% of users, is the risk of finding full places that lead to a big waste of time. All this missing and confused information about the places' policy and places' features, can have the consequences of wasting studying and working time or to undermine the quality of it for our target users.
Technological environment	With the actual system, we know that to perform the task of searching a place to study or work, 57% of our interviewees use smartphones, and the remaining 43% use laptops. Since our users use the system everywhere with no restriction, the system should maintain this flexibility. Considering that nowadays, everybody has a smartphone, a mobile app is the most flexible system we could use. The softwares used now by our target users are Google Maps (100%), Google search engine (71%) and Instagram (43%). For everyone it is important to rely on reviews and recommendations and on pictures of the places. So an internet connection, either if they are using a laptop or a smartphone, is mandatory. Considering that 57% of interviewees complained about places' policy regarding the usage of laptops, it is possible that they will find themselves in places where they cannot use them. So, in these cases, for laptop users (43%), if they need to search for another place, the only option they have is to use their smartphone. This, again, pushes our decision towards a flexible mobile app.
Physical environment	Our users will use the system everywhere, they can be at home, at university, they can be at a working space, they can use it while walking towards another place. Considering this, our users need a flexible system available anytime and anywhere with no restriction about the physical environment.

5. User Journey Maps

User Journey Maps can be expected using the following link.

USER SCENARIO

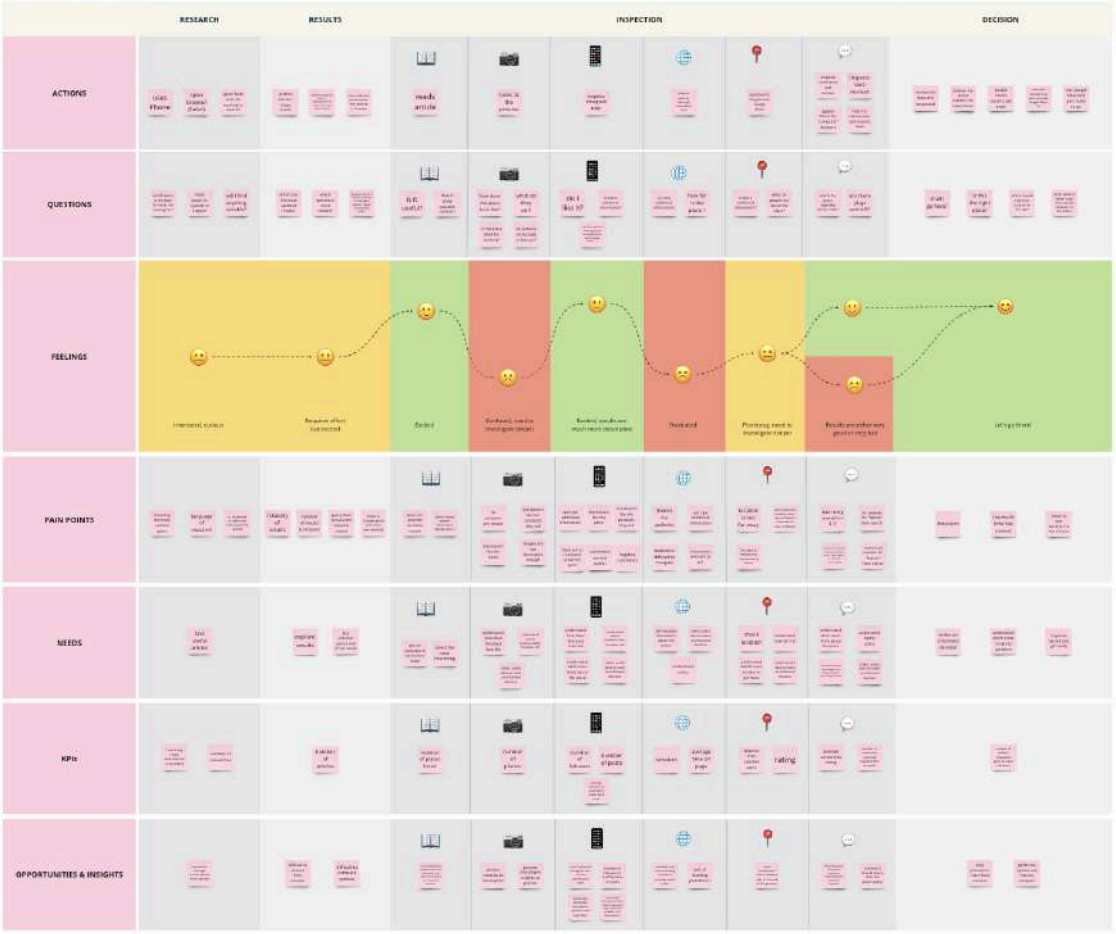
Britney is a working professional at a modern company. She enjoys working remotely because it gives her flexibility to work from anywhere and saves time. Since working at home can be dull and it is difficult not to get distracted if she doesn't change location, she is looking for a place which is quiet - so that she can take meetings - and reliable, because she has responsibilities and a tight schedule.

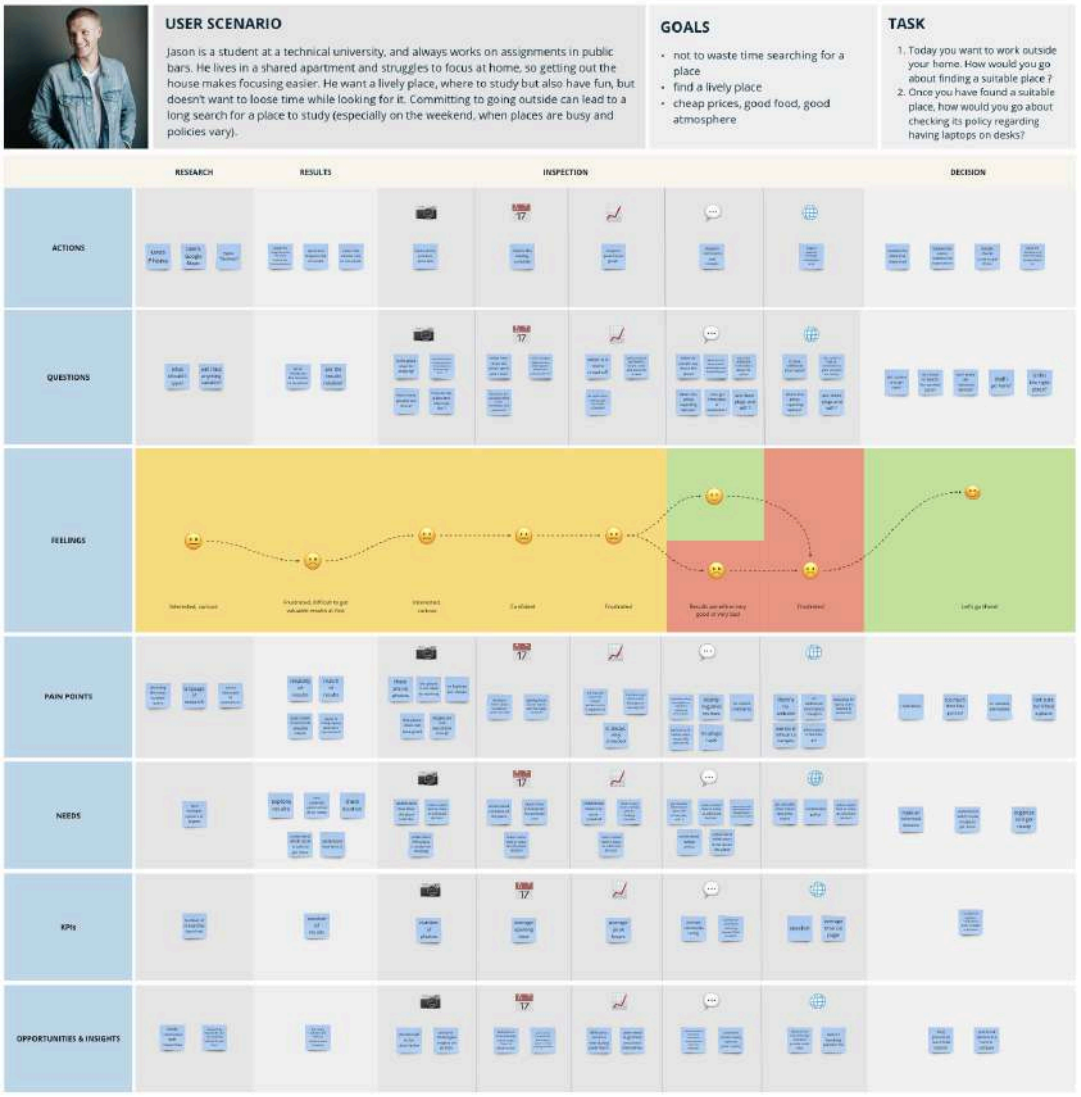
GOALS

- not waste time commuting
- finding a quiet and reliable place
- transparent policies for workers
- place close to home

TASKS

1. Today you want to work outside your home. How would you go about finding a suitable place?
2. Once you have found a suitable place, how would you go about checking its policy regarding having laptops on desks?





6. Annex A: gathered data

Demographics

Question 1: What is your age?

Manager01	27
Manager02	25
RemoteWorker01	27
RemoteWorker02	24
RemoteWorker03	25
Student01	23

Student02	26
Student03	23
Student04	24

Question 2: What gender do you identify with?

Manager01	Female
Manager02	Female
RemoteWorker01	Male
RemoteWorker02	Female
RemoteWorker03	Female
Student01	Male
Student02	Male
Student03	Female
Student04	Male

Question 3: What is your country of origin?

Manager01	Germany
Manager02	Mexico
RemoteWorker01	Germany
RemoteWorker02	Mexico
RemoteWorker03	Bulgaria
Student01	Spain
Student02	Italy
Student03	Italy
Student04	Italy

Question 4: How many hours per week do you work/study remotely?

Manager01	15h
Manager02	20h
RemoteWorker01	40h
RemoteWorker02	16h
RemoteWorker03	40h
Student01	4h
Student02	15h
Student03	20h
Student04	10h

Question 5: What is your screen time for Phone/Computer per day?

Manager01	1.5h/7h
Manager02	9h
RemoteWorker01	2h/8h
RemoteWorker02	8h
RemoteWorker03	10h/10h
Student01	3h/9h
Student02	2h/2h
Student03	12h
Student04	5h 24min/2h 53min

Remote workers/Students

Question 1: What is your personal experience with working/studying remotely?

RemoteWorker01	• Works remotely for 2 ½ years • Used to go to the office, but does not see reason • Sometimes from berlin and sometimes for abroad • Due to pandemic • 90% remote
RemoteWorker02	• Since September her work has been more challenging because she works in Mexico. • Time difference is 8 hours so she needs to work until late at night (Madrid time). • Her work is project-based so if she organises her work and meetings it's manageable. • Her clients know she is remote and in Spain. 1) Follow-up question: How do you manage your time? • Not super good • Organises around study schedule • Works after classes • Dependent on current projects
RemoteWorker03	• Organized • Days 4 working and studying • Working remotely • Overall difficult
Student01	• Last year he worked full time as a UI designer. • In a big city it is harder to move so everything is almost online for meetings. • Loves working remote because he prefers not to commute.
Student02	• Did both • Easier studying remotely because it is more individual and work more with teams • Difficult to ask for clarifications in work remotely (difficult communication)
Student03	• Studying remotely during university (5 years)
Student04	• More study than work • More since covid

Question 2: Can you walk me through a usual day of yours when working/studying remotely?

RemoteWorker01	• Gets up 8:30 - 9 • First email and coffee • A lot of meetings people need to be briefed • Meetings at 10am - till afternoon • Writing and documentation in between • Meetings are best remote • Works in Zoom meetings most of the time, even from the office • Never everyone is at the office • International company • Rarely meetings in person. Only 1v1. Which is preferred • Has had 1v1 in public spaces before. • The coffee shop needs to be not too loud for this. • Meetings might be confidential • Most of the time already know the places
RemoteWorker02	• Depends on class schedules • Usually messy and she needs to use her free time to work.
RemoteWorker03	• Wakes up early • Comes here at 8/8:30 • Daily meetings • Switches rooms • University or home for working • Works mainly at uni (if she has lectures) • If not, only at home
Student01	• Decides in a chat (Whatsapp) when to have meetings. • Prepares headphones and everything necessary before connecting.
Student02	• Wake up in the morning • If can work at the place he stays there • Outside place, shared • Depends on the tasks but usually prefer places where can talk loudly • Difficult of staying at home is people around • Lack of motivation / need for motivation (motivation comes from studying outside?)

Student03	• Wakes up early • Try to do some sport (not look at screen) • 10/11 am starts working • Does some breaks for eating, exposing to sunlight • Stops around 20/21
Student04	• first: to-do list review • then: attend lesson • start working on assignments

Question 3: What advantages/challenges have you experienced working remotely?

RemoteWorker01	• Connection might not be stable • Too loud • Don't know policy • There is a challenge to research fulfilment of personal requirements.
RemoteWorker02	• Gave her more freedom, eg: she went to Fuerteventura for 1 week. • More time independence to organise her hours with school. • Being in a different time zone is surely a challenge. • She doesn’t like to be home all the time so she needs to search where she can go.
RemoteWorker03	Advantages: • Flexibility • Can plan other tasks • Cannot do other tasks at the office (cook, take a shower…) • She can study and work (big plus) • Integration Challenges: • Shared apartment • No separate rooms for working • No separation between environments • Remote work is mixed (work life and private life are the same, everything happen in the same room… once she’s done with work she still thinks about it, there’s no differentiation) • She doesn’t have much space at home
Student01	• Very flexible

	• Very easy (just link and join). • Internet connection is a challenge. • He likes to have his private space so he likes that. • Likes that team members can connect from anywhere (even on trains, airports,etc).
Student02	• Benefit: manage timeline • Go at his pace, no rush • Challenges • No time to take break • Work until the task is finish, not when the day is over • Responsability • No timetable respected • Communication disadvantages
Student03	Advantages: • Change place • Study w friends and new people • Study at the park (sunlight) • Right environment = more productive • Flexibility Challenges: • Gets boring • Gets lonely • Gets depressing • Not all the places are a good fit (connection...) • Not always available
Student04	7. Wifi didn't work at home 8. Had to go out just to check all emails and communication 9. Had to scout for cafes/coworking spaces 10. Might not have space at library/cafe 11. Sometimes cafe policies disrupt work 12. Difficult for plan for, because tasks can take longer than expected

Question 4: What device do you use to search for a place to study / work?

RemoteWorker01	• Phone

RemoteWorker02	• Notebook • Laptop
RemoteWorker03	• Google • Google maps • Usually searches for a place during group works or travelling and needs to work • Types Coworking cafes / spaces / cafes
Student01	• Smartphone • He has a tablet and laptop but it's easier on a smartphone.
Student02	• Laptop • No phone • Mostly find place from his network (colleagues)
Student03	• Laptop • People (network) • Asks people • Simple query using search engine • Searches in University website
Student04	• Phone • google maps • browser

Question 5: Do you regularly follow your occupation in places outside your home and work/university?

RemoteWorker01	
RemoteWorker02	• Works at libraries but can’t have her meeting there. • Likes to take meetings in parks if she wants to enjoy the day after it. • Cafes when she works more time.
RemoteWorker02	• Yes, usually works at cafes/study and working environments at uni (Imdea)/home
Student01	• Doesn’t usually go to cafes. • Goes to Imdea (Eit library). • Cafes close to home
Student02	• Yes (Very sure (“absolutely”))

Student03	• Yes • She needs to see people
Student04	• Sometimes

Question 6: Can you tell me how you find these places to work / study ?

RemoteWorker01	• Google reviews • Calls them directly • Asks about the requirements • Blog posts
RemoteWorker02	• Social Media • Wandering • Google Maps
RemoteWorker03	• Keywords searching through Google Maps or Internet
Student01	• Imdea (teacher told him) • He went to eat in a bar and noticed a bigger room to study
Student02	• Public facilities, e.g. libraries, universities rooms • Used to this process since high school,especially for meetings with colleagues
Student03	• Asks people • Simple query using search engine • Searches in University website • Instagram pages (student associations, searching with #)
Student04	• Google maps/browser • Sometimes ask friends • knowledge of the city and recommendations

Question 7: What factors influence your choice of location?

RemoteWorker01	
RemoteWorker02	• Whatever is closer. • Depends what work she needs to do. • If there's a toilet, food, tables.

RemoteWorker03	• Stable wifi connection • If allows laptops (especially during weekends) • Choices for eating and drinking • Outlets for chargers • Starring (reviews)
Student01	• Not very crowded (social anxiety) • Quiet • Enough space • Basic equipment (chair, desk) • Sufficient space to work
Student02	• Depends on tasks: silence (individual study), place where they can speak (work groups) • Connection (wifi) • Electricity (computer)
Student03	• People she knows go there • Close to her place • Nice place (connection, plugs, sunlight)
Student04	• Wi-fi (has to be fast) • Not too quiet • Bar > Library

Question 8: What specific amenities or facilities are important to you when selecting a location to work or study?

RemoteWorker01	• Enjoy the place • Nice coffee • Good food • Terrace • Spacious and quiet • Ability to do video call (background) • Own space
RemoteWorker02	• If there's a toilet, food, tables.
RemoteWorker03	• Places to sit
Student01	• Cares about comfort. • Wifi (but he doesn't use public wifi because he cannot trust it) • Mobile network and data. • Temperature in the room (climate comfort)

	• Follow-up question: Do you prefer cold or hot rooms? • Colder rather than warmer but balanced
Student02	• Mostly bar, pubs where you find people and you can drink and eat • Aggregation (network)
Student03	• Enough space between people • Plugs, wifi … • Vending Machine (coffee) • Water dispenser -> Gesture for refilling water bottle
Student04	• Brake location for coffee/smoke • Plugs for phone • Wi-fi • “Room to breathe” not to close with other students

Question 9: Are you satisfied with your current selection? If not, what qualities are you missing?

RemoteWorker01	• Phone booth • Quiet booth
RemoteWorker02	• Retiro • Santander working coffees
RemoteWorker03	• Yes • Lots of choices • Weekend issues (mainly group works)
Student01	• Has all the amenities in IMDEA, perfect study ambiance. • • He spends more time there because the quality is good. • • Couldn’t think of anything specifically for cafes.
Student02	• Didn’t went to lot of places • Study room at uni • Coffee Shop (for group works) • They lack an Easier access to a place like a cafeteria • Found similarities with italian places for the universities rooms • Important to have drinks and food in places (automatic machines are not
Student03	• Not satisfied here in Madrid

	• Very hard to find a place she likes • Lots of people, super busy • Coffee places don't allow you to stay during weekends
Student04	• Super crowded • 1h que • has to check manually • goes back home

Question 10: What are the biggest challenges you have faced when trying to find places outside your home/office to follow your occupation?

RemoteWorker01	
RemoteWorker02	• Feeling not welcome to work there with a laptop. • Places are full and loud, she can't really do anything about it. • Has to move to parks or quiet places.
RemoteWorker03	• Opening hours
Student01	• Haven't really looked for anything new
Student02	• Closeness to home (30 min with public transport / 20 min on foot) • No paying to enter the place (importance of economic motivation) • He is willing to pay for consumption of drinks and food but not just for the access • Importance of good place (young people, beautiful women) • Easy reach • Free entrance to places • Importance of people around him (beautiful presence) • Easy reach places (geographical motivation) <20 min by foot • <30 by public transport.
Student03	• Be sure that you can find a seat there
Student04	• Having to check manually and lacking alternatives • Going through the same process again

Question 11: How do you typically access information about potential places to work or study?

RemoteWorker01	• Calling • Is it quiet? • What time does it get busy? • Google information is not satisfactory • Reviews are good • Often he goes to places to work, but only finds out that they have conflicting policies there. • Some “working coffees” only have one laptop table. • Policy about working times is not transparent. • Challenge to monetize coffee shops. Lack of opportunity to pay for work. “You can only drink to much coffee” • Sometimes you pay 15$ for the whole day, for premium services. • There needs to be a way to communicate the expectations of customers. • Some coffees use wifi codes to constrain the customer's time spent.
RemoteWorker02	• Google Maps • The place depends on what is closer at the moment. • Search “work cafe” • “Go and see” • If several places are full she goes to the park or back home
RemoteWorker03	• Google Maps • Articles on web • She copy paste location she finds online in Google Maps Decision based on: • Distance • Ratings • Laptops policy • Reels on IG • Word of mouth
Student01	• Looked for study rooms -> Checked at the schedule (wanted to go late at night, wanted to search for a 24h open study room) • Zoomed out (on the map) in his area • Looked for the closer space • Laptop weighs so he prepares everything before going.
Student02	• Speaking with colleagues and friends

	• Asking to university (is there some connection?) • Feature from university to help students find places to study
Student03	• Asks people • Simple query using search engine • Searches in University website • Instagram pages (student associations, searching with #)
Student04	• search by keywords first • blogs

Question 12: What is your interaction with other people in these places?

RemoteWorker01	• Does not interact
RemoteWorker02	• No interaction
RemoteWorker03	• Not really a lot of interaction • Interacts with staff • Asks if a table is free • Asks for wifi • People are mainly working • She doesn't really have time to interact (mainly working)
Student01	• Doesn't want interaction. • Wants to focus. • Even though he's alone he can also get distracted. • Follow-up Question: Would you be more comfortable about having a separate desk or sitting at a table with more people? • Prefers being on his own, isolated. • At libraries, he prefers single desks because he likes it. Even though usually more people don't really affects in his performance, but finds that when other people talk he gets distracted at moments.
Student02	• Small chat (at the bar) • Talks in breaks and after the study session (grab a beer). • Coffee breaks, eat breaks. • Break when tired, overwhelmed. Take break to rest • He found new friends there in the past • Smile -> seems he likes this argument. • Importance of bar environment.

Student03	• Goes w/ friends • Place where you drink coffee and have small chats during breaks (mainly w friends)
Student04	• eating with friends

Manager Questions

Question 1: Can you describe your establishment and what kind of services you provide?

Manager01	cafe/bar in Berlin Providing food/drinks Cultural space in neukölln Berlin for concerts, readings, and private parties/dinners/parties
Manager02	Business Hotel in Austin Space for Business travel American international food Not buffet Menu service

Question 2: What does your usual working day look like?

Manager01	Checking emails Checking event management leads Check meetings Prep events
Manager02	Work in the morning, 7am, Get prepared whenever customers come, serve them drinks, explain about the menu, care about allergies preferences,

	give recommendations, serve them, talk to them, give info about the hotel and area

Question 3: How would you describe the customers that your establishment serves?

Manager01	Age range end of 20ies to end of 30ies Older customers Urban Berliners with established jobs Not so many students Not super cheap -> older customers
Manager02	Most of them middle-class american workers Parents of students Business men-women People that go to the convention center nearby

Question 4: Do you use the Internet to market your business? If so - how do you do it?

Manager01	Squarespace /Webflow for website Newsletter Recommendations
Manager02	Not that involved Marketing and manager -> they make new arrangements because of comments and reviews of people that were in New chefs that want a new meal experience

	OpenTable very important for them

Question 5: Do you use any social media accounts for this?

Manager01	Instagram
Manager02	Instagram Website

Question 6: How do you feel about people working on their laptops here?

Manager01	Accepted No policy In winter there is little customers, because it is hidden -> not crowded(besides lunch) Not a target group, because no revenue
Manager02	Lots of them were not happy Didn’t want to disturb them because they don't know if they are in meetings Don’t want to interrupt Keep an eye on them but they just have coffee or a toast

Question 7: How do you communicate the rules for working on laptops in this place?

Manager01	No policy, has always worked out

Manager02	No policies But sometimes when there are a lot of people they tell them they can´t stay

Question 8: What factors do you believe contribute to the appeal of your coffee shop as a study/work space?

Manager01	Very calm Located in park No policy -> no problem Cozy *The electricity infrastructure is not so good.* *(not many outlets)*
Manager02	Quiet, peaceful But not a lot of spaces that they could be in for a long time

Question 9: Are there specific times or days when the coffee shop is more conducive to study or remote work?

Manager01	During the week rather than weekends In the afternoon (only opens at 12:00) From 2-6
Manager02	High season -> Same as american football, September - December Lowest season -> December - March Mornings: 8am - 11 am and afternoons:18-20 pm

	Week varies, no specific days

Contextual inquiry

Student01 - Task 1

Time	Steps
3.04 min	1. Open google maps 2. Looks for libraries near location 3. Enabled do not disturb mode 4. Chose one 5. Checks for photos (no) 6. Checks for website (no) 7. Moves to another one 8. Looks at the photos 9. Clicks one photo where temperature is shown (28 degrees, says wtf) 10. Checks peak hours in Google Maps features (info on how to plan to go there) 11. Checks schedule to see if it fits his study schedule 12. Check the website (is there additional information?) 13. Public library: is there any ID card to sign up for it? Or is it not compulsory? 14. He likes that one, he's still going to check others just in case he likes them 15. Skips one he just selected because it is not opened on saturday and sunday 16. He shifts to cafes studios (just cafes are cafeterias) 17. He checks photos 18. Saw a laptop 19. Clicks in the photo to inspect 20. Looks at peak hours 21. Looks at schedule 22. Surprised: opens earlier (7am) than study rooms and closes later (10pm) 23. Checks the websites 24. Does not get as much information as he needs 25. He needs to choose between these two 26. He will go for the library

	a. More space b. Saves it in google maps list c. Checks the location d. It's close enough e. No exam period during uni = there will be less people f. He wouldn't go at the end of the semester = very full

Student01 - Task 2

Time	**Steps**
3.56 min	1. Open Google Maps 2. Goes back ti the place 3. He assumes laptops are allowed (it's a library) 4. He checks photos for laptops 5. He sees them, good sign. Assumes it's allowed 6. Goes to the website 7. Services: WiFi. Assumes he's allowed to bring the laptop 8. Goes to reviews 9. Looks for the search field 10. Looks for keyword (ordenador): nothing 11. Tries with portatil: nothing 12. Tries with device: app crashes 13. Goes through first shown reviews to check if something useful is written 14. Reads one in particular 15. Laughs because one reviews says the place is too cold (in a funny way) 16. Finds one talking about sockets and usb a. He's pretty sure he can bring it 17. He'll go there and check

Student02 - Task 1

Time	**Steps**

3.32 min	1. Uses phone 2. Goes to Google Maps 3. Searches for “library” 4. Goes to the centre of Madrid where he lives 5. Sees there are some options 6. Misleading, he knows that some are close (already been there) 7. Searches again 8. Selects a new library (Biblioteca istorica de marques) 9. Photos: spaces where he can study 10. Check schedule (open until…) 11. Checks the comments 12. New searches: student bar 13. He doesn’t like results, changes query: working coffee. More choices 14. Chooses one coffee (behind the name there’s written coworking 15. sees the prices, menus, tables,,,, 16. comments related to his search: the place fits his expectations 17. decides to go there

Student02 - Task 2

Time	**Steps**
3.56 min	1. Uses phone 2. Goes to Google Maps 3. Goes to the menu 4. Checks first review: says that the slots are not the best and there are policies regarding laptops 5. He knows that tables will be different for pc and non pc users 6. Searches keyword computer in reviews: no results 7. Sees there’s an ig page 8. Checks it out 9. He thinks he won’t find anything there 10. Doesn’t find anything 11. Searches through the comments again

	12. Reads one bad review (⅖) saying that tables are different, if you are not in a laptop user table you cannot work but there's no signage to tell you that, the waiter does that 13. He has enough information to decide whether to go or not,he knows he can work there and that there are policies, he needs to ask the waiter. He would go

Remote worker01 - Task 1

Time	**Steps**
6.19 min	1. Open browser (safari) 2. Wants to look cafes or restaurants a. "Best cafes for working in madrid" b. Not work in coworking spaces c. 3. Prefers articles -> laptop cafes, more recommendations a. Not as accurate b. Not specific (laptops, wifi, seats?) 4. Looks at pictures once she decides on one a. Looks up Instagram b. Mention the price c. Location 5. Not really a coffee snob 6. If she find something that she likes (pictures) she looks up the place 7. Clicks on cafè federal 8. Link to ig page 9. Scrolls down 10. Website a. doesn't find info in the website 11. Looks on google maps 12. Two location, choses the closest one 13. Important : Review (4.1) 14. Normally applies filter for computer 15. Goes through reviews (translates them)

	16. Looks also at bad reviews 17. Sees that they have bad reviews related to computers (usually bars only have a few) a. Red flag: shifts to another bar for the research 18. Goes back to website and article 19. Selects a new one 20. Checks instagram 21. Goes to ig 22. Same steps as before a. Nice pics 23. Goes to google maps , looks at the location 24. Reviews 25. Good reviews from people with laptops 26. Chooses this one 27. Goes to google map, search for address and checks route

Remote worker01 - Task 2

Time	**Steps**
2 min	1. Goes to google maps 2. Tags in reviews 3. Checks in cafes she already knows 4. Clicks on reviews a. They say outlets in all tables b. Pictures c. Sometimes it says in maps that you can take laptops but from personal experience sometimes they have some specific rules that are not in the maps d. Not reliable

Ethnographic observation

1. **Environmental Context**

Location Description: There's tables, a bar for the food and drinks, shared bathroom, Wi-Fi, plugs (not in every table and one plug only), calm decorations, plants, yellow light and light from outside, big windows, no clothes hangers.

People are talking but it's not super loud, people working with headphones, people talking with friends, people alone eating, reading.

Friendly atmosphere, fast service, people of all ages but mostly around their 20-30's.

This place combines relaxing feelings (people just there to hang out with friends) and focused feelings (people working), so it's good for breaks and chats.

After lunch time people come in with kids, strollers, bikes so it looks more busy.

Good prices for breakfast food and drinks (coffees), people can have breakfast and lunch at a good price (10€ complete meal). Broad choice of food and drinks. Option to have anything on their menu to go.

Seating Arrangements: Small tables(working alone, max in 2 per table), stools, individual chairs, long benches (booths) with 2 or 3 tables.

Power Access: Not enough plugs for everyone(consider that this is a cafe and not a full equipped study place so has both simple customer and workers/students)

Lighting: Good sunlight in the place (big windows).

Noise Level: The place is not too noisy, people around are chatting making a good atmosphere.

2. **User Behavior and Interaction**

Arrival and Departure Patterns: Once you enter the cafe you are able to see all the tables, look for the one that is free and sit down so people are not confused with this system and they seem to know what to do.

Easy to find spots, thanks to the regular customers that do not stay there hours and hours, places are available very often.

Duration of Stay: Around 1-2 hours.

Device Usage: Laptops, printed things, notebooks, video calls, headphones (both for calls and music), books to read. Laptop policy: Max 3 Laptops per table at the same time, Max 2h of usage, NO on weekends. On the weekends you can't stay that long working in a device because they have more customers like families and friends coming to eat, more noise too.

Groups vs. Individual Work: As tables are not too big, some of the users are trying to balance all their things in the table, which seems a bit uncomfortable.

Breaks and Social Interaction: Students here alone, during breaks are on their phones alone, not talking to each other, but if they are with friends they chat with each other.

3. **Amenities and Services**

Wi-Fi Connectivity: There Wi-Fi and the password is in the menu or it is possible to ask the waitresses.

Food and Beverage Consumption: Students and workers take small food and drinks. One coffee, one juice, one croissant, one cookie, one …

Staff Interaction: The only interaction between the customers and the workers is asking for food and drinks.The staff is fast to welcome and serve the customer, but not fast in the cleaning of tables once users finish their dish/drink and considering the table size this could create a space problem.

4. **Space Management and Flow**

Crowding and Space Availability: Workers and students with laptops take the most time on tables, but there are a lot of people that only come here to have a drink and food, and once they finish they go, good rotation and free tables often.

Table Turnover: There is a pretty constant flow of people.

5. **User Feedback**

Observations of Frustrations or Delight: People enjoy the food and drinks they have.

Workers/students tend to buy little quantities of food, like coffee or juice, just to be able to sit in the place and spend little, like a ticket to get in. All students here have just one cup on their tables.

6. **Additional Notes**

Unique Features or Services: Decorations, good coffee, variety of drinks with different types of milk (matcha, chai, teas)…, can get water anytime you want from the bar (they have free glasses and water), a pet-friendly place, in the nights you can have drinks/cocktails.

Safety and Cleanliness: The waitress cleans every table once the customers go, seems pretty clean, the floor is clean, the bathroom is big, clean, and has decorations and a baby changer.

Personal experience: We had a nice time working, no problem with having our laptops on the table and stayed around 2 hours.

7.Annex B: modifications to schedule

Due to unforeseen circumstances we had to make changes to our original schedule. The updated schedule can be found in 1.1 description of activities performed.

Deviation 1: Demographic questions added

- "What is your age?"
- "What gender do you identify with?"
- "What is your country of origin?"
- "How many hours per week do you work/study remotely?"
- "What is your screen time for Phone/Computer per day?"

Deviation 2: Interviews

- Days of interview varied from the original plan due to availability of interviewees.
- One of the managers that was taken into account for the interview, had a lot of work on the chosen day so we only got some informal information and found someone else to do the whole interview.
- The other manager was changed as we found someone in Berlin that manages a business and was willing to do the interview.
- In the end we could get 9 interviews (4 students, 3 remote workers and 2 managers), 4 contextual inquiries (3 students, 1 remote worker) and 1 ethnographic observation.

Deviation 3: New observations description

For this project we will conduct contextual inquiry observations and ethnographic observations. For the first ones, we want to obtain a clear idea about users' mental model and detect hidden information that with interviews we can't elicit. We will ask them to perform two tasks to understand the process of how they search for study and work places and what factors influence their choices. For the latter, we want to get insight about how students and workers interact with each other and with the surrounding environment. For this observation, we want to go to a coffee shop, the

Urraca Cafè in Calle de Doña Urraca, 18, Madrid, where people go to study and work and dive into their physical, social and technological environment while studying and working. We will observe a maximum of 10 students/workers on a usual week day. We will go there after we do the interviews so that we will be able to confirm or contrast our information and gather new ones. We want to elicit information about their needs and pain points.

Deviation 4: New ethnographic observation template

This template provides a comprehensive overview of the user experience in the bar, focusing on its suitability as a workspace for students and professional workers.

1. **Environmental Context**

Location Description: Describe the physical location, ambiance, and general atmosphere of the bar.

Seating Arrangements: Note the types and arrangements of seating and their suitability for individual or group work.

Power Access: Observe the availability and accessibility of power sockets for charging electronic devices.

Lighting: Adequacy and type of lighting.

Noise Level: General noise level throughout the observation period.

2. **User Behavior and Interaction**

Arrival and Departure Patterns: How users find seating?

Duration of Stay: How long users stay and work/study.

Device Usage: Types of devices being used (laptops, tablets, smartphones) and any other work-related materials.

Groups vs. Individual Work: Differences of individual work versus group collaboration.

Breaks and Social Interaction: How users take breaks or engage in social interactions.

3. **Amenities and Services**

Wi-Fi Connectivity: Assess the ease of connecting to Wi-Fi and any related user behaviours or frustrations.

Food and Beverage Consumption: How users interact with the pub's food and drinks while working.

Staff Interaction: How users interact with the staff, especially related to their work/study needs.

4. **Space Management and Flow**

Crowding and Space Availability: How crowded the space gets and how users move in it.

Table Turnover: How quickly tables become available after being vacated and how it is managed.

5. **User Feedback**

Observations of Frustrations or Delight: Non-verbal cues of satisfaction or frustration.

6. **Additional Notes**

Unique Features or Services: Any unique features of the bar that might attract working professionals and students.

Safety and Cleanliness: The cleanliness of the environment and any measures taken to ensure user safety, which can impact the comfort and duration of stay.

Personal experience: Brief description of the observers' experience inside the working place.

Deviation 5: New contextual inquiry template

The new template is done trying to reduce the fields to collect in order to facilitate the observer in taking notes. The time is useful to measure the efficiency of the actual system users use. Steps, as its name suggests, is to track all the actions the users take and hidden thoughts in their tasks.

Time	**Steps**

March 24, 2024

Low Fidelity prototypes and planning of first usability evaluation

Human-Computer Interaction Project

Team 1

- Ortega Barrios, Carolina
- Tornier, Milan
- Barbanti, Francesco
- Del Prato, Matteo

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1 Competing designs

1.1 Introduction to the design

Customers who use coffee shops for laptop work have various requirements and preferences. We concluded from our context of use analysis, that there are two different perspectives relating to the different personas we identified. Students who use coffee shops to study are willing to commute to find appealing places that accommodate a social environment; remote workers - on the other hand - have requirements that relate more to their professional responsibilities. The latter need reliable workplaces that provide them with an opportunity to attend meetings, and are willing to pay extra for premium services. The two corresponding prototypes are a requirements-focused prototype and a social interaction prototype.

The **requirements-focused prototype** uses “Offers” that Coffee shop managers create to attract more customers who are willing to pay for premium services. While managers are users of the app too, we only prototype the interactions of their customers in this iteration. The offers are displayed on a map. The offers can be searched and filtered. When an offer is selected an overlay appears, that allows specification of time for the reservation and number of guests to be reserved for. To find out more about the establishment users can visit its profile. Once an offer is confirmed by the user they will be redirected to the activities view, where they can see and manage their reservations.

The **social interaction prototype** is based on the interaction between users and places as well as users between users. Users have access to a customised feed showcasing places their friends recommend and interact / have interacted with. For each action, social interaction features are highlighted, always always aiming to help users reach their goals. This approach is the biggest difference with the requirements-focused prototype: his prototype implements a design that aims to reproduce the social interactions that guide users in the process of choosing a place to study.

In both prototypes users can research according to personal requirements; in the second prototype, though, highlighted results are those linked to friends’ network. Another notable difference lies in the requirements: these are based and rated on users’ evaluations (e.g. the level of productivity of a place is defined by all those users who considered and rated the place as productive). This is another example of how we always manage to keep the social interaction behaviour.

1.2 First design: Requirements-focused Prototype

1.2.1 Viewpoint

Need: Remote workers need reliable Workplaces that are close in place and have strong requirements.

Finding: Managers have space to accommodate more laptop workers but don't advertise to them because they cannot monetize them. However, remote workers have reported to be willing to pay extra for their requirements.

Solution: Managers can create “Offers” in the App that remote workers can accept. For a fixed price, remote workers get a reservation and drinks/lunch/wi-fi for a specified time.

1.2.2 Interaction Devices and Styles

The interaction device we will design for is the **smartphone**. Participants have reported that they research places to work in bed in the morning. Further, the smartphone can help navigate the city, because it is readily available.

Our main interaction styles will be menus and forms. Users will specify the requirements for their work using a filter form and decide on actions to take on an offer via a menu. Further, direct manipulation may be utilised if users want to see a map displaying offers rather than a list. Users could mark their location on the map and explore offers in their area using drag motions.

1.2.3 Scenario or storyboard

Task 1: Find a place with requirements

You recently moved to Madrid, it is your first time coming here so you don’t really know where the areas are or new places you might like. Tomorrow you want to work with one of your friends in a cafe as you are both remote workers, one of your friends recommended you download Sitdown to find a place.

You open the app, and the first thing you see is a map that shows multiple coffee shops, you decide to filter so you have options more aligned to what you are looking for. You click on the only offer that aligns with your requirements and you make a reservation for the next day.

Task 2: Add a cafe to your wishlist

One of your friends told you that they like one specific place for halal, but you forgot who told you that and don’t know the name of that cafe but you are really excited about it and want to try it out. To be able to find it, you go search in the app to see if you can find the friend that recommended you the place so that you can save it for the future.

Task 3: Leave a review for “Sukis Cafe”

You visited Sukis Cafe and you really liked it. You want to give it a good review so your friends can see that it is a good place if they are looking for new places to visit. You go

to the app, and to not lose a lot of time you directly search for the cafe and leave a review of it.

1.2.4 Low Fidelity prototype (video)

Link to Video:

Video Prototype 1

1.3 Second design: Socially-focused Prototype

1.3.1 Viewpoint

Need: From the contextual inquiry, users need to see pictures and reviews and it is important for them to have social interaction. One of the most common ways for users to scout a new place is by word of mouth, and if the suggestion comes from someone trustworthy it is more likely the user will get there. Receiving suggestions about a specific place makes the research easier.

Finding: Interaction with the place before going there is important, meaning that users want to be able to know as much as they can about the place, its policy and atmosphere.

Solution: Create a social network prototype where users can rely on pictures, reviews and friends' recommendations to have a complete and concrete idea of the place. Push on the social interaction both between customer-place and customer-customer. Give the possibility to users to connect and chat with each other. Implement a social network philosophy to offer the users a more engaging experience giving them all the feedback and interactions they need to reach their goals.

1.3.2 Interaction devices and styles

This design will be a mobile app for smartphones because users need to be able to navigate through it anytime and anywhere, so it's much more convenient to have it in this format. As a stylish approach, the OS considered to design this app is the iOS of iPhones.

Our interaction style will be direct manipulation and will consist of a feed where users can see all the places recommended, commented and liked by a friend and special offers and recommendations based on their interests. Users will be able to interact with each other through a messaging feature. The organisation of the content and interactions is designed to enhance social activity. So, first of all we'll always present to the users a first impression given by their friends interaction.

Users will be able also to share live moments of their staying at a place. To do so, it is possible to open the phone camera from the app and do a video or a picture of the moment. This way people can see other friends studying and reach them. This is done

to increase the interactions and the occasions to study with other people. Also places can share these type of content to promote events and offers.

The users will be able to search for a specific place too. To do this they will have first content based on other people's reviews from which we categorise the different places, e.g. productivity, silence, chit chat, ecc. On a second level the users will be able to do a complete search both by name, where they can find places and users, and by filters.

Finally, the user can reserve a study and work session to any place on the platform and leave a review that will be collected to update the rating and classification of the place.

So, the first level of interaction will always be based on interactions with other users and places, then, on second and third levels, the users can also decide by their personal requirements through a more specific search.

1.3.3 Scenario or storyboard

Task 1: Find a place with requirements

You recently moved to Madrid, it is your first time coming here so you don't really know where the areas are or new places you might like. Tomorrow you want to work with one of your friends in a cafe as you are both remote workers, one of your friends recommended you download Sitdown to find a place and new friends in the new town.

You open the app in which you already registered. You see your personal feed as first content. Since no recommendations fit your needs, you go in the search section where you can see all the different categories. You decide to filter so you have options more aligned to what you are looking for. You click on the offer that aligns with your requirements and you make a reservation for the next day.

Task 2: Add a cafe to your wishlist

You need to study to prepare for an exam. You need to eat and you want a place where they sell halal, but you don't know any. You open the app and you go to the search section, where you apply the related filters. In the results, you find in the recommendations for you an halal place that is recommended by a friend. You like how the place presents itself and before deciding to go there, you save it in the favourites so you don't forget about it for the future.

Task 3: Leave a review for "Sukis Cafe"

You reserved Sukis Cafe and you really liked it. You want to give it a good review and recommend it to your friends in the app. You go to the app section about last reservations and you leave a 5 stars review.

1.3.4 Low fidelity prototype (video)

Link to Video:

Video Prototype 2

2 Planning of the usability testing

2.1 Evaluation goals

Perform a usability testing of the two low-fidelity prototypes, with special interest in how well each prototype fits the mental models of the participants. The usability testing will be performed using the “thinking-aloud” technique. During the test, we will measure effectiveness, efficiency, and user satisfaction.

2.2 Dates, places, and roles

Test	Date and time	Place	Comments
1	02-04-2024	Imdea building, room 279	Expected duration: 12:00 - 13:00 Expected Participants: 1
2	02-04-2024	Imdea building, room 279	Expected duration: 13:00 - 14:00 Expected Participants: 1
3	02-04-2024	Imdea building, room 279	Expected duration: 15:00 - 16:00 Expected Participants: 1
4	03-04-2024	Imdea building, room 279	Expected duration: 11:00 - 12:00 Expected Participants: 1
5	03-04-2024	Imdea building, room 279	Expected duration: 12:00 - 13:00 Expected Participants: 1
6	03-04-2024	Imdea building, room 279	Expected duration: 15:00 - 16:00 Expected Participants: 1

Test	“Computer”	Facilitator	Observers
1	Carolina Ortega	Milan Tornier	Matteo Del Prato Francesco Barbanti
2	Francesco Barbanti	Carolina Ortega	Matteo Del Prato Milan Tornier
3	Matteo Del Prato	Francesco Barbanti	Milan Tornier Carolina Ortega
4	Milan Tornier	Matteo Del Prato	Carolina Ortega Francesco Barbanti
5	Carolina Ortega	Milan Tornier	Francesco Barbanti Matteo Del Prato
6	Francesco Barbanti	Carolina Ortega	Matteo Del Prato Milan Tornier

2.3 Participants

Participants	Total: 6 Students: 3 Remote Workers: 3
Recruiting	The recruiting will depend on the availability of the participants to be able to have a 1 hour testing. They will be contacted via text message and in the UPM Campus. As we are dependent on the time availability of the participants, if they don't show up the day of the testing we might need to find a new participant and time slot for them.

2.4 Sequence

2.4.1 Welcome text

Thank you for participating in this interview. I am _____, and they are _____, and we are conducting this interview for the Polytechnic University of Madrid. We are interested in understanding the challenges students and workers face when they need to find a place to study and work. Your participation will help us build a better platform for you to accomplish this task in the best way possible.

We ask you to perform three different tasks using two different lo-fi, paper-based prototypes. We encourage you to ask questions if you have any, and share your thoughts with us during your performance: our goal is not to judge you, but to learn from you.
During the entire time that we will be conducting the testing, we encourage you to think aloud. This means to say everything that you think and feel in every step of the way, there are no right or wrong thoughts and it will be very beneficial for us to know your first impression, frustrations, and thoughts on each prototype.

Don't worry about making mistakes or giving "the right" feedback. Just be yourself and tell us how you feel. Your input is what will make these products shine. Thanks for helping us.

Do you have any questions before we begin?

2.4.2 Process

1. Say the “welcome text” (2.4.1) to the participant.
2. Explain the consent form (2.5) and collect the participant signature.
3. Gather personal information (2.6).
4. Do the usability testing of one of the prototypes. Ask the participant to perform the tasks (2.7), gather data (2.8) and observations (2.9).
5. After using the prototype, ask the participant to fulfil the user satisfaction questionnaire (2.10) and ask for general impressions (2.11).
6. Repeat 3, 4 for the other prototype.

2.5 Consent form

Informed Consent for Participant of Investigative Project

Universidad Politécnica de Madrid, Spain

Researchers: Milan Tornier, Carolina Ortega Barrios, Matteo del Prato, Fransesco Barbanti

I. THE PURPOSE OF THIS PROJECT

This study is about connecting laptop-using customers with cafes that want to accommodate them.

II. PROCEDURES

We inform you, the participant, that this usability test will last approximately one hour. During this activity, we are following the following process:

1. We will ask you some questions to gather demographic data.
2. We will ask you to perform several tasks using two paper-based low-fidelity prototypes.
3. We will ask you to complete a usability questionnaire (SUS) for each prototype.
4. We will ask you some questions about your experience using both prototypes.

III. RISKS

There will not be more than minimal risks by participating in our study.

IV. EXTENT OF ANONYMITY AND CONFIDENTIALITY

The results of this study will be kept confidential and your personal information will not be used except in this consent form.

Your written consent is required for the researchers to release any data identified with you as an individual to anyone other than personnel working on the project. The information you provide will be anonymous. The gained information will be written down in this sheet and stored in a safe place for at most 3 months after this interview. This study is done only for research purposes and the gained information will not be used for other goals.

V. COMPENSATION

Your participation is voluntary and unpaid.

VI. FREEDOM TO WITHDRAW

You can withdraw from this study anytime for any reason.

VII. SUBJECT'S RESPONSIBILITIES AND PERMISSION

I voluntarily agree to participate in this study, and I know no reason I cannot participate. I have read and understood the informed consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

Name:	Date:
Signature:	

2.6 Personal information questionnaire

The questionnaire will be in the format of an electronic document, it is intended to obtain demographic anonymous information from the participants. During the usability test it will be more convenient and fast for the facilitators and observers to gather all the information in one place.

Tasks to be performed by participants

Task	1
Title	Find a place with requirements
Starting situation	You're at home and are looking for a place to work on your laptop. You open the Sitdown App.
Task instructions	Find a place for laptop work for , where you can study 2 hours. It should allow laptop work, have wi-fi, provide vegan lunch and be no farther than 2km from your place. Book two seats for you and a friend from 12:00 -14:00 for today: Thursday, 4th April.

Task	2
Title	Add a cafe to your wishlist
Starting situation	Your friends just told you about a halal place that has good food. You open the sitdown app to add it to your wishlist.
Task instructions	Look for a place that is halal and that one of your friends likes. Add this place to your wish list.

Task	3
Title	Leave a review for "Sukis Cafe"
Starting situation	You are at home after coming back from working at Sukis Cafe, you liked it so much that you want to leave a positive review online.
Task instructions	You went to Suki's cafe and want to leave a review. Give it a rating of 5/5 and write "Amazing Coffee" and add a photo.

2.7 Objective measurements

Measurement	**Description**

Actions	Number of elemental actions performed (click, tap, …) to complete one task.
Mistakes	Number of mistakes made during one task.
Success	Yes/no (whether the participant succeeds at completing the task).

2.8 Observation sheet

During the Usability Test, the following template will be used to collect all data from Date, Time, and Participant ID, to Demographics, Objective Measures, SUS, and General Impressions.

https://docs.google.com/spreadsheets/d/12PFr9kCjRugo3wlLar0X57Vd0anLP6zVrPNuffqfmzw/edit?usp=sharing

2.9 User satisfaction: SUS questionnaire

Participant ID	
Evaluated prototype	
Date and time	

Reply with your degree of agreement or disagreement to the following ten sentences, where one means “I totally disagree with the sentence” and five means “I totally agree with the sentence”.

	1	2	3	4	5
I think that I would like to use this system frequently.					
I found the system unnecessarily complex.					
I thought the system was easy to use.					
I think that I would need the support of a technical person to be able to use this system.					
I found the various functions in this system were well integrated.					
I thought there was too much inconsistency in this system.					
I would imagine that most people would learn to use this system very quickly.					
I found the system very cumbersome to use.					
I felt very confident using the system.					
I needed to learn a lot of things before I could get going with this system.					

2.10 General impressions

Participant ID	
Evaluated prototype	
Date and time	
1. What are the main problems you have found while using this prototype?	
2. What is the part of the prototype that has been more difficult to understand? Why?	
3. Can you describe your overall experience with this prototype?	
4. Which is the prototype that you prefer? Why?	
5. What have you liked the most of each prototype?	

June 4, 2024

Usability testing report – high fidelity prototypes

Human-Computer Interaction Project

Team 1

- Ortega Barrios, Carolina
- Tornier, Milan
- Barbanti, Francesco
- Del Prato, Matteo

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1 Executive summary

The aim of SitDown is to match students and remote workers with their ideal working cafe. This means reliable search and reservation for customers and new ways of monetization for cafe shop owners. The map-based approach proved more promising after our initial low-fidelity prototyping iteration to determine whether to choose a social network or a map-based approach. This report deals with the high-fidelity implementation of that map-based approach to our app.

We implemented the high-fidelity prototype using the react-native library, the react-native elements library for UI components, and the react-navigation library. We also used typescript to add type safety to our implementation. The app contained all relevant screens to fulfil the tasks we had already used for our low-fidelity implementation.

We exposed the prototype to ten subjects, six of whom were students and four of whom were remote workers. They all attempted the three tasks, filled in a UEQ questionnaire, and gave qualitative feedback regarding their experience. The following chapters will outline the analysis of the data we collected and the learnings from the subjects' feedback. We will analyse effectiveness, efficiency, and self-reported user experience.

Our implementation achieved a score of 80, which we deem satisfactory. However, novelty and attractiveness were evaluated as poor. While it will be difficult to make the experience more novel, the next iteration of this project should attempt to make it more visually attractive. The analysis showed that especially the first tasks lacked efficiency and effectiveness.

2 Goal of evaluation

Evaluate the performance (effectiveness and efficiency) of participants when using the high-fidelity prototype. Evaluate the participants' satisfaction with the SUS questionnaire, and their user experience with the UEQ questionnaire.

3 Schedule update

Deviation	Aspect	Explanation
1	Change in the expected dates for the participants testing.	Due to the availability of the participants that were interviewed the expected dates had to change to fit into their schedules. The final interviews were done on: May 14, 16, 19 and 22.
2	Time used for the usability testing.	Originally the plan for the user testing was expected to be around 45 minutes but in reality the majority of the testers took less time.
3	Change in tasks	Changes are presented in Annex B.
4	Change in screens and alerts	Changes are presented in Annex B.

Table 1. Schedule update table listing deviations from original planning

4 Information about the performed usability testing

4.1 Dates and places

Session	Date	Place	Participants
1	14/05/2024	Imdea building, room 279	4 persona: Student (Jason) 1 persona: Remote Worker (Britney)
2	16/05/2024	Imdea building, room 279	2 persona: Student (Jason)
3	19/05/2024	Imdea building, room 279	1 persona: Remote Worker (Britney)
4	22/05/2024	Imdea building, room 279	2 persona: Remote Worker (Britney)

Table 2. Session, dates, place and participants table for each usability test performed

4.2 Participant demographics

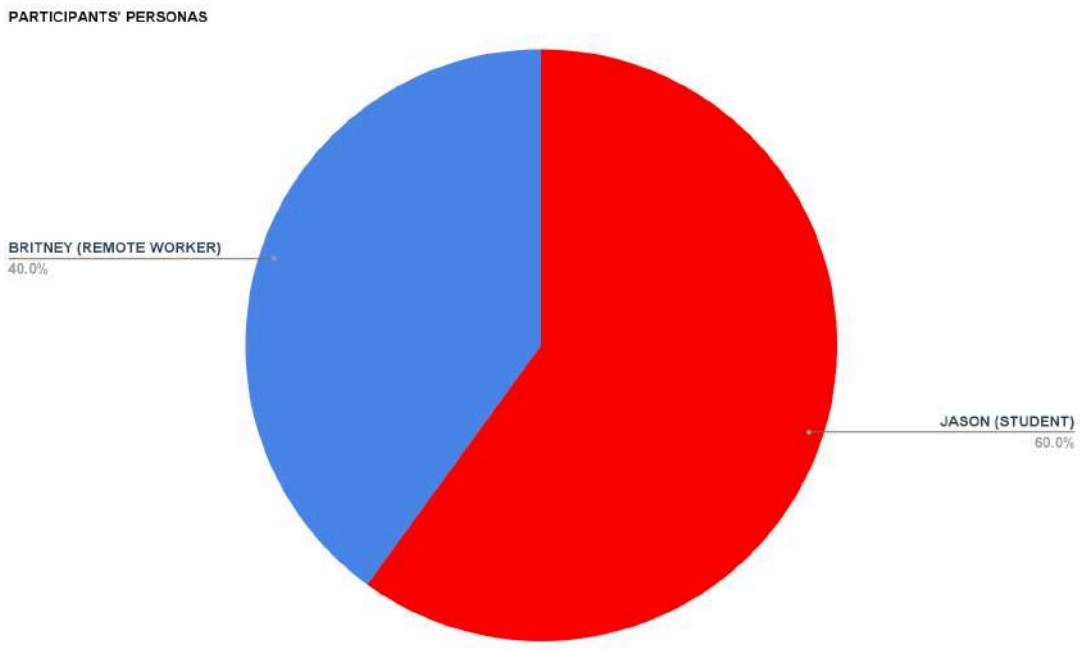


Figure 1. Pie chart with personas of 10 participants

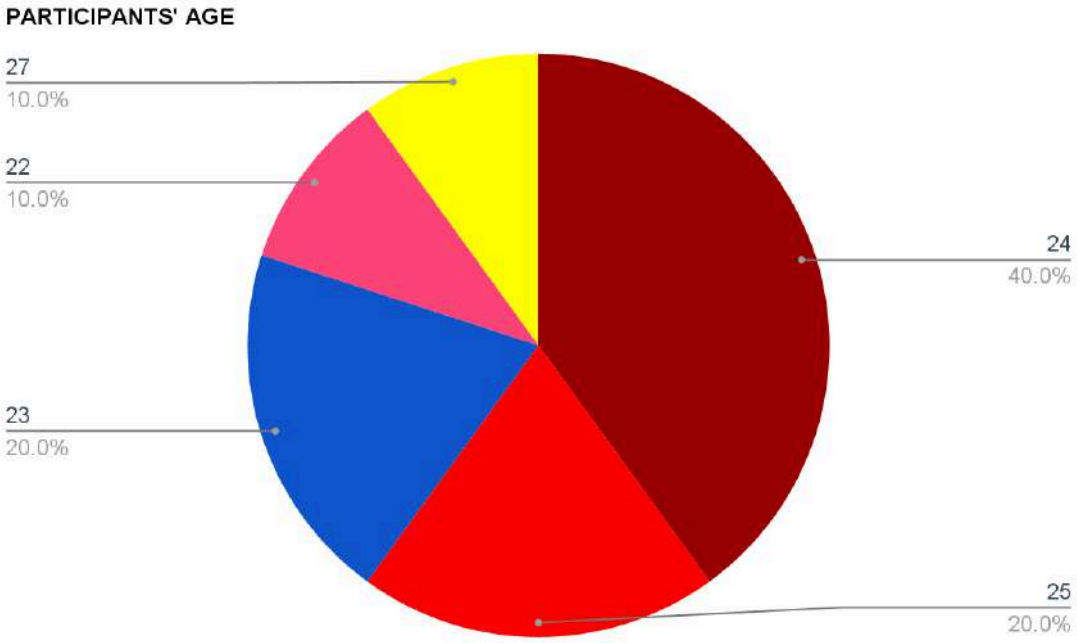


Figure 2. Pie chart with age of 10 participants

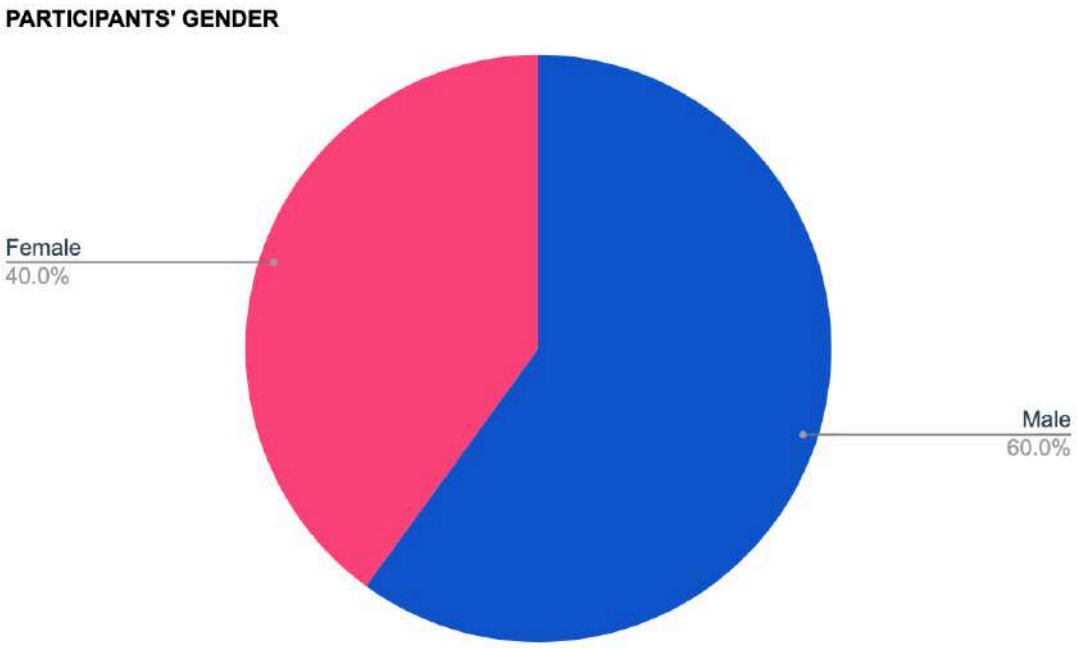


Figure 3. Pie chart with gender of 10 participants

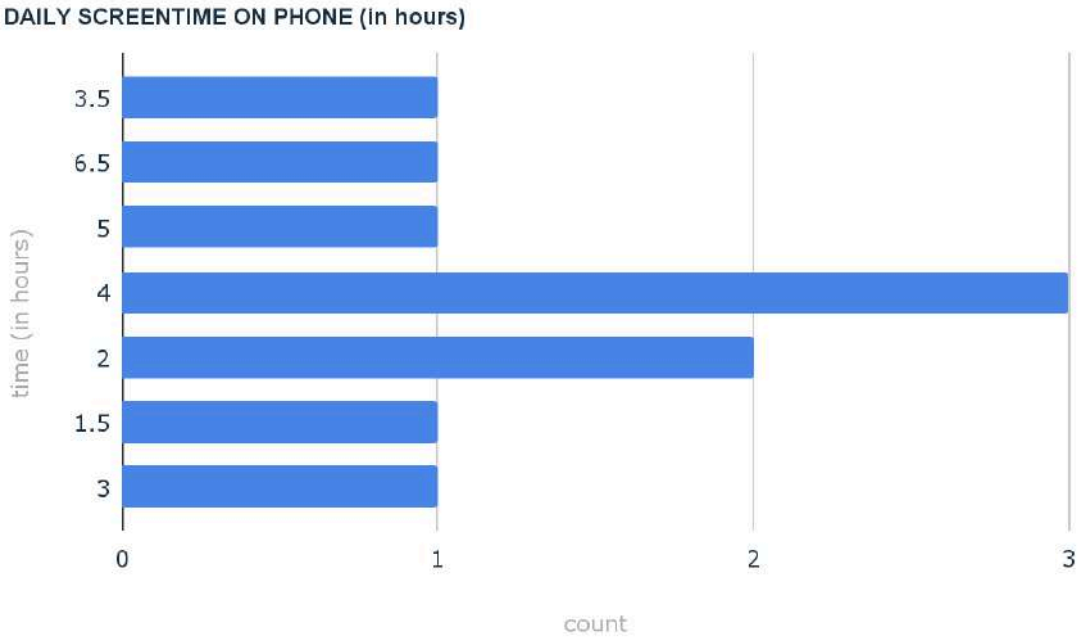


Figure 4. Bar chart with daily screen time on phone (in hours) of 10 participants

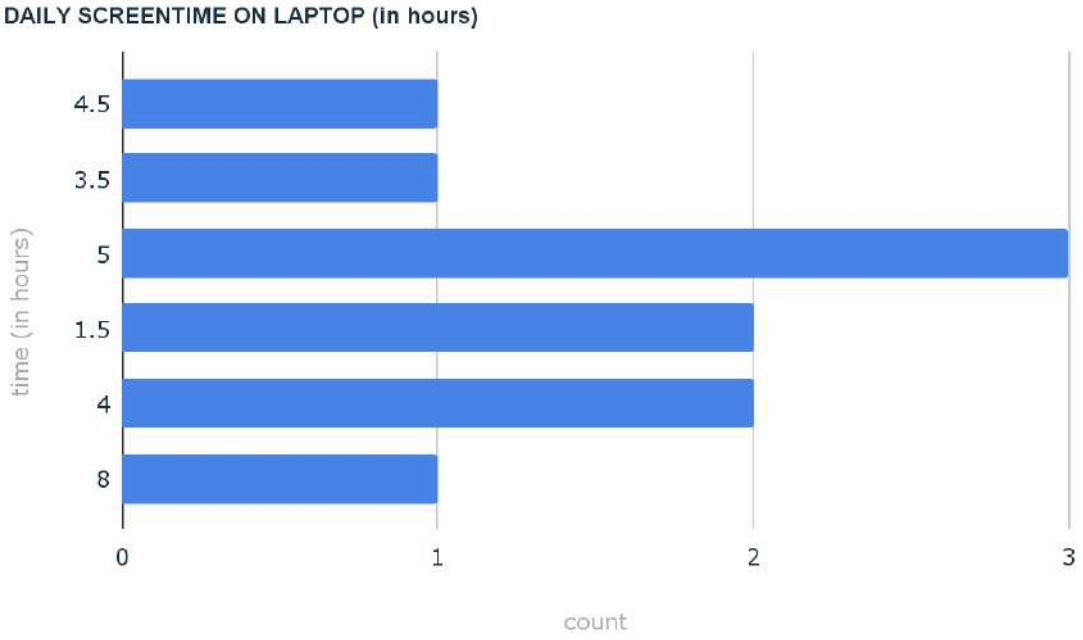


Figure 5. Bar chart with daily screen time on laptop (in hours) of 10 participants

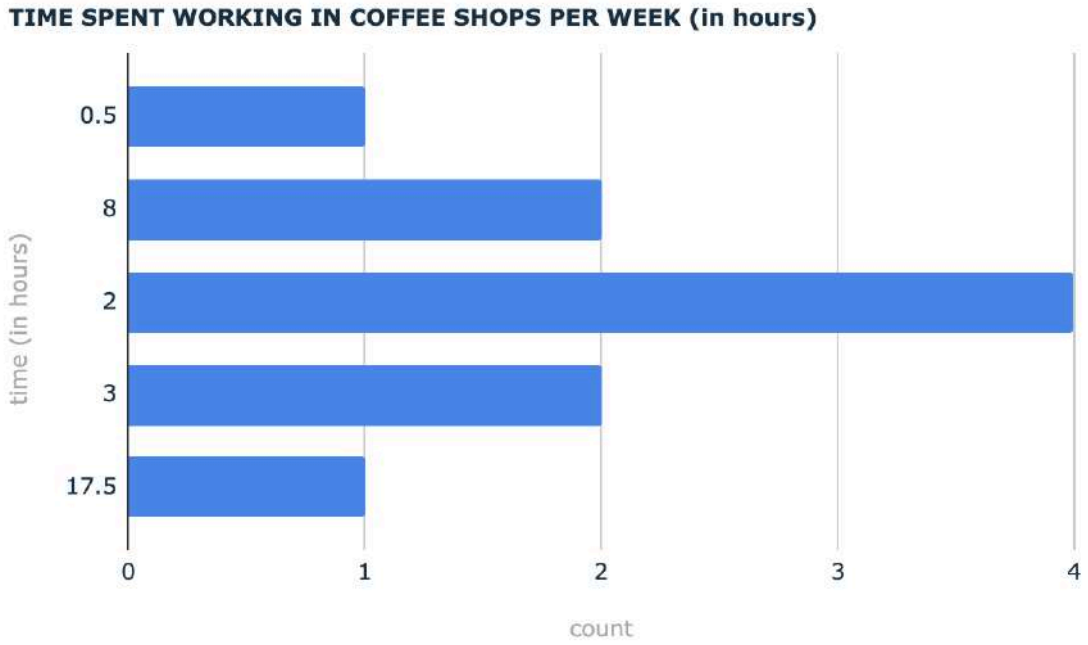


Figure 6. Bar chart with weekly time spent working in coffee shops (in hours) of 10 participants

5 Effectiveness

5.1 Effectiveness results

1. **Overall participants' effectiveness information**

	Mistakes (average)	Mistakes (std. dev.)	Success rate
Task 1	3.4	3.64	90 % (9/10)
Task 2	2.3	1.96	80 % (8/10)
Task 3	1.1	1.18	100 % (10/10)

Table 3. Table with effectiveness information for all participants

2. **Jason persona (student): effectiveness information**

	Mistakes (average)	Mistakes (std. dev.)	Success rate
Task 1	4	4.3	100 % (6/6)
Task 2	2	2	83.3 % (5/6)
Task 3	1.2	1.3	100 % (6/6)

Table 4. Table with effectiveness information for Jason persona (student) participants

3. **Britney persona (remote worker): effectiveness information**

	Mistakes (average)	Mistakes (std. dev.)	Success rate
Task 1	2.5	3.6	75 % (3/4)
Task 2	2.7	2.0	100 % (4/4)
Task 3	1	1.2	75 % (3/4)

Table 5. Table with effectiveness information for Britney persona (remote worker) participants

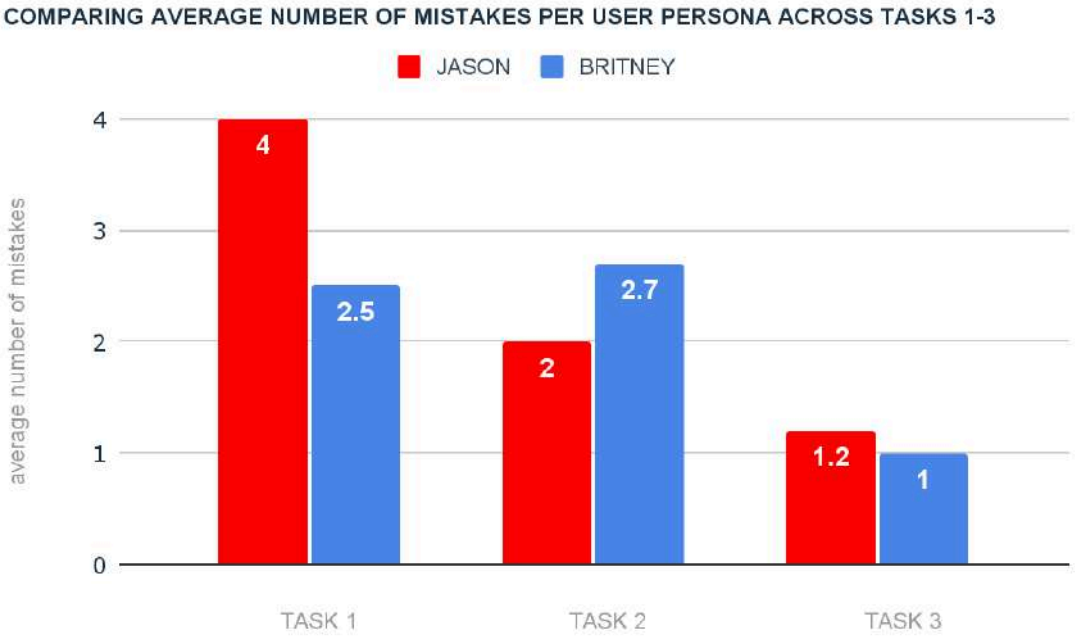


Figure 7. Bar chart comparing average number of mistakes per persona (Jason and Britney) across three tasks, from T1 to T3

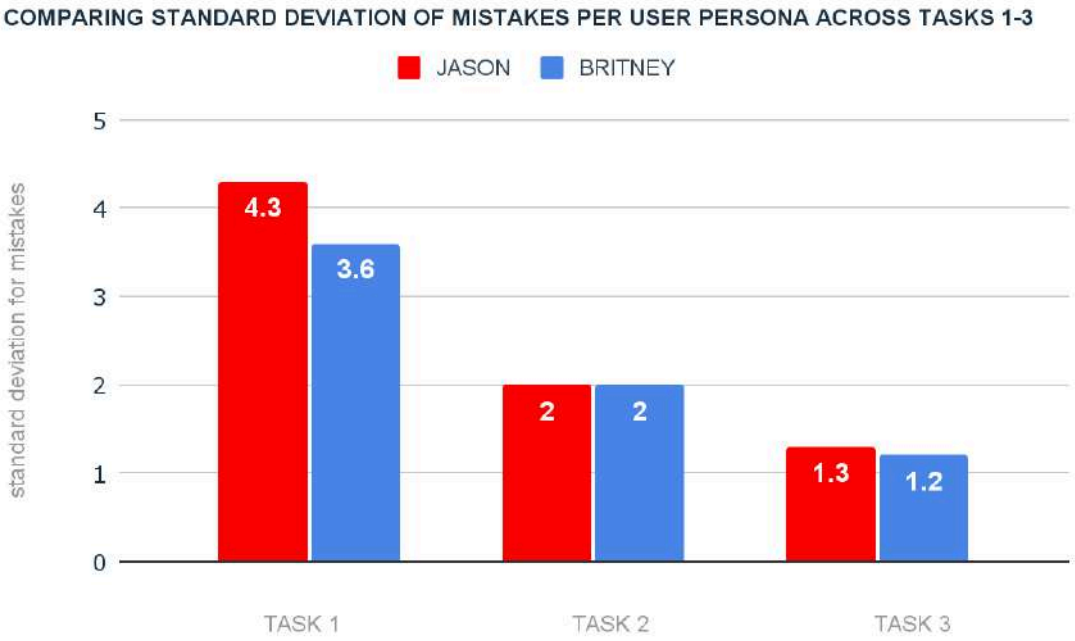


Figure 8. Bar chart comparing standard deviation of mistakes per persona (Jason and Britney) across three tasks, from T1 to T3

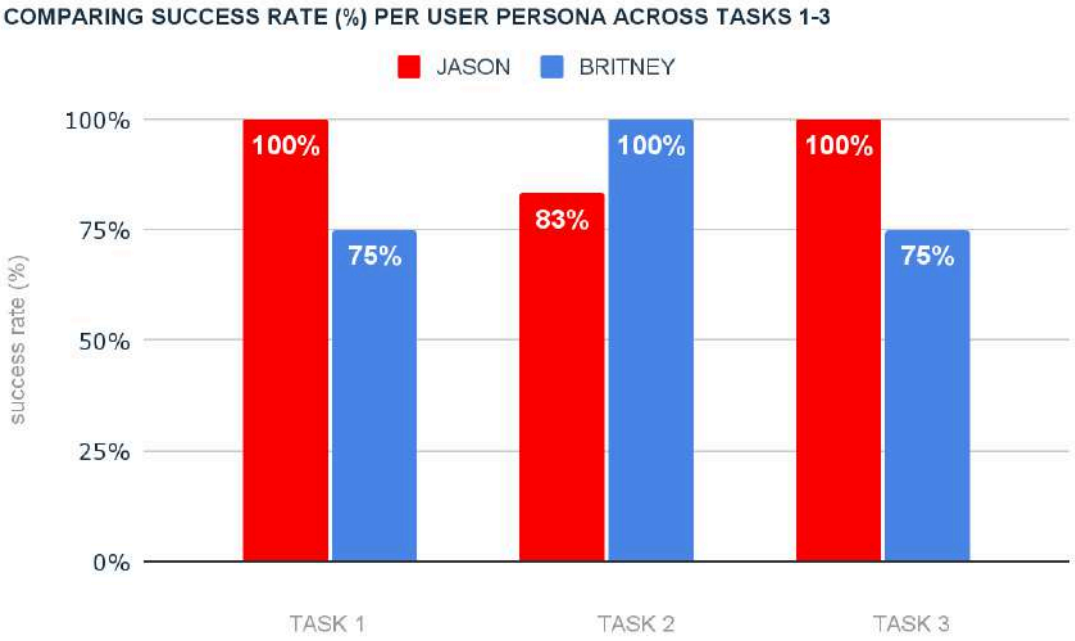


Figure 9. Bar chart comparing success rate (%) per persona (Jason and Britney) across three tasks, from T1 to T3

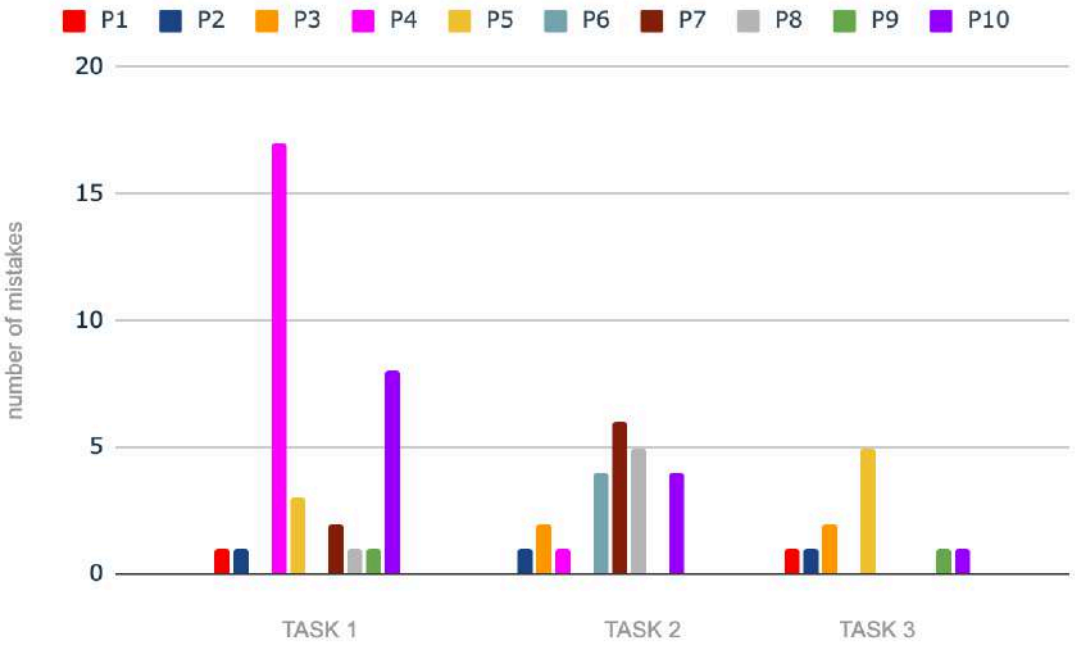


Figure 10. Bar chart with the number of mistakes (10 participants, from P1 to P10; and three tasks, from T1 to T3)

Effectiveness findings for the high-fidelity prototype:

- Finding 1: the overall success rate was 90% for task 1, 80% for task 2 and 100% for task 3. Jason personas achieved higher success rates in task 1 and 3, while Britney personas did only in task 2. This means task 1, although being the longest and the one with most requirements, wasn't as challenging as task 2; task 3 was the easiest to perform across all participants.

- Finding 2: because of an internal bug related to the feature for time setting during the booking activities, 30% of participants had a few issues at that stage, but eventually managed to keep going. This was one of the two places in our prototype with significant effectiveness issues.
- Finding 3: 50% of the participants began the research using the search bar instead of the filters. Only one of them, though, managed to succeed without the usage of filters; 3 others, after scrolling through the map, soon got to the filter section and refined the search from there. The last one kept using the search bar along with the map but failed to fulfil two tasks out of three.The search bar was the second place of the prototype with significant effectiveness issues: participants probably thought to fulfil the task requirements stage by stage, instead of setting all the parameters right from the beginning using the filter section. This behaviour was quite unexpected.
- Finding 4: one participant had to go back to the filters section to check whether he had applied date and time parameters. That is probably due to the fact that, after using filters, the system lacks reminding them to the users throughout navigation but only shows sorted outcomes.
- Finding 5: one participant typed “workplace” in the search bar to look for places where to work. Bars and cafes only showed up when their name was typed, and had no other tags to help users discover them throughout the research.
- Finding 6: P4 is an outlier (17 errors in Task 1): the participant did not read the last requirements of the task and went on using the prototype until he autonomously realised he was missing something. The comparison between average number of mistakes across user personas well depicts this phenomenon: while values being pretty tied throughout task 2 and 3, Jason outscores Britney in task 1 (4:2.5). If we look at figure 10, we can easily see the outlier P4 highlighted against all the other participants.
- Finding 7: for effectiveness, we considered participants who did not successfully complete the tasks. This resulted in having an outlier (P10) for task 1 (as can be easily seen in figure 10) as well as in task 2 (along with P7).
- Finding 8: 20% of the participants expected to see the “add to favourites” button at the end of the cafè details page.
- Finding 9: one participant expected the filter section to allow him to sort results by those liked by friends
- Finding 10: one participant expected to exit the cafè pop-up screen on the map by clicking outside of it instead of closing it from the specific button.
- Finding 11: 40% of participants used the search bar to look for a place where to leave a review, 30% started from the activity section and the remaining 30% went through friends list
- Finding 12: the review section was, at the beginning, misinterpreted by 40% of the participants. Of these, one clicked on the stars icon instead of the “leave a comment” button. Another one clicked on the reviews section thinking it would

open up; the remaining two had issues with overlaying and visibility of star icons when it came to assign a rating.

- Finding 14: 30% of participants thought that by clicking on the review item photo they could access the cafè details page (while the only working option was to click on the “visit” button). This led to an increase in the number of errors performed.
- Finding 15: 40% of participants made mistakes due to the fact that they had to manually clean filters. After launching a research using filters, if a new research has to be done, filters needed to be cleared manually.
- Finding 16: 30% of users did not find the wishlist button at first sight (they thought was down the page)
- Finding 17: 20% of users did not understand clearly where their location was by looking at the map

5.2 Effectiveness analysis

The low-fidelity prototype had a 100% task completion rate across the 3 tasks, whereas the high-fidelity prototype achieved 90%, 80% and 100% across tasks T1-T3 completion rate, indicating that the low-fidelity prototype had a slightly better completion rate. However, the nature of mistakes differed between the two prototypes.

In the low-fidelity prototype, users had issues with discovering filter options and made specific task-related mistakes. They also often made assumptions that were different from the intended design, such as trying to rate directly through profiles. In contrast, the high-fidelity prototype experienced significant issues due to an internal bug related to time settings and the use of the search functionality instead of filters.

Effectiveness problems of the high-fidelity prototype:

- Problem 1: an internal bug related to time setting management during the booking process caused issues for participants who were confused about the nature of the error and could not understand where it came from.
- Problem 2: searches through keywords by using the search tab were not as efficient as filtered searches through filters, leading only one participant out of three among those who actually tried this way to succeed in fulfilling the task.
- Problem 3: The system lacks visibility of status when filters are applied, failing to remind users which parameters they have chosen to sort results.
- Problem 4: the system should allow users to sort results by selecting places liked by friends in the filter section
- Problem 5: the cafes’ pop-up screen should be closed by clicking outside it (on the map) instead of using buttons.
- Problem 6: the cafè details page should be accessible by clicking on the review item picture instead of only by clicking on the visit button.

6 Efficiency

6.1 Efficiency results

1. Overall participants' efficiency (time) information

	Time (avg.)	Time (std. dev.)	Optimum time	Time ratio
Task 1	120.1	43.9	80	1.5
Task 2	34.5	14.5	25	1.3
Task 3	36.1	14.9	40	0.9

Table 6. Table containing information about time to perform tasks for all participants

Figure 11. Line chart comparing optimum time vs average time to complete three different tasks (from T1 to T3) across 10 participants (P1-P10)

2. Jason persona (student): efficiency (time) information

	Time (avg.)	Time (std. dev.)	Optimum time	Time ratio
Task 1	127.3	42.4	80	1.6
Task 2	30	12.8	25	1.2
Task 3	41.8	16.5	40	1.0

Table 7. Table containing information about time to perform tasks for Jason persona

3. Britney persona (remote worker): efficiency (time) information

	Time (avg.)	Time (std. dev.)	Optimum time	Time ratio
Task 1	105.6	46.8	80	1.3
Task 2	42	13.3	25	1.6

Task 3	27.7	7.1	40	0.7

Table 8. Table containing information about time to perform tasks for Britney persona

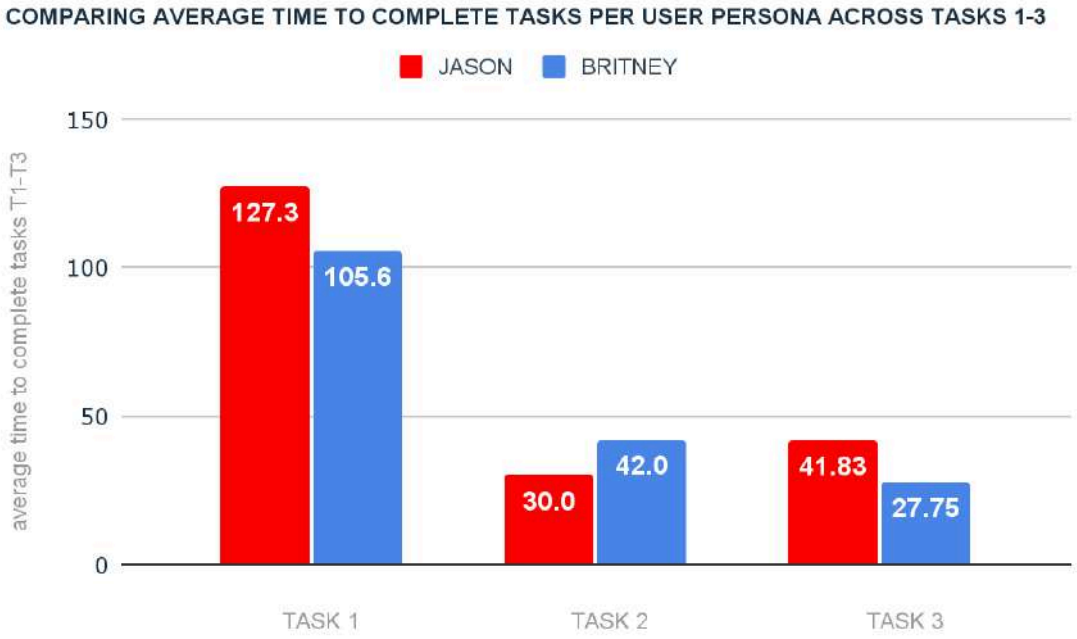


Figure 12. Bar chart with average time to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

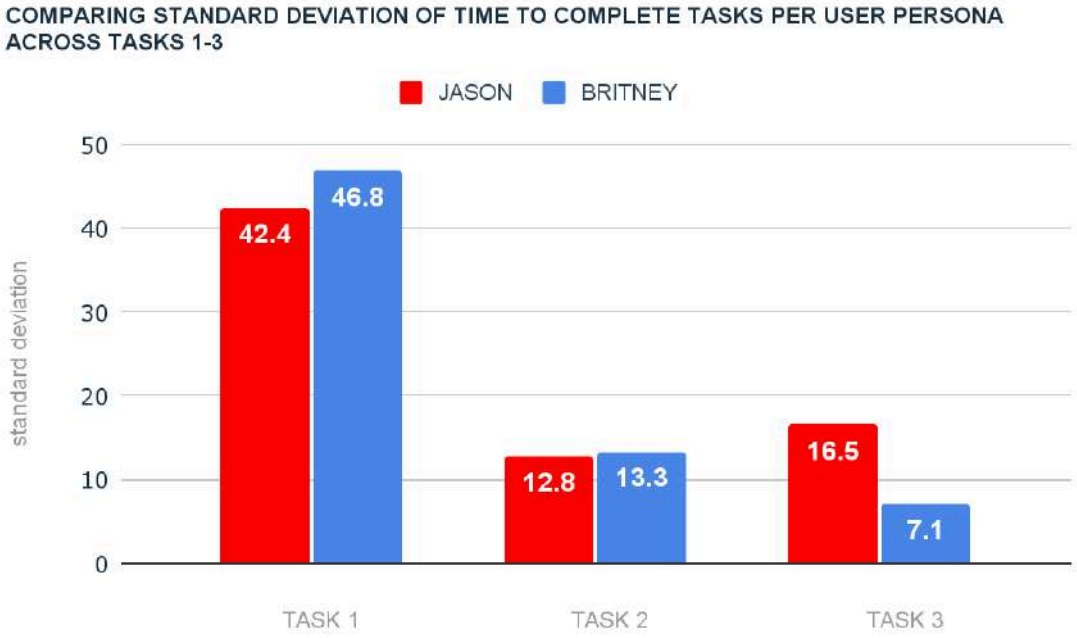


Figure 13. Bar chart with standard deviation of time to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

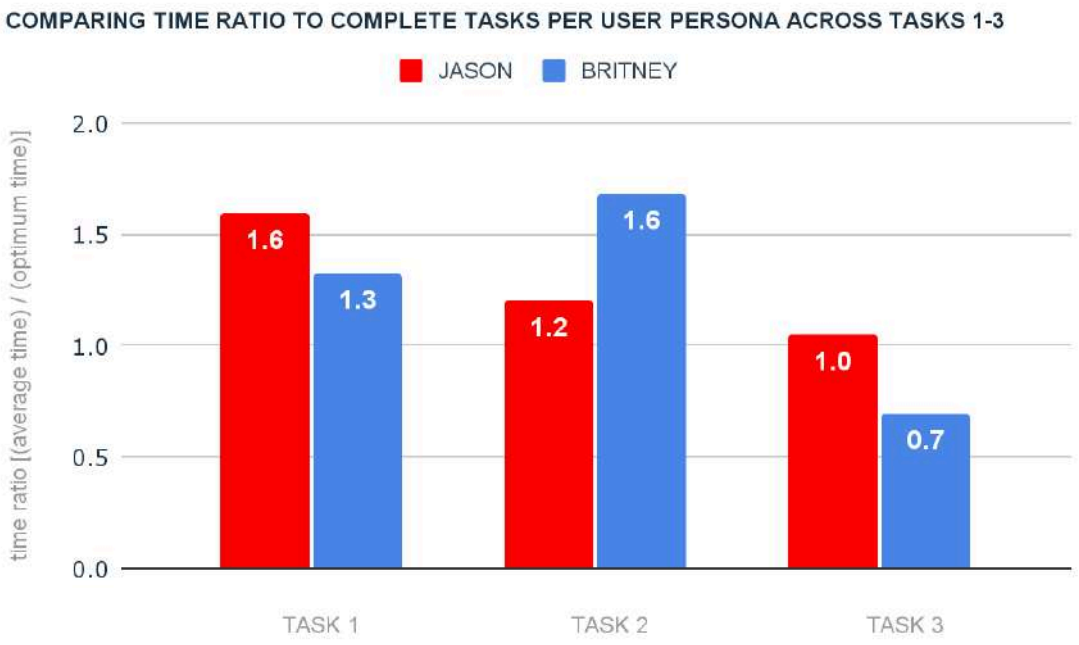


Figure 14. Bar chart with time ratio to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

Figure 15. Line chart comparing optimum time vs average time to complete three different tasks (from T1 to T3) per user personas (Jason, Britney)

1. Overall participants' efficiency (actions) information

	Actions (avg.)	Actions (std. dev.)	Optimum number of actions	Actions ratio
Task 1	21	7.3	14	1.5

Task 2	6.6	2.3	4	1.6
Task 3	8	2.8	8	1

Table 9. Table containing information about actions to perform tasks for all participants

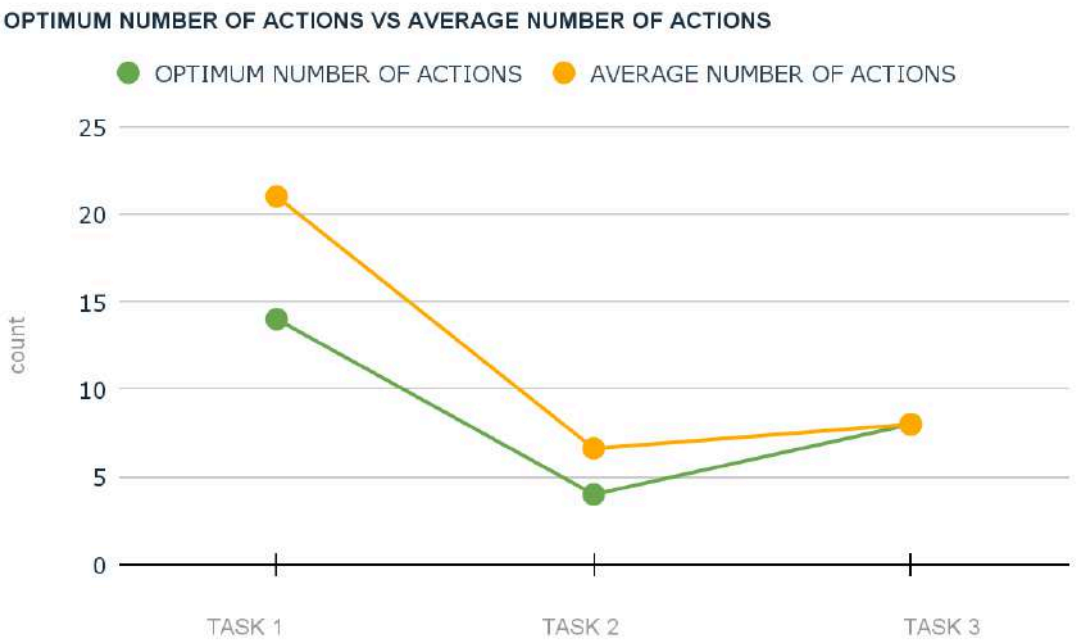


Figure 16. Line chart comparing optimum number of actions vs average number of actions to complete three different tasks (from T1 to T3) across 10 participants (P1-P10)

2. Jason persona (student): efficiency (actions) information

	Actions (avg.)	Actions (std. dev.)	Optimum number of actions	Actions ratio
Task 1	24.2	8.5	14	1.7
Task 2	6.5	2.6	4	1.6
Task 3	9.6	2.8	8	1.2

Table 10. Table containing information about actions to perform tasks for Jason persona

3. Britney persona (remote worker): efficiency (actions) information

	Actions (avg.)	Actions (std. dev.)	Optimum number of actions	Actions ratio
Task 1	14.6	4.4	14	1.0
Task 2	6.6	1.7	4	1.6
Task 3	5.5	0.7	8	0.6

Table 11. Table containing information about actions to perform tasks for Britney persona

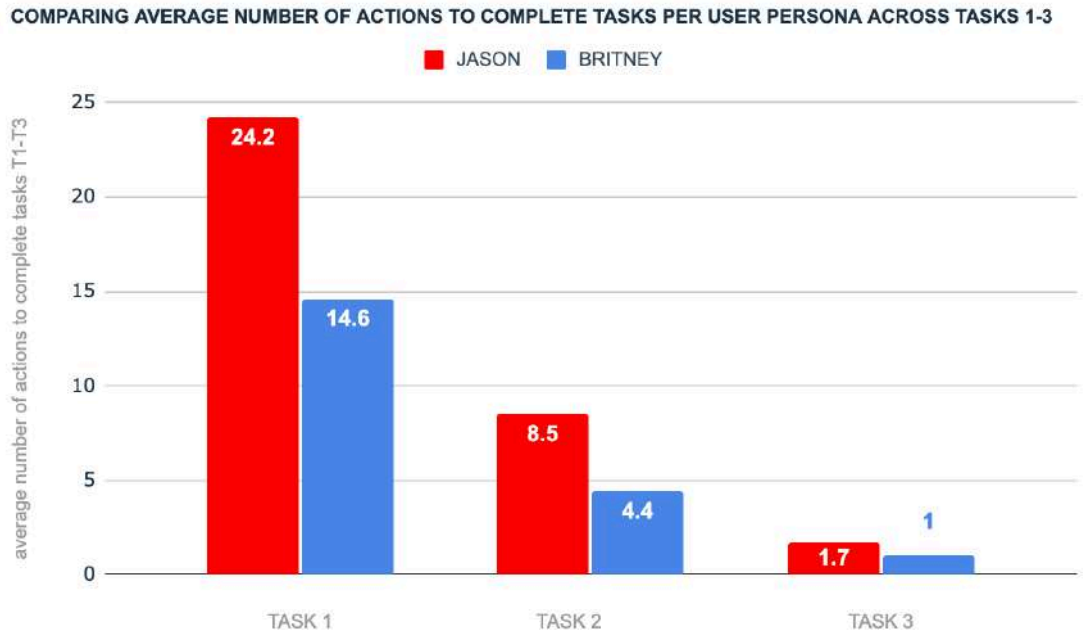


Figure 17. Bar chart with average number of actions to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

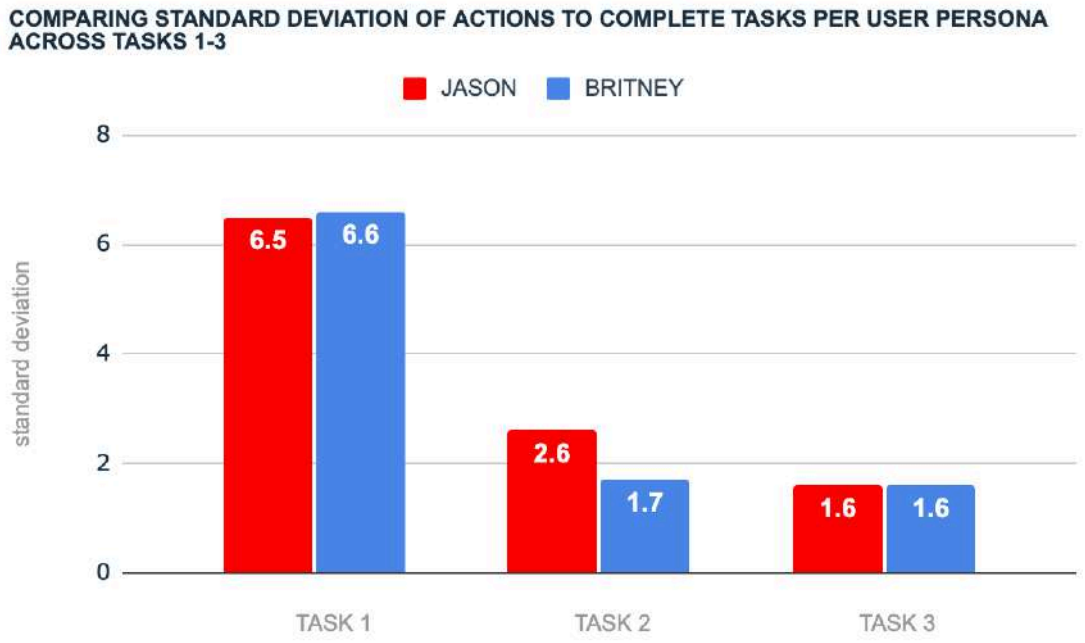


Figure 18. Bar chart with standard deviation of actions to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

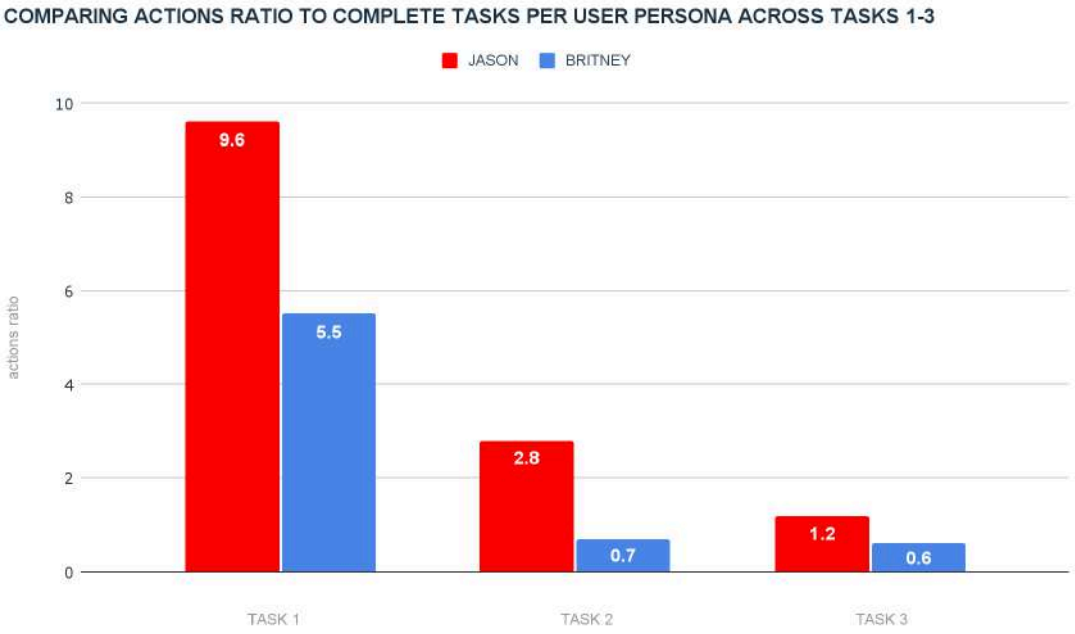


Figure 19. Bar chart with action ratio to complete tasks per persona (Jason and Britney) across three tasks, from T1 to T3

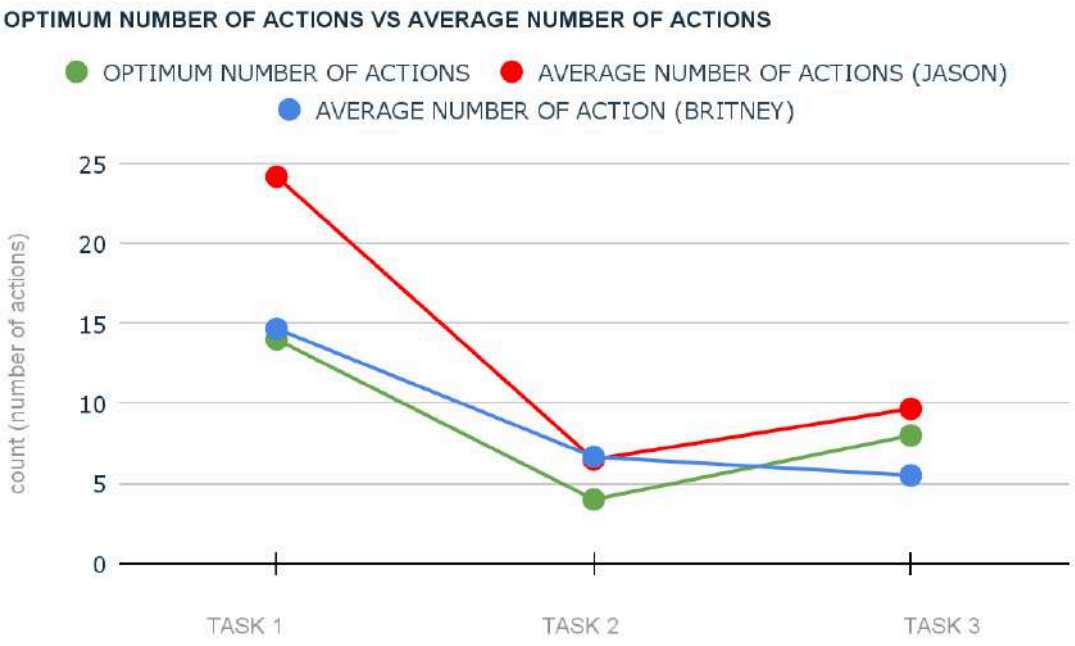


Figure 20. Line chart comparing optimum number of actions and average number of actions per persona (Jason, Britney) to complete tasks across three tasks, from T1 to T3

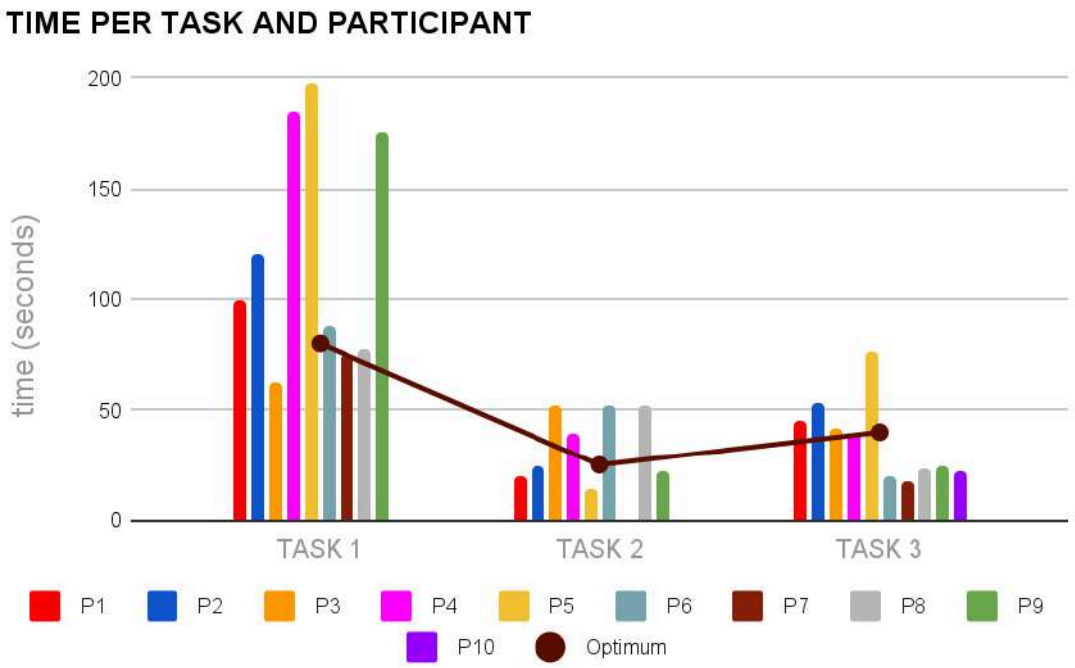


Figure 21. Bar chart with the time to complete the task (10 participants, from P1 to P10; and three tasks, from T1 to T3), compared to optimal value

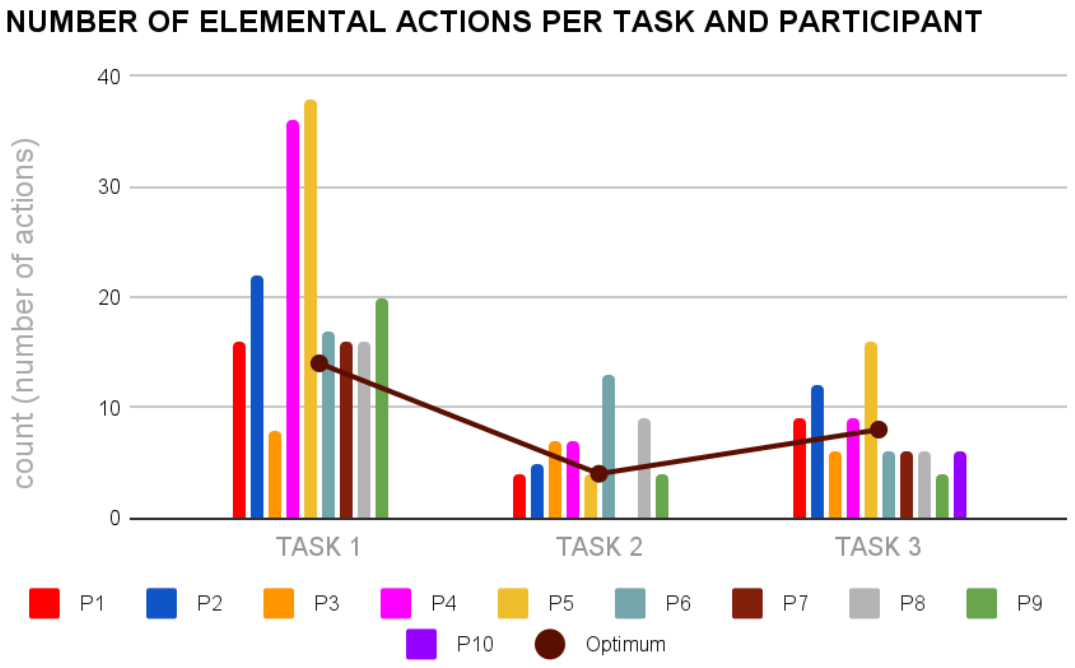


Figure 22. Bar chart with the number of elemental actions to complete the task (10 participants, from P1 to P10, and three tasks, from T1 to T3)

Figure 23. Line chart comparing time ratio vs actions ratio performed by Jason personas to complete three tasks, from T1 to T3

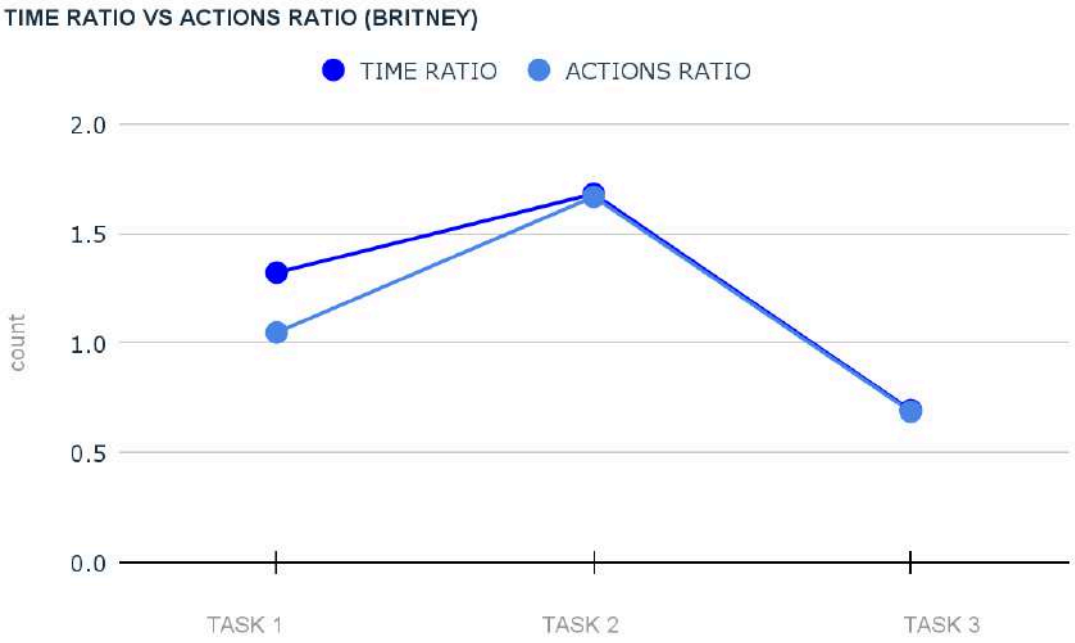


Figure 24. Line chart comparing time ratio vs actions ratio performed by Britney personas to complete three tasks, from T1 to T3

Efficiency findings for the high-fidelity prototype:

- Finding 1: Average time across all participants was higher than optimum time expected for task 1 and 2 but lower for task 3. This means users progressively understood quickly how the system works and managed to speed up their workflow. Although 40% of the users misinterpreted the “leave a review” feature

in task 3, they recovered pretty quickly from errors and managed to complete the task faster than expected, highlighting the overall learnability attribute of the system.

- Finding 2: Although in the first task Jason personas recorded higher average time than Britney personas and optimum time value (due to the fact that P4 is an outlier), the pattern changed significantly for task 2 and 3: in these two average time nearly matches optimum time. Britney personas recorded higher average completion times than optimum values during task 1 and 2, but had a lower value than the optimum in task 3. Time ratio well depicts this behaviour as well: while being higher for Britney personas only in task 2, it is outscored by the one recorded by Jason personas in task 1 and 3. This is mainly due to the fact that task 1 turned out to be longer than expected for all personas, having the majority of efficiency issues.
- Finding 2: 50% of the participants spent too much time trying to use the search bar when looking for the right places. The other half of the participants, who used the filter section from the beginning, recorded lower completion times.
- Finding 3: two outliers were not considered for efficiency analysis: P10 (who failed task 1 and 2) along P7 (who failed task 2). Time performance, along with the number of actions taken, were not taken into account when calculating values for the tasks they failed. P4 is an outlier but was considered since he completed the task.
- Finding 4: P4 successfully understood all the requirements of task 1 after 105 seconds after he had already started. This outcome affected time performances of both overall participants as well as Jason personas.
- Finding 5: P10 (although was not considered in the efficiency analysis) only used the search bar along with the map: it took her 209 seconds to complete task 1 (+89 seconds compared to average completion time) and 67 seconds to complete task 2 (+32.5 seconds compared to average completion time). This performance clearly explains how the search bar was not as efficient as the filters section.
- Finding 6: Participants took more time than expected throughout the booking process due to an internal bug related to time setting management.
- Finding 7: 30% of participants thought that by clicking on the review item photo they could access the cafè details page (while the only working option was to click on the “visit” button). This resulted in an increase in time spent on the screen along with an increase in actions taken.
- Finding 8: one participant expected to scan cafes liked by friends from the filter option instead of going through friends list, leading to an increase in performance time and number of actions occurred.
- Finding 9: misinterpreting how the “leave a review” feature works resulted in an increase in time performance and actions taken for 40% of the participants.
- Finding 10: the overall average number of action across all participants was higher than the optimum number for tasks 1 and 2, while the two values matched precisely int task 3. This shows how issues related to search bar performances affected outcomes in task 1 and how it took more actions than expected for participants to learn how to benefit from the friends section in task

2. Although 40% of the users misinterpreted the “leave a review” feature in task 3, they recovered pretty quickly from errors and managed to complete the task taking the same number of actions as the optimum value was.

- Finding 11: Jason personas’ average number of actions never matched optimum value. They were definitely higher in task 1 (due to the presence of an outlier, P4) and were the same as Britney personas’ for task 2. Britney personas’ average number of actions nearly matched optimum values in task 1 and was even lower than optimum number of actions in task 3. The graph comparing average number of actions as well as action ratio well depicts this pattern as well. If compared to the overall participants average vs optimum number of actions graph, we can see how task 2 was the one which required less actions, while task 1 has a great gap between values due to efficiency issues.
- Finding 12: Throughout the three tasks, only Britney personas achieved a time ratio lower than one (task 3), along with action ratio of 0.7 (task 2) and 0.6 (task 3).
- Finding 13: P5 and P6 took longer than expected to understand the filter section, which resulted in a higher completion time in task 1. Only P5 though recorded an increase in actions taken if compared to the average (for the same task).
- Finding 14: when comparing efficiency per personas (time ratio vs actions ratio), we can see how values recorded by Jason personas never went below threshold value 1, while this happened for Britney persona: the graph shows how the system performed better in terms of efficiency for the latter personas than the first ones.
- Finding 15: manually cleaning filters resulted in an increased number of time and actions for 40% of participants.
- Finding 16: looking for the wishlist at the bottom of the page resulted in an increased time for 30% of users.
- Finding 17: for 20% of users not clearly understanding where their location was in the map resulted in increased time and number of actions.

6.2 Efficiency analysis

The high-fidelity prototype showed how it took participants more actions than the optimum number, while the low-fidelity prototype showed that all users could finish the tasks close to the optimum amount of actions expected by the designers, despite having outliers in each task.

In the low-fidelity prototypes a few participants did not use the filters section as intended, and recorded notable differences in actions performed due to the visibility of the filter section and their expectations of finding significant features like Wi-Fi and laptop allowance icons in the café pop-ups or lists of offers. The participants who took fewer actions in Task 1 either found alternate paths or skipped steps, such as checking restrictions, which were considered important. On the café profiles screen, participants

often tried to interact with non-clickable items like stars and had difficulty differentiating between buttons and information chips.

In the high fidelity prototype initial tasks took longer than expected due to a lack of effectiveness of the search bar and an internal bug related to time setting during booking; despite this, users quickly recovered from mistakes, indicating good learnability. The high-fidelity prototype demonstrated a more pronounced learning curve and greater complexity, which led to variability in user performance and efficiency.

Overall, the high-fidelity prototype showed better effectiveness in real-world scenarios but revealed critical areas for improvement. In terms of efficiency, the high-fidelity prototype had more fluctuations and required more actions due to a richer functionality and initial usability challenges, whereas the low-fidelity prototype was more straightforward, leading to a more consistent but less informative performance evaluation.

Efficiency problems of the high-fidelity prototype:

- Problem 1: the search bar was not as an efficient tool as the filter section. Participants took longer time and more actions to carry out tasks by firstly relying on this feature (since it was the most intuitive) but eventually switching to filters.
- Problem 2: understanding which kind of requirements the task required and adjusting filters setting accordingly resulted in a significant increase of time spent to perform this action.
- Problem 3: an internal bug related to time setting management resulted in an increase of time spent by users trying to understand the nature of the error.
- Problem 4: learning how to use the friends section took users more time than expected. If the filters section allowed a “liked by friends” filter, it probably would have resulted in lower time rates.
- Problem 5: the “leave a review” section was misinterpreted by a few participants, resulting in higher time spent and number of actions occurring to perform the third task.
- Problem 6: manually removing filters increased participants frustration, since it took them longer to perform tasks and had to perform more actions than expected
- Problem 7: some features were hard to find: the wishlist button, as well as current location on the map, required users to spend more time and cary out more actions than we thought they would.

7 User satisfaction: SUS questionnaire

7.1 SUS results

SUS score: 80.5

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1	1	2	4	2
3	5	1	1	0
0	0	1	6	3
9	1	0	0	0
0	1	3	0	6
7	1	1	1	0
1	1	0	4	4
6	3	0	1	0
0	1	2	4	3
9	1	0	0	0

Table12. Results of the SUS questionnaire

SUS findings for the high-fidelity prototype:

- Finding 1: 20% of participants indicated they might use the system only occasionally, giving neutral scores. This suggests that the system does not fully meet the needs of all users, potentially due to varying personal habits or preferences.
- Finding 2: 10% of users found the system unnecessarily complex, while another 10% were neutral. This complexity likely stems from the restrictive navigation options, such as the requirement to use the filter section instead of the search bar for certain tasks and having to manually clean it. Additional complexity was noted in finding places liked by friends. One user said "It doesn't show the time I selected" when setting time during the booking process.
- Finding 3: 10% of participants did not find the system easy to use, and another 10% gave neutral scores. Two participants were unable to complete all tasks, highlighting potential usability issues that hindered a smooth user experience for everyone. The fact that users had trouble finding their position on the map, along with issues in identifying the wishlist button, are hint to that. One user asked "does the rating matter ?" and "does the time matter?" when applying filters.
- Finding 5: 10% of participants disagreed, and 30% were neutral regarding the integration of various functions. This suggests that some features might not have been as accessible or intuitive as expected, such as sorting places liked by friends or removing manually filters.“Is there a filter with friends?”
- Finding 6: 10% of participants found the system inconsistent, and another 10% were neutral. Inconsistencies could be due to the differing functionalities and paths needed to complete tasks, such as the lack of a “liked by friends” filter, the search bar used to look for terms like “halal” and “vegan” (attributes),which disrupted the expected workflow.
- Finding 7: 20% of participants disagreed that most people would learn to use the system quickly. This highlights issues with the learning curve, as some

users struggled to complete tasks and learn the system's features, reflecting a need for more intuitive design and better onboarding. One participant did not understand whether filters were applied: "is the filter selected?" he commented

- Finding 8: 10% of participants found the system cumbersome, while another 10% were neutral. This discomfort may be attributed to the differences in feature performance and the lack of a seamless task flow, requiring users to navigate different paths to achieve different goals. One participant, when applying filters, asked: "what day is it... should I know that? Should I look for this day specifically?".
- Finding 9: 10% of participants did not feel confident using the system, and 20% were neutral. This lack of confidence likely stems from the difficulty some users had in completing tasks and learning the system, as well as the need to shift from the search bar to filters for better results. One user, when trying to fulfil task 3, landed in the profile section and commented:" there's nothing here, am I stupid?"

7.2 Analysis of SUS

The SUS score of the high-fidelity prototype is good because it gained a score of 80.5, showing that the system fulfils usability requirements, although not being excellent.

SUS score for low-fidelity prototype: 84.1.

The low-fidelity prototype achieved a SUS score of 84.1, indicating a higher level of user satisfaction compared to the 80.5 score of the high-fidelity prototype. Users might have found the low-fidelity prototype simpler and more straightforward, which could lead to a perception of higher usability. In contrast, the high-fidelity prototype, while more feature-rich and detailed, might have introduced complexities and usability issues that affected the overall user experience. Despite the high-fidelity prototype's more advanced features, the higher SUS score of the low-fidelity prototype indicates that the simpler design was more intuitive and easier for users to navigate.

I think that I would like to use this system frequently					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Number of replies	1	1	2	4	2

For this sentence, the prototype had received mixed feedback because 20% of participants gave lower scores, probably due to their habits or personal needs; 20% gave a neutral answer, mainly because they might use it only from time to time and not often. The remaining 60% would be an active user of the system, since it satisfies their needs.

I found the system unnecessarily complex

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	3	5	1	1	0

For this sentence, the prototype had received good feedback because only 10% of users found the system complex, and another 10% gave a neutral score. The issues may be linked to the fact that to successfully fulfil task 1 requirements users had only one way to do it (through filter sections and not through search bar). Some concerns were raised also when trying to find places liked by friends (task 2). The remaining 80% didn't find the system complex, meaning they were able to navigate through it pretty easily.

I thought the system was easy to use					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	0	0	1	6	3

For this sentence, the prototype had received good feedback because only 10% of the participants were neutral, meaning the system somehow did not seem to be easy to use for everyone, especially if we consider that two participants did not manage to complete all tasks. The other 90% agrees with the sentence, indicating the majority did not have issues using the app.

I think that I would need the support of a technical person to be able to use this system					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	9	1	0	0	0

For this sentence, the prototype had received great feedback because 100% disagrees with the sentence: this means the systems did not integrate features that were too difficult for users to understand how to use.

I found the various functions in this system were well integrated					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	0	1	3	0	6

For this sentence, the prototype had received mixed feedback because 10% of the participants disagreed and 30% answered in a neutral way: this was probably because some features should have been accessible through different ways (for example, sorting places liked by friends was expected to be a filter option). The remaining 60% thought functions were overall well integrated in the app.

I thought there was too much inconsistency in this system.					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	7	1	1	1	0

For this sentence, the prototype had received good feedback because only 10% of the participants answered in a neutral way and another 10% agreed with the sentence. This was probably because some features felt inconsistent with some others, for example the fact that the filter section did not provide a “liked by friends” sorting options, but users had to follow on a completely different path to fulfil the task. The remaining 70% believed the system was overall very consistent.

I would imagine that most people would learn to use this system very quickly					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	1	1	0	4	4

For this sentence, the prototype had received good feedback because only 20% disagreed with the statement, highlighting how some participants had issues in completing tasks and learning their way around the system (2 participants did not manage to complete all the tasks). The remaining 80%, though, did not find the system hard to learn.

I found the system very cumbersome to use					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Number of replies	6	3	0	1	0

For this sentence, the prototype had received mixed feedback because only 10% of the participants agreed with the sentence, highlighting how the overall flow turned out to be uncomfortable for someone. This is mainly due to the fact that some features worked better than others and provided more detailed results (search bar vs filter section), as

well as using different paths to fulfil different tasks instead of making a seamless flow. The other 90% did not find the system uncomfortable to use.

I felt very confident using the system					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Number of replies	0	1	2	4	3

For this sentence, the prototype had received mixed feedback because 10% of the participants disagreed with the statement, while 20% answered in a neutral way. This is mainly due to the fact that not all of the participants managed to complete the tasks, as well as it took some time for users to learn how to use features and navigate the system (as can be seen in graphs comparing average values vs optimum values); for instance, 40% of the participants began by exploring search bar function and progressively shifted to filters. The remaining 70% felt confident using the system.

I needed to learn a lot of things before I could get going with this system					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Number of replies	9	1	0	0	0

For this sentence, the prototype had received good feedback because 100% of the users disagree with the statement, highlighting the system's learnability attribute.

Tables 13-22. Information of the replies to all (10) of the SUS sentences

SUS problems of the high-fidelity prototype:

- Problem 1: The search bar is not as efficient as the filters selection because it lacks sufficient information to help users fulfil task requirements. Many users even used it to search for attributes and common names but ended up with nothing.
- Problem 2: The absence of a "liked by friends" sorting option in the filter section causes inconsistency and forces users to take alternative, less intuitive paths to find this information.
- Problem 3: Some features in the system are not immediately accessible or intuitive, as evidenced by users having difficulty finding and using specific functions like sorting and filtering effectively.
- Problem 4: The overall flow of the app is uncomfortable for some users, especially when transitioning between different features that do not provide a seamless experience (like having to manually clean filters).
- Problem 5: some features were hard to understand and find, like the wishlist at the top of the cafè detail page and current location of users on the map.

8 User experience: UEQ questionnaire

8.1 UEQ results

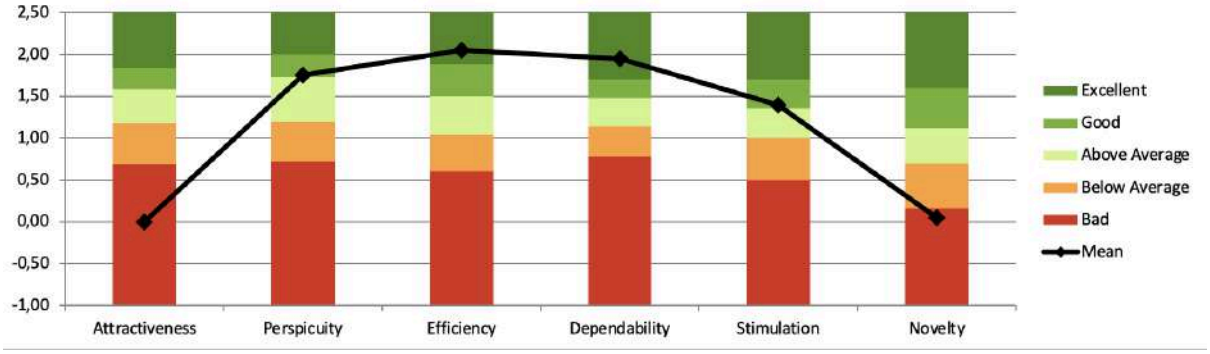


Figure 25. UEQ results

UEQ findings for the high-fidelity prototype:

- Finding 1: Some users appreciated the prototype layout and visual elements, while others found it lacking in appeal. This is mainly due to personal taste and the fact that the prototype still needs aesthetic refinement.
- Finding 2: the majority of users did not find the prototype attractive, indicating that it may lack interactive or innovative features. The prototype works with basic features and has no ground breaking ones to showcase; most of the features presented were relatively simple and already exploited in many other digital products.
- Finding 3: most participants found the system easy to understand and navigate, suggesting that they could quickly understand how to use the system without extensive learning. This is mainly because, although features may not be cutting edge, they are easy to use and to learn. Relying on well-known features helps users learn how to use the system way faster.
- Finding 4: users felt the system was efficient, allowing them to complete tasks quickly and without unnecessary delays. Participants managed to understand how the overall system works and managed to navigate it effectively throughout the tasks (success rates explain this).
- Finding 5: the system was seen as reliable and consistent by most users, which built their confidence in its performance. This is probably due to the fact that users found the system efficient, therefore reliable.
- Finding 6: some users did not perceive the system as innovative, feeling that it lacked unique or surprising elements. The system mainly relies on already known features and functionalities (maps, filter section, friends list, booking process…) and does not showcase any innovative element.
- Finding 7: Although the system was easy to use and learn, some users were not initially attracted to it and found it less engaging over time. This is probably due to the fact that, across tasks, functionalities to be used do not vary too much.

8.2 Analysis of UEQ

- **Attractiveness**: the high-fidelity prototype obtains a bad result because the system lacks visual appeal or an engaging interface. Users disliked it probably because the prototype still needs a lot of aesthetic refinement, and because it did not display innovative functionalities.
- **Perspicuity**: the high-fidelity prototype obtains a good result because most participants found the system clear and easy to understand. The learnability curve of the prototype shows how participants progressively gained familiarity with the system, making its functionalities easy to understand, straightforward and already known from other products.
- **Efficiency**: the high-fidelity prototype obtains an excellent result because the majority of users rated the system as efficient, indicating that once users understood how to navigate the system they could perform tasks quickly and effectively, demonstrating that the system's functionalities are well-optimised for performance. The prototype displayed only features useful to complete the tasks and nothing useless or counterproductive.
- **Dependability**: the high-fidelity prototype obtains an excellent result because users felt confident that the system was reliable and performed consistently without significant errors. The features deployed - although not being innovative - were easily predictable, ensuring a safe and secure interaction throughout the whole system.
- **Stimulation**: the high-fidelity prototype obtains an average result because participants probably found the system less engaging or exciting, likely due to a lack of interactive or innovative elements. The prototype does not display any groundbreaking features and fails to surprise users, making the process less exciting and motivating. The aim of the app itself, along with its tasks, are not so exciting and motivating overall.
- **Novelty**: the high-fidelity prototype obtains a bad result because users did not find the system innovative or new, possibly because the features and design are too conventional and do not offer unique or surprising elements that stand out from other systems. The system is not creative at all, and showcases already known features and flows, failing to grasp users' attention.

UEQ problems of the high-fidelity prototype:

- Problem 1: the high fidelity prototype is not attractive to users.
- Problem 2: the high-fidelity prototype is not creative enough and fails to catch users' interest.

9 General impressions of participants

9.1 What are the main problems you have found while using this prototype?

Findings on main problems

- Finding 1: 50% of the testers found the prototype confusing due to the buttons and labels and also due to the elevated number of actions to possibly be taken.

- Finding 2: 30% complained about the visibility of system status after the reservation, expecting a message of booking confirmation, the possibility to see past and future reservations and content changing after filtering.
- Finding 3: 30% of the testers found problems related to position and clarity of buttons or labels.
- Finding 4: 10% looked for a connection between friends and the cafes shown in the map.
- Finding 5: 10% of users found no problems with the prototype.

9.2 What is the part of the prototype that has been more difficult to understand? Why?

Findings on parts of the prototype more difficult to understand:

- Finding 1: 30% found the pop-up information not enough to perform the first task. In particular related to the date and time, they expected to see from the pop-up if the place was available for the indicated period.
- Finding 2: 10% had problems with the navigation in the map and the filtering.
- Finding 3: 10% stated a problem related to the activity section. They expected to find more activities than just the reservations such as the action to leave a review.
- Finding 4: 10% of users found difficulties with the functionalities not related to the map. This user, more than others, tried to use almost only the app to do every action to be performed for every task.
- Finding 5: 10% of users think that the bottom navigation bar was not enough visible.

9.3 What have you liked most of the prototype? Why?

- Finding 1: 40% of users liked the map and its functionalities.
- Finding 2: 20% of users found the filter section useful and complete.
- Finding 3: 20% of users liked that they could do the tasks in different ways.
- Finding 4: 10% of users liked the friend feature to see the recommended places.
- Finding 5: 10% of users found the bottom menu intuitive and well organized.

9.4 Can you describe your overall experience with this prototype?

Findings on the overall experience:

- Finding 1: 90% of users found the prototype usable and learnable. They liked its functionalities.
- Finding 2: 20% of users disliked the style and aesthetic of the prototype.
- Finding 3: 10% of the users asked for more visibility of system status. The user complained about the lack of reaction to every action in the prototype.

10 Relevant observations made

Insights after observing how the high-fidelity prototype was used:

- Insight 1 (negative): to search a place, instead of using the filter section as expected, users tried to search directly from the search bar.
- Insight 2 (positive): once the users found the filter section they learned how to use the search functionality.

- Insight 3 (negative): the implementation of the cards, in particular the cafe's detailed ones in the friend's profile, were not clickable. Users expected to click the image to access the detail page, but only the name was clickable.
- Insight 4 (negative): users expected to exit from the pop-up of cafes in the map just by clicking outside it instead of having only the "Close" button.
- Insight 5 (negative): users didn't know how to find the friend who was recommending the halal place. They just did it randomly and only because of the content of the friends recommendation screen they could complete task 2. One of the users suggested adding a filter in this section to find the right friend recommendation.
- Insight 6 (positive): most of the users had no trouble leaving a review, they did it very quickly and confidently. The problem here was mostly about the style of the page that would hide some important actions to perform the task (such as selecting the 5 stars). Anyway, these can be considered small mistakes.
- Insight 7 (negative): in some cases users preferred the search directly from the map. We expected them to search more directly from filters.
- Insight 8 (negative): users wanted to find more information in the pop-up of the cafe's details in order to take more consciously the decision of where to book.
- Insight 9 (positive): the fact that to accomplish a task there were different paths was appreciated by most of the users.
- Insight 10 (negative): users asked for more visibility of system status. This means that more actions need to have a reaction to be shown to the users. Sometimes in the prototype after an action there was no corresponding feedback and this confused some users (for example when filtering halal in the map doesn't change what it is shown).

11 Summary of usability problems

High-fidelity prototype	**Problem**	**Severity** (cosmetic, minor, major, catastrophe)
Problem 1	Filters Reload	Major. One of the major things in the high-fidelity prototype is that we didn't implement a "Clean Filters" button so the users didn't realise that they still had the filters of the last task.
Problem 2	Filters Button	Minor. The filters button was not used by some of the users, which could mean that it was not visible or clear enough that it was a filter button.
Problem 3	Search Bar Navigation	Minor. The search bar on this prototype just filters the list of cafes available,

		some of the users tried to look for requirements from the cafes typing words like “vegan”, “wifi” and expected to have an automatic filter of the cafes available with these requirements.
Problem 4	Friends Review	Minor. Users expected to see their friends' reviews appear in the reviews shown at the cafe profile, as another pathway to follow.
Problem 5	Map Navigation	Cosmetic. In this prototype it was not always clear to the users where their current location was and they were not sure at first in what area they should look 2 km away from. Users were expecting that when they were in the pop-up by clicking the map the pop-up would close.
Problem 6	Wishlist Button	Cosmetic. Some of the users scrolled down the page profile to look for the wishlist, it could be beneficial to highlight the wishlist button more.

12 Proposals to improve the prototype

Improvement	**Problem(s) addressed**	**Description of improvement**
Improvement 1	Search Bar **Problem 3**	Add more functionality to the search bar by having the possibility of not only searching for names, but also key words of requirements and have the results shown automatically.
Improvement 2	Filters **Problems 1 and 2**	Even though the button says “Filters” specifically, for the next iteration we can try to change the font size or the overall colour of the button so it is noticed by the users. Implement a “Clean Filters” button in the filters page so that the users can reload them with one click.
Improvement 3	Reviews **Problem 4**	Implement that at the top of the reviews shown in the cafe profile, you can see what your friends let for review in that

		specific cafe and what google users left for review.
Improvement 3	Aesthetics of the prototype **Problems 5 and 6**	Overall implement more UI libraries like bootstrap in order to change the aesthetics of the prototype to elements and icons that are more attractive to the users. Have a clear design and implement a colour palette, font and high-resolution images that the developers need to follow throughout the design for consistency.
Improvement 4	Prototype for Android and IOS **Problems 3, 5 and 6**	Take into account that users have different OS and the app needs to be developed and prepared for users with both Android and IOS, so Sitdown is a success and adapts to different expectations from users.

Improvement 1:

Figure 26. Improvement 1

Improvement 2:

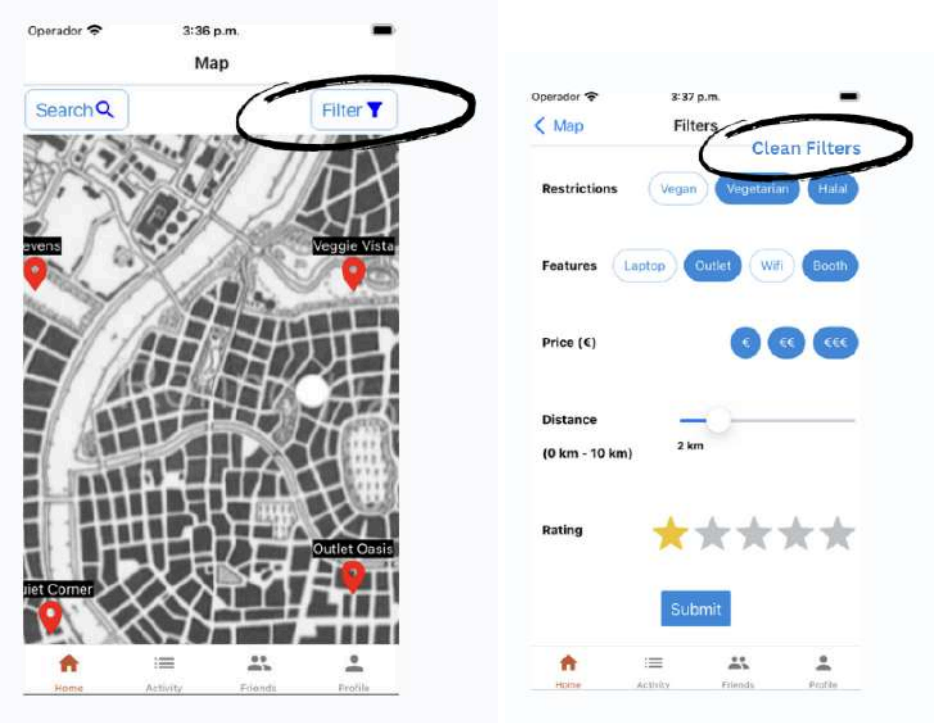


Figure 27. Improvement 2

Improvement 3:

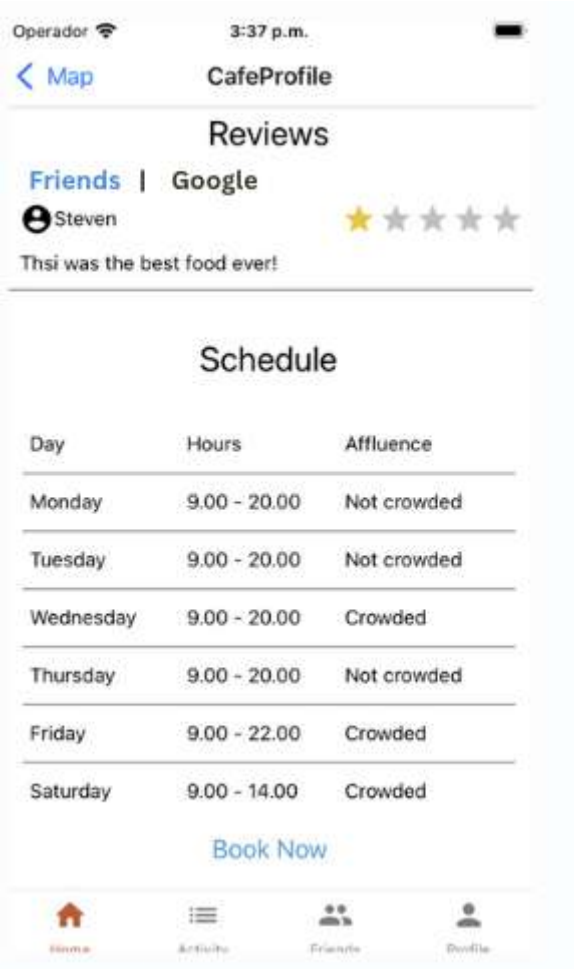


Figure 28. Improvement 3

13 General conclusions

The HCI project challenged us to develop a business idea from value proposition to a high-fidelity prototype. For our team's participants, this was their first experience developing an idea from scratch to such a high level of detail. The many challenges we faced along the way will help us avoid making similar mistakes in the projects ahead of us.

The three iterations of this research project, namely Context of Use analysis, Low-fidelity prototyping, and High-fidelity prototyping, all posed different challenges and provided valuable learnings as a result.

During the Context of Use analysis, we learned that the original questionnaire template has to be improved according to the findings you made during your interviews. Some questions become abundant while new ones arise. For the Low-fidelity Prototyping, we used a cutout screen to create a more realistic experience with the prototype. This approach led to a lot of difficulties during the testing because a lot of individual parts had to be moved. In the future, we could print the individual screens with phone frames. We learned to be more pragmatic when prototyping. In this setp users that participated during the testing sessions were often confused with some screens and the thinking aloud technique had to be sometimes reminded by the evaluators.

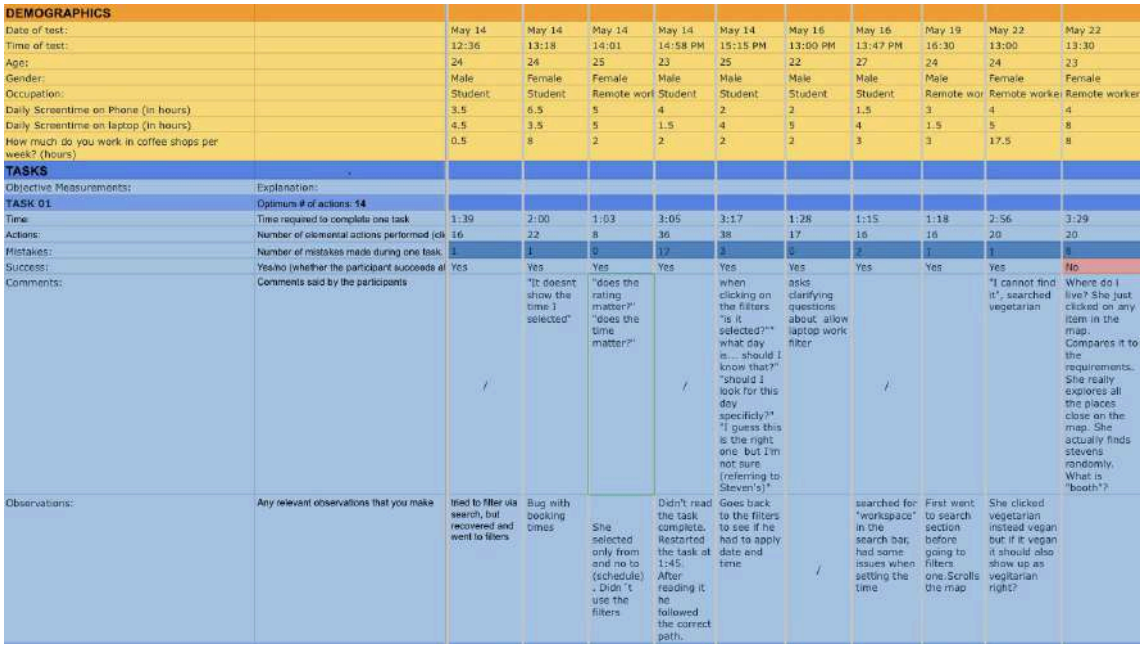
The main challenge for the high-fidelity prototyping was the coordination of the team. The time pressure made us jump into the implementation prematurely before specifying elaborately. This proved to cost more time than it saved in the end. We learned that time spent early can save time in the long run. Having a template and a clear plan about the coordination of this step would have proved more effective and it would have been more clear for the developers to follow it.

Regardless of the challenges, we created a prototype that was perceived as valuable by our subjects. Every iteration of this project tested new hypotheses and created new insights. We believe that further iterations of this research could help design a solution that would benefit remote workers, students, and coffee shops alike.

Our HCI Project was successful and provided many tools for future projects. Mistakes were made, but they all proved valuable learning experiences. Most of them can be reduced to assumptions made based on our understanding, making the significance of a human-centered design approach the most important learning of this project.

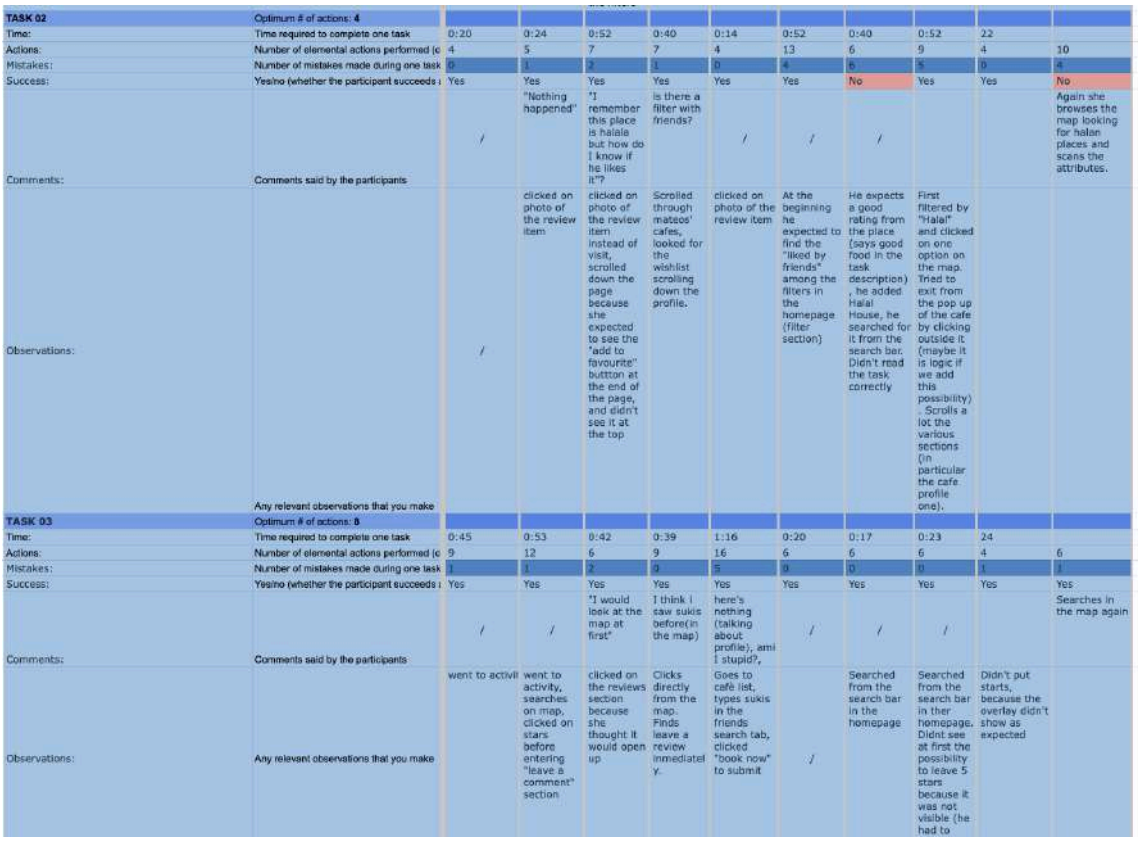
Annex A. Gathered data

1. **Notes taken by the evaluators during user tests.**
    a. Link to the full template: Usability Questionnaire Template



DEMOGRAPHICS											
Date of test:		May 14	May 14	May 14	May 14	May 14	May 16	May 16	May 19	May 22	May 22
Time of test:		12:36	13:18	14:01	14:58 PM	15:15 PM	13:00 PM	13:47 PM	16:30	13:00	13:30
Age:		24	24	25	23	25	22	27	24	24	23
Gender:		Male	Female	Female	Male	Male	Male	Male	Male	Female	Female
Occupation:		Student	Student	Remote wor	Student	Student	Student	Student	Remote wor	Remote worke	Remote worke
Daily Screentime on Phone (in hours)		3.5	6.5	5	4	2	2	1.5	3	4	4
Daily Screentime on laptop (in hours)		4.5	3.5	5	1.5	4	5	4	1.5	5	8
How much do you work in coffee shops per week? (hours)		0.5	8	2	2	2	2	3	3	17.5	8
TASKS											
Objective Measurements:	Explanation:										
TASK 01	Optimum # of actions: 14										
Time:	Time required to complete one task	1:39	2:00	1:03	3:05	3:17	1:28	1:15	1:18	2:56	3:29
Actions:	Number of elemental actions performed (cli	16	22	8	36	38	17	16	16	20	20
Mistakes:	Number of mistakes made during one task	1	1	0	17	1	0	2	1	1	8
Success:	Yes/no (whether the participant succeeds at	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Comments:	Comments said by the participants	/	"It doesnt show the time I selected"	"does the rating matter?" "does the time matter?"	/	when clicking on the filters "is it selected?"" what day is... should I know that?" "should I look for this day specificly?" "I guess this is the right one but I'm not sure (referring to Steven's)"	asks clarifying questions about allow laptop work filter	/		"I cannot find it", searched vegetarian	Where do I live? She just clicked on any item in the map. Compares it to the requirements. She really explores all the places close on the map. She actually finds stevens randomly. What is "booth"?
Observations:	Any relevant observations that you make	tried to filter via search, but recovered and went to filters	Bug with booking times	She selected only from and no to (schedule) . Didn't use the filters	Didn't read the task complete. Restarted the task at 1:45. After reading it he followed the correct path.	Goes back to the filters to see if he had to apply date and time	/	searched for "workspace" in the search bar, had some issues when setting the time	First went to search section before going to filters one. Scrolls the map	She clicked vegetarian instead vegan but if it vegan it should also show up as vegitarian right?	

Figure 29. Usability Questionnaire Template 1



TASK 02	Optimum # of actions: 4										
Time:	Time required to complete one task	0:20	0:24	0:52	0:40	0:14	0:52	0:40	0:52	22	
Actions:	Number of elemental actions performed (c	4	5	7	7	4	13	6	9	4	10
Mistakes:	Number of mistakes made during one task	0	1	2	1	0	4	6	5	0	4
Success:	Yes/no (whether the participant succeeds a	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Comments:	Comments said by the participants	/	"Nothing happened"	"I remember this place is halala but how do I know if he likes it"?	is there a filter with friends?	/	/	/			Again she browses the map looking for halan places and scans the attributes.
Observations:	Any relevant observations that you make	/	clicked on photo of the review item	clicked on photo of the review item instead of visit, scrolled down the page because she expected to see the "add to favourite" buttton at the end of the page, and didn't see it at the top	Scrolled through matsos' cafes, looked for the wishlist scrolling down the profile.	clicked on photo of the review item	At the beginning he expected to find the "liked by friends" among the filters in the homepage (filter section)	He expects a good rating from the place (says good food in the task description) , he added Halal House, he searched for it from the search bar. Didn't read the task correctly	First filtered by "Halal" and clicked on one option on the map. Tried to exit from the pop up of the cafe by clicking outside it (maybe it is logic if we add this possibility) . Scrolls a lot the various sections (in particular the cafe profile one).		
TASK 03	Optimum # of actions: 8										
Time:	Time required to complete one task	0:45	0:53	0:42	0:39	1:16	0:20	0:17	0:23	24	
Actions:	Number of elemental actions performed (c	9	12	6	9	16	6	6	6	4	6
Mistakes:	Number of mistakes made during one task	1	1	2	0	5	0	0	0	1	1
Success:	Yes/no (whether the participant succeeds a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Comments:	Comments said by the participants	/	/	"I would look at the map at first"	I think I saw sukis before(in the map)	here's nothing (talking about profile), ami I stupid?,	/	/	/		Searches in the map again
Observations:	Any relevant observations that you make	went to activi	went to activity, searches on map, clicked on stars before entering "leave a comment" section	clicked on the reviews section because she thought it would open up	Clicks directly from the map. Finds leave a review immediatel y.	Goes to café list, types sukis in the friends search tab, clicked "book now" to submit	/	Searched from the search bar in the homepage	Searched from the search bar in ther homepage. Didnt see at first the possibility to leave 5 stars because it was not visible (he had to	Didn't put starts, because the overlay didn't show as expected	

Figure 30. Usability Questionnaire Template 2

2. UEQ Questionnaire

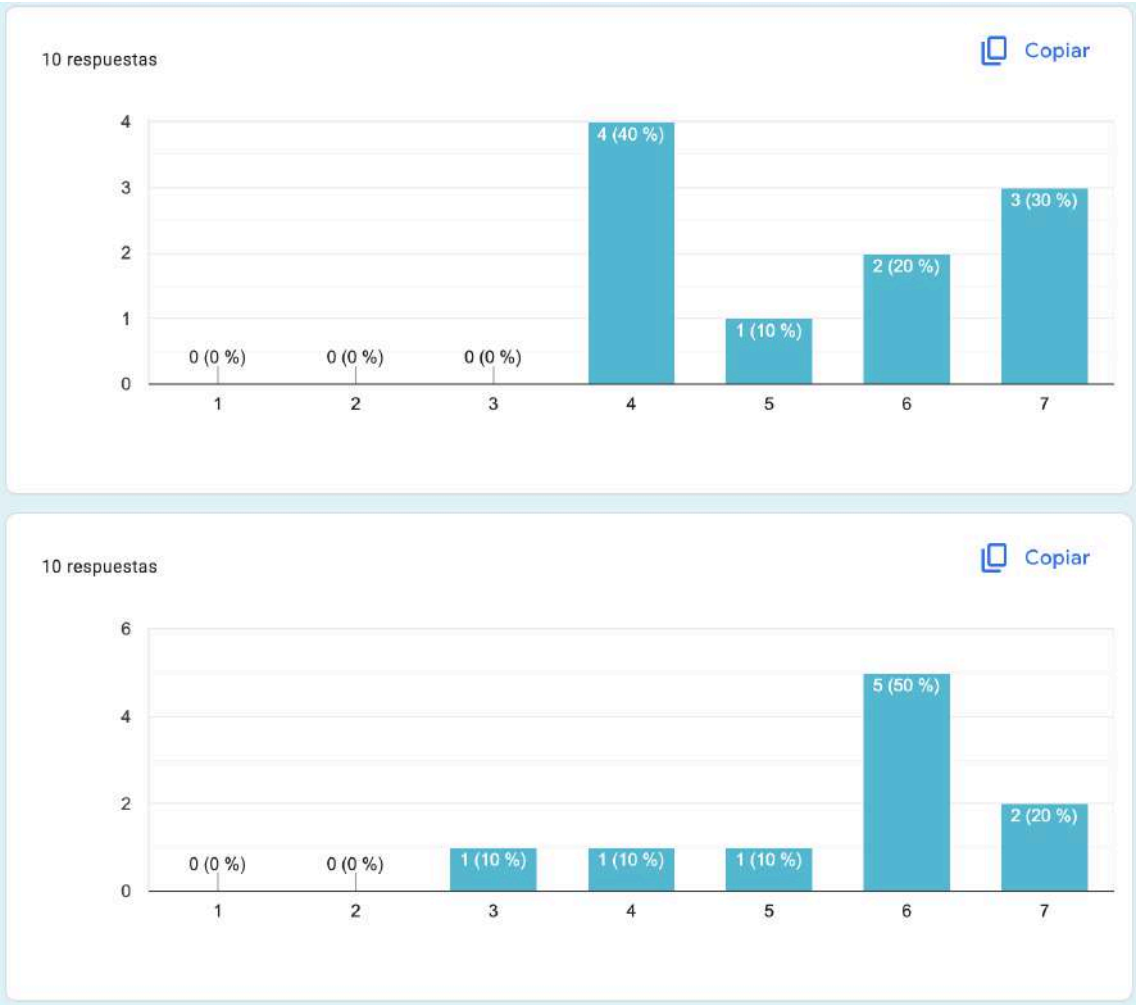


Figure 31. UEQ Questionnaire Answers 1

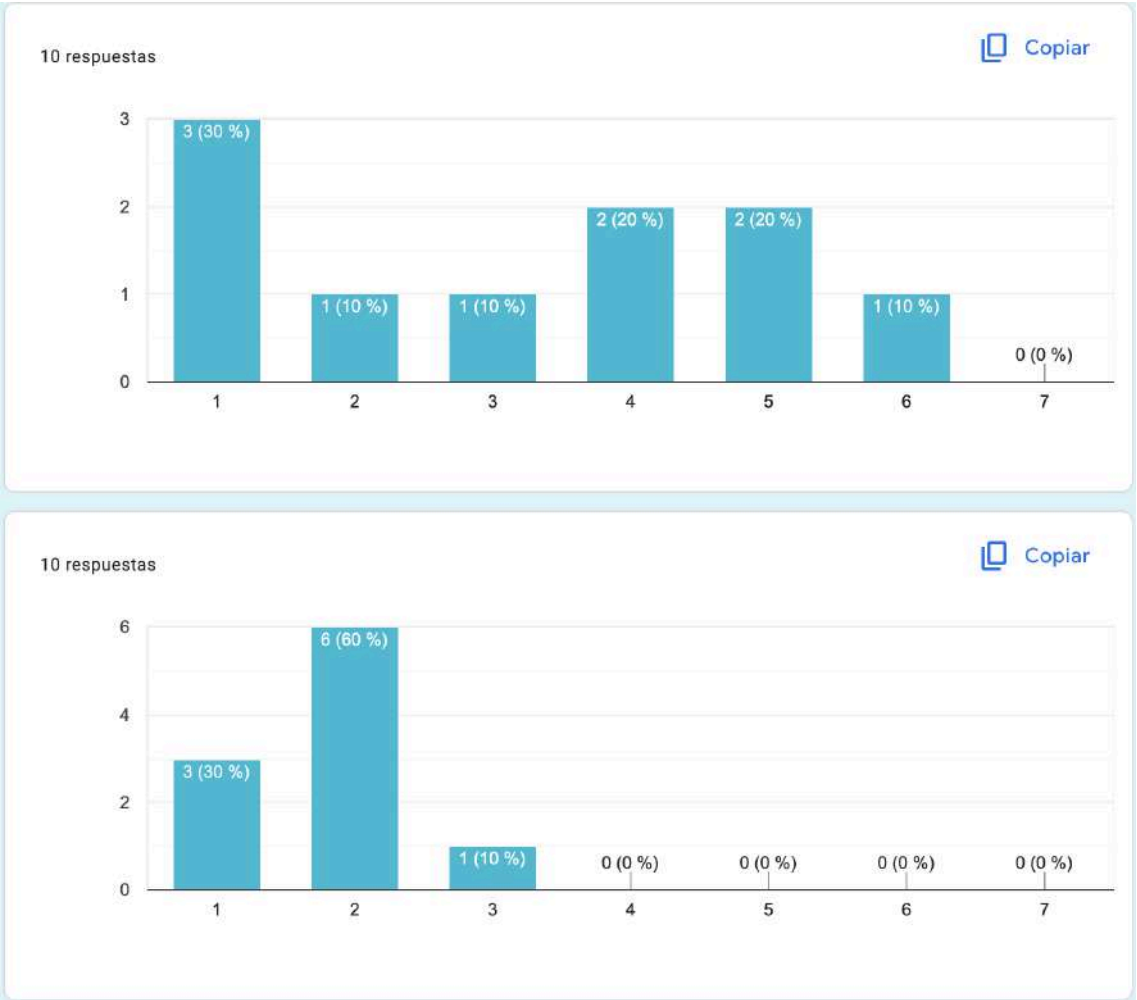


Figure 32. UEQ Questionnaire Answers 2

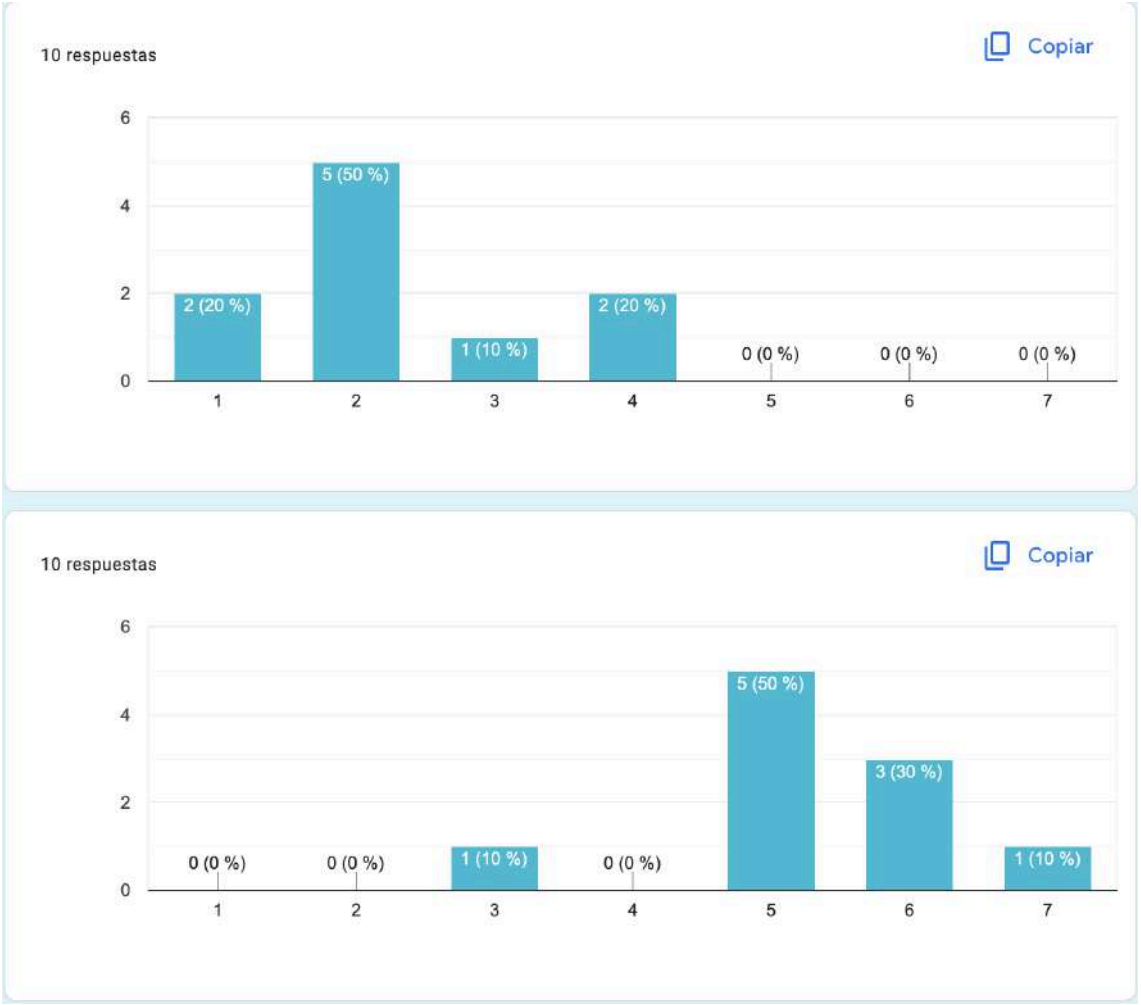


Figure 33. UEQ Questionnaire Answers 3

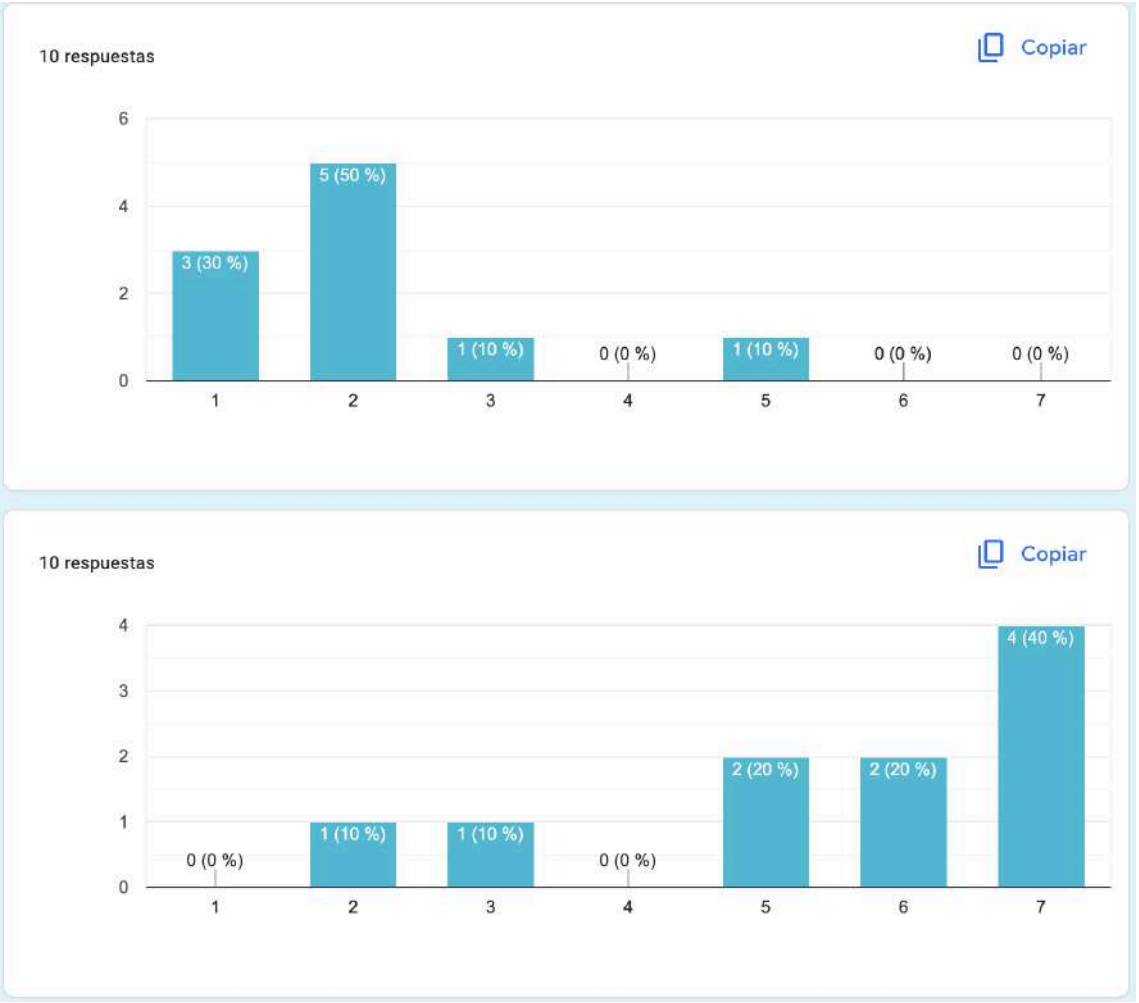


Figure 34. UEQ Questionnaire Answers 4

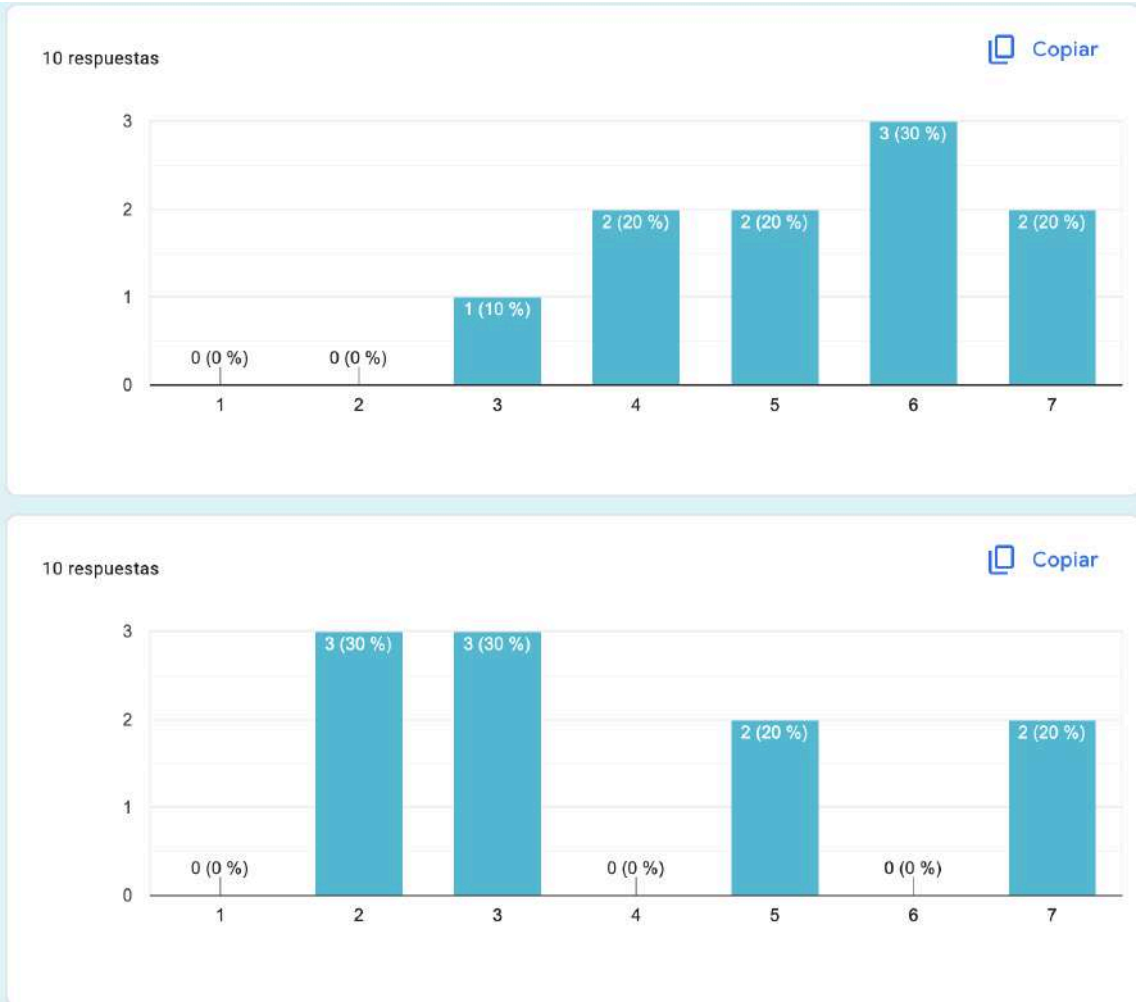


Figure 35. UEQ Questionnaire Answers 5

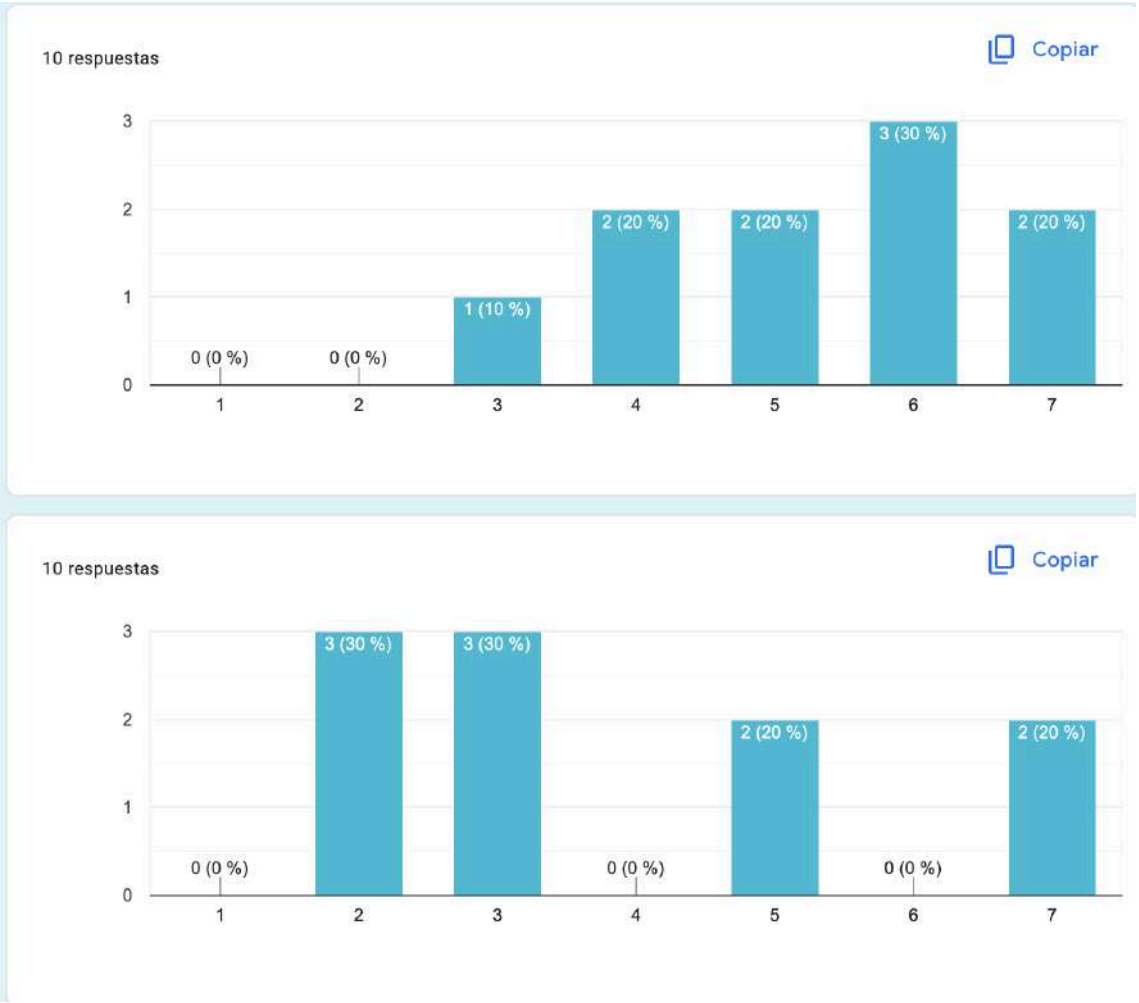


Figure 36. UEQ Questionnaire Answers 6

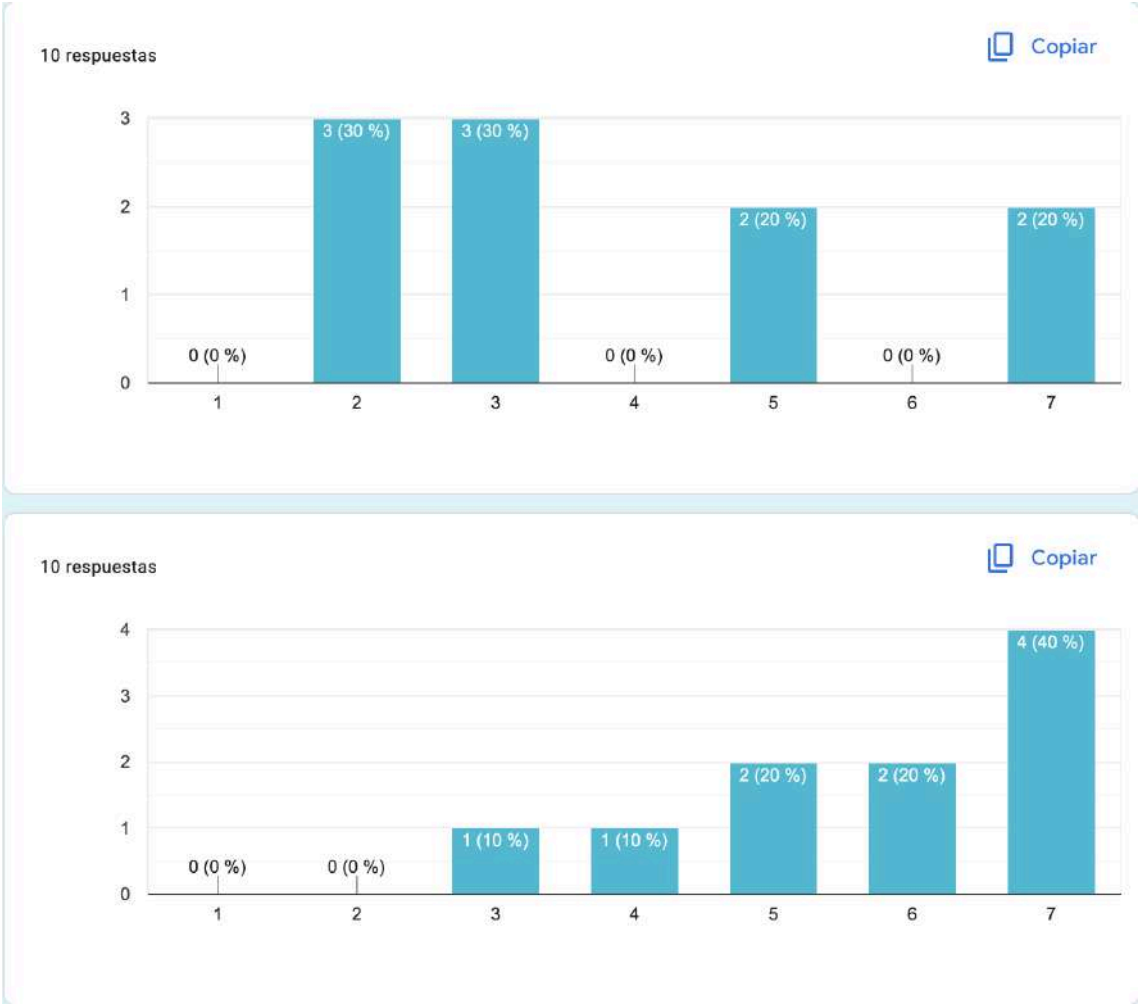


Figure 37. UEQ Questionnaire Answers 7

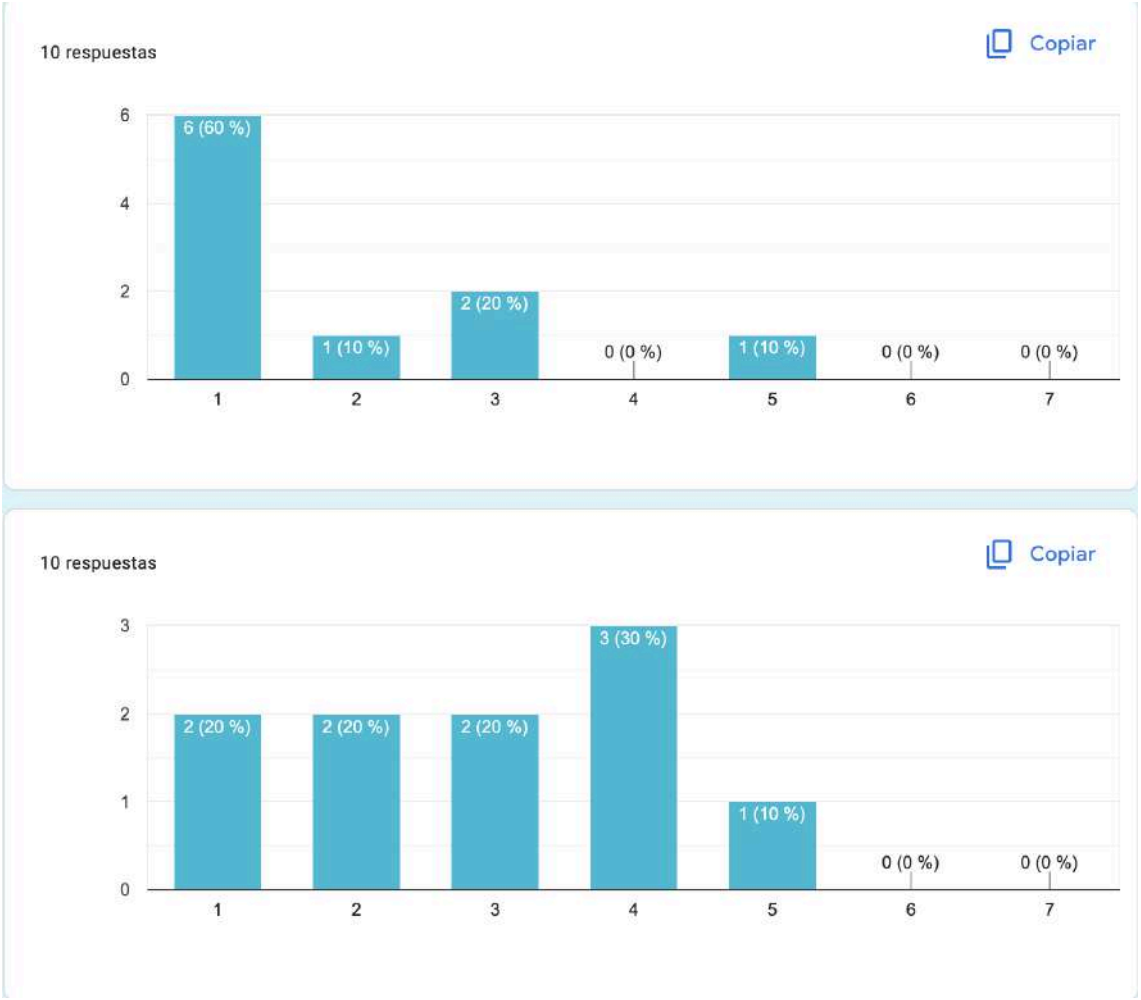


Figure 38. UEQ Questionnaire Answers 8

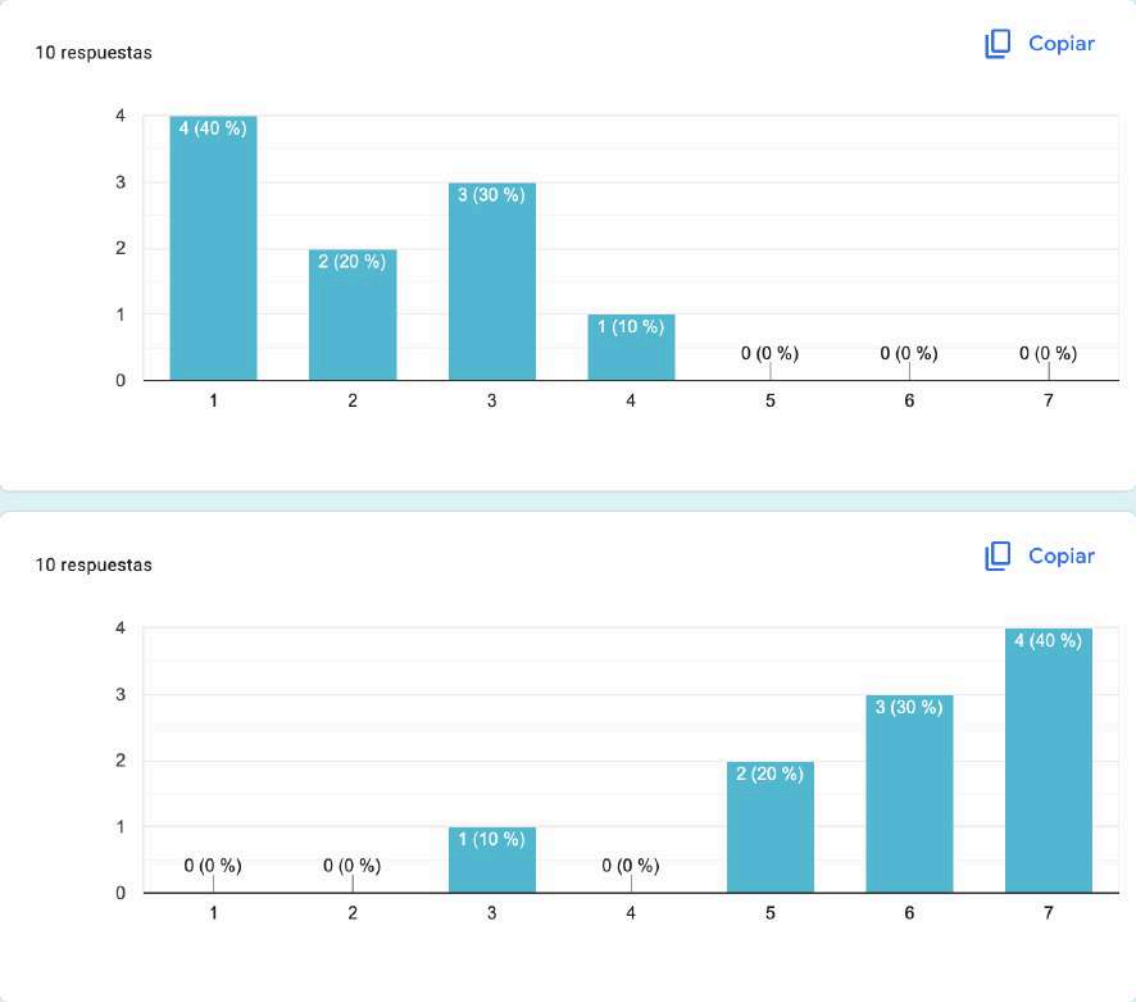


Figure 39. UEQ Questionnaire Answers 9

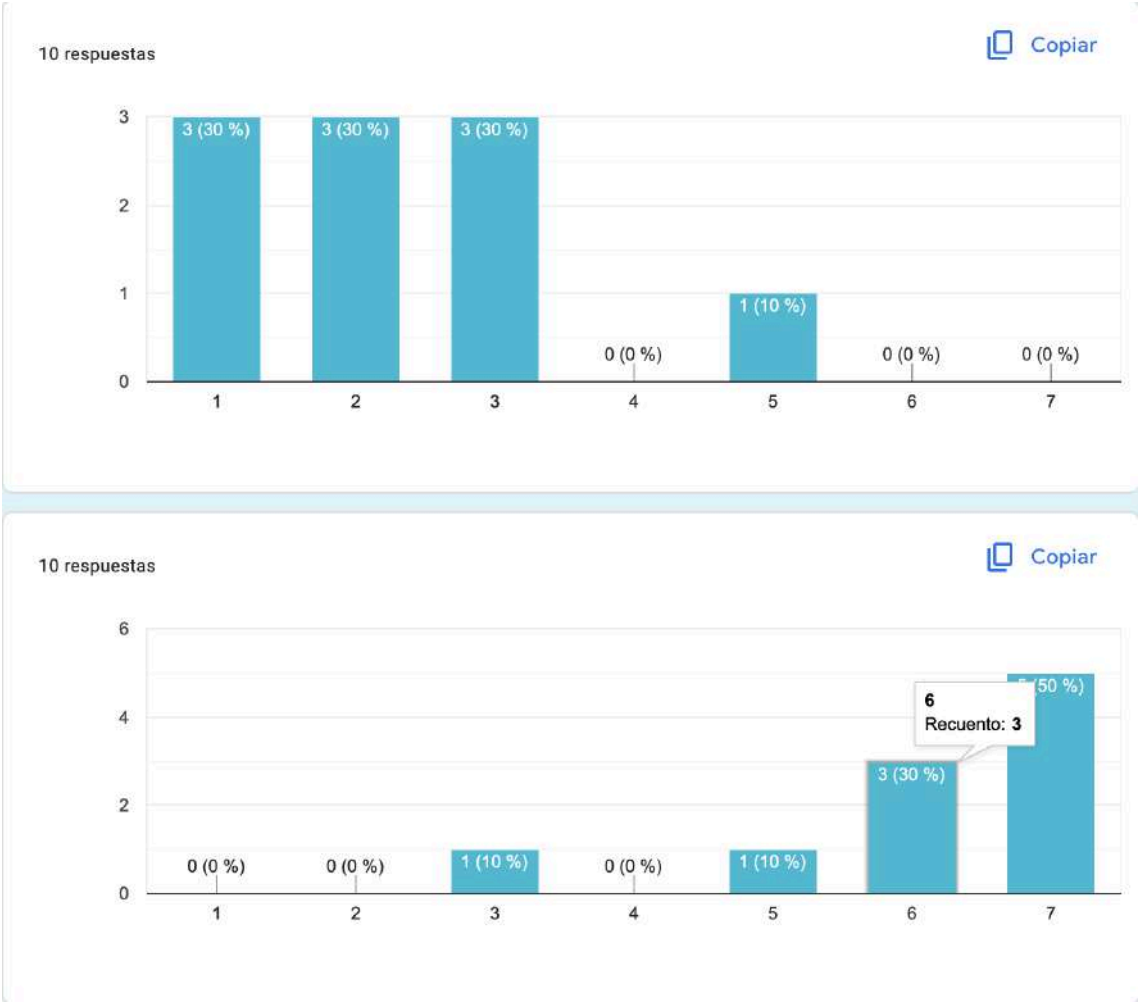


Figure 40. UEQ Questionnaire Answers 10

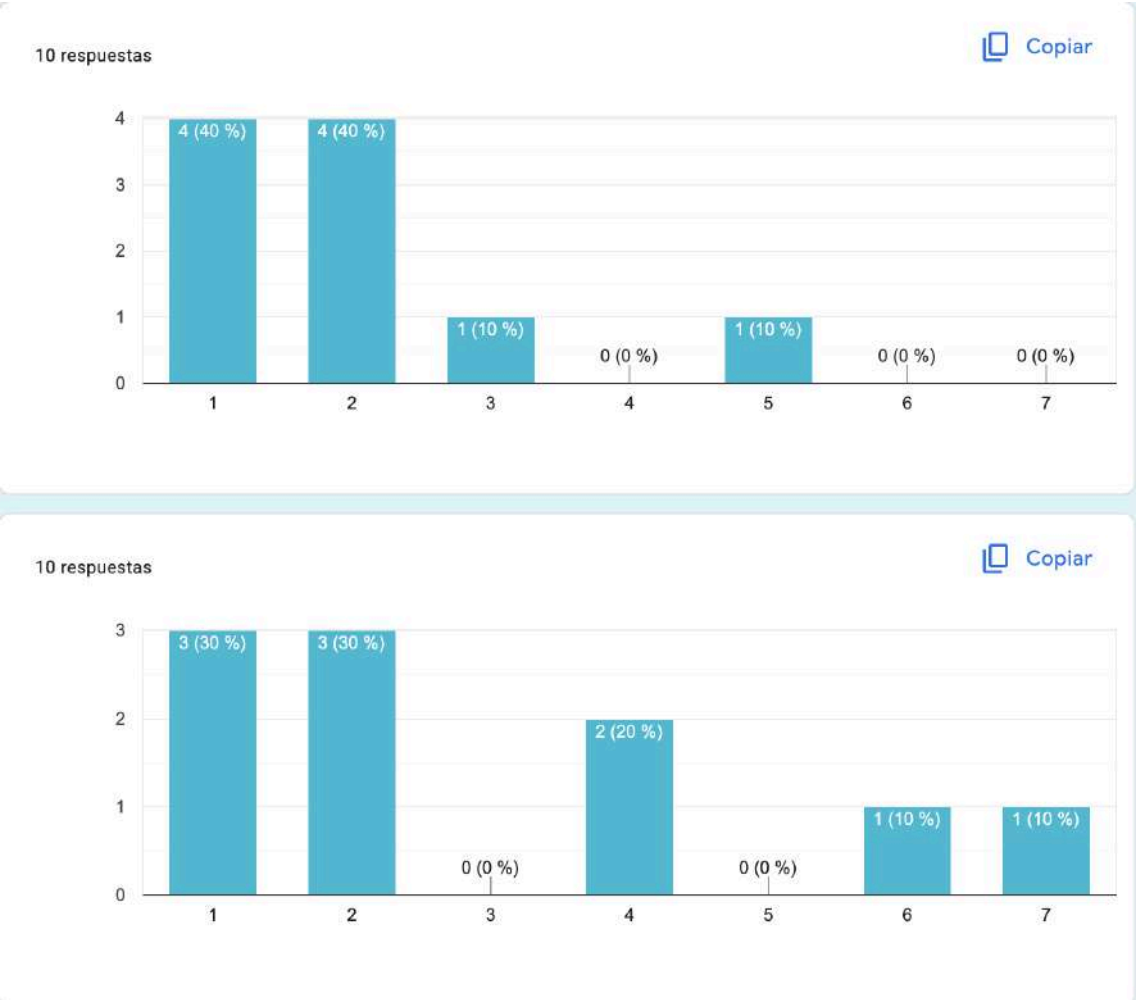


Figure 41. UEQ Questionnaire Answers 11

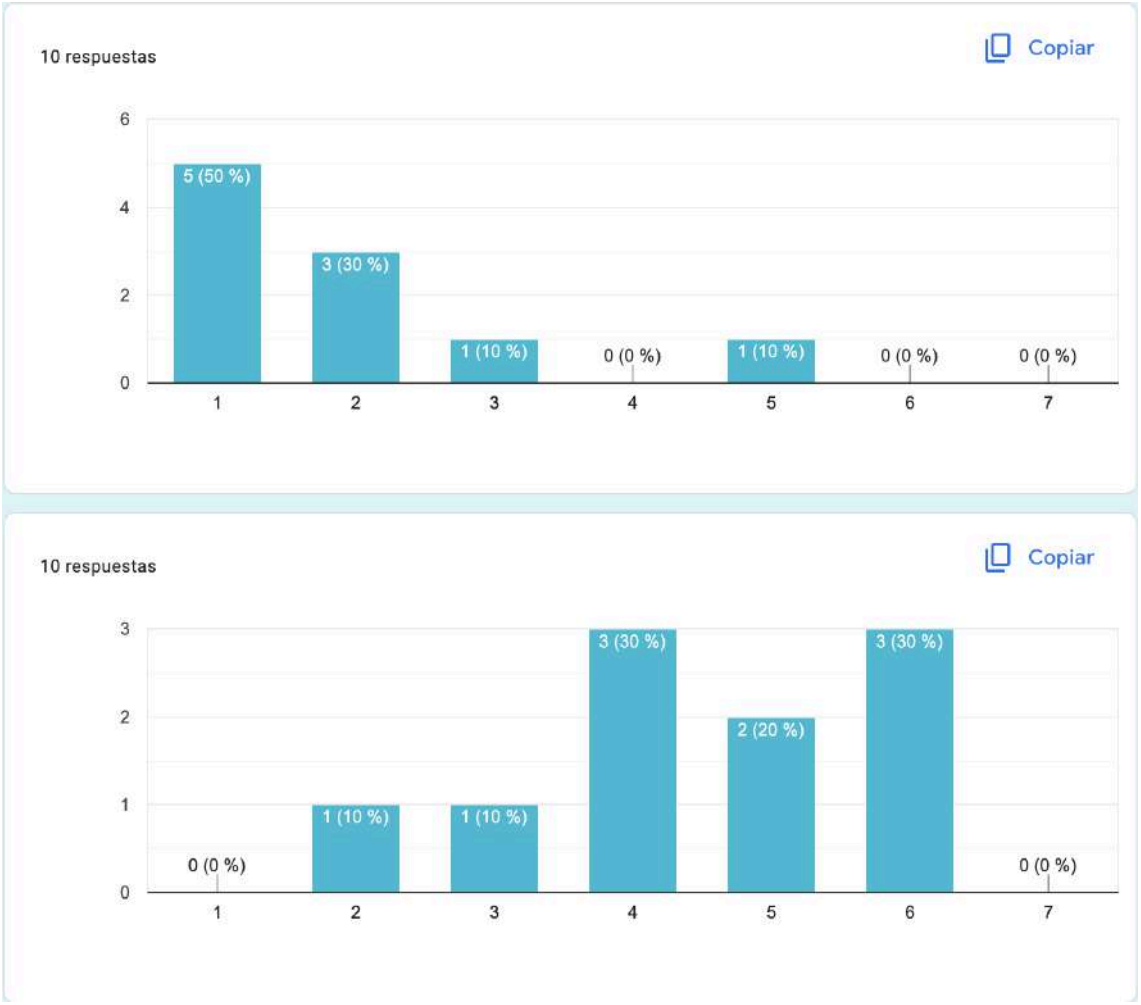


Figure 42. UEQ Questionnaire Answers 12

3. SUS Questionnaire

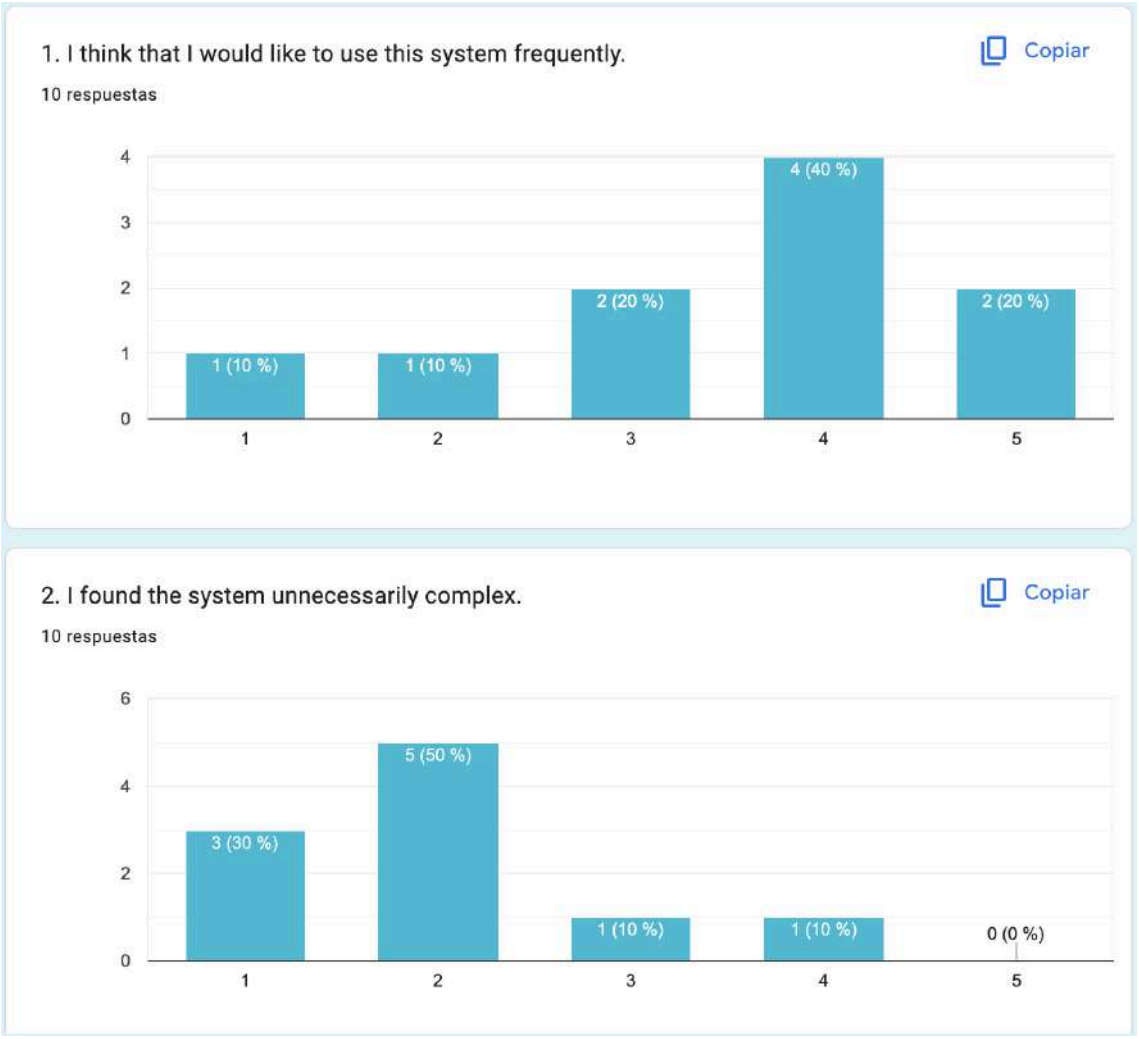
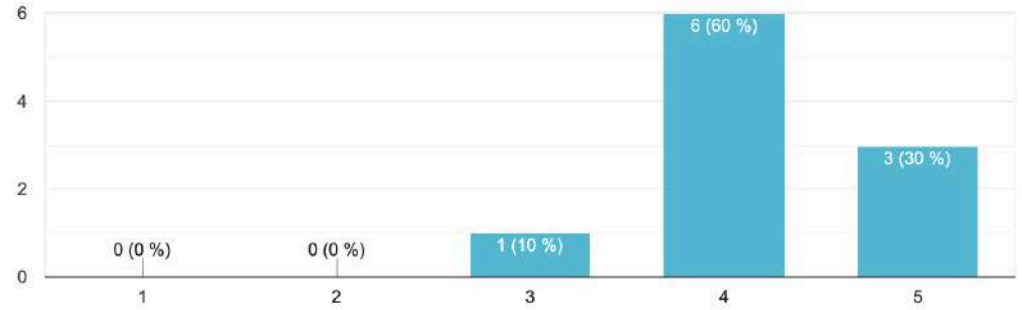


Figure 43. SUS Questionnaire Answers 1

3. I thought the system was easy to use.

Copiar

10 respuestas



4. I think that I would need the support of a technical person to be able to use this system.

Copiar

10 respuestas

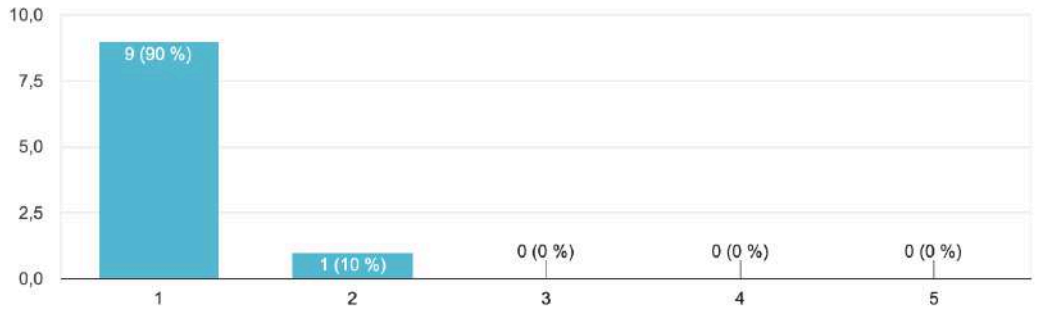
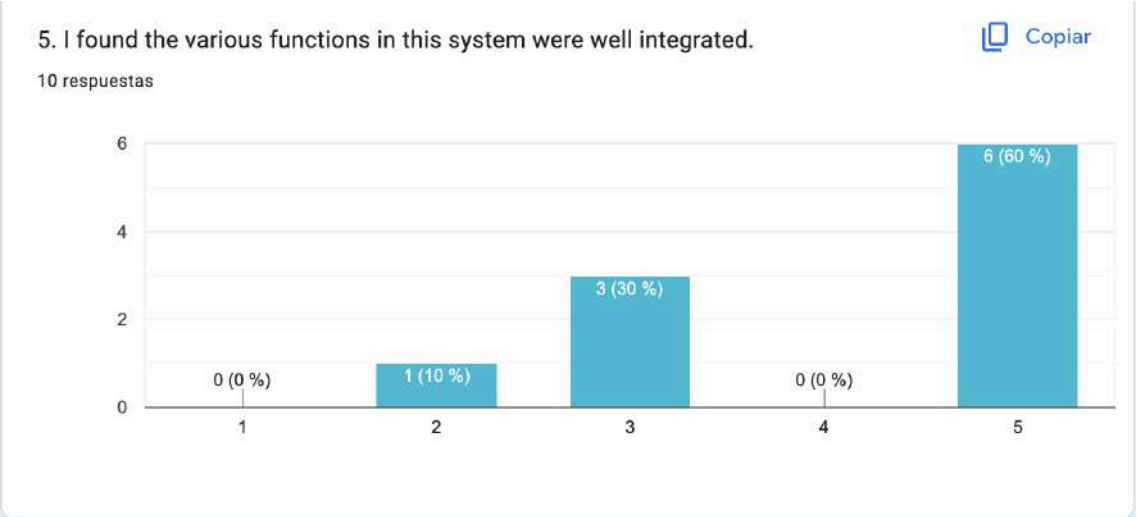


Figure 44. SUS Questionnaire Answers 2



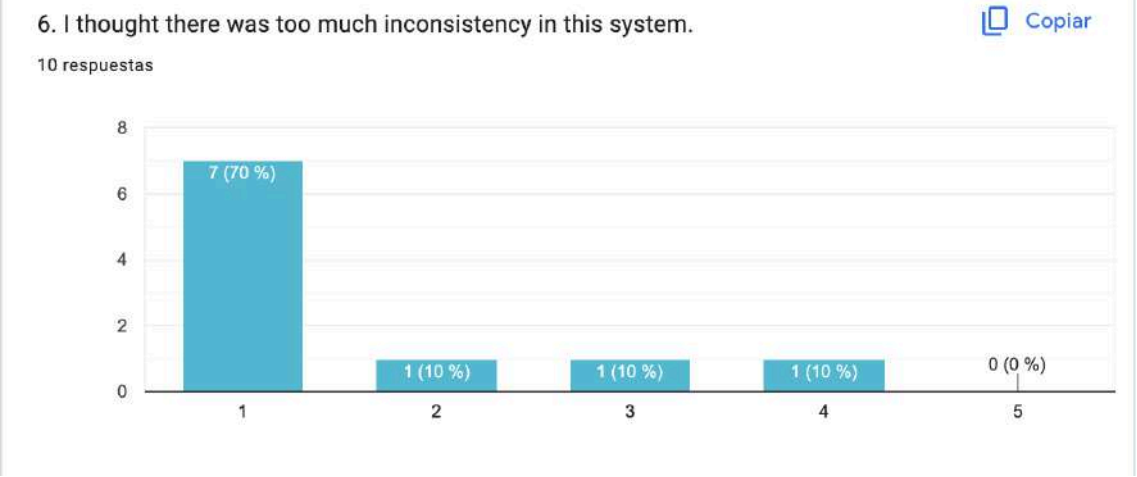


Figure 45. SUS Questionnaire Answers 3

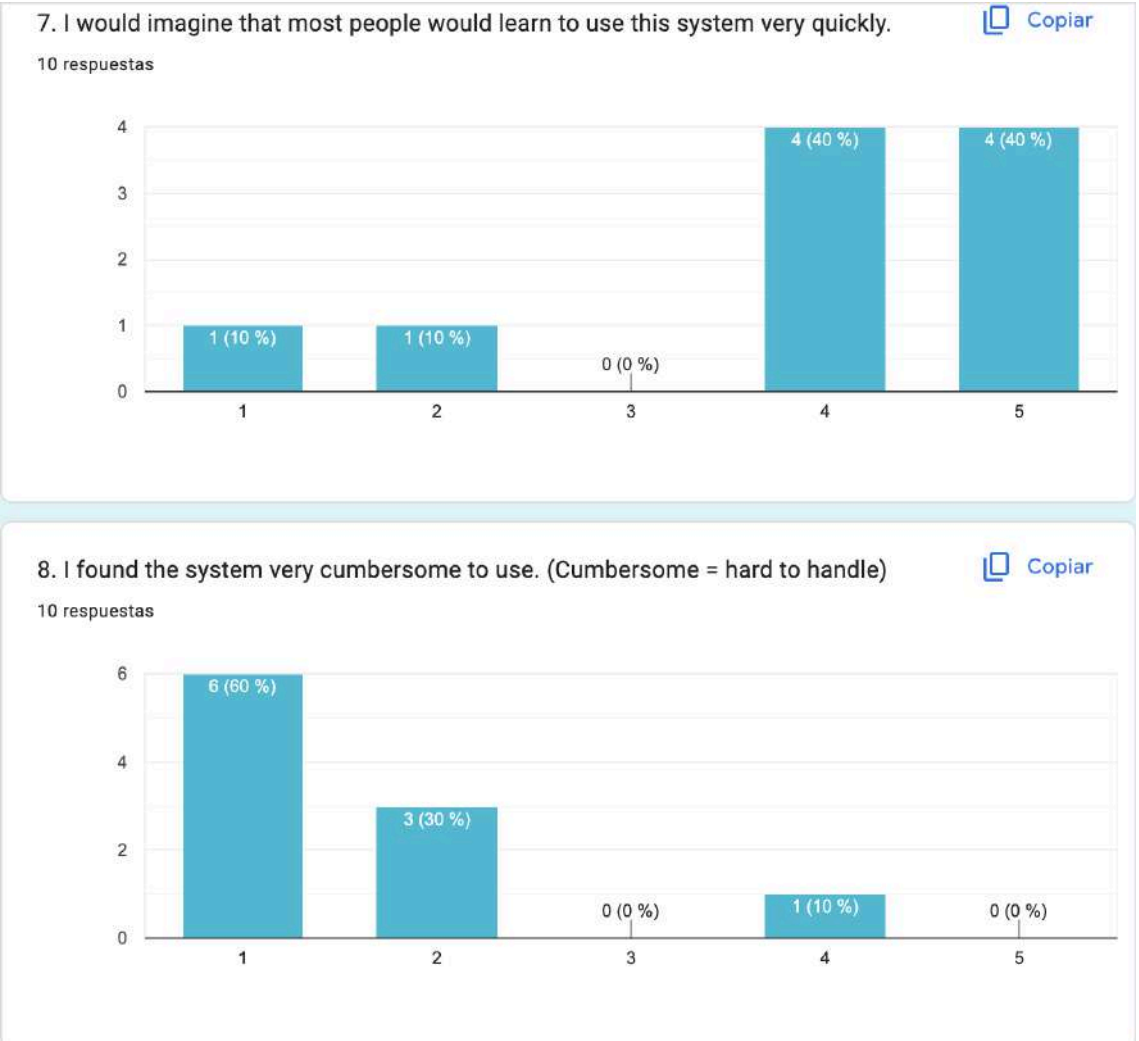


Figure 46. SUS Questionnaire Answers 4

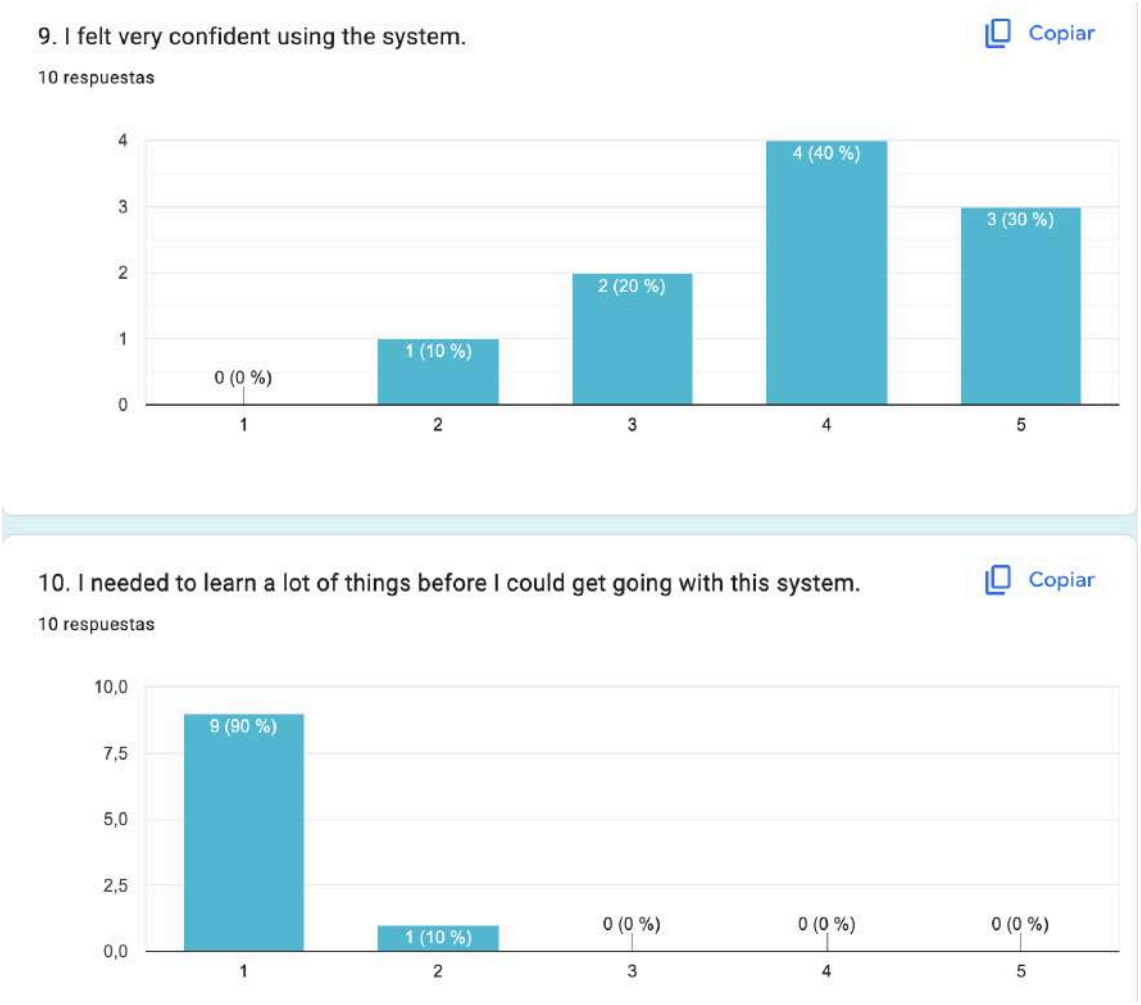


Figure 47. SUS Questionnaire Answers 5

4. **General Impressions Questionnaire**

2. What is the part of the prototype that has been more difficult to understand? Why?

10 respuestas

Straight forward, same thing about the state. Easy to navigate.

Serching for the place (can i book there for 2 hours? this information is missing before the search) because it was part of the task and she didnt know if she could accomplish the task before being in the booking page

How to book a place for a coffee shop there were some little things that took me longer to get.

The description of the places in the pop-up, he was expecting less information, more organized. The transparency of the pop-up looked confusing for him, because it was like somewhere you weren´t supposed to clikc.

How the process of booking (again date). Expected to select the dates in the filters and not just when about to book.Because the task description stated that he needed the time and day. Also in other booking platform you can select the date and time in advance.

Lower bar, not enough visible

Figure 48. General Impressions Questionnaire Answers 1

2. What is the part of the prototype that has been more difficult to understand? Why?

10 respuestas

The description of the places in the pop-up, he was expecting less information, more organized. The transparency of the pop-up looked confusing for him, because it was like somewhere you weren´t supposed to clikc.

How the process of booking (again date). Expected to select the dates in the filters and not just when about to book.Because the task description stated that he needed the time and day. Also in other booking platform you can select the date and time in advance.

Lower bar, not enough visible

nothing

A part from the problem stated before, the activity tab seems just as a collection of reservations while I expected more activities, for example if i leave a review i expect to see it here

Navigation in the map and filtering

the functionalities not related to the map

Figure 49. General Impressions Questionnaire Answers 2

3. What have you liked most of the prototype? Why?

10 respuestas

Very simple, intuitive so he didnt need to know the app top guess where to click.

lot of freedom, felt like there were different path to do each task

The map and the pins that were clickable and contained all the information.

The map, and to explore it. Well integrated with the filters so intuitive and fast to not have to change between a lot of screens.

The menu at the bottom, well organized and intuitive.

Interactivity/Efficiency

filter section

The possibility to filter by a lot of things and needs. And the fact i can see my friends recommendation. Because it gives many ways to reach the main purpose.

Figure 50. General Impressions Questionnaire Answers 3

3. What have you liked most of the prototype? Why?

10 respuestas

The map and the pins that were clickable and contained all the information.

The map, and to explore it. Well integrated with the filters so intuitive and fast to not have to change between a lot of screens.

The menu at the bottom, well organized and intuitive.

Interactivity/Efficiency

filter section

The possibility to filter by a lot of things and needs. And the fact i can see my friends recommendation. Because it gives many ways to reach the main purpose.

the map view that lets me see where the cafes are

from the map it was clear to undesrtand what each place was offering

Figure 51. General Impressions Questionnaire Answers 4

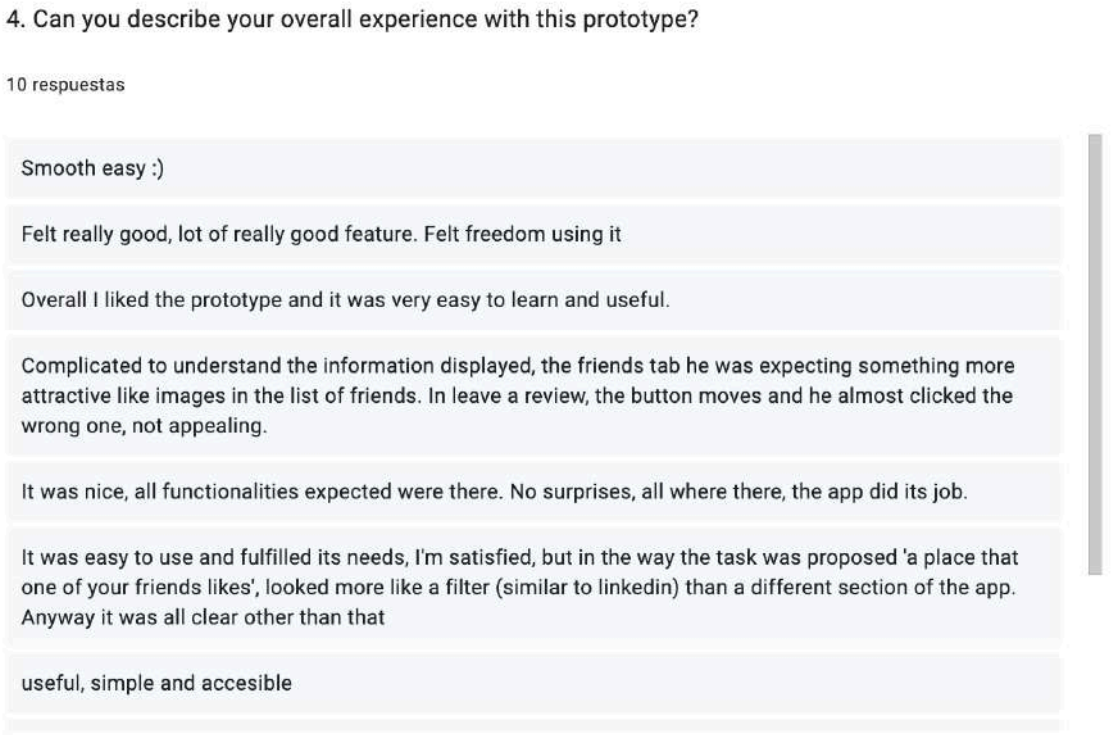


Figure 52. General Impressions Questionnaire Answers 5

Figure 53. General Impressions Questionnaire Answers 6

[Final Video of the High-Fidelity Prototype]

Annex B. Detailed changes in schedule

1. **Change in the tasks given to the users**

Task	1
Title	Find a place with requirements
Starting situation	You're at home and are looking for a place to work on your laptop. You open the SitDown App.
Task instructions	Find a place for laptop work for the 27th of May, where you can study 2 hours. It should allow laptop work, have wi-fi, provide vegan lunch and be no farther than 2km from your place. Book two seats for you and a friend from 12:00 -14:00

Task	2
Title	Add a cafe to your wishlist
Starting situation	Your friend Matteo just told you about a halal place that has good food. You open the sitdown app to add it to your wishlist.
Task instructions	Look for a place that is halal and that one of your friends likes. Add this place to your wish list.

Task	3
Title	Leave a review for "Sukis Cafe"
Starting situation	You are at home after coming back from working at Sukis Cafe, you liked it so much that you want to leave a positive review online.
Task instructions	You went to Sukis cafe and want to leave a review. Give it a rating of 5/5 and write "Amazing Coffee".

2. **Addition of a "Booking Page" to the prototype**

So it would be more clear to the users of the high-fidelity prototype that they were making a booking to a cafe, we added before the tests a Booking Page that appears after clicking "Book Now" in the button that appears in the cafe profile. We got rid of the process of booking in the pop-up that appears after clicking a cafe in the map and limited it into only containing the information of each cafe.

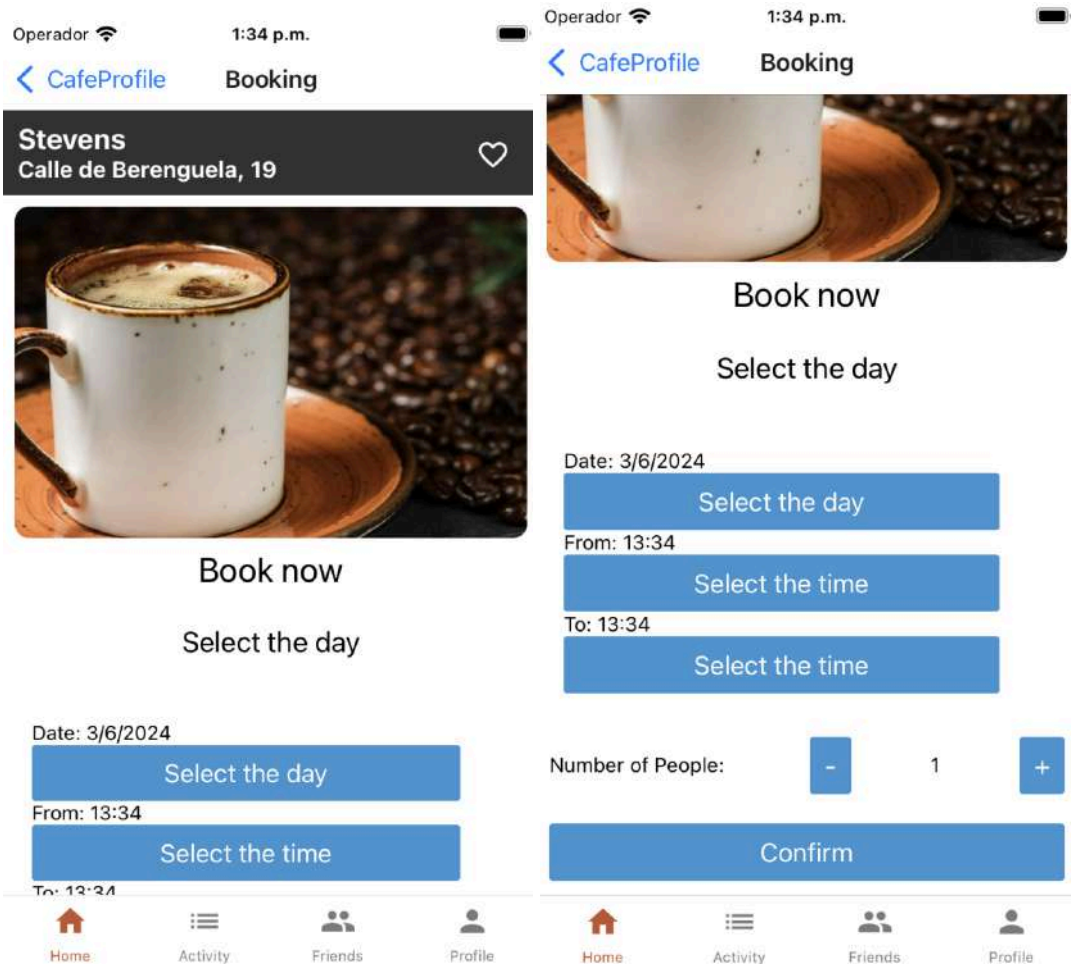


Figure 54 & 55. New Booking Page

3. Alert added (Booking Page)

Alert added after clicking “Confirm” button in the Booking Page for consistency and visibility of the status of the booking for the users.

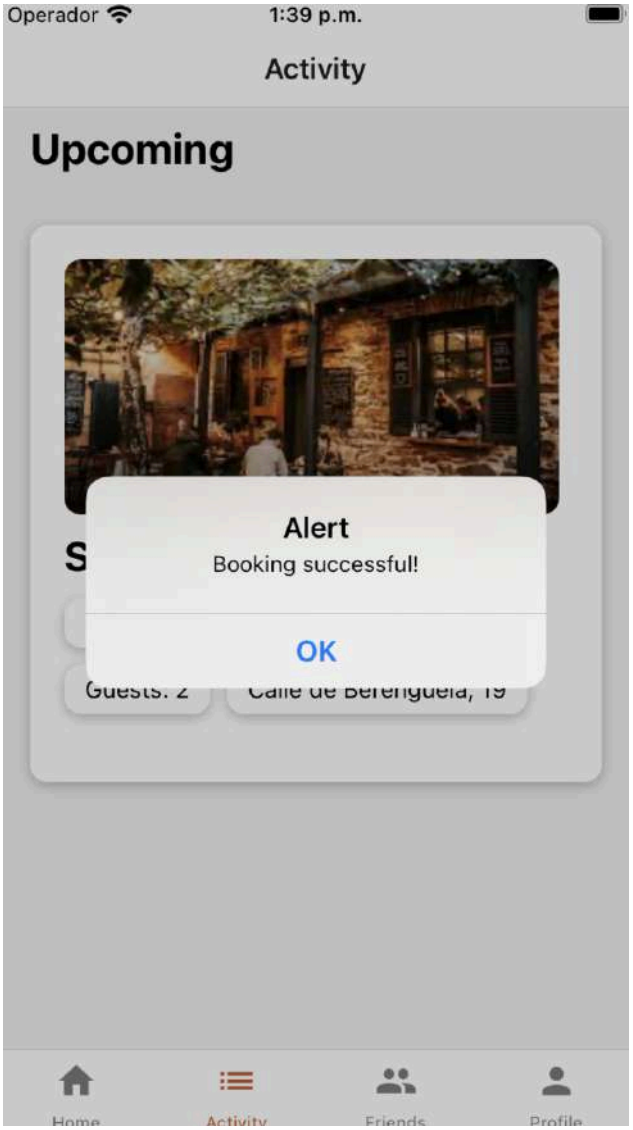


Figure 56. New Alert (Booking Page)

4. **Alert added (Review Page)**

Alert added after clicking “Submit” button in the Leave a Review screen for consistency and visibility of the status of the review for the users.

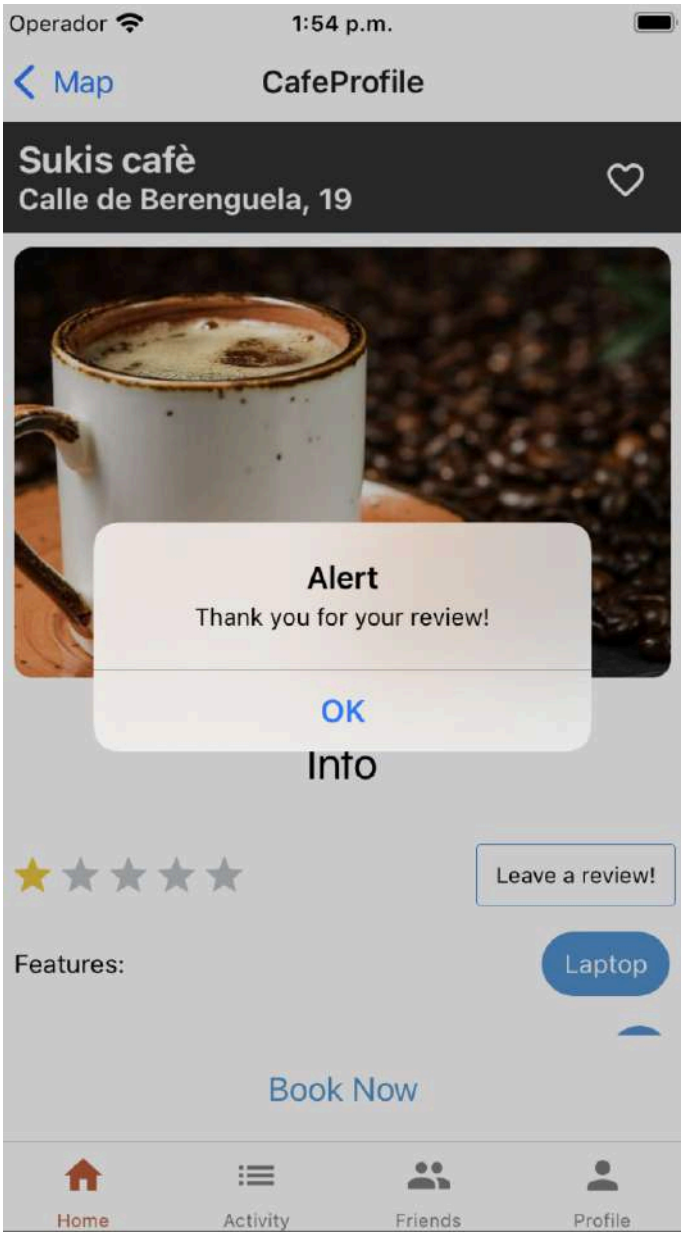


Figure 57. New Alert (Review Page)

May 6, 2024

High-fidelity prototype and planning of second usability evaluation

Human-Computer Interaction Project

Team 1

- Ortega Barrios, Carolina
- Tornier, Milan
- Barbanti, Francesco
- Del Prato, Matteo

Table of contents

1 Prototype design

1.1 List of screens

Screen	Description
Homepage / map	1. Main purpose: to show the presence and location of cafes in the geographical area where users are located, allowing them to launch specific research. 2. Functionality: users can either a. move around the map, looking for places already pinned down b. click on pinned down cafes c. click on the search bar d. click on filters Please note: map is a scrollable element
Homepage / cafè list	1. Main purpose: to show a list of all available cafes in the area, as well as allow users to launch keywords based researches 2. Functionality: users can either a. scroll down the list b. click on cafes c. type into the search bar and launch a keyword based research Please note: the list is a scrollable element
Homepage / filters	1. Main purpose: to empower users with a list of filters to perform specific, filtered researches 2. Functionality: users can a. select mandatory and optional filters among the ones presented b. show the results
Homepage / filtered map	1. Main purpose: to showcase results after a keyword - based or filters - based research has been launched 2. Functionality: users can a. move around the map and see where results are located b. click on results
Homepage / offer pop-up	1. Main purpose: to show an overview of the cafè users have clicked on in the map in the homepage and request a booking 2. Functionality: user can

	a. click on the name of the cafè to access the detail page b. inspect the details overview of the place c. select a date when to book a seat d. select the time they want to book the seat from e. choose, if needed, the number of people they want to book for f. confirm the booking g. close the pop-up and go back to the map
Cafè profile page	1. Main purpose: to show extensive information regarding the cafè selected to help users make informed decisions, allow them to rate the place and request a booking 2. Functionality: users can either a. scroll down to inspect details b. add the cafè to their wishlist c. inspect the location (meaning they can click on the address and be redirect to an external map app) d. click on the “book now” button e. click on the “leave a review” button Please note: the page is a scrollable
Review page	1. Main purpose: to allow users to leave a review and rate a place they have been to 2. Functionality: the screen allows users to a. assign a star rating b. leave a comment c. submit the review or cancel and go back to the cafè detail page
Activity / upcoming activities	1. Main purpose: to showcase users’ activity in the app - as in upcoming bookings - and remind them key cafes information along with bookings details 2. Functionality: users can either a. see an overview of their upcoming activities b. inspect few key information related to the place they have booked a seat in, along with booking details
Friends’ page / friends list	1. Main purpose: to showcase friends in the network 2. Functionality: users can a. see friends they have in their network b. click on friends’ profiles and inspect their activities c. look for new friends to add
Friends’ page / friends’ details and suggestions	1. Main purpose: to showcase friends’ details along places they have reviewed

	2. Functionality: users can a. inspect friends' details b. see which places friends suggest (name of the place and picture), along with their reviews and rating

1.2 Navigation map

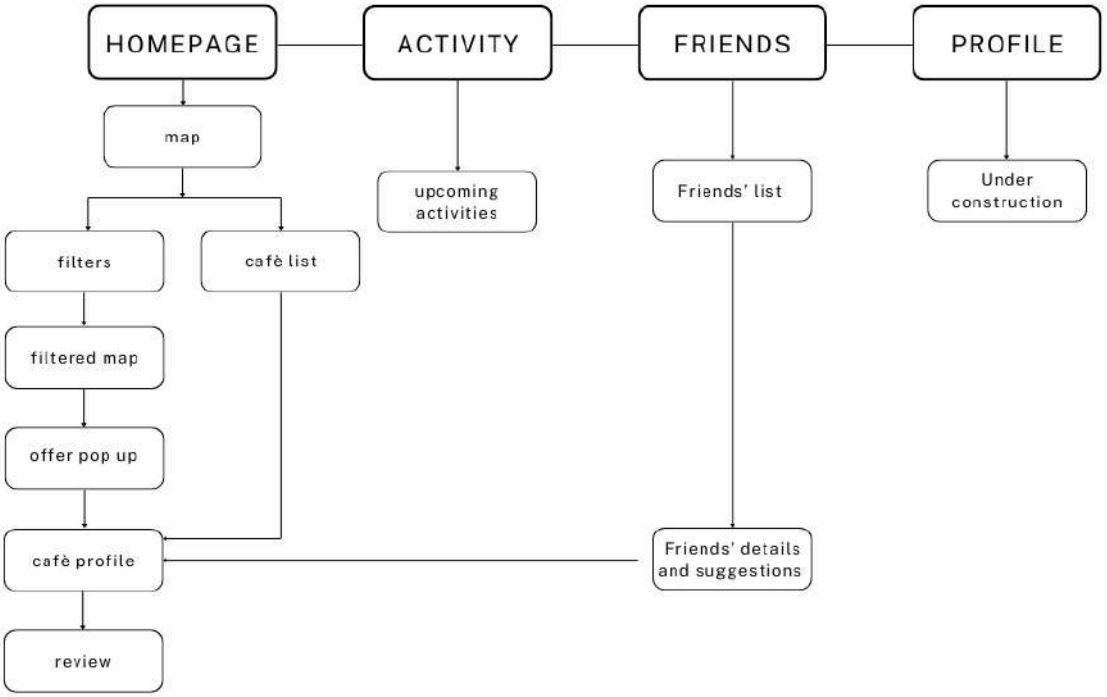


Figure 1.SitDown's navigation map

The app navigation map outlines the flow between different screens and features in the SitDown app, divided across four main screens: Homepage, Activity, Friends, and Profile.

1) HOMEPAGE

The **Homepage** is the primary screen from where users can access the **map page**. From here, users can either:

1) go to the **filters page** and launch a filtered research, being redirected to the filtered map screen
2) click on the search bar and access the **cafè list** page. From here, they can either:
   i) launch a keyword - based research, and get redirected to the **cafè profile page**
   ii) click on the cafes listed and get redirected to the **cafè profile page**
3) stay on the **map page** and inspect cafes details already pinned down, without applying any research

Once they click on a cafè icon from the map, they go through the **offer pop up**. From here, they can:

1) click on the cafè name to inspect the place, and therefore navigate to the **cafè profile page**
2) select a day and a time to book for, and get redirected to the **activity page**, where they'll see the **upcoming activities**

From the **cafè detail screen**, users can either:

1) scroll down the page to inspect details
2) access the **review page** to rate the place and review the place they have selected and are currently inspecting

2) ACTIVITY

In the Activities page, users directly land on the screen showing **upcoming activities.** Here, they can see their booking confirmation cards**.**

3) FRIENDS

The **Friends page** shows the **list of friends** users have in their own network. Clicking on a profile will lead to the **friends' details and suggestions page**, which shows the places the selected user has been to. By clicking on any cafè, users will get redirected to the specific **cafè profile page**.

4) PROFILE

The Profile page has not been prototyped and is currently under construction.

2 Planning of the usability testing

2.1 Evaluation goals

Perform a usability testing of the high-fidelity prototype, including performance measuring. The results obtained for effectiveness, efficiency and satisfaction will be checked against optimal values that are defined in this document.

2.2 Dates, places and roles

Test	Date	Place	Comments
1	13/05/2024	IMDEA Software Institute, room 279	Number of expected participants: 2 Estimated time: 15:30 - 17:00 (1h 30min)
2	14/05/2024	IMDEA Software Institute, room 279	Number of expected participants: 2 Estimated time: 12:00 - 13:30 (1h 30min)

3	16/05/2024	IMDEA Software Institute, room 279	Number of expected participants: 2 Estimated time: 14:00 - 15:30 (1h 30min)
4	20/05/2024	IMDEA Software Institute, room 279	Number of expected participants: 2 Estimated time: 15:30 - 17:00 (1h 30min)
5	21/05/2024	IMDEA Software Institute, room 279	Number of expected participants: 2 Estimated time: 14:30 - 16:00 (1h 30min)

Test	Facilitator	Observers
1	Milan Tornier	Carolina Ortega, Francesco Barbanti, Matteo Del Prato
2	Carolina Ortega	Milan Tornier, Francesco Barbanti, Matteo Del Prato
3	Francesco Barbanti	Milan Tornier, Carolina Ortega, Matteo Del Prato
4	Matteo Del Prato	Carolina Ortega, Francesco Barbanti, Milan Tornier
5	Milan Tornier	Carolina Ortega, Francesco Barbanti, Matteo Del Prato

2.3 Participants

Participants	Total number of expected participants: 10 Total number of participant per Jason persona: 6 Total number of participant per Britney persona: 4
Recruiting	The recruiting will depend on the availability of the participants to be able to undergo a 45min testing. They will be contacted via text message and in the UPM Campus. As we are dependent on the time availability of the participants, if they don't show up the day of the testing we might need to find a new participant and time slot for them.

2.4 Sequence

2.4.1 Welcome text

Thank you very much for coming and agreeing to help us during this usability test today. My name is _____ and these are my colleagues _____ : we are conducting this test for the Polytechnic University of Madrid. Our project is to develop an application called SitDown to help students and workers find ideal places for study or work, and we are interested in understanding the challenges they face during the process.

Today we'll be running through a high-fidelity prototype of the SitDown app. During the entire time that we will be conducting the testing, we encourage you to think aloud: this means to say everything that you think and feel in every step of the way, there are no right or wrong thoughts and it will be very beneficial for us to know your first impression, frustrations and thoughts on each prototype. Please have in mind that we are testing the app, not you. Any issue you may find is about the design and not your mistake.

We therefore encourage you to ask questions if you have any, and share your thoughts with us during your performance: our goal is not to judge you, but to learn from you.

We are going to use a stopwatch to time how long it takes you to accomplish a given task and make an accurate note of how you interact with it.

This is the order and pace of our session today:

1. Firstly, we will be asking you for personal information
2. Secondly, we will ask you to do the usability testing of our prototype: you will have to perform three different tasks and we will be gathering data and observations
3. Finally, you will be asked to fill out a user satisfaction questionnaire to enable us to measure your level of satisfaction with the app, as well as a user experience questionnaire, and to give us general impressions you might have had.

Feel free to ask in case something is unclear at any point or if you need more information. Do you have any questions before we start with the test?

2.4.2 Process

1. Say the “welcome text” (2.4.1) to the participant.
2. Gather personal information (2.5).
3. Do the usability testing of the prototype. Ask the participant to perform the tasks (2.6), gather data (2.7) and observations (2.8).
4. After using the prototype, ask the participant to fulfil the user satisfaction questionnaire (2.9), the user experience questionnaire (2.10) and ask for general impressions (2.11).

2.5 Personal information questionnaire

The questionnaire will be in the format of an electronic document, and it is intended to obtain demographic anonymous information from the participants. During the usability test it will be more convenient and fast for the facilitators and observers to gather all the information in one place.

2.6 Tasks to be performed by participants

Task	1
Title	Find a place with requirements
Starting situation	You're at home and are looking for a place to work on your laptop. You open the SitDown App.
Task instructions	Find a place for laptop work for the 27th of May, where you can study 2 hours. It should allow laptop work, have wi-fi, provide vegan lunch and be no farther than 2km from your place. Book two seats for you and a friend from 12:00 -14:00

Task	2
Title	Add a cafe to your wishlist
Starting situation	Your friend Matteo just told you about a halal place that has good food. You open the sitdown app to add it to your wishlist.
Task instructions	Look for a place that is halal and that one of your friends likes. Add this place to your wish list.

Task	3
Title	Leave a review for "Sukis Cafe"
Starting situation	You are at home after coming back from working at Sukis Cafe, you liked it so much that you want to leave a positive review online.
Task instructions	You went to Suki's cafe and want to leave a review. Give it a rating of 5/5 and write "Amazing Coffee".

2.7 Measurements

2.7.1 Objective measurements

Measurement	**Description**
Time	Time required to complete one task
Actions	Number of elemental actions performed (click, tap, …) to complete one task.
Mistakes	Number of mistakes made during one task.
Success	Yes/no (whether the participant succeeds at completing the task).

2.7.2 Optimal values

Task	Time	Actions
T1	1 min 20 seconds	14
T2	25 seconds	4
T3	40 seconds	8

2.8 Observation sheet

During the usability test, the linked template will be used to collect both objective data (time, actions, mistakes, success), comments said by the participants and relevant observations made.

2.9 User satisfaction: SUS questionnaire

Participant ID	
Date and time	

Reply with your degree of agreement or disagreement to the following ten sentences, where 1 means “I totally disagree with the sentence” and 5 means “I totally agree with the sentence”.

	1	2	3	4	5
I think that I would like to use this system frequently.					
I found the system unnecessarily complex.					
I thought the system was easy to use.					
I think that I would need the support of a technical person to be able to use this system.					
I found the various functions in this system were well integrated.					
I thought there was too much inconsistency in this system.					
I would imagine that most people would learn to use this system very quickly.					
I found the system very cumbersome to use.					
I felt very confident using the system.					
I needed to learn a lot of things before I could get going with this system.					

The linked template will be used for the SUS questionnaire.

2.10 User experience: UEQ questionnaire

Participant ID	
Date and time	

For the assessment of the product, please fill out the following questionnaire. The questionnaire consists of pairs of contrasting attributes that may apply to the product. The circles between the attributes represent gradations between the opposites. You can express your agreement with the attributes by ticking the circle that most closely

reflects your impression. Please decide spontaneously. Do not think too long about your decision to make sure that you convey your original impression.

	1	2	3	4	5	6	7		
annoying	□	□	□	□	□	□	□	enjoyable	1
not understandable	□	□	□	□	□	□	□	understandable	2
creative	□	□	□	□	□	□	□	dull	3
easy to learn	□	□	□	□	□	□	□	difficult to learn	4
valuable	□	□	□	□	□	□	□	inferior	5
boring	□	□	□	□	□	□	□	exciting	6
not interesting	□	□	□	□	□	□	□	interesting	7
unpredictable	□	□	□	□	□	□	□	predictable	8
fast	□	□	□	□	□	□	□	slow	9
inventive	□	□	□	□	□	□	□	conventional	10
obstructive	□	□	□	□	□	□	□	supportive	11
good	□	□	□	□	□	□	□	bad	12
complicated	□	□	□	□	□	□	□	easy	13
unlikable	□	□	□	□	□	□	□	pleasing	14
usual	□	□	□	□	□	□	□	leading edge	15
unpleasant	□	□	□	□	□	□	□	pleasant	16
secure	□	□	□	□	□	□	□	not secure	17
motivating	□	□	□	□	□	□	□	demotivating	18
meets expectations	□	□	□	□	□	□	□	does not meet expectations	19
inefficient	□	□	□	□	□	□	□	efficient	20
clear	□	□	□	□	□	□	□	confusing	21
impractical	□	□	□	□	□	□	□	practical	22
organized	□	□	□	□	□	□	□	cluttered	23
attractive	□	□	□	□	□	□	□	unattractive	24
friendly	□	□	□	□	□	□	□	unfriendly	25
conservative	□	□	□	□	□	□	□	innovative	26

The linked template will be used for the UEQ questionnaire.

2.11 General impressions

Participant ID	
Date and time	
1. What are the main problems you have found while using this prototype?	

2. What is the part of the prototype that has been more difficult to understand? Why?
3. What have you liked most of the prototype? Why?
4. Can you describe your overall experience with this prototype?

The linked template will be used to collect general impressions.

April 15, 2024

Usability testing report – low fidelity prototypes

Human-Computer Interaction Project

Team 1

- Ortega Barrios, Carolina
- Tornier, Milan
- Barbanti, Francesco
- Del Prato, Matteo

Table of contents

1 Executive summary

The aim of SitDown is matching students and remote workers with their ideal working cafe. This means reliable search and reservation for customers, and new ways of monetization for cafe shop owners. In order to discover the ideal way this can be done, we conducted usability tests on two prototypes relating to two hypotheses we deduced from our prior research. One of our prototypes (Requirements-focused prototype) tested the hypothesis that discovering cafes is mainly a question of searching based on individual requirements. The other (Socially-focused prototype) investigated the hypothesis that customers want to discover places to work, based on the experiences of friends and their existing reviews.

Our two low-fidelity, paper-based prototypes were exposed to 4 remote workers and 4 students. We discovered that most participants preferred the map based approach of the first prototype over the social-network like representation of the second. They enjoyed the map view and simple design of the interface, but were confused by our concept of “offers" that popped up on the map. Their mental model induced that items on the map would be the establishments themself, and not individual offers they made for customers. While most participants reported that they got confused using the second prototype, because there was a lot of information presented, they preferred the more simplistic representation of cafe profiles and the simplified filter.

Our next step will be the implementation of a high-fidelity prototype based on the Requirements-focused prototype. However, we will integrate the filter and profile pages of the Socially-focused prototype to avoid the confusions users experienced in the Requirements-focused prototype. Further we will evolve our concept of offers to overcome the confusions it posed.

2 Goal of evaluation

Evaluate how the two designs fit the mental models of the participants. The evaluation has been made using the “thinking aloud” method. Evaluated attributes: efficiency, effectiveness, and user satisfaction.

3 Schedule update

Table 1. Table with updates regarding the schedule

Deviation	Aspect	Explanation
1	Date	Due to the testers availability we had to change our time schedule according to their preferences. The actual plan is shown in chapter 4.1
2	Place	Since the testers were not all from UPM, instead of meeting them at Imdea building, room 279 as planned, we agreed with them other places more

		reachable for them. We tested at Imdea building, room 279 only the ones we could reach there. So in the end we have 4 tests done at Imdea building and 4 tests done in other places. The actual plan is shown in chapter 4.1
3	Participant number	In order to gather more exhaustive information about our prototypes we decided to increase the number of testers from 3 per personas to 4 per personas, so we decided to test 4 workers and 4 students, in total 8 testers. The actual plan is shown in chapter 4.1
4	Prototype 2 minor changes	In order to respect the heuristic 4 which is about standard and consistency, we changed the book dropdown menu in the cafe's detail page into a "Book now" button. We attach the new screen in Annex B.
5	Prototype 1 minor changes	Some of the information on the offer pop-up was changed to match the task. The number of participants was changed from "1" to "2"

4 Information about the performed usability testing

4.1 Dates and places

Table 2. Data and places

Session	Date	Place	Participants
1	04-04-2024	Imdea building, room 279	1 Persona: Student (Jason)
2	05-05-2024	Colonia Jardín	4 Persona: Remote Worker (Britney)
3	09-05-2024	Imdea building, room 279	1 Persona: Student (Jason)
4	10-05-2024	Imdea building, room 279	2 Persona: Student (Jason)

4.2 Participant demographics

1. Demographics:
    - Age: Participants' age ranges from 20 to 25 years
    - Gender: 5 males, 3 females
    - Occupation: 4 students, 4 remote workers

2. Screen Time on Phone:

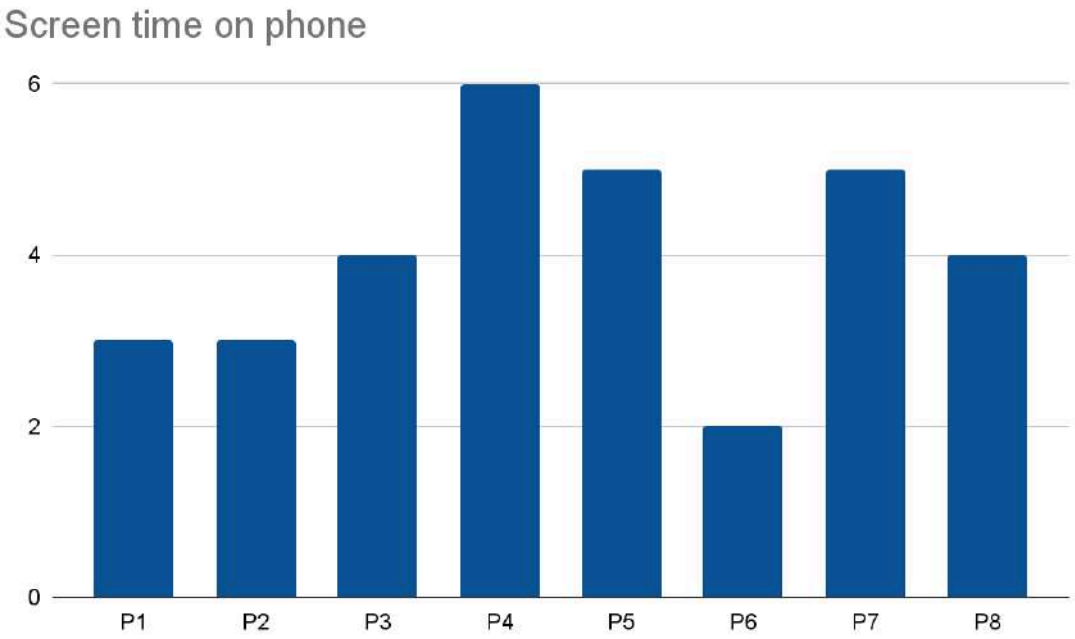


Figure 1. Bar chart with screen time on phone of 8 participants.

3. How much do you work in coffee shops per week?:

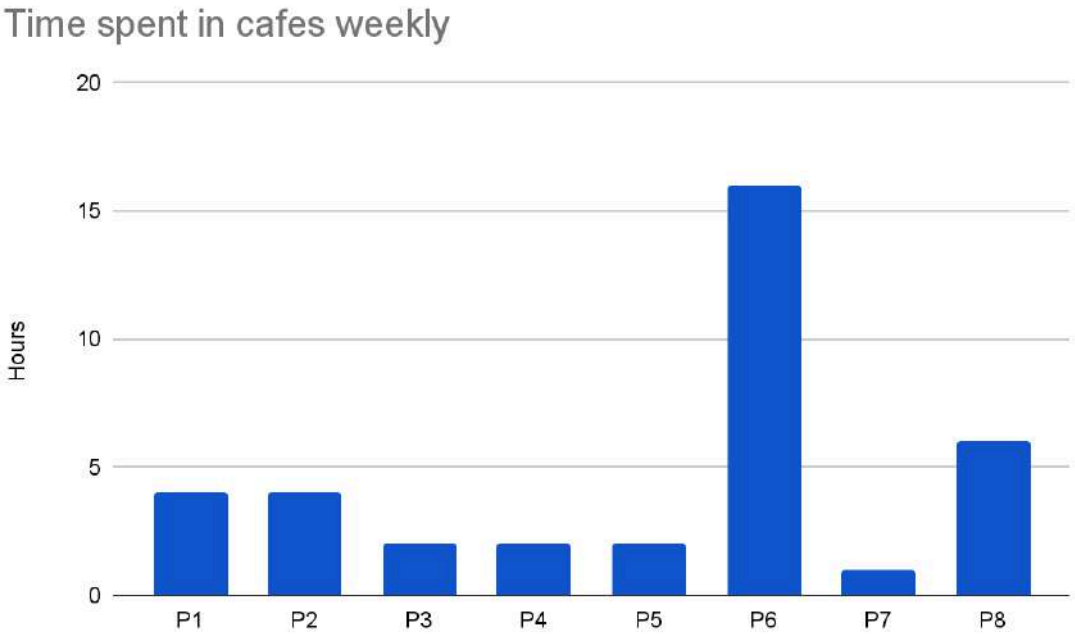


Figure 2. Bar chart with time spent in cafes weekly of 8 participants.

5 Effectiveness

5.1 Effectiveness of first design: Requirements-focused Prototype

Table 3. Table with effectiveness information

	Mistakes (average)	Mistakes (std. dev.)	Success rate
Task 1	0,87	1,09	8/8
Task 2	0,75	1,31	8/8
Task 3	1,62	1,03	8/8

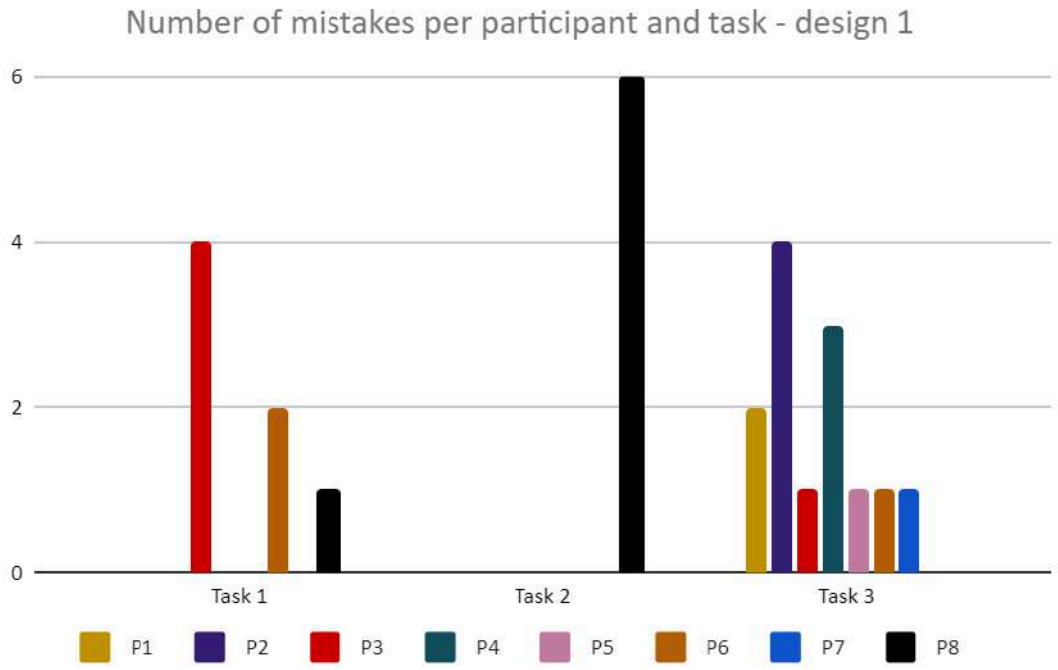


Figure 3. Bar chart with the number of mistakes (8 participants, from P1 to P8; and three tasks, from T1 to T3)

Effectiveness findings for first design:

- Finding 1: Despite mistakes being made, all participants could complete all of the given tasks.
- Finding 2: Common mistake for Task 1: 2/8 participants did not discover the filter option and just tried to click on all items to find the right place.
- Finding 3: Outlier in Task 2: Instead of going through friends to find a place recommended by a friend they searched for “halal” first. The profile section did not actually show the friend's review, which led to confusion.
- Finding 4: Common mistakes for Task 3: 3/8 participants tried to find Soukis cafe through the wishlist, or recent activities. We assumed they would use the search function. 2/8 participants tried to click the Star rating in the profile directly, assuming they could rate the cafe that way.

5.2 Effectiveness of second design:

Table 4. Table with effectiveness information

	Mistakes (average)	Mistakes (std. dev.)	Success rate
Task 1	2,50	1,25	8/8
Task 2	1,00	0,75	8/8
Task 3	3,12	1,40	3/8

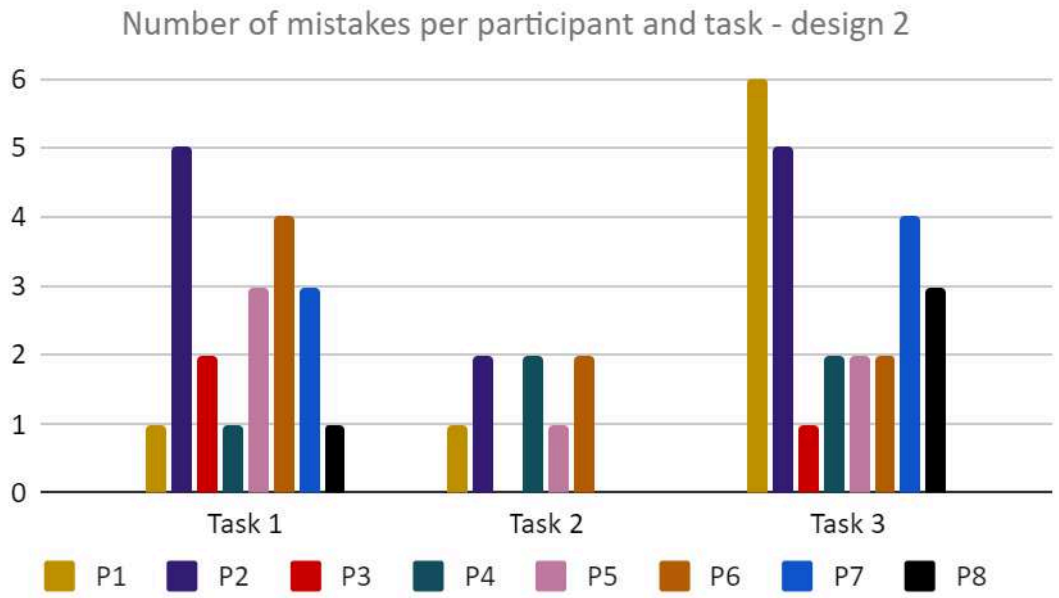


Figure 4. Bar chart with the number of mistakes (8 participants, from P1 to P8; and three tasks, from T1 to T3)

Effectiveness findings for second design:

- Finding 1: only 3 participants out of 8 managed to complete task 03. Such participants managed to reach the final result with one tip.
- Finding 2: 3 participants out of 8 managed to complete task 03 only after being given a tip, which was either that the place they needed to review had been booked through the app (P4,P6,P7), or that they should check their profile section (P2). Only one participant (P3) did not manage to complete the task after being given the tip to go through the profile section.
- Finding 3: When asked to write a review (task 03) all participants searched for the place to review via the search tab in the explore section. They always failed to complete the task because the detail inspection page is missing a “add a review” function, which is only accessible through the profile section. We wrongfully assumed that users would automatically explore their profile page to look for past activities. On the other hand, the task did not state that the place had been booked through the app: when we noticed participants were lost and decided to give them this tip, they all managed to flow to the right section in the navbar and to complete the task.
- Finding 4: In the difficulties of performing the third task, 6 users out of 8 thought that the recommend button could substitute the review. Although they didn’t expect to leave a review with that button, in the confusion they tried it.

- Finding 5: In the explore section, 5 users out of 8 tried to filter with the options given by the “Based on your mood” section.

5.3 Effectiveness analysis.

Table 5. Example of a table to compare mistakes.

	First design Requirements-focused prototype		Second design Socially-focused prototype	
	Mistakes (average)	**Mistakes (std. dev.)**	**Mistakes (average)**	**Mistakes (std. dev.)**
Task 1	0,87	1,09	2,50	1,25
Task 2	0,75	1,31	1,00	0,75
Task 3	1,62	1,03	3,12	1,40

Table 6. Example of a table to compare completion ratio.

	First design % of success	Second design % of success
Task 1	100%	100%
Task 2	100%	100%
Task 3	100%	37,5%

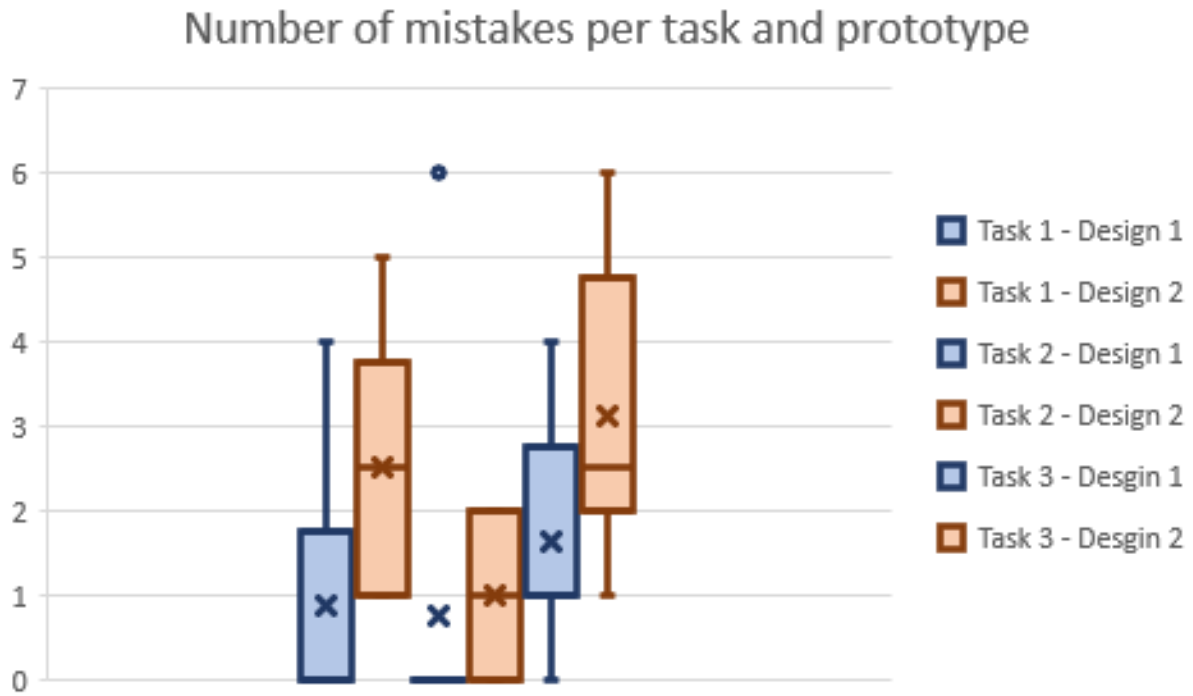


Figure 5. Box and whiskers diagram comparing number of mistakes per task and design

From the box and whiskers diagram it is very clear that the number of mistakes in the second design is higher in every task.

The first task was thought to be done more easily with the first design by putting the actions necessary to perform it in the foreground while in the second design these actions were placed in the second or third place. So, we expected that people would have done it more effectively with the first design. Considering the average of mistakes and the optimum actions for the two designs, the first one is better for effectiveness because 0.87, with 14 optimum actions (0.06 ratio of errors), is a better average than 2.5, with 17 optimum actions (0.14 ratio of errors).

The second task was thought to be done more easily with the second design by putting the actions necessary to perform it in the foreground while in the first design these actions were placed in the second or third place. So, we expected that people would have done it more effectively with the second design. Considering the average of mistakes and the optimum actions for the two designs, the second one is better for effectiveness because 1, with 6 optimum actions (0.167 ratio of errors) is a better average than 0.75, with 4 optimum actions (0.19 ratio of errors).

The third task was thought to see how the users approach to an important feature emerged in the interviews and observations process concerning the reviews. Considering the average of mistakes and the optimum actions for the two designs, the first one is better for effectiveness because 1.62, with 8 optimum actions (0.20 ratio of errors) is a better average than 3.12, with 9 optimum actions (0.35 ratio of errors). Considering that with the second design only 3 out of 8 testers managed to complete the task and everybody with a tip and also considering the feedback we received from the user themselves we can affirm that the first design is better than the second one. We noticed that this evaluation is influenced by the way we communicate the task. When we tipped the testers suggesting that they reserved with the app, they immediately would go to the right section and complete the task easily. Without this tip they couldn't complete the task. So we could say that if the place was not reserved by app, definitely the first design is better, otherwise we would need a second testing to define it.

To conclude this analysis, in ⅔ tasks the first design offers better performance than the second one in terms of effectiveness and in the one in which the second design is better there is a very small difference with the first one that we don’t consider strongly impacting.

So, overall, the first design offers better performance than the second one in terms of effectiveness.

6 Efficiency

6.1 Efficiency of first design: Requirements-focused Prototype

Table 7. Table containing information about number of elemental actions per task.

	Actions (avg.)	**Actions (std. dev.)**	**Optimum number of actions**	**Ratio between average number of actions and optimum: (average number**

				of actions) / (optimum number of actions)
Task 1	10,75	3,15	14	0,77
Task 2	5,12	1,96	4	1,28
Task 3	8,87	2,62	8	1,11

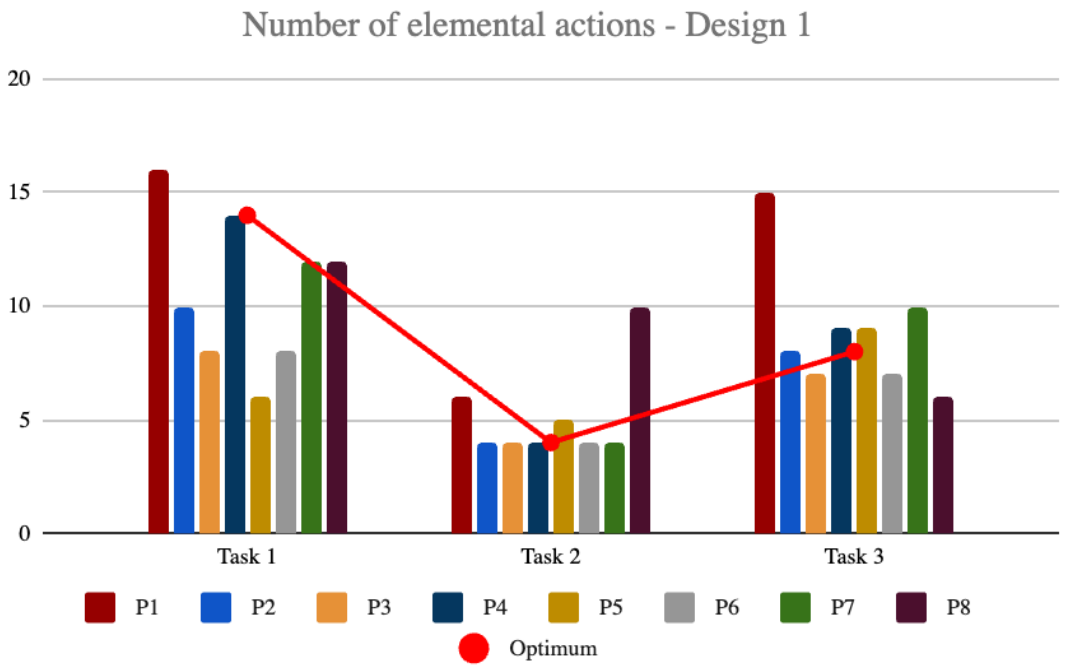


Figure 6. Bar chart with the number of elemental actions to complete the task (8 participants, from P1 to P8; and three tasks, from T1 to T3). Optimum value represented as a line.

Efficiency findings for first design:

- Finding 1: Even though we had outliers in each task, all of the users were able to finish the 3 tasks being close to the optimum amount of actions that was thought of by the designers.
- Finding 2: Some of the participants didn't use the "filters" section as planned by the designers, some of them didn't even mention it while they were describing the screen, and as a result never used it. This part is not as visible as expected, and this is why we can find differences in clicks between our participants. 5 out of 8 participants used the filters option.
- Finding 3: Some of the users expected to find the big things like wifi and laptop allowance icons, in the cards of the pop-ups or in the list of offers, this could have let them filter some options just from that action.
- Finding 4: The participants that had less actions in task 1 found another path or forgot to check some of the things described in the task and even though they successfully completed the task, checking the restrictions was an important step for the task.
- Finding 5: On the screen of the cafe profiles, some of the participants tried to click on not clickable items like the stars. Some of the participants also said that

they couldn't really differentiate between buttons and information chips, or the hierarchy of the chips shown throughout the description.

- Finding 6: A lot of Participants overperformed in comparison to our optimum(mainly task 1, but also task 3), because they skipped steps, like applying certain filters, that we deemed to be in the optimum path. Additionally, they remembered where certain information was and didn't take the steps that were anticipated.(task 3)

6.2 Efficiency of second design: Socially-focused prototype

In this section we will provide one graph and one table for both the personas. This is because there is not a big difference in their behaviour so their results are merged in one table and one graph.

Table 8. Table containing information about number of elemental actions.

	Actions (avg.)	**Actions (std. dev.)**	**Optimum number of actions**	**Ratio between average number of actions and optimum: (average number of actions) / (optimum number of actions)**
Task 1	17,25	1,75	17	1,01
Task 2	6,75	1,83	6	1,13
Task 3	15,33	2,89	9	1,70

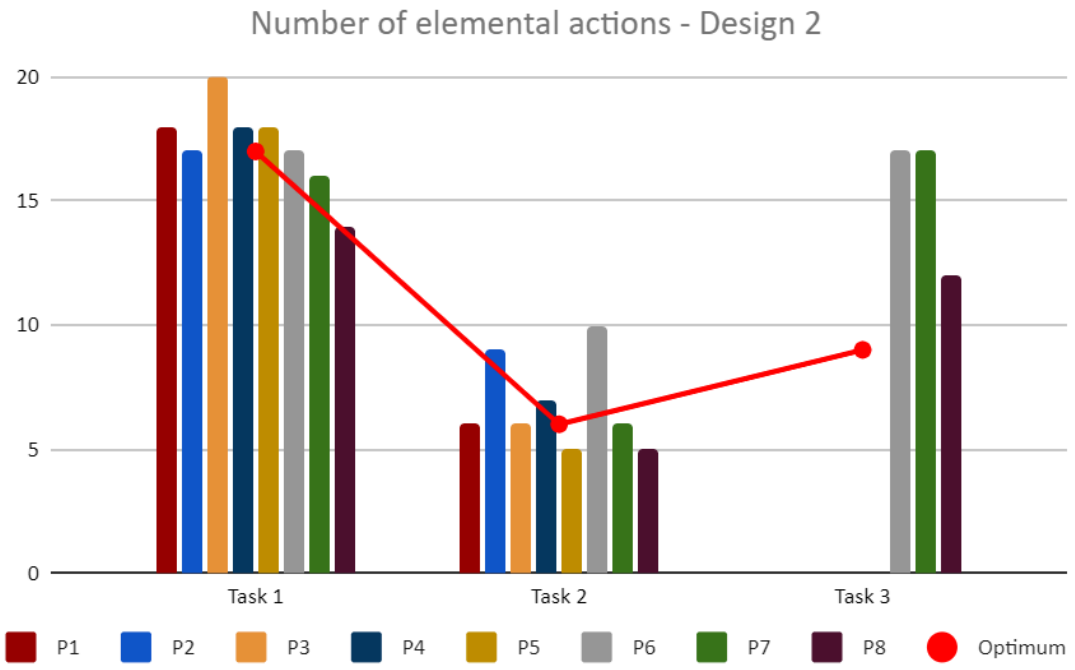


Figure 7. Bar chart with the number of elemental actions to complete the task (8 participants, from P1 to P8; and three tasks, from T1 to T3). Optimum value represented as a line

Before analysing the findings about the efficiency of this second design, we must say that the cases where testers made less actions than the optimum number is because of the content we choose to show in the paper prototype. For example, sometimes users were able to find a specific cafè just because we put it on the screens but not because they searched for it.

Furthermore, we noticed that the way we implemented task 3 was very challenging for the testers and different from their mental models, as a matter of fact only three of them were able to complete it with the facilitator tips and the others couldn't complete it at all. For the first 5 testers we consider the tip as a failure of the task because we told them exactly which section to go to, for the last 3 we consider the tip as non-invalidant because we told them that they booked the place with the app and they were able to find the section to leave the review by themselves.

In the following, we will state all the findings that affect efficiency. To establish what is an efficiency finding we considered anything that makes the users do a click that leads them in other directions.

Efficiency findings for second design:

- Finding 1: Although we taught that users will search immediately for filters considering the nature of the first task, we found out that the search screen has too much content that distracts the users in the filter selection and deviates them from their goals. This makes them click on another section of the screen "hiding" the filter option from their sight. Only 2 out of 8 went directly for filters in the search screen.
- Finding 2: Following the finding 1, we found that in general, for the users it is very important to find immediately the information they are looking for, with no need of putting extra content around it. In fact, 8/8 users were overwhelmed by the quantity of information presented.
- Finding 3: The importance of the standards using icons. In particular, in the second task, we used the "save" button to add to the wishlist instead of the standard heart. This caused some confusion to every tester, but with no other actions they managed to complete the task. Also because the context suggested to them that hearts were used for other purposes.
- Finding 4: To leave a review, 8/8 users tried to go to the cafè detail page and looked for that feature. This is why no tester made it to complete the task in less than 12 actions and no one was able to do it with no tip.
- Finding 5: The way we presented the tabs (e.g. "My feed" and "Discovery") are confusing for users. Actually we obtain the opposite effect, they think they are on the other page. Only 2 users out of 8 understood the section they were on.
- Finding 6: The filters for the search are one click too far from the users' mental models. Only 2 of them used the filters right away, the other 6 performed other actions to restrict the results of what they were searching.
- Finding 7: 5 out of 8 users used the search bar and the keyboard directly to search for halal places. The other 3 went through the expected path. This tells us that there is a little preference to search directly from the search bar when it is about filtering for one requirement.

- Finding 8: In the third task, when giving the tip that they went to the cafè using the app, we have a rate of 100% of them completing the task. We gave this tip only to three of the users, and to the others we told them which section to go to.

6.3 Efficiency analysis

Table 9. Table to compare efficiency.

	First design : Requirements-focused prototype			Second design: Socially-focused Prototype		
	Actions (average)	**Actions (std. dev.)**	**Actions (ratio over optimum)**	**Actions (average)**	**Actions (std. dev.)**	**Actions (ratio over optimum)**
Task 1	10,75	3,15	0,77	17,25	1,75	1,01
Task 2	5,12	1,96	1,28	6,75	1,83	1,13
Task 3	8,87	2,62	1,11	15,33	2,89	1,70

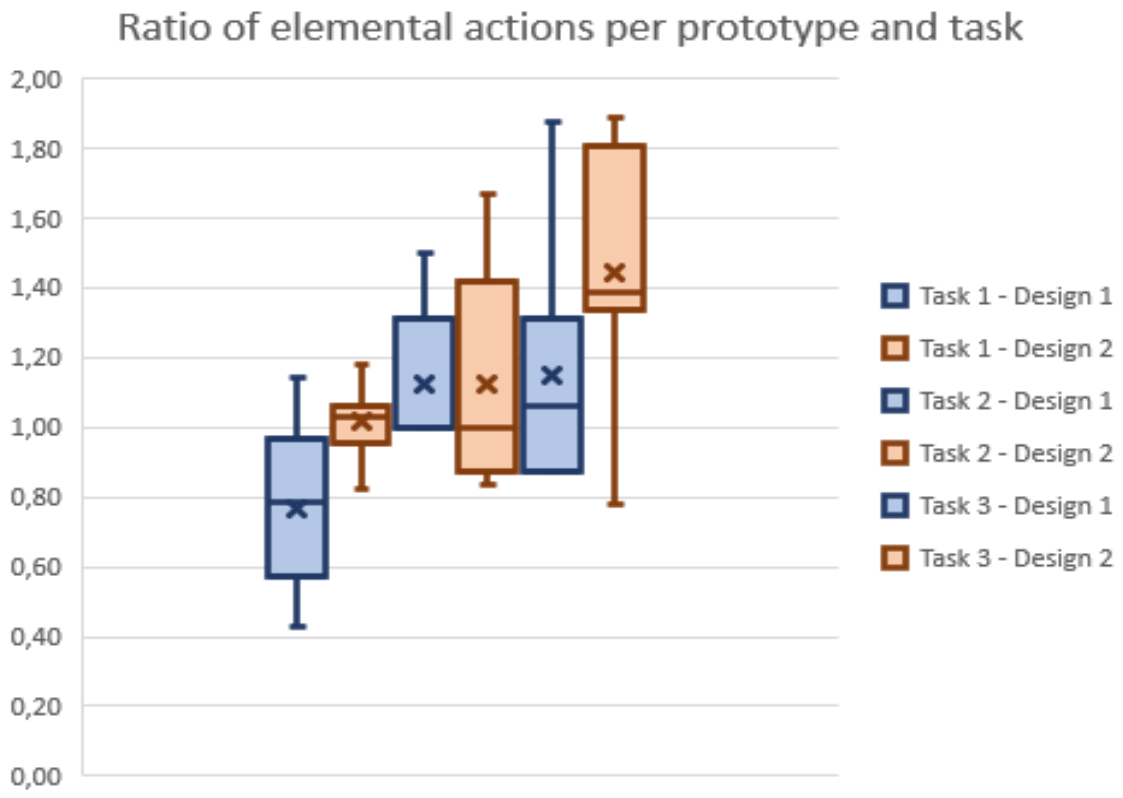


Figure 8. Box and whiskers chart to compare number of actions per prototype and task.

After analysing the data of the results for efficiency of each prototype there are some important things to highlight for each task.

In the first task, the optimum way to complete the task checking every requirement is to apply the filters. We found in both prototypes that some of the users didn't follow the expected path which had an impact on the efficiency of the task, however in the end prototype 1 had a ratio of 0,77 over optimum 14 and prototype 2 had a ratio of 1,01 over optimum 17.

In the second task, we expected to have better efficiency for prototype 2 because including the social part in prototype 1 was a second priority. In this case the prototype 1 ratio is 1,28 over optimum 4 and prototype 2 has a ratio of 1,13 over optimum 6, this indicates that there is a difference in the efficiency between the 2 prototypes and even though the users did make mistakes, the important findings here are that the purpose of this task was fulfilled, and in both designs there could be some improvements for the task design to be closer to the optimum ratio.

In the third task, we wanted to test an important feature for the users which is the reviews, as found in the interviews iteration people almost always check the reviews of a place to confirm it is good. For the task we wanted to test the one with more steps, in terms of efficiency, prototype 1 had a ratio of 1,11 over optimum and prototype 2 had a ratio of 1,70 over optimum. It is important to mention that not all participants completed the task in prototype 2. The findings here are that the design of prototype 1 can be improved so that in terms of efficiency the users can see the optimum path quicker. On the other hand, for prototype 2 this is the task with less efficiency as it took the users a lot more than expected to complete the task, and they made a lot of unnecessary actions in order to find the optimal path.

In conclusion, prototype 1 is the one that has better efficiency overall. Although prototype 1 didn't achieve optimal efficiency in all 3 tasks, it has a more consistent performance and it is not far from the optimum actions required for the tasks. Prototype 2 varies much more and in the majority of cases it requires more actions than optimal.

7 User satisfaction: SUS questionnaire

7.1 SUS for first design: Requirements-focused Prototype

SUS score: **84,1**

Table 10. Results of the SUS questionnaire for Prototype 1.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	1	0	2	4	1
2	7	1	0	0	0
3	0	0	0	3	5
4	8	0	0	0	0
5	0	0	0	5	3
6	5	2	0	0	1
7	1	0	0	2	5
8	5	2	0	1	0
9	1	0	1	2	4
10	6	1	0	0	1

SUS findings for first design:

- Finding 1: When asked if this is a system that participants would use frequently, 3 of the replies were neutral and one disagreed, this can be related to the time our participants usually spend in cafes, because if they don't go that often then the system, in general, doesn't add so much value in the day to day life.

- Finding 2: When asked if the participants felt confident using this system, one of the participants disagreed and one stayed neutral. The goal is to make the interface as friendly and intuitive as we can so the design itself could have been a factor for this and we can take into account the comments for future iterations.

- Finding 3: When asked if the participants needed to learn a lot of things to use the system, there was an outlier that said that yes, so it can be because of the task itself that was provided or again something in the design itself.

7.2 SUS for second design: Socially-focused Prototype

SUS score: **58,1**

Table 11. Results of the SUS questionnaire for Prototype 2.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	0	6	0	1
1	2	0	4	1
0	3	2	2	1
3	3	2	0	0
0	0	4	4	0
3	2	0	2	1
0	1	2	3	2
1	3	1	3	0
1	1	3	2	1
2	1	3	0	2

- Finding 1: 2 participants out of 8 found the interface overwhelming due to excessive information, stating "I didn't like it. It was cluttered and difficult to use" and "It was cluttered. A lot of information on screen". The issue can be attributed to the excessive amount of information and elements displayed on every screen, resulting in the increase of users' disengagement

- Finding 2: 2 participants out of 8 highlighted how they found the app confusing and not behaving as expected. Such feeling ("very confusing, sometimes didn't

behave as the expectation he had") is mainly due to the fact that the app was meant to allow users to fulfil searching and booking needs while emphasising its social component: merging these elements may cause new adopters to feel lost, as one person admitted: "I feel like this prototype is kind of counterintuitive and works more as a social app than a coffee shop finder"

- Finding 3: "I struggle to find how to leave a review on the location" and "the review: why can't he review it from the site instead of having to go to the profile ?" are comments which depict how 2 participants out of 8 manifested issues with the review system. Users expected to search for a specific place and be able to leave a review through the detail inspection page: the path intended to be followed was more misleading, forcing participants to go through the profile section without them being able to understand it.

7.3 Analysis of user satisfaction (SUS questionnaire)

Table 12. SUS scores of both prototype

s

	First design	Second design
SUS Score	84,1	58,1

Table 13. Comparison of the replies to the SUS sentences (10 tables)

I think that I would like to use this system frequently					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
First design	1	0	2	4	1
Second design	1	0	6	0	1

I found the system unnecessarily complex					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
First design	7	1	0	0	0
Second design	1	2	0	4	1

I thought the system was easy to use					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
First design	0	0	0	3	5
Second design	0	3	2	2	1

I think that I would need the support of a technical person to be able to use this system					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
First design	8	0	0	0	0

Second design	3	3	2	0	0

I found the various functions in this system were well integrated					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	0	0	0	5	3
Second design	0	0	4	4	0

I thought there was too much inconsistency in this system.					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	5	2	0	0	1
Second design	3	2	0	2	1

I would imagine that most people would learn to use this system very quickly					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	1	0	0	2	5
Second design	0	1	2	3	2

I found the system very cumbersome to use					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	5	2	0	1	0
Second design	1	3	1	3	0

I felt very confident using the system					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	1	0	1	2	4
Second design	1	1	3	2	1

I needed to learn a lot of things before I could get going with this system.					
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
First design	6	1	0	0	1

Second design	2	1	3	0	2

1. I think that I would like to use this system frequently

For this sentence, the best design is the requirements-focused prototype because - according to overall results from the SUS analysis - it turned out to be the preferred one by all participants who took part in the usability testing. The socially-focused prototype has been rated as much more difficult to use, especially considering the higher number of actions, mistakes and failures (in particular regarding task 03).

2. I found the system unnecessarily complex

The less complicated system is the requirements-focused prototype because - according to overall results from the SUS analysis - is way more intuitive and less complex than the second one. The socially-focused prototype displays features which go beyond the booking process, lacking intuitive and easy to access pathways to leave reviews.

3. I thought the system was easy to use

For this sentence, the best design is the requirements-focused prototype because - according to overall results from the SUS analysis - allows easier navigation, easier research and is overall more consistent and less overwhelming. The socially-focused prototype has been rated as more difficult to use, as it focuses more on the social interaction rather than just research and booking activities.

4. I think that I would need the support of a technical person to be able to use this system

Regarding this sentence, overall results from the SUS analysis point to the socially-focused prototype. Task 03 well resembles this feeling: 5 participants did not manage to complete the task (1 out of 5 did not even manage to reach the final goal with technical support), while the remaining 3 only succeeded thanks to external help.

5. I found the various functions in this system were well integrated

For this sentence, the best design is the requirements-focused prototype because - according to overall results from the SUS analysis - users rated it as more consistent, showing only relevant information in a visible way.

6. I thought there was too much inconsistency in this system

According to this sentence, more users agreed the socially-focused prototype has a higher level of inconsistency related to the requirements-focused one. This was probably due to the fact that too many elements were distracting for the participants, lacking overall intuitiveness.

7. I would imagine that most people would learn to use this system very quickly

For this sentence, the best design is the requirements-focused prototype because - according to overall results from the SUS analysis - it did not require users to seek

external help to complete tasks and allowed every participant to succeed. The socially-focused prototype, on the other hand, turned out to be much more difficult to work with, especially regarding specific tasks (task 03 in particular). The fact that some participants had to be guided throughout the test to help them complete all the necessary steps is a key indicator the system fails to be quick and easily understood autonomously.

8. I found the system very cumbersome to use

According to this sentence, findings pointed out that the socially-focused prototype has been more hard to handle for the majority of participants. This is mainly due to the fact that the system was too cluttered, showing a lot of information on screen and acting counterintuitive. Search results being highly dependent on friends' recommendations was considered more a struggle than an advantage.

9. I felt very confident using the system

According to this sentence, the best design is the requirements-focused prototype because - according to overall results from the SUS analysis - being very very similar to other applications in the way it works and displays information it encourages confidence among users when going through the item and using it.

10. I needed to learn a lot of things before I could get going with this system

According to this sentence, findings pointed out that users struggled to learn the socially-focused prototype more than the other one. This is mainly due to the fact that the system is mostly counterintuitive and works completely different from other applications used for the same tasks.

Based on the SUS results, the design with the best user satisfaction is the requirements-focused prototype because generally it was received with positive comments in terms of its usability, considering some requirements. The users found it intuitive and simple, as it allowed users to navigate and understand easily. One prototype that is appreciated by having features such as maps and clear step-by-step guidance may be specifically recommended for having a design that fits well with user functionality and simplicity expectations. However, the requirements-focused prototype does bear areas of improvement: much clearer form requirements, for example, and filtering options that would be able to include more of the user-desired features, such as “laptops allowed”.

The socially-focused prototype, on the other hand, was defined as social connectivity - with advanced social characteristics defined as very complex filters offering detailed information about cafes - participants appreciated the dynamic interaction the prototype offers. They could hence see activities and recommendations for friends in order to enjoy a richer experience. However, the prototype has received huge criticism for its interface being cluttered and the overloading functionality, burdening users with a lot of information, confusing them. The main pain points are the difficulty in navigating through the review system and finding the cafes: this would have to be done without necessarily tapping into the friend recommendations, which would indicate some

compromise in usability for the social features. The attempt to integrate social elements detracts from usability and doesn't actually make it very user-friendly.

8 General impressions of participants

8.1 General impressions on first design: Requirements-focused prototype

In the following section we describe the main problems users reported for the requirements-focused prototype. Some participants did not report any problems. Others reported conduction mainly related to filters and the presentation of information in the profile.

8.1.1 What are the main problems you have found while using this prototype?

Findings on main problems:

- Finding 1: 25% of participants (2 out of 8) participants reported that they could not think of problems to report.
- Finding 2: 25% of participants (2 out of 8) participants reported that they felt like filter options were missing.
- Finding 3: 12.5% of participants (1 out of 8) participants reported that he did not know where to look for the required information.
- Finding 4: 12.5% of participants (1 out of 8) participants reported that she could not interpret the “6h” on the offer-overlay. (“Do I have to stay 6 hours?”)
- Finding 5: 12.5% of participants (1 out of 8) participants reported that she expected the profile of cafes to show the reviews of her friends.
- Finding 6: 12.5% of participants (1 out of 8) participants reported that the use of chips on the cafe profile was misleading, as different chips appeared in different locations, when they should have been grouped together.

8.1.2 What is the part of the prototype that has been more difficult to understand? Why?

Findings on parts of the prototype more difficult to understand:

- Finding 1: 50% of participants (4 out of 8) participants were confused whenever they saw the selected time in the pop-up with the booking information because it said 12:00 but it didn’t indicate until when, even when the offer said it was for 2 hours.
- Finding 2: 37.5% of participants (3 out of 8) participants didn’t notice the filters option which made it more complicated for them to go on the expected path for the task, instead they just clicked on everything appearing on the map until finding the “right cafe”.
- Finding 3: 37.5% of participants (3 out of 8) participants that used the filters option, were confused about what part of the filters was mandatory or if they could even use it to look only for one thing (like the halal option), for example, it

was very clear on the price because they asked that what should they select if it wasn’t on the task and are not sure what they should do.
- Finding 4: 25% of participants (2 out of 8) participants said that they would have expected a “wishlist” section in the profile so that they could be faster in finding different cafes that they have already seen and liked.

8.1.3 Can you describe your overall experience with this prototype?

Findings on the overall experience with design 1:

- Finding 1: 25% of participants (2 out of 8) participants said that some of the components are misleading as they seem to be buttons because they look similar or might be reused components.
- Finding 2: 100% of participants (8 out of 8) participants liked that the first screen they could see was a map, it felt very intuitive and easy to see.
- Finding 3: 50% of participants (4 out of 8) participants disliked that they had to calculate the time of the offers and that the time frame selected wasn’t displayed directly.

8.2 General impressions on second design: socially focused prototype

In the following section we describe the main problems users reported for the socially focused prototype. The main comments related to the interface being overwhelmingly filled with information, and relating to the struggle with completing the third task of the usability test.

8.2.1 What are the main problems you have found while using this prototype?

Findings on main problems:

- Finding 1: 37.5% of participants (3 out of 8) indicated that the interface was too cluttered or overloaded with information. Relevant comments were "too many things in one page" and "too much info but didn't find the info he wanted."
- Finding 2: 50% of participants (4 out of 8) described the interface as confusing or not intuitive. Relevant comments were "UI was more difficult," and "overall confusing".
- Finding 3: 37.5% of participants (3 out of 8) identified issues with the review or feedback system. Relevant comments were "I struggle to find how to leave a review on the location," and "no rating from the profile."
- Finding 4: 37.5% of participants (3 out of 8) found inconsistency issues between their expectations and the functionality of the app. "Feed would be expected to hold recent activity," "vegan filter didn't reflect in the results" and "sometimes didn't behave as the expectation he had."

- Finding 5: 12.5% of participants (1 out of 8) expressed that the app did not fulfil its intended purpose as a tool to search for coffee shops. "works more as a social app than a coffee shop finder."

8.2.2 What is the part of the prototype that has been more difficult to understand? Why?

Findings on main problems:

- Finding 1: The way of how leaving a review was implemented was completely different from the mental model of the users tested. 6/8 of users tested, found it as the most difficult feature to understand and perform. The reason is that they expected to find this feature in the detail page of the cafè.
- Finding 2: 2/8 users found the search too complicated. One prefers a map because it is faster to find all the information, the other one asks for a search unrelated to the friend's recommendation.
- Finding 3: Although during the observations we saw all of the users confused about the usages of like and recommend actions, only one of them pointed this out as a problem that confused him/her a lot.

8.2.3 Can you describe your overall experience with this prototype?

- Finding 1: 25% (2 out of 8) of participants indicated that the interface was cluttered or overwhelming. Relevant comments were "I didn't like it. It was cluttered and difficult to use" and "it was a bit overwhelming to open it and see so many places to go."
- Finding 2: 50% (4 out of 8) of participants described issues with usability or ease of use. Relevant comments were "so many things wanted my attention," "needs to be easier to find things," "should be more easy to use," and "a bit harder to use than the previous one."
- Finding 3: 50% (4 out of 8) of participants provided positive feedback on the app's interface and features. Relevant comments were "felt really confident when going through it," "I like the main screen more than the other prototype," "I would use it," and "Easy to use. Simple."
- Finding 4: 12.5% (1 out of 8) of participants highlighted specific aspects of the interface as confusing. Relevant comments were "the part regarding the last task was confusing."

8.3 Analysis of general impressions of participants

Generally most participants reported to prefer the requirements-focused prototype. They reported the socially focused prototype was too cluttered. The map view aligned with the users goal of navigating to find a location and they experienced it as simple to use.

8.3.1 What are the main problems you have found while using this prototype?

The design with most important problems is the Socially focused prototype, because participants reported it was too cluttered, they did not understand how to leave reviews, and because its social approach did not align with its intended purpose of searching for working cafes.

On the contrary, the other Requirements-rocused prototype has less problems, mainly related to the representation of information. The main problems noted were that it was not indicated which filter options were mandatory and that filter options were missing. Further, the information on the offer pop-up could not be interpreted as intended. In the profile page the location of various chips led to confusion and participants struggled to differentiate chips from buttons. However, the mental model of the prototype aligned with what subjects were expecting.

8.3.2 What is the part of the prototype that has been more difficult to understand? Why?

The design with more understandability issues is the Socially-focused Prototype, because it presented the subjects with much more information than they could quickly comprehend. The most severe problem was that users did not intuitively navigate through the profile to leave a review on past sessions. They expected to leave a review through the profile page of a cafe. Further, they did not understand the results of the search and the difference between the like and recommended actions.

On the contrary, the other design has less understandable issues. The most difficult thing was the information about time frames presented on offer pop-ups. Further, they did not discover the possibility to filter and which filter were mandatory.

8.3.3 Can you describe your overall experience with this prototype?

The design with more positive opinions is prototype one, because all participants said they enjoyed the map view for navigating the various options.

The design with more negative opinions is prototype two, because the interface seemed cluttered and overwhelming. However, half of the participants reported they enjoyed the overview of recent reviews given by friends.

8.3.4 Which is the prototype that you prefer? Why?

7/8 participants reported they preferred the Requirements-focus prototype. One summarised it as being “Simpler to use, more intuitive, less overwhelming”. The participant who preferred the second prototype explained that it was superior for being more detailed.

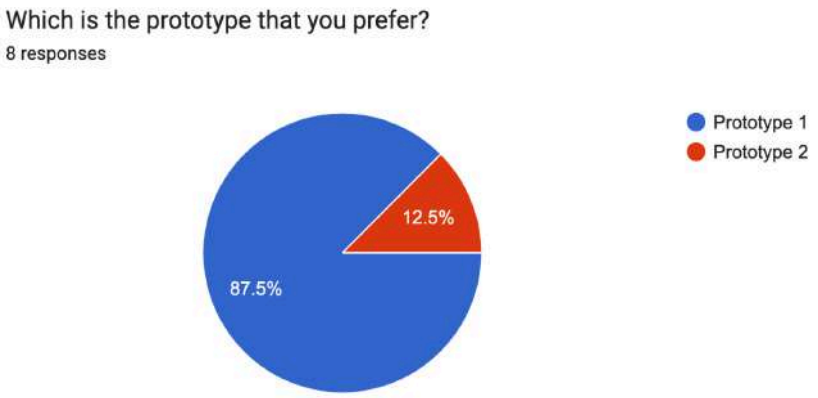


Figure 9. User preferences among the two designs.

8.3.5 What have you liked the most of each prototype?

For the first prototype, users have liked: The map view, the simplicity/intuitiveness, the step-by-step progression they experienced, and seeing your friends' recent reviews.

For the second prototype, users have liked: Better filter options, more informative while less cluttered profile pages of cafes, better features for time selection, seeing friends' recent activities, and having a feed to discover new cafes.

9 Relevant observations and usability problems

9.1 Observations for first design: Requirements-focused Prototype

Insights after observing how the first design was used:

- Insight 1 (positive): People used the search option to filter for individual filter criteria, such as halal or vegan, which we did not intend.
- Insight 2 (negative): People did not recognize the items on the map as “offers”. It was not entirely apparent to them what the “offer” pop-up afforded. Additionally, they commented that they expected to find more information in this view, such as the availability of wifi and laptop policy.
- Insight 3 (negative): Some users did not discover the filter option as quickly as expected or at all.
- Insight 4 (negative): The profile view led to confusion because we used Chips as a representation of data that was conducted with buttons. Subjects reported to be unsure which elements are clickable and which aren’t.

9.2 Observations for second design: Socially-focused prototype

Insights after observing how the second design was used:

- Insight 1 (positive): once users were given the tip that the place they needed to review had been booked through the app, they successfully managed on their

own to inspect the profile page and complete the task, identifying this section as the one storing information regarding user's activities.

- Insight 2 (negative): most participants misunderstood and were confused about which tab was selected (e.g. "my feed / discover" buttons on the home page).
- Insight 3 (negative): "save to favourite" button on the detail inspection page of every place is too little and not visible enough, requiring unnecessary effort to be found. Icons are misleading as well (the heart icon intended to be used when liking a place may have more associations to the favourite list than the bookmark one.
- Insight 4 (negative): the "events near you" section in the explore page - along with friends' stories in the home page feed - can be discarded since users did not interact with them and since they only have the effect of loading the page with information, causing distraction. A few participants tried to search for a place choosing a mood filter in the explore page.
- Insight 5 (negative): the detail inspection page of every place needs to host reviews (to be inspected) and a feature to allow users to publish them.

9.3 Summary of usability problems per prototype

Table 14. Problems of the first design.

First design	**Problem**	**Possible solution**	**Severity** (cosmetic, minor, major, catastrophe)
Problem 1	Offers on the map: The users were confused on what the offers meant.	When a user clicks on the map, the pop-up can be instead of a whole offer, just a screen where you can see more information,	Minor
Problem 2	The subject used the search bar to filter for "vegan" or "halal".	We can allow the search function to find not only based on name, but also properties of the cafe.	Minor (solution is advanced)
Problem 3	Users did not discover the filter.	We can make the filter more prominent, by making it text and icon.	Major
Problem 4	The chips in the profile were difficult to interpret and differentiate from buttons.	We will change the way we position buttons and the design of chips and buttons to prevent this confusion.	Cosmetic
Problem 5	Users were confused about what was mandatory to select in the filters.	We will add an asterisk "*" next to the categories that are mandatory in order to apply the filters.	Cosmetic

Table 15. Problems of the second design.

Second design	**Problem**	**Possible solution**	**Severity** (cosmetic, minor, major, catastrophe)
Problem 1	Leave a review	Give the possibility to the user to leave a review directly from the detail page of the cafe.	Catastrophe
Problem 2	Users did not discover the filter	We can make the filter more prominent, by making it text and icon.	Major
Problem 3	Usage of icons	Avoid the use of icons with similar purposes such as hearts for likes, thumbs up for recommendations and bookmark to add to favourites.	Minor
Problem 4	Overwhelming content	Decrease the number of information to be shown on each page and select them more accurately	Major
Problem 5	Usage of tabs	Implement tabs in a more standard way in order to make users immediately understand the section they are on.	Minor
Problem 6	Filters rankings	Specific filters for research (distance, date and time, menu…) should be accessible prior to filters used in the explore section just to get inspired while scouting (productivity, full immersion, group session…)	Minor
Problem 7	Output for filtered research	Implement a better visibility of system status when showing filtered searched results .	Minor

The design that has less relevant usability problems is prototype 1, because the only “major” problem in this prototype was that some of the users didn’t recognize the filter button available, but for the users that did find it, it had good usability, regardless the users that didn’t use it could complete the task with more actions. The rest of the problems were minor and didn't have any effect on the successful completion of the tasks for the users.

10 . Preferred design

Table 16. Comparison of usability results

	1st design is better	2nd design is better	Tie
Effectiveness	X		
Efficiency	X		
User satisfaction	X		
User preferences	X		
Usability problems	X		

The best design is the Requirements-focused Prototype (1), because it outperformed the Socially-focused prototype (2) in all areas. This is the design that will be used as the starting point for the high-fidelity prototype. However, the filters and profile page of the Socially-focused prototype were preferred by participants and will be integrated into our high-fidelity prototype.

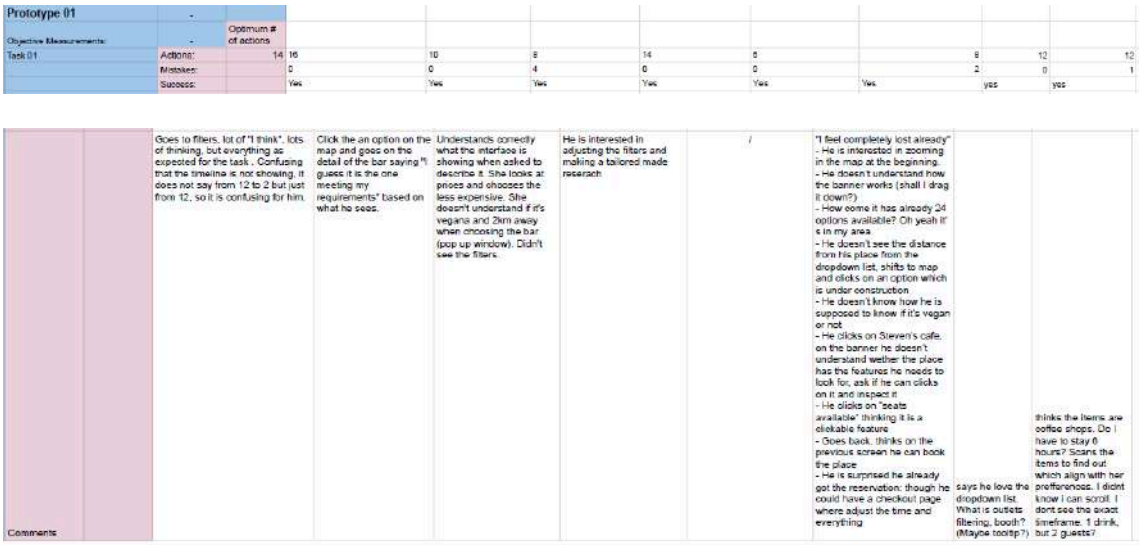
Annex A. Gathered data

Demographic notes:

Date of test:	-		04-04-2024	05-05-2024	05-05-2024	05-05-2024	05-05-2024	08-05-2024	10-05-2024	10-05-2024
Time of test:	-		17:50:00 - 18:48:00	14:20:00 - 14:58:00	15:17:00 - 15:55:00	18:10:00 - 18:55:00	17:25 - 18:08	15:01:00 - 15:50:00	14:27:00 - 15:02:	15:58:00 - 18:44:00
Questions:	-		No	No	No	Asked how many prototypes	No	What was your idea again?	No	No
Demographics:	Age:		24	21	20	24	21	25	24	24
	Gender:		Male	Male	Female	Male	Female	Male	Male	female
	Occupation:		Student	remote worker	remote worker	remote worker	remote worker	Student	Student	student
	Screentime on Phone:		3-4 hours	3 hours	3-4 hours	5-6 hours	4-5 hours	1.5 - 2 hours	4-5 hours	3-4 hours
	How much do you work in coffee shops per week?		once a week at starbucks	16-20 hours	3-5h a week	2h per week in coffee shops, 15h per week in uni library	One day per week goes to Starbucks and stays there for 6/7 hours	4-5h per week	less than 2 hours, when there is a lot of work sometimes he stays for 4 hours at a time	4hours per week

First design observations notes

Task 1



Prototype 01	-									
Objective Measurements:	-	Optimum # of actions								
Task 01	Actions:	14	16	10	8	14	8	8	12	12
	Mistakes:		0	0	4	0	0	2	0	1
	Success:		Yes	Yes	Yes	Yes	Yes	Yes	yes	yes
Comments			Goes to filters, lot of "I think", lots of thinking, but everything as expected for the task . Confusing that the timeline is not showing. It does not say from 12 to 2 but just from 12, so it is confusing for him.	Click the an option on the map and goes on the detail of the bar saying "I guess it is the one meeting my requirements" based on what he sees.	Understands correctly what the interface is showing when asked to describe it. She looks at prices and chooses the less expensive. She doesn't understand if it's vegans and 2km away when choosing the bar (pop up window). Didn't see the filters.	He is interested in adjusting the filters and making a tailored made research	/	"I feel completely lost already" - He is interested in zooming in the map at the beginning. - He doesn't understand how the banner works (shall I drag it down?) - How come it has already 24 options available? Oh yeah it' s in my area - He doesn't see the distance from his place from the dropdown list, shifts to map and clicks on an option which is under construction - He doesn't know how he is supposed to know if it's vegan or not - He clicks on Steven's cafe, on the banner he doesn't understand wether the place has the features he needs to look for, ask if he can clicks on it and inspect it - He clicks on "seats available" thinking it is a clickable feature - Goes back, thinks on the previous screen he can book the place - He is surprised he already got the reservation: though he could have a checkout page where adjust the time and everything	says he love the dropdown list. What is outets filtering, booth? (Maybe tooltip?)	thinks the items are coffee shops. Do I have to stay 6 hours? Scans the items to find out which align with her preferences. I dicint know I can scroll. I dont see the exact timeframe. I drink, but 2 guests?

General observation		Scroll to search for laptops, doesnt find, click on apply filters. He scrolled up and down twice. After the result page, he would click on search to look for laptops but since he sees only one results he clicks on it. Sometimes he does a confused face. Sees maps and understands what's showing, uses filters correctly, is a bit confused about change date / date selected but manages to do the correct thing, manages to complete task overall	Finds his needs and books the place. He is doing the task in a different way as we thought, but he managed to do it in less time and actions. Confused with time at first (in th popup), but good after. Good, finds the end of the task, very fast because from the map he found the only offer that aligned with his requirements. didn't filter and booked.	She chooses all the places which lead to under onstruction pages.	He asks information about the filter selection (can he set the price even if it's not in the task, along with other features such as quiet and chill)	she clicks on a random cafe in the map, then she clicks on steven cafe and she books from the popup directly	He says it's a lot to do in the task so lost on where to start at the beginning.He asks on how to get information to check the constraints. He completes the task but is not sure how he did it or if it's really complete.	checks list -> filters -> sets distance -> set timeframe -> adds guest -> selects date -> clicks wifi -> lunch -> vegan -> submit -> clicks on only offer -> book now	looks at the list -> filters -> less than 2km -> timeframe -> number of guests -> date -> wifi -> lunch -> vegitarian -> scroll -> apply -> click on item -> book now

Task 2

Task02:	Actions:	4	6	4	4	4	5	4	4	10	
	Mistakes:		0	0	0	0	0	0	0	0	
	Success:		Yes	Yes	Yes	Yes	Yes	Yes	yes	yes	

Comments:		Doesnt seem confident on what he does, seems he is quite unsure, but he is taking the right actions	She understands from the description that the place sells Halal food, easily gets there and adds it to the wishlist	Searches for "halal" in the search tab	Once she is on the popup in the map she says "there is no option to add to my whishlist"	- He goes to friends section, but realises he doesn't know the name of the friend - From the list he couldn't see whether specific food the places were offering - Doesn't understand if he's seeing her friend's activity / what she liked ...	What is the difference between lower chips and upper chips? I should have filtered before going to friends. Usually I would just look at halal restriction and then look if a friend reviews.	unclear about task. Is it about friends or finding the place? "I am not sure this is the place my friend likes"
General observations:	No problems on this task	Completes the task, pretty fast. Was confused on which friend to choose but selects the first and goes on with the task.	She manages to complete the task pretty quickly and without committing errors.	He is very keen on checking the monet range	Search -> "halal" -> clicks on the result on the map clicks on the name -> see the detail page of the place and add to wishlist	His attention is more on reading the task and he forgets what is available to see on the profile	Friends -> Sophia -> Clicks on soulkis -> adds to wishlist	Search -> "halal" -> checks list -> clicks on offer -> clicks on profile -> see more for the reviews ! -> scrolls ! -> Goes to friends -> Sophia -> clicks on soulks review item -> Adds to wishlist

Task 3

Task03:	Actions:	8	15	8	7	9	9	7	10	8	
	Mistakes:		2	4	1	3	1	1	1	0	
	Success:		Yes	Yes	Yes	Yes	Yes	Yes	yes	yes	

Comments:		Difficult with iphone keyboard	Goes to profile as first action->mistake. Then goes to activity -> mistake. Then return to map and search for the cafe. From here he correctly leave a review pretty quick and sure about what to do	Clicks on the five star, but then clicks on review.	He provided insights for a shortcut but still managed to accomplish the task	very confident and on point	- Photo of what? (When reading the task) - Asking if he booked his stay through the app, no answer given - Thinks he's done after sending the review and prior to receiving confirmation banner		
General observations:		After three tasks he seems more confident with the app (learnability). When he sees too much content (e.g. coffee profile page) he do a confused face (minimalism heuristic). He tries to leave a review directly from the stars he sees on the profile of the coffee -> mistake. He expect to see his review and not only the feedback of the review completed. Forgets one part (does not add photos) but manages to complete overall task. Expect to see that it is mandatory to upload pic to publish the review. He is confused on why he cannot see his review after publishing it	Correctly leave a review	She thinks that by clicking on star she rates the place	He thinks that a wishlist should be in the profile section. It's also more conveneit and faster instead of searching each time in the map, look for the results and finding the one you're looking for. He says too complicated. He would have given up this task. More in general this prototype has too much content and it is not intuitive. tried to find the functionality in other places (insisted on finding in favorities). But he eventually did it.	Clicks on sukis cafe -> see the popup-> goes to the page of detail of place clicking in the name -> clicks on leave a review and does it very quick and confident	Doesn't have problems, finds where to send review fast.	Activity ! -> Back to Map -> Search Souki -> click on it -> click on link to profile -> leave a review -> 5 stars -> comment -> image -> submit	Clicks on soulkis cafe -> leave a review -> rate as 5 -> write "amazing coffee" -> picture -> submit

Second design observations notes

Task 1

Prototype02	-										
Objective Measurements	-	Optimum # of actions									
Task01:	Actions:	17	18	17	20	18	18	17	16	14	
	Mistakes:		1	5	2	1	3	4	3	1	
	Success:		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Comments:		Clicked on filters but was confused so he had to read the task again. Uses the features to check his needs.Clicks on menu, and is vegan. Books the offe. everything seems correct o him, he books and at this point it is smooth for him.	He roams around the app a lot. He explores a lot of places that are not yet implemented	Sees places because its on discovery, sees the filters, goes smoothly from there to select the requirements, does all the expected actions like click on features, menu, schedule. Books the place because its good with the task. Completes the task.	He expect to find the time selection on the detail of the place where there are all the info about it (schedule, menu,)	Social media app, profile, friends, feed, what other people recommend or like about cafes. Asks if the black one is the only available i the hour schedule.	- Understands the layout is different - Understand he's in his feed and what it shows - Understands friends' activities on top - Understands navbar - When going to explore, he sees 2km distance is settled - Doesn't understand events and promotions - Understands he can selects cafes based on his mood, selects productivity expecting to find recommended cafes - He goes back home because he doesn't know where to search. ASKS IF HE CAN SWITCH TO discovery mode - He clicks on a place he sees on the homepage, because he sees a friend finds it productive - Find confusing the fact that the name of the place is below the picture and not above - He does not see the distance from his place, so goes to feature to check it - The menu convinces him that the place is vegan (couldn't find a label on the detail inspection page showing the place is vegan). Does not know about the mushroom steak, clicks on the online menu hoping to inspect it - Is interested in scrolling down through the pictures, but asks why ? They're not useful to him - Not sure if he's in the rating or feed section - Goes to the schedule section hoping to see if the place is free during selected hours - Confused about what graph next to the schedule means. wifi connection? Asks if he can clicks anywhere in that window - Happy to see every detail is already set	There is a filter set to 2km. Date and time is set.	thinks she is on discovery. What is the difference between discovery an explore? Is latina my location? or am I searching in that area? I am not sure if todays date is selected. The price filter should have a min and max not only max. cant see vegan food in booking. "another confirmation"

ID ->		01_	02_	03_	04_	05_	06_	07_	08_
General observations:		He expected the map to appear. He is confused, clicks on groups which doesnt exist. Wants to rectify his selection on filters. Expected vegan only, but gets results in the feed with other results.He needed to reread the task multiple times. Expected a map when going to search, is confused, does not know the mood, sees search on top. manages to use filter selection correctly. Goes back to filters to see if he checked free wifi, and checks it. Successfully completes the task	Does not find the information he is looking for on the first page. Confused clicks on productivity. Wonders what "events and promotions" are. Clicks on first item. Clicks on schedule. He isnt sure if he can work with a friend. Returns home. Clicks on the third item. Clicks on stevens cafe. Schedules the time. Clicks book now. Books the place. No more info of the place on the first page(he expected that), clicked on productivity and full but they don't exist. Manages to go to the cafe profile through his feed, clicks on the pop up of calendar bc he is confused about where to see that he can work with his friend.	At first, she was looking around everything and with the filters it was easy to find the right place.	Tries to go on discovery Then goes to explore -> search because he was looking for a specific name, but then he realise that the task has not a name so he correctly goes on filters and he feels pretty confortable in it. See the results, interpretate the icons (he guess the leaf is vegan but it is not 100 clear), clicks on the first result and opens the pop up schedule where i/he tries to interact with (such as the second tester). He decides to book and finds everything there and with no difficulties he books the place.	Explore, tries productivity, tries con, goes to search and tries to search vegan/work/cafe,home, scroll and see if she can find a recommendation, likes the first cafe so clicks on it. Goes to expected info, confused with time schedule, then completes task.Clicks notification for booking , so goes to profile, and checks the notification in bookings.	READ INFO IN ABOVE CELL	clicks explore -> click productivity -> clicks search -> types "workplace" -> filters -> sets "wifi" and "laptop" -> selects with friend -> study mode -> vegan -> submit -> checks lisas -> checks stevens -> clicks menu -> book now -> book now -> confirm -> close confirmation pop-up	explore -> filters -> wifi -> laptop -> clicks date -> scrolls -> group work -> silence -> check menu -> vegan -> submit -> clicks stevens -> book now -> scrolls -> books -> confirms

Task 2

Task02:	Actions:	8	6	9	6	7	6	10	6	6
	Mistakes:		1	2	0	2	1	2	0	0
	Success:		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

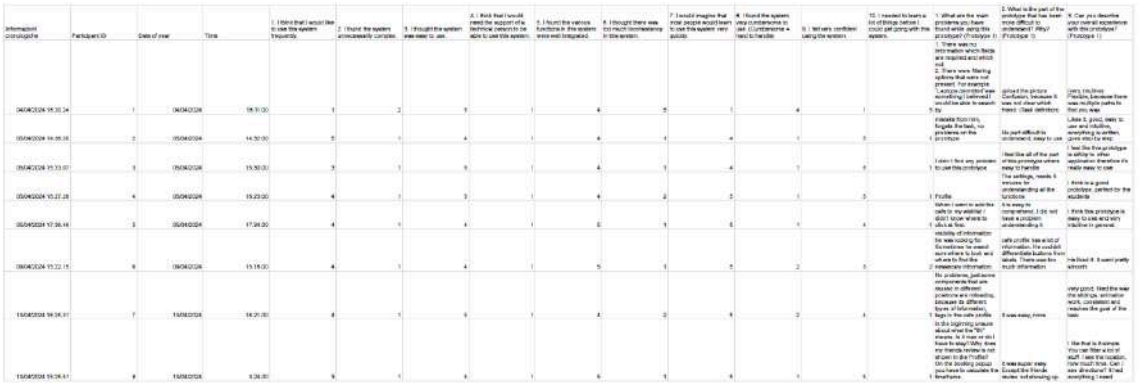
Comments:		Halal options are easy to find, confused in the profile when he sees a lot of pictures, wants to scroll.	Explored some pages that were not implemented. Seems a bit nervous after not finding the right path.	Comments she would do the same than the previous task.	"More complicated than prototype 1 to find the place" he asks for more clear information	Seems confused with the task and asks if she has more info. Goes smothly after looking at the prototype and trying to complete the task.	- Scrolls down through homepage looking for someone who has recently gone to Halal place - Asks about features (icon) showing, especially one regarding lack of plugs - Picks randomly items from the feed, but the pages are under construction. "I'm a little bit lost at the moment to be honest - Goes to search and types halal food - Clicks on the first item showing up in the recommended section - Checks the menu - Clicks on the Wishlist item, but wasn't sure because he though either that one or the heart would work as wish lists		Do I want to follow? probably not.
General observations:		Looks a lot to see where he can find his friend, didnt notice the screen selectio of the screen. Not successfully understanding he's on his feed and not sure wether to serach from. Successfully goes to filter section and research correctly. At the beginning scrolls down the page to find wishlist, is confused, but then sees wishlist save icon on top and manages to complete task successfully.	Opens Profile. Checks his friends, but it is not implemented. Clicks massages and it is not implemented. Clicks explore. Search halal. Finds Soukis. Checks the Profile. Adds to wishlist.	Goes to explore, filters halal places, sees the recommended by frinds so clicks on the first place.	Explore -> search "halal place"-> first result (not happy about the cleaness of the choices) -> click the name (nothing happens) -> save correctly	Explore, and ind friend. Search halal, clicks on the second place, clicks on sukis,	READ INFO IN ABOVE CELL	explore -> filters -> halal -> submit -> soukis -> save	search -> halal -> clicks on soukis -> clicks save

Task 3

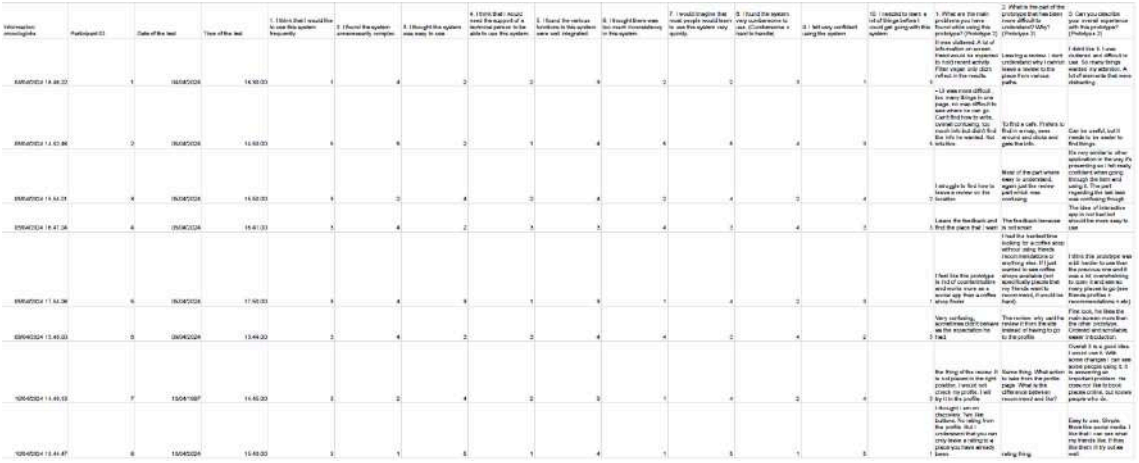
Task03:	Actions:	9	12	7	13	14	12	17	17	12
	Mistakes:		8	5	1	2	2	2	4	3
	Success:		No	No	No	Success after tip to go through profile. NO SUCCESS	no	Success after tip about the place being booked via app	Success after tip about the place being booked via app	Success after tip about the place being booked via app
	Comments:		He is confused with the task, not sure if he has to think that he already went there with the app.If he already went to the place he would expect the place to appear in his feed, or in his history of visited places. Tries ratings and doesnt find the solution. Tries to click the image of the profile, tries the heart but he/liked the picture. Starts to feel stressed so he rereads. He expects somewhere where he can leave a general review.Clicks on the profile, clicks on my comments, favorites doesnt understand why he cant find the place to leave a review.	Clicks on my Feed, but is already on my feed.	Wants to go to rating from the profile to leave a review, tries recommend. Expected to see somewhere to leave a review, it seems that she cant find where so she thinks of only uploading a picture to the feed with the descriptions of the task	Pre-consideration: In the first prototype he said that he would expect to find it where we put it in this second prototype, let's see his behaviour now. He doesnt know how to leave a comment and so asks for help.	Add a rating, she expected to see something to leave a review from the profile of the cafe. Also tries recommend, says she is very confused. Says that she would never expect to find that in the profile or past bookings.	- Looks for the cafe in the explore section by typing the name in the search bar - Tries to click in the photos in the bar's feed, thought the heart bottom on each photo would be connected somehow to review - After being given the tip (you booked through the app), he goes to the right section (profile) - Study session is a bit confusing, because the app had moods and studying was just one of them	recommendation could be related to sharing feelings and impressions. Just liking is not a recommendation, looks for a button to post. He is stuck, because he was expecting to rate from the profile. But now he doesnt know where to look.	I dont see my history or anything like that. After search I would expect a list.

ID ->		01_	02_	03_	04_	05_	06_	07_	08_
General observations:		He searches directly for the cafe, he is confused with the recommend and leave a review what if I want to leave a review and I dint want to recommend. Didnt think that needed to go to history, expected the button to be in ratings or somewhere else. Important insight: you can only leave a review if you make an assumption that you booked with the app before the place. Failed to complete the ask.He expects recent visits to be on his feed or his profile: still, he goes to search section and types Sukis. He lands in the page place, and is confused: how can he rate it without recommending it? Unsuccessfully tries to understand how to leave a review, finally lands in profile section. He does not manage to complete the task	Clicks on explore. Goes to soukis cafe. Clicks recommend it. Clicks ratings, but are under constructions. Clicks on the foto icon, but it is not implemented. Clicks on my profile. Clicks favorites. He is lost. Clicked on recommended and rating and seems confused why it doesn't exist.Sees photos and wants to add the review thought there. Says he is lost and couldn't complete the task.	Again usas explore, searches directly sukis. tries camera and other features. We redirect her to the profile page. clicks on My comments, favorites, help, friends, parameter. Didn't complete the task, even after tipp to go through profile.	Explore ->search -> access a place -> click recommend (expect to add to place he likes) After help he goes on profile and asks about study session, then he access there and feels comfortable about it (he moves fast).	Explore, profile. My comments. After tip of profile finds the review.	READ INFO IN ABOVE CELL	explore -> search -> soukis -> ratings !-> recommend !-> clicks on photo ! -> home !-> profile -> study session -> past sessions -> scroll -> click review -> type "amazing cafe" -> add image -> add stars -> comment	explore -> search for "soukis" -> recommend ! -> clicks ratings -> clicks on picture -> profile -> my sessions -> past sessions -> scroll -> "leave review" -> rating -> "amazing coffee" -> picture -> submit

First design SUS



Second design SUS



Prototypes comparison

Timestamp	Participant ID	Date of the test	Time of the test	Which is the prototype that you prefer?	Why do you prefer this prototype?	What have you liked the most of prototype 1?	What have you liked the most of prototype 2?
4/4/2024 18:48:40	1	4/4/2024	6:48:00 PM	Prototype 1	First one.	The Map. Because it reflects the spacial search.	I liked that there were filters for everything. In the find there was no filter for laptop usage. Had to check individual profils. Second prototype did that better.
4/5/2024 14:54:47	2	4/5/2024	2:52:00 PM	Prototype 1	It has a map and is really useful, all the info was there, can see everything around, faster to change through screens	Map, step by step, info	The information of the profile of the cafe, cool to have everything, photos, schedules, time
4/5/2024 16:56:26	3	4/5/2024	3:54:00 PM	Prototype 2	More precision in the second one.	Easier to access, similar to other apps, intuitive	Easy to find something specific, location, wifi, all the information was available
4/5/2024 16:51:53	4	4/5/2024	4:47:00 PM	Prototype 1	Easier to find places, just go without a lot of distractions.	Intuitive, would use frequently , fliters good, (but would like to add more something that he can also share with his friends), payment to share the check with friends. More interactive, partnership with another apps like satispay?	Likes the interactive, the place and the mood but too complicated, should be more to find a place.
4/5/2024 17:55:18	5	4/5/2024	5:55:00 PM	Prototype 1	Simpler to use, more intuitive, less overwhelming	Map that sees exactly where the cafes where, very intuitive, except of having to click on the name instead of a button of more info	A lot of recommendations in the open, once you went in a lot of info, likes the buttons of (feature, schedule...)
4/8/2024 15:48:57	6	4/8/2024	3:48:00 PM	Prototype 1	More consistent, even if it had more information it was more visible	The simplicity, everything you need on where you expect them to be.	How you see more easily the activities of friends, stay more updated on where they go
4/10/2024 15:47:57	8	4/10/2024	3:47:00 PM	Prototype 1	More about finding the places on her own than looking at friends opinion	Simple, can filter a lot of things, a lot information that is helpful.	Likes the social media idea, see the friends opinion in the first page and maybe can discuss later with them, just not a social media person.
4/10/2024 16:29:28	7	4/10/2024	4:25:00 PM	Prototype 1	He likes more the aesthetic part, how the content is presented. The map is more efficient for finding places.	The filters, the integration of the social part. Its easier to understand your friends activity, the review points directly to the cafe.	The filters, likes how you leave the reviews because it's social network so it's nice for a person that wants it to feel like a social media and what they would look for.

Annex B. Detailed changes in schedule

- New version of the cafe's detail page regarding the "Book now" button:

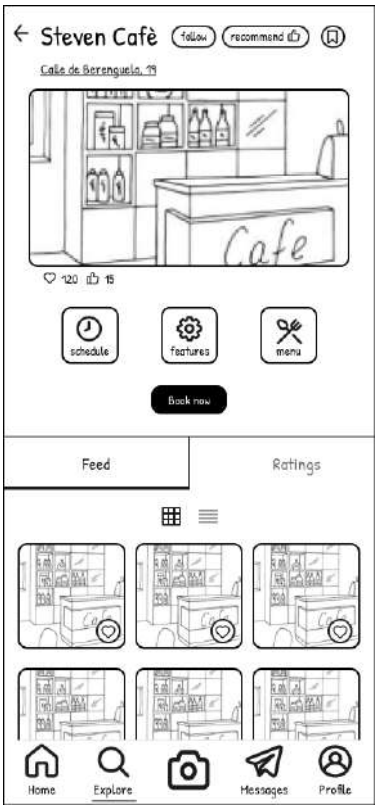


Figure 10. New design of the cafe's detail page.

- New information in the offer to match the task (change in number of guests, time and date):

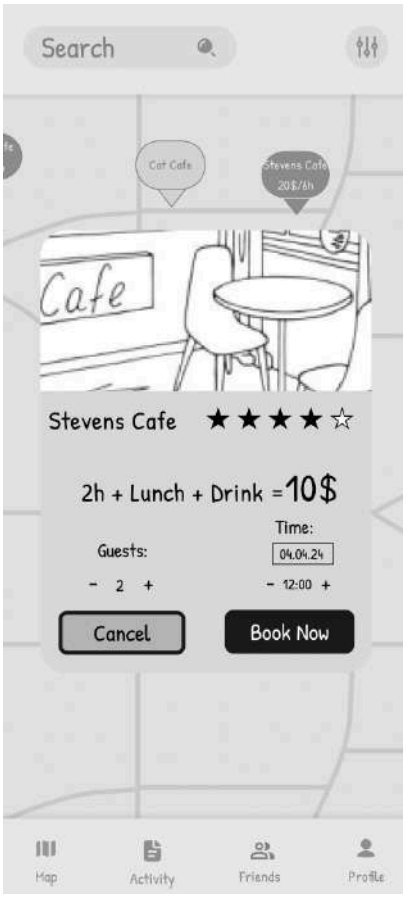


Figure 11. Offer screen.