Design Brief II
Qualitative Study & User Modeling
Design challenge II: Change
Punctuality

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1 Introduction

The main purpose of human-computer interaction is to offer a compelling user experience. To achieve this objective, designers should focus on users' goals and needs, which help to understand their expectations and aspirations.

Qualitative research can be a valuable tool to understand users' needs. One of the most effective and efficient ways to gather qualitative data about users is the technique of ethnographic interviews [1].

Once the research is completed, it is important to understand and visualize the gathered data. Therefore, users are modeled, and composite archetypes based upon behavior patterns observed during the interviews are created, called personas.

In this report, we present our research and our modeling. Based on a persona hypothesis covering six different user profiles, we prepared an I/O guide and proceeded to interview potential users. We found out that most people use mental checkpoints and try to avoid useless activities to avoid being late. We also discovered that traffic and lack of precision in public transport predictions are often cause of frustrations in user, together with a general belief that alarms do not work well. Finally, most users complained about effective solutions for overcoming their lateness, avoiding being ashamed and feeling more productive, which emerged as crucial user goals. These insights and the corresponding user behaviors are reflected in the primary persona we designated.

The rest of the report is organized as follows. In Section 2, we present six potential users and we state our persona hypothesis. In Section 3, we briefly describe the interviews' setup. In Section 4, we expose the findings derived from our interviews. In Section 5, we synthesize users' behavior patterns into behavior variables, mapping users to them. In Section 6, we provide and describe our primary persona. In Section 7, we conclude our work by presenting the three most surprising things we learned from our study.

As a reminder, the main ambition of our app is to provide a virtual tool to help people manage their time properly and overcome their punctuality deficiency with the assistance of different mechanisms and motivations.

2 Persona hypothesis

Before actually conducting the interviews and therefore observing the existing behavioral patterns of potential users, we established - from our own experiences and from the emergent insights of the domain research - a conjecture regarding the different user models.

Our persona hypothesis is summarized in Table 1 (next page). The columns *Potential motivation* and *Why?* describe, respectively, the user potential motivations for using our app and why do we decide to include him/her.

The profiles of John, Sophie and Bob are marked as *Mainstream user*s, as they ideally represent the kind of person usually late and poorly organized that we would like to primarily target.

Table 1: Persona hypothesis and potential users

Name	Persona	Demographics	Potential motivation	Why?
John	John is a student; he is often late; he has an unstable sleep pattern; he uses some apps to be more punctual but not very successfully; he does not experience an interior pressure for being on time and he has a less sharpened sense of time.	Male, 20s	To overcome lateness, to not anger friends.	To understand why is he late, how does he feel, how does he try to fix his bad habit, what works for him and what does not, why is he not very successful in using existing apps. *Mainstream user*
Sophie	Sophie is a student; she is often late; she is quite messy; she prefers to keep physical notes over using apps, although they do not help her that much in the end; she is concerned about being late for important meetings and she does her best to avoid it; however, she feels less motivated to be on time for social gatherings, for which she is chronically late.	Female, 20s	To overcome lateness, to not anger friends, to avoid judgements	To understand why is she late, how does she feel, how important is social pressure for her, how does she try to fix her bad habit, what works for her and what does not, why does she prefer not to use apps. *Mainstream user*
Natalie	Natalie is a student; she is never late and she strives to be punctual at all costs; she has a regular sleep pattern and she goes to sleep early; she has excellent organizational skills and sense of time; she tracks all her work using mental task lists; she feels accountable for personal meetings.	Female, 20s	To have a tool that makes life easier and helps gain even more productivity, to do not relapse, to keep her good habit, to encourage friends to not be late, to take off the burden of keeping a mental task list.	To know how she manage to always be on time and learn from her, to understand her motivations and how does she feel, to understand how important is social pressure for her.
Meredith	Meredith has an important job; she used to be late, but was able to overcome her lateness; she fixed her sleep pattern; she improved her sense of time; she relies on apps for organization; she feels accountable for personal meetings.	Female, 30s/40s	To have a tool that makes life easier and helps gain even more productivity, to do not relapse, to keep her good habit, to encourage friends to not be late.	To know how she managed to overcome her lateness and learn from her, to understand her motivations and how does she feel, to understand what makes the products she use effective and how they can be improved.
Bob	Bob is a working man and a father; he is often late; he often blames the traffic for his lateness; he regularly uses some apps, but he is not very satisfied with them; he is very busy but he struggles to organize; he feels accountable for personal and business meetings.	Male, 40s/50s	To overcome lateness, to not anger friends and colleagues, to attend on time business meetings.	To understand why is he late, how does he feel, how does he try to fix his bad habit, what works for him and what does not, why is he not very satisfied with current products; to understand if lack of punctuality impacts his job. *Mainstream user*
Karen	Karen is unemployed; she is a mother; she happens to be late sometimes, especially in the morning; she has an irregular sleep pattern; she is quite organized and has a good sense of time; she does not feel very accountable for her meetings, as her appointments are usually informal; she usually relies on mental checklists and paper agendas, and only casually uses apps.	Female, 40/50s	To overcome lateness, to not anger friends, to speedup her morning routine.	To understand why is she late, her motivations and how does she feel, if social pressure is important for her, why does she prefer to use physical agendas and checklists over electronic ones.

3 Interviews' setup

All interviews were carried out by the whole team via Zoom, from their respective houses: Andrea in Lausanne, Ludo in Avignon and Sena in Istanbul.

Due to the exceptional circumstances, the interviewees mainly come from our social circle.

Table 2: Interviewees

Name	Gender	Age	Profession	Date	Time	Location
Tommaso Subioli	Male	22	Student	20/03/2020	4pm	Rome
Léna Riou	Female	21	Student	25/03/2020	4pm	Avignon
Selin Eyupoglu	Female	22	Student	21/03/2020	6pm	Izmir
Suheyla Cetin Karayumak	Female	33	Instructor	19/03/2020	8pm	Boston
Stefano Veneziano	Male	56	Physicist	26/03/2020	9am	Rome
Anne Hoffstetter	Female	57	Photographer	29/03/2020	3pm	Avignon

We were able to recruit and interview all profiles we defined in our hypothesis, with minimal differences:

- Tommaso is a student and a young male latecomer;

- Léna is a student and a young female latecomer;

- Selin is a student who is never late;

- Suheyla is a young worker who overcame her lateness;

- Stefano is a mature worker who is often late; he was able to partially overcome his lateness, as it was less punctual when younger;

- Anne is now unemployed and punctual; she used to be late at a younger age when working.

4 Interviews' findings

In this section, we summarize the main insights emerging from our interviews. We first describe the most common tasks and activities of our users in their current situation, then we present their most common problems and frustrations and we give an overview of the most common usage contexts and locations where our product could be used. Finally, we conclude by describing the three most common user goals and motivations of why users may need our product.

4.1 Tasks and activities

During the interviews we inspected and analyzed the current solutions users are employing in order to control their preparation phase and aim for punctuality.

One technique that came up frequently is the use of mental checkpoints. This method consists of having time deadlines for each task of the user's preparation routine and systematically checking whether the allocated time was exceeded or not. If so, the user would try to make up for the lost time on the next activity by speeding up their pace. This organization allows them to dynamically manage their time and adjust their rhythm according to their punctuality prediction. This mechanism is used to cope with the time estimation bias some users are experiencing: "I can easily be distracted and lose track of time in the morning. I try to stay organized by scheduling mental deadlines so I can feel the stress of being late while I can still do something about it." (Léna). The underlying issue this solution is trying to tackle is the deficiency of time-based prospective memory (the ability to be reminded of doing an action at a certain time). It works by breaking down time into subsections and applying a "divide-and-conquer" mindset.

While some users prefer analog techniques, others try to control their punctuality with the help of digital solutions. The benefit of using technology is the reliability of the devices and the fact that reminders can intervene at any moment without the need to check by ourselves, as Stefano said: "With no electronic agendas, I would have used a paper one, but it does not offer the possibility to set reminders or alarms, so it's less effective because you need to remember to open it." The interviewed participants frequently established the transport time as the root of their lateness, due to its unpredictability. However, they found a way to estimate its duration with the use of apps like Google Maps or Waze. This emergent technology constitutes a very prominent change for late-comers and it has been a game changer for Anne who used to be chronically late: "Back in the days when I lived in Paris I was consistently late to work because of traffic jams. Nowadays, when I have a meeting, I use Google Maps to estimate the traffic before getting ready, and I always arrive right on time." However, while technology brought solutions, it also created new issues. Many participants reported losing time on the internet while scrolling on social media or watching videos.

Finally, almost all interviewees mentioned that having a regular and controlled sleep cycle is essential to punctuality. It is to no one's surprise that resting quantity and quality directly influences productivity. Therefore, it makes sense that the efficiency of one's morning routine or any other preparation phase during the day is affected by their sleep cycle. Suheyla even finds the necessary additional preparation time by waking up earlier: "When I go to sleep early, naturally I can wake up early. I'm still not very fast in the morning because I like to take my time and enjoy my breakfast. But if I have had enough sleep I can be ready and on time for work even if it takes me 2 hours to get ready." Aiming at better rest is one thing, but this habit can be quite difficult to adopt and requires discipline and consistency.

4.2   Problems and frustrations

For the purpose of creating a useful app, we have asked our interviewees about their problems and frustrations with punctuality and current apps in the market that are catered towards helping it.

The most commonly reported frustration among our interviewees was the unpredictability of traffic conditions and public transport. Traffic conditions can fluctuate within hours of planning and can ruin users' plans if they are unaccounted for. However, regularly checking traffic conditions can be unlikely and unrealistic to apply to users' daily lives and can be wasteful of their time. Therefore, our interviewees have stated their need for an app to remind them of the traffic conditions at the time of their scheduled events, e.g. doctor's appointments or meetings with friends, and routine events, such as going to school or work. One of our interviewees, Suheyla, who has overcome her lateness, stated that one of the recurring causes of her lateness used to be the everchanging traffic conditions in the big city (Istanbul) that she used to live in. Selin, who is almost never late to any occasion, stated that even she can be late to meetings because of unpredictable last-minute changes in traffic and public transport. Léna, who is often late, stated that Google Maps is practically useless because it is not accurate for subways and that she really enjoyed the local app in Sydney that offered the possibility to display the current geolocalization of the next bus.

Another commonly reported problem was the tendency of alarms to lose their incentive over time as users get used to them. If users lack the internal motivation to be on time to begin with, alarms are not strong enough incentives to change that. Tommaso, who is chronically late, stated that he does not even feel like setting up alarms anymore because they do not work well for him. Other interviewees like Suheyla and Léna said that they often have to set up multiple alarms because one is not enough for them to take action.

Lastly, our interviewees have stated their frustration of having to use multiple apps to organize their day. Even an experienced technology user like Suheyla has stated her frustration with current scheduling apps in the market. "No app in the market syncs all the different apps I use, such as Gmail, Microsoft Outlook, and reminders, and even if they do, like Apple calendar, they do not let me add reminders and alarms or color-code her events." Stefano, who has partially overcome his lateness through digital technology, has mentioned his frustration with having to manually enter alarms for events instead of being prompted by the app to automatically do so.

4.3   Usage contexts and locations

During our interviews, we have gathered insight about the potential usage contexts and locations of our product.

The first context of use of our app will be any time they are dependent on the traffic, i.e. whenever they will drive or use the public transport. The most commonly stated issue among our interviewees (five out of six) was the effect of unexpected traffic conditions on their punctuality. Suheyla has said prefers Google Home over Google

Maps simply because of the active reminders she can receive such as traffic alerts and flight status updates, whereas Léna finds Google Maps useless because of its inaccuracy in public transport updates. Hence, our app will be used for actively reminding the user of the traffic and public transport schedule updates and the respective time they need to leave to be on time for their meeting.

The second context of use of our app will be during our users' morning routines before they have left home. The time of the day our interviewees have trouble with punctuality is quite variable although they have the biggest issue in the morning. Therefore, we can infer that our app will be useful in users' morning routines, such as getting ready to go to school or work. Tommaso, who is a chronically late student, has stated his lack of sense of time, especially during his morning routines, while Selin, who is on the other end of the punctuality spectrum, has said that whenever she is late, which is quite rare, it is usually in the morning.

Lastly, our app will be used while users are at school or work to actively remind them of their current lateness status for their next meeting or lecture. Our interviewees have stated their trouble with anticipating the amount of time it will take to walk to a meeting or lecture within campus. Stefano, who is a physicist at CERN, said "I can be late at work, but almost never for social gatherings, because they are less frequent. I'm late at work because I have a lot of meetings to attend." Hence, our app will remind the user to leave on time for their next meeting if they are at school or work.

4.4   User goals and motivations

The interviews helped us identifying the main use cases of our app. Even though we interviewed people coming from very different backgrounds, three main goals emerged prominently: overcoming lateness, avoiding shame and feeling more productive.

The main motivation behind the design of our product is helping people cope with lateness. Most of the interviewees indeed expressed their desire to overcome lateness and become more punctual, although not all of them admitted to have the necessary willpower to actually do it. Thus, they seek a product capable of motivating them effectively. For example Tommaso, a chronically late person, does not use any products because he thinks they are not effective in motivating himself. On the other hand, Suheyla was able to overcome her lateness because the competitive environment in which she started working (Harvard) successfully motivated her. As such, our app should probably create a competitive scenario to better stimulate our users.

Moreover, we found that social status is very important for the people we interviewed. Keeping a good relationship with friends and colleagues and not feeling ashamed are between the main reasons why individuals try to be punctual, but without help they are sometimes hard to achieve. For instance, Léna, who is often late for social gatherings and classes, is bothered by the fact that she is labeled by her friends as the late one. Another example is Tommaso, who sometimes struggles to maintain a good relationship with his friends because of his lateness: he told us he already had in the past some serious arguments with friends that got really mad. Finally, even a working person such as Stefano, physicist at CERN, expressed his concerns towards being late, saying that he usually feels "awfully ashamed" when late at a meeting; Stefano also told us that it even led to jokes about Italians being late at meetings, "not something I am really proud of", he admitted.

The last most common user goal we observed is related to productivity. Several interviewees consider being on time an important boost for their productivity. For example, Suheyla and Stefano feel more productive when early at work, as they can prepare better for subsequent meetings. Even students such as Selin, Léna and Tommaso strive to be more productive by trying to deal with deadlines sooner, but often fail due to procrastination, relying only on their discipline. Finally, Anne desires to be more productive and finish her duties early to be able to enjoy longer moments of freedom and relax.

5 Behavior variables

5.1 Variable definitions

During the interviewing and observing phase, participants delivered a considerable amount of information in correspondence with the flow of questions. This abundance of data - if handled correctly - can give us precious insights about the primary persona our app is supposed to aim at. By aggregating the attitudes and habits of all participants, we can extract the behavioral archetypes that constitute the kernel of the question of punctuality.

A rather obvious behavior variable that immediately comes up when thinking about it is simply the frequency of the participants' lack of punctuality. This parameter is a measurable quantity that evaluates the actual degree of chronic lateness.

During the observational study, we noticed that the time of day the subjects were frequently late was quite variable and dependent on the interviewee's profile. Indeed, some of them were more prone to lateness in the morning while others had punctuality issues in the afternoon. This parameter can heavily influence the interaction between the user and our app, as the preparation needs are not the same for the two schemes.

Another pattern that stood out of the interviews is whether a given participant is frequently late for professional meetings or for casual gatherings. This behavior variable is implicitly related to the underlying pressure the interviewee is feeling regarding punctuality and their sense of obligations.

Some variables are not dependent on the subject's personality but rather on their surroundings and more specifically on the relatively unpredictable transport time. While traffic does not concern some participants, it can be the primary reason for the lateness of others.

One thing that was unanimous among all participants is the need of some form of planning for the upcoming tasks. Organization is the key mechanism to overcome lateness and it seems rather logical that everyone has its own (more or less efficient) way of managing their schedule. Participants achieved planning with the use of either physical tools (digital and/or analog) like todo lists, reminders, calendar, or exclusively via mental scheduling.

The spectre of attitudes the subjects are feeling when they arrive late range from not caring to feeling ashamed. This insight is precious for our research because it can help us predict the efficiency of a social pressure feature included in the app. The lack of implicit form of pressure might actually be the cause of punctuality deficiency of some participants.

Another measure we collected during the interviews is the participants' willingness to use an app to solve their issue. We can then make a prediction from this information about the difficulty to convince the primary persona to use our product.

The capabilities of the participants may also be a factor to take into account, and in particular their organizational skills. The more tidy a person is, the more likely they are to be punctual as they manage their time efficiently and don't let themselves be overwhelmed by their tasks and activities.
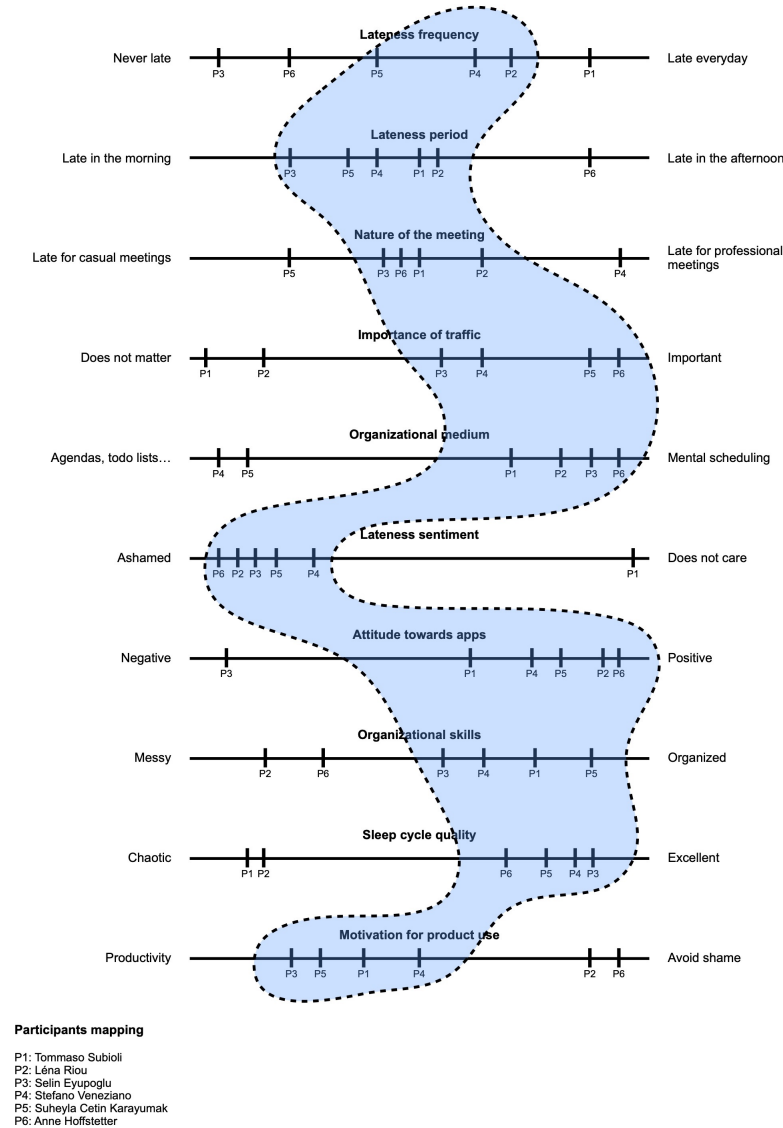
It's also interesting to observe the quality of the sleep cycle and consider its impact on punctuality. Clearly, participants should aim at a more stable and qualitative sleep cycle as rest boosts efficiency and therefore favors punctuality.

Finally, the last observed variable is the motivation that would convince interviewees to use our future product (i.e why would they want to overcome their eventual punctuality issues). Some reported that their goal was to optimize their productivity while others stated that their main concern was to stop being shamed.

5.2   Mapping of behavior variables

Now that we have defined the behavior variables that are relevant for our project, we can assign the values for each participant. From this flow of values we can derive the river of behavioral variables that will be used to identify properly the primary persona.

Figure 1: River of behavioral variables

Participants mapping

P1: Tommaso Subioli
P2: Léna Riou
P3: Selin Eyupoglu
P4: Stefano Veneziano
P5: Suheyla Cetin Karayumak
P6: Anne Hoffstetter

6   Primary persona

James is a 23-year-old graduate student who has to juggle his engineering school and part-time internship at an IT company at the same time. He always finds himself running late to his surprise, thinking he could have managed to get going in time. He struggles the most with getting ready in time to go to his morning lectures as he has an irregular sleep schedule and often finds himself scrolling through social media before he goes to sleep past 2 am. He prefers to keep his tasks as mental checkpoints despite his poor organizational skills to remember to perform them in time.

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James feels ashamed and sorry whenever he arrives late to a social gathering with a small group of friends. He always finds himself running to catch the bus to get to his work on time and sometimes has to take the next one because of the unexpected changes in the bus schedule, which makes him miss his daily stand-up meetings. Although he works harder than most interns at this company, he gives the impression that he is irresponsible and gets into trouble by his supervisor for being late. On the contrary, he does not mind being late to classes in large lecture halls where the professor will not notice him arriving late. Nonetheless, he is tired of missing the announcements made in the beginning of the class and the stress of having missed something important.

Figure 2: Representative pictures of our primary persona (taken from [2], [3], [4])

Despite having tried multiple apps to help with his tardiness such as reminders, alarms, and calendars, they do not give him enough incentive to leave on time. He is looking for an app to fix his bad habit of tardiness to avoid being ashamed in his friend group, appeal to his supervisor at work, and improve his productivity at school and work by arriving on time.

7   Conclusion

To conclude, we would like to share the three most surprising things we learned from our qualitative study.

First, the people we interviewed tended to prefer mental checkpoints and task lists over agendas. This surprised us because we expected them to rely more on external tools for being punctual, since they require less "mental discipline" and willpower.

Then, we were surprised to learn that for most interviewees alarms do not work very well, as they tend to get used to them and to regularly use their "snooze" option.

Lastly, we realized that most of the subjects affirm to have the ability to compress and speedup their morning routine, but yet they consciously decide to avoid it, as they do not want to rush and they enjoy that short time of freedom for themselves.

References

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