TrentinGreen

A GREEN APP FOR EVERYDAY LIFE

Human Computer Interaction Course, year 2018/2019

Group name: return to_sleep

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EXECUTIVE SUMMARY

Sustainable mobility refers to the use of either non-polluting travel methods (e.g., walking or cycling), collective travel methods (e.g., bus, train, or car-pooling) or low-pollution travel means (e.g., electrical cars).

The goal of this project is to **design a mid-fidelity prototype** of a system that would encourage people to increase their use of sustainable mobility options, since most of times they're not the most suitable choice for everyday life.

Users will record their sustainable movements in our system to earn points. They can exchange points with rewards.

There are several parties in this project, and each party has different needs. Our goal was to see how various types of people, from the young student to the old lady, deal with the use of sustainable means of transport in everyday life, in order to understand what they liked and disliked about it.

We decided to focus on the Trentino region: this area has few big cities and inhabitants of the mountain valleys need to reach them both for working and leisure purposes. For this reason, we were able to work with a good sample of people, with many different needs. This allowed us to have a deeper understanding of what the real problem is and a more focused view on the possible solution that we're going to describe in this report.

Relying on the interviews we conducted, our aim was to understand how we could encourage a larger number of people to prefer using a sustainable transportation method rather than their private car or motorbike. Although there are some critical flaws about sustainable mobility from the users' point of view, we think we could find a good compromise: all the people need is a good reward for their good action towards environment, and that's what our project is all about. Some other requirements emerged from the interviews where about the speed and easiness of use: many suggested that the system may be used while waiting for the bus or while being inside it, maybe when it's crowded.

The first prototype we developed was made of sketched printed on paper and displayed only the main features of the app we imagined. Some people tested it as much as possible with our help when it was needed to swipe through screens. The first impressions they had were good and thanks to the feedback they gave us we were able to refine the medium fidelity prototype presented at the end of this report.

ANALYSIS OF EXISTING SOLUTIONS

We analysed some existing systems for sustainable mobility. There are two different approaches to the topic: on the one hand there are apps willing to simplify the use of sustainable means of transport, like apps that let you buy tickets, check timetables, share a car lift, plan a bus voyage and share a bike. Some examples are: OpenMove, Uber, BlaBlaCar, FlixBus, Bike Sharing apps.

On the other hand, there are "real life games" that reward the users based on their behaviour: generally the user can collect points based on how much he walks or takes the bus and in some cases he can spend these points in some ways. This is a good idea, but the game is often not worth the candle: prizes aren't really boosting interest towards sustainability. Examples are: Viaggia Play&Go, We City, Green Apes, BetterPoints.

What we were able to observe is that there are a lot of systems that provide services for sustainable mobility, but none of them really stimulate the user to prefer it rather than using his/her own car. As a matter of fact, using your own car gives you a lot more freedom on where, when and how to go, at the expense of being more disrespectful towards the environment. On the other hand, sustainable solutions aren't comfortable enough to choose them.

Our idea wants to fill this gap: we want to boost the use of sustainable means of transport and we plan to do so by rewarding the users with material prizes. Our system will be affiliated with commercial activities in the area interested, which could be the city of Trento or even the entire Provincia Autonoma di Trento.

OUR IDEA

We focused on daily movements of people only in the area of Trento. Our system will award users with *points*. Users may redeem them from bus and train tickets, and bike sharing reservations, since everything is associated with a unique code.

Points will be awarded based on the mean of transport used. We provide a table with an example:

Vehicle	**Points awarded**
Bus	10 points/km
Train	10 points/km
Bike	13 points/km
Walk	15 points/km

Maximum points per day: 150

We decided to assign points based on the means' sustainability. Riding the bike awards the user less points than walking, even though sustainability is the same, because you can cover longer distances. Bus and train give the same points per km because they limit CO2 emissions in the same quantity.

When travelling by train or bus, the system starts the GPS tracking after scanning the QR located on the vehicle. Via GPS the system understands when you leave the bus/train and gives you the points.

When walking or riding the bike the user must manually start and stop the GPS tracking in order to obtain the points. The tracking stops automatically if the users forgets about it because it can see if he/she is stationary for too long or if he/she is no longer near a railroad or a bus path.

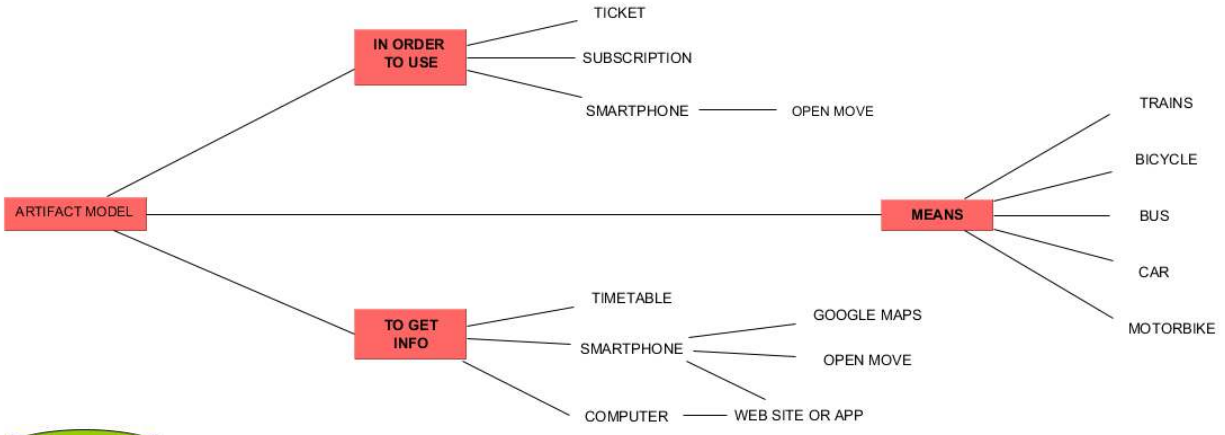
INTERVIEWS RESULTS & PERSONAS

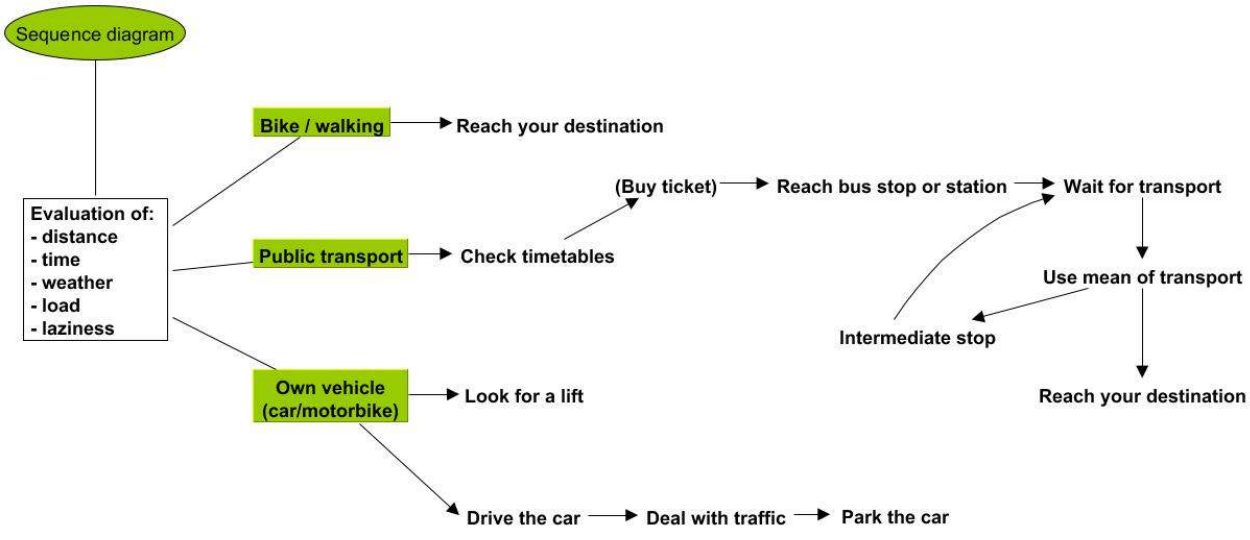
We interviewed 20 people. We used a set of general questions for everybody and examined in depth certain topics based on the person competence and interest.

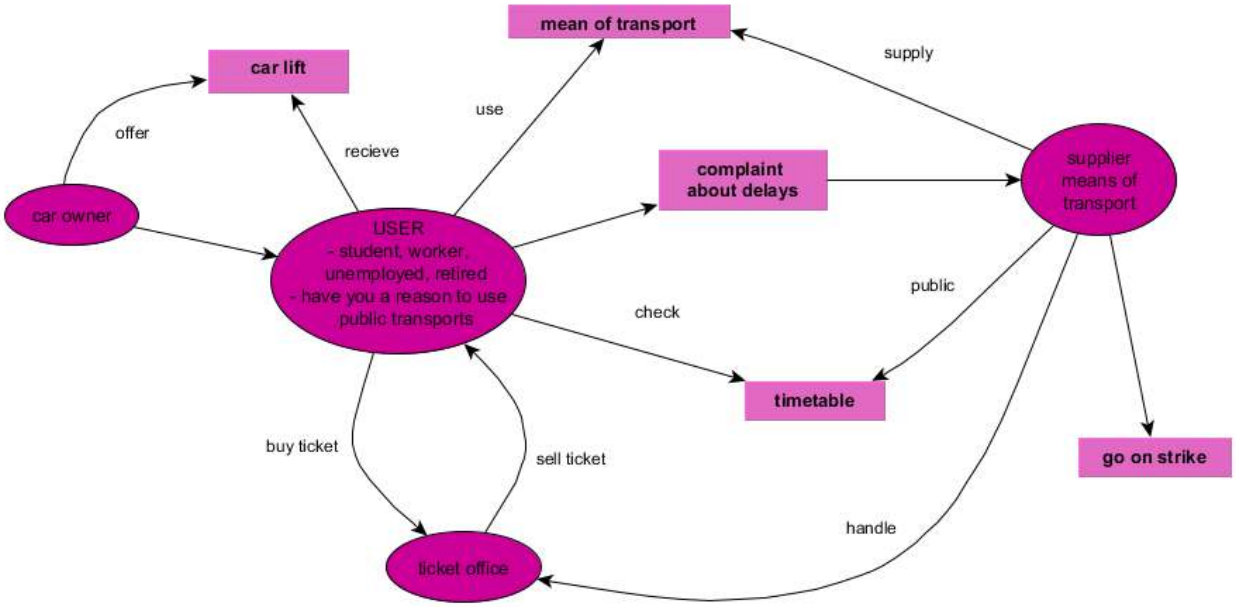
Thanks to the interviews, we modeled the typical trip. People have a lot of information sources, both digital and physical and many use smartphones not only for retrieving info, but also to buy tickets.

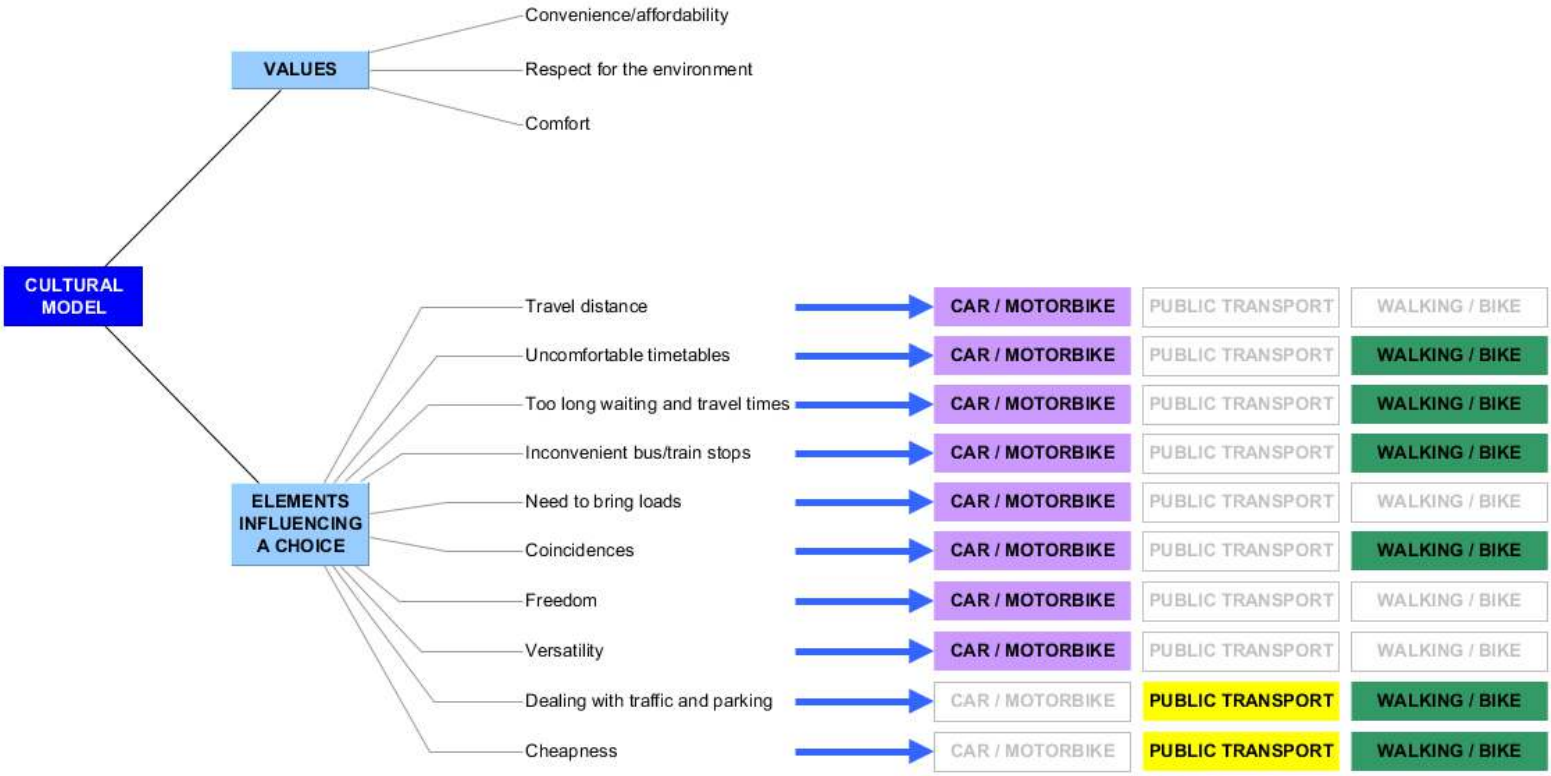
Generally, people know why they should use sustainable means, environmentally speaking, but since movement is a fundamental thing in everyday life, they must consider pros and cons of every means based on the activity they must perform: as an example, choosing the car means that you'll have problems with traffic and parking, but allows you to bring loads. Choosing public transport instead means that you'll have to deal with delays, crowded buses and trains, sometimes strikes. Going by bike or walking would be a perfect solution, provided that the distance to cover isn't long and the weather is good.

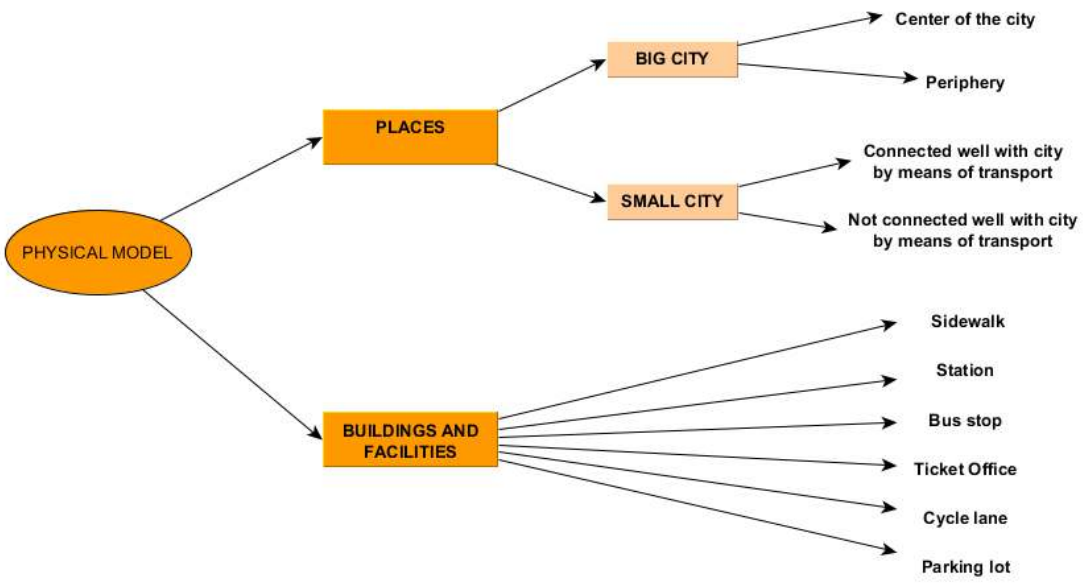
It is also important to consider that in a region like Trentino it is easy to use sustainable means of transport if you live in a city, but many people live in small towns on the mountains or in small valleys that aren't well connected if you don't use the car.






mean of transport
car lift
supply
use
offer
recieve
complaint about delays
supplier means of transport
car owner
USER
- student, worker, unemployed, retired
- have you a reason to use public transports
public
check
timetable
go on strike
buy ticket
sell ticket
handle
ticket office


VALUES
Convenience/affordability
Respect for the environment
Comfort
CULTURAL MODEL
ELEMENTS INFLUENCING A CHOICE
Travel distance
Uncomfortable timetables
Too long waiting and travel times
Inconvenient bus/train stops
Need to bring loads
Coincidences
Freedom
Versatility
Dealing with traffic and parking
Cheapness
CAR / MOTORBIKE
PUBLIC TRANSPORT
WALKING / BIKE


PHYSICAL MODEL
PLACES
BIG CITY
Center of the city
Periphery
SMALL CITY
Connected well with city by means of transport
Not connected well with city by means of transport
BUILDINGS AND FACILITIES
Sidewalk
Station
Bus stop
Ticket Office
Cycle lane
Parking lot

PAOLO – University student

“Everyday I take the train from Trento to Rovereto, where I study. When I move around Trento I walk or I take the bus.”

ATTITUDE AND MOTIVATIONS
He likes to walk, hang out with friends and he's a very active guy.

ABILITIES AND DISABILITIES
He's often late and he's a bit of a daydreamer.

TECHNOLOGY PROFICIENCY
He's got a smartphone and a laptop and is quite good at using it, even for more complicated things like programming.

RESOURCES
He has a driving license but he doesn't own a car nor a bike.

PERSONAL CONTEXT
He often moves around alone during his everyday activities.

KEY-NEEDS
“I don't have a lot of free time and I think that waiting for the bus or the train is a big waste of time. That's why when they offer me a car lift I never refuse it.”

ELISA – Young worker

“I live in a small town so I mostly use the car.”

ATTITUDE AND MOTIVATIONS
She likes to relax after working all day. She prefers having lunch at home.

ABILITIES AND DISABILITIES
She is very good at planning her daily movements with public transport.

TECHNOLOGY PROFICIENCY
She likes to check social networks on her smartphone and uses a computer just for working purposes.

RESOURCES
She has a car which she shares with her brother and a bike.

PERSONAL CONTEXT
She's a bit anxious and prefers being too early rather than late.

KEY-NEEDS
"I have a busy life, since I work eight hours a day, so I don't like wasting my time."
"I don't like dealing with traffic so I take the bus when it's possible."
"I work 10km away from home and I live in a small town."

MATTEO – Worker and family man

“I live in the city of Trento. I go to work with my car and when possible I use the bike.”

ATTITUDE AND MOTIVATIONS
He likes to return home as soon as possible after working so that he can stay with his family as much as he can.

ABILITIES AND DISABILITIES
He can combine work and family life well.

TECHNOLOGY PROFICIENCY
He uses a computer only for working but he's not too expert. He has a smartphone and he mainly uses it to call or send messages.

RESOURCES
He has a personal car and a bike.

PERSONAL CONTEXT
He brings the kids at school before going to work. He likes to spend quality time with his family and he doesn't like being disturbed.

KEY-NEEDS
"When the weather is good I use the bike because it helps me avoiding traffic jams in Trento"

CARLA – Old lady

“I live in the city of Trento. I often use public transport.”

ATTITUDE AND MOTIVATIONS
She looks after her nephews. She runs the house and is the queen of the kitchen.

ABILITIES AND DISABILITIES
She walks for short movements in town.

TECHNOLOGY PROFICIENCY
She has an old smartphone that she uses just to call her sons and nephews. They're trying to teach her how to use WhatsApp.

RESOURCES
She doesn’t have a driving license anymore.

PERSONAL CONTEXT
She likes to be independent but she needs help when she goes to the grocery and must return home with heavy bags. She takes the bus if necessary.

KEY-NEEDS
"I have a bus subscription since there are special prices for over 65, but often I don't find a seat. If I need to go shopping I prefer asking my daughter for a lift."

MARKET GAP & PEOPLE'S NEED

What we were able to observe is that there are a lot of systems that provide services for sustainable mobility, but none of them stimulate the user to prefer it rather than using his/her own car. As a matter of fact, using your own car gives you a lot more freedom on where, when and how to go, at the expense of being more disrespectful towards the environment. On the other hand, sustainable solutions aren't comfortable enough to choose them.

What the users need is not another app providing information about the best means to choose or where to take them, because there's plenty of them. What they really need is something that convinces them that taking the bus isn't more inconvenient than using the car, despite all the negative sides, like fixed timetables, time spent, etc.

USER REQUIREMENTS

Functional requirement:

- rewarding the user by the use of points - As suggested by Joseph, 20 years old, student.
- keeping track of your movements - As suggested by Stefania, 19 years old, worker.

Non-functional requirements:

- supported on smartphone - Suggested by all of the interviewed
- Perform a main action in under a minute - Marco suggested that it could be used while waiting for the bus
- One must be able to use it on a crowded bus, with only one hand - Some interviewed suggested that it could be faster than OpenMove, if possible
- Easy to use even for those who don't usually use technology
- Light app, easily supported by most smartphones – also low-end models

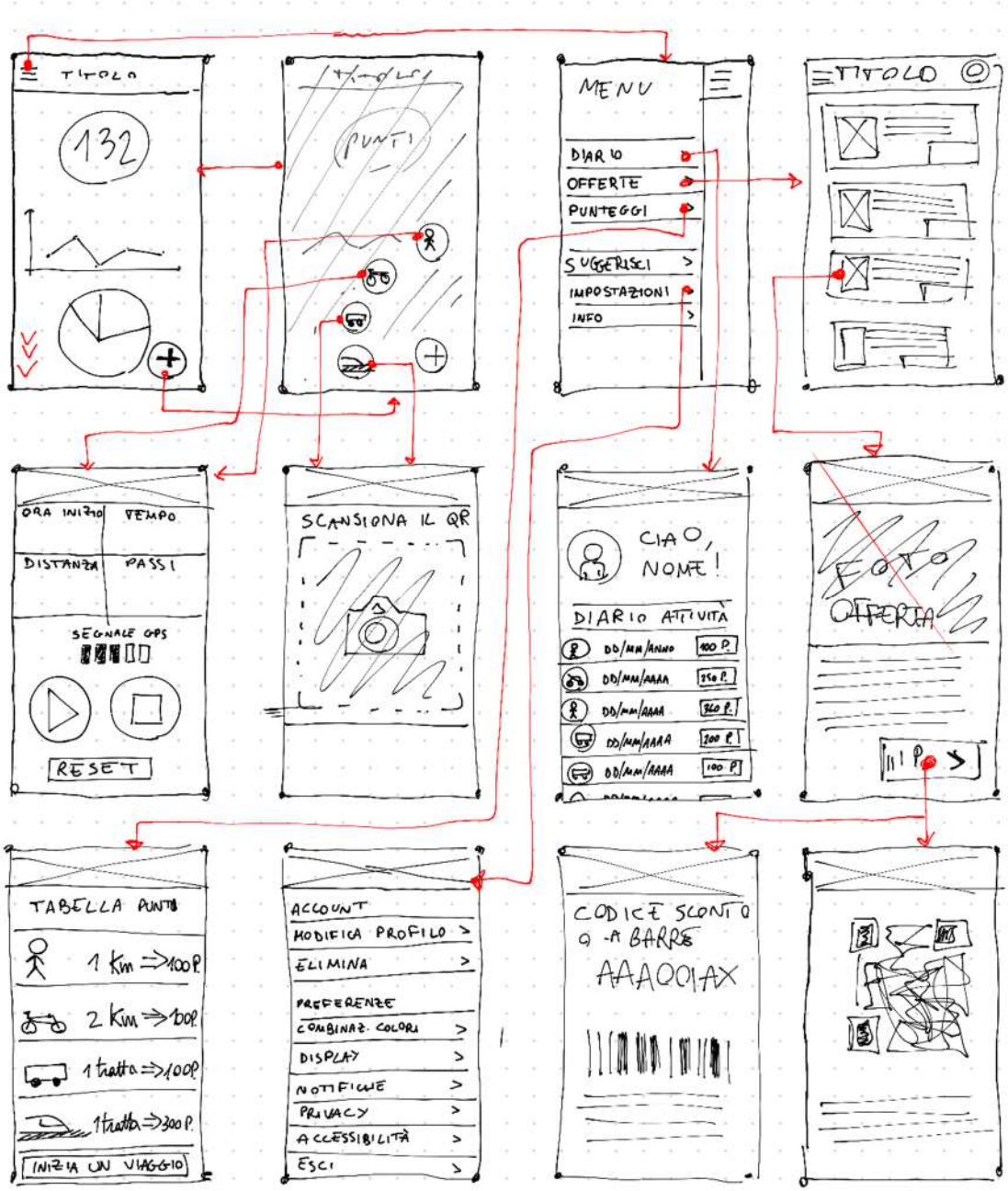
Thinking about the design, it will be important to put every important button within the reach of a thumb: this means that the app will be usable not only with just one hand, but with just one finger and it's the best way possible.

As for the points, it will also be important to give the possibility to spend them in a desirable way: bars, food shops, restaurants, clothes shops should be the main partners of this project because they attract a large audience. Giving free bus tickets when reaching a certain amount of points is also an interesting option.

In the use case scenario on the right, the user decides to travel by bus: he jumps on and scan the QR. The system understands when he gets off the bus via GPS and gives him points. After some trips, the points he earned allow him to claim a free coffee at his favourite bar.

LOW FIDELITY PROTOTYPE

After analysing the requirements, we came up with the following low fidelity prototype.



Link to better quality image:

https://drive.google.com/file/d/1vHuhf4CmVPbCkf-BuuIP78n_yFIO7Lxu/view?usp=sharing

For whatever trip you choose (bike, walk, bus, train) our app will track you with GPS technology.

If you choose a trip with train or bus you have to scan the QR-codes that can be found on the means or in the station in order to start the tracking and to prove that you're using public transport. On the other hand, if the user chooses to walk or ride a bike, he will have to start and stop the GPS tracking. It's not mandatory to stop the tracking since the system can understand when a user leaves a bus or stops walking.

The algorithm will then validate the trip checking your phone's GPS with the mean of transport's GPS and will give points proportional to the traveled distance and the mean of transport used.

In the app there is a special section to visualize your personal activity with your points. You can spend the points to obtain discounts on different products and you will be provided a bar code or a QR code or a simple code to show to the partnering company.

If you want, you can invite someone to use the app. You and your friends will earn extra points.

We tried to stick to the requirements we found out during the interviews. Every important feature is reachable with one thumb, so the app can be used with just one hand.

EVALUATION OF THE LOW FIDELITY PROTOTYPE

We let 7 people test our app's low fidelity prototype in order to gain feedback. We printed it and we cut out every screenshot and helped the users navigating through them in an interactive mode: every time they tapped a button, we changed the screen for them.

We found out some things that needed to be changed or improved:

- We removed the graph in the main page because many users didn't understand it or they didn't find it useful and they prefer a pie chart;
- Some people at their first attempt didn't understand how to start a new travel ("+" button in the main page), so we decided to replace it with a more explanatory "new travel" button;
- Some users asked if they had to keep the app open during travels or if they could use it in background, so we specified that the only important thing is not to kill it.
- We reviewed the amount of points assigned because some users told us that they did not find them too balanced
- Some users suggested to add the possibility of typing in a code instead of scanning the QR.

We then asked which awards may be more attractive and many people suggested food prizes or discounts in some shops, as well as free bus or train tickets.

Despite of the doubts listed above, people appreciated the usability of the app, even though it is just a low fidelity prototype.

MEDIUM FIDELITY PROTOTYPE

We have modified the low fidelity prototype to satisfy users suggestions. We focused on the usability of our application, for example we simplified the homepage, which now shows just the amount of points and a pie chart of used means, and we added a button "+ new travel" that's easier to understand.

We put attention on simplicity and speed of use in order to make it accessible for all people, even the less experienced.

In this prototype we emulated just the most important functions and features and we left out some details like the settings menu, the links for the social invitation and other small features.

Link to the interactive prototype:

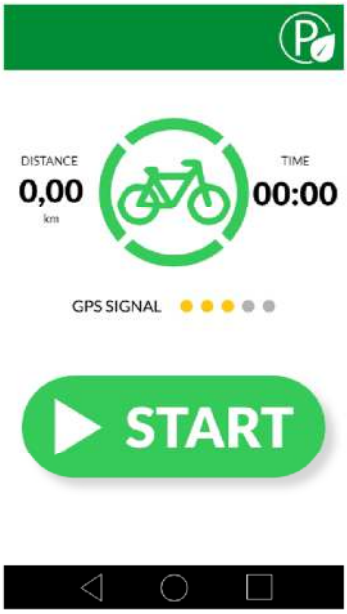
https://xd.adobe.com/view/ac15770f-b448-4c7c-7cec-5669b0936e61-da24/

MAIN FEATURES OF THE PROTOTYPE

Homepage

Travel selection

QR code scanner



Bike trip screen - similar for walking

List of rewards, accessible via the menu (up left in homepage)

How a reward looks before purchasing it with points

QR code that allows you to use the reward

Bar code and numerical code to let you use the reward

BRIEF EVALUATION OF THE MEDIUM FIDELITY PROTOTYPE

Due to a lack of time, we were able to quickly test the medium fidelity prototype with just four people. They appreciated the changes between the first and the second prototype and in general they had good impressions about it, even though some of them still had some doubts about the fact that the app can be used in background, but we believe that this could be made clear only with the use of the real app.

CONCLUSION

We are satisfied with our work, our idea was welcomed by all the interviewed people. The last step will be the improvement of the entire app but it's not our duty, for now.

We need to obtain some arrangement with shops, restaurants and obviously with "Trentino Trasporti" which is the society that provides the public transport service on which our app is based.

For the system to succeed it is necessary that more and more companies and people embrace the project and decide to support it.