

Sapienza University of Rome

Human Computer Interaction – A.Y 2022/2023

Applied Computer Science and Artificial Intelligence

---

# **A Crowd-Sourced Mobility Application**

---

*Authors:*

Doku Martina

Iannotti Giuseppina

Locatelli Dennis

Muià Elena Maria

Loi Dario

Marincione Davide

May 2, 2023

# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
1.1	Our Idea . . . . .	2
1.2	Existing Competitors . . . . .	2
1.3	Need Finding . . . . .	3
1.3.1	Our Questions . . . . .	4

# Chapter 1

## Introduction

### 1.1 Our Idea

The intent of our application is to give more precise information about possible delays or irregularities in the public transportation service. This could be achieved by the retrieval of information delivered directly by the community of users, who may have the chance to inform others about possible delays or overcrowding of the bus or the tram that they are taking. Furthermore, all the users will collect some credits for every contribution, which will be devolved into charity, in one of the NGOs chosen by the user, among those proposed by the application.

### 1.2 Existing Competitors

**Google Maps:** It is one of Italy's most frequently used mobility applications. It is a web service that provides detailed information about geographical regions and sites worldwide. In addition to conventional road maps, Google Maps offers aerial and satellite views of many locations. It works both for public transportation and private ones.

- **Pros:** It is very intuitive and offers many fundamental features. It delivers information about possible paths to reach the destination with their duration and arrival time. It specifies the possible expenses needed for every choice taken.
- **Cons:** The path duration is not defined by crowdsourced information or GPS tracking applications. It is based totally on statistical inferences which means that is almost never precise.

**Moovit:** It is one of the main mobility applications for public transportation only. It provides information about the statistically best path to reach a destination point. Describing when and where to take the transportation means in order to reach the destination as fast as possible.

- **Pros:** More reliable than Google Maps (based on users' interviews), the interface is very intuitive.
- **Cons:** Too many ads, the defined timing is almost never correct.

**Probus:** The application is designed for Android only and it only works with buses. It informs the user about the waiting time of a certain bus line and the fastest path to reach a destination.

- **Pros:** Useful because it is strictly focused on busses, and therefore is able to offer a more tailored experience to users.
- **Cons:** Although the time estimates are reliable within a single bus trip, the application does *not* give information about future ones, hence, users do not know how long they will have to wait for the next run.

**Citymapper:** Citymapper is a public transit app and mapping service which displays transport options, usually with live timing, between any two locations in a supported city. It integrates data for all urban modes of transport, including walking, cycling, and driving, in addition to public transport.

- **Pros:** An almost always accurate and comprehensive direction guide. Free for both Android and iOS. It provides a calories counter and specifies the expenses for every chosen path.
- **Cons:** Not available in many cities and it does not retrieve crowdsourced information.

**Transit:** Transit is a mobile app packed with features that help you plan a trip on the bus. Real-time bus tracking and information, service alerts, and trip planners are some of the many useful features that make this app a favorite for transportation services.

- **Pros:** GPS tracking of public transportation in real-time, crowdsource support (tracking the user location when they use the app as a navigator), information about all the surrounding bus stops and possible paths to the destination.
- **Cons:** Many useful services are not free. It does not work very well in Italy.

### 1.3 Need Finding

**The Interviews** In order to better understand what our users want, we first conducted a round of interviews, these allowed us to interact colloquially with our potential users and to gauge what they think are the major discomforts of public transportation. We also wanted to understand their approach to personal privacy and community-driven applications. We used data we obtained as a guide for our next steps in the design process.

### 1.3.1 Our Questions

Our interviews were standardized around a set of ten questions that we designed, as a group, to be as open-ended as possible. We wanted to avoid leading the interviewees to answer in a particular way, have them act as designers, or figure out the specific purpose of the survey until later on, when the general questions were answered.

#### The Questions:

1. Did you commute via public transport in the last week? If so, what type?
2. What criteria do you consider when choosing your means of transportation?
3. What are some frustrating aspects about public transportation?
4. Do you use mobility apps (like Google Maps) while commuting? If so, which functionalities?
5. How much do you trust the information given by your app of choice?
6. Do you worry about giving authorizations to apps? Are there some you are more willing to share?
7. Are you concerned about organizations distributing your location based data to third parties?
8. Would you trust mobility info more if it were crowd-sourced? Would you participate in such a program?
9. Would a honor system, rewarding you based on the credibility of your contributions, incentivize you to participate more?
10. In a community-driven app, how interested are you in customizing and showing your profile?

**The Outcomes** To carry out the interviews, we split our groups into 3 teams of 2 people each. Each of those teams had a target of 10 interviews to reach, which was achieved in a few days (with some extra interviews to spare).

Overall, if we look at the general trends, we can draw the following conclusions:

- A majority of our interviewees use public transportation on a daily basis, and most of them commute via bus or metro.
- All of the interviewees use mobility apps, with Google Maps being the most popular, usually paired with an app such as Moovit to provide more accurate information.
- Most of the interviewees find frustration in three things:
  1. Overcrowding of the vehicles
  2. Lack of punctuality
  3. Unreliability of bus rides (which are often late or do not show up at all)

- Users are generally willing to share data that is required for the functioning of the app, and are only really concerned about their privacy if the issue is brought up.
- Users enjoy the prospect of a community-driven application, and would be willing to participate in such a program, especially if it were to improve the quality of the service.
- Users are generally not interested in customizing their profile, *especially* in the context of a mobility app, this varies from person to person, and seems to correlate with the person's technical knowledge, but the general trend shows that the feature is not very popular.
- In a similar fashion, users seem not to be interested by a gamification system, rather seeming to prefer more direct rewards, either monetary, in the form of a better service, or through the possibility of devolving their rewards to charity.