

The perception and value of time in the context of urban mobility

A user experience design case study

Aditya Gujuran, Independent

Email: aditya.gujaran@gmail.com

João Bernardino

TIS.pt - Consultores em Transportes, Inovação e Sistemas S.A.,

Email: joão.bernardino@tis.pt

Hugo Serodio, Independent

Email: hugo.serodio@gmail.com

Abstract

As the current urban mobility paradigm undergoes rapid and innovative disruption, the future of cities is being rethought and redesigned. To stimulate and inform this metamorphosis, the MoTiv project aims to collect opinions from travellers on a larger and more holistic set of factors involved in the experience of urban travel that is not limited to the usual variables of time and cost. The project looks to collect this data via a mobile app. This paper reports on the process of designing this mobile app that was eventually named Woorti.

Keywords: urban mobility, value of travel time, user experience design, quantified self, gamification, qualitative data collection

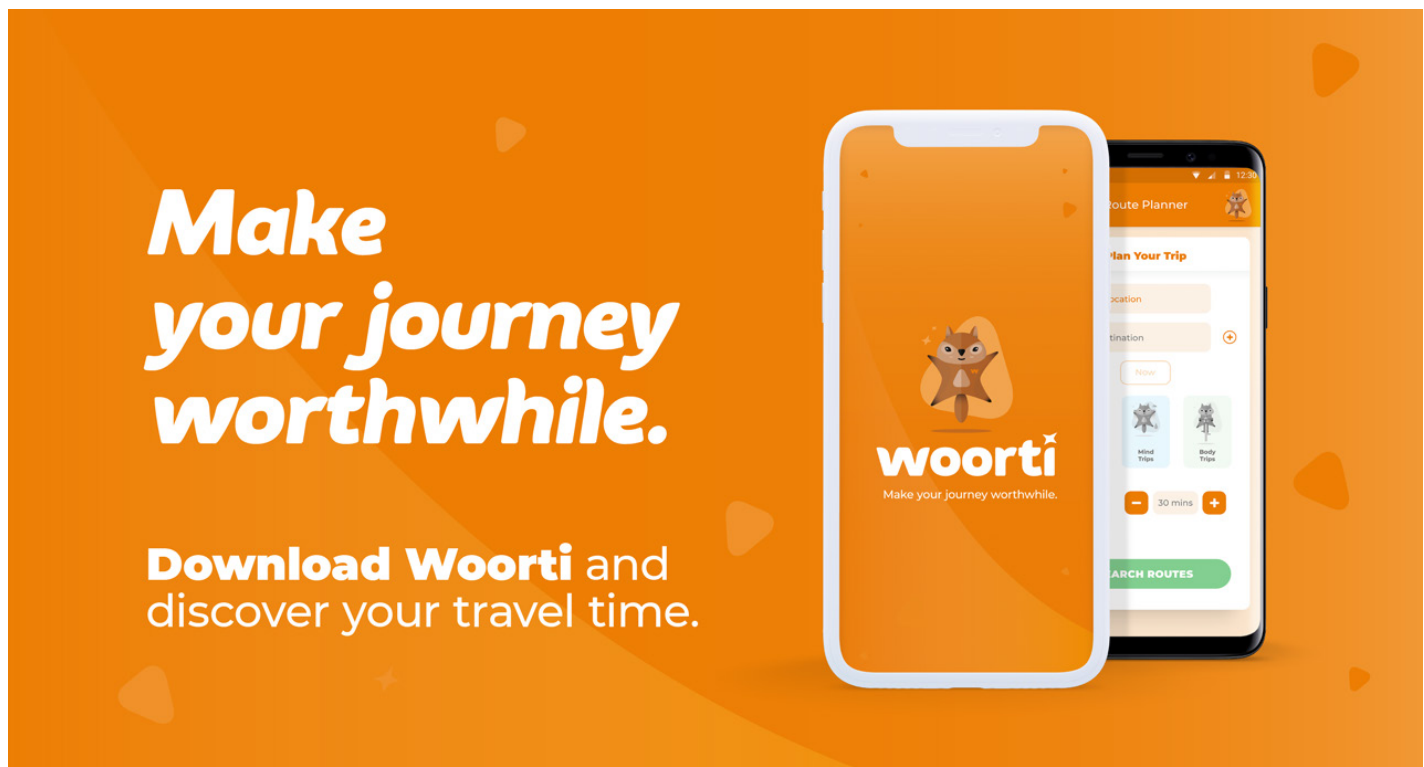


Fig 1 - Woorti Intro

1.1 Introduction

The number of factors involved in making a choice on how to get to work from home or how to get to school from home are often not limited to merely time and cost. [1] However most of these factors are subconscious and rarely considered by urban planners and transport operators. The MoTiV project aims to change this by conducting a scientific study to collect qualitative data on various factors with over 5000 participants from 10 European countries in urban areas and other areas with advanced transportation. This data set aims to uncover behavioural patterns and learn more about the latent user needs and expectations with regard to choices in urban mobility. This data set will eventually be opened to stimulate further research and better inform mobility businesses, urban planners, economists etc.

The instrument to collect this rich and qualitative data from people as they travel, on trip and post trip, is a mobile app named Woorti. Woorti was created using design thinking methodologies to discover the best way

to not only collect data without being too tedious for the user but also to figure out how tracking one's commutes could provide new value to the user and create a moment of introspection. It's important to note that travelling or commuting in urban contexts is a daily and usually a mandatory activity for the majority of urban dwellers and often overlooked in individual reflections.

1.2 Initial Considerations

As the success of the MoTiV project hinged on the quantity and the quality of the data collected, there was a need for the app to be attractive to its user base. This presented significant challenges in today's cognitively competitive landscape where most urban users have entrenched behaviour patterns and mobile phone usage patterns with regard to their travel. Additionally, the app also had to meet diverse needs of the various stakeholders involved with their research purposes. It was necessary to find additional motivations for user engagement.

Persona	Value proposition	Features related
Olinda	Save time	Reliable trip information Ease of use
Duarte	Handle delays	Identify public transport delays and gamify them
Lara	Optimize time Record feelings	Chatbot Logs
Frederik	Rewards	Promotions and contests
Johanna	Gamify your trips	Gaming elements Indicators on trip performance in various ways
Andrej	See all the benefits and costs of how you travel	Indicators on trip performance in various ways
Samantha	Contribute to a research project	Share results of the research
Roger	Help us improve our service and get a reward	Payment or voucher to a service Monetary cost information on trips
August	Help us research about how people travel	Above all, simplicity about what to do

Tab 1 - Personas of Woorti

The market research and app engagement strategy [2] developed by the MoTiV project consortium defined that the main value proposition for users would be to help them improve their travel time. It outlined various requirements for the Woorti app, including the use of gamification, a quantified self approach for individual mobility and a personalized and feature rich travel planner. It also detailed a mapping of the various user personas of the app and suggested features/functionalities.

During the early phase of the design process, the card sorting methodology was used to arrive at a high-level information architecture. With the information architecture and a brief albeit vague notion of the proposed features, the design of the app progressed with the Travel planner.

MoTiV Information Architecture

HOME	ROUTE PLANNER	MY TRIPS	DASHBOARD	MOBILITY COACH	MY PROFILE
Trip Validations	Search Trip	Trip Detail	Mobility Overview	Interesting info	User Photo
General Surveys	Origin location	Trip Origin	Total distance travelled	Hints	User Name
Trip Surveys	Destination location	Trip Destination	Total distance cycled	Hints based on recorded trips	User email
Coach Tasks	Route points/ Intermediate points	Trip Cost	Total calories spent	Stories	General Surveys
Coach Hints	Mode of transport	Time Time	Mobility Time Breakdown	Goals	User preferences
Coach Stories	Date and Time of arrival	CO2 emissions	By mode of transport	Alternative Routes	Modes of transport in order of preference
Coach Goal progress	Sort Trip Results	Calories spent (if applicable)	By type of time (productive, health, unusable)	Streak counters	Other route planner preferences
Streak Counters	By Time	Trip validation (if auto detected)	Daily Travel Budget breakdown		Less transfers
Total Points	By Cost	Trip related survey (if applicable)			Less Cost
Jump to Route Planner	By least Transfers	Trip Speed			Less Time
	By gen cost	Space occupied			Less CO2
	By time usability	Trip evaluation (leg level evaluation)			App permissions
	By environmental costs	Mood			Location permissions
	Trip Results	Satisfaction			Notification permissions
	Origin location.	Report Incidente (Strike/ Accidente)			App Settings
	Destination location	Start Trip (manual recording)			Preferred language
	Route points				Feedback
	Mode of transport.				Change Password
	Date and time of departure				
	Date and time of arrival				
	Environmental indicators				
	Health indicators				

Fig 2 - Information Architecture

2.1 Designing the route planner.

From the start, it was clear that the design of the route planner was not a core feature of the app. With the wide adoption of pre-existing route-planners in apps like Google maps, Citymapper, Moovit etc, there was a standard design that existed almost like a design pattern.

While there wasn't much room for creativity in terms of the layout, Woorti's route planner did seek to offer an alternative to these existing products. In line with the main

value proposition, this was accomplished by creating a route planner that offered its users search parameters such as "Productive trips", "Active trips" "Relaxing trips" and "Trip time budget". This allowed the user to search for trips that were based on factors outside of the usual. Depending on what they wanted from their travel time, users could search trips prioritized with matching attributes.

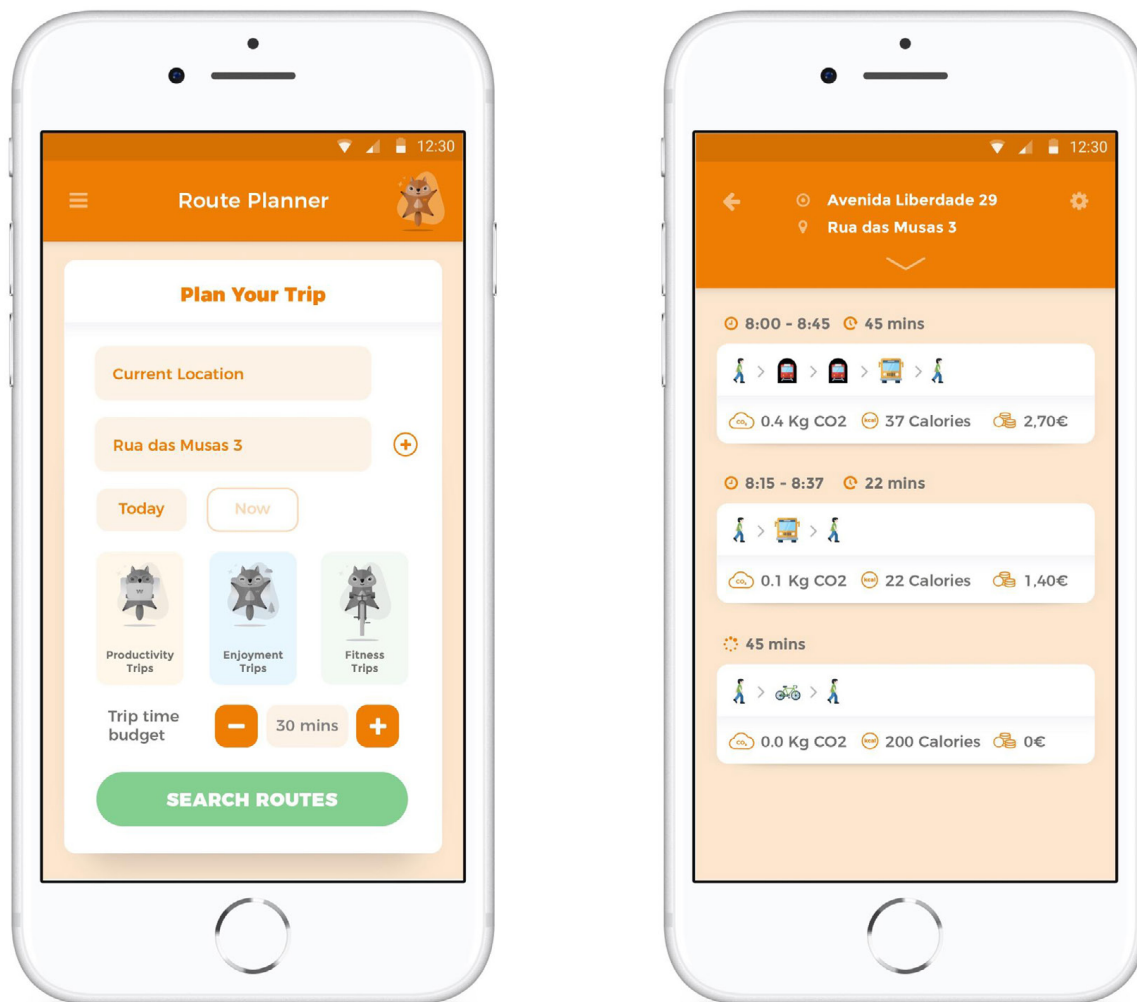


Fig 3 - Route Planner

2.2 Travel Mobility Coach

Perception and value of time are highly subjective and each individual's lens is shaped by one's specific socio-economic factors. As Woorti was a data collection tool there was a need for the data collected by Woorti to be contextually calibrated by the individual user. This led to the creation of the concept of Worthwhileness and its three value dimensions - Productivity, Fitness, Enjoyment.

Based on the user's evaluation of the various modes of transport, the app would create a model of the user's perception of time spent across the various modes of

transport. This breakthrough facilitated the creation of the mobility coach concept!

The mobility coach represented by the Woorti's mascot is a gamified coach that automatically tracks and scores the user's trips. After a week of usage, it creates a baseline travel profile thanks to the automatically tracking and scoring the trips made in this period. Based on this profile model, it prompts the user to set a "mobility goal". Once the user sets a goal, the mobility coach will "nudge" the user to make slightly different choices for his/her trips in line with the goal.

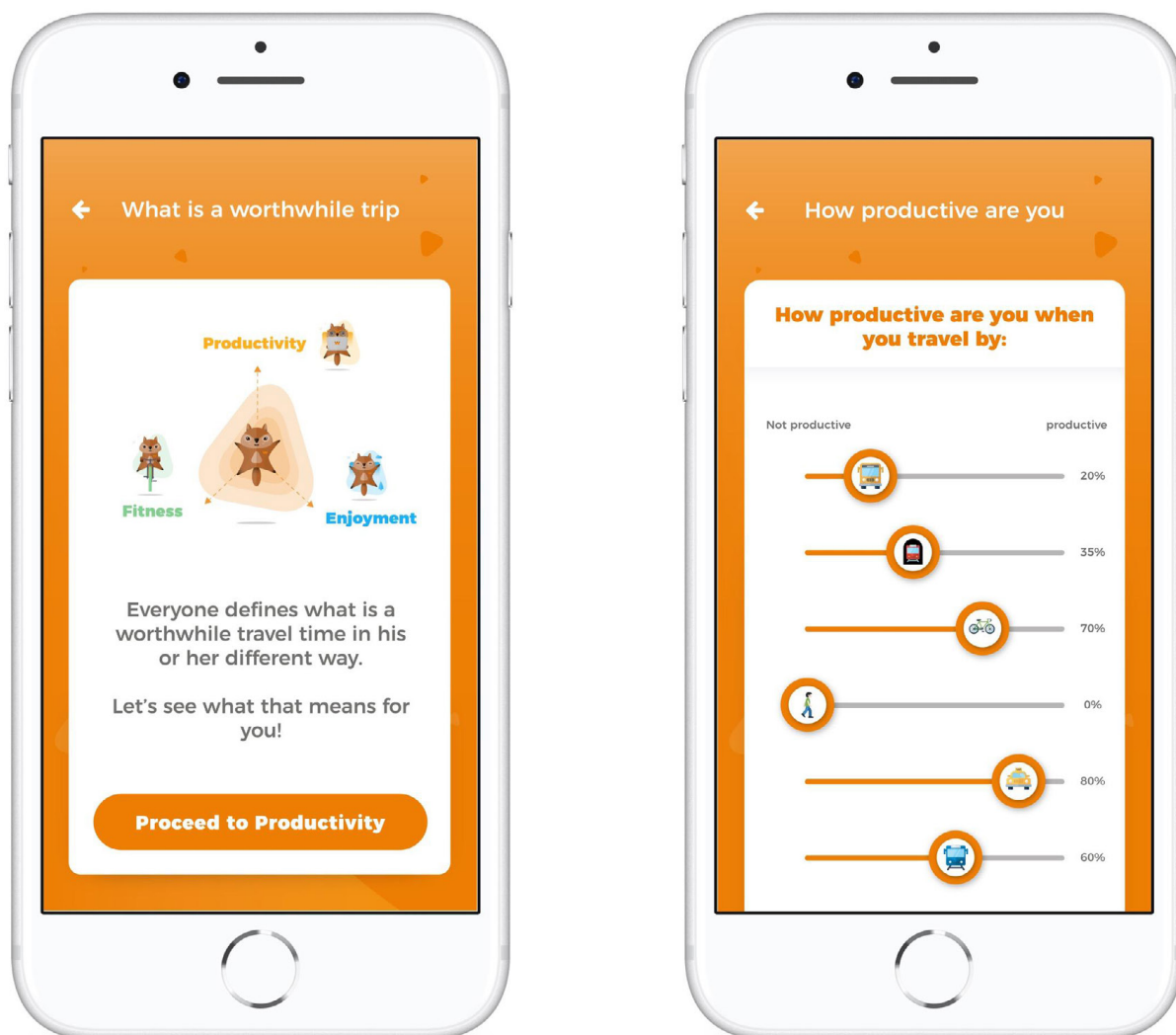


Fig 4 - Defining worthwhileness

Outside of the mobility goal and the nudging mechanism, the mobility coach also shares content on a daily basis geared towards not only illuminating the various alternatives modes of travel that exist and also helping the user make more conscious and intentional decisions about his/her travel.

This scoring model turned into the backbone of the value proposition of the app and was eventually reflected in the route planner as well. For example, all trip results yielded by say a productive trip search are ranked by its productivity score.

2.3 Travel Dashboard

While the Mobility coach was designed to help, the user achieve a specific goal should he choose to do so, it was clear that an interface that would automatically illuminate and help the user visualize his/her travel time was in the context of his/her city would be a great breadcrumb to lead to this action. Tapping into the suggestions of gamification and quantified self, a quantitative mobility dashboard was designed to help achieve this.

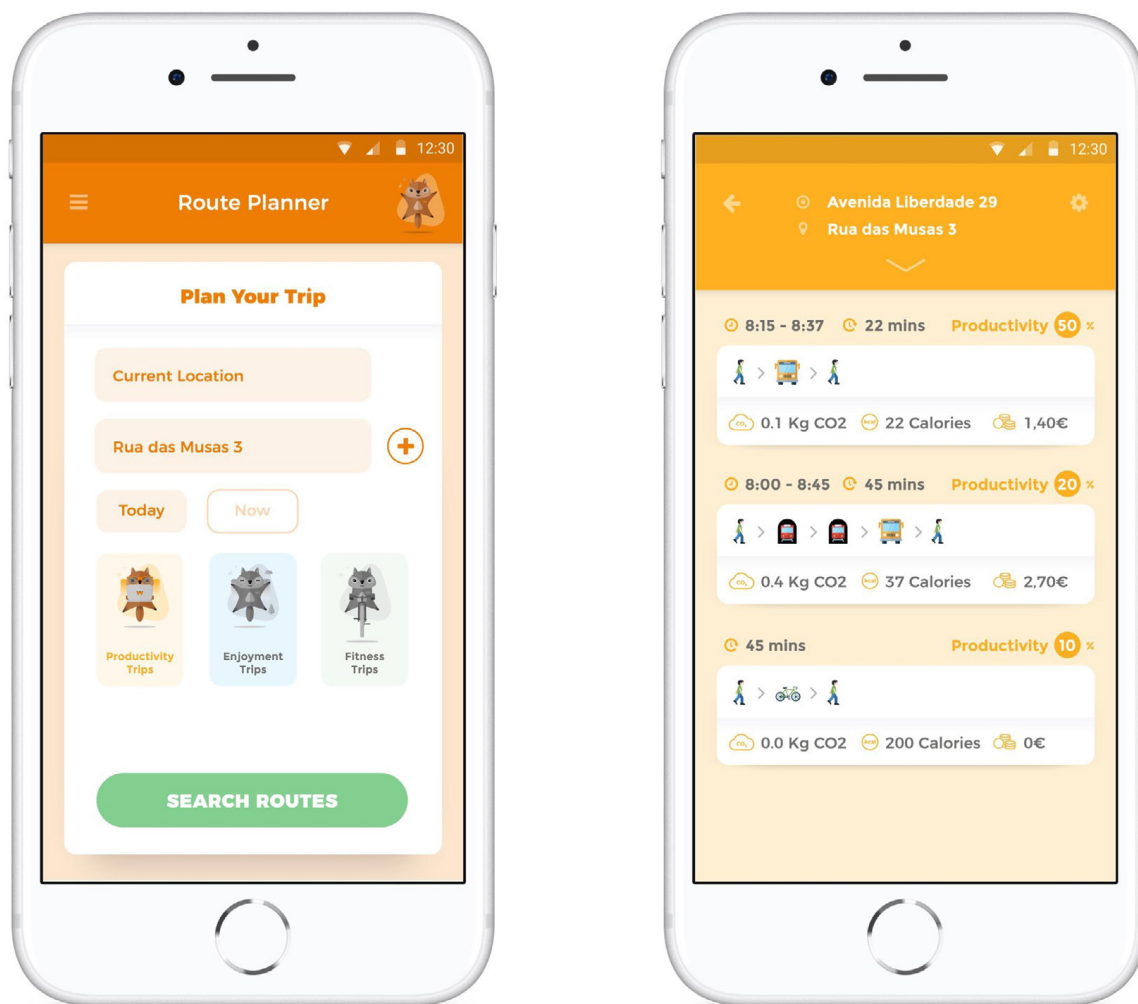


Fig 5 - Route planner yielding results ranked by productivity

The dashboard was inspired by successful trends in health related quantified self data and how a mere exposition of this data proved to be a great first step in driving behaviour change. It also took however a travel time dimension, showing users how worthwhile their trips were being in each value dimension. Adding to the mobility coach target, this was another incentive for the user to regularly validate the data on their trips. In the mobility dashboard, the user is presented with a simple language textual interpretation of the data behind his/her patterns with the graphics hidden one click away (in an attempt to present the insight upfront as opposed

to presenting the raw data). A secondary view allows the user to compare himself to the city he lives in leveraging the game dynamics of competition.

2.4 Survey Modules

Last but not the least, one of the core objectives of the app was to collect rich contextual qualitative data without being tedious to the end user. In an effort to diverge away from the sensation of “filling a form”, survey modules in Woorti employ game mechanics of leader boards and graphic elements like emoji to bring a certain levity to the task.

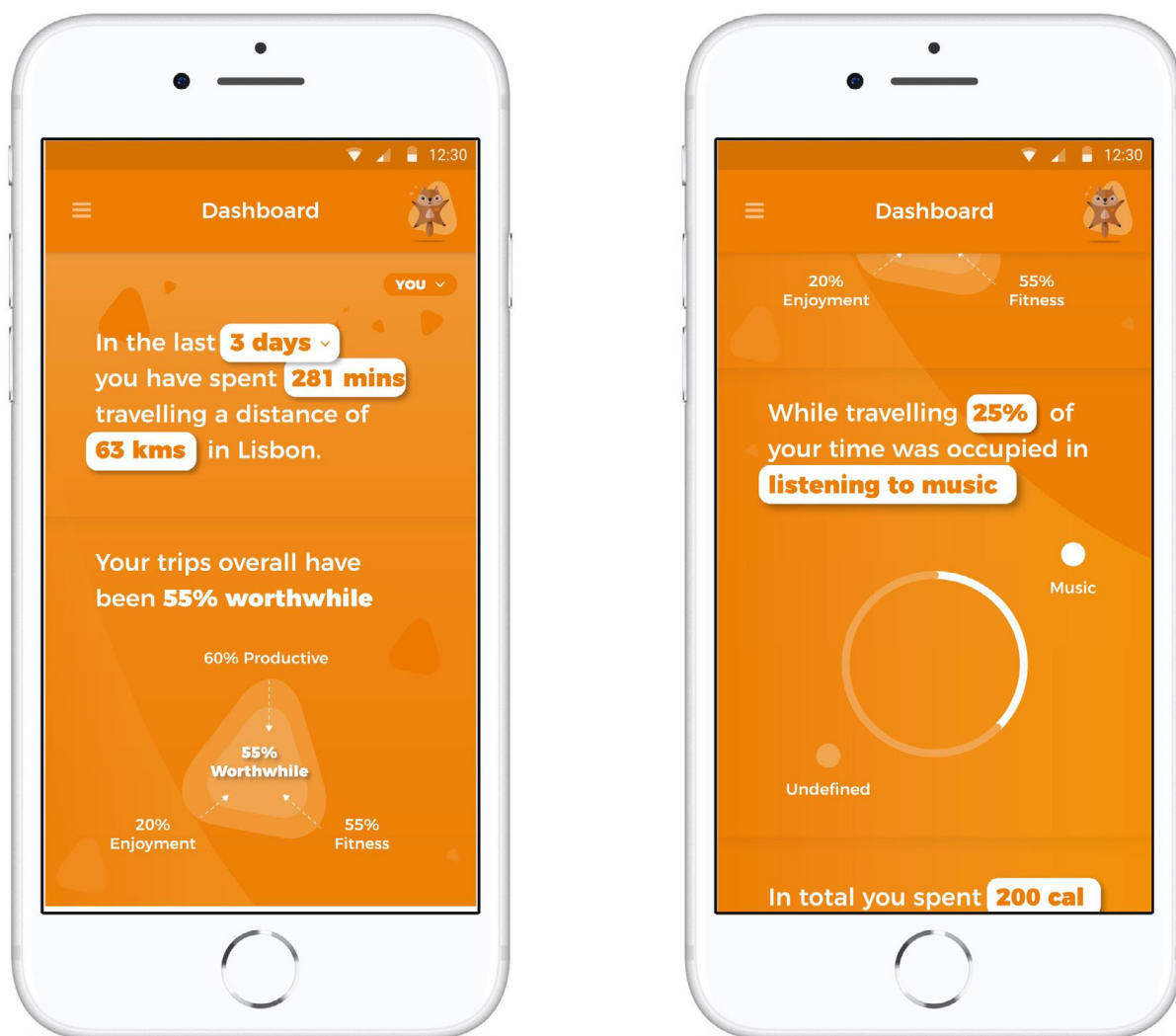


Fig 6 - Dashboard Individual

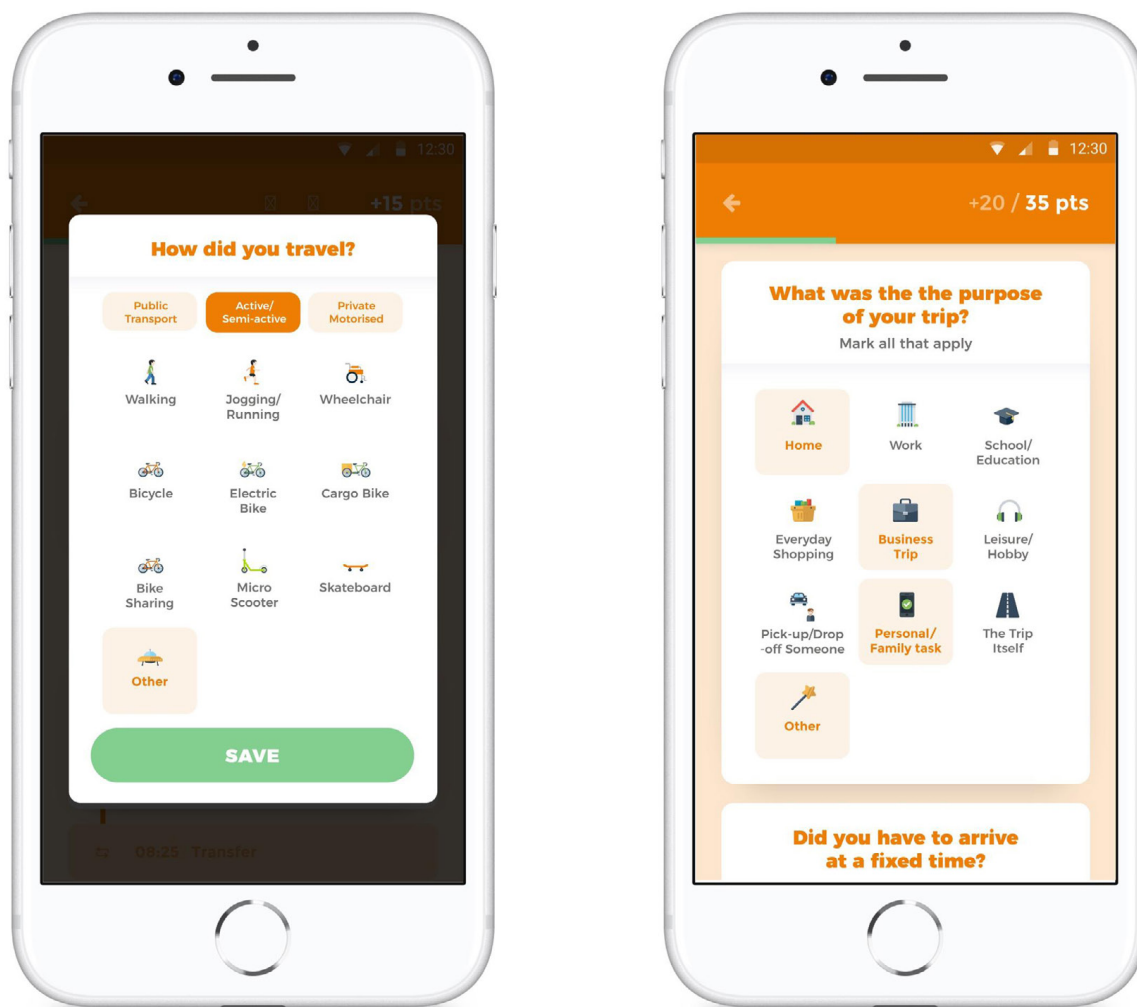


Fig 8 - Survey modules

3.1 Conclusion

Designing Woorti was an exercise in exploring and experimenting with ideas that represent an outlook that is future looking. It's no secret that transport operators, urban planners and other similar stakeholders seek ways to reach their audiences and learn from their experiences to improve their services in the same way that brands aim to reach their customers. Woorti aims to meet this need and create a real-time channel between stakeholders and their customers.

A number of factors are starting to converge that are increasing the demand on the market of mobility. Socio-economic factors such as a growing demand for affordable housing coupled with shifting workplace cultures of remote work offer a glimpse in the shifting needs of urban

populations. Technological trends such as autonomous cars beg the question: what would travellers do if they no longer needed to drive? And let's not forget, environmental concerns such as weaning citizens off private mobility is intrinsic to the future of a sustainable planet. The future of the world hinges on effective and efficient urban contexts with flexible mobility infrastructures. Woorti aims to contribute to this future in an informed, cheerful and positive manner.

4.1 References

- [1] Giuseppe Lugano et al 2018: Worthwhile Time in Transport: Capturing the Subjective Value of the Travel Experience by Smartphone
- [2] João Bernardino et al 2018: Market Analysis and App Engagement Strategy