D3.4 – Report on user needs and requirements assessment in pilots

E. Marlier (EPF), S. Lima (EPF), K. Bulanowski (EPF), B. Royo (ZLC), F. Di Ciommo (CambiaMO)

Document Number	D3.4
Document Title	User needs and requirements assessment in pilots
Version	2.0
Status	Final
Work Package	WP 3
Deliverable Type	Report
Contractual Date of Delivery	30.04.2021
Actual Date of Delivery	30.06.2021
Authors	Evelien Marlier (EPF), Sandra Lima (EPF), Katie Bulanowski (EPF)
Contributors	Floridea DiCiomo (cambiaMO), Gianni Rondinella (cambiaMO), Andrés Kilstein (cambiaMO), Eleonora Tu (ITL), Thais Lamoza (Door2Door), Michelle Spector (Technion), Wim Vanobberghen (imec), Beatriz Royo (ZLC)
Reviewers	Alexandra Erfort (VDI/VDE-IT), Annette Randhahn (VDI/VDE-IT), Caroline Cecile De Geest (VUB MOBI)
Keyword List	User requirements, digital mobility tools, vulnerable groups, pilots, cybersecurity, data collection, user recruitment, empowerment
Dissemination level	PU

INDIMO Consortium

The project INDIMO - *Inclusive Digital Mobility Solutions* has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533. The consortium members are:

No	Participant Legal Name	Country
1	VRIJE UNIVERSITEIT BRUSSEL	BE
2	VDI/VDE INNOVATION + TECHNIK GMBH	DE
3	INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM	BE
4	CAMBIAMO S.C.M.	ES
5	DEEP BLUE SRL	IT
6	TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY	IL
7	MOZGASSERULTEK BUDAPESTI EGYESULETE	HU
8	FUNDACION ZARAGOZA LOGISTICS CENTER	ES
9	POLIS - PROMOTION OF OPERATIONAL LINKS WITH INTEGRATED SERVICES, ASSOCIATION INTERNATIONALE	BE
10	EUROPEAN PASSENGERS' FEDERATION IVZW	BE
11	DOOR2DOOR GMBH	DE
12	VIVERO DE INICIATIVAS CIUDADANAS	ES
13	COOPCYCLE	FR
14	FONDAZIONE ISTITUTO SUI TRASPORTI E LA LOGISTICA	IT
15	POSTE ITALIANE - SOCIETA PER AZIONI	IT

Document change record

Version	Date	Status	Author (Unit)	Description
0.1	24/04/2021	Draft	Evelien Marlier (EPF)	First draft including info on data gathering and analysis per pilot
0.2	06/05/2021	Draft	Evelien Marlier (EPF)	Second version further elaborating the methodology
0.3	18/05/2021	Draft	Evelien Marlier, Katie Bulanowski and Sandra Lima (EPF)	Draft version including analysis of pilot results
0.4	20/05/2021	Draft	Evelien Marlier, Katie Bulanowski and Sandra Lima (EPF)	Draft document ready for internal review
0.5	02/06/2021	Draft	Katie Bulanowski (EPF)	Draft version addressing internal review comments (VDI/VDE-IT)
0.6	25/06/2021	Draft	Katie Bulanowski (EPF)	Draft version addressing feedback from CambiaMO
1.0	29/06/2021	Final	Katie Bulanowski (EPF)	Final version integrating VUB feedback, ready for submission
1.1	19/11/2021	Draft	Katie Bulanowski (EPF)	Draft version addressing comments and revision requests by the EC
2.0	26/11/2021	Final	Katie Bulanowski (EPF)	Final revised version ready for submission

Copyright Statement

The work described in this document has been conducted within the INDIMO project. This document reflects only the INDIMO Consortium view and the European Union is not responsible for any use that may be made of the information it contains.

Executive summary

As part of Work Package (WP) 3, which manages the implementation phase of the pilots, this deliverable refers to the output of Task 3.3 (T3.3) 'Pilot Phase 1'.

In order to collect the data for our analysis, we organised and implemented one questionnaire per pilot. User goals, needs, preferences, digital skills, social network and transportation availability were identified and evaluated for each pilot. The digital tool, the physical service and support, privacy and security were also assessed. This investigation was based on the pilot preparation phase and took into account the guidelines that were written down in the pilots handbook (D3.1). On the other hand, this task further elaborated on the findings of WP1 'Analysis of barriers and opportunities for tapping the full potential of the digital interconnected transportation system' of the INDIMO project. As compared to the findings in WP1, we addressed the bigger picture of the pilots, also taking into account factors like social network and family situation, support and transport poverty of the interviewed participant.

The pilot activities in phase 1 were continuously monitored and supported. A special training session on user involvement strategies was organised to support the pilots with the recruitment of vulnerable-to-exclusion end-users.

Because each pilot has its own context, target groups and culture-specific aspects, they all needed customised approaches and individual support. Hence, it required more time than expected to develop and create customised versions and to adjust all the questionnaires to the specific pilot contexts. In future projects, but also for the next co-creation phases in the INDIMO project, it is necessary to **foresee and dedicate enough time for the coordination of pilots and for the data gathering activities**.

While each pilot is unique and covers different target groups and their needs, we could still draw some overall conclusions which link them together:

One of the most important findings of our study is that it is becoming **more and more difficult to apply user segmentation:** there are huge differences across user groups but also within user groups. Users across the pilots indicated that it is very important that the digital mobility systems have an appropriate level of 'personalisability'. A person's travel preferences can vary greatly, depending on a specific context (travelling alone / with others, travelling for work / leisure, making a chain-trip or not, having access to public transport or a private car etc.). So when designing mobility services, it is necessary to **take into account the bigger picture** and these different aspects too.

In order to gain the trust of the pilot target groups, and of citizens in general, we found that a **strong public-private cooperation** between the mobility providers and local governments as well as NGOs that support vulnerable-to-exclusion groups will be necessary. These local organisations that have strong ties with the targeted end-users can help with creating campaigns to raise awareness and increase feelings of trust of the (new)

mobility services. This can definitely help to increase user acceptance and user uptake of the services and create win-win situations for all parties.

Another important conclusion we could draw is that digital mobility services need to be **dynamic and customisable, while not increasing complexity too much.** This balance is seen as one of the most important challenges for improving digital mobility systems.

Another very important finding is that **short feedback loops** need to be created between developers/operators and end-users **in order to realise 'quick wins' and short term improvements**. In future projects where there are similar technological developments, and in the next INDIMO co-creation phases, it is important to be on the ball and pass things on quickly. Applying an agile approach can really add value and improve the services along the way.

The synthesised findings and results of Task 3.3 in this report, D3.4, form the basis for the next phases in the pilots for the (re)design of the service or technology making use of the INDIMO Inclusive Digital Mobility Toolbox from WP2 and will help address the major user needs.

Table of Contents

List of figures

List of tables

1. Introduction

The overall aim of the INDIMO project is to extend the benefits of the new and emerging digitally interconnected transport system to people who currently face barriers to using such systems due to the limited physical or cognitive accessibility to the digital interfaces or socio-economic barriers. Therefore, the project will help develop a universally accessible on-demand personalised digital transport system, which is usable and accessible to the widest range of people while catering for individual needs and offering personalised mobility options.
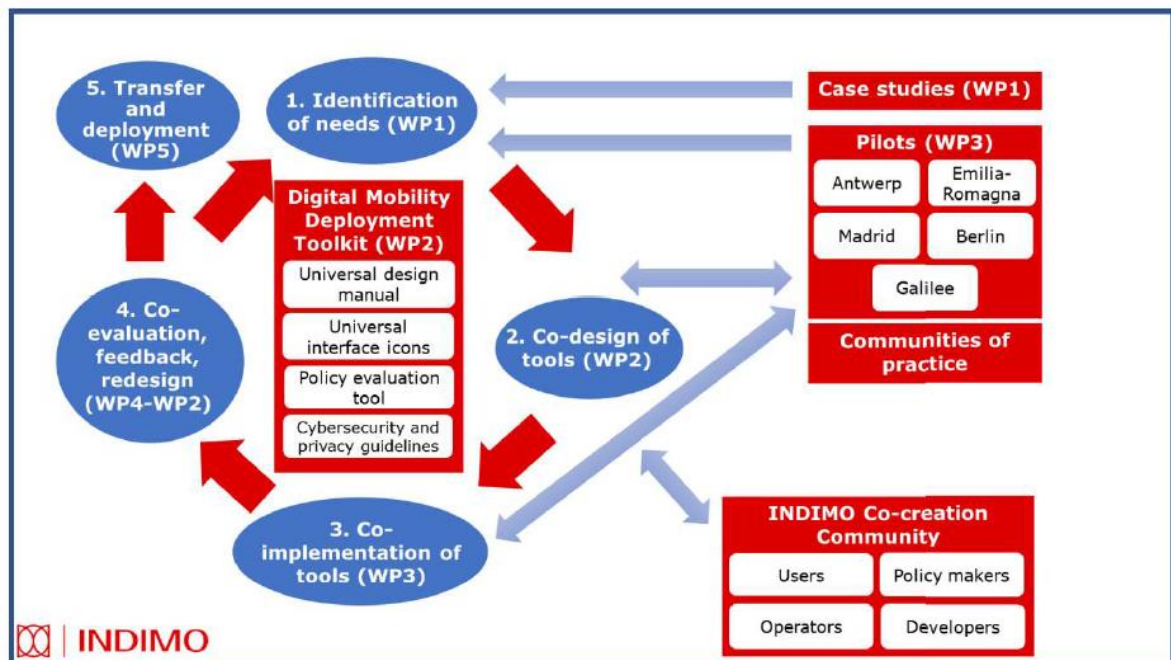
Figure 1 - INDIMO methodology: the five-stage co-creation process (blue) in relation to the workplan (red). (Source: DoA)

This deliverable is related to stage 3 of the INDIMO co-creation process (WP3), during which information from each pilot is gathered and the tools that were created will be validated in order to collect feedback and to further improve the digital mobility systems.

More specifically, this deliverable refers to the output of Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots'. It contains the details about how the data was collected in order to perform the user needs and requirements assessment in the pilot phase 1.

This task has three main objectives:

• To complement WP1 by further investigating user acceptance, needs, goals and preferences as well as challenges, difficulties, limitations and constraints of users of

digital technologies within the local pilots of Emilia Romagna, Antwerp, Galilee, Madrid and Berlin;

- To gather additional data focusing on the influences of social network and professional support, and setting priorities for technological development and how to empower the vulnerable-to-exclusion groups in using digital mobility services;
- To collect data for monitoring the impact to support WP4: data gathering on the pillars of user acceptance, inclusivity and accessibility and cybersecurity and personal data aspects to set the baseline measurements in order to improve and evaluate the developed tools.

In order to achieve these results, the methodology as developed in D3.1 'Pilot handbook' was followed as well as the data gathering guidelines described in D4.1 'INDIMO Evaluation Framework'. Besides following these guidelines, regular meetings were set up with the different dedicated INDIMO partners in order to align the methodologies, monitor the data gathering activities and support the pilots where necessary.

1.1. Aim of the deliverable

This deliverable gives an overview of the data gathering activities that were carried out in the different pilots. It includes the strategies that were used for the recruitment of participants and how the pilot activities were monitored.

It further provides insights in the specific user needs and user requirements that were detected in the different components of the digital tools, the physical tools, service agents, the user assistance and the support they need when using these services.

This deliverable also contains some cross-pilot conclusions and recommendations on how to gain people's trust and to improve the uptake and the design of the INDIMO tools. Finally, some general tips and tricks for future research when working with different vulnerable to exclusion groups are shared.

1.2. Relations to other relevant deliverables and WPs

Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots', to which this deliverable relates, is part of WP3 (pilots and demonstrations) and is directly related to other WPs and deliverables (see Figure 1). Task 3.3 is part of the 'pilot phase 1', where the initial assessment on user requirements towards digital services in the pilots was conducted. The user research that was carried out is complementary to the research already performed in WP1 on user profiles, needs and requirements, but goes deeper into certain needs of specific vulnerable-to-exclusion groups and fills in the gaps. On the other hand, in this task, data was gathered for the baseline measurements: they tailor the evaluation framework defined in the D4.1. The INDIMO evaluation framework is based on five pillars: (i) user acceptance; (ii) inclusivity and accessibility; (iii) cybersecurity and

personal data aspects; (iv) process evaluation as well as (v) applicability and transferability. It builds the basis for the next phase in the project. The findings will also help to feed the IMDIMO Inclusive Digital Mobility Toolbox in WP2.

1.3. Task participants and sharing of responsibilities

Task 3.3 was led by the European Passengers' Federation (EPF). Zaragoza Logistics Center (ZLC), the pilot coordinator, was in charge of aligning and monitoring the different pilot activities. CambiaMO, who is in charge of leading the local Communities of Practice (CoP), supported by engaging these local communities to help with data gathering and validating the findings, which is further outlined in section 2.7 of this document (Task 3.2 'Communities of practice: learning by practice through the five selected pilots'). All local pilot partners (ITL, Imec, Technion, CambiaMO and door2door) were responsible for collecting the data for the user surveys and the baseline measurements. Finally, the (Vrije Universiteit Brussel) VUB was in charge of monitoring and evaluating the data gathering activities carried out within the evaluation framework (WP4).

1.4. Structure of this deliverable

The deliverable is subdivided into four sections and three annexes. This first chapter includes a general introduction and gives a brief overview of the goals and the activities that were carried out in the pilots. Chapter 2 will present the applied methodology to gather the necessary data to identify the specific goals, needs, skills, capabilities, limitations, challenges and constraints of end users, how these activities were coordinated and what the role of the CoPs was. Chapter 3 is dedicated to the analysis of the user surveys conducted in each pilot. Chapter 4 consists of a cross-pilot analysis, conclusions and a description of the recommendations and lessons learnt.

page **15/122**

2. Methodological approach to grasp user needs, goals and preferences

This section gives an overview of the methodologies that were applied to identify the user needs in the pilots. The user needs assessment in the pilots is part of the first phase in the co-creation process, the requirement analyses. It complements the research that was conducted in WP1. The methodology for this deliverable followed the approach for Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' as laid out in the D3.1 'Pilot handbook' and D4.1 'INDIMO evaluation framework'.

As described in the Introduction of this document, the main goal was to collect additional data for all pilots. Concretely, this meant understanding how pilot end users would receive the introduction of new or redesigned INDIMO digital mobility services in their communities. To gather this required information and to further research certain aspects and dimensions from Task 1.2 'Analysis of the requirements of users towards the digital interconnected transport system' and Task 1.3 'Identification of user capabilities and requirements of a digital transport system on users' that needed more insights, a customised survey to target vulnerable end users in the pilots was designed and implemented for each pilot. User goals, needs, preferences, digital skills, social network and transportation availability were identified and evaluated respectively. The digital tool, the physical service and support as well as privacy and security were also assessed. We then evaluated the results to draw overarching conclusions about the necessary requirements and needs for the pilots' digital mobility services. Based on the assessments detailed in this deliverable and on input from WP1 and 2, the pilots will (re)design their service/technology in Task 3.4 'Pilot phase 2 – (re)design or service/technology'.

Our general methodological approach for this deliverable can be explained as follows:

1. Identifying target groups;
2. Collecting information about user needs, goals, preferences and background in the five pilots and by means of interviews or surveys;
3. Analysing the results individually for each pilot;
4. Analysing the results collectively and drawing conclusions.

Before we discuss the methodology and data collection strategy in more detail, we briefly want to outline how Task 3.3 and this deliverable fit into the INDIMO project and what the roles of the different pilots are.

2.1. Background information on the INDIMO co-creation process in the pilots

The five pilots in the project perform as an overarching platform for experimentation and as integral parts of the co-creation cycle. The five pilots do not only serve as a testing platform for the tools developed but also as a living laboratory that will enable INDIMO to involve the four INDIMO target groups users, developers, operators and policy makers (Figure 2) in all stages of the research, i.e. needs assessment, development of tools, testing of tools, feedback to tool development, transfer and scaling up. All pilots will apply co-creation as a general method that will rely on the creative ideas and input of the participants. Co-creation approaches will ensure that the results will be based on user needs and will increase the rate of user acceptance.
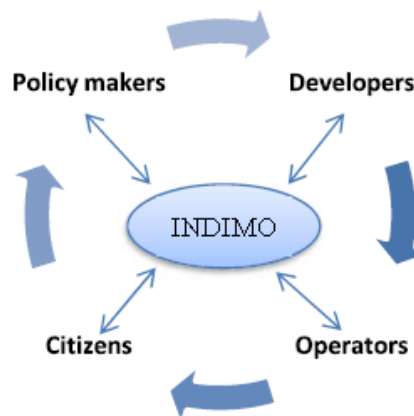
Figure 2 - INDIMO Local pilot target groups (Source: INDIMO DoA)

The objectives of the pilots are detailed in Figure 3 below. They will participate in the five stages of the INDIMO methodology, playing an essential role as a backbone of interactions between the WPs, and knowledge generators for target groups, and especially citizen target groups will serve as content generators from the experiences with the mobility solutions throughout all the phases of WP3 (source: D3.1 Pilot handbook).

The INDIMO methodology is based on a five-stage co-creation process. In stage 1 (requirement analyses) the needs of the target groups towards an inclusive and accessible digital transport system are identified (WP1). This is the base for stage 2 (development), in which a set of tools will be co-developed in order to respond to these needs and provide guidelines to developers, operators and policy makers (WP2). The tools and guidelines comprise the INDIMO Digital Mobility Toolbox. In stage 3 (validation) these tools will be implemented and verified in the pilot projects (WP3). In stage 4 (evaluation) the pilots will also provide feedback on the tools developed (WP2) regarding usability, risks, benefits and transferability of the toolbox. Finally, in stage 5 (transfer and deployment) the redesigned tools and guidelines are disseminated and scaled up in order to increase their impact (WP5).
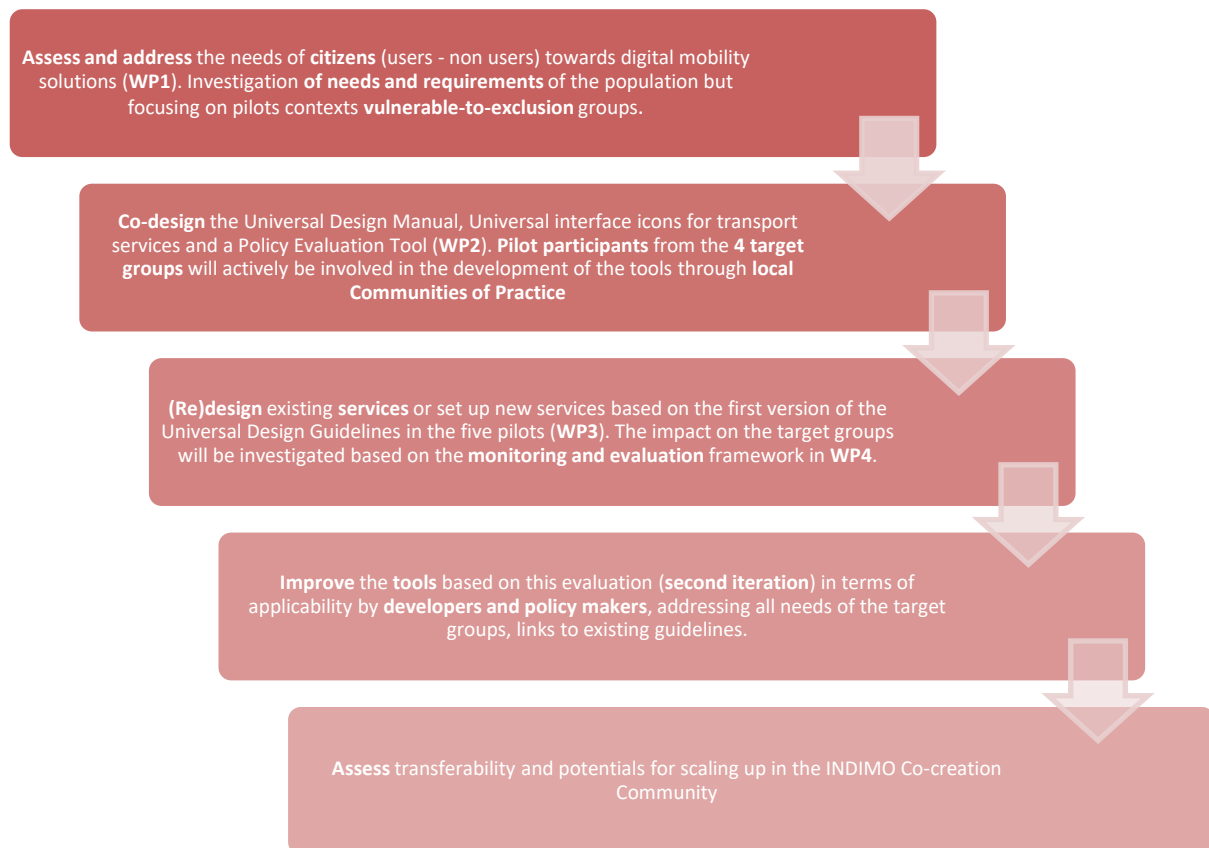
Figure 3 - INDIMO pilots' specific objectives

It is important to highlight that the INDIMO pilots were selected to cover different locations (countries), which enables a comparison of addressing the needs of the same target groups (Figure 2) in areas with distinct cultural and political backgrounds. The pilots' locations also reflect varying spatial configurations, i.e. urban (Madrid, Antwerp), peri-urban (Emilia-Romagna, Berlin) and rural (Galilee), as digital inclusion faces diverse issues in different spatial contexts. Finally, pilots render specific services to vulnerable citizen target groups covering a wide range of possibilities (Table 3 - Applied research methods per pilot). Such combination will allow enhancing the INDIMO Inclusive Digital Mobility Toolbox transferability providing guidelines for all stakeholders in Europe irrespective of the cultural or political context.

2.2. Coordination process in pilot phase 1

Redesigning new digital mobility services that enhance the customer experience and that take into account specific needs of vulnerable users require intensive field research. The process and results of capturing users' requirements and the baseline data collection (see D4.2 and D2.5) required cross-functional teams with representatives from Task 4.2

'Evaluation of inclusion and accessibility including a gender perspective', Task 4.3 'Process evaluation', Task 4.5 'Cyber security and personal data privacy assessment' as well as Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' and the pilots' leaders to work collaboratively during the Task 3.3 phase 1 period.

In the beginning of pilot phase 1, we agreed to have individual meetings with each pilot because we felt that they needed more personal support (as each pilot has its very own context, target group and issues to tackle). To ensure a fruitful collaboration and fluid communication with and between the pilot partners, the INDIMO WP3 and WP4 dedicated research partners agreed with setting up bi-weekly *pilot specific coordination meetings*. The objective was to monitor the progress of every individual pilot and to be able to respond quicker to unexpected challenges and questions. Another objective was to support them in defining tailored engagement strategies for the recruitment of participants for the different data gathering activities.

ZLC, as WP3 leader and pilots' orchestrator, coordinated these bi-weekly individual pilot meetings. Other INDIMO partners that participated in these meetings were representatives of CambiaMO, EPF and VUB and pilots' specific representatives (ITL, door2door, Imec, Technion). The result of this 30-minute sharing space was to respond to methodological questions in real-time and support the pilots in the successful implementation of the first phase of the INDIMO co-creation methodology. The status of the activities and the different subtasks were reported in a living document or monitoring template. After these pilot-specific meetings, the monitoring template status, along with the minutes, was saved and shared with all meeting participants.

In addition to these individual meetings, two *pilot group meetings* were organised at the beginning of phase 1 to train the pilots in conducting the CoP and to explain engagement and recruitment strategies (see section 2.4) to involve participants during phase 1 of the INDIMO co-creation process. After these two group meetings, it was decided not to organise group meetings in a structural way. The pilots indicated that, with the individual pilot follow-up meetings, they had sufficient support.

Finally, *WP3 task leaders* met together monthly during the pilot strategy meetings, in order to respond to identified and foreseen challenges and provide corrective and preventive actions. During this first period, the following supportive mechanisms were defined:

1 Dissemination materials report with descriptions and links to all the existing INDIMO project materials, channels and possibilities to create new contents developed by WP5 "Dissemination".

2 Travel budget reallocation template. INDIMO project, WP and task leaders agreed with reallocating the trip's budget to facilitate the involvement of external participants for the data collection activities. The main reason was that social distancing measurements and lockdowns due to the COVID-19 pandemic did not allow the facilitation of face-to-face workshops or interviews. The INDIMO target users with a lack of digital skills made this scenario even more challenging. Providing some incentives such as vouchers, discounts or small gifts facilitated the recruitment process.

After the finalisation of the first pilot phase, the WP3 partners started by defining the framework and next steps for phase 2 and agreed with keeping the pilot-specific meetings only when requested specifically and to organise pilot group meetings instead. The pilots indicated that it would be useful for them to have these group meetings, to exchange good practices and to learn from each other.

An important lesson learnt while monitoring and coordinating the pilots, is that when working with distinct use cases and target groups in different countries and contexts, you need to keep 'an open mind', and be able to adapt your methodologies accordingly. With organising individual meetings with each pilot, the dedicated INDIMO partners tried to optimise the support each pilot required.

2.3. Identification of target groups

The target-group respondents of each pilot were based on the ones identified respectively in D1.1. On top of this, the personas that were developed in D1.2 also served as a starting point to select the end-users for the user requirement assessment. For each INDIMO pilot one persona was created, with the goal of representing the most relevant characteristics and profiles of potential end-users.

In the table below, you can see per pilot which user profile was targeted to complete the end-user survey and the baseline questionnaires.

Pilot name and location	User profiles (and characteristics)
P1. Introducing digital lockers to enable e-commerce in rural areas (Emilia Romagna-Italy)	Older people and migrants/ foreign people, residing in peri-urban locations; lack of digital services; lack of dedicated network infrastructures; language barriers; low income, …) **Persona Luisa**, an older woman living in Monghidoro, lacks digital skills and relies on traditional media and her social network to receive information.
P2. Inclusive traffic lights (Antwerp–Belgium)	Vulnerable pedestrians (i.e. older people; people with reduced mobility; people with reduced vision) **Persona Johanna:** a blind person who lives in the city and loves to walk. She doesn't like using complex digital solutions. When she moves around in the city, she wants more time to cross and wants to receive real-time info about road situations.

P3. Informal ride-sharing in ethnic towns (Galilee)	Informal ride-sharing users (ethnic minority men/women; residing in the periphery; language barrier; lack of digital skills) **Persona Mariam:** a young Arab woman, living in a village and balancing between honouring cultural traditions and also being attracted to modernisation, facing transport poverty.
P4. Cycle logistics platform for healthy food delivery (Madrid-Spain)	Delivery users (people with reduced mobility; people with reduced vision; socially isolated-unwanted loneliness; not-connected people; low income; COVID-19 confined) **Persona Maria Carmen:** a socially isolated person with low income in Madrid. She needs support for everyday expenses and wants to have more social contacts and be more autonomous.
P5 On-demand ride-sharing integrated into multimodal route planning (Berlin-Germany)	On-demand ride-sharing users (caregivers of children/ impaired/ elders; women; lack of services; lack of digital skills, residing in peri-urban locations) **Persona Marie:** a 30-year old mother living in a peri-urban region, not having a car at her disposal. She wants more flexible options to move around, and take her children along.

Table 1 - User profiles and personas per pilot

It is important to mention here that the INDIMO pilots recruited participants in the period of February – April 2021. This period fell in the midst of the second wave of the COVID-19 pandemic, which certainly complicated recruitment and data gathering.

2.4. User involvement and recruitment

Due to the COVID-19 pandemic, it was even more difficult to reach out to people belonging to the target groups. It forced some pilots to take more time to recruit citizens or to make the necessary online arrangements for the interview. For the Galilee-pilot, the main challenge in finding participants was the limited use and exposure to the informal shared-ride app due to COVID-19. For the Emilia Romagna-pilot, it was difficult to reach the community of Monghidoro online. For the Antwerp-pilot, response was limited at first due to the Easter holiday.

Because most pilots found it very challenging to reach the required number of 10 to 15 participants, EPF organised a training session for the INDIMO pilots in order to support the pilot teams with the recruitment of participants for this task. During this session, they were provided with a number of strategies that could help them with the recruitment of participants. These strategies were based mostly on the user involvement strategies that were outlined in the D3.1 'Pilot handbook'. The table below displays an example of the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **21/122**

strategies that were detected for pilot 1, Emilia Romagna. More information for each pilot can be found in D1.3.

Involvement strategy	How to implement it
Requesting support from institutional service agencies	Verify with the local administration which association could be involved to reach more people. Regular updates with administration and technical offices.
Partnering with citizen groups, community and voluntary organisations	The number of associations in this area is limited. They could be contacted to verify their interest in involvement and then a suitable strategy could be applied (participate in their meetings, act as testimonials).
Activating snowball referrals	Select a first wave of users and ask them to spread the message.
Announcing through media calls and advertisement	Verify what media our target users use and conduct a strategy accordingly.
Engage through social media interaction	Verify if social media is a channel used by our target groups and study which interaction is most effective (campaign, ads…) to eventually implement it.
Inviting a convenience sample through emails and phone calls	Prepare a newsletter to be distributed, or ask if the municipality or other associations have this type of newsletter.
Distributing flyers in places where users lie (shops, bars, plazas, etc.)	Leave leaflets in key points of the municipality, including the Post Office and City Hall.
Ads on local classified websites (like subito in Italy)	Not planned, as this type of channel is more suitable for interactions among privates.
Banner ads on most used apps by those groups	Not planned.
Announcements on specific vulnerable groups magazines/newspapers/podcasts/radio programmes	The possibility to use these channels will be verified and a strategy devised accordingly.

Table 2 - P1 Emilia Romagna: Users' involvement strategies in the co-creation process (some user profile characteristics)

Since all pilots needed hands-on tools for recruitment, we tried to be as pragmatic as possible during the training and offer concrete tips about:

- Which channels the pilots can use to reach out to their target group;
- Which external parties / organisations can help with the recruitment;
- Which methodologies they can apply (snowball methodology);
- Which incentives could be given to the participants;
- How they could shape the recruitment message (e.g. the importance to emphasise what is in it for them).

The figure below shows an example of a slide that was used during the training session.

Figure 4 - Tips and tricks of shaping the recruitment message

We also shared some good examples from other projects, like TMaaS, on how an attractive visual / social media message could look like: (see Figure 55 below)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **23/122**

Figure 5 - Good practice of attractive visual shared during the pilot training session

To help with the recruitment of the participants, visuals and social cards, including a manual on how to use them were created by the WP5 partners. The pilots could customise these and use them on social media and on their website. An example of a visual that was created for pilot 2 Antwerp is displayed in Figure 66.
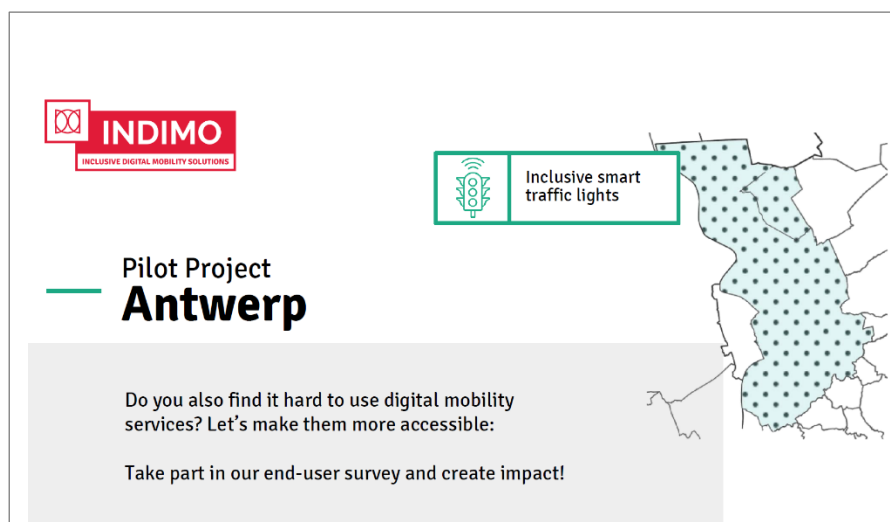
Figure 6 - Example of a visual created to help with the recruitment in Antwerp

Afterwards, each pilot team contacted the relevant stakeholders or organisations needed for reaching potential survey participants for each pilot. This included for example organisations that were interviewed in Task 1.2 'Analysis of the requirements of users towards the digital interconnected transport system' which work with some of the groups we targeted. Recruitment channels included:

- CoP-members

- Local stakeholders
- User representatives
- Local Facebook groups

Some pilot teams also used their own communication channels to reach more people. The role of the CoP is discussed in more detail in section 2.7.

To incentivise people to take part in the questionnaires, we used:

- Gift vouchers
- Recyclable bottles
- Vouchers for drugstores / pharmacies

Specific strategies varied based on factors like cultural inclinations or the limited penetration of digital communication methods. A more detailed overview of the end-users who participated and how they were recruited is presented at the beginning of the pilot analysis (chapter 3).

2.5. Data collection on user requirements in pilots

The most important step in Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' was to collect data of end users regarding the digital mobility services in the pilots, complementing the WP1 research activities.

In order to properly frame the focus of the user requirement assessment in the pilots, several meetings with the WP1, WP3 and WP4 partners were organised. Based on the outcomes of these conversations and on the customer journey maps that were created, a total of four focal areas were defined that the research should shed light on:

- Social context: we want to find out if the social network can or cannot be relied on, the (professional) support someone gets, and the influences of using digital mobile services.
- Specific context in which they (would) use the tool: what are the moments where people would make use of the service? What time of the day, where and why would they use the services? Which broader conditions are there?
- Priorities in technological development: what should be the priorities when we are improving the different digital mobility services? What aspects are most urgent?
- Empowerment of vulnerable-to-exclusion groups: How can we best support the different target groups so that they feel more comfortable in using the digital services?

After various meetings with the pilots and research partners on how this data should be gathered, it became clear that there was no one-fits-all solution that we could apply to

collect the necessary information to fill in the gaps. That is why various research methods were used for the data gathering, with each method adjusted to the target group and the context of the specific pilot.

An overview of the research methods that were used in the different pilots can be found below in Table 3 - Applied research methods per pilot:

Pilot name and location	User profiles (and characteristics)	Applied research method
P1. Introducing digital lockers to enable e-commerce in rural areas (Emilia Romagna-Italy)	Older people and migrants/ foreign people, residing in peri-urban locations; lack of digital services; lack of dedicated network infrastructures; language barriers; low income, …) **Persona Luisa**: an older woman living in Monghidoro, lacks digital skills and relies on traditional media and her social network to receive information.	Customised online survey in Italian Tool used: Survey Monkey Two versions were created: - One for people having used digital locker systems before - One for people that had never used such a service
P2. Inclusive traffic lights (Antwerp–Belgium)	Vulnerable pedestrians (i.e. older people; people with reduced mobility; people with reduced vision) **Persona Johanna**: a blind person who lives in the city and loves to walk. She doesn't like using complex digital solutions. When she moves around in the city, she wants more time to cross and wants to receive real-time info about road situations.	Customised online survey in Dutch Tool used: Survey Monkey Two different versions of the survey: - One for people already using digital applications that assist them when they are travelling

		- One for people not making use of digital applications when they are moving around
P3. Informal ride-sharing in ethnic towns (Galilee)	Informal ride-sharing users (ethnic minority men/women; residing in the periphery; language barrier; lack of digital skills) **Persona Mariam**: a young Arab woman, living in a village and balancing between honouring cultural traditions and also being attracted to modernisation, facing transport poverty.	Face-to-face interviews in Arab conducted by Kayan Two different versions of questions were developed: - One for participants who have already used ride-sharing services in the past - One for participants that have never used a ride-sharing service before
P4. Cycle logistics platform for healthy food delivery (Madrid-Spain)	Delivery users (people with reduced mobility; people with reduced vision; socially isolated-unwanted loneliness; not-connected people; low income; COVID-19 confined) **Persona Maria Carmen**: a socially isolated person with a low income in Madrid. She needs support for everyday expenses and wants to have more social contacts and be more autonomous.	Customised online survey in Spanish Tool used: Google forms One version was developed for people that are currently using a food / grocery ordering service
P5. On-demand ride-sharing integrated into multimodal	On-demand ride-sharing users (caregivers of children/ impaired/ elders;	Use of paper format, so questionnaires could be filled in on-the-spot

| route planning (Berlin-Germany) | women; lack of services; lack of digital skills, residing in peri-urban locations)

Persona Marie: a 30-year old mother living in a peri-urban region, not having a car at her disposal. She wants more flexible options to move around, and take her children along. | Local partner in Marzahn who offers support for low-income women, conducted the interviews. Later on, the responses were integrated in the online tool 'Typeform' to enable the analysis

Two versions were developed:
- One for participants that already used ride-sharing services before
- One for participants that haven't used ride-sharing services before |

Table 3 - Applied research methods per pilot

Once the best research method was identified, interviews/surveys were conducted including questions about:

- Socio-economic data of the survey participants;
- Information about access people have to different mobility modes;
- The support participants get from their network;
- Professional support participants get in their daily life;
- The needs and requirements that the (pilot) digital service satisfies;
- The physical needs and requirements that should be accounted for;
- The type of assistance they would like to receive when (first) using the service;
- The types of actions that would gain trust to try the service.

The questionnaires were customised for each pilot. For some pilots, two versions were developed: one for persons that were already using a (similar) service, and one for people who had never used a similar service or proxy. For the Madrid pilot however, we intended to understand what was stopping non-users from using the digital service and therefore created one survey. These questionnaires took into account the pain points that were detected through the customer journey maps that were developed in Task 1.2 'Analysis of

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **28/122**

the requirements of users towards the digital interconnected transport system'. These customer journey maps focused on the current situation without the INDIMO redesigned application. We asked the participants of the end-user survey to rank these from most important to least important, so that priorities per pilot can be given.

At the beginning of each survey, the participants were asked to consent to take part in the survey. You can find the Informed Consent Form that was used in ANNEX 2.

The results were analysed per pilot, and then merged to make connections and form more overarching conclusions. An overview of our findings can be found in the conclusion of this deliverable.

2.6. Data gathering baseline measurements

Complimentary to this Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' is Task 4.2 'Evaluation of inclusion and accessibility including a gender perspective', which gathered data for the baseline measurements so that the INDIMO tools can be improved and evaluated. To be able to evaluate the INDIMO tools in each pilot, performance indicators need to be measured for the four main goals or pillars of the project, around which the general evaluation framework described in D4.1 'Evaluation framework' has been structured:

1. User acceptance (how do users perceive and use improved services and applications?);
2. Inclusivity and accessibility (how inclusive and accessible are the new or improved digital mobility or logistics services and applications to the users?);
3. Cybersecurity and personal data aspects (to what extent have the cybersecurity and personal data aspects improved in the improved services and applications?);
4. Process evaluation of the INDIMO Inclusive Digital Mobility Toolbox (how can the tools be used in practice to improve the current way of working?).

The WP4 partners, together with the WP3 partners, supported the pilot partners in the data collection by providing them with a list of performance indicators, data to be collected and from whom this needs to be collected, data collection methods and assessment methods. Also, some limitations that may affect the data collection or assessment processes were highlighted.

During the pilot specific follow up meetings (discussed in section 2.2), the data collection process was closely monitored. The analysis and findings related to the baseline measurements in D4.2 'Baseline data reports for pilots' will not be further discussed in this deliverable.

2.7. Role of the CoP in pilot phase 1

This section briefly describes the role of the CoPs in pilot phase 1, which also provide input on user requirements for INDIMO. D3.2 'Communities of practice report' explains this in more detail.

In each pilot location, a CoP was installed at the beginning of the project. The CoP is an instrument to build knowledge through group dynamics, debates, and collective exercises. It is also a way through which experiences in different geographies and settings are shared and transferred. It is an informal knowledge transfer that emerges through a work of coordination of various sessions, which are organised and follow a coordinated agenda among the different CoPs for each pilot deployed in the INDIMO project.

Vulnerable-to-exclusion groups are represented in the CoP meetings by potential users or, when required, user's associations or specialists that could stand in their place and represent the user's insight. Other local organisations such as NGOs, local or neighbours' organisations and associations, public institutions, academic specialists, logistic and mobility service providers were also invited to the CoP. Some pilot-specific participants (e.g. urban planners) were also included, which was the case in Emilia Romagna and Antwerp.

Because these CoP-members are locally rooted and have strong connections with different vulnerable-to-exclusion groups, they could help with the recruitment of the participants for the different INDIMO research activities. On the other hand, they can also support with disseminating the INDIMO results and findings, helping to increase the impact. Establishing a CoP at the beginning of a project can for these reasons be very fruitful.

In total, there were 86 unique members and 193 participations in the INDIMO CoPs. The number of participations refers to the fact that some members participated more than once. The per-pilot split can be found below:

- **Emilia Romagna**: 25 unique members, 34 participations
- **Antwerp**: 19 unique members, 35 participations
- **Galilee**: 15 unique members, 25 participations
- **Madrid**: 19 unique members, 76 participations
- **Berlin**: 8 unique members, 23 participations

Because a group can be smarter than its smartest member, collective intelligence can arise from the gathering and exchanges of different stakeholders, ranging from users, users' representatives, policy makers, researchers, experts and other actors. This sheds a new light on perspectives that can help to test, validate and endorse the input that is gathered in the different INDIMO research activities.

Therefore, the main user requirements identified in WP1 were presented to participants of the five INDIMO CoP groups. The main requirements were selected following the frequency

of appearance during the qualitative fieldwork, the focus given by the interviewee in the course of their speech, and their relevance in accordance to the research objectives. Then, a session of the CoP across pilots was conducted to run the exercise of requirements' prioritisation. This implies two dimensions: a) a poll to assign a level of relevance to each requirement by a general CoP with end-users and users' representatives; and b) a poll to assign a level of effort that the development and implementation for that requirement would take, by collecting the point of view of developers and operators involved in the same CoPs. Via an online, simultaneous, short and personal survey of participants, the members of the CoP had the opportunity of assessing the requirements for their use-value, being 3 a high level of priority, 2 an intermediate level and 1 a low level of priority. Later on, and based on the results of the personal survey a consensus was reached among all the members and through debate, establishing a final common level of priority reached through agreement, with "A" being the highest priority. The requirements are organised according to the rating they reached in the context of the CoP polls. Here we show the example of P3-Galilee, just as an illustration of the procedures. Further detail and analysis can be found in deliverable D3.2 and in the Universal Design Manual (D2.2).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **31/122**

Requirements rated in P3 CoP | Galilee

	Main requirements (from D1.3)
	Additional main requirements for specific pilot (from D1.3)
	Requirements by persona (from D1.2)

		Users' value assessment	Developers' effort assessment	
	no. of Requirements rated	25	24	25
R_ID	INDIMO | Requirements from D1.3 and D1.2	P3 value	P3 effort	P3 Priority
R1	**ACCESSIBILITY**			
R1.03	Include map visualization with the real time position of driver/rider	3	3	C
R1.04	Matching the digital mapping with the real geography using the colloquial variety of local language	2	3	D
R1.05	Attracting routes/locations to support educational and caring mobility needs	1		n.a.
R1.53	possibility to enhance the font	2	1	B
R3	**INCLUSIVENESS**			
R3.01	Humans behind; there should always be the possibility of getting human assistance.	3	3	C
R3.04	Availability of language choices (considering foreign people)	3	3	C
R3.51	some sort of remote support function provided by the service, preferably in the form of a helpdesk of which the contact information is provided by the digital interface. This should be available 24/7	2	3	D
R3.52	service needs to be affordable or at least offer transparent pricing	3	3	C
R3.53	users should be able to contact the service agent	3	3	C
R3.54	work together with organisations or associations with ties to the target audience	3	2	B
R4	**WORKFLOW**			
R4.01	Very important information (i.e. working hours, contact phone) should appear very big at the beginning	2	3	D
R4.03	Include the possibility of viewing user's ratings.	3	3	C
R4.51	an easy one-time registration	3	1	A
R4.52	service to be reliable at all times	3	3	C
R4.53	easy to use interface that does not include too many steps to activate or use the service	3	2	B
R5	**PRIVACY AND DATA SECURITY**			
R5.01	Terms and conditions summarized in checkboxes	3	2	B
R5.52	certain security measures to be taken to keep the users and their data safe	3	3	C
R5.54	service should require as less personal data as possible to function properly	3	2	B
R6	**SAFETY & SECURITY**			
R6.01	Include emergency button in case of physical/ sexual attack	3	3	C
R6.51	service provided by or endorsed by a trusted and reliable organisation	2	3	D
R7	**PHYSICAL INTERFACE**			
R7.51	service agent should be reliable, friendly and empathic	2	3	D
R7.53	service agent needs to have a profile showing the reviews of other users and giving a feedback option	3	3	C
R8	**COMMUNICATIONS**			
R8.52	awareness campaign that targets their user audience and stresses the benefits of the service	2	2	C
R8.54	campaign and training sessions as mentioned above, Emilia Romagna, Antwerp, as well as Galilee and Berlin see the benefit of developing an introductory video tutorial that explains the service step-by-step	3	3	C
R9	**COVID-19 RELATED**			
R9.01	Establish a COVID-19 protocol and communicate it.	3	3	C

Figure 7 - Requirements rated in P3 CoP Galilee

Furthermore, the surveys conducted in Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' is closely linked to and complements the research done in these CoPs.

3.Analysis of user requirements per pilot

As already mentioned, the requirements gathered and outlined in this D3.4 will be complementary to the requirements found in Task 1.2 'Analysis of the requirements of users towards the digital interconnected transport system' and Task 1.3 'Identification of

user capabilities and requirements of a digital transport system on users'. Our intention was to expand on and further research certain areas that needed more insights, paying special attention to for example migrant populations. With this in mind, we present our methodology and results in the following sections.

3.1. P1 Emilia Romagna

The Emilia Romagna pilot focuses on digital services related to tailored e-commerce in the rural areas of Italy, with the ultimate goal of improving the social inclusion of those citizens. These services will utilise digital lockers equipped with networking services to provide a digitally included ecosystem for parcel delivery.

In this regard, our goal was to evaluate the interest in and needs of people using digital mobility services for parcel delivery. To complement the research already done in WP1, we aimed to focus on older persons lacking digital skills.

We therefore included questions about:

- Socio-economic data of the participants;
- Information about access to different mobility modes;
- The support participants get from their network;
- Professional support participants get in their daily life;
- The needs and requirements that the digital service should satisfy in order for them to use it;
- The physical needs and requirements that should be accounted for;
- The type of assistance they would like to receive when using a locker;
- The types of actions that would gain trust to try a service like this.

To gather interested persons to participate in the survey, we used multiple channels:

- The survey was published on two Facebook groups where many people living or interested in Monghidoro are updated on the local news;
- The survey was published on the ITL website;
- The survey was distributed by local stakeholders and members of the CoP, like the Municipality of Monghidoro, LEPIDA and other local organisations.

As an incentive for taking the survey, participants were gifted a gadget, which was sent in agreement with those who left their email contacts.

The survey itself consisted of 34 multiple-choice questions and was administered via SurveyMonkey. For some questions, participants could indicate four top preferences or answers. It is also important to note that in some cases, not all participants answered all questions, which can alter the overall data. The results presented in this document are

therefore described as percentages based on the number of participants who answered each question.

This dataset consisted of 15 participants, of which, 40% were from the Italian region of Monghidoro. 40% were between 61 and 65 years old and 80% were women. A majority of the respondents did not have a disability.

Education and occupation levels varied, though most (93%) participants finished secondary school or a higher degree, 33% worked 40 hours or more and 26% were unemployed. 94% stated that their household income was 1,000€ or more per month, with almost half of participants landing within the 1,000€ to 1,500€ range.

Digital skills were quite high, as 100% of participants owned a smartphone, 86% owned a laptop and 53% owned a landline telephone. 86.6% of participants also had access to online banking and 93% indicated that they had access to apps in the previous month.

Regarding the modes of transport available to them, participants were well connected and mobile. 93% had access to a car (as driver), 66% had access to a bus or tram, and 33% had access to a bike, train or metro.

The social network and support of participants was also quite high; 66% said they can count on a strong social network. However, 93% indicated that they could not rely on professional support in their daily lives.
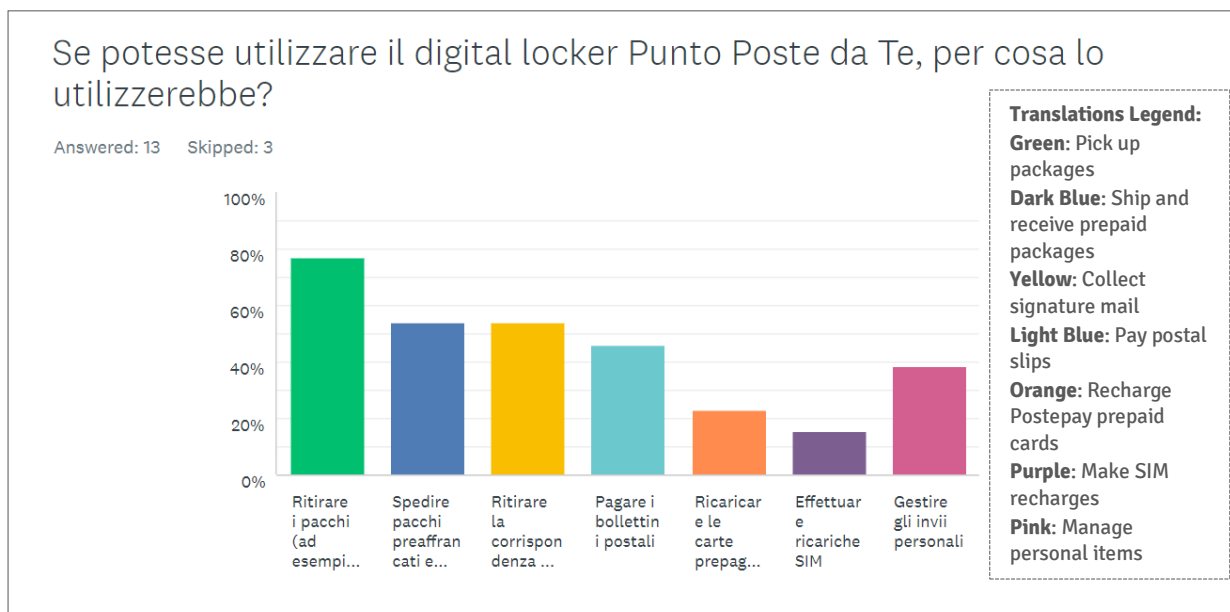
Figure 8 - Answers to the question: If you could use the Punto Poste da Te digital locker, what would you use it for?

We started the survey by asking participants for what purpose they would use a digital locker. The four most common answers were:

- Pick up packages (e.g., those from e-commerce) (77%)

- Ship and receive prepaid packages, and return e-commerce (54%)
- Collect signature mail, including with return receipt (e.g., registered mail, insured mail) (54%)
- Pay postal slips (46%)

When asked if they had used a digital service locker before, 76% of participants said they had not and also 76% said they would not need assistance using it. Only one person indicated that they would like an initial explanation before using it.

Immagini che nella sua zona sia attivo un servizio di locker digitale, indichi quali esigenze questo servizio potrebbe aiutarla a soddisfare (selezioni le tre esigenze che le interessano di più)

Answered: 13 Skipped: 3

Translations Legend:
Green: Reduce the distance and duration of the walk and waiting time to collect packages
Dark Blue: Receive and ship packages in a secure location
Yellow: Perform multiple operations
Light Blue: Pay postal bills and top up phone and prepaid cards
Orange: Facilitate the sending and collection of parcels at convenient times
Blank: Other

Figure 9 - Answers to the question: Imagine that there is a digital locker service in your area; indicate what needs this service could help you meet?

We then asked which needs a digital locker service could fulfil in the region. Answers were mixed, but facilitating the sending and picking up of parcels at convenient times (like Sunday and Saturday) received a high response at almost 100%. Other needs, which received more than 50% of votes, were:

1 Perform multiple operations (e.g. parcel collection and bill payment at the same time, saving time)
2 Reduce the distance and duration of the walk and the waiting time to collect packages or perform other operations

Two additional responses, which did not quite reach 50% but are nevertheless noteworthy:

3 Pay postal bills and top up phone and prepaid cards in various ways (digital and/or physical) depending on personal tools available

4   Receive and ship packages in a secure location
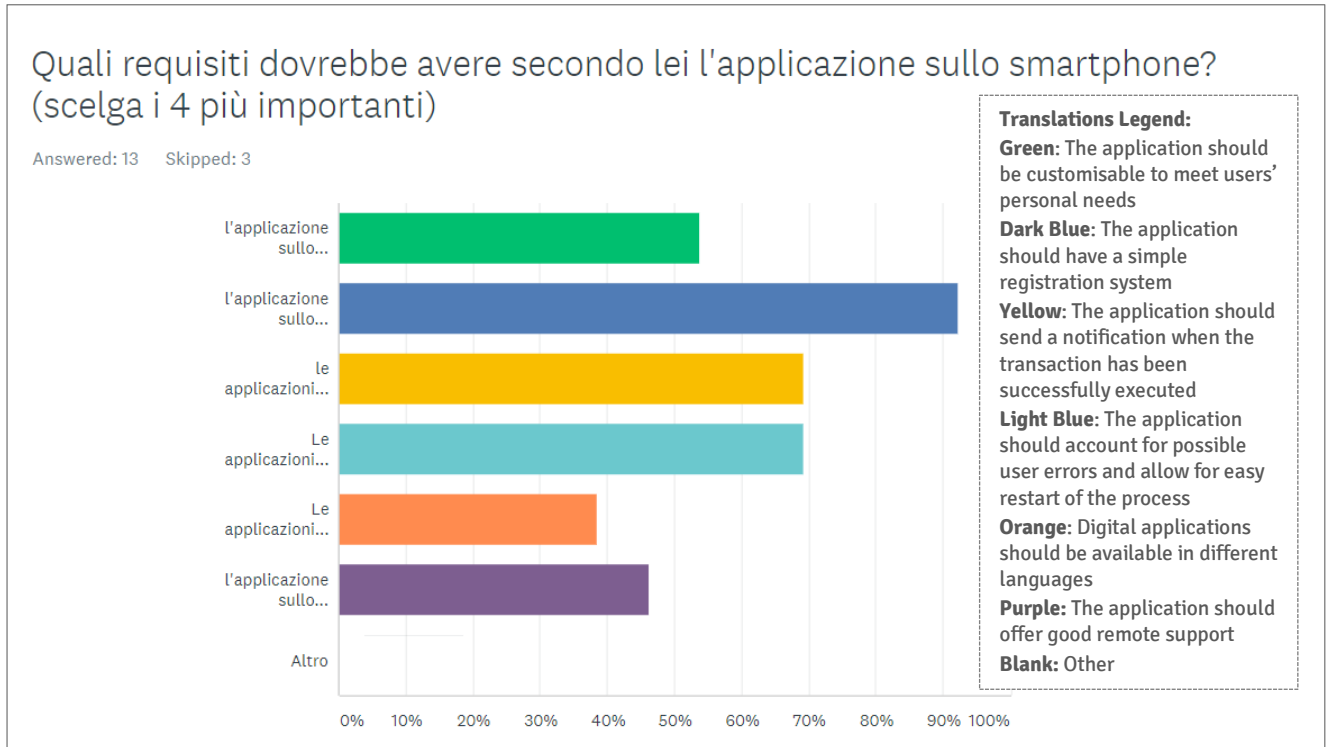
Figure 10 - Answers to the question: What requirements do you think the smartphone app should have?

We then shifted from needs to looking at requirements. When asked about the requirements that the smartphone app should fulfil, it is clear that most (92%) participants favoured having a simple registration system. Other popular requirements were:

1   The applications on the smartphone should send a notification when the transaction has been successfully executed (69%).
2   Apps on the smartphone should account for possible user errors and allow for easy restart of the process (69%).
3   The smartphone application should be customisable to meet users' personal needs (54%).

Also quite important and worth mentioning is that many users also felt that the smartphone application should offer good remote assistance.
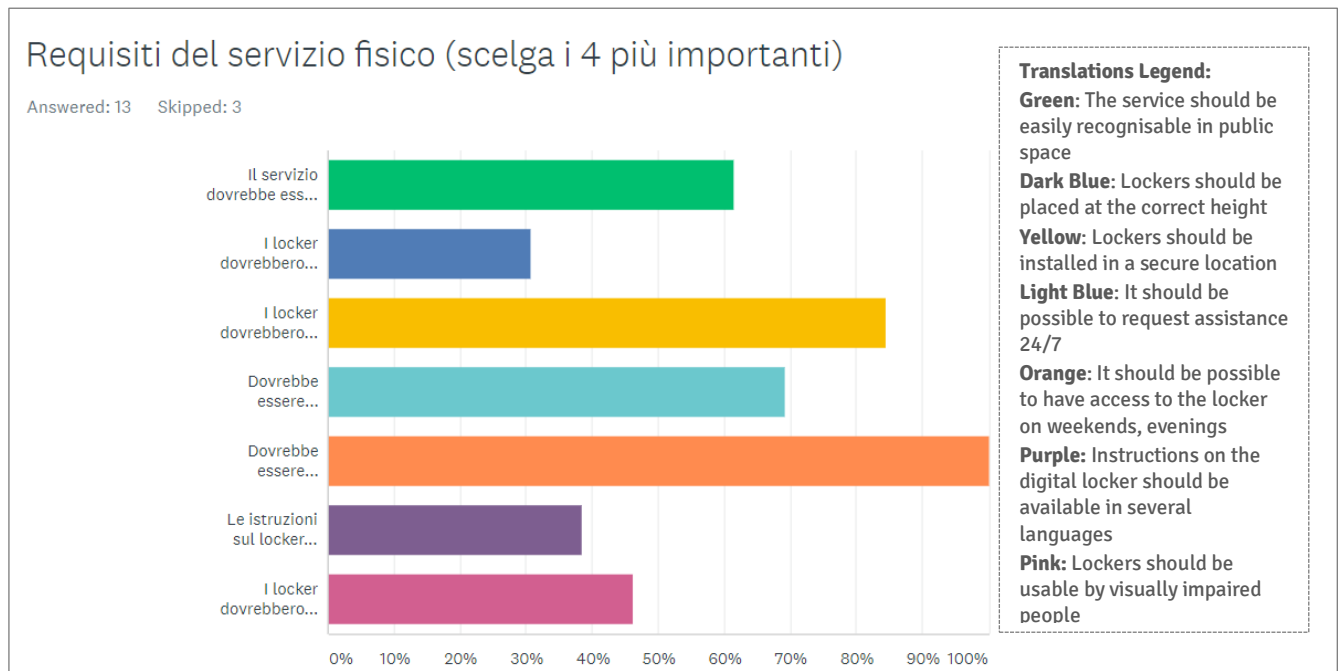
Figure 11 - Answers to the question on physical service requirements

Diving deeper into the physical service of the Emilia Romagna pilot, we asked participants to specify their top four needs in relation to the lockers themselves.

We can derive four key requirements from the results:

1. It should be possible to have access to the locker on weekends and evenings (100%).
2. Lockers should be installed in a secure location (85%).
3. It should be possible to request assistance 24/7 (69%).
4. The service should be easily recognisable in public spaces (61%).

An additional 46% of responders answered that the lockers should also be usable by visually impaired people.
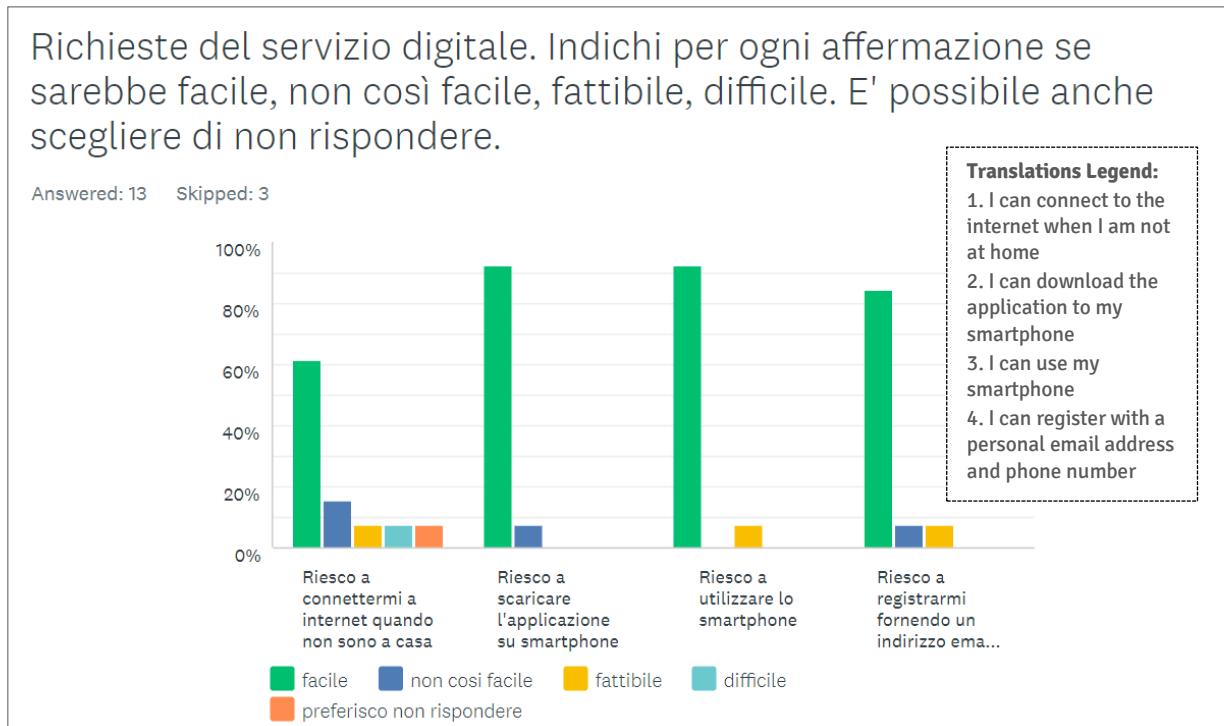
Figure 12 - Answers to the question: Digital Service Requests. Indicate for each statement whether it would be easy, not so easy, feasible, difficult.

After discussing the needs and requirements of the service, we needed to understand the potential level of difficulty of using these services. We therefore asked participants to state how easy or difficult the following actions would be:

- I can connect to the internet when I am not at home.
- I can download the application to my smartphone.
- I can use my smartphone.
- I can register with a personal email address and phone number.

From the graph, it is clear that participants could generally use digital services and were in fact quite skilled in most of the above actions. However, connecting to the internet is one area where 40% of participants had trouble.
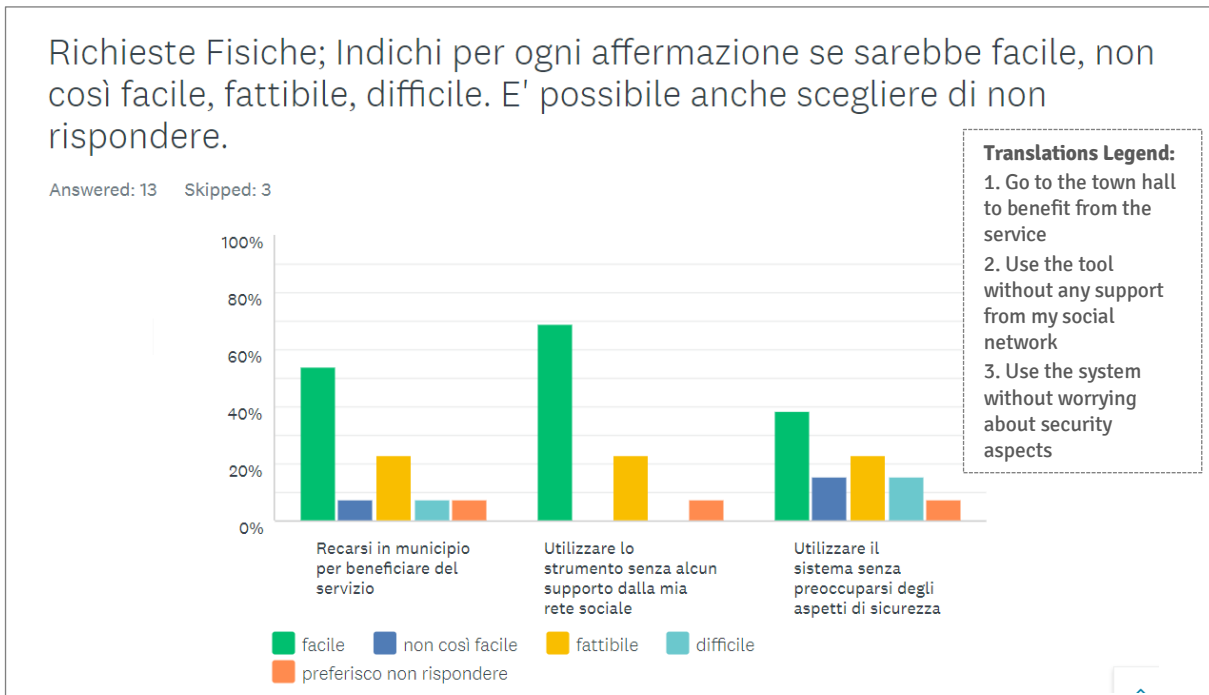
Figure 13 - Answers to the question: Physical Inquiry; Indicate for each statement whether it would be easy, not so easy, feasible, difficult.

As far as the physical component, we asked participants to indicate the level of difficulty regarding the following statements:

- Go to the town hall to benefit from the service.
- Use the tool without any support from my social network.
- Use the system without worrying about physical security aspects.

A majority of participants felt it would be easy to go to town hall and use the tool without any support, likely because most of them had access to cars and other means of transportation. Less than half felt they could use the system without worrying about security, therefore making safety an important aspect not to be overlooked.
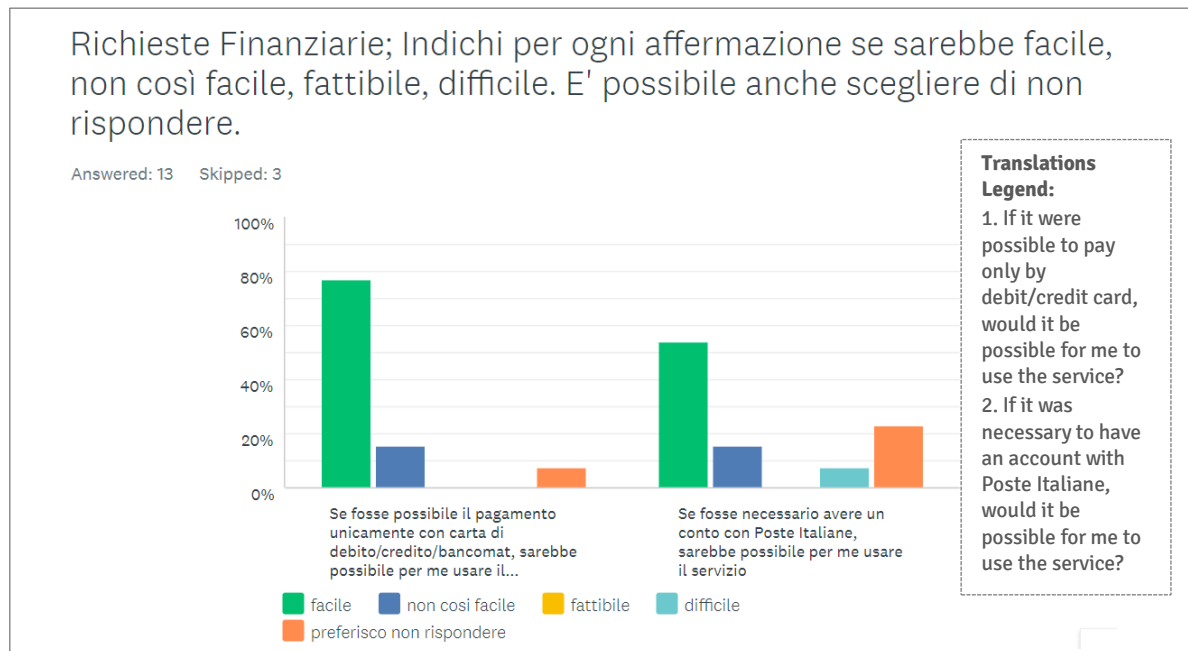
Figure 14 - Answers to the question: Financial Requests; Indicate for each statement whether it would be easy, not so easy, feasible, difficult.

Moving on to the financial aspect of using the tool, we asked participants to remark on how difficult the following would be:

- If it were possible to pay only by debit/credit card, would it be possible for me to use the service?
- If it was necessary to have an account with Poste Italiane, would it be possible for me to use the service?

To both statements, most participants indicated that they would not have trouble using the service if they can pay via debit/credit/bancontact, likely because our participants were digitally skilled. Additionally, 53% remarked that it would be easy to use the service with a Post Italiane account. In both cases, more than half of participants felt the financial aspects of the tool would be easy to use.
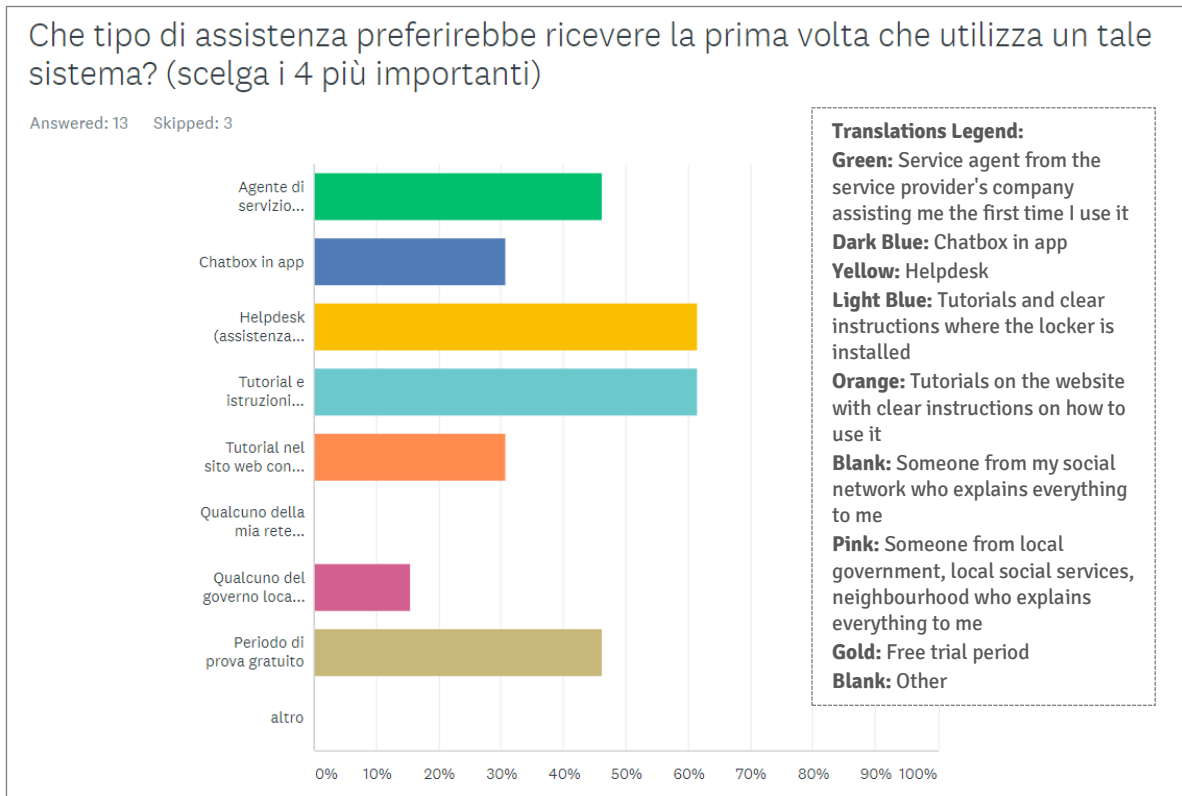
Figure 15 - Answers to the question: What kind of assistance would you prefer to receive the first time you use such a system?

We understand that an app may not be self-explanatory or straightforward upon first use. We therefore needed to identify how participants wished to receive assistance and asked their preferences. Though it was clear from previous results that most participants felt the services would be easy to use, they still remarked that the following would be their preferred method of receiving assistance:

1   Helpdesk (remote assistance via telephone) (62%)
2   Clear tutorials and instructions on where the locker is installed (62%)

Di cosa ha bisogno per sentirti sicuro/a quando utilizza un servizio di mobilità digitale online o scarica un'app per la mobilità? Selezioni gli elementi di cui ha bisogno per sentirsi al sicuro dall'elenco seguente:

Answered: 13   Skipped: 3

Translations Legend:
Green: Consent form
Dark Blue: Privacy statement
Yellow: A specific label that ensures trust
Light Blue: Reviews / ratings from other users
Orange: Advice from people I trust
Purple: Advice from organisations I trust
Blank: None of the above
Blank: Other
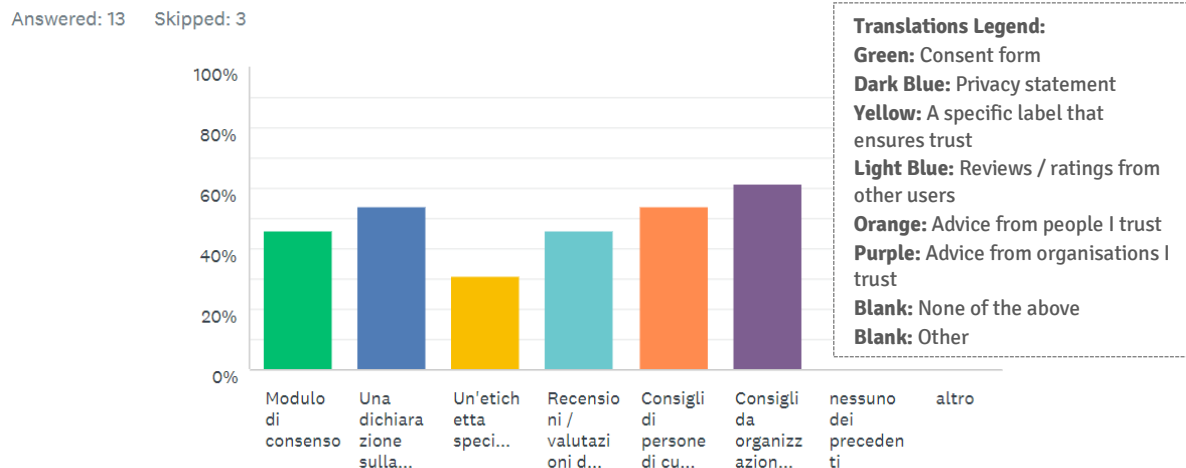
Figure 16 – Answers to the question: What do you need to feel safe when using an online digital mobility service or downloading a mobility app?

Because maintaining trust is an important factor when discussing digital services, our next aim was to evaluate the participants' requirements around digital safety. Though for the most part results were scattered, more than half of the participants remarked that the following were important:

1   Advice from organisations I trust
2   Advice from people I trust
3   A Privacy Statement

Additionally, almost half of the participants indicated the following:

- Reviews / ratings from other users
- Consent form

We see here that advice from people in their social network ranked high as a motivator for using an app. This can possibly be attributed to the fact that most participants indicated that they could rely on their social network.
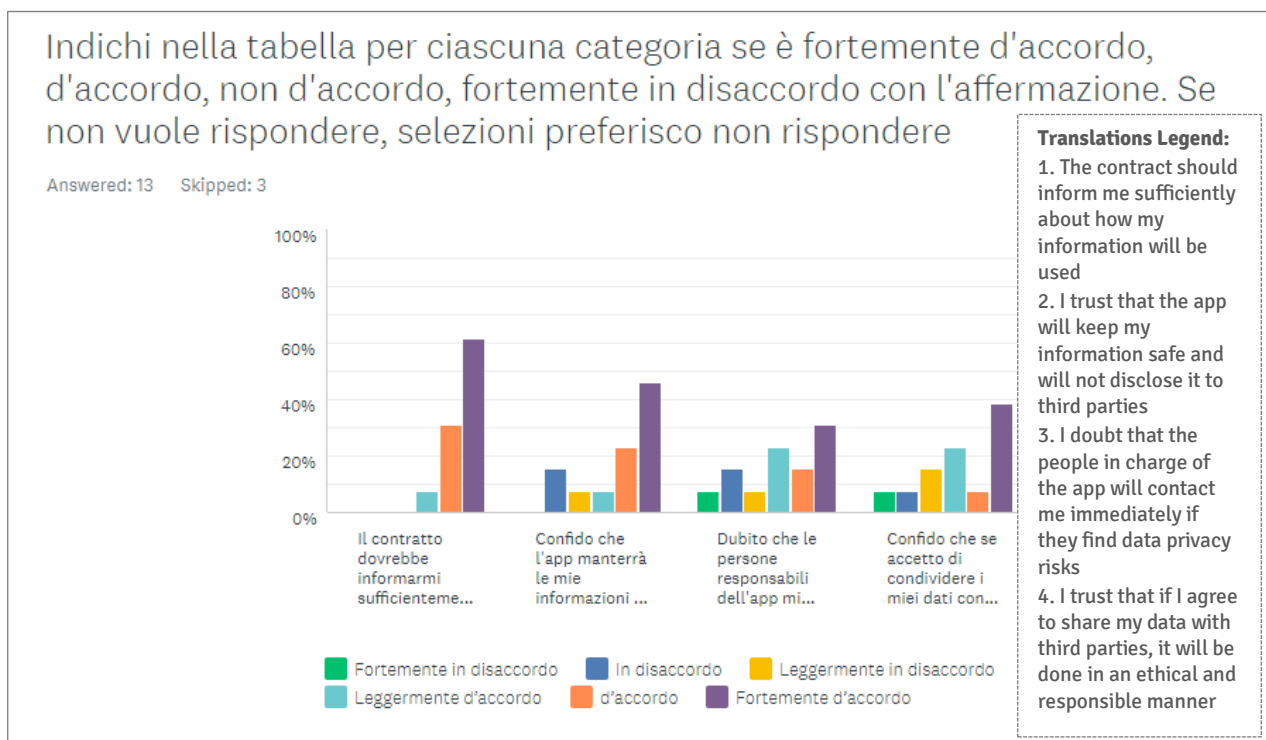
Figure 17 - Answers to the question: Indicate in the table for each category whether you strongly agree, agree, disagree, strongly disagree with the statement.

As a follow up question, we asked responders to agree or disagree to additional statements regarding app security:

- The contract should inform me sufficiently about how my information will be used.
- I trust that the app will keep my information safe and will not disclose it to third parties.
- I doubt that the people in charge of the app will contact me immediately if they find data privacy risks.
- I trust that if I agree to share my data with third parties, it will be done in an ethical and responsible manner.

For all the above statements, a majority strongly agreed. However, there was more scepticism regarding the last two statements referring to data privacy and data sharing. Here again we see that many participants are cautious about the safety aspect of Emilia Romagna's proposed digital services.
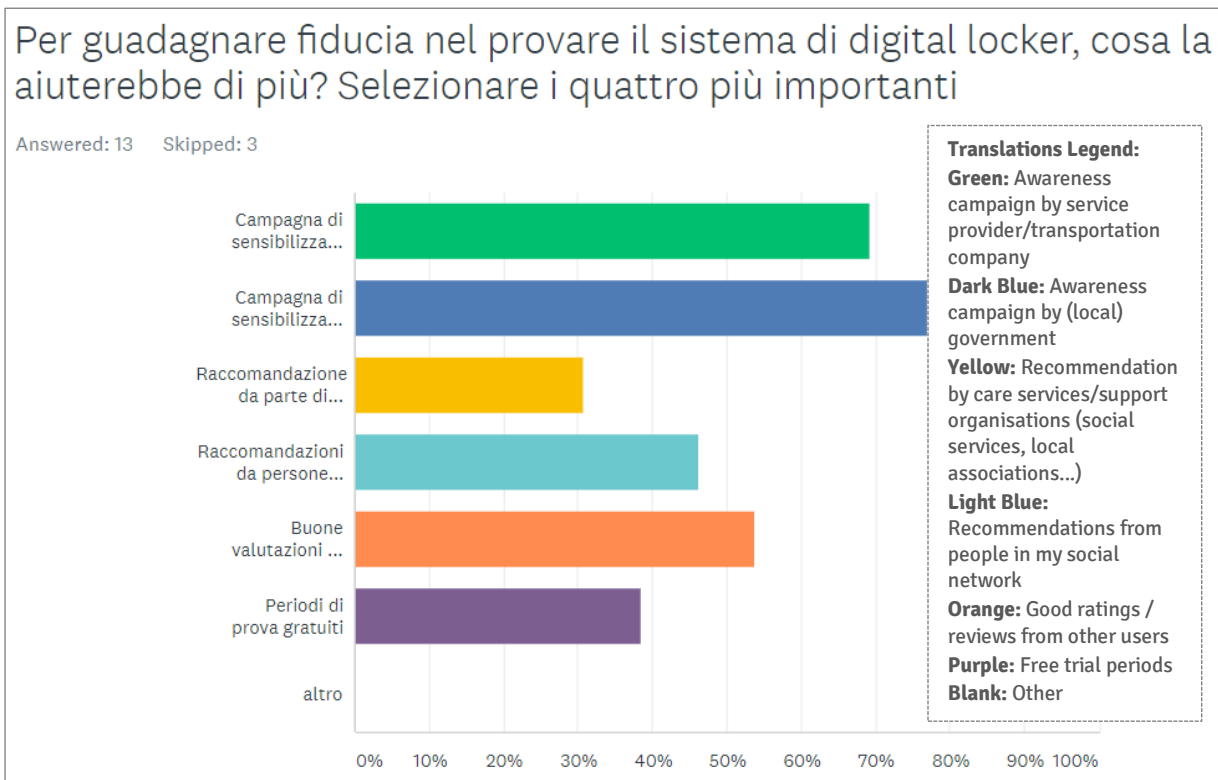
Figure 18 - Answers to the question: To gain confidence in trying the digital locker system, what would help you the most?

To better understand how to gain trust from potential users, we asked participants to review seven statements and choose their top four.

More than half reacted that the following would prompt them to try the digital lockers:

1. Government (local) awareness campaign
2. Awareness campaign by service provider/transportation company
3. Good ratings / reviews from other users

Additionally, almost half responded that recommendations from people in their social network would influence their decision to use the digital lockers. Interestingly enough, though 93% of participants indicated that they could not rely on professional support, they still stated that a government awareness campaign was the best way to gain their trust.

When looking at the overall results in the Emilia Romagna pilot, we be careful in the data analysis because this pilot contained digitally skilled individuals with a strong social network and access to transportation. We had 15 participants in total, all of whom owned a smartphone and most of whom owned a laptop and used apps. 40% of participants were between the ages of 61 and 65, the rest were younger than our target age group of elderly people. Additionally, although more than half of the participants indicated having a strong social network, almost all responded that they could not rely on professional support.

Concerning the modes of transport available to them, most participants were well connected with many means of transportation available. Almost all participants had access to a car as a driver, more than half had access to a bus or tram and about a quarter had access to a bike, train or metro. This can affect the responses received from participants, as they are capable of easily moving around to reach a digital locker for example.

Regardless, we can derive three key elements that will be crucial for the success of the digital locker services in Emilia Romagna:

1 **Trust & security**: A common theme found in our results is security and developing a sense of trust with users. Participants generally seemed skeptical about the security of this new system. They would like to be ensured that:
   a. the service informs them of how their information will be used in addition to any privacy risks;
   b. trustworthy organisations recommend the service;
   c. the service is rated favourably by other users;
   d. accounts for possible user errors and an easy restart of the process;
   e. the lockers are installed in a secure location.

2 **A personal experience**: Participants often referred to certain details that can make the full app experience more customisable and easy to use. Elements they found important for the app were that it:
   a. sends a notification when transactions are successful.

3 **Convenience**: Drawing on the fact that the app experience should be personal, the service itself should also be convenient. Survey participants often placed importance on factors that make using the service more convenient and easy to use, like the possibility to:
   a. send and pick up parcels at convenient times like weekends and evenings;
   b. easily register for the system;
   c. perform multiple operations (e.g. parcel collection and bill payment at the same time);
   d. request assistance 24/7.

Although we had a small sample size that was not exhaustive of our targeted group, we can however confirm the importance of security, customisation and convenience within a digital mobility service for parcel delivery in Emilia Romagna. Participants stressed that the service should be easy to use and the lockers should be available during weekends to send and pick up parcels. With so many transportation options available to these participants, we can surmise that traveling to the lockers is not an issue for them.

One area where participants were not as skilled in was connecting to the internet outside of their homes. We can hereby conclude that WiFi hotspots will be important for simple usage of the service. Instructions should also be readily available and it should be possible to request assistance 24/7. A clear easy to use app will be fundamental for success.

Furthermore, participants had mixed feelings about the security of the service. We therefore need to reassure potential users that this service will be secure and trustworthy in all areas. In this regard, though participants stated that they could not often rely on professional support, a campaign from local government was perceived as the best way to increase trust levels towards the service.

3.2. P2 Antwerp

The Antwerp pilot focuses on digital services related to inclusive smart traffic lights, with the goal of making mobility in cities more fluid and efficient for everyone. For this pilot, we aimed to evaluate the interest in and needs of people using digital mobility services, with a focus on vulnerable pedestrians. We also took into account the behaviour of pedestrians and groups of pedestrians to guarantee that they can cross the street with enough time.

As previously described, D1.2 served as the basis for identifying the target groups to include in each pilot's survey. However, because previous interviews and research in WP1 mainly focused on people with a visual impairment, we aimed to complement that research and fill in the gaps by focusing on Antwerp's second target group of elderly people.

For this survey we asked questions about:

- Socio-economic data of the responders
- Information about the access to different mobility modes
- The support participants get from their network
- Professional support participants get in their daily life
- What needs should the digital service satisfy in order for them to use it
- The requirements they identified as most important for the digital tool/service and the implementation of it in a physical environment
- What type of assistance they would like to receive when using a service like this
- What types of actions would make them gain trust to try a service like this

To find participants, we contacted the stakeholder organisations we interviewed in Task 1.2 'Analysis of the requirements towards the digital interconnected transport system', who work with the target audience of the survey:

- Vlaamse Ouderenraad (elderly)
- Vief (elderly)
- KVG (mobility impairment)
- VFG (mobility impairment)

Each of these organisations has a network of people providing care to the target audience or have members that belong to the target audience as they provide services to support them. To incentivise people to participate as the survey demanded an effort, three

participants could win a voucher for an online store if they completed the survey and registered for the lottery.

The survey consisted of 40 multiple-choice questions and was administered via SurveyMonkey. For some questions, participants could indicate three or more preferences. It is also important to note that it was possible for participants to skip questions without answering. The results presented in this section are therefore described as percentages based on the number of participants who answered each question.

This dataset consisted of 44 participants; of which 30% noted they have a disability. Additionally, 80% of participants were above 60 years old, 77% were retired and 40% were female. Most participants completed secondary school or higher, with 36% stating that their highest diploma was from a secondary school.

Digital skills were quite high, as 90% of participants noted they owned a smartphone and 81% owned a laptop. 75% of participants also had access to online banking and more than half indicated that they use apps. From this we can conclude that our dataset includes digitally skilled people.

Regarding mobility and the modes of transport available to them, 79% of participants identified the car (as driver), 61% identified the (electric) bike and 54% identified the bus/tram. This means that most participants were quite mobile and had many options to travel. Additionally, 75% of participants indicated that they often travel alone in Antwerp and 30% indicated that they would like more time for crossing the street.

The social network and support of participants is quite limited - 39% had severely limited support, while 13% had rather limited support. Furthermore, 77% of participants also indicated that they lacked professional support.
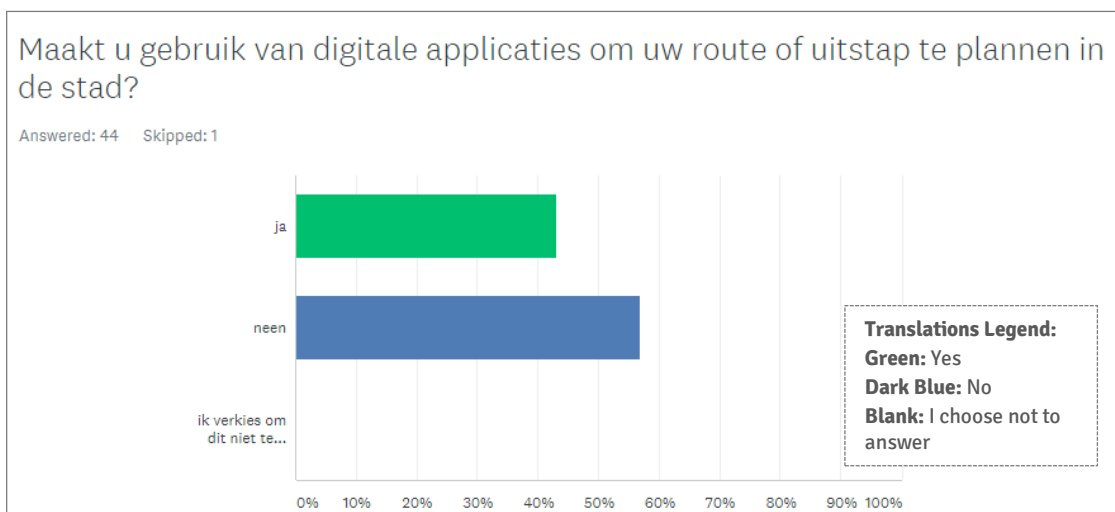
Figure 19 - Answers to the question: Do you use digital applications to plan your route or getaway in the city?

Before delving into questions around the needs and requirements of the participants regarding a digital mobility service, we first needed to understand how they currently move around. We therefore asked if they use a digital application for route planning. Interestingly enough, 56% of participants answered that they do not use digital applications to do so. Likewise, 64% indicated that they use non-digital tools for route planning, perhaps due to the elderly ages of participants.

When asked more specifically which digital applications they used for route planning:

- 100% (of the 17 people who responded) indicated Google maps.
- 52% indicated the De Lijn app for buses.
- 23% indicated the NMBS app for trains.
- 5 % indicated a route planner GPS.

Likewise, for moving around in cities:

- 88% (of the 17 people who responded) indicated Google maps.
- 52% indicated the De Lijn app.
- 17% indicated the NMBS app.
- 5% indicated using a GPS.

As we can see from the above answers, Google Maps was the preferred digital solution for route planning and mobility.

Figure 20 – Answers to the question: If you use one or more digital services to walk around the city, what goals do you wish to accomplish? Please select a maximum of three goals from the list below.

Now that we collected data regarding the types of applications used by the participants, we needed to know the purpose and goals for using such applications. Here we see that the most common responses included:

1. To get a connection to public transport;
2. To go shopping;
3. To go out in the evening (events, restaurants, entertainment etc.);
4. To visit friends, family or acquaintances.

Aan welke noden beantwoordt de digitale applicatie die u gebruikt bij uw verplaatsing in de stad? Gelieve de drie meest belangrijke noden aan te duiden in de lijst. Indien er andere noden zijn die niet opgelijst zijn, kan u deze aanvullen bij 'andere'

Answered: 17   Skipped: 28

Translations Legend:
Green: To learn the fastest walking route
Blue: To know the safest walking route
Yellow: To locate a particular location and know the way to it
Light Blue: To know where someone can pick me up
Blank: To obtain information around accessibility
Purple: To find out real-time information about my route
Pink: To inform me, before I leave, that certain infrastructure is not as it should be or is not working
Gold: To make sure I am sitting correctly and reduce my stress
Blank: I prefer not to answer this
Blank: Other (please specify)

Figure 21 – Answers to the question: Which needs does the digital application you use when moving around the city meet?

When asked about the needs that these digital applications fulfil, it is clear that most participants using a digital app favoured using them to detect a particular location and know the way to it. Other responses included:

- To make sure I am sitting correctly and reduce my stress;
- To learn the fastest walking route;
- To know the safest walking route.

Figure 22 - Answers to the question: What are the most important technical requirements for you that a digital application should meet in order to support you in your movements in the city?

Diving deeper into the needs around digital applications for mobility, we asked digital app users to indicate the three most important requirements. From the results, we can see three key needs:

1   The digital application must be able to be used without a subscription or log-in.
2   The digital application must be able to be used without a digital connection.
3   The digital application should not take up much memory storage on my smartphone.

We can understand from these responses that participants look for an easy-to-use application that does not require a subscription or log-in.
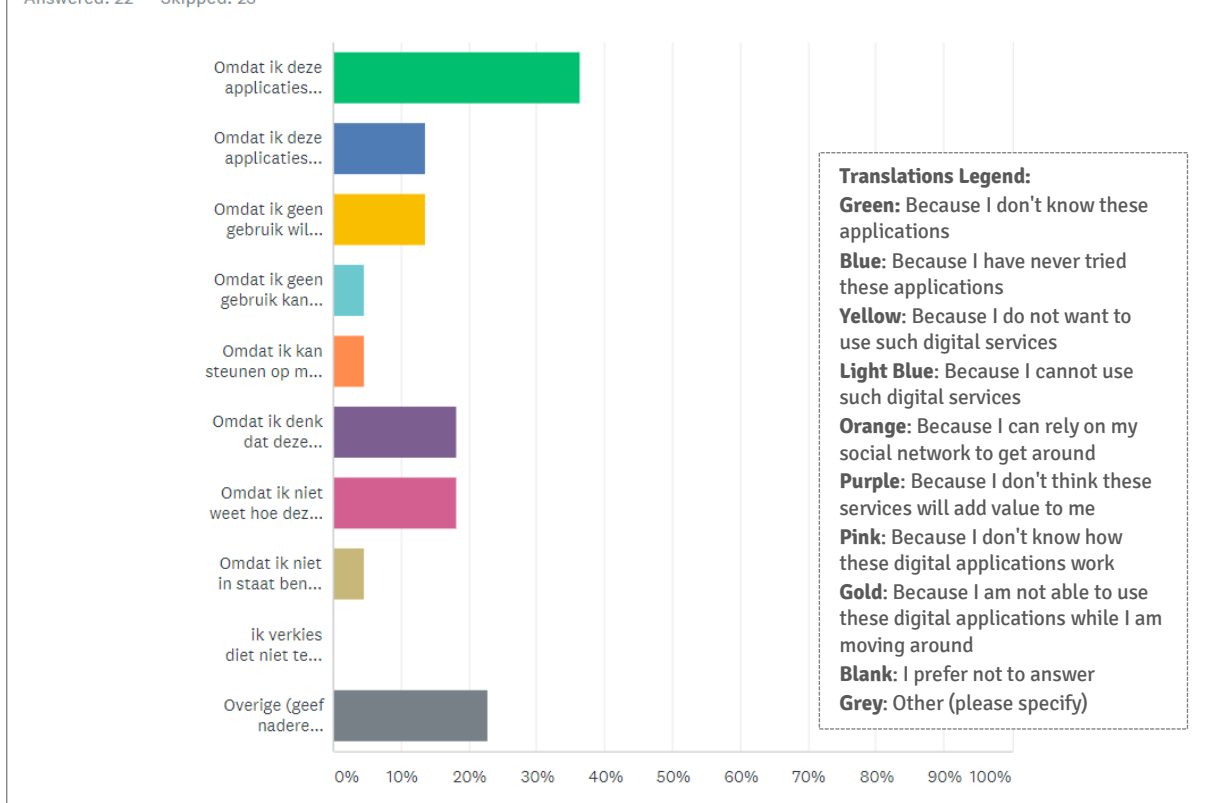
Figure 23 - Answers to the question: If you are not currently using digital applications to plan your journeys around the city or for support during travel, can you tell us why this is the case?

As seen earlier, more than half of the participants responded that they did not use digital applications for route planning or trips. With such a high number, it is critical to understand why this is the case. We therefore asked what was stopping these non-users. Most common reasons included:

- Because I don't know these applications;
- "Other";
- Because I don't think these services will add value to me;
- Because I don't know how these digital applications work.

One of the possible explanations might be that, when people consult the Google Maps website and the websites of public transport companies, it is not perceived as using a digital application. Of the five participants who responded "other", the most common reason was that they knew the city well enough to move around without further assistance,

thus inferring that there was no benefit of using such a service. The reason "I don't know how these digital applications work" might be partially explained by the fact that most participants cannot count on a strong social network nor do they get professional support, so they have no one that can alert them to the existence of such apps or show them how to use them. However, all of the above are merely assumptions. More research is needed to know the exact reasons for not using digital applications. If non-users would use such a service, it would be to know the safest route or to look up 'new' locations

Figure 24 - Answers to the question: Imagine there was a digital application that could help you to better plan your movements and support you when you are moving (e.g. by giving real-time information or additional information that you need in your situation). What would be the most important needs that this application should meet?

When asked to indicate the three most important needs a digital application for planning and supporting mobility should satisfy, we can see three trends from the graph above:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **53/122**

1   To detect a particular location and know the way to it;
2   To get real-time information about my route (e.g. if there are roadworks on my route);
3   To know the safest walking route.

Keeping in mind that many non-users felt they knew Antwerp well enough already, they indicated that a digital app could help them plan a route to a new location. Nevertheless, it is important to note that two other options were considered by more than 30% of these non-users:

- To know the quickest walking route;
- To inform me, before I leave, that certain infrastructure is not as it should be or is not working properly.

Figure 25 - Answers to the question: Which type of support would you prefer when using digital systems for the first time in the future?

Using technology can sometimes be confusing or complicated, especially when using it for the first time. Therefore, we asked what type of assistance non-user participants would like

when using digital services. This may include such things as help with usage issues but also assistance to understand the app at first use.

Our responders ranked the following four as their preferred assistance methods for using an app like this for the first time:

1   A chat box in the app itself
2   An online tutorial or YouTube video to help navigate through the app
3   A manual / video explanation in the app with clear instructions on how to use it
4   Someone from my personal network to explain everything to me

In contrast, rated least useful were the options for audio support (5%) and feedback (0%).
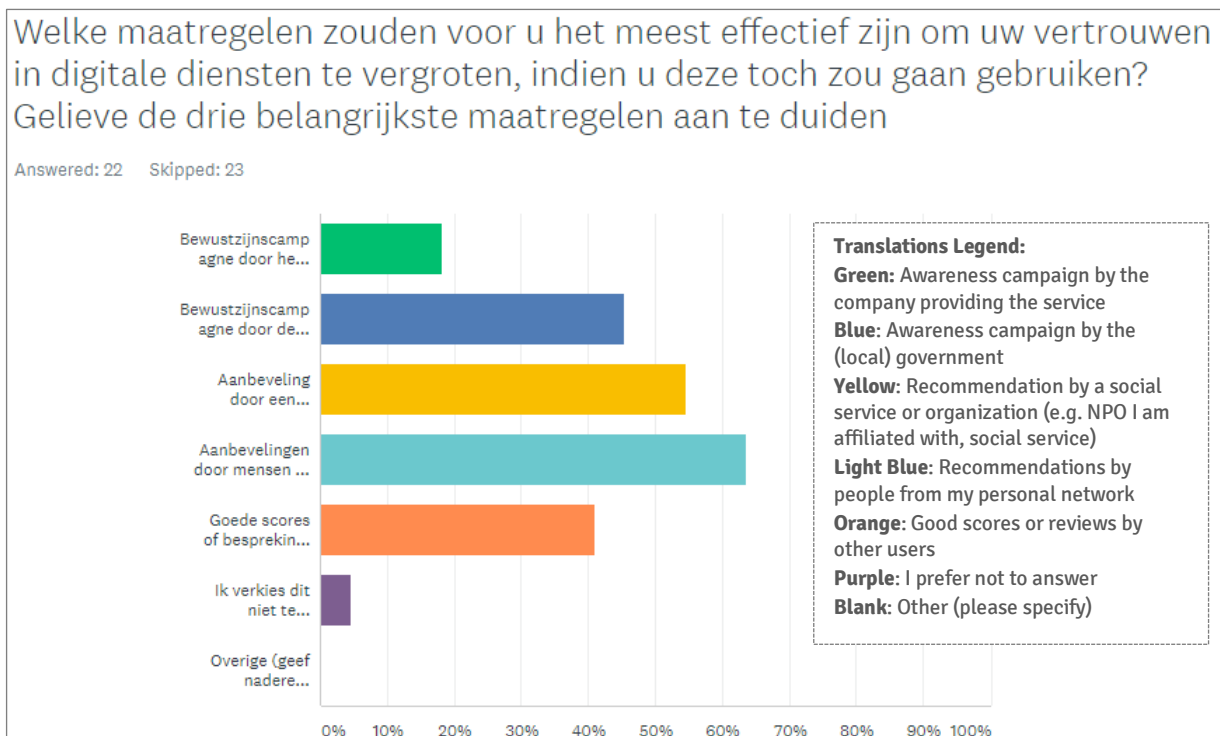
Figure 26 - Answers to the question: What measures would be most effective for you in increasing your trust in digital services, if you did start using them?

Equally as important is how trust factors into app usage. We asked non-user participants to indicate which measures can gain their trust and confidence and possibly persuade them to use a digital app. Though many participants indicated having limited social and professional support, more than half still noted that recommendations from people in their personal network were highly influential. This is in addition to recommendations by social services or organisations. Other relevant answers included awareness campaigns by the (local) government and good scores or reviews by other users.

Wat vindt u in het algemeen van het gebruiksgemak van de digitale applicatie(s) die u gebruikt om uw mobiliteit in de stad te plannen en te ondersteunen? (Gelieve in de tabel bij elke stelling aan te duiden of u het er 'helemaal niet mee eens', 'eeder niet mee eens', 'noch mee oneens, noch mee eens', 'eerder mee eens of helemaal mee eens' bent. Indien u niet wenst te antwoorden, selecteer dan 'ik verkies om dit niet te beantwoorden).

Answered: 17   Skipped: 28
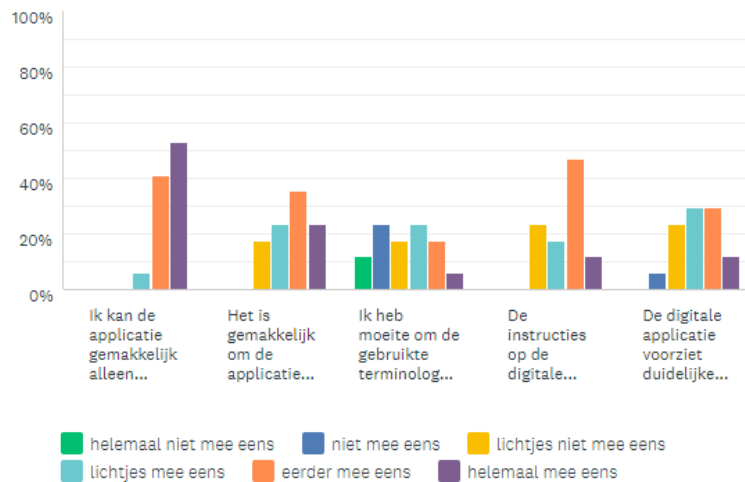
Translations Legend:
1. I can easily use the application alone
2. It is easy to tailor the application to my personal needs
3. I have difficulty understanding the terminology used in the application
4. The instructions in the digital application are clear
5. The digital application provides clear information to support my use (e.g. instructions)

Legend: helemaal niet mee eens / niet mee eens / lichtjes niet mee eens / lichtjes mee eens / eerder mee eens / helemaal mee eens

Figure 27 - Answers to the question: Overall, how do you feel about the ease of use of the digital application(s) you use to plan and support your mobility in the city?

For the next question, we asked digital app users to measure their level of satisfaction regarding the usability of digital applications they are using. They were asked to rate the following statements:

- I can easily use the application alone.
- It is easy to tailor the application to my personal needs.
- I have difficulty understanding the terminology used in the application.
- The instructions in the digital application are clear.
- The digital application provides clear information to support my use (e.g. instructions).

As far as using the application alone, the majority of responders agreed that they could easily do so. Regarding tailoring the application to their personal needs, the answers were more mixed. However, most responders tended to agree that they could personalise the apps to their needs. When it comes to terminology used in the apps, the results were divided. About half of the participants agreed that they understand the language of the apps, while the other half did not. While most participants felt the instructions of the apps

were clear, a small percentage still disagreed. And lastly, the overall clarity of information received a total of 70% of participants agreeing that the apps were clear. However, important to note here is that most people only somewhat agreed, and another 30% did not agree. From these results, it is clear that mobility apps can be improved in terms of user friendliness.
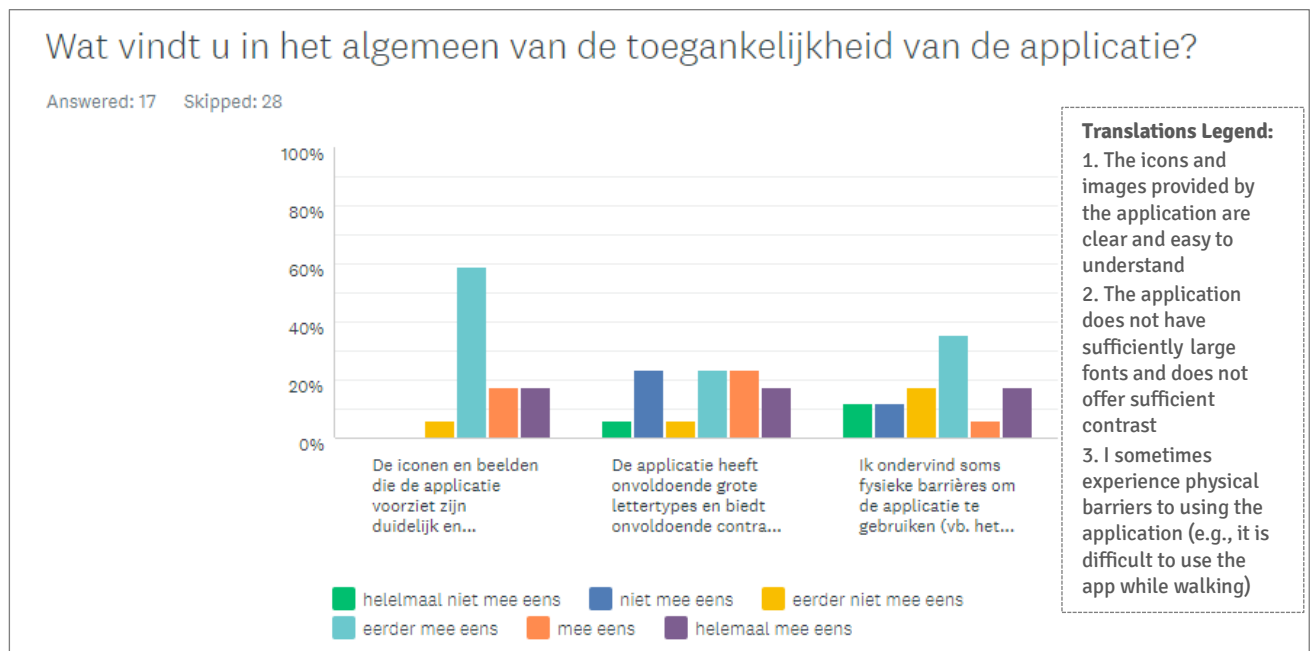
Figure 28 - Answers to the question: Overall, how do you feel about the accessibility of the application?

As a follow-up question, we asked app users to agree or disagree with three additional statements regarding app usability. We received the following results:

- "The icons and images provided by the application are clear and easy to understand"- more than half somewhat agreed.
- "The application does not have sufficiently large fonts and does not offer sufficient contrast"- results were mixed, with most participants (71%) agreeing to some extent.
- "I sometimes experience physical barriers to using the application (e.g., it is difficult to use the app while walking)"- 41% of participants disagreed, while 58% agreed.

Again, the results here point to some usability areas that are lacking in the current apps.
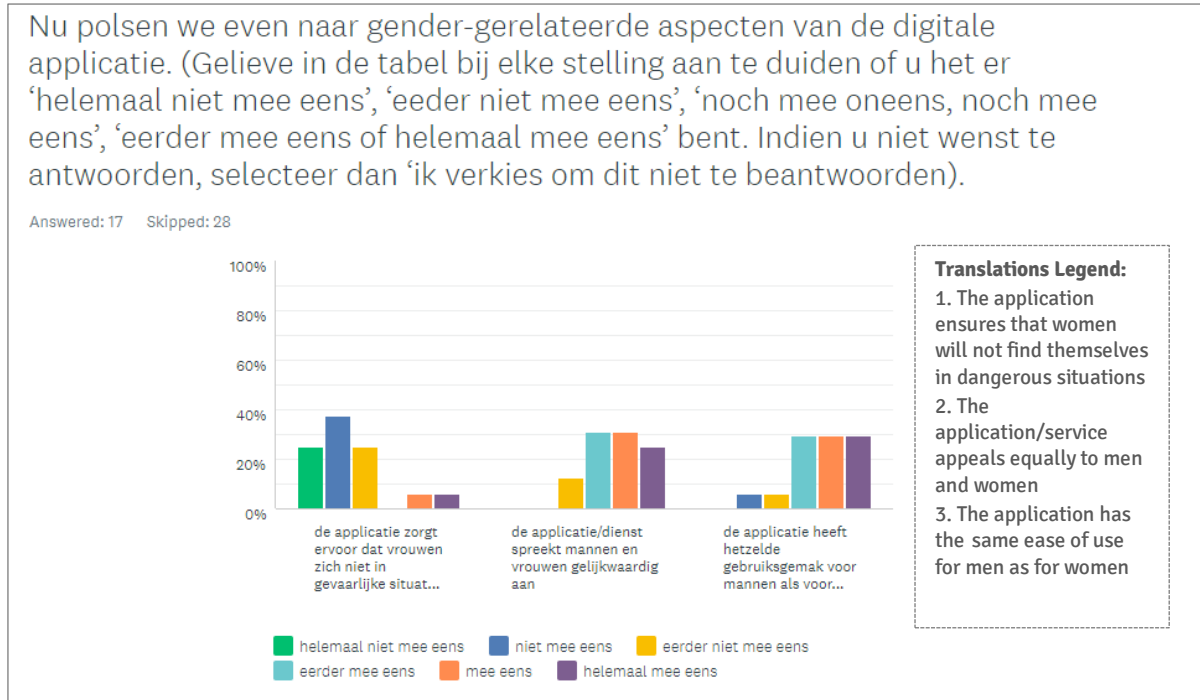
Figure 29 - Answers to questions about gender-related aspects of the digital application.

To better understand if gender plays a role in app usage, we asked users to rate three statements:

- The application ensures that women will not find themselves in dangerous situations.
- The application/service appeals equally to men and women.
- The application has the same ease of use for men as for women.

For the most part, users agreed that the application is equipped for use by both men and women in terms of user friendliness and target audience. However, a majority of participants noted that the application does not ensure that women can avoid dangerous situations.
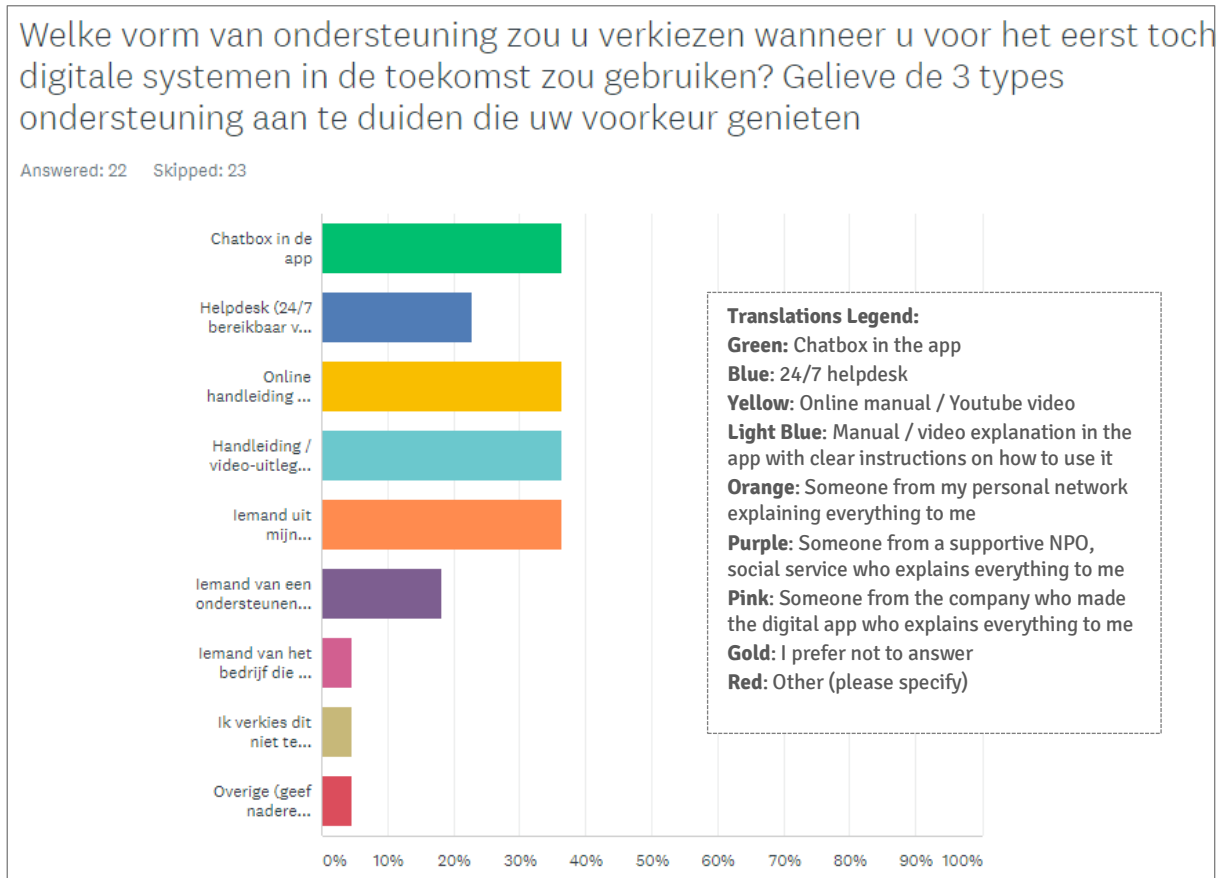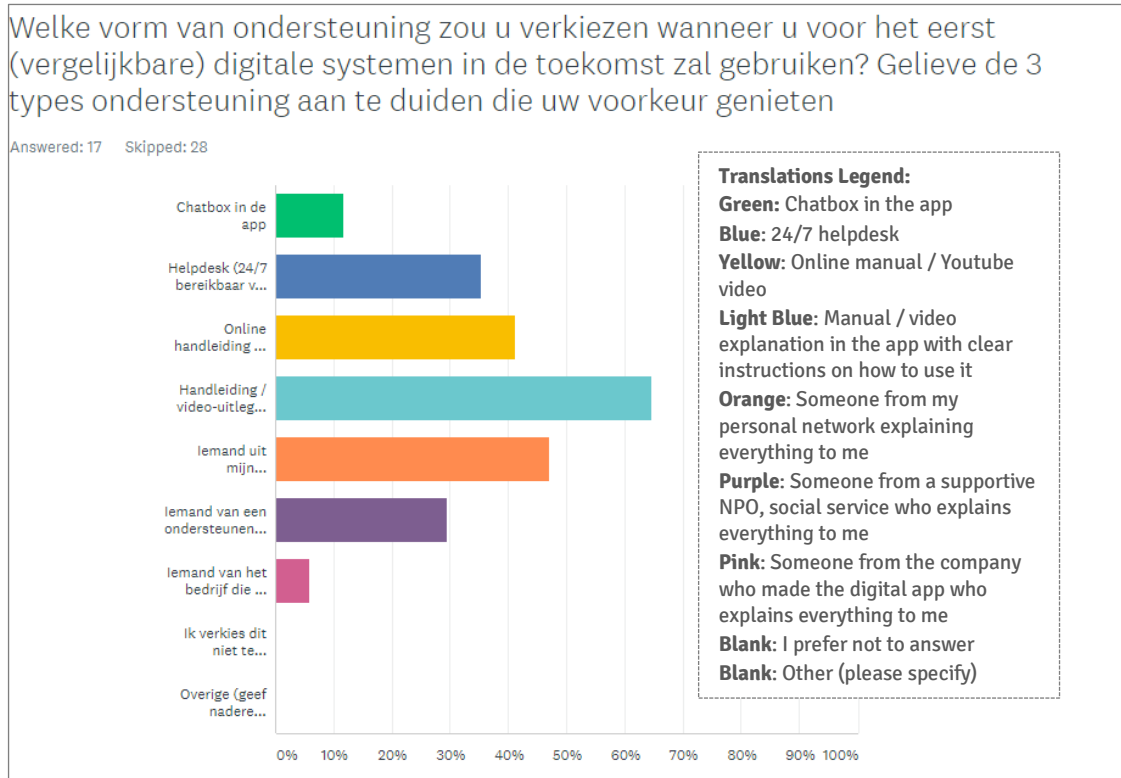
Figure 30 - Answers to the question: Which type of support would you prefer when using (similar) digital systems for the first time in the future?

We now asked users about the type of support they prefer when using similar digital systems for the first time. Here, the answers slightly differentiate from what we saw from non-users. A manual / video explanation in the app with clear instructions was by far the most voted for option, followed by an explanation from a social contact and a 24/7 helpdesk.
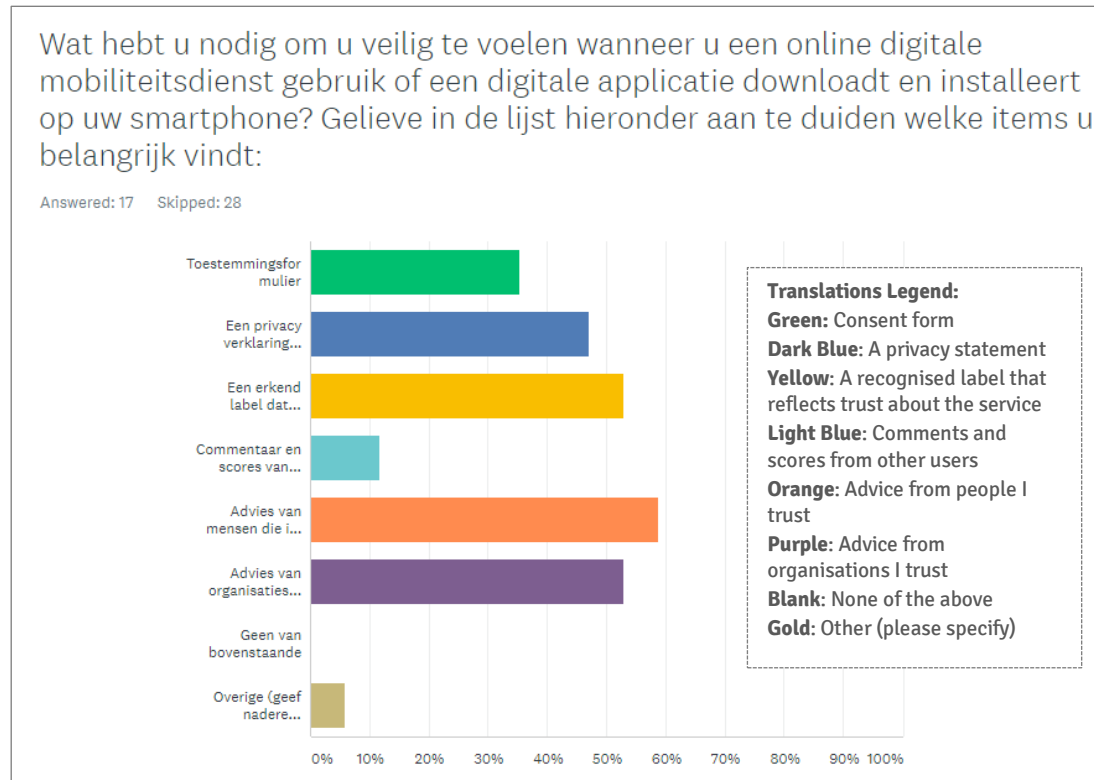
Figure 31 - Answers to the question: Which type of support would you prefer when using (similar) digital systems for the first time in the future?

Coming back to this idea of trust, we asked users about other ways they will trust an application. More than half stated that the following affected their confidence in using an app:

1   Advice from people I trust
2   Advice from organisations I trust
3   A recognised label reflecting trust about the service

Two other significant factors were privacy statements and consent forms. Similar to non-users, users relied heavily on advice from their social networks and trusted organisations.
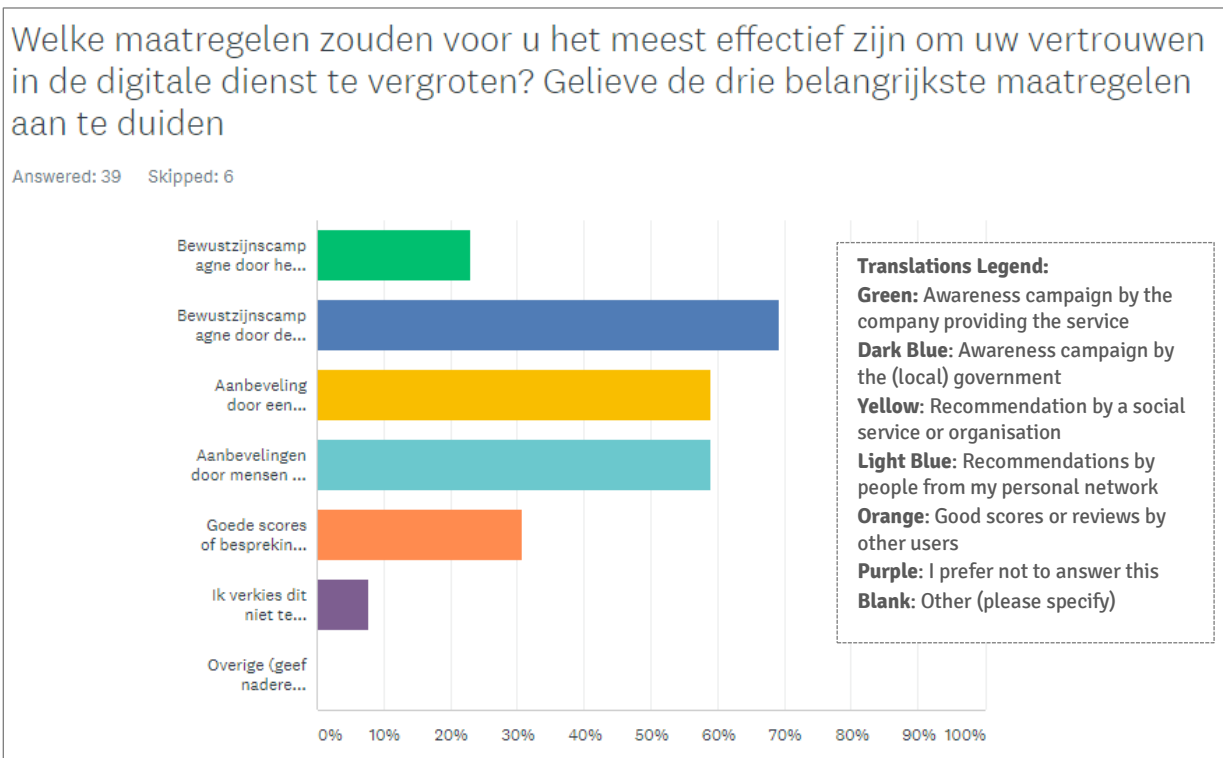
Figure 32 - Answers to the question: Which measures would be most effective for you in increasing your confidence in the digital service?

Lastly, we asked responders to indicate the measures which increase their trust in a digital service. As seen in the above graph, the following three elements were rated highly:

1. Awareness campaign by the (local) government
2. Recommendation by a social service or organisation (e.g. non-profit organisation of which I am a member, social service)
3. Recommendations from people in my personal network

When further analysing the results data from the Antwerp-pilot we need to keep in mind that though 44 people participated in the survey, 80% were above 60 years old and had high digital skills, perhaps due to the online nature of the survey itself. Additionally, most participants have different mobility modes at their disposal; having access to a car as a driver, (electric) bike and the bus/tram and 72% were not confronted with a mobility impairment or restriction. Still, 30% indicated that they had a disability, or that they faced reduced mobility. Nevertheless, we did have a nice split between users and non-users of mobility apps, which allowed us to look into what can be improved for digital mobility app users, and similarly, what can influence non-users to use digital mobility apps.

With that in mind, if we look at the results carefully we can however conclude two overarching aspects fundamental to the success of a digital mobility app in Antwerp:

1   **Trust**: A common theme in the results for both users and non-users is trust. This sense of trust draws on the following factors:

    a. That trustworthy organisations or people from the participants' social network use and/or represent the service, with recommendations from their own social network perceived as best to increase trust levels;

    b. That the service is rated favourably by other users;

    c. That the app has a specific label to guarantee trust.

2   **Usability**: Many participants noted that they had physical barriers when using applications, and that the fonts used are not entirely sufficient. They also stressed the importance of the app not requiring a log-in, that an internet connection should not be necessary and that they would like real-time updates in the app, although real-time updates require an internet connection. Other important factors regarding usability relate to how the app provides support to new users:

    a. An online tutorial or YouTube video to help navigate through the app;

    b. A manual / video explanation in the app with clear instructions on how to use it.

We can confirm that survey participants for the Antwerp pilot would be more inclined to use a digital mobility service that fits their two main criteria for success: trust and usability. 30% of survey participants responded that they would like to have more time to cross the street, thus confirming the potential need that traffic lights should be more inclusive, even for our participants regularly using other means of transportation.

Additionally, a majority of the Antwerp participants were not already using a digital mobility app, either because they were quite familiar with the city already or because they did not know of these applications. What's more, if non-users would use such a service, it would be to know the safest route or to look up 'new' locations.

Furthermore, though a majority of participants indicated having a limited social network and support, recommendations from their social network were still perceived as best to increase trust levels towards the service. It is also crucial to involve government and other organisations in awareness campaigns.

3.3. P3 Galilee

The Galilee pilot focuses on digital services related to informal ride sharing in ethnic towns in Israel. These services rely on digital channels, such as smartphone apps, which will provide new opportunities for interactions among residents in small towns and villages.

For this pilot, we intended to understand the needs and attitudes of Arab women towards the digitalisation of mobility services, and more specifically, in a dedicated smartphone app for arranging carpooling services. We targeted not-connected persons lacking digital skills. We therefore created a survey of 30 questions about:

- Socio-economic data of the participants

- Information about the access to different mobility modes
- The support participants get from their network
- Professional support participants get in their daily life
- The needs that the digital service satisfies
- The most important need and requirements for the digital and physical services
- The types of actions that would gain trust to use a service like this

Participants volunteered to take part in the survey and did not receive any incentive for doing so. Given the cultural inclination and limited penetration of digital communication methods in the traditional Arab community, we chose to conduct face-to-face interviews using Kayan, a feminist organisation focused on empowering women. Kayan directly reached out to participants via phone calls.

The survey itself consisted of 30 multiple-choice questions. For some questions, participants could rank their preferences from "Importance 1" to "Importance 4" and in some cases, to "Importance 9". These results were then weighted and modulated to provide the most realistic interpretation of the collective answers. While interpreting the results, we therefore attributed the value of "6" to "Importance 1", "5" to "Importance 2", "4" to "Importance 3" and "3" to "Importance 4" and so on. That provided a better overview of which factors were most important, taking into account not only the options that scored highest in each "Importance" but actually considering the overall rating of each participant for each option.

This set of interviews consisted of five participants. Each participant represented a different age group, ranging from 18 to 65 years old, and most had no impairments. All five participants were highly educated females who had obtained a university degree or higher, most of which work 35+ hours in a week.

Participants were digitally skilled with a wide variety of devices available to them. All five owned a smartphone and most owned either a desktop PC, laptop or tablet. Most also had access to apps, online banking, and landline phones and a few had access to vending machines.

Regarding the modes of transport available, all participants identified having access to a car (as driver) and the bus/tram. Four out of the five participants also had access to the train/metro. Survey members already had a wide array of mobility options available to them.

Additionally, most participants indicated having a strong social network, though two out of the five participants reported that they could not count on professional support in their daily lives.

Because the goal of this pilot is to empower non-connected Arab women in the rural villages of Israel, it was important to gauge the potential of digital services offering carpooling options. But in order to do this, we first needed to better understand the needs,

goals and requirements survey participants have in the services they currently use. We therefore began by asking which digital services they used out of the following:

1   SAFARCON
2   Waze
3   Moovit
4   Google Maps
5   Uber
6   GetTaxi
7   Other

Out of the above options, all participants indicated using SAFARCON, a ride-sharing app, and Waze, a navigation app. Google Maps was also specified by a majority, while Moovit and GetTaxi were indicated by a minority. Uber was not indicated at all. The fact that all women use at least two mobility apps also indicates that they have reasonably high digital skills.

When asked about their goals or reasons for ordering a ride, a majority (three out of five) of the participants pinpointed the following four goals as key:

1   Going to work
2   Going to the doctor, pharmacy or another health-related service
3   Going to buy groceries (food, drinks etc.)
4   To connect to public transport

Visiting family, relatives or friends and going to university or secondary school were in the minority, only receiving two votes from participants. Shopping, going to evening activities and bringing children to school each received one vote. We can therefore derive from these answers that most participants would not use a carpooling service when going to leisure activities, but more for necessities like going to work.

In addition to the goals and reasoning behind ordering a ride, we asked participants to identify their needs currently satisfied by the services they are using. We therefore asked them to review the following six needs and indicate which are being met:

• Need 1: safe transport option in the evening
• Need 2: offer on-demand planned trips
• Need 3: carry heavy luggage or groceries
• Need 4: flexible and faster service than public transport
• Need 5: cheaper service than by taxi
• Need 6: carry children/baby

For this question, all participants indicated that the service must be cheaper than a taxi. A majority also indicated need 2, offer on-demand planned trips, while the remaining needs

were only specified by a minority of participants. From this, we can assume that price will also be a crucial factor when using a carpooling service.

Moreover, while the actual needs for using such a digital service are useful, the opposite end of the spectrum is just as critical. We therefore intended to gather feedback about what was lacking in the current service offerings. We identified additional 10 needs and asked which of these current services do not fulfil:

- Need 1: offer a reliable service 24/7
- Need 2: offer safe and secure child friendly and child-focused service
- Need 3: ability to carry heavy luggage or groceries
- Need 4: to take along a maxicosi / stroller
- Need 5: to make chained trips (connect various daily activities)
- Need 6: to take along children/baby
- Need 7: to go from location A to B without too much effort
- Need 9: offer a flexible and affordable service
- Need 10: to reach the destinations I want to reach (work, school etc.)

Need 1 was ranked very high, meaning that digital service users prefer a service that is reliable and accessible the whole day (and night) and that this is currently not the case. The majority of the participants also indicated that they would like to use the service to get from A to B without too much trouble. This may indicate that this is not always the case now, probably because the service is not always available where they live, or at their destination, or that the service is not always easy to use.

Regarding requirements for a digital tool or service, we asked participants to rank what was most important to them out of the following eight elements:

1. The digital solution should be customizable to my personal needs (e.g. adjusting the font).
2. The digital solution must have an easy one-time registration system.
3. The digital solution must offer audio-assistance in Arabic.
4. The digital solution must make it possible to book chained trips (= to combine multiple destinations in one trip).
5. The digital solution must enable giving feedback and viewing reviews.
6. It should be possible to select a male or female driver.
7. The digital solution should have a subscription that is easy to change, start or stop.
8. It should be possible to select a point of interest and location indicators in order to select places for pick-up and drop-off.

Requirements for a digital tool/service
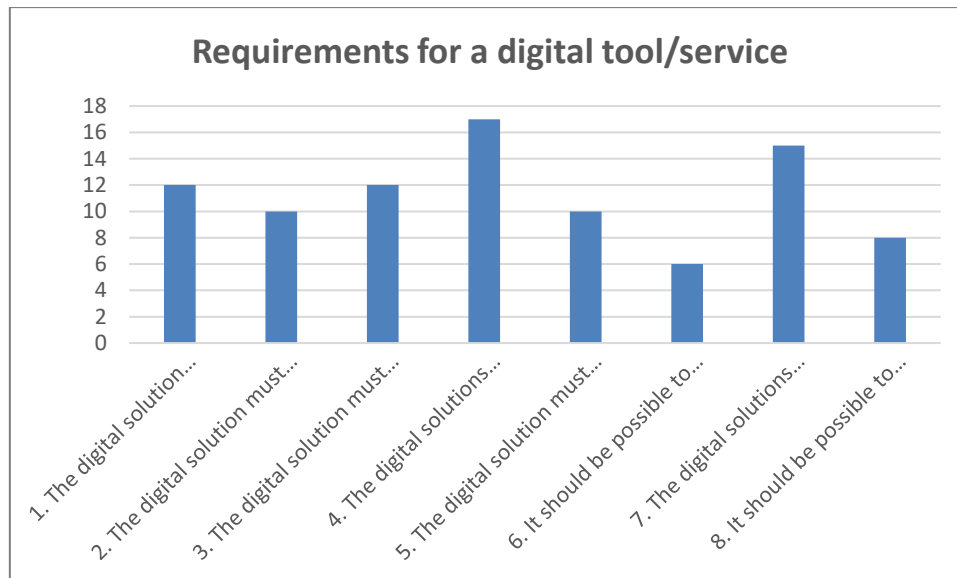
Figure 33 - Answers to the question: Requirements for a digital tool/service (rank from very important to least important)

Looking at the graph, we see that the results are quite varied. While participants rated option 4, the possibility of chained trips, the highest, there are no landslide winners, especially when considering the survey's sample size and the fact that all women had access to cars and public transportation. Other notable requirements include the ability to easily start and stop a subscription (#7), customisation options (#1) and the availability of audio assistance in Arabic (#3). Related to the findings in WP1, particularly the audio assistance in Arabic should receive attention.

The Galilee pilot also has also a strong physical component. To this end, we needed input on significant requirements regarding the physical service and more specifically, the driver. We therefore asked participants to rank the following physical requirements:

1 The service must be easily recognisable in public spaces.
2 The service must be run by a trustworthy and reputable organisation.
3 The service must arrive punctually at the pick-up and drop-off location.
4 The system must have affordable prices and the possibility to pay with cash.
5 The pick-up points should be accessible and close to my home.
6 The pick-up points should be fit to assure a safe onboarding.
7 It should be possible to request assistance.
8 Car requires enough room to drive mothers with children and their belongings comfortably.
9 It must be possible to ask for assistance via app, email and phone.
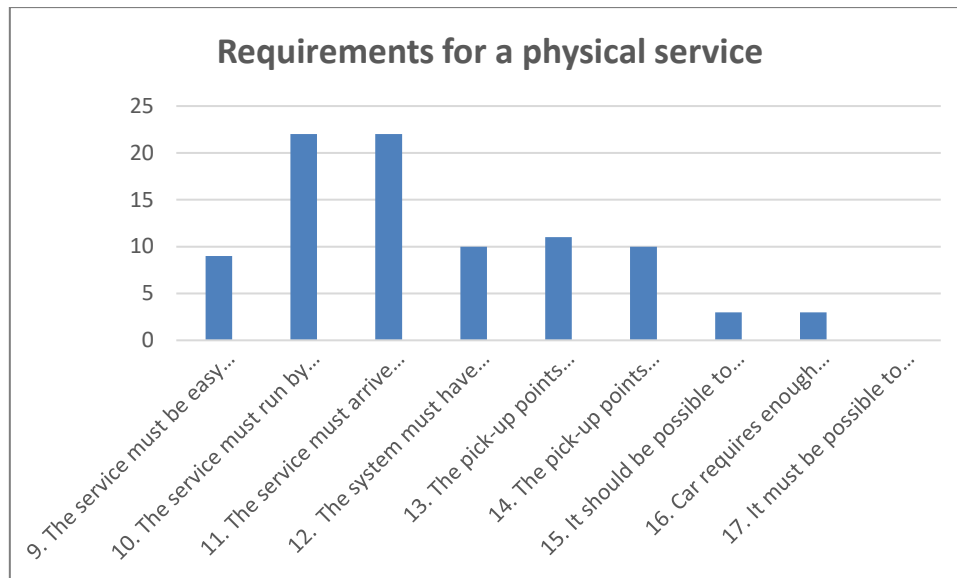
Figure 34 - Answers to the question: Requirements for a physical service (rank from very important to least important)

It is clear from the graph above that trust and punctuality are valued factors here, as participants specified that the service must be both reputable and must arrive on time (requirements 10 and 11). This might also be influenced by the participants' culture: in some cultures more than others, arriving precisely on time is very important (as it is in Israel). Requirements 10 and 11 received the same ranking. When we look at the 'least' ranked requirements, we see that taking children on board is not high on the wish list of the participants.

Regarding the driver, we asked participants to rate the following:

1   The driver should receive training to support mothers with on/off-boarding and during the ride.
2   The driver is punctual and recognisable (specific uniform, sign, car branded).
3   It should be possible to rank/review the driver and to see other people's reviews.
4   It must be possible to choose a male/female driver.
5   The driver should be ready for small adaptations of the ride along the way.
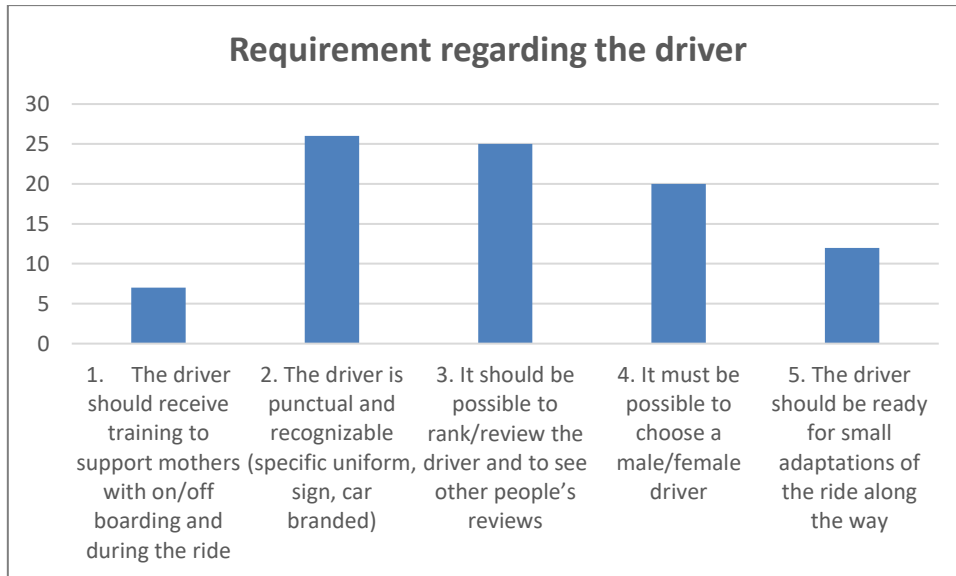
Figure 35 - Answers to the question: Requirements regarding the driver (rank from very important to not important)

Again, based on the results, we see high values for punctuality and trustworthiness (requirements 2 and 3). Most participants stated that the possibility to rank and review drivers is necessary, thus circling back to this notion of trust and to the importance of having the possibility to rate and provide feedback to peers. Likewise, many participants would like the option to choose if their driver is male or female. This complements the findings of WP1, where it was found that it is not common for young women to be seen in the village in a vehicle with a stranger.

When asked to indicate their preferred type of assistance when first using a ride sharing service, most respondents indicated a 24/7 helpdesk, an introductory video and a chat box in the app. A note here: though not all participants properly ranked their preferences in terms of importance (e.g. by assigning 'importance 1', 'importance 2', etc.), it was clear which methods received the most votes.

Lastly, we wanted to understand how services like the one in Galilee can gain users' trust, asking our participants how best to gain their confidence. Key factors for the participants were:

- Recommendations from people from my social network
- Good ratings/reviews by other users
- Awareness campaign by the service provider
- Recommendation by help services / supporting organisations (e.g. medical staff, NGOs representing women etc.)

All five participants said that recommendations from their social network are main triggers for using and trusting a service. Perhaps this is because most women indicated having

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **68/122**

strong ties to their family, friends and neighbours and thus value their opinions. Ratings from other service users were also meaningful with 4/5 of participants indicating this.

When looking to the results overall, a major challenge in finding participants for the Galilee pilot was the limited use and exposure to the informal shared-ride app due to COVID-19. The resulting small sample size of the Galilee pilot, we must be careful when making assumptions and extrapolating conclusions. All participants were highly educated women with access to a smartphone and are tech-savvy, with access to digital services. They also have plenty of mobility options available to them, as all participants had access to a car. In general, participants also had strong social networks.

However, based on our survey results, we can conclude two main points regarding the successful use of a digital mobility app for ride sharing:

1. **Trust**: Participants prefer a trustworthy and reputable system. This sense of trust reflects not only on the general idea that the app comes from a trustworthy and reputable organisation but also on the following elements:
   a. the service is used by their social network and contacts;
   b. the service is rated favourably by other users;
   c. users can rate and review their drivers.
2. **Ease of use**: Survey participants indicated that subscriptions should be easily adjustable and flexible according to their personal needs. Participants also stressed the importance of:
   a. pick-up points close to their homes,
   b. ability to book chained trips,
   c. driver punctuality,
   d. assistance in Arabic,
   e. 24/7 service.

Despite the limitations of our research due to the small sample size and the similar demographic of the participants in Galilee, we can however confirm that women from the Arab community would be more inclined to use a ride-sharing service that fits their two main success ideas: trust and ease of use. Participants valued certain factors especially, like punctuality. Another key element stemming from our survey includes affordability. These services should be cheaper than taxis, according to survey participants.

As a digital tool however, it is rather difficult to make an overarching conclusion on absolute must-have requirements for a ride-sharing app, as the results are quite scattered and our data sample included women with similar socio-economic backgrounds. Likewise, though many survey questions discussed child-friendly services, it is unknown how many participants were mothers. This could be useful for further research. These women had strong social networks and were using digital services already. Furthermore, we did not reach our main target group of non-connected women, as most responders were digitally skilled and had access to multiple modes of transportation. All survey participants already indicated using a ride-sharing app, in addition to Waze for navigation.

However, it is clear that friends and family are critical in influencing digital service use, especially considering that these women can rely on friends and family in their daily lives. We can therefore hypothesise that app users with a strong social network will be more inclined to use and trust a ride-sharing app if their social contacts are also using it.

3.4. P4 Madrid

The pilot in Madrid is focused on digital services related to at-home food delivery. These services rely on an app installed on a mobile phone, tablet or computer and provide prepared food from a variety of local restaurants or products from local stores delivered at your home by bicycle at pre-set times that suit the user, delivered at their doorstep, guaranteeing the cold chain.

For the non-users of the mobile application created in Madrid, we intended to understand what was withholding them from using the service and what could motivate them to use such services. We also aimed to target not-connected persons. We asked them questions about:

- Socio-economic data of the responders
- Information about the access to different mobility modes
- The support participants get from their network
- Professional support participants get in their daily life
- What needs should the digital service satisfy in order for them to use it
- The requirements they identified as most important for the digital tool/service, the physical service and of the service agent/delivery driver/rider
- What type of assistance they would like to receive when using a similar tool
- What types of actions would make them gain trust to try a service like this

To gather participants, we distributed our questionnaire among participants of the Madrid CoP. We sent the survey link during the session and encouraged each participant to answer the questionnaire immediately after the CoP session ended. Later on, we sent a reminder to each of them by email. Participants did not receive any incentives for taking the survey.

The survey responders were given multiple choices for each of the questions and asked to rank their preferences from "Importance 1" to "Importance 4".

These results were then weighted and modulated to provide the most realistic interpretation of the collective answers. While interpreting the results, we attributed the value of "6" to "Importance 1", "5" to Importance 2", "4" to Importance 3" and "3" to "Importance 4". That allowed us to have a good overview of which were the most important factors for each question, taking into account not only the options that scored highest in each "Importance" but actually considering the overall rating of each participant for each option.

For this set of interviews, CambiaMO reached out to 10 participants. This is a fairly small sample, as they had already done huge efforts to gather participants for the baseline survey and the WP1 tasks. The cambiaMO Task 3.3 'Phase 1: user requirements assessment in the INDIMO pilots' survey was run during a specific organised CoP meeting because most of the relevant data about requirements, needs and goals were already gathered through the previous qualitative Semi-structured Interview work and the baseline survey involving more than 75 users. The sample for this Task 3.3 survey therefore includes 10 diverse persons. Most of these participants were in the 45 to 54 and 55 to 64 age groups, were female (7) and had obtained a university degree (Bachelors or Masters).

Regarding the devices they have available, all participants had access to a smartphone and consequently, most stated they also had used apps and online banking lately. The participants had also access to either a desktop PC, a laptop or a tablet. Most of them also stated they make use of landline phones.

When it comes to the modes of transport, most participants identified the car (as passenger) as their most frequently used mode of transport. Public Transport (bus/tram or train metro) came second and car (as driver) was third. Besides this, our participants also used shared mobility services, (car/bicycle or step) and a minority owned a bicycle as a means of micro-mobility.
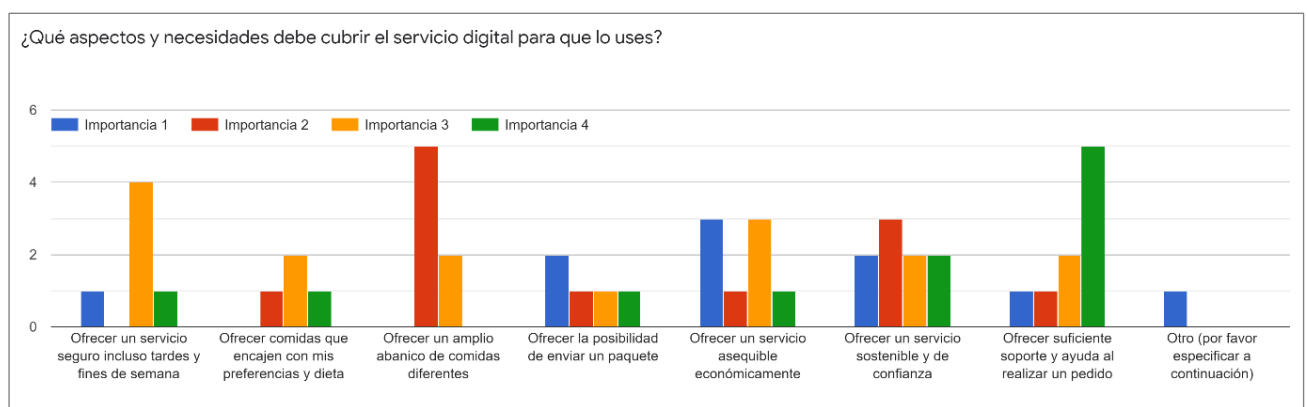
Figure 36 – Answers to the question: What needs should the digital service need to satisfy, in order for you to make use of the service?

As a first question, we asked participants to rate the importance of the following needs that should be satisfied by a digital service:

- To offer a safe service, also in the evening and on weekends
- To offer meals that suit my dietary needs
- To offer a wide range of meals
- To offer the possibility to drop off a parcel
- To offer an affordable service
- To offer a trustworthy and sustainable service
- To offer enough support when placing an order

- Other

We can see the four top needs (with blue in the graph as importance 1, red as importance 2, yellow as importance 3 and green as importance 4) for participants to use the service:

1   To offer a trustworthy and sustainable service;
2   To offer an affordable service;
3   To offer enough support when placing an order;
4   To offer a wide range of meals.

Nevertheless, it is important to also note that the other three options were also considered by some of the responders:

- To offer a safe service, also in the evening and on weekends;
- To offer the possibility to drop off a parcel;
- To offer meals that suit my dietary needs.

We can understand from this question that the responders would be more inclined to use a service that combines social, economic and sustainable interests while offering a wide range of services that fit their needs.
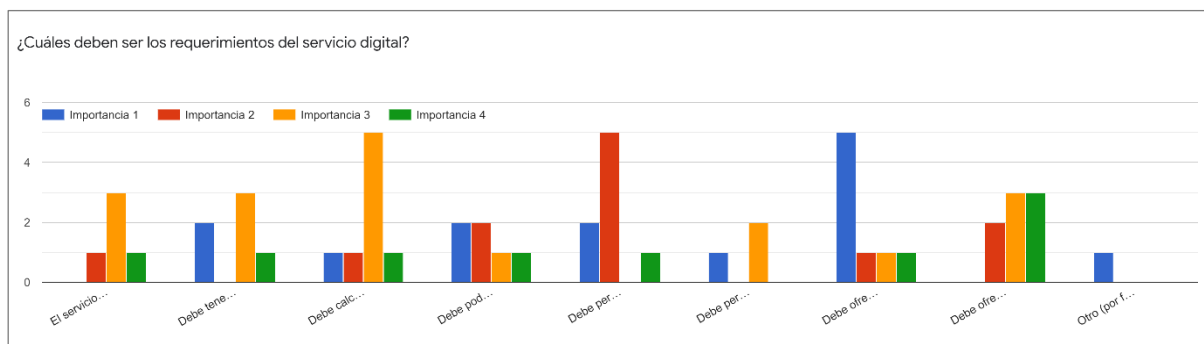
Figure 37 - Answers to the question: Requirements digital tool/service (rank 1 to 4, from most important to least important)

Looking further and trying to understand what the requirements of a digital tool or service, such as the one being developed in this pilot, are for non-users to use such a service, we asked participants to rank the following:

- The digital solution should be customizable to fit my personal needs
- The digital solution must have an easy registration system
- The digital solution must use a transparent pricing system
- The digital solutions must make it possible to order from a weekly menu or order food for a longer period

- The digital solutions must enable it to make mistakes and restart the process easily
- The digital solutions should be possible to use the service without having a subscription
- The digital solutions should offer good meals for affordable prices
- The digital solution should offer a good remote assistance
- Other :

We can see four clear main criteria from the graph above:

1 The digital solutions should offer good meals for affordable prices;
2 The digital solutions must enable it to make mistakes and restart the process easily;
3 The digital solution must use a transparent pricing system;
4 The digital solution should offer a good remote assistance.

It was also important to the respondents that the digital solution includes a possibility to order from a weekly menu or order food in advance for a longer period of time, that it should have an easy registration system and should be customisable to fit their personal needs.
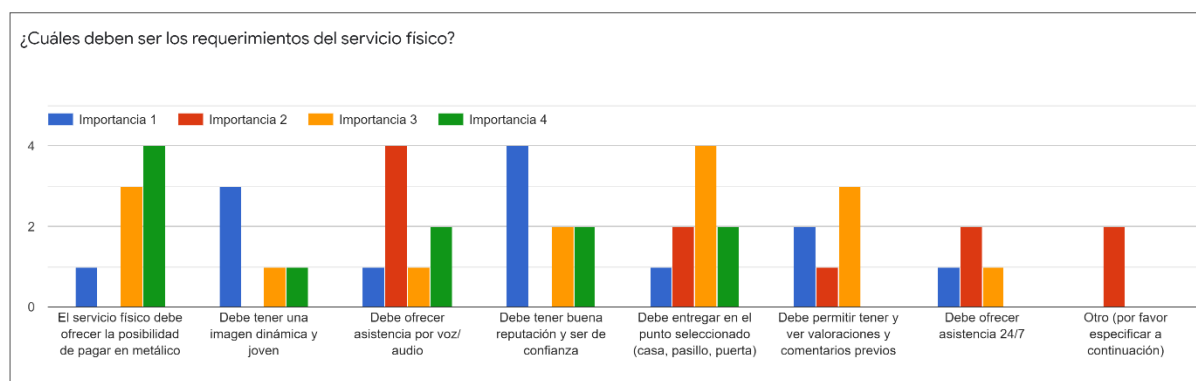
Figure 38 - Answers to the question: Requirements for physical service (rank 1 to 4, from most important to least important)

The service offered in Madrid also has a strong physical component. Regarding this, we wanted to understand what the requirements of this physical service would be for the responders to use the service. We asked about:

- The service must provide the option to pay cash
- The service should have a young and dynamic image
- The service should offer audio-assistance / audio guidance
- The service must be run by a trustworthy and reputable organisation
- The service should deliver the food/groceries at my preferred location (i.e. at the home, in the corridor or at the doorstep, etc.)
- The service must enable it to give feedback and see reviews

- It should be possible to request for assistance 24/7
- Other :

Both the idea that the service should deliver the food/groceries at their preferred location and that the service would be run by a trustworthy and reputable organisation scored the highest in the responders' views. Offering audio-assistance and the option to pay by cash, scored third and fourth place respectively.

Responders also found it important that the service allows feedback and reviews, that it would have a young and dynamic image and that it would have 24/7 assistance. Participants also mentioned the possibility to connect other paid services/paid apps within the same app.
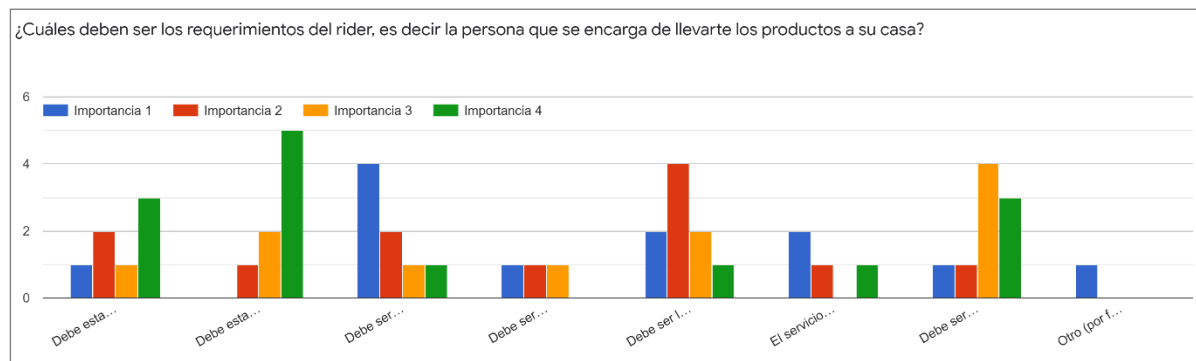
Figure 39 - Answers to the question: Requirements regarding the service agent/delivery driver/rider (rank 1 to 4, from most important to least important)

As a delivery service, the requirements of the service agent or rider are also quite critical. We asked about the following:

- The driver/rider should receive training so he knows he needs to speak slowly and clearly
- The driver/rider should be informed where he needs to drop off the food / groceries
- The driver/rider is punctual and recognisable (specific uniform, sign, car branded)
- It should be possible to rank/review the driver/rider and to see other people's reviews
- The driver/rider should be possible to be reached if needed (eg via Whatsapp)
- It must be possible to pick who your delivery driver is
- The delivery driver/rider must be friendly and assist the clients if necessary (eg. With putting groceries inside)
- Other :

Our responders indicated the following main requirements regarding the service agent:

1   It should be possible to reach the driver/rider if needed (e.g. via WhatsApp);
2   The driver/rider is punctual and recognisable (specific uniform, sign, branded car);
3   The delivery driver/rider must be friendly and assist the clients if necessary (e.g. with bringing groceries inside);
4   The driver/rider should receive training so they know they need to speak slowly and clearly.

Rated less important but also mentioned was that the drivers should be informed where they need to drop off the food or groceries and that it should be possible to choose the delivery driver. Another relevant point for the drivers mentioned as "other" was that they understand the app so that they could themselves solve technical problems during the delivery.
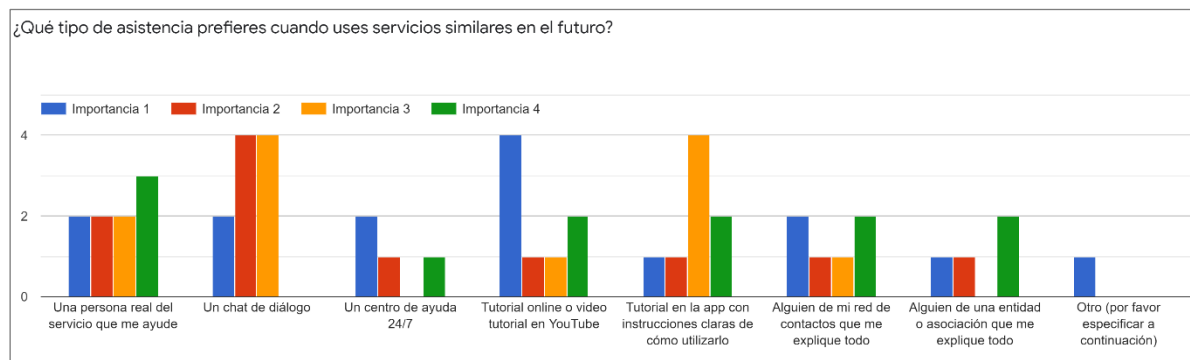
Figure 40 - Answers to the question: What type of assistance would you prefer when using similar systems in the future for the first time?

Using new technological systems might be complicated at first, even for highly-educated people as in our sample. Therefore, we asked what type of assistance they would like to have when using such services. This could be assistance when something goes wrong, but also simply to help understand the app at first use. We therefore asked for their preferences among the following:

•   Service agent (real person) from the service provider company that assists me
•   Chatbox in app
•   Helpdesk (24/7 available)
•   Tutorial online/youtube video
•   Tutorial in the app with clear instructions how to use it
•   Someone from my social network that explains everything to me
•   Someone from the social services, my supporting NGO…that explains everything to me
•   Other :

Our responders ranked the following four as their preferred assistance to receive when using an app like this for the first time:

1 A chat box in the app itself;
2 A tutorial online or a YouTube video to help them navigate through the app in the beginning or (equally important) a service agent (a real person) from the service provider company that assists them;
3 A tutorial in the app with clear instructions on how to use it.

Moreover, our responders found that if someone from their social network would explain the app or if the app provided a helpdesk (that would be available 24/7) this could also play an important assistance role in their use of the app.
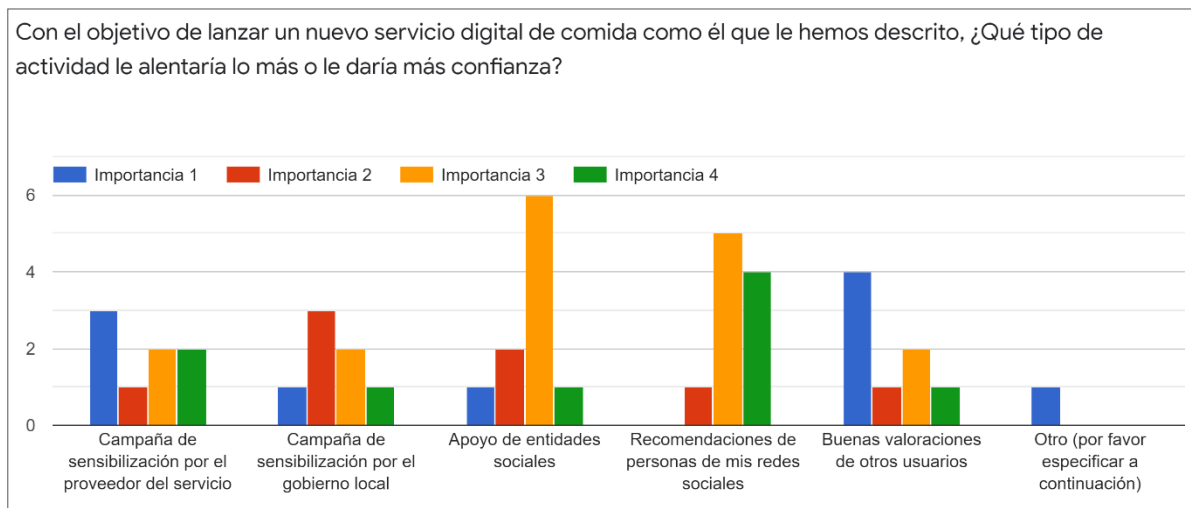
Figure 41 – Answers to the question: In order for you to gain trust to try out a food/grocery delivery service, what would be the most helpful?

Lastly, we wanted to understand how services like the one being developed in Madrid can gain trust from customers, asking our audience what it would take to gain their confidence. We asked them to rank the following according to their importance:

• Awareness campaign by the service provider
• Awareness campaign by (local) government
• Recommendation by help services / supporting organisations (eg medicins, NGO's representing women…)
• Recommendations from people from my social network
• Good ratings/reviews by other users
• Other :

All options scored quite high, thus all being fairly important to our responders. Nevertheless, we can point out the four most relevant as:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **76/122**

1   Recommendation by help services/supporting organisations (e.g. doctors, NGOs representing women etc.);
2   Good ratings/reviews by other users;
3   Awareness campaign by the service provider;
4   Recommendations from people from their social network.

Furthermore, when analysing all data from the Madrid pilot we need to be careful not to make assumptions and extrapolate conclusions. The small sample size and its characteristics make it unrepresentative of the generic "non-user" of mobile apps. Most participants were highly-educated women with access to a smartphone and experience in using apps and online banking. They also indicated to have plenty of mobility options when choosing how to get around.

If we look at the results carefully, we can see that for this sample three main things seem to pop up as key for a successful use of a digital mobility app:

1   **Trust**: They refer to want a trustworthy and transparent system. This sense of trust reflects not only on the general idea that the app comes from a trustworthy, sustainable and reputable organisation but also on these key aspects:
     a. That the service is safe in all stages;
     b. That it allows them to make mistakes and restart the process easily;
     c. That the pricing of the items is shown in a transparent manner;
     d. That the driver is recognisable, reachable, friendly and has sufficient training;
     e. That important/trustworthy organisations or people from their social network use and/or represent the service.
2   **Affordability**: For our responders, the services of a food-delivery app should be affordable, they should also include various payment options.
3   **A tailored experience**: Our sample also often refers to aspects that make the full app experience more pleasant, either with a more personalised service (e.g. having meals that are in line with their dietary constrains, picking where to drop off the food) or having good assistance (when starting to use the app, throughout the service and if something goes wrong). Moreover, the participants seem to be more likely to use the app if it has good reviews or if someone from their social network recommends it, showing that this app will be more likely to be a pleasant experience.

This complementary survey of T3.3. about needs, goals and requirements confirms that the non-users contacted for this survey in Madrid would be more inclined to use a digital mobility service that fits their three main success ideas: a service that comes from a trustworthy, sustainable and reputable organisation, that is affordable and that provides a tailored and pleasant experience. Adding to this, strong marketing and the influence of the social network of people using the app, we could potentially bring these non-users to use a service like the one in Madrid.

3.5. P5 Berlin

The Berlin pilot focuses on digital services related to route planning and ride sharing. These services comprise an app, Door2door, which allows users to search for and book a shared ride in Berlin. The goal of the survey here was to gather information about women with children who live in the Marzahn-Hellersdorf area of Berlin, and more specifically, concerning their inclusion in digital mobility services.

To gather survey participants, we contacted a local partner, Haus Matilde, in Marzahn-Hellersdorf. Haus Matilde is a social house offering support for low-income women, in addition to sports classes, political and empowerment discussions, advice and emergency apartments for victims of violence. Haus Matilde then reached out to women about participating in the survey. In agreement and upon recommendation of Haus Matilde, we offered participants a 30 € gift voucher.

The survey itself consisted of 30 multiple-choice questions and was administered via Typeform. We focused on and investigated a few different facets related to:

- Socio-economic data of the participants
- Information about participants' access to different mobility modes
- The support participants get from their social network
- Professional support participants get in their daily life
- The usability and level of inclusion in existing ride-sharing tools
- The needs and requirements a digital service should satisfy, for both users and non-users
- The requirements they identified as most important for the digital tool/service, the physical service and of the service agent/delivery driver/rider
- The types of actions would gain users' trust in a service like this

For some questions, participants could indicate four top preferences or answers. It is also important to note that some questions applied to only part of the participants, since we are discussing users and non-users of mobility apps. Therefore, not all questions were answered by all participants. The results presented in this section are therefore described as percentages based on the number of participants who answered each question.

For this set of surveys, 16 women living in Marzahn-Hellersdorf in Berlin participated, ranging from 18 to 60 years old. 75% had secondary school degrees or higher. Many of these women indicated having a good social network but did not get professional support (more than 80% indicated this). 50% of participants chose not to answer about their income.

Most participants owned and used smartphones and laptops, and more than half used apps, online banking and landline phones.

Regarding mobility, 93% of participants stated that they had access to the train or metro, while 12% had access to a private car as a driver and only 6% had access to car- or bike-

sharing. Additionally, though many women were not willing to share their mobility restrictions; 26% indicated their inability to carry heavier loads and 18% had visual impairments.

It is important to note that some women chose to skip answering questions about their education, mobility restrictions and average household income. Perhaps this can be attributed to concerns regarding data security.
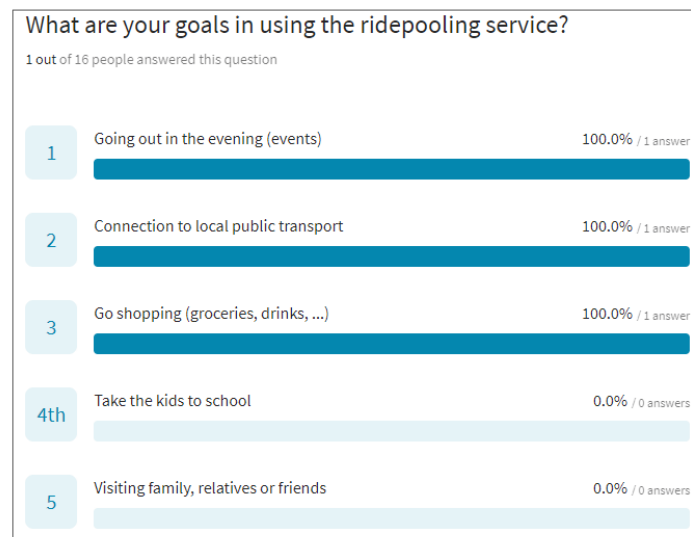
Figure 42 - Answers to the question: Which of the following digital applications do you use to order a ride-pooling service?

With the goal of understanding the needs and requirements for ride-pooling services in Berlin, we first asked users about their current situation, like which services they use and for what purpose. Since only 6% indicated using car- or bike-sharing, the feedback about why was also quite limited. However, the main intention behind using such a service was for going out in the evening, connecting to local public transport and going shopping.
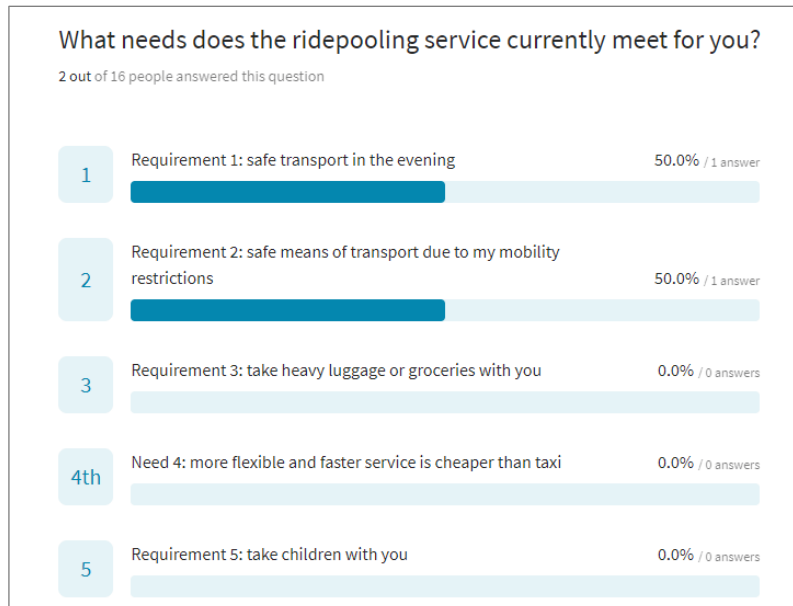
Figure 43 - Answers to the question: What needs does the ride-pooling service currently meet for you?

Based on that, we then needed to understand the needs and requirements that the used services met. Here we can derive that safe transport was the main necessity for users, both in the evening and due to mobility restrictions.
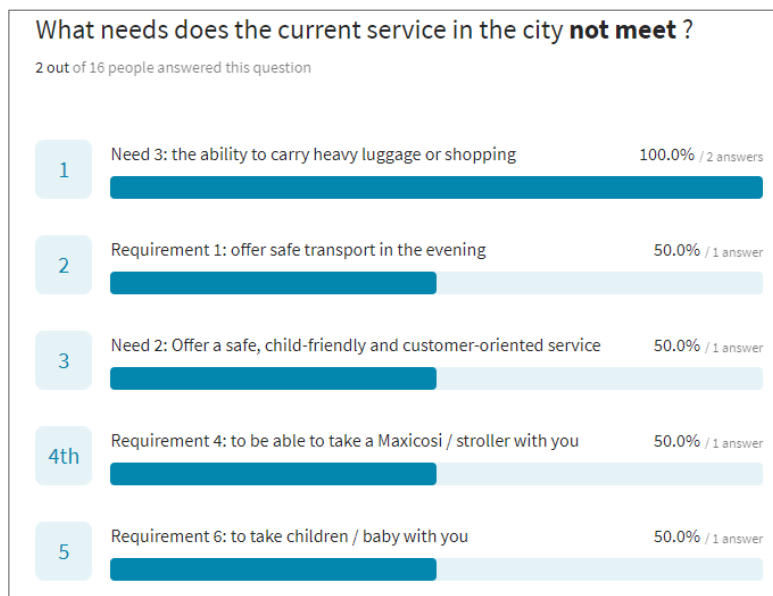
Figure 44 - Answers to the question: What needs does the current service in the city not meet?

In contrast to the previous question, we needed to gather user feedback about the areas where the general mobility services in Berlin were lacking and where they can be improved. This will assist us in measuring the impact of introducing ride-sharing services.

Consequently, we can see from the responses that ride-sharing users overall felt a lack of safety. Both safe evening transport and safe, child-friendly and customer-oriented service were noted as needs that were not met. However, carrying heavy luggage or shopping received the most response from users.
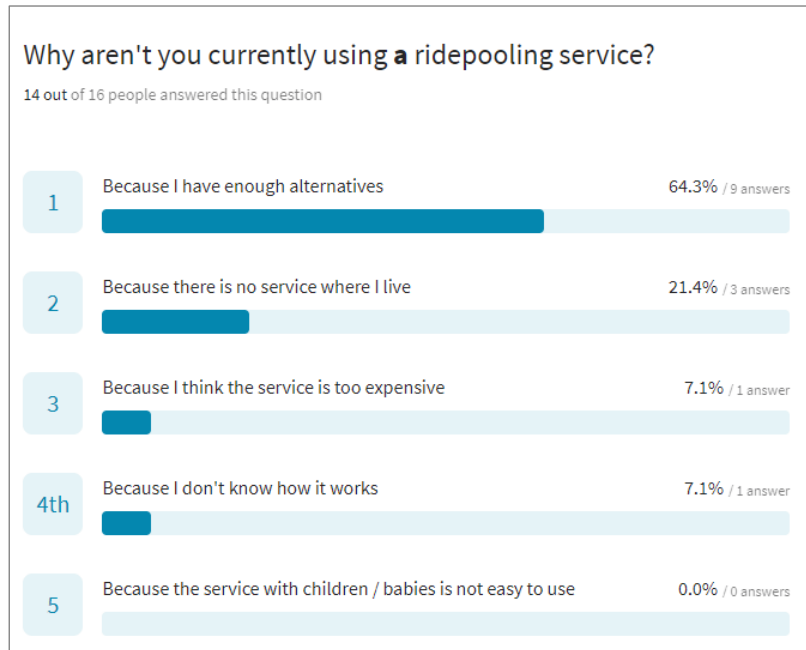
Figure 45 - Answers to the question: Why aren't you currently using a ride-pooling service?

Drawing on the features currently lacking in ride-sharing services in Berlin, we then asked non-users to indicate why they did not use such services. Though some non-users felt it was too expensive, did not know how it worked or had no service available to them, a majority of participants indicated that they had enough mobility alternatives already.
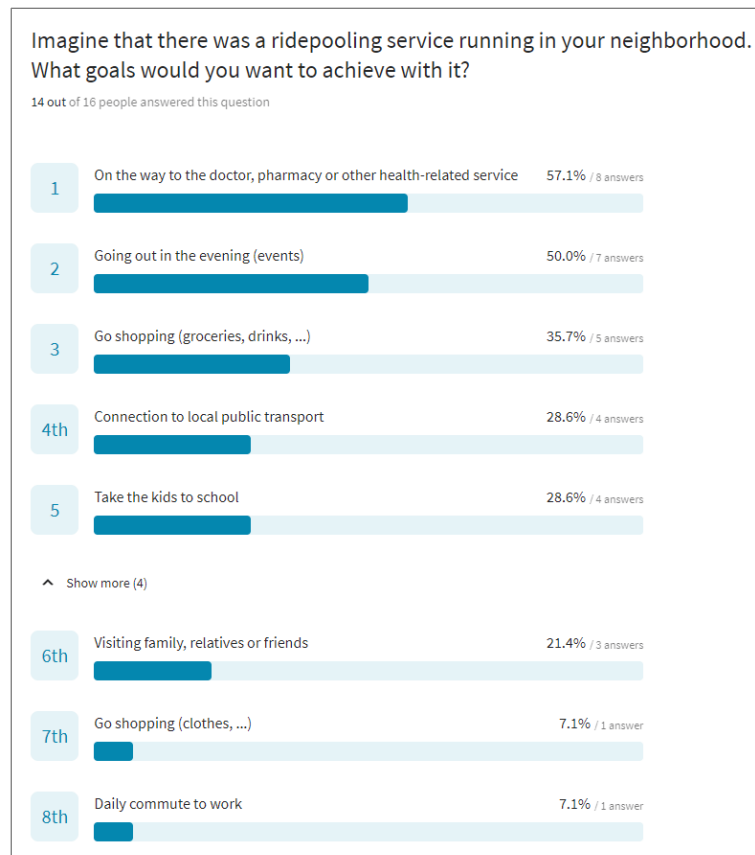
Figure 46 - Answers to the question: Imagine that there was a ride-pooling service running in your neighborhood. What goals would you want to achieve with it?

This next question is key to further understanding what draws people to use such a service. We asked non-users to specify the potential needs that a ride-sharing service could fulfil for them. Though reactions were mixed, the most common, receiving about half of the votes, were:

1   Going to the doctor, pharmacy or other health-related service
2   Going out in the evening.

Other responses were:

- Going shopping
- Connecting to local public transport
- Taking the kids to school
- Visiting family, relatives or friends
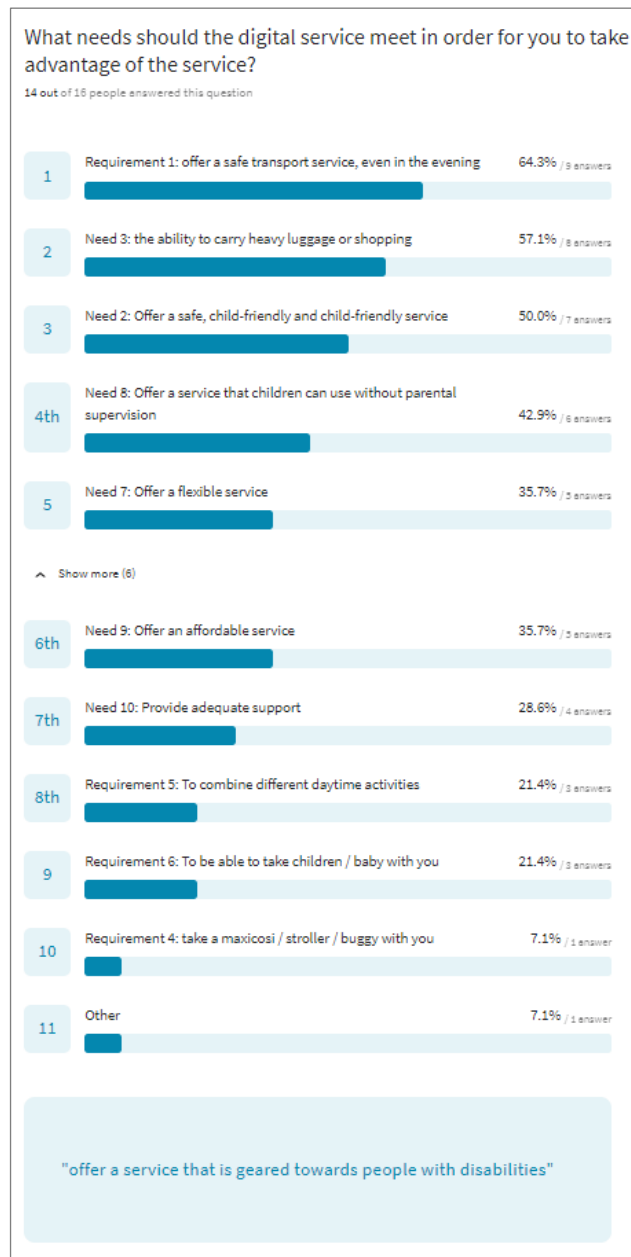
Figure 47 - Answers to the question: What needs should the digital service meet in order for you to take advantage of the service?

Furthermore, we asked non-users to specify their needs regarding a ride sharing service. Again, results were mixed, with more than half indicating the following:

1   Safe transport service in the evening
2   Ability to carry heavy luggage or shopping
3   Safe, child-friendly service

Again, evening transport was ranked high on the list. Other prevalent needs were:

- A service that children can use without parental supervision
- A flexible service
- An affordable service

We can also see one response to offer service for people with disabilities.

Moreover, as a follow-up question to the needs that the service should meet, we asked participants to indicate what they felt were necessary requirements for the digital service in Berlin. For this, participants rated the importance of the following elements:

- The digital solution should be adaptable to my personal needs.
- The digital solution must have a simple registration system.
- The digital solution has to make it easy to book a ride for my child without parental guidance.
- The digital solution must make it possible to combine several destinations in one trip.
- The digital solution must have a fast online payment option.
- The digital solution should offer the possibility of using the service without a subscription.
- The digital solution should have a subscription that is easy to start, change or end.
- The digital solution should make it possible to easily select pre-defined goals.

By far, the most important requirement was that the digital solution has a simple registration system, with 64% of participants voting for this as their number one choice. On the opposite side of the spectrum, the least important requirement was being able to book a ride for children without parental guidance. 42% of users voted for this as their 8th and last requirement. The remaining results were quite varied.

We then asked participants to do the same for the physical performance of the service. The following elements were ranked based on their importance:

- The service must be easily recognisable in public spaces.
- The pick-up points should be easily accessible and close to where I live.
- The service should have a young and dynamic image.
- The pick-up points should be suitable to ensure safe boarding.
- The service must be integrated into public transport.
- It should be possible to get customer support.
- The vehicle should be comfortable and have enough space to take a Maxicosi/stroller with you.
- The vehicle must offer enough space to comfortably drive mothers with children and their belongings.

The two highest ranked requirements regarding the physical service were that pick-up points are easily accessible and close, and that the service is easily recognisable. Having a young and dynamic image and customer support were both rated as least important.

We then asked non-user participants to rank the following driver requirements:

- The driver should receive training to help mothers get on and off.
- The driver should be informed through the system that children are taking part in his journey and how many children there will be.
- The driver is punctual and recognisable.
- It should be possible to rate the driver and see other people's reviews.
- The driver should be ready for small adjustments to the ride while driving.

The three most important requirements were that the driver is trained to help mothers, is informed about how many children will be in the car and that he/she is punctual and recognisable. Less important requirements for the driver were that he/she is ready for adjustments to the ride and having the possibility to rate the driver.
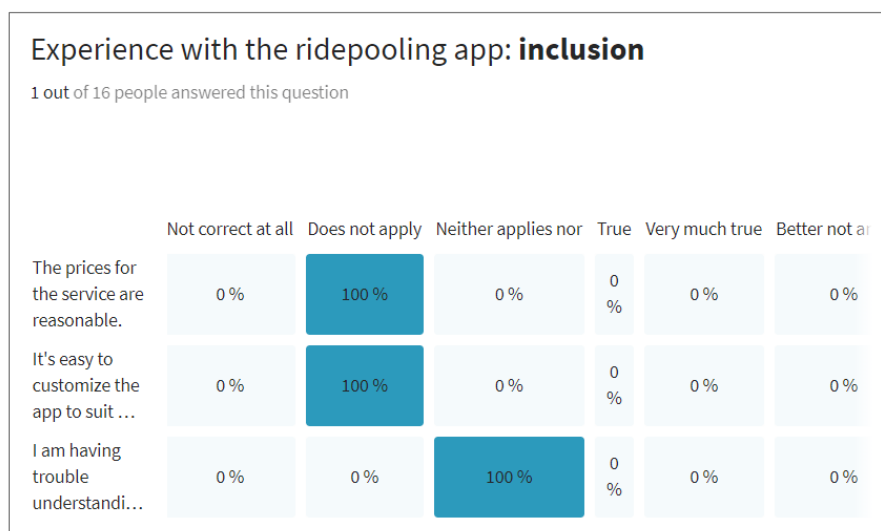
Figure 48 - Answers to the question: Experience with ride-pooling app: inclusion

After gaining this useful insight about the needs and requirements of potential ride-sharing users, we then asked current users of ride-sharing services to share their experiences. We had one user responding to these questions and we started with inclusion. Based on this user's feedback on the three elements about prices, customisation and understandability, we can see that prices were not reasonable and the app was not easily customisable.
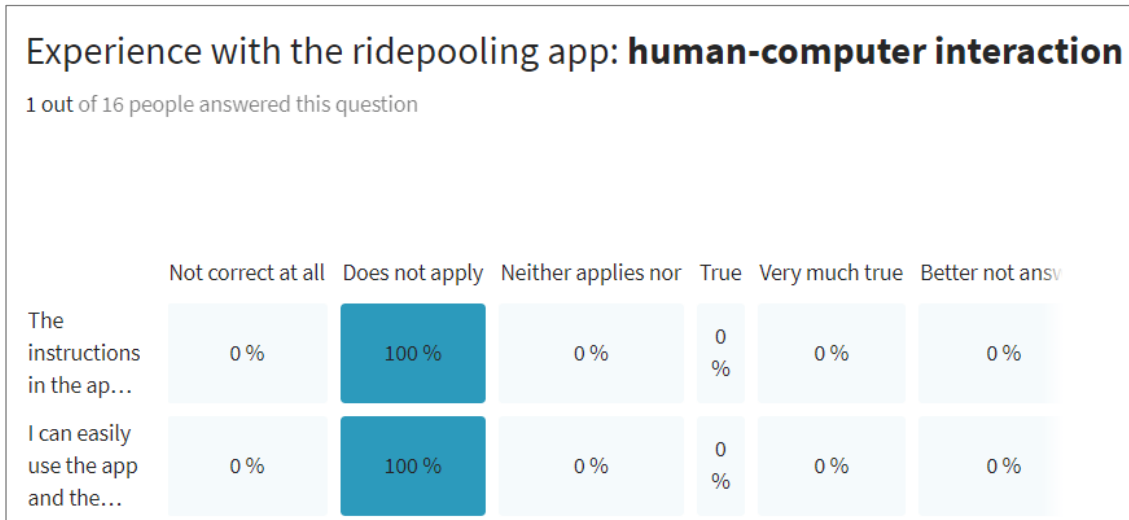
Figure 49 - Answers to the question: Experience with the ride-pooling app: human-computer interaction

Regarding the clarity of the app itself, the user responded that instructions were unclear and that she could not easily use the app.
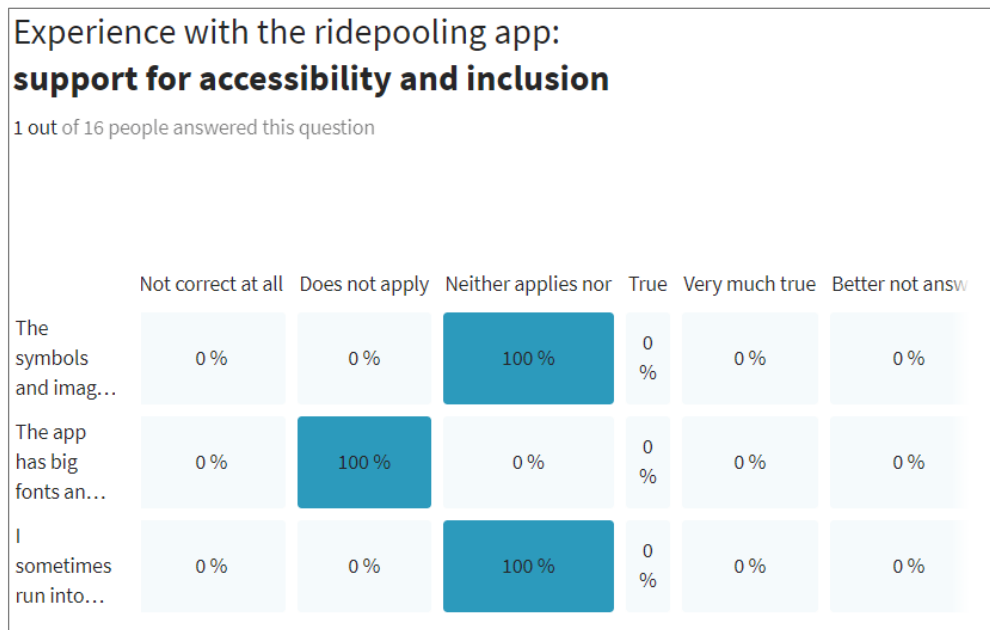
Figure 50 - Answers to the question: Experience with the ride-pooling app: support for accessibility and inclusion

Important to also discuss is how users experienced the app in terms of inclusion. Here, the user indicated that the fonts and contrast of the app were not good enough, but that the symbols and icons were neither clear nor unclear. Additionally, she did not encounter major issues when using the app, though her answers suggest that the user friendliness of the app can be improved in these areas, especially since the Berlin target group is focused on elderly, low educated people lacking digital skills.
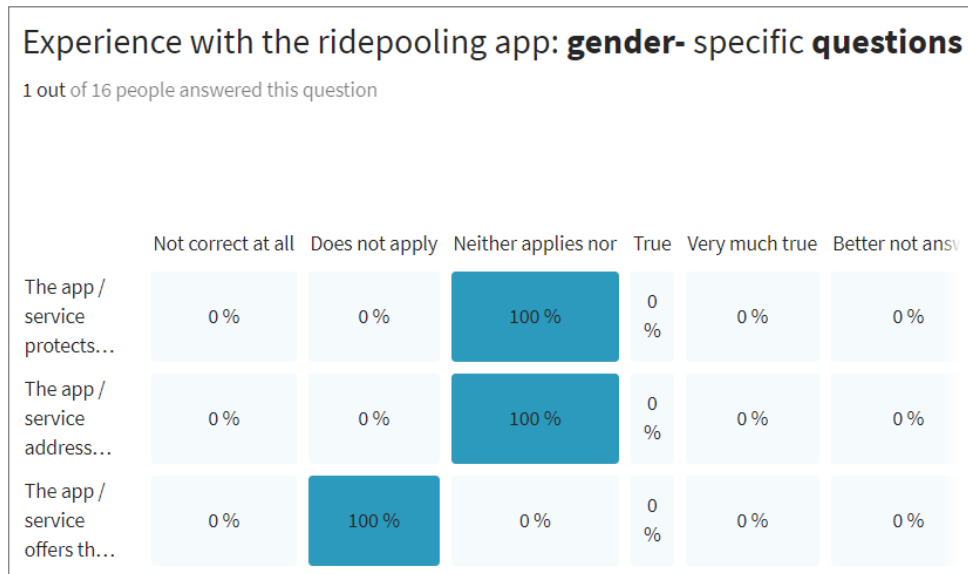
Figure 51 - Answers to the question: Experience with the ride-pooling app: gender-specific questions

Regarding gender, we asked about the following:

- The app/service protects women from getting into unsafe situations.
- The app/service addresses men and women equally, not gender-specifically (e.g. he/she).
- The app/service offers the same ease of use for women as for men.

Here, the user responded that the app was less easy for women to use, also due to her first two responses about the protection of women and equal service provision.

Experience with the **non-digital** aspects of the ridepooling service (e.g. the drivers):
Use of the service

1 out of 16 people answered this question

	Not correct at all	Does not apply	Neither applies nor	True	Very much true	Better not a
I can use the service easily	0 %	100 %	0 %	0 %	0 %	0 %
The procedure for using the service is…	0 %	100 %	0 %	0 %	0 %	0 %
The app / service offers the same eas…	0 %	100 %	0 %	0 %	0 %	0 %
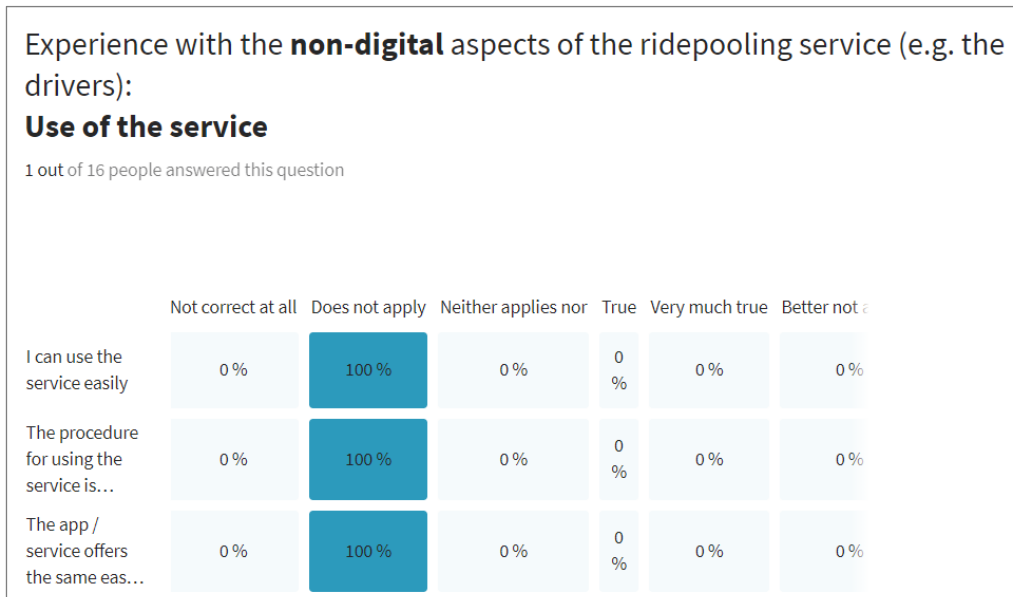
Figure 52 - Answers to the question: Experience with the non-digital aspects of the ride-pooling service (e.g. the drivers): use of the service

Next, we moved on to the physical aspects of the service, starting with ease of use. In general, the response was that service use was not understandable, clear or easy to use.

Experience with the **non-digital** aspects of the ridepooling service (e.g. the drivers):
support for accessibility and inclusion

1 out of 16 people answered this question

	Not correct at all	Does not apply	Neither applies nor	True	Very much true	Better not answ
I can easily reach…	0 %	100 %	0 %	0 %	0 %	0 %
I can easily find t…	0 %	100 %	0 %	0 %	0 %	0 %
I can easily identi…	0 %	0 %	0 %	100 %	0 %	0 %
I can get in / out of…	0 %	0 %	100 %	0 %	0 %	0 %

Figure 53 - Answers to the question: Experience with the non-digital aspects of the ride-pooling service (e.g. the drivers): support for accessibility and inclusion

Other components of the physical service include reaching or finding the pick-up location, identifying and getting in and out of the car and interacting with the driver. We therefore asked users how these elements were perceived. Here, we can see that finding and reaching the pick-up location was difficult, while identifying the car was easy and interaction with the driver was somewhere in the middle.
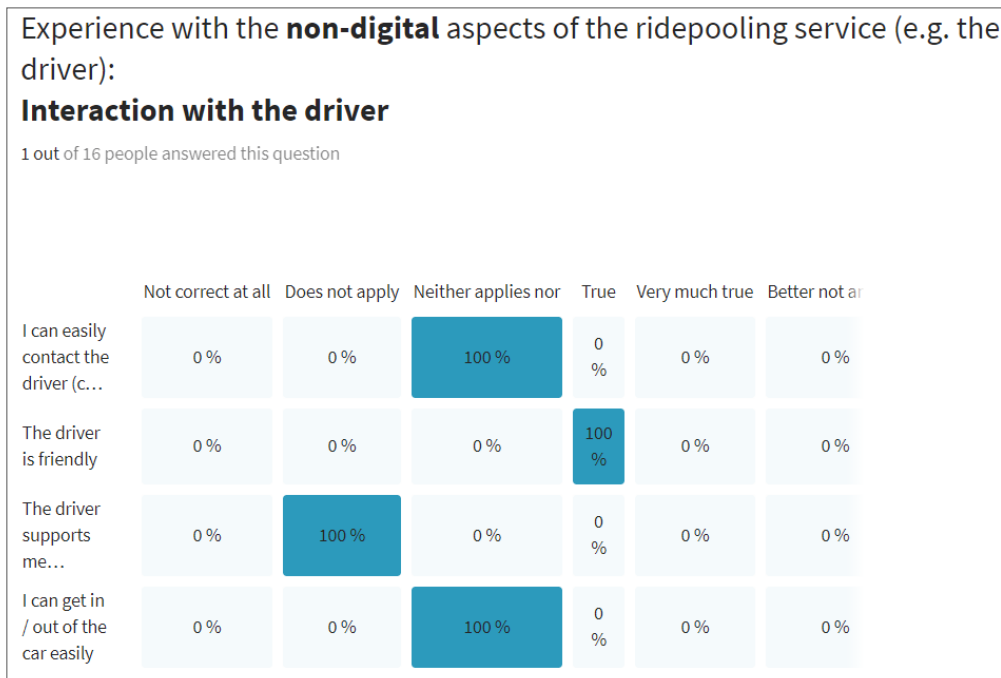
Figure 54 - Answers to the question: Experience with the non-digital aspects of the ride-pooling service (e.g. the drivers): interaction with the driver

Lastly, we asked specifically about the interaction with the driver, as this is an important aspect of a ride-sharing service. We therefore asked the user about:

- Contacting the driver
- Friendliness of the driver
- Support from the driver
- Getting in and out of the car

As seen in previous results, we can determine that support from the driver is lacking. However, both contacting the driver and getting in and out of the car were neither easy nor difficult for this particular user.
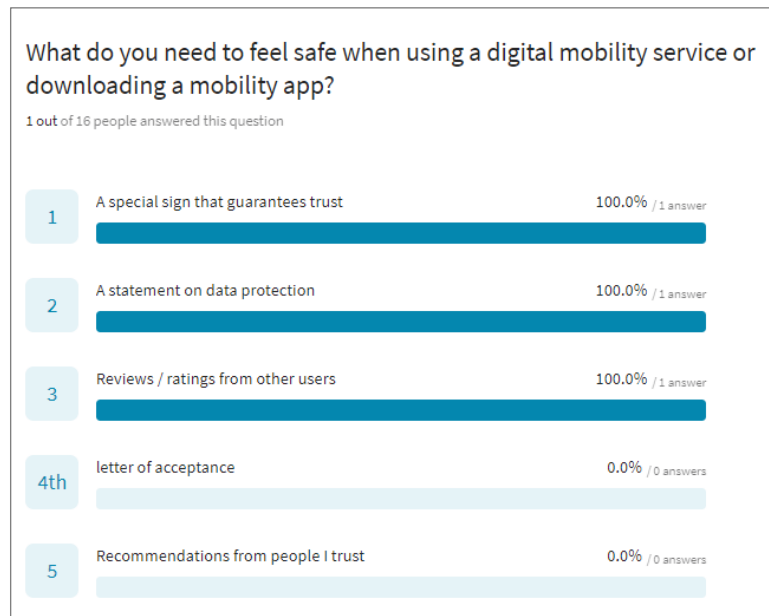
Figure 55 - Answers to the question: What do you need to feel safe when using a digital mobility service or downloading a digital mobility app? (app users)

As a next part, we asked about trust and security. We started by asking about app components that are useful for gaining users' trust when using a digital mobility service or app. To better understand this, we asked both users and non-users of current ride services.

We received feedback from the user currently using ride services that the following are important:

• A special sign that guarantees trust
• A statement on data protection
• Reviews/ratings from other users
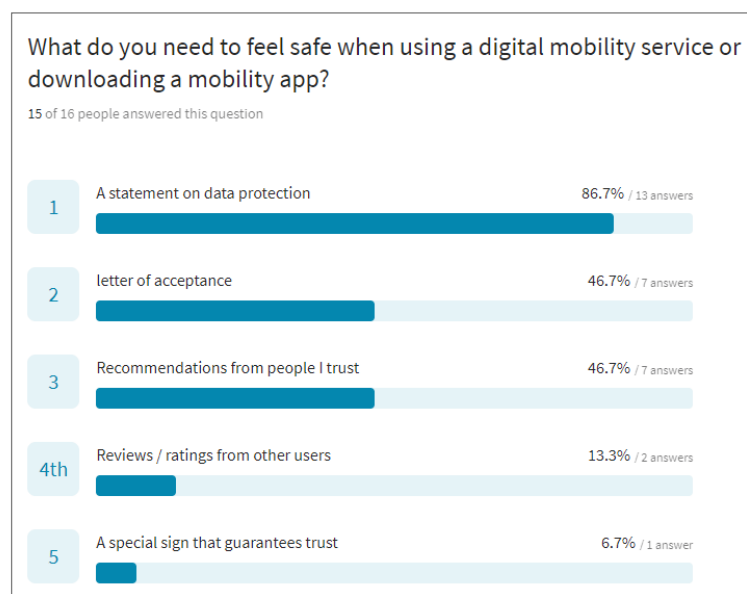
Figure 56 - Answers to the question: What do you need to feel safe when using a digital mobility service or downloading a digital mobility app? (non-users)

Contrary to the current app user, non-users indicated the following as important:

- A statement on data protection
- Letter of acceptance
- Recommendations from people I trust

In general, a statement on data protection was ranked highly by both groups.

Service confidentiality

1 **out** of 16 people answered this question

	Not correct at all	Does not apply	Neither applies nor	True	Very much true	Better not a
The app gave me enough…	0 %	100 %	0 %	0 %	0 %	0 %
I'm not sure if the app will prote…	0 %	100 %	0 %	0 %	0 %	0 %
I trust that the app will keep my…	0 %	0 %	100 %	0 %	0 %	0 %
I doubt that those responsib…	0 %	0 %	0 %	100 %	0 %	0 %
I trust that if I consent to my data…	0 %	0 %	100 %	0 %	0 %	0 %
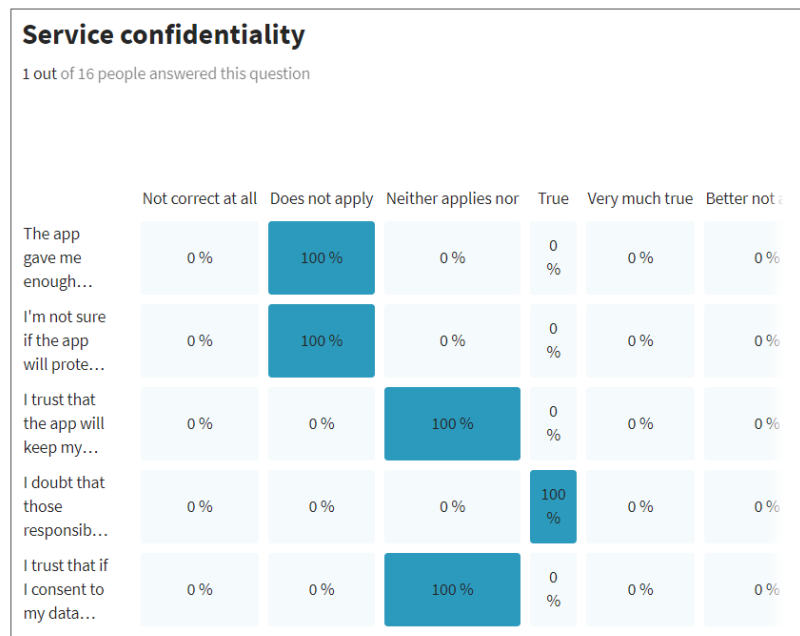
Figure 57 - Answers to the question: Service confidentiality (users)

When asked about data privacy and confidentiality, the app user had mixed feelings, stating that the app did not give her sufficient information about how her data was being used or if it was protected.

We then asked about how to gain users' trust in trying a ride-pooling service for the first time. For this, we asked current app users to rate five statements based on their importance. We received the following feedback in order from most to least influential:

1. Good ratings/reviews from other users
2. Awareness campaign by the service provider
3. Recommendations from people in my social network
4. Awareness campaign by the (local) government
5. Recommendation by auxiliary services/supporting organisations

Likewise, we asked non-users to do the same exercise, resulting in a different outcome:

1. Recommendations from people in my social network
2. Recommendation by auxiliary services / supporting organisations (e.g. NGOs that represent women)
3. Good ratings / reviews from other users
4. Awareness campaign by the service provider
5. Awareness campaign by the (local) government

Though results differ, we can see in both cases that social network recommendations are generally ranked high, while awareness campaigns by the (local) government are ranked low.

Do you think you can meet the following requirements in the table using the statements below, and do you think the requirements are too difficult (limiting)?
Digital service requirement
15 of 16 people answered this question

	That would be easy for me	Not easy, but doable	That would be difficult for me	Better not a…
I need to be connected to the…	26.7 %	26.7 %	6.7 %	40 %
I need to download an…	33.3 %	26.7 %	0 %	40 %
I need a smartphone	66.7 %	0 %	0 %	33.3
I have to register by providing …	33.3 %	26.7 %	6.7 %	33.3

Figure 58 - Answers to the question: Do you think you can meet the following requirements in the table using the statements below, and do you think the requirements are too difficult (limiting)?
Digital service requirement

To better understand the non-users of ride-sharing services in Berlin, we asked for some background information about how feasible it would be for people to try it, based on digital, physical and financial factors. Regarding the digital service requirements, we see that many women chose not to answer this question. It is however clear that access to a smartphone was not a major issue for participants, as 66% answered that it would be easy for them.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **92/122**
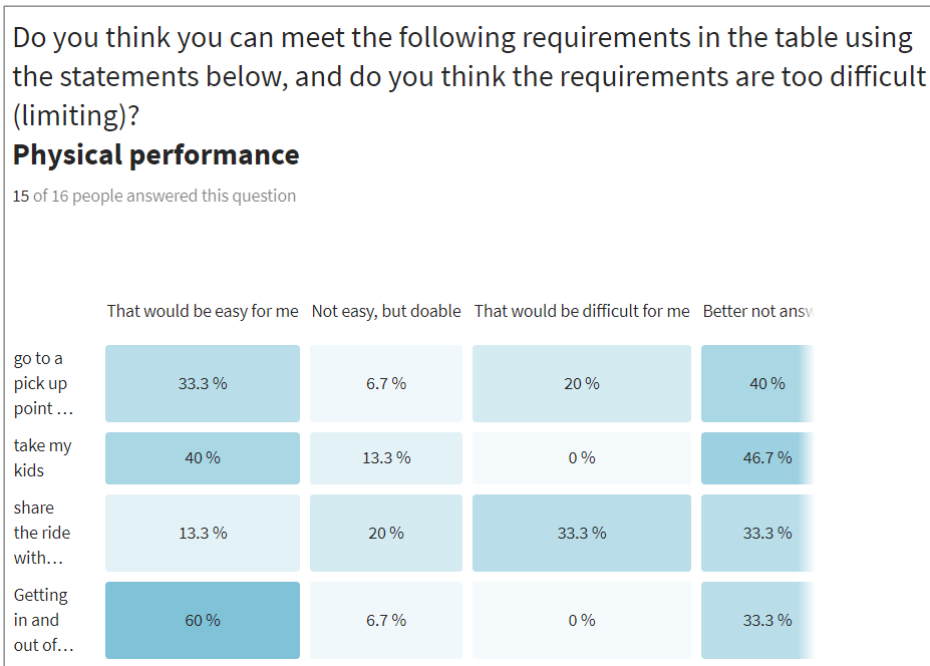
Figure 59 - Answers to the question: Do you think you can meet the following requirements in the table using the statements below, and do you think the requirements are too difficult (limiting)? Physical performance requirement

Regarding the physical performance part, many women chose not to answer, though 60% stated that getting in and out of the car would be easy. Almost half (40%) stated that taking their children would also be easy. 33% of participants indicated that sharing the ride with other people would be difficult for them.
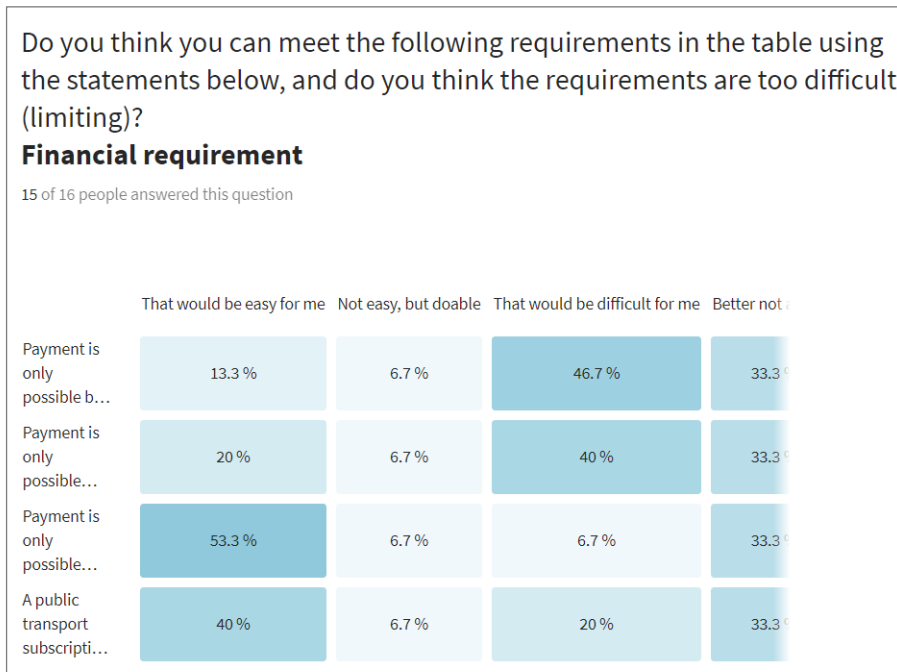
Figure 60 - Answers to the question: Do you think you can meet the following requirements in the table using the statements below, and do you think the requirements are too difficult (limiting)? Financial requirement

Responses to financial requirements were varied. Though some participants did not feel comfortable answering this question, we can see from the graph above that almost half of participants responded that it would be difficult to pay via credit and debit cards only. 53% indicated that payment by cash would be easy. We can therefore infer that participants would like different payment options, though cash is preferred.

Lastly, we asked these non-users to rank the support they prefer when using similar systems for the first time out of the following:

1 In-app tutorial with clear instructions on how to use it
2 Tutorial (online / YouTube video)
3 Driver from the ride-pooling service who looks after me
4 Chat box in the app
5 Helpdesk (available 24/7)
6 Someone from my social network who explains everything to me
7 Someone from the local government, NGO, neighborhood who explains everything to me

69% of participants rated tutorials both in-app and online as their top methods for support. 62% indicated that they would like the driver to look after them.

Furthermore, though our overall dataset was small and contained a mere 16 participants, we are still able to generate some valuable information about non-users of ride-pooling applications in the Marzahn-Hellersdorf area of Berlin. A majority of survey participants indicated never using a ride-pooling service, which allows us to focus on why they do not

use these services and what will influence them to do so. Interestingly enough, one major factor in this regard is that a majority of participants indicated having access to the train or metro, and therefore did not need a ride-sharing service. Additionally, because only one person had experience with current ride-sharing apps, it is therefore more difficult to draw major conclusions about where those services are lacking.

However, if we look carefully, we can still derive two common themes in the collected results:

1. **Safety**: Safety often appears as a common concern for both users and non-users. It is a reason why our one current user uses ride-sharing options, but it could also be a trigger for non-users to start doing so. Safe evening transport and safe, child-friendly and customer-oriented service were noted as needs that were not met in current systems.
2. **Clear instructions & usability**: Another prevalent theme in the results is the idea of clarity. Based on the feedback of the app user, we can ascertain that a ride-pooling app should be clear, easy to use and have good instructions. Icons and text should be clearly visible.

While we were quite limited regarding the data collected for current users of ride-sharing apps in Berlin, we could however gain perspective on why others do not use these services and what might influence them to do so. Though we aimed to focus on our target group of unconnected women with limited mobility options, 64% of non-users indicated that they already had enough mobility alternatives. However, if they would use such a service, they would use it for safe evening rides and to transport heavy luggage and groceries. Child-friendly service was seen as less important, though we did not specifically learn how many participants were mothers, which could be interesting to investigate in the future. We can therefore conclude that safety plays a crucial role in gaining attraction, especially for our Berlin participants who are already connected to public transportation and will need an extra push for using a ride-pooling service. Additionally, since many participants did not choose to answer questions about their income, education or mobility restrictions, we can also assume that data security in a digital tool is quite important.

As far as the digital app itself, we learned that a digital application needs to be flexible and take into account personal preferences. It should also be clear and user friendly to be more inclusive, as our interviewed user reported some trouble with the clarity of the services she currently uses. This is further accentuated by the fact that our dataset contained many digitally skilled people, so in order to effectively reach our target group, a ride-pooling app must contain legible text and icons.

Safety and usability are therefore two major forces we often saw in our results and can potentially persuade non-users to use an app for route planning and ride sharing.

4.Conclusions

In this final section of our analysis, we summarise the underlying insights we attained about the goals and needs of users and non-users of digital mobility applications. As compared to our findings in WP1, we addressed the bigger picture of the pilots, also taking into account factors like social network and family situation, support and transport poverty of the interviewed participant.

It is worth noting that in general, each pilot context and target group has specific requirements. This is the case not only across user groups and pilots, but also within the user groups themselves. Due to this, there is no one-size-fits-all solution. Nevertheless, while each pilot is unique and covers different target groups and their needs, we can still draw some overall conclusions which link them together.

4.1. End user requirements: cross-pilot overview along user profiles and characteristics

Collecting survey responses was not always easy due to the COVID-19 pandemic, the holiday period and limited digital exposure by some members of the target groups. We did not often reach our primary target group for each pilot, as it is difficult to get in touch with vulnerable groups. In the case of elderly target groups, recruitment done via email generally reaches people with (at least some) digital skills, meaning that our results are not always representative for the entire elderly society. We must therefore be careful in drawing conclusions, keeping in mind the underlying bias in our dataset and that most interviewed persons are somewhat digitally skilled and connected.

While we aimed to include a wide range of user profiles, it should also be mentioned that responders were generally well-connected in terms of mobility and transportation options. In Berlin for example, 93% of participants had access to the train or metro, while all participants in Galilee and 66% of participants in Emilia Romagna had access to the bus or tram. Additionally, most (or all) participants in Emilia Romagna (93%), Antwerp (79%) and Galilee (all) had access to cars as a driver.

Nevertheless, we had 90 total participants across the pilots. After reviewing each pilot's results, we can see that requirements and needs are quite distinct in some cases. One overarching theme, however, is empowerment and the development of a trustworthy tool. This means enabling feedback methods to give advice, targeted communication and involving caregivers, social networks and NGOs to build a trusting relationship so that people are more willing to use digital mobility services. Collaboration with trusted, local organisations is seen as a decisive action to get people to know a service. This is especially the case for the mostly female and middle-aged groups of Emilia Romagna and Madrid. We can therefore infer from our results that the following are key elements for empowering users to utilise a digital mobility service:

- Online and offline tutorials
- Explanation and recommendation from trusted organisations and members of a person's social network
- Reviews from other users
- A trustworthy label

Regarding access to transport modes, since the participants live in different contexts (urban, peri-urban and rural areas), the mobility options available to them and their mobility patterns vary accordingly. However, access to the car as a driver was quite commonplace across all pilots except Berlin. As mentioned already, all participants in Galilee had access to cars, while most participants in Antwerp (79%), Madrid (60%) and Emilia Romagna (93%) also reported this. The only exception was Berlin, where most participants reported having a low income and only 12% had access to a car as a driver.

The main goal for using (digital) mobility services was often to have **safe options for transport in the evening**, as seen in Galilee, Berlin and Antwerp. Regarding available public transportation options, the participants from Madrid and Berlin had best access to these modes. In the case of Berlin, more than half of the participants indicated that there are already enough transport alternatives in place that a ride-pooling service is not necessary for them. If they would use such a service, however, it would be for evening transportation and for moving heavy luggage and groceries. Similarly, Antwerp participants already know their city quite well and therefore do not often use mobility applications. They would use a mobility app to learn the safest travel route, get real-time updates on road obstacles and look up new locations. In Galilee, our survey also included well-connected participants who all indicated already using ride-sharing apps. For them the affordability of the service was the most important aspect.

Generally, we found that most of the participants had at least one or two modes available and most respondents are not really confronted with severe transport poverty. However, we found out that across the pilots, there are still unmet needs regarding (digital) mobility services, being:

- Flexible on-demand services that enable chain trips
- Affordable and reliable mobility services, definitely in the evenings
- Good and integrated connections with public transport services
- Trustworthy and sustainable mobility services

Despite the big differences in socio-economic backgrounds of the participants, there is also recurring theme regarding the need for **a clear, easy-to-use interface**. This consists of readable text, sufficient contrast and identifiable icons, which is especially the case for users who can count on limited professional support in their daily lives, like in the Antwerp and Berlin pilots.

We also see that there is a general need for an easy and convenient system. **Personalisation** was seen as important, as users identified wanting a tailored experience to make their use of the app more pleasant. Flexibility was highly requested by all pilots, especially by middle-aged and elderly participants. In the case of Madrid, it is important that meals be aligned with a user's dietary constraints. Emilia Romagna wants locker access during weekends, evenings and holidays, and Galilee stressed the importance of pick-up points close to their home addresses. Berlin's participants also noted the importance of adapting the ride-sharing service to their personal needs by enabling chain trips. Additionally, Antwerp, Galilee and Emilia Romagna stressed the importance of easy subscriptions.

Again, **empowerment** is essential so that users have the right tools and assistance for using a digital mobility service. It is therefore important to develop tutorials, both online and offline so that users are adequately supported; as well as in-app reviews from other users.

Another important factor regarding usability relates to how a digital tool can best **assist users**; both new and experienced. In general, having an online tutorial was often requested across all pilots, though it was especially favoured by the digitally skilled persons of 45 years and older in Antwerp and Madrid.

For the Berlin participants (ranging from 18 to 60 years old), an in-app tutorial was also favoured, while the participants of Emilia Romagna chose on-the-spot instructions and a helpdesk as most advantageous.

Though it is difficult to conclude why the preferences are so varied, as most users in all pilots are digitally skilled and have smartphone and app access, perhaps the difference is due to the combination of age with the familiarity of using internet. While all Emilia Romagna participants owned smartphones, 40% were between 61 and 65 years old and 40% also stated that connecting to the internet was difficult. Such a user may therefore prefer instruction that does not involve connecting to the internet.

Lastly, a successful mobility tool relies on developing **trust and gaining users' confidence** in the service they are using. How to gain users' trust was therefore a common question throughout all pilots, as people need to feel safe and want to use a transparent, digital tool. For this reason, we aimed to uncover the best way to generate trust so that users will feel comfortable using a digital mobility service. Participants in Emilia Romagna were particularly skeptical about the security of the service, so it is crucial that we reassure potential users that this service will be secure and trustworthy in all areas.

This sense of trust not only stems from the idea that the tool itself is trustworthy, but also that it is recommended by notable organisations, other users or social contacts. For both persons with a solid social network and without, trust in a service is generally best generated via recommendation from a family member or a friend or via an organisation they know and rely on. Ratings from peers and other users are also very important and in all cases, we discovered that developing a trustworthy label can really help gain users' trust.

We can conclude that enabling feedback and review features, as well as supporting campaigns from local governments or professional (caregiver) organisations can greatly help promote the use of (new) digital mobility tools.

4.2. Lessons learnt

Based on the processes and outcomes described in Pilot Phase 1, there are several areas which can be optimized in future actions and activities with the INDIMO pilots. Briefly, these are:

- Recruitment of participants
- Data collection
- Developing digital mobility solutions
- Empowerment of users

Due to the COVID-19 pandemic, it was even harder to reach out to vulnerable-to-exclusion groups, especially the elderly people and people with a migration background were harder to reach. In order to optimise the recruitment of participants, it might pay off to **organise a dedicated training session** in which tips and tricks to recruit people and **strategies on different user involvement** are shared to empower the recruitment teams.

Despite the strong efforts of the pilot teams, they did not always manage to achieve the originally requested number of 10 to 15 participants everywhere. We also noticed that in some pilots there was a **bias in participants**, in the sense that the targeted groups were not always reached. This can be partly explained by the COVID-19 pandemic, but on the other hand it can also be explained by the fact that sometimes recruitment was too one-sided through one channel. If you only appeal to people through online channels, there is a good chance that you will only reach people with digital skills. Also, if you spread your message mainly via one organisation, there is a good chance that you will reach a homogeneous group of people. That is why it is always important to **send out the recruitment messages through a variety of channels**, both on- and offline, and to team up with different organisations that are willing to help with the dissemination. If circumstances allow it, it pays off to organise some face-to-face events too. By doing so, chances of getting more diversity in the set of respondents are higher.

Attractive images, visuals and storytelling techniques are good instruments when recruiting. These should be applied more often.

We noted that participants and local organisations that helped with data collection greatly appreciated it when the results were shared with them. This also helps motivate them to take part in upcoming research activities. In the Antwerp pilot, a short meeting was organised to **share the most important findings** for the people that participated was warmly welcomed.

Some of the CoP-partners and other external parties that were involved in the user involvement indicated that the co-creation process is a **valuable learning process** for them as well.

When looking at data collection, before disseminating a questionnaire, it is important to ask at least one person of the target group to **proof-read the survey**. This can help detect obstacles or questions that are difficult to understand or might be misunderstood by the respondents.

Because each pilot has its own context, target groups and culture-specific aspects, they all required customised approaches and individual support. It was more time-consuming than expected to develop and create customised versions and to adjust all the questionnaires to the specific pilot contexts. In future projects, but also for the next co-creation phases in the INDIMO project, it is necessary to **foresee and dedicate enough time for the coordination of pilots and for the data gathering activities**.

Additionally, one of the most important findings of our study is that it is becoming **more and more difficult to apply user segmentation**: there are huge differences across user groups but also within user groups. Users across the pilots indicated that it is very important that the digital mobility systems have an appropriate level of 'personalisability'. A person's travel preferences can vary, depending on a specific context (travelling alone / with others, travelling for work / leisure, making a chain-trip or not, having access to public transport or a private car etc.). So when designing mobility services, it is necessary to **take into account the bigger picture** and these different aspects as well.

Based on these findings, we can state that the most important lesson learned when designing digital mobility systems is that they are **dynamic and customisable, while not increasing the complexity** too much. This balance is seen to be one of the most important challenges for improving digital mobility systems.

Another very important finding is that **short feedback loops** need to be created between developers and end-users in order to **realise 'quick wins' and short term improvements**. In future projects where there are similar technological developments, and in the next INDIMO co-creation phases, it is important to keep up with things and to pass them on quickly. Applying an agile approach can really add value and improve the services along the way.

Suggestions for the development and design of digital mobility solutions that were found in this study are:

- Optimise the possibilities to personalise the mobility services, based on someone's preferences and specific needs. Now most services are still too generic.
- Make it possible to **change settings easily**, as personal needs are dynamic and can change depending on the context and location (e.g. travel with or without children).
- In the pilots of Antwerp, Galilee and Berlin it is very important to **offer real-time** and specific information.

- Enable the integration of the **INDIMO mobility services** into existing services (e.g. public transport) and applications (e.g. by creating APIs).
- It should become much easier to **give feedback** on different aspects of the tools: on layout and design aspects but also on the user-friendliness of the dashboard as a whole.
- It is important to create clear instructions and tutorials, both on- and offline, definitely when using the service for the first time.
- Make sure people can ask for support when necessary. Preferred **assistance tools** are chatbots, helpdesks and service agents.
- Be able to **kill your darlings**: not every person or vulnerable-to-exclusion group is in need of a specific (digital) mobility service (e.g. ride-sharing service for people who can easily access public transport or have a car), or will only use it when a number of preconditions are met (e.g. blind people will only use a smart traffic light if the pathways around it and route towards it are safe).

And lastly, empowerment of users is key. In order to gain the trust of the pilot target groups, and of citizens in general, a **strong public-private cooperation** between the mobility providers and local governments / NGOs that support vulnerable-to-exclusion groups will be necessary. Local organisations with strong ties to the targeted end-users can help with creating campaigns to raise awareness and increase the feeling of trust of the (new) mobility services. This can definitely help to increase user acceptance and user uptake of the services and create win-win situations for all parties.

Another important way to empower the user, and definitely elderly people, is to make sure they receive **human support** when first trying the mobility services. They prefer to receive this support from someone they know, a family member, caregiver or someone from an organisation they trust.

The end-users indicated that a '**trustworthy label**' could also help to gain trust. We believe that it would be best, if this is taken care of on the EU-level, so there is conformity about the criteria that are used (ethics, sustainability, trustworthiness, external control and authorisation) also for services used when people travel abroad.

Last but not least, it is important to **enable easy feedback** so people can report if something is not working properly and ask for immediate support if necessary. This can also lift feelings of trust and **increase user satisfaction** substantially. Being able to score services and to see the reviews from others is seen as an important aspect to increase people's level of trust.

Annex 1 – Template questionnaire used in pilots

INDIMO PROJECT

End user survey questionnaire template

Before reading this document, please keep in mind the following:

- The survey template/draft below is the outline of the survey for gathering users' needs and requirements towards the digital mobile system from the **perspective of current users** of the service (or a similar service) in the pilot or people belonging to the target group.
- The survey is normally to be distributed to **10 to 15 users in each pilot** and user case study. It is not meant to be a hard-core survey (large numbers with representative selection) but to grasp responses from users with vulnerable characteristics with respect to their needs and expectations towards inclusive aspects of the current system. So that 'gaps' to work on can be identified.
- The survey responses are meant to complement the insights gathered from the interviews with stakeholders, desk research…

Welcome page

Hello,

Many digital tools have emerged the past years that promise the traveler a lot of new possibilities and personalized services at every stage of a journey. The INDIMO project believes that it is important that everyone can benefit from these digital solutions and can make fully use of them when moving around. That's why we need your help now. We need to understand the needs and attitudes you have towards the digitalisation of mobility services. By completing our survey the INDIMO researcher will be able to better understand your requirements towards these tools and make digital mobility services in Europe easier to use and more inclusive.

In total we ask you 30 questions. It will take you around 20-30 mins to answer them. For some questions you have to select an option from a list. For other questions the answer is more open-ended and we kindly ask you to write down your opinion or experience. There are **no wrong** answers. If you don't want to answer a particular question, please select "prefer not to say". For some questions you can also indicate that you don't know the answer.

You can complete the survey until 29t^h of March 2021. Your input remains completely anonymous but is very valuable and needed.

You can read more information about the INDIMO project on www.indimoproject.eu

 If you have a question, don't hesitate to contact our research team: (add details!)

Many thanks in advance to fill in this survey!

The INDIMO Team

Consent form and link to privacy declaration

A. Background and skills:

We start the survey with a couple of questions about your background and skills. If you don't want to answer the question, please select 'prefer not to say'. If you don't know the answer, please select 'I don't know'.

1. What is your age? *Please select from the dropdown list below your age group*

☐ 15-17
☐ 18-24
☐ 25-30
☐ 31-35
☐ 36-40
☐ 41-45
☐ 46-50
☐ 51-55
☐ 56-60
☐ 61-65
☐ 66-70
☐ 71-75
☐ 76-80
☐ 80+
☐ Prefer not to say

2. **What is your gender?**
   - Male
   - Female
   - Other
   - Prefer not to say

3. **What is your highest completed educational level?** *Please indicate from the list below your highest educational level*

   - Didn't attend school
   - Primary school
   - Secondary school
   - Bachelor
   - Master
   - Post-Graduate
   - Prefer not to say/don't know

4. **What is your occupation? ? Please select all that apply**

- I work 35 hours or more
- I work 25-34 hours
- I work 24 hours or less
- I am a full time student
- I am a part time student (less than 50% of my time)
- I am unemployed
- I am retired
- Other

5. **Which of the following tools have you used the past month?** *Please select each tool you used from the list below*

- Desktop computer
- Laptop
- Tablet
- Smartphone
- Apps (Google Maps, Local transport provider, …)
- Online banking
- Vending machines (at work or other public place)
- Landline telephones
- None of the above
- Prefer not to say

6. Which of the following tools do you own? *Please indicate the tool() you own from the list below. Multiple answers are possible*

- Desktop computer
- Laptop
- Tablet
- Smartphone
- Landline telephones
- None of the above
- Prefer not to say

7. **What modes do you currently have access to and do you use at least 1 time per month? (added)**

- *Bicycle*
- *Car (as passengers)*
- *Car (as driver)*
- *Scooter / step*
- *Bus / tram*
- *Train / metro*
- *Shared car, shared bike*
- *Other (please clarify)*

8. **How strong is the support you get from your social network (= friends, family, neighbors) for everyday e.g. to pick up orders, groceries and other basic needs?"**

- Very limited
- Somewhat limited
- just enough (not limited, not strong either)
- Quite strong
- Very strong

9. **Can you count on professional support (e.g. care givers) in your daily life to help you with for example groceries, help with cooking, help with administration?**

- No
- One time a month
- a couple of times per month
- on a weekly base
- on a daily base
- Some time a year

10. **Do you live in Monghidoro?**
- No
- Yes

11. **The average monthly income of my household is:** *(Please choose the option from the list below)*
    - Less than 1000 euro net a month
    - Between 1000 and 1500 euro net a month
    - Between 1501 and 2000 euro net a month
    - Between 2001 and 2500 euro net a month
    - More than 2501 euro net a month
    - Prefer not to say

12. **Are you currently having one of the following disabilities when moving around in your daily life?** *Please indicate the answer out of the options for each type of impairment.*

    - Visually impaired (I don't see well): yes - no - prefer not to say
    - Auditive impaired (I don't hear very well): yes - no - prefer not to say
    - Reduced mobility (I don't walk very well): yes - no - prefer not to say
    - Lack of Ability to carry goods (I can't carry normal weighted goods myself) : yes - no - prefer not to say
    - Other (please elaborate)

13. **In which area do you live?** *Please write it in the box below. If you don't want to tell it, please leave the box open*
    - Urban
    - Suburban
    - Rural

    B.) Goals, needs and user tasks

Please insert here a short explanatory text about how the digital locker system already in place of PI in other areas works and how it looks like. Maybe even integrate a short youtube movie? That would make it easier for people to see what is meant here.

With the following questions, we would like to find out your attitude and feelings towards a digital locker service.

14. **Have you already used a digital locker service in the past (e.g. in another city)?**

- Yes
- No

15. **Would you need assistance from someone to use a digital locker service?** *Please select the correct answer below*

  ○ Yes, I believe I would need assistance to use such a service
  ○ No, I believe I could use such a service without assistance
  ○ Prefer not to say

16. *For what reason do you need the assistance?* *Please specify in the box below*
  …..

17. **Imagine that a digital locker service would run in your area, please indicate which needs this service could possibly help you to satisfy (please select the three needs that are of most interest for you)**

  - reducing the distance and duration of walking and waiting time to pick up parcels or perform other operations
  - receive and send parcels in a safe place
  - perform several operations (e.g. parcel collection and payment of the bill) simultaneously, saving time)
  - to pay postal bills and top-up telephone and prepaid cards in various ways (digital and or physical) depending on the personal tools available
  - Facilitate sending and collecting parcels at convenient times (e.g. sundays, saturdays…)
  - Other: (please explain)

The digital locker system has different components: an application on your smartphone and the lockers themselves

18. **Which requirements should the digital application on the smartphone have according to you?** (please pick the 4 most important ones)

- The digital solution should be customizable to fit my personal needs

- The digital solution must have an easy registration system
- The digital solutions should send a notification when the transaction is correctly executed
- The digital solutions should take into account possible mistakes from the user and aloow an easy restart of the process
- The digital solutions should be available in different languages
- The digital solution should offers good remote assistance

19.. Requirements physical service (please pick the 4 most important ones)

- The service must be easy recognisable in public space
- The lockers needs to be placed on the right height
- The lockers must be installed at a safe place
- It should be possible to request for assistance 24/7
- It should be possible to have access to the locker also in weekends, evenings…
- The instruction on the locker display must be available in different languages (Italian, Spanish, Arab, Urdu…) and use familiar terminology
- The lockers must also be able to be used by people with visual impairments

----

D. Usability of the service

Thanks for your answers already so far. In the next section we are interested to what extent you are feeling that the service itself would be usable for you.

E. Users' perception of the service use demands and their ability to meet demands

20. In the table with statements below, do you think that you are able to meet the following demands and do you think that demand is too severe (constraining)? *Please indicate for each statement if this would be easy for you, not that easy, but doable , if it would be difficult for you or if you prefer not to say…*

Digital service demand	This would be easy for me	Not that easy, but doable	This would be difficult for me	Prefer not to say
I need to be connected to the internet				
I need to download an application				
I need a smartphone				
I need to register by providing a personal email and phone number				
Physical demand	This would be easy for me	Not that easy, but doable	This would be difficult for me	Prefer not to say
going to the city hall t to benefit from the service				
Making use of the tool without any support from my social network				
Making use of the system				

without worrying about safety aspects				
Financial demand	This would be easy for me	Not that easy, but doable	This would be difficult for me	Prefer not to say
If payment is only possible via credit/debit card/paypal	yes/no		yes/no	
If payment is only possible when you have a PI account				

What type of assistance would you prefer, when first time using such a system? Please choose the 4 most important ones

- Service agent (real person) from the service provider company that assists me first time I use it
- Chatbox in app.
- Helpdesk: remote assistance via phone
- Tutorials and clear instruction on location around the tool
- Tutorial in the website with clear instructions how to use it
- Someone from my social network (friends, children) that explain everything to me
- Someone from the local government, local social services, neighborhood that explains everything to me
- Free trial period
- …

F. Trust, safety and information security:

21. Which type of data do you think is sensible and you are not willing to share when using application or digital services? *Please indicate which data you don't want to share*

- Name
- Age
- Gender
- Address
- Income
- Health
- Credit card number
- Other, please specify:

22. What do you need to feel secure when using an online digital mobility service or download an app for mobility ? *Please select the items you need to feel secure from the list below:*

- Consent form
- A privacy declaration
- A specific label that guarantees trust
- Reviews/ratings from other users
- Advice from people I trust
- Other, please specify

23. Do you read the permissions a mobile app or online service sends you when using digital mobility services?

- Yes, I read them
- Only sometimes I read them
- I don't read them
- Prefer not to say

24. Do you currently use antivirus or anti-malware apps on your digital device(s)?

- Yes
- No

25. *Please indicate in the table for each category whether you strongly agree, agree, don't agree, strongly disagree with the statement. If you don't want to answer, please select prefer not to say)*

Trustworthiness of the service	**Strongly disagree (1)**	**Disagree (2)**	**Not disagree, not agree (3)**	**Slighty agree (4)**	**agree (5)**	**Prefer not to say**
The contract should inform me sufficiently about how my data will be used						
I would trust that the app will keep my information safe and not disclose it to third parties						
I doubt that the people responsible for the app will contact me immediately if they experience data privacy risks						
I trust that if I agree to share my data with third parties, it will be						

done ethically and responsibly						

27. **In order for you to gain trust to try out the locker system, what would help the most?** *Please choose the 4 preferred onces*

- Awareness campaign by the service provider / transport company
- Awareness campaign by (local) government
- Recommendation by help services / supporting organisations (eg medicins, social services, local associations…)
- Recommendations from people from my social network
- Good ratings/reviews by other users
- Free trial periods
- Other…(please clarify)

Ending of survey

You arrived at the end of the survey. We thank you for your effort and your contribution to our research project. Your answers will help us in improving the digital mobility system and make them more accessible to all.

The INDIMO project foresees the launch of **a second survey** next year to evaluate the improvements of the [DMS/DDS name] application.

Please tell us if you are available for us to contact you in order to evaluate the changes made thanks to your responses to this first questionnaire.

¨ Yes, I am available.
¨ No, I am not available.

The Indimo Team

Annex 2 – Informed Consent Form – End user survey Task 3.3

> INDIMO project

This Informed Consent Form has three parts:

- **Part I: Information Sheet** (to share information about the study with you)
- **Part II: Statement of Privacy and confidentiality** (to be signed by researcher)
- **Part III: Certificate of Consent** (for your signature if you choose to participate)

Part I: Information Sheet

You are asked to participate in a study included in the INDIMO project (EU Horizon 2020 No. 875533, https://www.indimoproject.eu/). Your participation is voluntary and you are therefore not obliged to participate in this study. If you do not wish to participate, this will not have any (negative) consequences.

You can ask the researcher questions at any time if something is not clear. Take enough time to decide whether or not you want to participate. You can stop your participation at any time (in writing or orally- see below for the contact details of the researcher) and you do not have to give a reason.

Below you can find more information about the study and how it will proceed. If you want additional information, you can contact the researcher and/or coordinator of the project.

This research is conducted and led by Evelien Marlier, within the INDIMO research group coordinated by the Vrije Universiteit Brussel (VUB).

Contact details

Researcher: Evelien Marlier

EPF Email: evelien.marlier@epf.eu

Telephone number:

Europan Passengers' Federation

Kortrijksesteenweg 304, 9000 Gent Coordinator of INDIMO project: Imre Keseru (email: imre.keseru@vub.be), Vrije Universiteit Brussel (VUB

Course and purpose of the study

This survey aims at collecting data for the purposes of the INDIMO-project: improving the accessibility and social inclusion of digital mobility services. The project in particular aims to break the barriers that people face in accessing digitally interconnected transport systems. The data will be analysed separately in order to fully assess the needs, capabilities, limitations and constraints for citizens like you. .

The survey does not have any commercial purpose. The involved participants do not receive any monetary benefits by conducting this activity. They participate on a voluntary basis and can withdraw from the activities at any time.

The survey results may be published in project reports, journal articles, conference presentations, and via any other mode of scientific exchange and dissemination considered appropriate, while protecting the participants' anonymity. Data collected will be published in anonymous form.

Participants' personal data (First and Last Name, E-mail address, IP-address, Gender, Level of education, language, income, nationality Current socio-professional category) will only be used by the INDIMO researchers for the purposes of the project.

Personal data will be collected, processed and protected according to the General Data Protection Regulation (GDPR) (EU) 2016/679. Participants will have the right to request access to and rectification or erasure of personal data. A restriction of processing concerning the data or to object to processing as well as the right to data portability is also possible, just by sending an email to the responsible of data treatment listed hereafter. Participants will also have the right to lodge a complaint with the supervisory authority indicated in Part II.

Part II: Statement of Privacy and confidentiality

During this research, personal data will be collected from/about you. I, Evelien Marlier , am responsible for storing and processing these data correctly and I have an obligation to inform you about it. For this reason, I draw your attention to the fact that I will collect First and Last Name, e-mail address, IP-address, Gender, language, income, nationality, Level of education and Current socio-professional category from/about you.

First of all, you must know that I as a researcher have an obligation of confidentiality in regard to the data that are collected. This means that I, for example in the context of a publication or conference, will never reveal your name or other information that might identify you. Individual results are never published.

Secondly, your personal data will be processed in accordance with the principles imposed by the new European General Data Protection Regulation (GDPR) that has been in force since 25 May 2018. I'm responsible for processing your personal data correctly and the VUB acts as the controller of the personal data. Data controller can be reached at the following phone numbers and email addresses.

Andries Hofkens

Data Protection Officer

T : +32 2 629 1099

M : +32 (0)498 345 271

DPO@vub.be – Andries.Hofkens@vub.be

Your personal data is collected and processed in the context of the INDIMO project. The collection and processing of your personal data is only possible if you give your explicit consent. I may only use your personal data for scientific research purposes.

You have the right to request access to and rectification or erasure of personal data or restriction of processing concerning the data subject or to object to processing as well as the right to data portability. If you have any questions please contact the researcher (Evelien Marlier) and/or project co-ordinator (contact details mentioned in part I).

To guarantee your privacy, a number of protection measures will be taken:

- The data and results that are collected from/about you are not anonymous in the first phase, therefore they are converted into codes or categories as quickly as possible. This means that a second data set is created. Only the researcher (Wim Vanobberghen) and the relevant INDIMO pilot partner (if needed) have access to the key of this code and therefore to the non-anonymous data. This ensures that only the researcher can link this data to you as a person.
- Audio recordings are converted to transcriptions as quickly as possible and then deleted. Additionally, any such audio recordings will always be taken with your

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875533.

page **117/122**

permission and in no way will exclude you from taking part in the survey if the permission is not given.

- Your data will be first stored on Typeform which is GDPR compliant. Data will be deleted on Typeform as soon as the survey response collection period is over and the data set will then be stored on the VUB server. An anonymized set will be transferred on the SharePoint of the VUB (Vrije Universiteit Brussel) . This is an online platform that is highly secured and has strict access conditions. Your data will not be saved on the personal computer or on a USB stick of the researcher and will never be emailed.
- Your data will (possibly) be shared with the consortium members of the INDIMO project. These members (except one) are within the European Union. In that case, agreements will be made to guarantee comparable guarantees. Access to data will be granted on a "need to know" basis and will not be extended any further than absolutely necessary. The data is stored for 5 years on SharePoint and for not more than the project duration on the other platforms. They are then deleted.

If you want to exercise your rights and/or have further questions about your rights and the processing of your personal data, you can always contact the Data Protection Officer of the VUB: dpo@vub.be.

Finally, you also have the right to submit a complaint about how your personal data are processed. You can do this at the Belgian Data Protection Authority that is responsible for enforcing data protection legislation:

Gegevensbeschermingsautoriteit (GBA)

Drukpersstraat 35

1000 Brussel

Tel. +32 2 274 48 00

Email: contact@apd-gba.be

Website: www.gegevensbeschermingsautoriteit.be

Researcher

I, the undersigned Evelien Marlier, researcher, declare that I have provided the required information about this study in written form published on the online survey form before the agreement/disagreement to take part in the survey must be stated by the participant

I confirm that no pressure has been exerted on the participant to have him/her consent to participate in the study, the participant has the right to withdraw his/her consent and I'm willing to answer any additional questions.

I confirm that I work in accordance with the ethical principles as stated in "The Code for Scientific Research in Belgium" and the ethical principles within my specific research discipline.

I confirm that I work in accordance with the legal obligations regarding the correct processing of personal data as stated in "General Data Protection Regulation (GDPR).

Signature

Date: _____01/03/2021_____

Part III: Certificate of Consent

Name and Surname of participant: _____

Organisation (if applicable): _____

E-mail address: _____

- ☐ I declare that I'm informed about the nature, purpose, duration, potential benefits and risks of the study and that I know what is expected of me.

- ☐ I have had enough time to think and I have been able to ask all the questions that have come to mind and I have received a clear answer to my questions.

- ☐ I declare to be aged 18 or older

- ☐ I understand that my participation in this study is voluntary, I have the right to withdraw my consent and that I'm free to stop my participation in this study without having to give a reason.

- ☐ I understand that during my participation personal data about me will be collected and that the researcher ensures the confidentiality of these data in accordance with the relevant Belgian and European privacy legislation (Cf. AVG or GDPR)

- ☐ I agree to the processing of my personal data in accordance with the modalities described in the "Privacy and confidentiality" section.

- ☐ I also authorize the transfer to and processing of my encrypted data in countries other than Belgium.

Choose what fits among the following two statements:

- ☐ **I agree** to take part in this survey.

- ☐ **I do not agree** to take part in this survey.

☐ I agree to participate in the study described and I have received a copy of the signed information and consent form.

Signature

Date: _____   _____

Annex 3 – INDIMO User Profiles

The INDIMO project's deliverable D1.1[1] describes the work covered to identify the user characteristics of the vulnerable-to-exclusion groups and the INIDMO user profiles that integrate more than one characteristic.

---

[1] D1.1: Framework for analysis of user needs, capabilities, limitations & constraints of a digital transport system

#	Pilot Project Owner	Pilot Name	User Profile(s)	User Characteristics/Target Groups Included (All or Most[2]) in the Profile
P1	Emilia Romagna	Introducing digital technology to enable e-commerce in rural areas	1st user profile: Older people who receive/send parcels	• Age: older people (over 65) • Lack of digital knowledge • Residing in peripheral locations • Lack of digital services • Lack of dedicated network infrastructure (e.g. bus stops, postal office, petrol stations.) • Limited access to transport services and commercial delivery services
			2nd user profile: Migrants or foreign people[3] who receive/send parcels	• Low economic conditions (assuming migrants from outside of Europe) • Lower level of education • Language barrier • Lack of digital knowledge • Residing in peripheral locations • Lack of digital services • Lack of dedicated network infrastructure (e.g. bus stops, postal office, petrol stations.) • Limited access to transport services and commercial delivery services
P2	Antwerp	Inclusive traffic lights	Vulnerable pedestrians	• Age: older people (over 65) • People with reduced mobility • People with reduced vision
P3	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	• Ethnic minority man/women • Residing in the periphery • Insufficient public transport services • Language barrier

---

[2] In case a user participating in the research does not meet all of the user characteristics, but he or her meet most of them – he or her can be included in the research.

[3] This user characteristic is based on reports of CMBO (2017) which state that the median income of foreigners in Bologna was about half, compared to that of Italians in Bologna. We have used the term "foreign population" and "immigrants" indicating people (both of Italian of foreign citizenship) that changed their residence from an external municipality to that of Bologna or one of municipalities in its area.

#	Pilot Project Owner	Pilot Name	User Profile(s)	User Characteristics/Target Groups Included (All or Most[2]) in the Profile
				• Lack of digital skills
P4	Madrid	Cycle logistics platform for delivery	Healthy food delivery users	• People with reduced mobility • People with reduced vision • Socially isolated (unwanted loneliness) • Not-connected people (e.g. Low digital skills, lower technology availability) • Low income • COVID-19 isolated with none or reduced number of daily trips allowed
P5	Berlin	On-demand ride-sharing integrated into multimodal route planning	On demand ride-sharing users	• Caregivers (children/ impaired/ elders) • Gender: women • Lack of services (reduced mobility) • Lack of digital skills (although owning a mobile phone) • Residing in peripheral locations

Table 4 - INDIMO D1.1: User Profiles and their characteristics