



D1.3 - Users capabilities and requirements

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Executive summary

The goal of this document is to show the process of grounding of the users' profiles and to expose the usage capabilities, requirements, and limitations that were found associated with each profile in the course of research conducted in Task 1.3 related to the potential use of the Digital Mobility services and Digital Delivery services. The INDIMO pilots were organized in the way of getting a better understanding of the reception of different mobility solutions by users and non-users. A great part of the findings of the research hinges on the collective learning that was created during the interviews, that allowed us to get insights from various users and non-users, different practitioners and other key actors and enlarge our vision on the subject. The main findings explored throughout this section are pilot-related; but there are some themes that go across pilots.

For all pilots, technology, if it is not accompanied by the right guidance and assistance, might be experienced as a barrier rather than as a facilitator. When digital applications do not tackle these adjustments to different populations in a clear way, traditional and learned paths to satisfy needs appear as the only alternative or, at least, as the preferred alternative. It was found that certain populations have gained some familiarity with some specific apps (for instance, older people with Whatsapp, cognitive impaired youngsters with Instagram), but learned it in a very automatic and instrumental way. This does not mean that the persons have a flexible approach towards digital tools that enables them to explore new domains of digital knowledge by themselves. It was found, as seems clear in the cases of Madrid and Emilia Romagna, that the lack of familiarity with digital tools leads to different fears associated with their use. These are mainly data privacy fears, fear of the lack of orientation or aid, the feeling of getting lost in the process or not being able to cope with so much information. But, in general, the digital experience is coupled with a physical experience with the service, and the two dimensions should not be separated. When users are already familiar with digital services (which is more and more common every day) and when they are offered the right tools for guidance, including the possibility of contacting human assistance, the digital tool opens a wide range of alternatives, new behaviours regarding mobility and food consumption, new paths of autonomy and of self-confidence. Digital tools are included in everyday practices in such a natural way that users are not completely aware of how embedded they are in their practices.

Another finding, interesting to be commented on, is that, independently of the type of user and the usability issues associated with this type, all kinds of users express values, principles and ideas about the world in their act of consumption/use. This was especially clear and shared by the Berlin and Madrid pilots. So, the offer should tackle the set of motivations and preferences which are expressed in the act of use and consumption, with which the individual identifies. A set that is not constrained to digital or physical usability.

Some insights that went beyond what had been proposed by previous literature are related to the identification of specific needs of women. Most of the literature about women and mobility focuses on the gender-biasedness of transport planning and the negative experience of threat and potential harassment of women in the public space and transport. An important insight of the study is to show that regular mobility services address a "male individual" user and do not

contemplate the specific needs of caregivers in charge of dependents, who most of time are women. Concerning physical disabilities, a new insight is that assistance appears as a two-fold aspect: as favoring autonomy or intruding in it; both as empowering or as undesired assistance. Thinking of accessibility of street crossings, many papers have connection with fluidity of vehicles circulation and there are not many articles that view smart traffic lights from the point of view of the pedestrians. Finally, we also identify foreign people as central potential users of the locker systems of parcel delivery, for satisfying some of their unmet needs.

Based on these learnings, we have elaborated a list of inputs for Digital Mobility Toolbox, that may assist on the development and deployment of the digital mobility and delivery services of the future, and we have produced the main requirements for the digital and graphical interface of the apps, associated to the populations sensitive to them.

Finally, because the world has been transformed by the outbreak of COVID-19 and the exceptional situations that arose with it, the response and accommodation of different users' profiles to this anomalous situation was also explored. It was found that COVID-19 has a dual effect in most of the pilots: it may increase the need of apps to avoid a perceived mobility risk. But also, the new scenario may be experienced as a barrier to a new exposition which is contained in the use of service. The details of these findings will be examined in the remaining pages.

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List of acronyms

Acronym	Meaning
AB	Advisory Board
ATM	Automated Teller Machine (i.e. cash machine)
CAQDAS	Computer Assisted Qualitative Data Analysis
DDS	Digital Delivery Service
DMS	Digital Mobility Service
EU	European Union
GC	The INDIMO's Guidelines for Cybersecurity tool
GDPR	EU General Data Protection Regulation
ICT	Information and communications technology
PE	The INDIMO's Policy Evaluation tool
PT	Public Transport
SSI	Semi-Structured Interview
UDM	The INDIMO's Universal Design Manual
UIL	The INDIMO's Universal Interface Language

1 Introduction

The main objective of the INDIMO project is to extend the possibilities and benefits of the new scenario of digital on-demand transport to those groups that currently face barriers to access and feel excluded from these new usages. Physical, cognitive, geographical, and economic accessibility and inclusion are challenges posed by digital interfaces, that hinder the potential of the new technology in the field of transport. There is a risk that new digital mobility and logistics services will not be available and accessible to all members of society. 22% of all European households still do not have access to broadband internet especially in rural areas. Mobile broadband penetration also shows a high variation within Europe with 70 subscriptions per 100 persons in Hungary as a lowest value. In some EU Member States, over 25% of the population still does not regularly go online. Almost 10% of EU citizens have never used the internet, with a high number of non-users among those with low education levels, aged over 55, retired or inactive (European Commission, 2020). This data shows that internet-enabled mobility is not an obvious choice for millions of Europeans although internet access is just one of the reasons why they may be excluded. The work aims at extending the usability of digital mobility services and digital delivery services to the app-based systems in order to bridge the existing usage gap. The project aims at having a wide variety of people covered by personalized mobility options that satisfy their needs.

1.1 The aim of the deliverable

With the objective of organizing the procedures of data collection, mainly through semi-structured interviews with users, non-users, and stakeholders, several dimensions were selected which aim at the **definition of user's requirements of the universal design manual for digital mobility services**. The identified dimensions in D.1.1 – Analysis Framework of User Needs, Capabilities, Limitations & Constraints of Digital Mobility Services- are the following:

1. Goals /purposes/ value of using the service
2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users)
3. Needs
4. Description of the workflow when using the digital mobility service
5. Usability of the service's digital interface
6. Usability of the service's physical interface
7. Skills / capabilities
8. Difficulties, limitations, challenges, and constraints
9. User's perception of the service use demands and their ability to meet the demands
10. Self-use, assist other or group use
11. Perception of personal data privacy and security
12. Safety perception
13. Perception of the service's resilience to crisis like Covid-19
14. Attitudes, feelings/ emotions, preferences and opportunities

These dimensions guide the workflow of the questionnaire and allow to organize the speech of the respondents in a coherent verbalized form (Annexes A1 and A2). They are also the main axes to organize the coding of the transcription, as it will be later seen. This work, along with journey maps and Personas created within Task 1.2, will enable the definition of use requirements of the universal design manual and Universal Interface Languages for digital mobility services and the creation of a set of recommendations for cybersecurity and personal data protection. Some suggestions have been identified as well for the policy evaluation tool.

In the current document, the focus will be on the methodological approach and strategy that was taken to carry out the fieldwork. It will present the way the questionnaires were elaborated, based on the proposed dimensions, and how the interviews were carried out. The interviews will be synthesized into the debriefing documents that will be at the basis of following process of Coding. The Thematic Analysis will be carried out for identifying users' capabilities and requirements.

1.2 Relationship with other relevant deliverables and WPs

The User capabilities and requirements deliverable D1.3 has been built-up thanks to the data collection pilot activities. Afterwards, the analysis of these data described in this deliverable will be used as inputs by the WP2 involved partners to feed the elements of the INDIMO Inclusive Digital Mobility Toolbox; to provide a framework for developers and policy makers to design and implement an inclusive digital transport system; to recommend ways and strategies to ensure data protection and cybersecurity in digital transport solutions; to help design digital transport solutions that are better tailored to vulnerable-to exclusion groups. The content of this deliverable will also be used by the pilot coordinators to nourish and provide feedback for their Communities of Practice to understand and identify the needs of target groups toward digital mobility and delivery solutions (WP3, task 3.2).

1.3 Task participants and sharing of responsibilities

Task 1.3 to which this deliverable relates to is led by cambiaMO with contributions from ITL, PI, IMEC, Technion, VIC, CoopCycle and Door2Door, providing the inputs from users and target groups in the pilots, from MBE and IMEC for the inputs from the case studies and finally from DBL, ZLC, Technion, IMEC and EPF for the methodology of data collection and analysis.

As part of the development of this task, a long iteration of calls and documents was carried out between cambiaMO and the other contributor partners for the definition of the several elements to carry out and organise the fieldwork, to report on the selection of the respondents according to the identified users' profiles, to proceed from transcriptions of interviews to coding and to the final thematic analysis performed for each pilot and case study.

1.4 Structure of the deliverable

This deliverable is subdivided into eight sections and three annexes.

After the introduction, Section 2 presents the current knowledge on the topic of this research, including the substantive findings and the theoretical and methodological contributions made in past research.

Section 3 describes the methodological approach and the way the fieldwork was organized and carried out, reporting on the selection of the respondents according to the identified profiles for each pilot. Section 3.2 describes the collection of data through the Semi-Structured Interviews and the debriefings compilation, while Section 3.3 presents the process of coding and the result of the codebook. It also covers the ways the transcriptions are coded for the thematic analysis.

Section 4 describes the results of the thematic analysis with regards to the characteristics of the pilots' profiles. It elaborates on capabilities, limitations, and requirements of the users within each pilot and profile.

Section 5 collects the results raised from the research, showing the inputs collected from the user experience for the Digital Mobility Toolbox that will be worked out, the main requirements for digital and graphic interface of the apps (and populations more sensitive to the requirement).

Section 6 points out the lessons learned, the difficulties to find target profiles for the interview and carry out the interviews, the warm welcoming by interviewees and the awareness of doing something relevant for vulnerable-to exclusion groups of population.

Lastly, Section 7 presents the conclusions of the whole research with the main insights for specific target group of people.

2 Literature review

The spread and social value of the ICT and the digital domain has given rise to new forms of exclusion and new problems of accessibility, which add up to those already existing in a physical pre-digitalized world. The concept of digital divide or digital exclusion was born, associated with the spread of digital tools for communication and organization of social life and the asymmetries of digital skills that actually exist among a variety of segments in the society. The digital divide is thus defined as the gap between those who have high access to digital tools and those who have low or no access at all, either because of not having access to the equipment, not having access to Internet connection, not having the adequate skills and capabilities or not feeling appealed by technology for doing everyday tasks in a different way (Saha, 2014). Following the work of Persaud (2001) the digital knowledge gap can be more than ten times the income gap around the world. This digital disparity has enlarged the distances in privileges and opportunities between different segments of society. The concept of digital literacy has gained visibility in the field of digital inclusion. While digital literacy has broadly been classified as skills and knowledge of diverse nature (e.g., Vanwysberghe, Paulussen & Verdegem, 2011; van Deursen and van Dijk 2010), the most advanced research has shaped it through the notion of self-efficacy (e.g., Helsper

and Eynon 2013). Self-efficacy is defined as 'the belief in one's capability to organise and execute the courses of action required to manage prospective situations' (Bandura 2010, 2).

The discussion over digital inclusiveness gained momentum along with the development of the concept of Smart Cities. In most of the literature Smart Cities use information and communications technologies to enhance its liveability, workability and sustainability (Eremia et al, 2017). Nevertheless, in the last years the notion of Smart City has drifted from a rather dominant technological approach towards a more human-based perspective, where accessibility and inclusiveness, as well as sustainability, merge in a new concept that brings new aspects to the debate. According to Nápoles, Páez, Panelas et al (2019) it is recognized that the mobility of people and the transport of goods imply major challenges for the continuously growing cities and that urban mobility policies must integrate technology in order to minimize the impact that mobility has on the environment and the quality of life of these systems. These demands of a new era imply the emergence of new resources, such as Big Data and the Internet of Things. But a social and human perspective must be committed in order to guarantee social equity, sustainability and inclusiveness of different vulnerable-to-exclusion groups.

Many authors have recognized that social exclusion and asymmetries of opportunities are important problems that need to be tackled by policies. In this context, an optimistic view of technology remarks the potential of digital tools to increase citizen's engagement (Newton, 2012) as long as they remove barriers from government and public interaction and information exchange. Discussions and developments about the potentialities of the Internet of Things as a new way to improve the everyday lives of people with functional diversity are extending more and more (Mulhari et al. 2015). Those who are more critical to the process point out the ineffectiveness of technology to address social inequity (Basiri, Azim, Farrokhi, 2017). There is a notable white space in the literature in the exploration of the intersection of technology, inclusion, equity and social sustainability.

Along with the problem of digital inclusion, there is a growing concern on the consequences of transport poverty on inequality. This is, the effect of the inaccessibility to mobility services in certain regions or for certain groups. The availability, accessibility and affordability of transport all have a major impact on people's ability to find and retain employment, to take advantage of opportunities for education, to access healthcare and to buy food and other needs (Frye, 2011). The lack of, or inability to use, mobility services is shown to be a factor sustaining poverty, unemployment, and other socioeconomic inequalities since it blocks access to these very same crucial opportunities (Lucas et al., 2012; Delbosc and Currie, 2011).

In the literature review, there is a shifting focus on some of the topics that we explore in this work. Lindeman et al (2020) explores the possibility of enhancing capacity for caregivers of older family members through technology. Majumder et al (2017) think of technology providing assistance for caregiving in the shape of embedded sensors and monitors, computer and decision-making platforms, sensors and actuators. However, there is still a lack of literature on all three relevant aspects together of caregivers, mobility and technology.

With regards to digital mobility of services for the care of children, Speroni (2020) studied in Los Angeles County the services of HopSkipDrive, a ride hailing app specifically designed for taking

children to school, HopSkipDrive operates in eight states and has transported over a million children. The author finds that the service contributes to compensate for the lack of general education transport services through a more equitable method of transport that opens opportunities for vulnerable-to-exclusion youngsters. Speroni points out the access to a flexible service that enables students to reach a wide range of destinations efficiently, which allows students to attend the best school for their needs, and not to be conditioned in this choice.

Concerning the inclusion of digital mobility and delivery services in rural areas and zones of geographical isolation, Choi, Schuster and Schoenberg (2019) explored how the aging population in Appalachia (Kentucky, United states) manages its transportation and the assistance that digital mobility can provide in the move towards a transition to non-driving technologies. The authors look for possible solutions to the challenge of meeting rural transportation needs. The findings of the authors affirm that digital-based mobility management could maximize the use of scarce but existing resources in rural areas. Besides that, the project should not depend only on private endeavour, but should also hinge on the partnership between government, non-profit organizations and private initiatives. Eckhardt et al (2020) affirmed that rural areas face challenges in the organization of mobility services as a result of spatial lengths, scattered population and less capillary flows of people and goods. Public transport services are often insufficient, unreliable and heavily subsidized. The present movements of urbanization and demographic transformation, along with a growing number of older people, will make matters worse—especially concerning statutory social and health service transportation and targeting specific segments, such as the elderly. Furthermore, according to the authors, the public sector's ongoing need to meet cost and environmental targets create additional challenges on the organization of transport services in rural areas.

In the domain of digital inclusion of people with physical disabilities, Tsatsou (2020) carried along an in-depth study of intra-disability diversity in the digital realm and the related role of individuality and selectiveness in the digital choices and experiences of people with disabilities. The author finds that while disability appears as one of the main barriers to digital inclusion, people with impairment's related attitudes, decisions and experiences are very likely defined by individuality and selectiveness, resulting in intra-disability diversity.

Gebresselassie and Sánchez (2018) conducted a thorough study on how smartphone applications tackle social-sustainability challenges in urban mobility. They focused on transport disadvantages experienced due to low income, physical impairment, and language barriers. They analysed a wide range of apps and concluded that the apps responded to social sustainability in mobility in two ways: (a) by deploying a universal design in general-use apps, including cost-aware features, and offering language options; and (b) by specifically developing smartphone apps for people with reduced mobility or vision. Their finding shows that some of the most used general-use apps, such as Waze, Uber, and Google Maps, includes accessibility features in their digital interface indicates two things: that accessibility is increasingly a consideration for smartphone app developers and that ICTs can be used for socially sustainable practices regarding mobility.

In the domain of digital mobility services targeting specifically women, there is not much yet elaborated. A great part of the literature on mobility services has a universal stance that refrains

from approaching the specific needs of women and the way digital tools can contribute to them. There are some pilots that, nevertheless, address these needs. Onono, Odhiambo, Congo et al (2019) carried along a pilot of 24-hour ride hailing system to increase access to maternal and new-born services of health, in an area of generalized transport poverty in rural Kenya. The main purpose of the study was to explore the ways in which the 24-hour transport navigation system affected their pregnancy and childbirth care-seeking experience, as well as the process of familiarity with the service

3 Methodology

The data collection has been performed via in-depth semi structured interviews (SSI) that have been developed upon the dimensions identified in D1.1 and recalled in the previous section. The following figure provides a framework of data collection and analysis, through qualitative data gathered at each of the 5 Pilots.

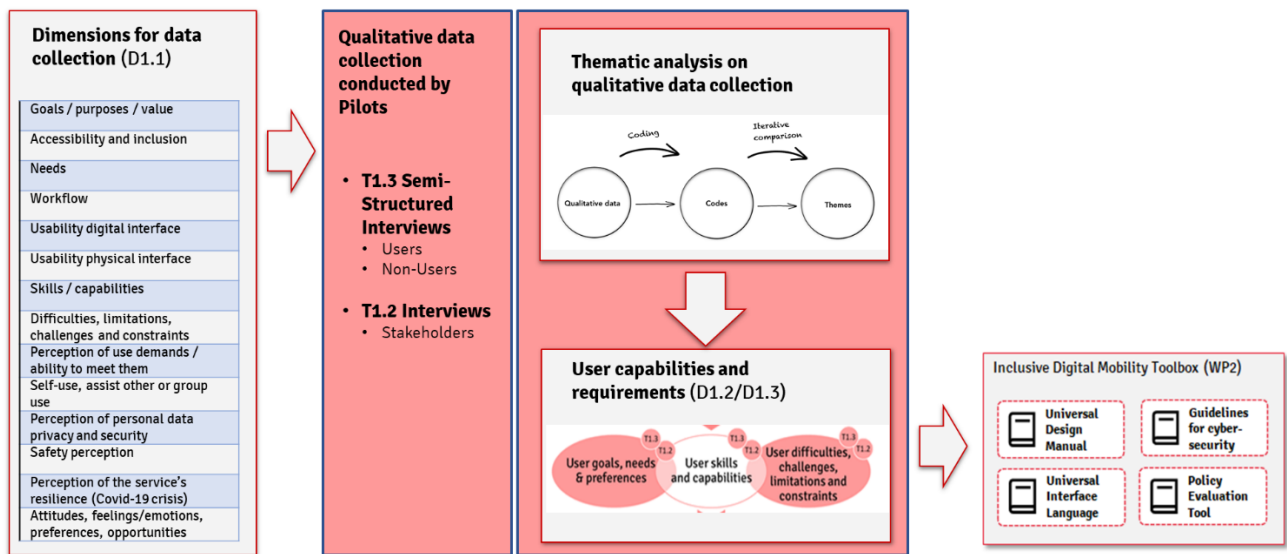


Figure 1. Framework of data collection and analysis

The target-group respondents of users and non-users were the ones identified for each pilot in D1.1. The following are the user’s profiles corresponding to each pilot:

Pilot name and location	User profiles (and characteristics)
<ul style="list-style-type: none"> P1. Introducing digital lockers to enable e-commerce in rural areas (Emilia Romagna-Italy) 	Older people and migrants/ foreign people who receive/send parcels (lack of digital knowledge; residing in peri-urban or rural locations; lack of digital services; lack of dedicated network infrastructures; language barriers; low income)
<ul style="list-style-type: none"> P2. Inclusive traffic lights (Antwerp–Belgium) 	Vulnerable pedestrian (older people; people with reduced mobility; people with reduced vision)

<ul style="list-style-type: none"> ● P3. Informal ride-sharing in ethnic towns (Galilee) 	Informal ride-sharing users (ethnic minority; women; residing in villages or rural areas; language barrier)
<ul style="list-style-type: none"> ● P4. Cycle logistics platform for delivery healthy food (Madrid-Spain) 	Delivery users (people with reduced mobility; people with reduced vision; people with mental health impairments; socially isolated-unwanted loneliness; not-connected people; low income; COVID-19 confined)
<ul style="list-style-type: none"> ● 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)

Table 1. Pilots' names and user profiles

To enhance our knowledge and understanding focusing on users with physical impairments, the INDIMO partner MBE, has conducted in Budapest, Hungary, a qualitative fieldwork of complementary interviews to collect information about the public transport use of people with physical disabilities. This will improve our focus on the specificities of impaired people with disabilities already included in P2 Antwerp and P4 Madrid. Three user groups were selected: people with reduced mobility, people with reduced vision and caregivers of disabled people.

Furthermore, to understand better the capabilities, limitations, and requirements of some of the addressed populations, it is sometimes needed to interview stakeholders, which are community organizations that work close with the target population.

Two different questionnaire templates have been elaborated for both users and non-users interviews and a third one for stakeholders' interviews. These questionnaires have been customized to the user profile and digital mobility/delivery service of each pilot (see Annex A2).

For each interview, a debriefing document was filled by interviewers based on the provided template. In the debriefing document the relevant fragments of each interview were included. In this way, the debriefing behaves as a summary with the highlights of the testimonies of the respondents. Afterwards, this text was used for the coding process and for moving forward on the Thematic Analysis (Rosala, 2019).

The entire process from carrying out the interviews to coding and to identifying relevant themes is graphically represented in the figure below and it is described in the following way:

- the **coding process**: in which relevant verbatims from interviews are labelled with appropriate codes to identify and compare segments of text that are about the same thing. These codes allow to sort information easily and to analyse data in terms of similarities, differences, and relationships among segments. The coding process has been conducted with the help of Quirkos CAQDAS (Computer Assisted Qualitative Data Analysis) software (<https://www.quirkos.com/index.html>)
- the **thematic analysis** is a systematic method of breaking down and organizing the identified codes for identifying and constructing significant themes (Rosala, 2019).

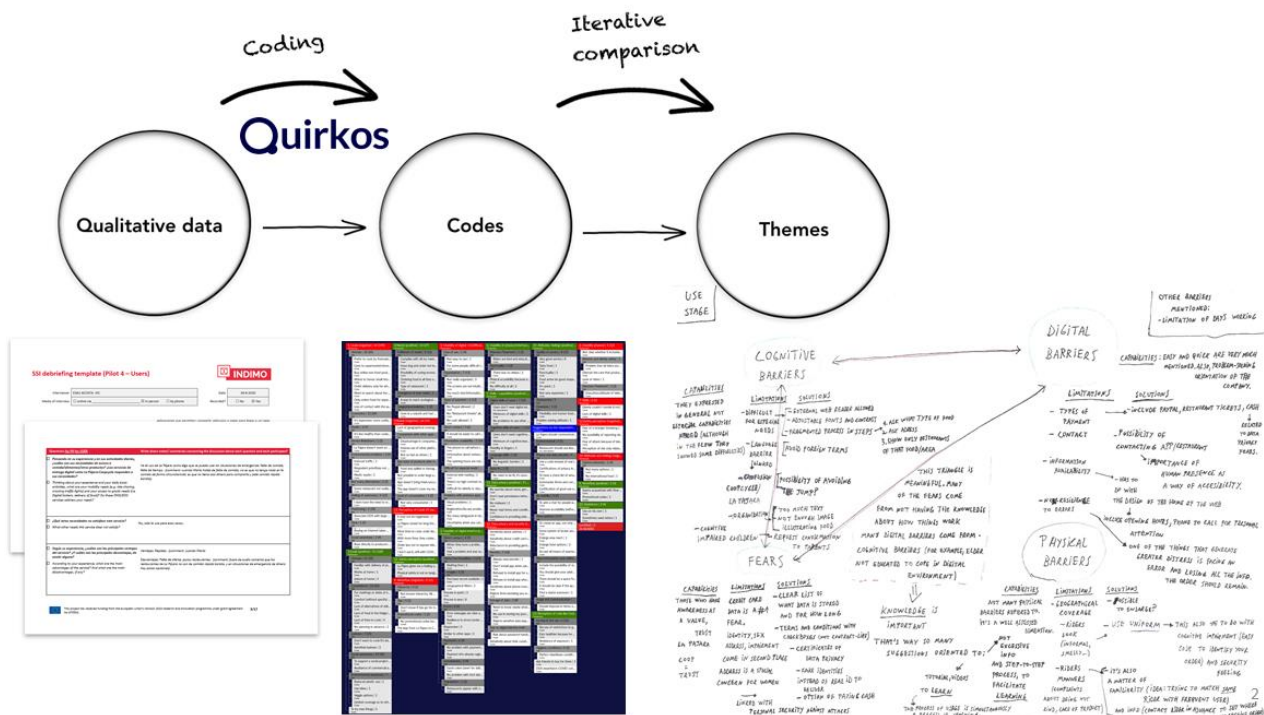


Figure 2. The process from interviews to coding and to identifying relevant themes

Furthermore, the capabilities, limitations, and requirements that match the user experience of digital services have been identified.

Finally, a list of inputs for INDIMO Digital Mobility Toolbox (i.e. Universal Design Manual, Universal Interface Language, Guidelines for Cybersecurity tool and Policy evaluation tool) is gathered.

3.1 Strategies for recruiting users, non-users, and stakeholders

The stakeholders were targeted to 1) narrate their experiences and perceptions about everyday work with the target group of population at risk of exclusion; 2) assist in the identification and contact of people that satisfy the sample requirements for fitting the users' profile for each pilot. The comprehension of the needs and requirements of the vulnerable-to-exclusion population towards technology would have been much difficult to obtain if directly addressing the target population, for example, in the case of people with a cognitive impairment. Speaking to stakeholders was a way of overcoming the difficulty to get detailed information which may be intrinsic to certain disabilities. Therefore, the interviews to stakeholders were included in our data base of users and non-users interviews for coding and supporting the interpretation of the users and non-users discourse. Annex 3 includes the list of the main characteristics of interviewed users, non-users and stakeholders including their identification for referring to the used verbatim.

With regards to the role of the stakeholders assisting in the contact of target groups, in the case of Emilia Romagna the stakeholders that contributed to access information are Lepida (in-house company of the Region of Emilia Romagna which provides network services), the Municipality of Monghidoro, the civil society organization AiBi, Unione dei Comuni Savena-Idice (Union of Municipalities including Monghidoro) and the SRM Reti e Mobilità (Mobility agency).

In the case of P2. Antwerp, the local partner first contacted local organisations of older people, people with reduced vision and people with reduced mobility (VFG, KVG, Okra, S+, Vief) in order to recruit respondents within their networks. In the first instance this contacting strategy was not successful due to the specific Covid-19 measures in the city of Antwerp that forced these organisations, often also working with volunteers, to focus on providing their key services to their target-group of population. Therefore, the local partner got in contact with INTER, the Flemish agency on inclusion and accessibility, that allowed them to recruit via their network. The local partner decided to keep the focus on Antwerp with some extension to similar Northern Belgian cities such as Gent, Leuven and Brussels in order to facilitate the data collection, and because the Smart traffic lights projects was associated with this city.

In the case of P3 Galilee, interviews with stakeholders were conducted, mainly with representatives from public agencies and civil society organizations, such as: the Chief Scientist Israel Ministry, the Smart Mobility Initiative from the Prime Minister Office, a transport planner (involved in the app development), the Ad & Marketing Company (involved in the launch of the app), and Kayan, a Feminist Arab Women organization.

In the case of P4 Madrid, the selection of the sample of respondents was made in close collaboration with VIC and La Pájara, who contributed specially to identify users of the delivery service platform and app CoopCycle / La Pájara. The stakeholders' interviews include the Andaira Coop., that coordinates the municipal "Unwanted loneliness project"; the NGOs Down Madrid and ASINDOWN, that work with cognitive impaired people; the organization ONCE that works with people with reduced vision; the foundation ONCE that works with generally impaired people and the organization Caritas, which works with socially vulnerable-to-exclusion segment of low-income population. Stakeholders were interviewed, representatives of people that still do not use specifically the app/platform service of CoopCycle / La Pájara and possibly have experience at using other digital delivery apps.

In the P5 Berlin pilot, the strategy to find non-users was based on snowball referral. The responsible of the pilot in Berlin, door2door was in contact with FrauenNetz, a network of women projects in the neighbourhood of Marzahn-Hellersdorf, and Haus Matilde, where the users' tests will take place. After the first referral, a snowball effect took place to interview non-users that fit into most of the characteristics according to Berlin's user profile.

The responsible of the pilot in Berlin interviewed experts that work around women's mobility and digital innovation and inclusion, such as a user-centric designer, urban design strategist, women mobility expert and researcher of the Technical University of Berlin.

3.2 Collection of data: Semi-Structured Interviews and Debriefings

In the following step, after contacting the respondents and stakeholders' organizations of users and profile-fit non-users, data were collected with the focus on goals, needs, capabilities, difficulties and the rest of the dimensions already explored in section #1. The data collection was carried along by semi-structured interviews (SSI). Most of the interviews had a duration between 60 and 75 minutes each. Along with the collection of the information, the researchers had the opportunity of completing a journey, including comments and annotations about the feeling they had during the performance of the interview, and other observations that were underlying the interview.

Interviews were conducted between the end of August and January 2021 at each Pilot location. They were conducted in two modalities according to Pilot's specific circumstances, especially determined by COVID-19 restrictions and preferences of people interviewed. When possible, a face-to-face interview was preferred while the online modality was chosen alternatively using different means: video conference platforms such as Zoom, Skype, Teams for people familiar with the digital world; WhatsApp or by phone for people lacking digital skills. The table below includes the typology of respondents and the number for each group of respondents per pilot.

		Pilot					Case	Total
		P1 Emilia Romagna	P2 Antwerp	P3 Galilee	P4 Madrid	P5 Berlin	Budapest	
Stakeholder interviews (T1.2)	face-to-face	2	0	2	0	0	0	4
	online/phone	3	5	3	5	5	0	21
	Total	5	5	5	5	5	0¹	25
SSIs U-NU interviews (T1.3)	face-to-face	10	0	5	6	1	11	33
	online/phone	0	11	9	7	9	1	37
	Total	10	11	14	13	10	12	70
Stakeholder and SSIs U-NU TOTAL		15	16	19	18	15	12	95

Table 2. Details of SSI conducted within each pilot

A specific procedure and protocol concerning the tools used for data collection has been elaborated and can be consulted in Annex A1.

¹ Stakeholders' interviews in Budapest have been exclusively used as input of Task 1.2.

After collecting the expressed consent by the interviewees, each interview was recorded for the later completion of the debriefing documents.

The debriefing was the document where the relevant fragments of each interview were included, by dimensions and questions. In this way, the debriefing behaves as a summary with the highlights of the testimonies of the respondents. This text was used to code and to move forward on the thematic analysis of the qualitative collected data (Banner, DJ; Albarran, JW, 2009).

3.3 Coding process

Before moving on the thematic analysis, and in order to have the possibility of making comparisons and reaching a greater uniformity in the presentation of data, cambiaMO provided the pilots with a codebook template including a proposal of initial codes and articulations of codes (nets). A code is a word or phrase that acts as a label for a segment of text. A code describes the main context of the text and is a shorthand for more complex information. It summarizes and makes compact this information (Maguire & Delahunt, 2017). Once codes are assigned, the procedure facilitates the identification and comparison of segments of text that are about the same topic. The codebook was reflecting the various D1.1 dimensions that organized the collection of data, but split into positive and negative aspects for facilitating the organization of the information. This served as the base for the codification, which aimed at identifying recurrent and relevant topics in the analysis. Different verbatim from the respondents ended up, after the process of coding, associated to a single code or multiple codes. The codes allow researchers to sort information easily and to analyse data to uncover similarities, differences, and relationships among segments. We can then arrive at an understanding of the essential themes.

The software Quirkos was used for coding. Quirkos is a CAQDAS (Computer Assisted Qualitative Data Analysis) to make the process of coding easier. It is designed aiming at ease of use and a quick and clear visualization of data, using colour codes and spatial organizations with a hierarchy view or a grouping view. Quirkos program allows to include statements from the different categories of respondents (user, non-user and stakeholder) and coupling or differentiate them during and after the coding process. In addition, Quirkos allowed INDIMO pilots to simultaneously and interactively working during their respectively coding processes (St John and Johnson, 2000).

The way codes are assigned and articulated is presented in the following figure, with examples of verbatim and the code obtained.

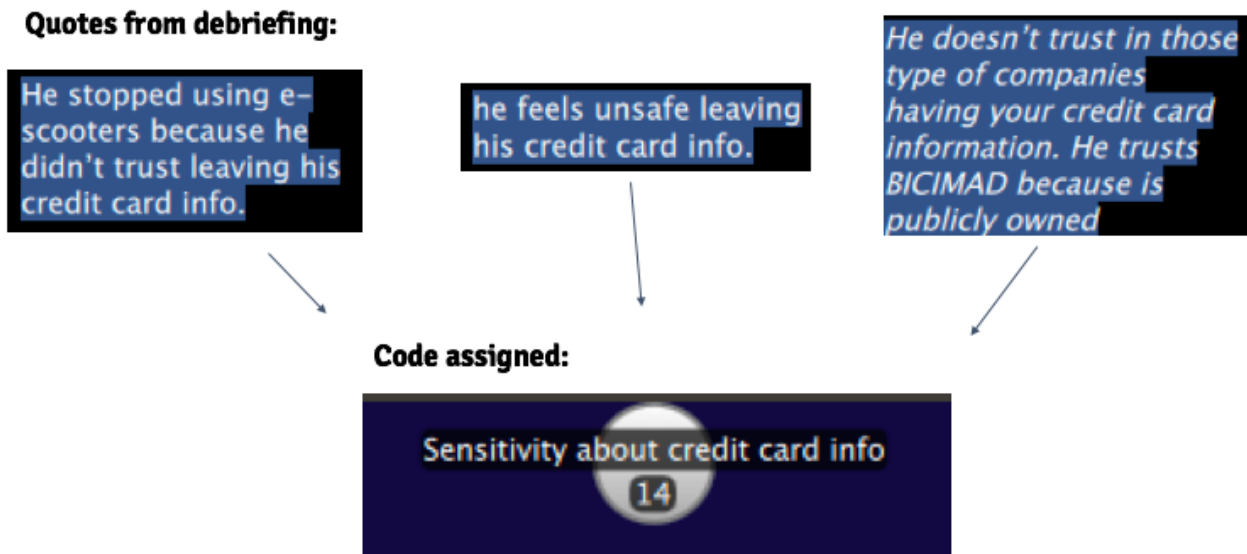


Figure 3. Example of technique used for codes definition

In the example above, it was found in different testimonies and from different respondents verbatim that are signalling a concern about the use of credit cards and the provision of the related information. Thus, this common concern was identified and created a code that could unify captured related verbatim. So, the above shown verbatim were associated with the code “Sensitivity about credit card info”. It is possible to see that there were 14 other fragments of speech associated with the same code.

The analysis moves forward from singular to the most general, it is a process of finding common ideas and generalities. So, since there are a great number of unrelated multiple codes, codes will be grouped by similarity into articulations of codes, named *nets*. A net allows us to group different codes in a meaningful way so as to contribute to a hierarchy in which we ascend to a greater level of generalization. The net behaves also as a visual aid to make simpler the complexity of data. An example of a net articulating several codes is included in the following figure.

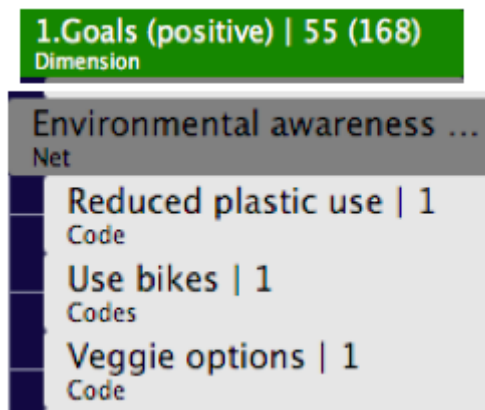


Figure 4. Example of a net articulating several codes

First, all the dimensions could be split into positive (includes codes related to positive comments) and negative (includes codes related to negative comments). A positive comment is understood as a mention by a respondent related to the service tested in the pilot or digital services in general that facilitates the implementation of Digital Delivery Services/Digital Mobility Services (DDS/DMS). In contrast, a negative comment is understood as a mention by a respondent about the service tested in the pilot or digital services in general that hinders the implementation of DDS/DMS. In the case when a code is neither positive nor negative, but it is rather a suggestion from the users, it could be indicated that it is a suggestion (using the colour blue instead of red or green). The first classification of the codes was, thus, determining whether the code was associated with a positive or a negative remark. In the following case, “Reduced plastic use”, “Use of bikes” and “Veggie options” were all positive aspects; they were all valuable items of CoopCycle / La Pájara service in Madrid. Therefore, they were included in the dimension **Goals (positive)**.

So, just as an example, during the Madrid interviews there were comments about CoopCycle / La Pájara making an effort to reduce the use of plastic packages in their delivery as a driver to use the delivery service. Then there was another comment about the firm using their own bikes as a positive aspect. And there was a third comment about the availability of vegetarian options. A code was assigned to each of the following comments as shown: “Reduced plastic use”, “Use bikes” and “Veggie options” (code’s name may contain shortened words to simplify and be efficient). These three codes have something in common, and grouping them by the common underlying factor is a way of facilitating the reading of the data. So, the net “Environment awareness” is a way of articulating the ideas of reduction of plastic, the use of bicycles and the availability of vegetarian options in a single concept. This is our net, included in the dimension “Goals” (positive).

The process of grouping several codes into a net may be further described with the following examples.

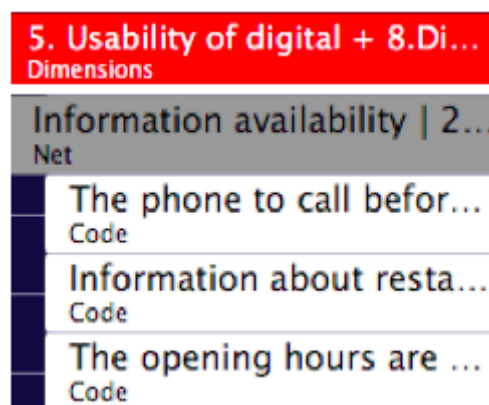


Figure 5. The process of grouping several codes into a net

In this example it is possible to see that there are three codes that are related to the information given by the app/web page: “The phone to call before the order arrives wasn’t clear”, “Information about restaurant was missing” and “The opening hours are not at the beginning of the page”. The common underlying factor of these codes is the difficulty of the users to access information about

the restaurant, the phone numbers, the opening hours etc. These codes are articulated into the net "Information availability". This net "Information availability" is, at the same time, included in the dimension "Usability of digital interface (negative)", since it is the articulation of codes associated with negative remarks.

The following table presents a summary of the most common codes by dimension and by pilot, showing the recurrence of mentioning, so as to understand the weight it had on the whole discourse.

Dimension	P1 Emilia Romagna	P2 Antwerp	P3 Galilee	P4 Madrid	P5 Berlin
Goals/ purposes/ values	<ul style="list-style-type: none"> -Little/no e-commerce use (8 mentions) -Don't use deliveries (7 mentions) -User of digital/online material and resources (10 mentions) -Interesting for foreign people (6 mentions) -No time limitation (6 mentions) 	<ul style="list-style-type: none"> -For planning route and timing in advance (9 mentions) -For inspecting accessibility (8 mentions) -For all destinations (5 mentions) -For walking and public transport (further trips) (4 mentions) -Decision not to walk when bad weather (3 mentions) 	<ul style="list-style-type: none"> -For going to university/study (10 mentions) -For going to work (10 mentions) -I don't have the need of ridesharing (10 mentions) -For going to medical service (5 mentions) -Arab/family social consent (3 mentions) 	<ul style="list-style-type: none"> -Goes to supermarket/ stores by themselves / search of autonomy (20 mentions) -Avoidance of commercial apps (18 mentions) -It's expensive / more costly than cooking (13 mentions) -Don't want to cook (6 mentions) -Enlarge food options (4 mentions) 	<ul style="list-style-type: none"> -Use bicycles (9 mentions) -Prefers to take private car (7 mentions) -Cheaper than taxi (5 mentions)
Accessibility and inclusion (reasons for not using the service)	<ul style="list-style-type: none"> -Needs assistance to use technology (15 mentions) -No need to buy online (6 mentions) 	<ul style="list-style-type: none"> -Restricted destinations: bad road infrastructure (2 mentions) 	<ul style="list-style-type: none"> -Give feedback to developers about accessibility (3 mentions) 	<ul style="list-style-type: none"> -There should be human assistance to arrange details (5 mentions) -Offer alternative of WhatsApp/ Phone number (4 mentions) -Include auto-filling/ suggestions by the app (4 mentions) 	<ul style="list-style-type: none"> -Enlarge the service to support chained trips (4 mentions) -Offer guideline, tutorial (4 mentions) -Needs marketing targeting these populations (4 mentions) -Prefer to have information on paper (4 mentions)
Needs	<ul style="list-style-type: none"> -Reaching remote areas (5 mentions) -Facing difficulties to get around (4 mentions) 	<ul style="list-style-type: none"> -Length of time to cross should be extended (10 mentions) -Bad designed traffic light: no sufficient time (9 mentions) - Uneven pedestrian roads / puddles (8 mentions) -Crucial information: how long do I still have green light? (6 mentions) -Gap between pavement and road (edge/corner) (5 mentions) -Bad designed 	<ul style="list-style-type: none"> -Ride-sharing enables fulfilment of my existing needs (7 mentions) - Ride-sharing helps overcome geographical isolation (4 mentions) -Woman prefer using a ride-sharing service with a woman driver (1 mention) 	<ul style="list-style-type: none"> -I don't have the need to order food/ I can go myself (7 mentions) -Lack of geographical coverage of the app (5 mentions) 	<ul style="list-style-type: none"> -It needs to be punctual (8 mentions) -Does not operate in their area (5 mentions)



Dimension	P1 Emilia Romagna	P2 Antwerp	P3 Galilee	P4 Madrid	P5 Berlin
		<p>traffic light: button at bad height (5 mentions)</p> <p>-No good view / sight of cars, flows and crossing (3 mentions)</p> <p>-Design public space: street furniture (3 mentions)</p>			
Workflow	<p>Don't understand what to do (2 mentions)</p>	<p>-Bad pedestrian lane / crossing lane quality: use bike path or roads instead (1 mention)</p> <p>-Bad street edges at crossings: make a detour to other crossroad (1 mention)</p>	<p>- I am acquainted with the ride-sharing App flow (5 mentions)</p>	<p>-Not really organized (4 mentions)</p> <p>-Too much text /information (4 mentions)</p> <p>-Flow not step-by-step (4 mentions)</p>	<p>-Difficulties with location and driver (6 mentions)</p>
Usability of digital interface	<p>-Inadequate equipment (11 mentions)</p> <p>-Old mobile phones/ no smartphones to use the service (7 mentions)</p> <p>-Low/ lack of web coverage service (4 mentions)</p> <p>-Useful functionalities (3 mentions)</p> <p>-Process is easy (3 mentions)</p>	<p>-Artefact: easy to forget it (7 mentions)</p> <p>-You need to care about memory, battery and connectivity (7 mentions)</p> <p>-The artefact may generate a stigma (5 mentions)</p> <p>-Mobile app: no operations needed (5 mentions)</p> <p>-Difficult for older people or people with reduced vision (4 mentions)</p> <p>-Camera: no action required (4 mentions)</p>	<p>-App for Arab women (4 mentions)</p> <p>-Should be easier to get help and call the support centre (4 mentions)</p> <p>-Link to social media registration needed (4 mentions)</p> <p>-Problems of location features in rural areas (4 mentions)</p> <p>-Difficult for special needs (3 mentions)</p>	<p>-No cash/PayPal/ restaurant tickets allowed (8 mentions)</p> <p>-Difficulty for older people or people with reduced vision (7 mentions)</p>	<p>-Ability to provide child information (9 mentions)</p> <p>-Doesn't inform if there is a child seat available (6 mentions)</p> <p>-Include possibility of saving favourite destinations (5 mentions)</p> <p>-Be able to call the driver (5 mentions)</p>
Usability of physical interface	<p>(not relevant)</p>	<p>-Mobile app / phone: uncomfortable use in wheelchair (5 mentions)</p> <p>-Extra information: need for a uniform approach (3 mentions)</p> <p>-Button: not easy to know they exist (2 mentions)</p>	<p>-Problem with men drivers (2 mentions)</p> <p>-Need support agent (2 mentions)</p>	<p>-For comprehension, riders should speak with short sentences (5 mentions)</p> <p>-Poverty of dwelling (3 mentions)</p> <p>-Riders should be punctual not to generate surprise (3 mentions)</p>	<p>-Have the right equipment for children (9 mentions)</p> <p>-Need more space in the car (4 mentions)</p> <p>-Driver should support (6 mentions)</p>

Dimension	P1 Emilia Romagna	P2 Antwerp	P3 Galilee	P4 Madrid	P5 Berlin
		mentions) -Button: problems with height of the button (2 mentions)		mentions)	
Skills/capabilities	-Language barriers (generic) (10 mentions) -Lack of familiarity with digital applications (9 mentions) -Words in English (4 mentions) -Not able to use smartphones and Apps (7 mentions) -"Not skilled enough" because of his/her age (7 mentions)	-As easy / simple to use as possible (9 mentions) -Inform via media, social media and/or organisations (6 mentions) -Others lack digital skills (2 mentions) -Involve mobility trainers (2 mentions)	-Map and location reading skills (7 mentions) -Language skills (6 mentions) -Minimum of digital skills (3 mentions)	-Don't need digital skills/ Need minimum of digital skills (6 mentions) -Don't need cognitive skills (5 mentions)	-Be able to use an app (6 mentions) -Explanations should be in easy language (3 mentions)
Difficulties/limitations (with previous apps)	-Understanding procedures (7 mentions) -Difficulties with digital payments (4 mentions)	Not ashamed to ask for help (2 mentions)	-Missing mapping of locations support (3 mentions) -No Arab language support (2 mentions)	No direct contact (4 mentions)	
Self-use, assist other or group use	-Use on his/her own (4 mentions)		-Use on his own (5 mentions) -Already used apps like this one (3 mentions)	Empowers autonomy (4 mentions)	Use on his/her own (5 mentions)
Data privacy and security	-Sensitivity about personal data (generic) (10 mentions) -Sensitivity about credit card info/ financial position data (7 mentions) -Don't understand personal data management and protection (4 mentions) -No worries about name, gender etc (3 mentions) -Confidence in providing personal data if for a clear purpose (2 mentions)	-Know the company to trust and share (5 mentions) -Shared data needs to have a purpose (4 mentions) -They know too much about you (2 mentions)	-Sensitivity about credit card information (8 mentions) -Sensitivity about giving the address (6 mentions) -Sensitivity about giving the phone number (2 mentions)	-Sensitivity about credit card info (15 mentions) -Sensitivity about address (6 mentions) -Rejects firms bombing you with ads (4 mentions) -Include certifications of privacy in the use of cards (2 mentions)	-Sensitivity about credit card information (9 mentions) -Confidence to provide data for a clear purpose (8 mentions) -Paypal is more secure (5 mentions) -Sensitivity about child information (3 mentions) -Summarize clearly terms and conditions (4 mentions)

Dimension	P1 Emilia Romagna	P2 Antwerp	P3 Galilee	P4 Madrid	P5 Berlin
Safety perception	<i>(not relevant)</i>	-Non target users misuse service in their advantage (3 mentions)	-Fear of a stranger breaking in (3 mentions) -Fear of attack because of being woman (1 mention)	-Fear of a stranger breaking in (4 mentions) -Fear of attack because of being woman (3 mentions)	-Safety due to digital registration (4 mentions) -Safety because it's from the government (4 mentions) -Feels generally safe (4 mentions)
Reliability	-Need to trust the tool/ app (3 mentions) -Trustworthiness of the service provider (8 mentions)	-Light has to work without excuses (5 mentions) -Information status traffic light: integrate in Google Maps (3 mentions) -Easy ways to report (2 mentions) -Information status traffic light: informed when it's fixed (2 mentions)	-App is trustworthy (5 mentions)	-App is trustworthy (9 mentions) -Need word of mouth to trust (3 mentions)	-App is trustworthy (5 mentions) -App does not show accurate information (2 mentions)
Perception of COVID crisis	-Avoid queues (4 mentions) -Social Distancing (4 mentions)	-Getting no assistance when outside (6 mentions) -Dependent on yourself (2 mentions) -Does not want strangers to touch their wheelchair (1 mention)	-Health safety concerns (6 mentions) -Don't use it because of the COVID-19 (3 mentions)	-Increase in use of DDS (net) (9 mentions) -Delivery may not be hygienic (3 mentions) -App should communicate that it follows COVID protocols (1 mention)	-Fear of entering enclosed space (7 mentions) -Fear of not knowing if previous/current occupants were exposed (6 mentions) -Safe if social distance can be kept (4 mentions)
Attitudes and feelings	-Positive attitude/perseverance (9 mentions) -Attitude due to cultural habits (3 mentions) -Too complex (4 mentions) -Fear of being ripped off (4 mentions) -Anxiety/Fear of unknown things (4 mentions)	-Broader public space is more important than the light (5 mentions) -Potential usage: Yes but no special detour (2 mentions)	-Positive attitude (9 mentions) -"Not for me" attitude (2 mentions)	-Very good service (8 mentions) -"Not for me" attitude (5 mentions)	-Social tolerance with children (14 mentions) -Service is for young people (13 mentions) -Children safety (10 mentions) -Not know how people will react to children (7 mentions)

Table 2. Most common codes by dimension and by pilot (Red= negative Green=positive Blue= suggestion)

4 Thematic analysis

Thematic analysis is a systematic method of breaking down and organizing rich data from qualitative research by tagging individual observations and quotations with appropriate codes, to facilitate the discovery of significant themes. As the name implies, a thematic analysis involves finding themes (Vaismoradi et al. 2013). A theme is a description of a belief, practice, need, or another phenomenon that is discovered from the data that emerges when related findings appear multiple times across participants or data sources (Maguire & Delahunt, 2017). The workflow implies associating verbatim of the respondents to codes, codes are included in nets by similarity, nets are then included into the stated dimensions. And the combination of these elements, by interpretation, guide us in the elaboration of themes, having in mind that the main pillar of themes are capabilities, limitations, and requirements for the end users (Nowell et al. 2017).

One thing to clarify is that the theme is the result of a qualitative interpretation. There is no fixed formula to reach each theme (Braun & Clarke, 2006). The analysis of multiple respondents of different profiles, the recurrence and intensity of certain fragments of speech, the relevance that respondents give to each piece of discourse and the experience of researchers together with their previous knowledge guide the interpretation.

Given the specificities of each pilot and the fact that the service proposed is different in nature, this thematic analysis will be conducted pilot by pilot. Thus, every pilot is a sub-section from this broader section of thematic analysis. Then a summary of the thematic analysis and of the main findings per pilot is presented. A comparison of themes among various pilots and their points of contact concludes this thematic analysis section.

4.1 Emilia Romagna pilot (P1). Digital lockers for e-commerce in rural areas

4.1.1 Themes identified

In the Emilia Romagna pilot (P1) five themes have been identified. In the following sections they are described in details and correspondent dimensions, nets, and codes are mentioned.

Theme 1. DIGITAL BARRIERS

P1.Th1 DIGITAL BARRIERS	<p>Older users tend to feel frustrated and overwhelmed by technology. There are intense fears that the connection between the device/app and the locker is not straightforward.</p>	
	<p><u>Finding:</u> for certain groups, tech is seen as a problem to overcome, rather than as a facilitator. There is a combination of generational issues with idiosyncratic aspects of life in rural areas.</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<p>Older people interviewed recognize that:</p> <ul style="list-style-type: none"> ● Gaining awareness of his/her own capabilities is an important starting point to approach new digital applications. ● A positive attitude towards digital technologies and applications prepares older people to learn how to use them. 	<p>Physical limitations:</p> <ul style="list-style-type: none"> ● Reduced vision ● Difficulty using touchscreen. ● Speed at which the windows/objects move within an application. <p>Other barriers:</p> <ul style="list-style-type: none"> ● Language barriers. The use of English words or technical language increases older people’s feeling of uncertainty. ● “Not being interested because I don’t need it” The feeling that it is difficult to change rooted habits that have worked across the person’s lifetime. 	<ul style="list-style-type: none"> ● Creating a positive attitude through communication. ● Provide a strong case that can motivate users. ● Importance of local peer volunteers, as trusted communicators. ● Assistance for older people, especially in the start-up phrase. ● Partnership with local associations ● Remote service operators. ● Voice-assisted menu. ● Free number to call in case of need.
	<p>Learning process:</p> <ul style="list-style-type: none"> ● It is difficult to change the way people have done things most of their lives. It involves a change of habits and way of thinking. 	

According to their previous experiences with digital applications in general, older people pointed out their need of assistance to start using services that are provided in the digital locker. They are aware of the difficulties they could face, especially at the beginning. The availability of initial

and trusted support that provides them with an explanation of the functioning and functionalities of the service reassures older people and reinforces their positive attitude towards something perceived as convenient and challenging at the same time. The emphasis is the need for assistance in person, with someone that can explain directly what to do and how to deal with technology.

It is important to point out that “older people” does not necessarily relate to the age group but rather the familiarity that they have with the digital world. For example, as found during the SSI, parents who are 50-60 years of age might also experience the anxiety related to this theme.

Another issue present is the lack of familiarity with the digital world. The digital locker will require users to understand its functioning, procedures and perform other actions (downloading an app, dealing with the digital identity). When given a rough description about the procedures to use the locker, it was clear that the familiarity with the digital devices was a major theme for all target groups. For some of the interviewees it was clear that learning about new things could be a painful and frustrating process. The required effort is perceived as overwhelming and not worth it, because reluctance to change rooted habits is present. People therefore develop uncomfortable feelings generated by the encounter with the digital world. Also, there is the concern (from those who support the introduction of the service) that people will be discouraged to use the locker after the first time, if the initial experience was not positive.

To introduce the digital locker to older people in an effective way, it is important to effectively communicate the service to older people, to create a positive attitude towards the new functionality. Effective communication should be adapted to older people's reality, clearly explaining what the digital locker is for in their daily life and what advantages it can offer.

Since the older population differs internally, it is important to clearly identify which is the older adults' group to be addressed. Different communication approaches have to be built up according to these characteristics. The communicator has to be recognized as a trusted person. Local peer volunteers have been identified as “the best people to convey information” because of their direct relationships and knowledge of the territory and its inhabitants.

It is important to design a service around the digital locker that includes several possibilities to provide older adults with assistance, especially in the start-up phase. Several types of personal assistance have been suggested by the respondents. For example, creating partnerships with local associations that can operate as facilitators to introduce and “mediate” the service. Local facilitators/ volunteers should train older adults – especially the frailest ones, at risk of exclusion – first of all in using a smartphone and digital applications, secondly the digital locker. This training aims to explain and encourage digital locker use. The involvement of local peer facilitators would enhance trust in the service, especially for older people. Other possible actions:

- Guaranteeing assistance from remote service operators;
- Adding a voice-assisted menu for people with reduced vision or, more in general, an audio guide to help people to follow the process requested;
- Guided procedure using animation on the display;
- Establishing a toll-free number to call in case of need;
- Including audio/ video tutorials for “smarter” seniors (from the digital point of view) in the smartphone application;

- Audio feedback, notifications and warnings could be useful when accessing the system with specific credentials. Feedback and notifications aim at reassuring the older user.

The fear of “complicated things” which is linked to the lack of familiarity with the digital world is arguably one of the most difficult points to address, because it is rooted deep down in human nature to feel uncomfortable with unknown things and, unless there is a strong motivation to change, people will not switch their mindsets. In this sense, it is important not only to introduce the locker in an effective and friendly way, but also to provide a strong case that can motivate users to change their habits and approach the service. Some examples of motivation could be:

- It is a lot more convenient to use the digital locker (in terms of money, time-saving, reduction of queuing...)
- Using the locker provides a sense of autonomy, of competence and accomplishment
- I can rely on an additional service that allows me to do my errands and stop by without hassle to the locker

This theme is based on the combination of dimensions, nets, and codes:

Needs	Difficulties (with previous apps)
Needs assistance to use technology	Visual impairment
Safety perception	Direct contact
Safe because he was helped	No human behind
Skills/ Net: language skills	Understanding procedures
Words in English	Orientation difficulties with webs
Language barriers	Criticalities in the use phases
Lack of technical language	Difficulties with digital payments
Skills/ Net: lack of digital skills	Assistance
"Not skilled enough" because of his/her age	Understanding procedures
Not able to use smartphones and apps	Problems in using the ATM machines
Disoriented by technologies	Attitudes and feelings
Lack of familiarity with digital	Too complex
Difficulties to manage offers from the mobile operators	Positive attitude/perseverance
Accessibility and inclusion/ suggestions	Person available to support users
First use person assistance	Partnership with local associations as facilitators
Remote assistance	School to support service introduction
Guided procedure	Families to support service introduction
Tutorial	

Table 3. Dimensions, nets, and codes used to build the P1.Theme 1. DIGITAL BARRIERS

Theme 2. GEOGRAPHIC AND INFRASTRUCTURE ISSUES

P1.Th2 GEOGRAPHIC AND INFRASTRUCTURE ISSUES	<p>There are positive and negative comments associated with the geography of the rural place of the pilot. A digital service could shorten distances; people in rural areas tend to have logistics problems and a new online offer could tackle them.</p>	
	<p>At the same time, it is clear from the responses that in rural areas the connection to the Internet is poorer. Because of idiosyncratic elements, devices may not be updated.</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<p>In less populated areas there is currently a convenient use of digital delivery services</p> <p>There is a gap to fill: in remote villages, it takes great energy to pick up shipping or mail and there is no network currently supporting them.</p>	<p>Income of foreign families to afford an internet connection</p> <p>Willingness to buy a mobile phone/device when it is not seen as necessary, from the point of view of older people.</p> <p>Only some functions of the mobile phone are used and perceived as helpful.</p>	<p>Strategic placement of lockers: villages are dispersed, but there is some aggregation point of communities (e.g., local bar)</p> <p>Infrastructure: need of address by the institutions and the service providers.</p> <p>For the uptake of digital devices, it is not a matter of owning one but rather feeling competent in using it. (e.g. training)</p>
<p>Awareness that rural areas have a lower level of internet/connection coverage compared to the city</p>		

The theme of geographical issues and inadequate infrastructure is twofold. On the one hand, rural areas suffer from the lack of infrastructures and services. Internet connection is poor, the signal does not provide a stable and sufficient connection. Rural residents do not enjoy the same level of services that is granted to those living in urban areas, and there is a general awareness about this limitation. This aspect of inadequate infrastructure is seen as not easy to change, because it is the institutions or service providers that should update and improve connection services.

On the other hand, this theme is about inadequate equipment. Many older people do not own (and indeed do not wish to own) a smartphone. When they do, it is usually their relatives who provided it to perform simple actions with the recommendation of not doing anything else. The fact that they own a device, does not reflect the capability of using it. This is a big issue that limits some categories of older adults to access digital mobility services, as suggested by the representative of the Monghidoro municipality: “If you do not have a smartphone, the service cannot be used” (P1_Stake1_01_Monghidoro municipality).

Foreign rural residents usually have lower income and the Internet connection is a cost. They prefer to browse and access services from their mobiles: foreign people tend to be more acquainted with technology and use it to communicate with their relatives in other countries or find specific goods that they do not find close by.

But geography also implies an opportunity: disperse villages and low-density areas have more logistics problems; individuals make greater efforts in order to pick up mail or shipped products, and there is no current network that fits their needs.

This theme is based on the combination of following dimensions, nets, and codes:

Usability of digital interface/ Net: inadequate equipment	Needs/ Net: geographic isolation
Old mobile phones/ no smartphones to use the service	Reaching remote areas
Low/ lack of internet coverage service	Accessibility and inclusion/ suggestions
Usability of digital interface/ Net: Ease of use	Device physical positioning
For some people, difficult to browse with mobile	

Table 4. Dimensions, nets, and codes used to build the P1.Theme 2. GEOGRAPHIC AND INFRASTRUCTURE ISSUES

Theme 3. FEARS (distrust on data management)

P1.Th3 FEARS (distrust on data management)	Especial concerns about the use of the data by service providers, about receiving unsolicited commercial information, and sensitivity about financial data (credit card number, bank account and so on)	
	<u>Findings:</u> the more vulnerable the group, the greater the concern about data management.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Recognize the importance of personal data protection as a starting point to pay attention to GDPR. The respondents learn more about it and ask for assistance when dealing with online interactions that request the use of sensitive data (e.g., payments, credentials use).	<ul style="list-style-type: none"> • Older people’s lack of familiarity with digital technologies; • Older people’s lack of trust in truly managing and protecting their own personal data when interacting online; • Information concerning GDPR (e.g. consent forms) are too complex to be correctly understood without assistance. 	Consent forms concerning personal data protection should be simplified (3- points policy?) Notifications, warnings, other types of feedback could be useful to reassure online payments (make sure the operation had a successful outcome) Presence of a trusted guide or tutor at the locker point strengthen trust. At the beginning, providing service for free as an incentive to clear out doubts

Very often, people see the regulations such as GDPR as too complex to understand and easy to fool (from the company’s side), when the regulations were originally meant to protect their personal data. During the interviews it was clear that many people, especially older people, do not trust the system related to data protection, nor they understand it. When they were presented with the consent form, they regret that in any case they would not know what their data was used for. Many older people claimed that, without their consent, much information about them was already available publicly (e.g., address, income). Also, they gave many examples of how they received lots of commercial information and felt that they had no power to change that. So, some older people prefer to avoid and accept to share personal data only when they see someone in person: “I prefer not to accept anything I cannot interpret correctly”, pointed out a non-user of advanced age.

Older people’s data sensitivity especially concerns information related to their financial positions, e.g., current account numbers and card numbers. This aspect strongly discourages them to shop online or make online payments. Facing their lack of familiarity with the digital

world in general and the perception of not fully understanding how to properly use digital solutions and the effects of their actions (i.e. being afraid of doing something wrong), they prefer to renounce to make online payments to avoid risks (e.g. card cloning, data steal, etc.). Concerning foreign people, many of them do not have the language skills to fully comprehend a text of 2-3 pages explaining GDPR issues. They trust the person that has given them the consent form.

This theme is based on the combination of dimensions, nets, and codes:

Data privacy and security	Reliability
Sensitivity about personal data	Need to trust the tool
Sensitivity about credit card info/ financial position data	Untrustworthiness of the service provider
People already know my data without my consent	Be sure the operation was successful
Don't understand personal data management	Trustworthiness of the service provider
No worries about name, gender etc.	Accessibility and inclusion/ suggestions
Confidence in providing personal data if for a clear purpose	Notifications to reassure
Awareness of importance of personal data	The guide of a trusted person as a trusted mechanism
	Service for free as incentive

Table 5. Dimensions, nets, and codes used to build the P1.Theme 3. FEARS (distrust on data management)

Theme 4. CULTURAL AND ETHNIC IDENTITY ASPECTS

P1.Th4 CULTURAL AND ETHNIC IDENTITY ASPECTS	In this pilot, the language barriers are especially relevant, much more highlighted than in other pilots. At the same time, there are many positive or negative items related to the service that are linked to the condition of foreign people.	
	This theme encompasses favourable points (there is a need and interest of foreign people on courier and delivery systems) and barriers (language and cultural barriers).	
CAPABILITIES	LIMITATIONS	REQUIREMENTS

<p>Foreign people are used to exchange mails and products with their families back home.</p> <p>They are fond of receiving ingredients to prepare the food from their land, as an example.</p>	<p>There are foreign traditional families that hinder the use of the Internet among their children.</p> <p>There are typical problems of new-comers such as not having a credit card to operate.</p>	<p>Availability of language choices considering communities of foreign people.</p> <p>School to support service introduction. Children can mediate for the adoption of parents’ use.</p> <p>Set the locker far from the scrutiny of foreigner’s communities and family (to ensure autonomy).</p>
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There are many cultural and ethnical identity aspects that are conditioning the adoption and potential use of this locker (Ariza, N., & Maya, J. 2014). The language barriers were pointed out by respondents, but it should be interpreted twofold: first, it may imply difficulty for the use of the app (as long as it does not have the language options that could facilitate the reading, in accordance to the national communities present). But secondly, it also skips the interaction between foreign people and the postal office personnel in a conventional setting. The locker could be a positive point to skip human interaction which entails, not only the language barriers, but also the shame of the person to make him/herself understood in front of other native speakers (the clerk, the public present). A positive background for this implementation is that sending and receiving parcels is a current and established practice among foreign people, in order to be in touch with their relatives, to receive ingredients to prepare their traditional local recipes that cannot be found in Italian supermarkets. This is relevant for Pakistani, Indian and other Eastern communities which are found in Emilia Romagna.

Of course, in this cultural and ethnic theme, the barriers imposed by traditional families who have a close grip on the consumptions of their children should be included. As a stakeholder who observed the behaviours of the Pakistani community, there should be special strategies targeting the engagement of the digital service by members of these groups, since families tend to be more closed and patriarchal. If the lead (the “head of the family”) does not allow the use of Internet or specific functionalities of devices, the son and daughter might own a mobile phone but have some applications forbidden. They know what is not for them, and they refrain themselves from using the forbidden functionalities. It is important then to place the lockers in strategic points away from the influence and scrutiny of the traditional communities, to give them space for autonomy

This theme is based on the combination of dimensions, nets, and codes:

Goals and values/Net lifestyle	Goals and values/ Net: conditioning traditional family
To send money to their countries	Not allowed to use
Receive correspondence and parcels	Family doesn't support skill development (gender)
E-commerce (experience)	Accessibility and inclusion / Suggestion
Receive correspondence during vacations	Language choice
	School to support service introduction

Table 6. Dimensions, nets, and codes used to build the P1.Theme 4. CULTURAL AND ETHNIC IDENTITY ASPECTS

Theme 5. ALLOCATION OF TIME

P1.Th5 ALLOCATION OF TIME	One of the main assets of this service is something intangible but at the same time very costly: time. To be more accurate, flexibility in the use of time. It has to do with avoiding queues, with the distances, with the autonomy.	
	<u>Finding:</u> there are two important claims when it comes to time allocation: saving time and allowing a flexible use of time.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
The incentives that people usually have to avoid queueing are reinforced by the risk of COVID exposure.	The time-saving that the app implies can be obscured by the losses of time associated with difficulties on the navigation of the digital interface.	The locker should be placed in such a way that it maximizes the time of service.
Experience in sending money and parcels by foreign people and older people (a great need of contact with their families)		The time availability of the locker should go beyond the office hours of the Post office.
		Multifunctionality: it should also allow the user to pay bills, charge mobile phone cards, collect parcels and registered mails.

Concerning this specific DDS, convenience could regard several aspects of older and foreign people’s everyday life. In both cases, time-saving and time flexibility are the most relevant aspects. The digital locker is potentially available 24/7, even when the local post-office in Monghidoro is closed. It would facilitate to avoid queues at the post-office in the peak days (i.e. the Thursday market), when inhabitants of the local community reach the small town also from the far away hamlets. As the representative of the Monghidoro municipality underlined: *“The thought of being able to come to five, six in the afternoon and carry out an operation on the digital locker without anyone is certainly something that tempts them” (P1_Stake1_01_Monghidoro municipality).*

In terms of convenience, the digital locker is also appealing because it allows to pay bills, top up of mobile phone cards, collect parcels and registered mails. This, again, will avoid queues at the post-office, enhancing people’s autonomy and time availability.

Besides that, avoiding queues and avoiding interaction with the clerk is seen as a prevention of exposure amidst the COVID crisis.

It emerges from different dimensions/ nets/ codes:

Goals and values/ Net: convenience	Needs/Net: fulfilment of existing needs
Relieve relatives from errands	Facing difficulties to get around
Avoid queues	Have more time/ time flexibility
No time limitation	
Time-saving	

Table 7. Dimensions, nets, and codes used to build the P1.Theme 5. ALLOCATION OF TIME

4.1.2 Capabilities, limitations and requirements by pilot’s user profile characteristics

People living in peri-urban or rural areas

This characteristic is common to foreign people and older people living in Monghidoro so this paragraph introduces some generic findings about geographical isolation and not-connected people.

People living in areas such as Monghidoro do not enjoy the same level of service as in urban areas, and particularly they experience difficulties in connection/Internet services, difficulties in mobility with any transport mode besides the car. Monghidoro is spread out in many little fractions that have no connection between them and the centre of Monghidoro.

Unlike lifestyle in the city, there are few options for people in the rural areas to obtain certain services. This is a reality commonly accepted and inhabitants recognise that living in Monghidoro is much cheaper. The community of Monghidoro is quite tight, and there are often strong connections among people. The community is also active and engaged in many activities of different kinds, despite being a small village (3,700 inhabitants).

Older people

Capabilities. They are aware that the modern world requires skills and competences and, in many cases, they can see the need of using some services, both for entertainment or to meet their needs (e.g., chat with relatives). They heavily rely on younger generations to perform specific tasks related to technology and they are often “supervised” by their family. Older people in Monghidoro are often “natives”, and they are attached to their own home village. One of the non-user pointed out that he lives in a fraction of Monghidoro most of the year, but he spends the winter to go closer to the city during the winter because life would be much harder in his home in Monghidoro (e.g. house is old and harder to keep warm, streets are not accessible, overriding in this way the better cost of living of Monghidoro).

Limitations: They do not feel confident enough that they could proficiently use technology. They feel that many services offered by technology and e-commerce will not be beneficial for them, because they have their habits and tend to shop in a traditional way. Among the older non-users that were interviewed it was clear that the educational level could also have an influence. Those who had higher educational levels and were in the habit of reading were more positive to the use of the digital locker.

Anna said that she buys directly at the store because she's "very limited when it comes to "digital things"" - P1-NU-2

"The older people in Monghidoro do not use e-commerce so much" -- P1-ST-4

Requirements: To introduce the digital locker, it is important to foresee interaction in person to assist in the use. It would also be useful to involve the younger generation that can support in the acceptance of the new service/device.

Foreign people

Capabilities: From the interviews with the stakeholders, it is understood that foreign people are a wide group of heterogeneous people. The first migrants to arrive (e.g., Moroccans) have managed to integrate quite well. Latest arrivals (e.g., Pakistani) have a lot more difficulties, because they do not speak Italian and cultural differences clearly emerge. They are also much more attached to their own original traditions and culture. For example, they have large families in a patriarchal structure, where women enjoy little freedom and must go out accompanied by someone. We were told that one of the younger Pakistani interviewees had a relationship with a person from Monghidoro and later was asked to marry according to the tradition of her culture with a man she did not previously know. The income of these foreign families is also lower. One of the stakeholders mentioned that "Monghidoro is the new suburb of Bologna" because here housing is a lot cheaper and affordable for families.

Language is a strong barrier, especially for performing everyday tasks at the post office (some of the residents of Monghidoro mentioned that).

Foreign people seem more prone to e-commerce and online browsing for their own needs or to supply themselves with products they cannot find nearby.

Limitations: It was clear from the interviews with some users that their level of Italian was not good enough to allow them to elaborate on their thoughts and perceptions. It is perhaps not only a limitation related to the knowledge of the language but also the level of education, which often was a barrier in the interviews. It could be that this influences also the use of the digital locker. For example, in the interview with S. (woman from Nigeria) she often gave very short answers and even when encouraged to express herself she did not seem to find the words. She expressed the concern about how to interact and engage foreign people, especially from Pakistani community, where families are more closed and patriarchal, where the head of the family does not allow to do certain things. But kids and young people know how to use technology and smartphones, while for the interviewees, they are not allowed to use them. They have priorities

on how to use the digital technologies, they play with them, they use smartphones, but “*they are not allowed to use it for other things*”.

Requirements: migrants are in especial need of couriers and shipping systems to exchange money, parcels and local products with relatives in their countries of origin. At the same time language barriers make the interaction with the clerk more difficult and creates a scenario of exposure of the migrant in front of many native speakers of Italian. In that context, the existence of a locker is a barrier-breaker itself, since it satisfies needs minimizing at the same time the interaction in the language the migrant is not proficient in. But this service should be accompanied by language options that are customised for the different ethnic groups present (Moroccan, Pakistani, Nigerian etc). Another requirement has to do with the limitations that many children raised in a traditional family face. In some contexts, Internet might be censored or an implicit taboo. So, the school can be a vehicle of adoption where they can learn new knowledge away which is not fostered at home.

4.2 Antwerp pilot (P2). Inclusive traffic lights

4.2.1 Themes identified

In the Antwerp pilot (P2) five themes have been identified. In the following sections they are described in details and correspondent dimensions, nets, and codes are mentioned.

Since the technology of a smart traffic light benefitting pedestrians and in particular older people, people with reduced mobility and people with reduced vision is new, it was noticed that the respondents in general had the reaction of being, on the one hand, intrigued by the technological possibility, but on the other hand they dismissed any kind of hype around it and were rather cautious. Therefore, it was found that many themes are fields of tensions between two or many options that the path of technological innovation can take (i.e. more sensors on traffic lights able to recognize users' characteristics and needs or individual app for vulnerable users).

Theme 1. DIFFICULT EXPERIENCE OF CROSSING

P2.Th1 DIFFICULT EXPERIENCE OF CROSSING	The mobility of people with reduced mobility or vision, when not assisted by a friend, relative or even an assistant dog, is to some extent restricted.	
	Finding: The restriction depends on several factors and contexts (weather conditions, state of public infrastructure, obstacles, type of impairment), although a personality trait (curious, explorative, not afraid to ask for help to strangers) is also involved.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> • People on wheelchairs have more flexibility to discover areas and routes. • Visually impaired use avoidance strategies and memorization of routes. • Those with canes have a more positive feeling of security. • Possibility for autonomy: broader mobility depends on a network of friends and relatives. 	<ul style="list-style-type: none"> • Crossing a street is always stressful. • All users feel the green light has a short time. • Fear not being visible for car drivers. • General bad state of sidewalks. • They need additional info about the crossing (works in the streets? tram rails?) • Another limitation: their mobility depends on the weather (pushing a wheelchair isn’t easy when soaked). 	<ul style="list-style-type: none"> • Install system on meaningful roads from a user perspective. • Support detection of target groups by the traffic light. • Communicate status of lights (red/green) to users. • Extend length of light according to user’s needs. • Offer extra info on the quality of the road. • Communicate to user’s that smart lights are actually working. • The device should work at all times and not under demand.

The first insight is that the non-users indicate in the dimensions of goals (positive and negative) that their mobility, when not assisted by a friend, relative or even an assistant dog, is to some extent restricted. Various nets belonging to the dimensions of goals point to the reasons that can be detected for this situation of “restricted individual mobility”. The restriction depends on several factors and contexts (weather conditions, state of public infrastructure, obstacles, type of impairment), although a personality trait (curious, explorative, not afraid to ask for help to strangers) is also involved. In general, one can say that blind and people with reduced vision are more restricted than wheelchair users. Blind and people with reduced vision tend to follow several roads alone. These are routes they have studied – they know where the obstacles are placed, how to circumvent them, when to turn left etc. Those routes are situated in their direct neighbourhood (to necessary destinations as shops or services) or work-related. Following such

routes independently also demands a lot of mental concentration and focus. So, learning new routes is not an easy task as well.

Wheelchair users have more flexibility to discover other areas and can move more freely. But that capacity depends on the type of wheelchair - manual or electrical - and the accessibility conditions of the pedestrian sidewalks. All wheelchair users complained about the state of road accessibility in Belgium. In the case of older people, it is often a feeling of unsafe traffic conditions that limit mobility and, with aging, some "little troubles" that make mobility physically difficult. Also, general physical condition comes into play with older people as certain actions demand more effort compared to younger people.

Within the roads they take while walking without assistance, crossing a street is described as a situation that requires a lot of attention and can be incredibly stressful. Sometimes avoidance strategies are used to avoid the crossing, especially when it is a big road or there are no traffic lights present. In those situations, some non-users indicated to take other ways. This is especially the case for wheelchair users and people with reduced vision. As the dimension of needs (positive and negative) and the nets indicate, they all feel that the length of the green light is too short as they hardly arrive on time to the other side. They walk more slowly than the average pedestrian. Another common complaint is about the difference that needs to be bridged between the pedestrian walkway and the road that still exist at a certain amount of traffic lights. Thirdly, there is a concern for not being visible for car drivers (one can never know if a driver is not respecting the red light) or cyclists, especially those that need to turn right at crossroads and often start a few seconds earlier than other cars. Fourthly, extra information is required concerning the remaining time of the green light. Finally, although less present, there is a demand for extra information about the state of the crossing (e.g., tram rails, works), especially for people with reduced vision or blind. Particularly blind people also highlight that they need to know if it is red or green. If the light does not make a particular sound, it is hard to know for them and they need to rely on other sounds (car motors, pedestrian moving). The last is not 100% reliable all the time.

Capability: It was noticed in the interviews that non-users who state not being afraid to ask for help from strangers and having a more curious and explorative nature are more capable to move beyond certain routes on their own. This is especially the case for wheelchair users. It also depends on the type of wheelchair they use. For example, electrical wheelchairs allow for a wider range as it does not require an effort to push. What concerns people with reduced vision (and to some extent a part of blind people), the use of a cane is also correlated to a more positive feeling of security and safety as pedestrians and hence seen as a tool that fosters movement. Broader mobility (longer distances, trips beyond stores or administrations) depends on the network of friends and relatives.

Limitations: A general limitation is the bad accessibility of public space and pedestrian walkways. While blind and people with reduced vision refer mainly to obstacles (city furniture that is not set according to regulations, stores that put goods for sale on the street) and potholes, wheelchair users highlight that the pedestrian walkways are not flat, leading to situations where they might fall more easily. Some testified to take the edge of the road instead of the pedestrian walkway. The conditions of crossroads and traffic lights are not considered as better. Height of the button

to ask green light, bad positioning of the button forcing still to turn before crossing the street, a light too far from the crossing itself etc are all elements that limit people to cross in a safe and comfortable mood. 'Remediating' these mistakes demands time and hence more time to cross the street with the resulting negative experiences (Am I on time? will the cars notice me?)

Next to bad public infrastructure, a second limitation on mobility is the weather. Especially from autumn till spring, when it is cold and it rains/snows often, the three target audiences expressed that they either stay home or rather go on the move with friends or relatives (by car, train, public transport). Because they move slowly (blind people, older people) or they need to push the wheels of the wheelchair with their hands (manual wheelchair users), the target groups are suffering from the weather conditions more than other pedestrians (e.g., wet feet for blind people who cannot easily avoid potholes in the pavement).

Third, a limitation on the 'move' can happen at crossroads when the traffic lights are not working. It is currently not possible to know in advance if a light is active. Being confronted with such a situation means that a blind person (if trained for a detour) or a wheelchair user have to find another route and hence arrive late at the destination.

Requirements:

- Smart traffic light functionalities will have to be initially installed on traffic lights on crossroads along routes that are meaningful and important for the target groups.
- Smart traffic light system should clearly support the detection of the target groups in order to generate an appropriate intervention.
- Smart traffic light system should clearly communicate the status of the light (red or green) in an auditive way (via a sound or voice).
- Smart traffic light system should be able to extend the length of time based on detection of the profile.
- Smart traffic light can provide extra information on duration of green light.
- Smart traffic light can provide extra information on the quality of the crossing (objects, works) and the position of the person (which direction he/she is going).
- Intervention into the accessibility of the public space around the smart traffic light at the same moment of installation of the smart traffic light system is recommended in order to have an effect.
- A system (via open data that can be published in route planners) should be devised to inform people that the smart traffic light system along a certain road is working.
- Smart traffic light systems should work the whole time, regardless of moment (night-day) or time of the year (cold-winter, ...).

This theme was built with the following dimensions, nets and codes:

Goals and values/ Net: restricted destination	Needs/ Net: operational hours
Bad road infrastructure	No limited hours desirable
Obstacles on the road	Needs/ Net: bad designed traffic lights
Goals and values/ Net: bad weather	Not sufficient time of green light
Bad weather restricting wheelchair manoeuvring	Safety perception/Net: being detectable by others
Bad weather, decision not to walk	Am I detectable by others?
Restricting mobility	Safety perception/ Net: light has to work properly
Needs/Net: lack of crucial information	Negative effect on accessibility if light does not work
How long I still have green light?	People rely on the light
Needs/Net: bad quality of road infrastructure	You won't use it
Uneven pedestrian roads	
Gap between pavement and road	

Table 8. Dimensions, nets, and codes used to build the P2.Theme 1. DIFFICULT EXPERIENCE OF CROSSING

Theme 2. UNIVERSAL OR POPULATION-FOCUSED DESIGN?

<p>P2.Th2 UNIVERSAL OR POPULATION- FOCUSED DESIGN?</p>	<p>The question to what extent the design choices made during the smart traffic light development will benefit all people with an impairment or not.</p>	
	<p>Findings: the four options presented to respondents (mobile app, artefact, camera, or button) have pros and cons, and no option will completely please all the segments and personal preferences.</p>	
<p>CAPABILITIES</p>	<p>LIMITATIONS</p>	<p>REQUIREMENTS</p>
<ul style="list-style-type: none"> No action required is the most universal framework. The last is associated with a camera that detects characteristics. The preferences of users depend on: possession of digital tools, skills, personality traits. 	<ul style="list-style-type: none"> Other groups can take advantage and the device will stop being linked to people with disabilities (e.g., parents with strollers) If camera: high degree of training of the camera required. older people, cognitively impaired and people with muscle disease at the arm will have difficulties with manipulating mobile app. Mobile app can be forgotten. 	<ul style="list-style-type: none"> Involve target groups throughout the process. Preferably, no action demanded from user. No extra skills needed. As handsfree as possible. Not much data-consuming in the mobile phone. Dealing with forgetting and no charging.

What is at stake in this theme is the question to what extent the design choices made during the smart traffic light development will benefit all people with an impairment or will only be helpful to a certain group. The design of the smart traffic light was discussed by most of the non-users from two perspectives: from their own situation and from the perspective of the “other”, being either another category (e.g. the older people in case of a non-user belonging to the people with reduced mobility category) or other people belonging to the same category of the non-user. Questions were made about the intended feature from the viewpoint of possession of digital tools, of skills, of personality traits or of certain situations that highlighted that if a certain technological path was chosen that ignored these remarks, the risk was to forget the universal character of inclusive design. While it could be understood by the non-users that at a certain moment in the development path one needs to make a choice that could not please everybody, this choice should not be considered as an end point. This theme is emerging in the dimensions of ‘usability of the physical interface’ and ‘usability of the digital interface’. Here the various options were presented (mobile app, artefact, camera, or button) to allow the identification of the user and the implementation of the smart traffic light features.

Some traces are also found in ‘attitude and feelings’ dimension. Of course, every development track is about searching how to fit a technology with user’s needs and characteristics and part of the comments are reactions on a proposed technology to solve the issue of crossing a street more comfortably during green light. One reaction was to highlight that the technology could facilitate that other groups in society - for example parents with a stroller - could also take advantage of the light. The important insight from this theme is to make us aware that aspects should not be assumed without involving the target groups throughout the process and that the design process will be a continuous learning exercise given the novelty for each of the involved parties.

Capability: The non-users highlighted that the best solution would be one that is integrated in the light itself and does not require any action from the target audience. Working along this line has the advantage that everybody, regardless of the impairment, can be part of the solution and no capability is necessary. This aspect goes in the direction of a camera that detects a certain characteristic that is common to the target audiences (e.g., the speed of movement). The major challenge with this solution is to make sure that detection is done in a correct and adequate way, which requires a high degree of training of the camera. Since for non-users, other technologies pose limits (see below), it was noticed that those that have more digital experience, have a more positive stance towards technological solutions that require an effort from users.

Limitations: The codes relating to this aspect are directed associated with the older people, the cognitively impaired and people with muscle diseases at the arms. There are technical limits for the detection of vulnerable people with no visible traits. For the latter two groups, the barriers are physical and cognitive. For older people, the lack of possession of digital tools and lack of skills is highlighted. The second range of limits is found in the context of personality traits. A mobile application or an artefact can be forgotten at home. Or the user can forget to check a critical component such as the status of batteries, connectivity or memory.

Requirements:

- The smart traffic light system should preferably not demand any action of the user and detect him/her automatically.
- Any system should be easy to use and not require extra skills from the user.
- The smart traffic light system with camera-detection should work with a reliable and well-trained algorithm for detection.
- The smart traffic light system with a mobile application should be handsfree as much as possible.
- The smart traffic light system with a mobile application should technically not consume much data, battery power or occupy much space on the memory of the mobile phone.
- The smart traffic light system with an artefact should be light, non-obtrusive and simple to use.
- The smart traffic light system with an artefact should include an approach to prevent forgetting and prevent non-charging.

This theme is based on the combination of the following dimensions, nets, and codes:

Usability of digital interface/ Net: difficulties for especial needs	Usability of digital interface/ Net: camera (detection)
Difficult for elderly or visually impaired	Algorithm reliable
Usability of digital interface/ Net: mobile app/phone	No action required
Not inclusive	Detect all target groups
Not able to use while walking	Avoid stigma
Limitations on memory, battery, data	Usability of digital interface/Artefact
Requirement of not forgetting the phone at home	Easy to forget (artefact)
Usage makes you move slower	More reliable than an app
No operations needed	Easy to walk with (artefact)
Usability of physical interface/Net: mobile app/phone	Easy to lose (artefact)
Bad weather: uncomfortable to keep in hand	Attitudes and feelings/ Net: technical doubts
Uncomfortable to use on wheelchair	App technically not a good solution

Table 9. Dimensions, nets, and codes used to build the P2.Theme 2. UNIVERSAL OR POPULATION-FOCUSED DESIGN?

Theme 3. STIGMAS AND STEREOTYPES

P2.Th3 STIGMAS AND STEREOTYPES	This population desires not to be labelled by their condition. Some aesthetic characteristics of the proposed paths, particularly artefacts, contribute to the labelling because of the visibility of the solution.	
	Finding: a clearly visible and attached to the body solution, such as an artefact, is perceived as an extension of the body and, hence, an extension of the impairment.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<p>The population fosters autonomy: don’t want to be perceived as “in need of assistance” and doesn’t want to have devices attached that reinforce this need of assistance.</p> <ul style="list-style-type: none"> • Awareness that the length of traffic lights should reach a balance between the need of vulnerable groups and flow of transport. 	<ul style="list-style-type: none"> • Many of the solutions are quite visible and prevent users being perceived as “just one regular citizen”. 	<ul style="list-style-type: none"> • Include other groups such as parents with kids or strollers. • Avoid stigmatization in the design. • Work in co-creation with the target group, even for aesthetic and appearance choices.

Besides making choices in design with respect to which technology to use and how they might hamper or not accessibility and inclusion, non-users also pointed out firmly to the aesthetical part of the design. They need to avoid the feeling that they are labelled with their impairment. The danger of stigmatisation appeared especially in the dimension of usability of the digital/physical interface and in relation to the possible option of an artefact that has to be positioned on the body of the person. Concerning the light, particular signalisation that the spot is equipped with smart light infrastructure that supports certain user groups should avoid any stigma or labelling. In case of the artefact, the concern is that it will be very visible to other people and hence fix a certain label to users. Another way that people can feel stigmatized by the solution would be by granting too much time to cross a street. One non-user in a wheelchair explained that he feels actually very embarrassed that the traffic has to stop longer than normal because of him. It confronts him with his disability and also gives the feeling that drivers can start labelling wheelchair users as too demanding. An exaggerated length of time beyond a clear need should therefore be avoided.

The feeling of not being addressed too explicitly because of their impairment can also be discerned in the dimension of attitudes. It is a call not to think in stereotypical ways. Some non-users said that the smart traffic light is not only good for them, but also for other people, such as parents with a stroller. It is therefore wrong to only frame the problem of ‘extending the light’ as a necessity for people with reduced mobility or vision.

Requirements:

- The aesthetic design of the smart city light system should avoid any feeling of stigmatisation.
- The aesthetic design of the smart city light should be done in co-creation with people that represent or belong to the target group.
- The design of the functionalities of the light and the impact of its interventions should be based on clear needs.
- When designing the smart traffic light within INDIMO, it is important to also have an open mind towards opportunities with other potential interested user groups.

This theme was built with the following codes:

Usability of digital interface/ Net: artefact	Suggestions by respondents
Fear of stigma	Engage target audience through the project
Attitudes and feelings/ Negative self-perception	Assistance/ Net: assistance from attributes
Traffic has to stop because of me	Let others know you experience problems (white stick)
	Delegate responsibility to others (white stick)

Table 10. Dimensions, nets, and codes used to build the P2. Theme 3. STIGMAS AND STEREOTYPES

Theme 4. SCEPTICISM ABOUT ITS EFFECTIVENESS

P2.Th4 SCEPTICISM ABOUT ITS EFFECTIVENESS	Certain sceptical stance towards its concrete effectiveness	
	<u>Findings:</u> the main perceived obstacles to effectiveness are 1) the lack of quality public space around the traffic lights; 2) the lack of a uniformed vision and deployment (fragmentation); 3) the uniformity not restricted to one city; 4) the fear of misuse by non-target groups making the device lose credibility.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Non-users engaged in the local community or those more educated are more sensitive to this topic.	Difficulties for citizen participation. Requests and complaints to authorities do not guarantee changes in practice.	<ul style="list-style-type: none"> • Clear and strategic vision in a policy. • Integrate smart traffic plans in larger plans. • Measures to prevent misuse. • Creation of awareness.

While the non-users did not express real negative reactions towards the smart city light as such, it is possible nonetheless to discern in the dimension of “attitudes and feelings” a certain sceptical stance towards its concrete effectiveness. The light has a potential to be a needed support to make the crossing of the street more autonomous and safer for the target groups. But this does not mean that it is sufficient by its mere existence. Four reasons for this concern can be detected. First, the scepticism relates to the effectiveness of the traffic light even if the major challenge that is the lack of both accessible public space and pedestrian walkways, is not tackled on a more general scale. Or at least in the surrounding of the light. In other words, the path to the smart traffic light is as important as the light itself. Secondly, the introduction of the light should go hand in hand with a clear and uniform policy and vision on deployment. Given the reduced mobility options for the target groups when walking alone, it cannot remain a deployment that is limited to a few crossings in one neighbourhood. Third, it is important that the implementation will also be uniform in the city and across cities. If a universal approach will be difficult to ‘read’ by the user, the crossing for the target groups might get discouraged.

Besides infrastructure, vision and policy, other road users might also have an impact on the liberating potential of the smart traffic light. Non-users mentioned here a potential abuse by other pedestrians to influence the light in their favour or simply activate a button without considering its impact. There is a fear that such misuse will lead to a bad perception of the smart traffic light and public authorities might therefore be put under pressure to restrict its deployment.

Capability: Impaired non-users that are engaged in the local community advocate for systemic and effective smart lights interventions rather than one-spot symbolic implementation.

Limitations: The non-users claimed that, despite writing to the local municipality or being member of a local advisory board on accessibility, it is not easy to have their voices heard. Although local authorities listen to the suggestions or complaints, a direct impact on the ground is not guaranteed and often takes many years.

Requirements:

- Developing a clear vision and strategy on smart traffic lights in the city, together with concerned users, stakeholders and city authorities.
- Integrate smart traffic lights deployment in larger plans for accessibility of public space.
- Enhance awareness through communication campaigns and civic engagement to avoid misuse by other pedestrians.
- Design an incentives system that avoids potential mis-use by other pedestrians or cars and bikes users.

This theme was built from the following codes:

Goals and values/ Net: bad quality of road infrastructure	Safety perception/ Net: misuse by others
Uneven pedestrian roads	Non-target users use the service in their advantage
Gap between pavement and road	Careful with misuse
Usability of physical interface/ Net: button	Attitudes and feeling/ Net: about deployment
Misuse by others	Need for uniform approach over cities
Usability of physical interface/ Net: extra information	Consistent deployment within cities.
Need for uniform approach	Usability of physical interface/ Net: waving at the traffic light
	Will not work
	Many people would wave their hands; municipality will get rid on it.

Table 11. Dimensions, nets, and codes used to build the P2.Theme 4. SCEPTICISM ABOUT ITS EFFECTIVENESS

Theme 5. COVID-19 CRISIS

P2.Th5 COVID-19 CRISIS	Mobility of these groups is restricted and hinges on the assistance of others for orientation or overcoming obstacles. Because of fear of COVID exposition, now they rely more on themselves.	
	Finding: the vulnerable groups go to places or choose routes where they know they have higher probabilities of getting assistance.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Target groups develop strategies to still get help, now respecting social distance. They count on the support of stable networks of friends and relatives. Because most activities are available online, there is less need to go out for events. 	<ul style="list-style-type: none"> Amidst COVID, vulnerable populations are a group of risk and they were advised to stay home. There is a limitation when not having an available group of friends/relatives. A button implies physical contact with an item touched by many people. There might also be some caution of the 	<ul style="list-style-type: none"> Communication campaign to make clear that helping others in the street does not result in increasing risk. Design handsfree services.

	<p>person with disability that others do not touch their wheelchair.</p> <ul style="list-style-type: none"> ● Avoiding public transport because of the COVID exposure implies new difficulties for their everyday mobility. 	
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This theme looks at the effects that COVID-19 had on the target audience’s ability to receive help from others when they circulate in the public space. The outbreak had an enormous impact on this ability. Due to the corona pandemic, the non-users that usually require help from others, whether it is from friends or family or from strangers, now rely more on themselves when it comes to venturing out in the public domain. This makes them more vulnerable. Before COVID-19 most pedestrians did not hesitate to help someone with reduced mobility or vision. They would help them determine which way to walk, would push their wheelchair over an obstacle or would push a button at a traffic light or in the public transport if the target groups could not reach it. Things have changed and this behaviour is less common. Thus, the non-users with impairments are either dependent on themselves or they only go to certain places when someone is available to assist them. This means they have to adjust to their companion’s schedule. They will have to wait for them to be available. However, in certain places, the person is only allowed to go in alone, for example the store, which makes the action process even more challenging. As a result, the target audience avoids going outside and might get more isolated. Finally, a few non-users mentioned that because of Covid-19, touching buttons on the traffic light is something they would like to avoid in the future.

Capability: People in the public domain that are not afraid of the virus or to stand close, while respecting safety measures, are more willing to provide support. People from the vulnerable groups that managed to deploy strategies to get help while respecting social distance will likely feel secure to ask support from other pedestrians (e.g.: a blind respondent has a special approach to receiving help. Another pedestrian could still lead her when crossing the street by standing in her back). Secondly, non-users with a stable network of friends and relatives declared they could count on support, although it is less easy to organise and the range is limited to activities like doing groceries.

Limitations: The pandemics require certain guidelines and regulations to be followed. All our three target groups are part of the so-called group at risk which are advised to stay at home by Belgian authorities. Due to these restrictions announced by the government and the way the virus spreads, impaired people will have difficulties to find support or assistance. If one does not have a large social network of friends or relatives, COVID-19 might lead on the long run to a greater feeling of isolation.

Requirements:



- Information needed that helping a visually or mobility impaired person with moving in the public space or crossing a street is not a risk.
- Device a solution that prevents touching buttons and works handsfree.

This theme was built using the following codes:

Perception of COVID crisis/ Negative	Perception of COVID-19 crisis/ Positive
Hygiene: touching objects	Aid when crossing/ Others not afraid of helping to cross the street
Getting no assistance	Never alone at busy intersection
Harder to get help	More is available online/ more online events to attend
Routes to necessary stores are difficult without assistance	Distance between you and others/ No clear impact
Hygiene: avoiding aid with wheelchair	
Dependent on oneself/ Higher feeling of isolation	

Table 12. Dimensions, nets, and codes used to build the P2.Theme 5. COVID-19 crisis

4.2.2 Capabilities, limitations and requirements by pilot’s user profile characteristics

Older people

Capabilities:

Older people have the skills to move to different places and different distances, mostly nearby their own home or the store, but they also go outside for a walk. They go by foot, use the car and public transport. They can venture out in public space without assistance and are able to visit places they do not know well, however a lot of older people tend to avoid this because they feel unsafe.

“For a lot of activities from just going to get some air, or let my dog out to go to the shops. I also assist in my free time INTER with events like festivals.” - P2-NU-11

“I do all my trips in the neighbourhood on foot. I go also with public transport, among others, for my time as a volunteer for INTER.” - P2-NU-11.

The digital skills of the target group vary, but they are rather able to check something online or use certain mobile applications to plan their route.

“Yes, I use apps but it is mainly for route finding purposes or parking finding purposes (parking spots for people with reduced mobility).” - P2-NU-11.

“I check the local websites of towns where I need to go to find parking spots reserved for people with reduced mobility. I have such a card as I volunteer to help such people.” - P2-NU-11.

“I use route planners a lot, in particular Google Maps and the National Railroad. I use it to find my way.” - P2-ST-3

“Currently, we see among our members (older people) that most of them, if they have a computer, use it for basic purposes (contact), but their main mobility needs are not served (no use of extra options such as

buying tickets). Older mobile phone users are generally mainly using the phone to call, not to go online or use mobile apps.” - P2-ST-3

Limitations:

Older people travel at a slower pace and tend to be uncertain. Some feel unsafe venturing out on the road, which is why they often follow routes they are familiar with and avoid certain places, like big intersections. Bad infrastructure, such as potholes or uneven sidewalks, cause problems for them.

“Areas that are problematic for me are bad sideways (holes, not even).” - P2-NU-11.

“Experience has confirmed that older people are indeed more inclined to follow a known route.” - P2-ST-5

“Avoid intersections where they feel unsafe. Enter only out of necessity.” - P2-ST-5.

“To go in a safer way to certain parts of the city where crossing now is difficult or traffic too dense.” - P2-ST-3

Requirements:

The target audience mostly requires more time to cross the street safely. This will lower anxiety levels and will increase the feeling of security and certainty. This is mainly the case for long crossroads or crossroads at busy intersections.

“In general, time is the most prominent issue with crossing itself as an activity.” - P2-NU-11.

“It can definitely be an element to become more independent in the traffic.” - P2-NU-11.

“To have more time to cross at certain dangerous or long crossroads.” - P2-ST-3

“To go in a safer way to certain parts of the city where crossing now is difficult or traffic too dense.” - P2-ST-3

“Time is very important. Signal that every older person knows that I can now cross. Maybe also: time indication. Can be reassuring on the one hand, but can also cause stress on the other. Can take away doubts / fear / ambiguity.” - P2-ST-5

Older people also have the need to know where these smart lights are placed or want to be able to recognise it. To accomplish this the light could be integrated in online route planners and could have a certain colour or sticker. This requirement also indicates the need to know about the status of the light, if it is working or not. This could be integrated in route planners as well. Additionally, older people require an easy way to report when the light does not function properly.

“To incorporate the location of such traffic lights in route planners such as Google Maps. Is there/are there smart traffic lights close to an important destination for older people this is useful.” - P2-ST-3

“The light should also be recognisable (so a standard solution everywhere) and clearly, especially in the beginning when there are few present, visible and detectable by older people as being a smart light. For example, by a special sticker.” - P2-ST-3

“If the service is not working, this should be clearly communicated and also a horizon of when the issue is solved should be communicated. This is important for older people as their mobility often follows certain fixed patterns and it gives them time to plan for alternatives or look for solutions (e.g., postponing an activity until the issue is fixed).” - P2-ST-3

“It should be reliable (working!) and in case it does not work one should be able to report it fast. Maybe a phone number or a button?” - P2-NU-11.

To inform the target group of the light and its workings, older people associations should be contacted, but one should also inform them via mainstream media, like the paper, radio or the news.

“Work via a targeted campaign to let people know that such a light exists. Media, interest organisations can be good channels. Look how to reach different profiles.” - P2-NU-11

"If there is such a light, explain how it works in the first month (s). Information campaign (magazine, newspaper, radio, TV), training campaigns. Elderly associations: take a walk or an info meeting." - P2-ST-5

Finally, the light should be as easy to use as possible. The target group should not have to undertake different and/or more steps to activate the smart light compared to other traffic lights.

"It should be simple, not make the mistake of asking us to develop new skills. Simple means as few as possible manipulations via light or another device." - P2-NU-11

"Important is that the light will be easy to use, preferably with one single operation (button, instruction) so that there is no extra complexity because the light is smart. Need for short instructions and clear instructions." - P2-ST-3

"The fewer actions the better." - P2-ST-5

People with reduced vision

Capabilities:

The target audience has developed skills and capabilities so they can independently go to certain places, like their work, the store or another location and are not afraid to ask for help. They are able to go out alone when using familiar routes and use different kinds of public transport to reach their destination. This gives them a certain degree of independence. With help, they are able to learn new routes as well.

"There are things that have to be done: going to the store, going to work. I go to the fitness as well. I have to get there too. I do use public transport a lot. I have to be able to get to places of public transport. I live near Tour & Taxis in Brussels, there are some things around, but not many. I use every public transport. But to get there I have to walk a while." - P2-NU-4

"On foot or public transport when on my own or with a partner. Car with friends." - P2-NU-5

"I am walking around for my free time and for my work in Brussels where I am a library worker. I also shop and often go to the theatre." - P2-NU-6

"As a general rule I am walking if the destination is within a 1km circle from my home, then metro and tram (no busses as I don't like to drive with them, too busy, crowded and too much stopping), uber, train for longer distances." - P2-NU-1

Some people are able to use either a computer or a phone to check where they are going. However, not all people with reduced vision are able to use a smartphone and its apps developed for the target audience.

"I use digital applications such as Google Maps and street view to plan my trips in advance. How do I need to go (route planner) and how does the route look like and if there are obstacles (street view)." - P2-NU-6

"I don't have a smartphone yet, but I am planning to use one. My partner helps me by checking Google Maps and Street View." - P2-NU-5

"I have a special folder on my smartphone in which I have the apps that I use for my mobility: Google maps, Uber app, NMBS app (public train), MIVB (public transport in Brussels) and the Blindsquare app, which is an app that allows me to get information about specific things in my surrounding (e.g. which kind of building I am in front of, how far away located from a building, ...). This app I am using because it accurately describes what to do." - P2-NU-1

Limitations:

Visually impaired people do not tend to venture out to locations they are unfamiliar with. The target audience tends to have a high level of autonomy in their own territories, but they will require assistance when going to a place that is unexplored.

"I learn new routes with a professional mobility trainer or service." - P2-NU-5

Other than that, several people with reduced vision lack digital skills. They do not use a smartphone and apps for the people with reduced vision, which means that they need assistance from others to help them plan their route.

"I am using the internet at home but also in company with my partner. I would certainly ask him for help to detect my route if it would be an unknown one." – P2-NU-5

"I don't use a smartphone yet so I have no usage of the services you mention." – P2-NU-6

Requirements:

People with reduced vision require auditive signals to place themselves within their surroundings. Based on the auditive information they receive from the other pedestrians or from other sources, they can try to deduce if they can cross. However, they only have certainty if the light informs them that they are allowed to cross, since other pedestrians may try to cross with the red light or cars will speed through a green light. This causes uncertainty. The solution should then take this into account by offering an auditive signal that indicates green light and the time it will be on.

"The people walking around me, they indicate a lot." – P2-NU-4

"Acoustic traffic lights are handy, because they tap on one side and on the other, so you can hear in which direction you have to cross." – P2-NU-4

"Finally, orientation and knowledge about green or red. A good solution that I always use if available are rateltickers. Otherwise, I base myself on the noise of cars. This is more reliable than pedestrians. When a car stops, it stops and you are sure it is red for them. A pedestrian sometimes has the ability to overrule the light if he sees an option, so it is not so smart to follow them blindly." – P2-NU-6

"We see that at complex crossings they can confuse the person who does not see well as it is not always easy to distinguish one is making sound for what." – P2-NU-1

People with reduced vision experience difficulty in unfamiliar territory. They will rarely venture out on their own to a place they do not know. Either someone will accompany them or they will use a service, like the mobility trainers, to teach them the new route and surroundings. This is important because people with reduced vision encounter quite a bit of obstacles, like badly placed street furniture, holes due to low quality pavement, complicated intersections and unclarity about what direction to walk in to get to their destination. Thus, the light should offer them information about the crossing itself, not just whether it is green or red. It could offer information about the time they have left, what direction they are walking in and if there are any obstacles present, like tram tracks.

"In unfamiliar territory you do not always know how the streets in your area are designed, you do not have the simple checkerboard system of New York. You can hear cars driving, but they come from all directions ... if you don't know that in advance, it will be difficult. Or someone needs to verbally tell you." – P2-NU-4

"Important to understand is that I only follow alone routes I know. I learn new routes with a professional mobility trainer or service." – P2-NU-5

Other than that, people with reduced vision require a uniform and simple approach when it comes to these types of solutions. If not, it may complicate the crossing or cause dangerous situations for the target group.

"It should be careful that it does not require extra effort that will make me more tired and hence less attentive in traffic situations." – P2-NU-5

"Everything in Belgium must be done the same everywhere, so that you know that you can rely on something like this." – P2-NU-4

"It will be important that the light does not pose any extra skill or capabilities. It should actually reduce all problems connected with the dimensions you mention." – P2-NU-6

"What is also important is that these solutions are deployed consistently over the whole surface of a city and not only at certain crossings." – P2-NU-1

Lastly, people with reduced vision wish to keep their hands free so as to use their white stick or keep themselves upright if they might trip.

"I can imagine that when I would use my smartphone, I would use it not while walking but on a certain safe spot, so for the act of crossing I would not use it." – P2-NU-5

"I would choose the third, namely the keychain. It's something you have with you. You shouldn't be constantly looking for it. Anyway, I think the keychain, or via mobile app. I also thought of a bracelet, something low profile, that you don't have to walk around with a special device. The moment your mobile fails, you still have the bracelet." – P2-NU-4

People with reduced mobility

Capabilities:

The target audience is able to venture out on their own, with or without assistance. They mostly travel to work or to the store, but sometimes also activities with family and friends. However, they often need help getting around due to the bad infrastructure of the pavements or when they do not know the surroundings. The target group is not afraid to ask for help from strangers when they are in the public domain. They mostly travel by wheelchair or car, but sometimes make use of public transport. For this they often need help from someone else.

"I go wherever I want because I have no problem asking for help; so I don't just take the known routes, but also others, because I have no problem asking for help. If something doesn't work, ask for a solution." – P2-NU-7

"The car for work and leisure (when not going for a walk around in the neighbourhood), sometimes the bike. Train sometimes but then I need to contact in advance." – P2-NU-7

"Preferably I use the car to go to work or to go to the grocery store. Walking is more recreational (e.g., in Ghent to practice my mobility)." – P2-NU-2

"I can walk but I have problems with keeping my balance. So short distance I do either on foot, if there are no worse conditions of the pavement, or via the wheelchair. Most of the time this is for working and shopping, so for what the current situation referred to as essential movements. I also moved specifically to this neighbourhood in order to live close to shops, work and transport options." – P2-NU-3

Other than that, this group prepares their trips by using different digital applications or websites. They often use Google Maps and/or On Wheels to check the route one day in advance. It is also used to find parking spaces for people with a disability. This means their digital skills are well developed.

"Google Maps: when I need to go somewhere but I don't know the way. Maps especially when I go somewhere by car and then look it up in advance (one day beforehand). Once in the car I put on the GPS. When you're already there, it would be more if you are walking and then specifically going somewhere and then using it, not beforehand. Knowing the route, not knowing what the road looks like. Parking very close to where you need to be." – P2-NU-7

"In order to prepare my trip, especially to new destinations. I look around to check the surroundings and to assess if it is accessible. Via Google Maps but also apps like public transport." – P2-NU-3

"When I go to a training program or a meeting, I look at Google Maps or Google Street View. If it is of course still up to date, some of those images are 5 years old. Then I look for a blue parking space so I can park my car as close as possible. So, I use it to find parking and to see if something is accessible." – P2-NU-2

Limitations:

People with reduced mobility are less likely to visit unknown places without assistance. If they do, they use mobility applications. Flexibility when moving around is something they have trouble with, as they are bound to a wheelchair. This limits their mobility. They have difficulty not to fall or keep moving when there is bad infrastructure. This is mainly due to the unequal pavement, the height of the push button and the high edges of the sidewalk or lack of slope when trying to go from sidewalk to street. Because of these issues, wheelchair users experience stress or unease when crossing the road as they do not have enough time to cross.

"Mobility is for me a disaster in Gent. I live in the historical centre which is now a pedestrianized zone but the accessibility of it is a disaster as well as other parts in the city (quality of pavement, holes, traffic lights that are not adapted to my height). It all thus depends on whether it is accessible where I need to go. Some stores I go to, others I can't even enter or to others the route is not good to go so they would rather come to me instead of letting me suffer along the route." - P2-NU-9

"The problems are mainly the inaccessible roads, sidewalks that are way too high, very poorly constructed sidewalks. I am obliged to go on the street because the sidewalk is sloping, so I cannot keep my body under control as easily." - P2-NU-8

"If there is a bike path or pedestrian path, I will use the bike path because there is no edge there. Buttons are sometimes too high, but usually it's okay. In terms of time: pedestrian lights last longer, which makes me doubt, think: which one should I take? In general, I don't have enough time." - P2-NU-10

"From the sidewalk to the street: sometimes if you want to go from the sidewalk to the street, there is a high edge; there's a danger of falling. It's not safe to cross, and there is not much time to cross, that is frightening. it would be more convenient if everything is flat." - P2-NU-7

"I'm constantly stressed, because by the time you get across the street it's already green." - P2-NU-2

"The main important goals of such a smart and inclusive traffic light should be to adapt timings to my needs. Today if I don't know if I have enough time left to cross, I often skip a turn of green and wait till the next one in order to not get stressed by having the question in my head 'do I have enough time? Secondly it is the quality of the road and pavement. If there are obstacles or the pavement/road is not of good quality, I don't feel safe to cross and fear to fall on the ground." - P2-NU-3

When the weather becomes colder or it is raining, they will have more difficulty moving around. Rain mainly causes them to lose grip on their wheelchair which makes it harder for them to get to their destination, but there is also the danger of falling and the increased braking time. Other than that, it influences both their own visibility and that of other road users, specially car users.

"But the weather has an impact on my visibility and my mobility, because of the rain you have less grip on your wheelchair, the braking time is longer." - P2-NU-10

"My general mobility pattern is also dependent on weather conditions, whether when walking or in my wheelchair. If it rains, my trip lasts longer, so I'll get wet (or when it is cold, I get pain in my muscles)." - P2-NU-3

"It all depends also on the moment: weather, season, hour... in winter or when cold, more difficult to move forward in a manual wheelchair." - P2-NU-9

"When you go out with your wheelchair, are there certain conditions that you set for yourself? It shouldn't be too cold, because if my hands are cold, my mobility will diminish, making me feel less safe. So especially the temperature; the cold wind and rain are things I pay attention to." - P2-NU-8

Requirements:

People with reduced mobility require more time and less anxiety when crossing the street. Due to several obstacles, like high edges, it is harder for this group to reach the other side of the crossing before the light turns red. Other than low quality infrastructure, this is the problem that people with reduced mobility struggle with the most. To resolve this issue, the light should be green for a longer period of time and

inform how much time there is left when an impaired person crosses the road, as this is also an issue for those with a visual impairment.

"It would also be interesting to know how much time I have still left. Now I am waiting for the next green light because when it is green when I arrive, I don't know how much time I have still left. As my wheelchair is manual, it takes power to start at a light so I am not fast, so better organisation of time of green light is a must." - P2-NU-9

"I find the countdown lights very useful, especially like in New York or Canada. It's clear for everyone." - P2-NU-10

"I find it useful, for example in Antwerp, that you have lights that count down and indicate how much time you have left. This should be used more." - P2-NU-8

"Light does not remain green long enough. From the moment it is green, you have to hurry to get to the other side. Often I am only halfway there." - P2-NU-7

Secondly, the target group would like for the solution to be as simple to understand as possible. They should not have to acquire new skills and undertake other and/or more steps than what is now the case. To learn about the light and how it works, they wish to be informed through media channels or organisations. The smart traffic light should be uniformed.

"Not having to learn too many new things is a must. The simpler the better, the less the better." - P2-NU-7

"From your experience it would be very easy to use. Not digitally complicated, preferably one action. Apart from that, one simple action is sufficient, preferably no action, automatic detection." - P2-NU-2

"To make it known: through the media (radio, television, newspaper: reach people personally). Try through associations that are specifically aimed at the target groups, to explain the application (Braille League, Okra,...). The problem is: not everyone is a member of such a group, not everyone gets reached. That is why the role of the media is also important. Or set up a website with information." - P2-NU-3

"It must be generic or else you will never adapt it to the context. Here in Ghent the roadworks are sometimes not known by the city council, works are often ad-hoc. It's a misery. There should be no additional confusion, no cacophony." - P2-NU-10

Lastly, the target audience wishes the smart traffic light to be reliable. They would like to know where the light is placed and if it works or does not work. Other than that, there should not be allowed room for error. To tackle these issues, the light could be integrated in route planners such as Google Maps, the organisations of the target group could be informed or an internet page which will be regularly updated could be designed.

"Integration in Google Maps, especially the information if it works or not." - P2-NU-9

"That I know where to report it if it's broken. And that we know when it was fixed or when they're working on it." - P2-NU-10

"I think it is important that if you look at your route in advance, you can see it too. Perhaps with a colour that clearly contrasts yellow and black. Maybe bright blue? Those parking spaces are like that. I think people are more likely to make that association." - P2-NU-2

"In order that people feel good to use it, it will be very important the service will work, not once, but all the time. If it is not reliable people won't use it. Do you have a plan B for your concept in case it won't work? A non-digital alternative is always needed and, in that sense, also user support is important: inform us when it is broken or when it will be fixed. Why? Because if I know it is not working, I know I have to make a detour. That helps me to be mobile because I know I have to find an alternative. If I don't know, I get lost and probably won't go out anymore unless it is fixed. Especially this will be the case with bad weather conditions. So: good functioning not only as a technical challenge but because it really supports my mobility. Important to inform about the status of the light. Is it broken? Is it fixed or being fixed?" - P2-NU-3

“If you start letting the system fail a few times, you won’t use it anymore. Once is still possible, but then the cars have to wait for you again.” - P2-NU-2

4.3 Galilee pilot (P3). Informal ride-sharing in ethnic towns

4.3.1 Themes identified

Theme 1. Cultural barriers that limit women ride-sharing

P3.Th1 CULTURAL BARRIERS THAT LIMIT WOMEN RIDE-SHARING	The presence of Arab social consent implies that women need to ask for familiar approval to ride a vehicle with others than members of the family.	
	Finding: in this context, the families of the women are part of the decision process and may limit the female users’ autonomy.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Recommendations, word of mouth and a good background of the driver have the ability to enhance the confidence in the service. 	The autonomy of the woman is constrained. The social norm with the “eyes” of the family and the community are posed on women’s behaviour. There are language barriers that act as additional cultural barriers: <ul style="list-style-type: none"> Many apps don’t show the Arabic names of villages or geographical points. The Arabic interface should be spoken Arabic. 	<ul style="list-style-type: none"> Advertise with messages for gathering trust of women, their families and the whole community. Communication campaigns for reinforcing mutual trust and responsibility within the whole community. Spoken Arabic interface Creating locations map including their names in local language and the way how local people use to call those locations.

This first theme exposes the nature of the cultural environment of the Arab villages under analysis. The awareness of the benefits of the service precisely for being a woman, the protection against possible attacks or harassment may be biased by the family voice that have a strong influence on using or not the on the ridesharing service. The aspect of reputation and gender mandate is clearly on the table, which involves not only the reputation of a young woman who is

seen in the village as passenger of a vehicle with a stranger, but also the reputation that the driver must hold to make the trip possible. A stakeholder explains that the driver being of good background or recommended could increase levels of trust from the family and the women user.

Another side of these cultural barriers is associated with the language barriers. The first problem that arises is that there are many variations of the Arabic language across the Arab world, with remarkable changes in vocabulary and even grammar. Besides this, the spoken Arabic may show huge differences with respect to the illustrated Arabic, which is more common in literature or academic writing. The Arabic interface targeting these women should incorporate an adaptation of language which is closer to the spoken one and move away from the standard Arabic. Otherwise, there is a risk of not getting grip of the idiosyncrasy and the cultural specificities of the rural villages under observation. A second related point is that in a bilingual context, many villages and geographical places have names in Hebrew and Arabic, but locals only know and use the Arabic name. There might be the case in which locals are completely unaware of other place names that are not the Arabic ones. It is important to adapt the mapping to this reality which is closer to the local use of the language, than to the official maps.

During the last year, cultural barriers to sharing are reinforced by the social distance conditions imposed by the COVID pandemics. The difficulty of achieving social distance in a small enclosed space is translated into a general fear of sharing.

This theme was built using the following codes:

Goals and values	Goals and values/Net: feeling of autonomy
Arab family social consent	I don't have the need for ridesharing
Attitudes and feelings	Suggestions
"Not for me" attitude	Discrete registration
Skills	Needs
Language Skills	No need of it

Table 13. Dimensions, nets, and codes used to build the P3.Theme 1. Cultural barriers that limit women ride-sharing

Theme 3. Fears about security

P3.Th2 FEARS ABOUT SECURITY	The greatest fears of the potential users are related to their security: the possibility of threats such as being followed, being attacked, harassed or insulted.	
	Finding: sensitivity about their address is more important for stakeholders than bank and credit card info, a unique feature of this social environment.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Stakeholders recognize that many women would not ride alone on a bus. In this context, ride-sharing could have the potential of enhancing security. 	<ul style="list-style-type: none"> Reluctance to providing address information. Sensitivity about providing real identity (name and picture are mentioned) Hostility is there in the background. 	<ul style="list-style-type: none"> Female drivers. Fake names instead of real identities. Emergency bottom in case of physical/sexual assault Ranking drivers (score and comment) Have direct contact channels with the driver’s platform.

In the rest of the pilots, data privacy and security have a significant role, and, among these elements, credit card information was one of the most sensitive issues. In the case of Galilee, there are higher fears regarding personal security. This is clearly exposed in the range of threats that appear mentioned by stakeholders: being followed, disclosing where you live, others knowing your identity or your image, being physically or sexually attacked, and receiving offenses or insults. Part of these feelings might be related to pre-existing conflicts and part to the already mentioned disapproval of the community of certain autonomous practices by females. The vulnerability of women in this context is clearly depicted. There is an established and naturalized hostility against women that is clearly a background of these feelings. Part of the threats of sexual attacks or harassment is overcome with the possibility of female drivers. But also, it is helpful ranking drivers and commenting on their service, attitudes and behaviours during the trip to warn other users. The direct contact with drivers is also a factor of trust generation. Some suggestions are directly linked to the reaction in case of attack, such as the emergency bottom.

This theme was built using the following codes:

Usability of physical interface/ Net: women and elderly safety	Data privacy and security
Problem that all drivers are men	Sensitivity about their address
Safety perception	Sensitivity about phone number
Fear of attack because of being women	Feel safe with passcode
Sensitivity about their location	Suggestions
Difficulties (with previous apps)	Use a code instead of real ID
Direct contact with driver	Create a help button
Attitudes and feelings	
Word of mouth gives me safety	

Table 14. Dimensions, nets, and codes used to build the P3.Theme 2. Fears about security

Theme 3. Digital barriers

P3.Th3 DIGITAL BARRIERS	<p>A profile of potential users that exhibit characteristics close to the Emilia Romagna case: low-connected rural villages with population accustomed to do things in an analogical more than digital way.</p>	
	<p>Finding: there are a lot of suggestions about how to tackle these problems, and most of them have to do with personal assistance and guidance.</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Many potential users have already used or are familiar with other digital mobility services, such as: <ul style="list-style-type: none"> Unimodal route planners (e.g. Waze) Multimodal route planners (e.g. Google Maps) Ride-hailing apps (e.g. Uber) Digital parking Besides the critical stages (registration and first use), the stakeholders are positive about the presence of digital skills needed to use the app, once the users get accustomed to them. 	<ul style="list-style-type: none"> Understanding the general concept of ride-sharing (with apps as providers of service) is difficult for some segments. The skills needed to download the app might present more difficulties than the actual use. A whole aid structure is needed specifically to provide support and help to the potential users. There might also be problems with map reading that requires another set of skills. 	<ul style="list-style-type: none"> Assistance by multiple channels: <ul style="list-style-type: none"> Voice-assisted menu Help by social networks (i.e. digitalized younger women can help their mother, aunt...) Help desk/ support center Audio guidance Whatsapp help Promoter at the bus stop, offering explanation. Also, adjustable fonts and icons for older people. Add social media registration. Easier maps.

We found in Galilee some characteristics that are shared with the public of P1 Emilia Romagna pilot. It is about small rural villages’ populations, which face certain levels of infrastructure poverty and some elements of disconnection. Digital technology lately penetrated these villages but there persists some resistance to them, and, specially, older people chose to do things in the way they know and in the way they have always done. There is a strong claim for support and instruments of guidance. Stakeholders imagine a large team devoted to providing help to those who have difficulties with the use; they speak about help desks, support centers, a multitude of channels where users may be in touch. There is a suggestion for the app to produce the right education and guidance material. Also, adaptation for special needs, such as images, icons and adaptable fonts.

This theme was built using the following codes:

Usability of digital interface/Net: ease of use	Skills/Net: Lack of cognitive skills
First time registration difficulties	Map reading
Difficult for especial needs	Skills/Net: Lack of digital skills
Assistance	Difficult to manage uncertainty
Need tech support	Suggestions
Assistance in general	Audio help
Skills	Feedback
(Well) Educated	Intro movies with setup and first use instructions

Table 15. Dimensions, nets, and codes used to build the P3.Theme 3. Digital barriers

Theme 4. Difficulties to adapt the map to the geographical reality.

P3.Th4 DIFFICULTIES TO ADAPT THE MAP TO THE GEOGRAPHICAL REALITY	Some characteristics of the land and its history and the customs of inhabitants make the mapping complex.	
	Finding: the matching between the geographical space, its nomenclature, the practical use of this nomenclature by the users and the digital mapping is key to develop this project.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Taxis and paid vehicles are very used in everyday mobility. It is an established practice. 	<ul style="list-style-type: none"> There are rural streets with no names nor numbers. This implies a difficulty for the user ordering. Many digital maps do not identify the 	<ul style="list-style-type: none"> Adapt the mapping to this geographic reality. Use points of interest as sites of onboard/offboard instead of focusing on addresses. Flexibility towards geographical nomenclature.

	<p>Arabic names of some locations.</p> <ul style="list-style-type: none"> • Many digital maps do not recognize points of interest, that are references of location in the context of these villages. • No clear origin destination, paying attention to the whereabouts. 	
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The adaptation of digital tools of mapping to the actual geography of the area and the habits regarding occupation of space by the inhabitants is a real challenge. Some streets do not have names or numbers; people locate themselves in the space using points of interest as reference. This is the actual use of the space by the population, so the question that remains is how a digital tool should adapt to this reality which is different from that of another type of city or geography. At the same time, a bilingual land implies that sometimes apps only recognize the Hebrew names of certain geographical landmarks and not the Arabic (not to say the spoken variety of Arabic language). A system of alternative reference or points of interest for common onboard or offboard should be generated. Creative and imaginative solutions are needed to offer a new shape to the mapping system.

This theme was built using the following codes:

Usability of digital/Net: software failure
Location detection problems
Skills/Net: lack of cognitive skills
Map reading
Reading map and location skills
Suggestions
Add point of interest to overcome lack of address in rural

Table 16. Dimensions, nets, and codes used to build the P3. Theme 4. Difficulties to adapt the map to the geographical reality.

Theme 5. Ride-sharing assuming the role of public transport

P3.Th5 RIDE-SHARING AS POTENTIAL SUBSTITUTE OF PUBLIC TRANSPORT	The type of everyday use, work and study use that the ride-sharing receives, approaches it to the role of public transit.	
	Finding: where there is transport poverty, ridesharing could substitute the public transit, being more flexible and cheaper than taxi services.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Rideshare covers the gap of connectivity: to go from village to village. Ride-sharing for everyday routine: work, study, errands, get medical assistance. Benefit of availability: it is planned in advance. 	<ul style="list-style-type: none"> This aspect, although positive, hinges on the insufficient provision of other modes. 	<ul style="list-style-type: none"> Quality assurance by institutional endorsing or auditing. Feedback of end-users to developers.

In this geography with scattered small villages in a rural context, and with an identified poverty of transport (Lucas et al. 2019; Reis et al. 2019), the ride-sharing assumes the role of public transit. This means that villages are mainly connected by private transport, including ride-sharing and ride-sharing. It is used for routine activities (such as work or study) and for everyday activities such as errands or paperwork). Fears of women about being alone on the bus, as it was mentioned, also favour ride-sharing and ridesharing as a replacement of public transit. The lack of infrastructure generates this scenario, although it is a benefit of the ride-sharing that derives from the lack of public transport alternatives.

This theme was built using the following codes:

Needs/Net: Geographical isolation	Goals and values/Net: Lifestyle
Lives in rural areas	Going to university/study
Planning rides in advance	Going to medical services
Goals and values/ Net: Convenience	Going to family visits
Lack of alternative transport	Going to entertainment
Comfort	

Table 17. Dimensions, nets, and codes used to build the P3. Theme 5. Ride-sharing as potential substitute of public transport

Theme 6. COVID crisis

P3.Th6 COVID CRISIS	Fears of sharing enclosed space with strangers and perception of enlarged COVID exposure	
	Findings: this “fear of sharing” merges with cultural barriers and disapproval of women sharing spaces with strangers without family consent.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Partially, the decrease in the use of ride-hailing or ride-sharing may not have to do with fears of exposure, but with the shutdown of activities, such as university campus or cleaning jobs. 	<ul style="list-style-type: none"> Difficult to maintain social distance. Less mobility during the lockdowns and afterwards. Health concerns 	<ul style="list-style-type: none"> Limit number of passengers Enforce use of mask. Enforce open windows during the trip. Install physical separation between the driver and the passengers.

Perception of COVID-19 crisis (negative)
Less mobility during COVID lockdowns
Health concerns
I don't use it because of COVID-19
Vehicle may not be hygienized
Exposure to driver or passengers
COVID brought new problems of accessibility
Perception of COVID-19 crisis (positive)
Ride share more useful

Table 18. Dimensions, nets, and codes used to build the P3.Theme 6. COVID crisis

4.3.2 Capabilities, limitations and requirements by pilot’s pilot profile characteristics

Ethnic minorities

Capabilities: many digital mobility services are already integrated in the life of rural Arab villages and of the ethnic minorities that live there (minority in relation to the identity of the majority of population of the State where they live). During the interviews, there were mentioned unimodal trip planning such as Waze, multimodal route planners such as Google Maps and ride-hailing apps such as Uber or Lyft or digital parking. They appear as part of their mobility:

"I usually use Waze to plan my path and avoid police, I think it is a good service"--P3-NU-9

"For searching a destination abroad I use multimodal route planners, I think it is a good service"--P3-NU-4

"I may also use ride hailing platforms abroad"--P3-NU-3

"I do use digital parking applications when I need to park my car outside my village, it is a very good service"-- P3-NU-2

There is diversity in this group: as it happens with the general population, there are segments that have incorporated digital tools while others do not even know the existence or the concept. The important element for ethnic minorities is that their villages face infrastructure problems, lack of connectivity and lack of transport availability. It appears for many that a ride-sharing app is targeting these issues:

"Need to increase transport availability"-- P3-ST-1

"Makes it easier to me to reach the destination"-- P3-NU-9

"Rides are not spontaneous but planned in advance"-- P3-ST-3

The app seems important to satisfy the mobility needs of these groups that are not well satisfied with public transit. This is shown in the fact that many of the everyday life tasks are currently covered with ride-hailing or taxi services. It is important to pay attention the degree of preference of ride-hailing for purposes such as going to work or to study, for going to medical centers or to places of entertainment:

"I use ride-sharing (as Uber) for going to work, study and medical services"-- P3-NU-2

"I use ride-sharing for going to work, study and for entertainment too"-- P3-NU-5

"I use ride-sharing for going to Study and medical services"-- P3-NU-3

Limitation: one of the greatest barriers that a portion of this group faces (although not all of it) is the need to develop the skill of digital map reading. It is a skill that is associated with the experience using digital mobility services (and there is a gap among the targeted audience in this regard). The matter turns much more complex by the difficulty of matching the real geography of the village to the maps (which implies that not all references appear in the way they are known by the villagers):

"I think they should be able to read a map"-- P3-NU-8

"Problem with entering specific addresses given lacking infrastructure and mapping in Arab rural areas. No street names and/or numbers"-- P3-ST-4

"I lack the ability of reading a map"-- P3-NU-6

"I don't know how to Read a map"-- P3-NU-7

The need to be educated in technological concepts and standards is also mentioned by the respondents as an additional barrier that could have impacts on the people of rural villages. There is a perception that most of them are not so well acquainted with digital tools:

"Be familiar with the terminology and the digital standards, I think that they have to be educated too"-- P3-NU-7

"Being familiar with the terminology and digital standards"-- P3-NU-6

Requirement: An important issue that could favour the integration of ethnic minorities into the users' group is language. There seems that although Arabic is their everyday language, mapping apps and route planners tend to have an unfit incorporation of the language into the interface. There are problems of matching digital mapping with real geography. And, there are also issues with incorporating not only the Arabic language but also the colloquial form which is the most frequently spoken by the ethnic minorities of the rural villages under study. They have experienced previous apps that had no support in Arabic language. Targeting the language issue is a way of asserting very clearly that the app is made especially for Arab women:

"The App was developed by native Arab developers. Given language nuances was granted, only technology barriers in general need to be overcome. After one try, second try.. the digital transformation will happen"-- P3-ST-2

"Should know relevant languages" – P3-NU-10

"Interface needs to be user friendly, using spoken Arabic language (not classical standard)"-- P3-ST-5

"Digital interface should use spoken Arab language with feminine grammar"-- P3-ST-5

"Interface should use local language dialect"-- P3-NU-6

"Problems using App can be because of language barriers, lack of digital skills, and no tolerance for errors"-- P3-NU-8

Women

With regards to the condition of women in the target audience of the service, there appear two main points that will be treated here. The first one is autonomy vs familiar and community constraints. The second is the perception of hostility against women in the voice of the potential users.

Capabilities: among the respondents, there are those who were thriving to gain autonomy within a community of traditional ties. Here, female autonomy is seen as threatening. The idea of autonomy appears in different moments of the conversations, and the app is seen as possibly contributing to this factor. One of the reasons for this is the community disapproval and the individual fears of riding a bus alone:

"In villages women don't just get on buses all alone"-- P3-ST-3

The app is seen as convenient and satisfying everyday needs like it was referred to by many potential users. It was remarked by stakeholders that ride-hailing is currently a required service for women to access university and to promote their education and the opportunity to develop different roles in society. The physical limitation to the university could be an additional reason for women from rural villages not getting higher education. It is also associated with work:

"Provides the means for Arab women to get to work and university. Promoting employment and high education."-- P3-ST-5

"Arab women use ride share for running errands in neighbourhood and for rides to/from work"-- P3-ST-1

Limitations: many women accept more explicitly or more implicitly some of the traditional mandates that fall upon them. Many do not like them but comply anyway because of community pressure. For many of respondents the idea that women cannot ride a vehicle with a stranger without family consent is something of clear importance to consider:

"Arab social consent to ride with other than family members."-- P3-ST-5

"First need Arab social consent to ride in a vehicle with other than family members."-- P3-ST-5

The high usage of private cars goes hand in hand with this social precept. One of the arguments that stresses the idea of "no need" of an app is the normalization and dominance of private cars for everyday activities. Private cars have a large presence and are a relevant competitor of this service. But it is embedded within a cultural environment that stresses the idea of women less visible in the public domain:

"I usually use the car when it is available and I may use the metronit for going to work"-- P3-NU-7

"I usually use my car, it is more comfortable"-- P3-NU-10

"I usually use a car"-- P3-NU-8

Maybe because this disapproval of women riding vehicles with strangers exists and is strong, there is a feeling of threat associated with their use. The feeling of threat that women experience is generally present because of additional cultural factors. It is commonly linked to fears related to security. Women are afraid of giving the address and being followed, giving their identity and getting exposed, providing their real name, their telephone number etc. The idea of danger, risk and unsafety are very often mentioned:

"Yes, I would not be so comfortable in sharing a ride with a stranger - I am not pretty sure that I can trust him"-- P3-NU-10

"Sharing a stranger a ride, I can't expect what will happen"-- P3-NU-9

"I think that it is not safe"-- P3-NU-7

"I will not share my personal information and details because I don't feel safe"-- P3-NU-9

"Yes, I will not feel comfortable to share a ride with a stranger. Unfortunately, I belong to a violent society, I will not be able to trust a stranger easily"-- P3-NU-1

In the previous quote appears a social frame to the perception. "It is a violent society" provides a social context to this attitude that is observed in many women users.

In line with the previous, there is also some concern about providing credit card data. This was also the case for other profiles of other pilots, and it does not appear to be restricted to women:

"I am not sure that my data will be protected"-- P3-NU-8

"I would not share my personal name and my credit card details, I think that there is no need and a little bit dangerous" – P3-NU-10

Both the Arab family and community consent and the fears associated with this can lead to a "not for me" attitude that is a strong barrier to overcome. It is the feeling of not belonging in the appeal of a service.

"I do not have any feelings towards the service-- P3-NU-10

"(I feel) nothing at all" -- P3-NU-4

Requirements: the first requirement for the service is good communication addressing Arab women. These two conditions (Arab and woman) must be clear keys in the messages for this group. The communication should be aimed at generating confidence among women, given the concerns related to their security and the constant sight of the community upon the individual actions. This is the way it is expressed by stakeholders representing the collective of women:

"Need trusted advertisement emphasizing the service advantages and benefits, sustainability, mutual surety and responsibility, enhancing mobility options and mode choice, need branding"-- P3-ST-4

"On behalf of Arab women I know, App provides a good solution."-- P3-ST-3

An additional requirement coming from this segment is the need to provide feedback to developers of the app. This could help them to make the right adaptations to fit women's needs. The idea is that new inputs may arise during the experience with the app, and the possibility that the application offers channels of feedback could turn positive for all stakeholders involved. It is the idea of the continuous improvement:

"Need to get feedback and quality assurance (QA) insights for improving the app continuously"-- P3-ST-3

"Feedback is important"-- P3-ST-5

"Feedback is a must! Notifying of problems, issues, and difficulties will help developers improve the App features specifically and the service in general."-- P3-ST-3

Another topic that is raised as a requirement relates to the strong fear of physical attacks. One potential user suggests the inclusion of an emergency button to warn the app in case of an assault:

"Emergency button in case of physical/sexual attack. Feedback on driver, car, ride. Ranking with stars"-- P3-ST-5

This last comment affirms the importance of increasing, in this social context, the tools that ensure an environment free of violence against women.

Users residing in periphery

Arab women tend to concentrate in areas of less connectivity and more transport poverty (i.e. poor transport system connectivity, less frequency of services, affordability matter for using transport). The lack of opportunities is stressed by the opportunities of mobility provided by the transport network. In this scenario, the availability of a ride-sharing app that satisfies their needs of the target audience may favour the access to university or to job opportunities, as we have already mentioned. The dependence on private means to access some places is well expressed in the mention of "exploring new places" as perceived benefit of the app/service, aiming at the gain in accessibility:

"I use the app for going to work, visiting my family and exploring new places" -- P3-U-3

"I use the App for getting to Medical services and family visits, as well as exploring new places" -- P3-U-2

Nevertheless, there are not many quotes that indicate that the choice of this service could be driven by economic factors affecting low-income groups. There is only one mention about choosing ride-sharing for price, for saving money in comparison to taxis or other services:

"Arab women use ride-sharing to save money" -- P3-ST-3

The ownership and use of private cars is very extended in the sample of women interviewed and in the area. The car seems to be present even in low-income segments. Women not only use their own car, but they do not seem to need a replacement for that behaviour; they find it the most convenient:

"I use just my car" -- P3-NU-1

"I do not need the service when I have my car" -- P3-U-3

"When I have my car or the help of my family to reach a destination, (I use it)" -- P3-U-2

"Generally, I have my car and prefer to use it because I think that the service does not make me feel safe" -- P3-U-1

Car dependence is so remarkable in the area that many car owners only understand the opportunity of using a ride-hailing or ride-sharing service when facing problem with the car:

"I usually use my car but I do use Safarcon application too when I am facing a problem with my car" -- P3-U-3

"It can be very useful for me when I face a problem with my car" -- P3-NU-8

The search for alternatives to the private car narrowed even more with the fears arising from the COVID pandemics. Now, there is a health concern joining already existing fears about personal security and data protection.

"I prefer not sharing a ride with a stranger because I will not feel safe, I will be very worried about my health too"-- P3-NU-7

"I prefer not using it especially during this time due to health concerns"-- P3-U-4

"I think it is not safe to share a ride with a stranger"-- P3-U-3

"I am afraid of getting infected"-- P3-U-2

Car dependence culture in a given area is a sensitive topic for low-income populations since it implies that a greater portion of the household income will be invested in transport. This expenditure will retrieve money from other needs and goals. This is the scenario we can deduct from the interviews.

The service enables going to work, study and getting medical services -- P3-NU-2

4.4 Madrid pilot (P4). Cycle logistics platform for delivery healthy food

4.4.1 Themes identified

In the Madrid pilot (P4) nine themes have been identified. In the following sections they are described in details. Correspondent dimensions, nets, and codes are mentioned.

Theme 1. FEARS

P4.Th1 FEARS	Fears arise from a lack of <u>knowledge</u> about how things work. That’s why there are so many suggestions about: <ol style="list-style-type: none"> 1. Not excessive info in the app, step-by-step flow to facilitate learning, 2. introductory tutorials/ videos to learn. 	
	Finding: usage should be treated simultaneously as a process of learning.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Users who have awareness as a value (social/environmental) trust La Pájara-CoopCycle platform also about their data management	Credit cards are the number 1 fear. Info about identity and address comes 2nd. Address, special concern for women.	<ul style="list-style-type: none"> ● Clear list of what data is stored and for how long ● Terms and conditions with checkboxes ● Certificates of data privacy ● Option of paying in cash ● Fake IDs to deliver to
Trust by contiguity	Personal security	

In Madrid, the theme ‘Fears’ was identified. It does not emerge from a single dimension, but from elements found in many of them. Users and non-users showed a concern about handling information of different kinds in the dimension “Data privacy and security”; there was a concern about availability of payment methods in the section “Usability of digital interface” from which a fear was also detected; there were concerns about the contact with the rider in the dimension “Usability of physical interface” and “Safety perceptions”; and many mentions to fears were taken from the “Suggestions” dimension. From elements captured from different dimensions “Fears” was identified as a barrier. It was interpreted that this attitude arose from the lack of knowledge of how things work. And that was a reason for a multitude of suggestions about usage treated simultaneously as a learning process (step-to-step flow, tutorials, videos etc).

This identified theme is linked to the three axes chosen to organize the outcome: capabilities, limitations, and requirements. With regards to capabilities, it was observed that those respondents who have awareness as a value (either social or environmental awareness) also trust CoopCycle/La Pajara with data management. This finding was called ‘trust by contiguity’. The trust that the coop generates in one field is transferred in the mind of users to contiguous fields. This leads us to think that confidence in data management is sustained by other aspects of the image of the firm/app that go beyond the data management itself. It can be seen as a capability of the user (the possibility of amplifying their confidence) as well as a potential for coops/ socially responsible enterprises)

With regards to limitations, credit card is the number one fear and it is the only one that is not questioned. Then sensitivity about identity, gender, phone number, address come in second place, although there are also respondents who do not show any concern about this. Providing the address and getting in close contact with the rider appears as a special fear for women and it is linked with personal safety.

Concerning requirements, many of the listed requirements were included in the "Suggestions dimension" and have to do with concerns about data management. Users would feel more comfortable if they knew what is the info that the app stores and for how long. There are worries about the generation of a database with purposes different from the initial relation between user and firm (such as bombing the user with ads) or even identity theft. Secondly, there are repeated calls to simplify contents and, especially reduce text lengths and add more visuals. In this context, the long and difficult to read "Terms and conditions" are something to be changed. One respondent suggested Terms and conditions with checkboxes (3 or 4 of them) to simplify the operation of granting permission.

Another point that could give users more confidence are certificates of data privacy. A label, a certificate, an audit firm that provides robustness may be something important for first users or doubtful users. But, because even with these guarantees, there still might be users who are reluctant to pay with a credit card, there must exist alternative methods. This explains why there were so many mentions to the unavailability of payment methods, which exceeded the idea of "alternatives" and pointed straight away to the feeling of security.

The other aspect of fear concerned the contact with the rider. Here, the possibility of a person breaking in, of an attack for being a woman or older people, of mistaking a stranger for a rider are highly focused. But the contact with the rider in times of COVID also involves the hygienic conditions of delivery. In a nutshell, these are the associations that are made during the flow of the thematic analysis, and that involves identifying the theme (combining elements of different dimensions that are significant by recurrence and relevance in the user's mind) and working it along the axes of capabilities, limitations and requirements. These axes can also be used to understand the singularities, attitudes, motivations and behaviours of each of the INDIMO profiles, as will be next shown.

Data privacy and security	Safety perception	Suggestions of respondents about data privacy
Sensitivity about address	Fear of a stranger breaking in	Use certifications of data privacy
Sensitivity about credit card info	Fear of attack because of being woman	Include certification of good use of data
Sensitivity about phone number	No possibility of reporting rider	Include certifications of privacy in the use of cards
Sensitivity about condition of handicapped	Reliability	Use a code instead of real identity info
Reluctance to providing gender info	Trustworthy	Having a checklist of what data the app shares
Refuses to install app for security reasons	Need the word of mouth to trust	Summarize terms and conditions
Fear of digital identity theft	Usability of physical interface	Accessibility and inclusion/ suggestions
Doesn't believe in certificates of safety	Problem that all riders are men	Accept all payment options
Avoids sharing personal data	Fear of the rider	

Table 13. Dimensions, nets, and codes used to build the P4.Theme 1. FEARS

Theme 2. SEARCH FOR AUTONOMY

P4.Th2 SEARCH FOR AUTONOMY	The thrive for autonomy is a common theme to all, but especially in cases of reduction of mobility and vision. Seen as a way of personal realization and feeling of overcoming adversity .	
	<u>Finding:</u> some profiles may experience digital delivery services as an assistance option, an alternative that undermines/strengthens their ability to have things done by themselves	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Mainly older people recognized their need of assistance and already	"I can do it myself" feeling. Large deliveries for	<ul style="list-style-type: none"> • Human behind • New services or new scale (supermarket shopping/ courier)

have help (from relatives or stores’ employees). In geographical isolation there’s also recognition of need of solutions	essentials and small proximity purchase by themselves.	<ul style="list-style-type: none"> Enlarge food options (so it’s not seen as a form of assistance but rather as selecting something special: veggie, fair trade, local) <u>FOOD WITH A PLUS</u>
	Still physical interface is preferred, despite COVID crisis <u>HUMAN CONTACT</u>	

Autonomy is a key element among the respondents. DDS appear on one hand as an expression of an assistance that many people with disabilities prefer to limit in order to affirm their independence. But at the same time, many people recognize the potential that these apps have as a tool to facilitate everyday operations and satisfaction of regular needs. This is especially clear in the isolated older people that recognize that they are currently ordering delivery to staff in stores or rely upon the help of relatives. This help is very valuable, since older people recognized their difficulties specially to carry heavy products. But this attitude coexists with the gesture of “I can do it myself”, which appears remarkably associated with visual impairments and restrictions to mobility. A good question is how to bring new delivery opportunities for this segment avoiding the perception that DDS are undermining the autonomy of the target audience. A path to explore is working on the concept that DDS offer a plus regarding the quality of products or the scope of the food options. This could be a way of softening the perception of the delivery as an assistance that is not welcome. Another option is to enlarge the type of services that DDS are in charge of, such as courier. This last was very required by isolated people to keep the contact with relatives and friends. The following are the codes used to build this theme:

Goals and values/ Net: Lifestyle	Goals and values / Net: Feeling of autonomy	Assistance	Accessibility and inclusion/ Suggestions
Prefer to cook by themselves	I don’t have the need to order food/ I can go myself	Empowers autonomy	Human assistance to arrange details
Go to supermarket/store by themselves	Thrives for autonomy	Use on his own	I don't have the need to order food/ I can go myself
Want to search about the product by exploring the shop personally	Needs/ Net: not many alternatives	Is autonomous	Enlarge food options
Difficulties with previous apps	The app doesn't cover my need of courier		
Dislikes using apps			

Table 14. Dimensions, nets, and codes used to build the P4.Theme 2: SEARCH FOR AUTONOMY

Theme 3. “NOT FOR ME”.

<p>P4.Th3 “NOT FOR ME”</p>	<p>Individuals that do not even consider the possibility of ordering food through an app. Not appealed by the claim.</p> <p><u>Finding:</u> In the case of low-income people, even though they could understand the benefits of delivery in time of pandemics, they associate the whole DDS with expensive products, out of their pocket.</p>	
<p>CAPABILITIES</p>	<p>LIMITATIONS</p>	<p>REQUIREMENTS</p>
<p>The apps create new needs in individuals: Lockdown related Sustainability (see Theme 8) Buying online has the potential of being enjoyable (for many it’s not now)</p> <hr/> <p>Society has increasing standards of comfort at all levels (order for convenience, meetings, dates)</p>	<p>Perceived as luxury/only for special occasions/ for busy people “NOT FOR ME” ATTITUDE Economic problems (lack of money plus availability of time to cook) Material barriers of low income:</p> <ul style="list-style-type: none"> a) Dwelling: no separate intercom/ shared spaces (exposition) b) Device: low connectivity, reduced data package, not enough space for apps 	<ul style="list-style-type: none"> ● Possibility of affordable menus ● Separate regular orders from special occasions ● No minimum expenditure ● Availability of different payment methods ● Previous phone communication of the rider to adjust delivery indications (overcome dwelling issues) <p>OPTIONS FOR ALL</p>

As it is shown in the table, sometimes there are large barriers that prevent even thinking about the possibility of ordering delivery. These barriers are attitudinal, symbolic and material at the same time. These aspects are continuously interweaving. For example, sharing the dwelling with other households is a material difficulty linked to an attitude (the avoidance of exposure to others; delivery is full of meaning and it is done in the sight of others, which can contribute to the stigmatization of a group). There’s an attitude of “not for me” that persists; this conveys feelings of self-underestimation: delivery is for others, it’s a luxury I cannot afford, it’s for busy people, I am not the type. Economic problems contribute to this perception but it is not all about it. Many suggestions on this line have to do with thinking of the “universality” of the offer. In the same way it is important to think how to develop digital and physical interfaces that include a

higher number of potential users, the options of food should be also treated as part of this inclusiveness aspect. Affordable menus are important; but also breaking the image that delivery is only for special occasions. Delivery for different vulnerable populations may require regularity, adjusted menus or economic catering that end up lowering as much as possible the unit price. Payment alternatives are also crucial with relation to this theme.

The following are the codes used to build this theme:

Attitudes and feelings	Usability of physical interface/Net. Poverty of dwelling	Accessibility and inclusion/ Suggestions
"Not for me attitude"	Many people in the same unit	No minimum amount of purchase
Attitude of cautious with spending	Lack of intercom (difficult to deliver)	Accept all means of payment
Goals and values/Net: economics	Usability of the digital interface/ Net: type of payment	Separate regular orders from special occasions
It's expensive/more costly than cooking	Many migrants don't have bank account/ No cash allowed	Human assistance to arrange details
Budget restriction of impaired	Usability of digital interface/ Net: inadequate phone equipment	Goals and values/ Net: lifestyle
Outside the budget of risk to exclusion people	Phone plan with limited mega to navigate	Orders delivery only for special occasions
Needs/ Net: level of consumption	Lack of space on the phone	Don't want to try new things/ not interested in gourmet
Don't need to consume that much	Goals and values/ Net: Health	Barriers for disable prevent enjoying the purchase
	It's less healthy than cooking	Buying online could be enjoyable
	Don't want to take risk of changing food	

Table 19. Dimensions, nets, and codes used to build the P4.Theme 3. "NOT FOR ME".

Theme 4. PHYSICAL BARRIERS

P4.Th4 PHYSICAL BARRIERS	Mainly focused on the interaction with the riders and the treatment that the food receives in the carrying process.	
	<u>Finding:</u> COVID-19 brought new concerns about contact. Security is mainly present for women, and also implies interaction with rider.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Not many physical barriers referred to. It’s a well-assessed item. There’s a potential in geographical coverage, one main reason to order.	Rider’s look can reinforce distrust (informal, not uniformed...) Rider’s manners can reinforce feeling of isolation/ dehumanization (complaints about them not being kind or careful) Questions about care on the food (spills, breaks etc). Also questions about COVID safety	<ul style="list-style-type: none"> ● Uniforms for riders (also related to cognitive issues; easy recognition that lowers stress levels) ● Train the riders in special needs of vulnerable users. ● Punctuality (to avoid generating surprise) ● Enlarge geographical coverage ● Package: shape codes for people with reduced vision

Regarding the usability of the physical interface, it is possible to start by establishing that is not a great source of disconformity and it shows a reasonable positive assessment. The main concerns have to do with the rider’s treatment and appearance, with the care received by the food (or at least the user’s perception of the care received by the food) and the interaction with the riders. Interaction with riders is mainly a topic by those who feel more vulnerable to attacks, such as women or older people. These aspects highlight the idea that it is important to think in terms of care and not only in terms of service. Delivery services are services of care. With regards to the first aspect, the way the rider introduces him/herself and interacts does not only generate trust, but also enhances accessibility (speaking slowly and clear is important for the understanding of cognitively impaired or foreign people). It happens something similar with the look: it not only conveys the idea of a respectable brand, generating confidence in the user, but also implies an easy way of identification (by uniforms, for example). The notion of “that’s my rider” is important for cognitively and people with reduced vision.

The following are the codes used to build this theme:



Usability of physical interface/ Net: Bad state of product	Needs/ Net: Geographical isolation	Usability of physical interface/ Suggestions
Food was spilled or damaged	Lives in a suburb and had difficulties to go to supermarket	Riders should anticipate arrival with call/message
Distrust the care the products receive	Products away from home	Use uniform
Usability of physical interface/ Net: Manners and treatment		Riders should be punctual not to generate surprise
Education of riders		Riders should be kind and empathic
Usability of physical interface		Riders should introduce themselves
Look of riders		Riders should have tidy appearance
Hygiene conditions		Packs should have different colours and shapes
Not clear whether it includes forks and knives		There should be training for the app’s workers

Table 20. Dimensions, nets, and codes used to build the P4.Theme 4. PHYSICAL BARRIERS

Theme 5. DIGITAL BARRIERS

P4.Th5 DIGITAL BARRIERS	Related to the age of people and to level of disconnection, but not only. There’s a recognition that digital skills are a new literacy and there’s a willingness to adopt tools.	
	<u>Finding:</u> for a rather aware segment, disconnection may have a voluntary component	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Even less digital audience have some familiarity with WhatsApp or other message channels to contact relatives (COVID may have increased it).	Relevant information for users Problems of availability (e.g., clear opening hours) Problems of location and hierarchy. (e.g., not asking address before filtering restaurants)	<ul style="list-style-type: none"> ● Possibility of contacting app/restaurant on the phone/WhatsApp ● Step-by-step interface ● Include good number of images ● Create introductory tutorial ● Include auxiliaries (completion bar, calculator of how much one’s spent)
“Easy to use” and “quick” are very much mentioned. It appears that there is a problem-solving orientation from La Pájara-CoopCycle platform.	Little human contact (important for segments that find excess of info stressful) Program not resilient to errors (e.g., if it falls, the order is not retained)	

This is a theme that is directly linked to digital literacy, and thus is quite related to generational aspects. It was found in our study that there is a level of digital disconnection, which may have both an imposed and a voluntary component (don’t need to know, don’t need to integrate). There is a willingness of older generations which expresses in the use of WhatsApp or instant messaging to communicate with their families. But this knowledge tends to be specific, punctual, limited to software they have experience with, and not flexible and extendable to other apps/programs. So, a gap between a practical/ operative learning of a tool and a skill was found. Some stakeholders told us that many older people were familiar with WhatsApp but they would not even try to download a new app. This is precisely the gap between a learning and a skill: the skill is the ability of extending a knowledge to an adjacent object. The way of tackling this problem is accommodating the digital requirements to different levels of digital mastering, for instance, offering the opportunity of ordering, making questions or complaints through WhatsApp or other instant messaging platforms. Many respondents also targeted the ease of the platform; a step-to-step interface appeared several times. The idea is that the interface should be thought of as a complex problem: you solve one step of the problem at a time. Additionally, auxiliaries and tutorials are quite valuable.

The following are the codes used to build this theme:

Usability of digital interface	Workflow/ Net: organization	Skills	Accessibility and inclusion/ suggestions
Not easy to use	Not really organize	Lack of digital skills	Create a help bottom
For some, not easy to browse with mobile	Not known hierarchy/ All mixed up	Minimum of digital skills	Create introductory tutorial
The program shut down unexpectedly	The screens are not intuitive	You need to know the existence of the app	Include completion bar
Difficulties (with previous apps)	Too much text/info	Most of them already used to WhatsApp	Include calculator
Registration/ access problems	The opening hours are not clear	No problems with other apps	Easy interface (steps and images)
Uncertainty when cancelling orders	The phone numbers to call are not clear	Users don't need digital skills	Offering alternatives such as phone call or WhatsApp
No human behind	Flow not step-to-step		Error detection and help offer
Too many safeguards in terms and conditions			

Table 21. Dimensions, nets, and codes used to build the P4.Theme 5. DIGITAL BARRIERS

Theme 6. COGNITIVE BARRIERS

P4.Th6 COGNITIVE BARRIERS	Implies a wide range of issues that go across different segments. Problems of attention with older people, dementia, Down syndrome, people under pharmacology treatment, etc	
	Finding: it is a great barrier for usability of digital tools, but there are different grades of capability.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
For the general population, respondents do not express special capabilities needed to use the app, although they show more difficulties in the flow.	Difficult for special needs (orientation, getting lost, making decisions is stressful, simultaneous choices are even worse)	<ul style="list-style-type: none"> ● Not excessive texts/ not excessive choices. ● Include auto-filling/ suggestions by the app. ● Include confirmation of purchase by tutors/ warning message. ● Avoid foreign words on the platform. ● Error detection and help offer. ● Physical aspects (riders being punctual, speaking with short sentences in a clear way)
Even in serious cases, there’s familiarity with intuitive apps and apps based on icons and steps (such as Instagram)	Language barriers (English terms) Confusion with La Pájara and CoopCycle jump (when entering the web of the first, leads to the web of the second).	

The big problem about this theme is that cognitive barriers imply a wide array of conditions, which render a heterogeneous landscape. During our talks, problems of attention with older people, dementia, Down syndrome, people under pharmacology treatment, etc were all mentioned and discussed. Even within one impairment, there are different grades which involve different functionalities and practical orientation. The experts suggested that one key aspect to have in mind at the time of designing a platform is making the individual face the lowest number of choices possible. Choices tend to make cognitively impaired people to stress, to be gripped by anxiety and to feel lost. Auto-filling, suggestions, memorizing previous orders and indications contribute to lower the intensity of choices. It is a path to reduce the load of strain associated with them. In the same way, an excess of text is always disturbing, and many things that can be conveyed with written language, can also be expressed with images and icons. The inclusion of the last is very suggestable. Some of the physical aspects of usability previously mentioned are relevant for his theme.

The following are the codes used to build this theme:



Skills	Needs / Net: Profile of disability	Accessibility and inclusion/ Suggestions
Lack of cognitive skills	Medication keep them away from cooking	Confirmation of purchase by parents
Difficult to judge amounts/ costs	Haven't learned how to cook (mental problem)	Include auto-filling/ suggestions by the app
older people couldn't handle it/ not even interested	Dementia or other health problems	Create a completion bar
Foreign words frighten them	Data privacy and security	Train developers on user’s experience
Spectre of impairment	Cognitive impaired/older people not aware of risks	Physical interface/ Suggestions
Minimum of cognitive skills		Use uniforms
Users don't need cognitive skills		Riders should be punctual not to generate surprise
Speed of the processes		For comprehension, riders should speak with short sentences

Table 22. Dimensions, nets, and codes used to build the P4.Theme 6. COGNITIVE BARRIERS



Theme 7. GRAPHIC BARRIERS

P4.Th7 GRAPHIC BARRIERS	A topic that is mainly sensitive for people with reduced vision, but also for socially isolated or COVID-confined, characteristics that tend to coincide with a great number of older people, people with reduced vision or more needed of graphic aids.	
	Finding: it’s one of the main reasons for not enjoying online purchase and rather preferring shopping at the store.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
There are some positive comments about good colours, no problem with font size and simple graphic interface about La Pájara-CoopCycle app.	They involve much more than one single variable: colour, contrast, position on the screen, uniformity of icons, voice-assistance, simplified menus of options etc. Visual aids (pictures) and avoiding too much text is a need for overcoming both graphical and cognitive barriers.	<ul style="list-style-type: none"> ● Graphic interface should be compatible with external reader. ● Include a voice-assisted menu. ● Include a sound to confirm user’s actions. ● Organize food spatially on the screen (breakfast on top, then lunch, then tea etc... ● Every dish and every restaurant should be associated to an image. ● Customizable font sizes and types.

The theme Graphical barriers is clearly associated with the digital interface, but also to some aspects of the physical interface (for example, the package). One of the aspects to consider in the design is anticipation: lowering the uncertainty is a key issue. The graphic barriers will expel users and make them favour the physical stores. Here there are some aspects which contribute to a tidy, clear and organized layout of the visual components, which is common to all users: the use of colours, of fonts, of an intuitive spatial organization which facilitates the reading. But also, special adaptations for the use of a wider segment of people: voice-assisted menu, sound to confirm actions etc.

Usability of digital interface/Net: difficult for special needs	Difficulties (with previous apps)
Requires external reader	Short-sighted problems
No high contrast mode	Skills
Difficult for older people or people with reduced vision	Blind people are not interested in screens
Not enough visual aids	Accessibility and inclusion/ Suggestions
Lack of voice-assisted menu	A voice-assisted menu should be added
There should be feedback to the user about reception of their actions	Include a sound to confirm user’s actions
Workflow/Net: organization	Organize food spatially on the screen
No standardized position of the icons	

Table 23. Dimensions, nets, and codes used to build the P4.Theme 7. GRAPHIC BARRIERS

Theme 8. SERVICE CHOICES AS A PERSONAL STATEMENT.

P4.Th8 SERVICE CHOICES AS A PERSONAL STATEMENT	The act of selecting a DDS goes beyond the provision of goods. It entails a message, a statement about personal values, views, lifestyles and concerns.	
	Finding: the adherence of the platform to the user’s personal values is associated to general reliability.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Pájara-CoopCycle’s cooperative form, part of the social economy, is valuable by many users. It’s a sign of being a responsible organization.	Ordering delivery in general might be attached to “coldness”, in opposition to the “warmth” of preparing your own food, with products you bought in proximity stores, to salesmen that you know.	<ul style="list-style-type: none"> • La Pájara-CoopCycle should communicate their values and what makes them different. • User’s tips: make clear where they go. • Reduce use of plastic packages (replace by cardboard etc) • Offer veggie options. • Highlight when restaurants use local, organic, fair trade or artisanal products. • Allow user’s comments on restaurants.
Many evaluate the app in opposition to what they call “commercial apps” (Glovo, Deliveroo etc). Avoidance of commercial apps is present.	Preparing your own food is many times associated with concepts such as “family”, “homemade”, “quality” and “healthy”. WARM VS COLD	

This theme is very much related to the images created by brands, the outside layer of services, and their ability to promote the identification of users. This involves matching with the image

that users claim in the act of purchase. As it was expressed in the previous table, the act of purchase is a statement about the personal values, principles and beliefs of the public. When the platform is able to connect with the user’s values, a relation of confidence is set up. As it has been explained, ordering delivery is associated with “cold” images, while preparing the food by oneself is associated with “warmth”: family, household, closeness, quality, health. Another typical association: delivery services linked with large food chains, which embodies a kind of loss of personalization of the consumption. For DDS, it is important to highlight the elements of social responsibility and environmental awareness in a clear way. Whether there is local trade, fair trade, fair payment policies, organic and vegetarian options, options for special health conditions, all these alternatives are a part of the philosophy of the service, which is taken into account at the time of selecting options of food. Another important issue is that even vulnerable groups, whose choices have to match with very strict conditions of accessibility, consider idiosyncratic/“soft values” of the stores they buy from. The act of purchase as a statement of values seems clearly illustrated in the significant rejection to order from “commercial apps” (this is the way they refer to Glovo, Deliveroo, etc) which is almost a ubiquitous feature of the heavy users of La Pájara/ CoopCycle. But the main reason for dissatisfaction with these apps is the neglect of labour rights towards their riders. Nevertheless, the whole scope of elements that contribute to this awareness sphere are: social projects, reduction of plastic, vegetarian and vegan options, favouring local and small stores, supporting food of the world, reducing traffic, among other mentions.

Goals and values / Net: Lifestyle	Goals and values/ Net: Social awareness	Goals and values/ Net: Environmental awareness
Wants to favour small shops	To support a social project	Plastic waste
Apps means loss of contact with salesman	Avoidance of commercial apps	Induced traffic
Goals and values/ Net: Positioning	Support local stores	Prioritizes not wasting food in the fridge
Associates DDS with large chain stores	Attitudes and feelings	Riders use own bikes
Goals and values/ Net: Health	No international food	Veggie options
Economic options of delivery tend to be unhealthy	Not many options	Restaurants should use less plastic package
		La Pájara should communicate that it is more expensive than other because of the social project

Table 24. Dimensions, nets, and codes used to build the P4.Theme 8. SERVICE CHOICES AS A PERSONAL STATEMENT

Theme 9. COVID-19 CRISIS.

P4.Th9 COVID-19 CRISIS	COVID-19 scenario, in the user’s mind, is not directly linked to the choice of delivery or not. It doesn’t come up spontaneously, only when asked.	
	Finding: pandemics and lockdowns bring about reasons for both increasing and decreasing food delivery orders. There’s not a unique response.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
Some respondents recognized DDS as essential in the COVID context. Restrictions to mobility increased their consumption online.	Lockdowns also implied more time to cook. For many, cooking was a routine activity when the scope of possible activities was restricted. Personal economic insecurity associated to the pandemics also hindered delivery.	<ul style="list-style-type: none"> ● Follow strict COVID protocols. ● Communicate compliance with COVID protocols ● Delivery of supermarket shopping and not only prepared food? ● Minimize contact between riders and users but as long as it doesn’t reduce accessibility (e.g., a person in a wheelchair that needs things taken up to his/her floor).
For many, ordering food was accompanied by more digital orders in general. Digital service as couriers to receive items from relatives who avoided contact.	Other limitations appeared, mainly avoiding contact with riders, or caring not to expose riders. Requirement of leaving products at the gate: less accessibility.	

Two important findings should be remarked here. The first one, concerns about COVID are not the main drivers of choice for delivery. Even though many believe that the pandemics was an opportunity to try delivery services, the subject of COVID did not come about spontaneously and, when it emerged, was not directly conditioning the choice of delivery. The second important finding in this theme is that COVID crisis can be interpreted as a factor favouring the use of DDS or as a barrier to it. On the side of those who find the pandemics as an opportunity to expand the use of DDS, there are worries about the exposition in stores and supermarkets, and, in general, an increase in online consumption because of the restrictions to mobility. On the side of those who understand that pandemics hinder the use of DDS, there were found concerns about the personal financial situation which leads to a greater intention of saving, coupled with an increased time for cooking (because of the reduction of activities, the saving of travel time as a

result of teleworking or new configurations of work). There are also concerns about the sanitation of products and the hygiene conditions imposed by the riders.

Perceptions of crisis like COVID / Net: Increase use of DDS	Perception of crisis like COVID / Net: Prevents use of DDS
Because of restrictions to go out, more consumption online	Delivery may not be hygienized
Eats healthier because he uses La Pájara	La Pájara closed for long time. Used other apps.
DDS essential in COVID context	More time to cook, order less.
Useful in time	Order less not to expose riders
Avoidance of exposure	I don't use it, still with COVID
To come out of the routine	Difficult for handicapped to maintain social distancing
	COVID brought new problems of accessibility
	Problems with online purchase during COVID lockdown

Table 25. Dimensions, nets, and codes used to build the P4.Theme 9. COVID-19 CRISIS

4.4.2 Capabilities, limitations and requirements by pilot’s pilot profile characteristics

As a result of the analysis, it was possible to identify capabilities, limitations and requirements that match the user experience of digital services of different selected characteristics that define the different profiles. In the case of P4. Madrid profile, this includes: people with reduced vision, people with reduced mobility, 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, as follows.

People with reduced vision

Capabilities: the degree of reduced vision may vary among the target population, and these lead to different levels of autonomy in their everyday life. As a whole, it is a group that values independence very highly and may interpret having their food delivered as a loss of autonomy. Some of them find enjoyment in making their own shopping, although one respondent acknowledges the need of the accompaniment in the store for some specific tasks, such as reading the expiration dates of the products. They also recognized that COVID crisis made things worse, in the sense that a help in the store is now needed, for instance, because of the difficulty to meet the social distancing requirements.

“Her couple went shopping for her during COVID lockdown, she would have taken longer. It would have been difficult to maintain safety distances and so on” – P4_NU_04 –

The need of help from friends and relatives and the thrive for autonomy is a common topic to mobility and visual impairment, as it is seen in these verbatims:

"Being blind she can't be so independent. But she thrives for autonomy" -- P4_NU_05 --

Limitations: they tend to avoid or are not extremely comfortable with screens and use it as restricted as possible. For instance, one respondent recognized using only WhatsApp because of the benefit of audio messages. It is easy for them to get lost in the complexity and multiplication of icons. When vision is partially reduced, they need the icons to be uniform and intuitive, their number reduced and their location on the screen to be standardized (same icon always to appear in the same position). The lack of contrast and the font are also frequent limitations.

"The home page has a lot of text and too little visual. It also applies for an older person". -- P4_ST_02 --

When the level of visual impairment is high the app or web page needs to be easily readable by external readers, and this is something that many respondents find as a scarcity of current apps.

Requirements: most of the people with reduced vision require large fonts and the possibility of customization. The image has to have enough contrast (since at some levels of visual difficulty, the contrast marks the difference between seeing and not seeing). An item to point out is that the problems of people with visual difficulties with regards to small fonts and excessive presence of texts is shared by the older people, as shown in this verbatim:

"Sometimes they don't have good sight, they type only with one finger, have bad sight, so they go back and erase. They fight against the autocorrection. It may be despairing". -- P4_ST_01 --

The last is an interesting remark: many difficulties are shared by different profiles.

Continuing with requirements, the app has to be fit for external web reading, and this implies some constrictions at the time of designing and using graphs. Another requirement is the possibility of a voice-assisted menu, which was missing in the La Pájara app. Finally, the people with reduced vision would highly value the feedback for the actions they do on the screen. A sound or a beep to indicate that the program has received and recognized the action by the user is important for the continuous rapport between user and interface. Icons should be homogenized and also create standards for the position of these icons on the screen. Large images and limited texts accompanying should be prioritized instead of excessive text.

There are requirements for the people with reduced vision that have to do with the physical interface. For instance, if each type of food was associated with a shape of the package, the recognition of the content would be much easier for a blind person.

"Packages should have different shapes and colours. A breakfast of a colour or rounded shape, dinner with squared shape. The shapes, the colours and the order in which this is handed out are essential". -- P4_ST_04 --

People with reduced mobility

Capabilities: Similar to reduced vision, it was found the discursive line of the search for autonomy, as a way of personal realization and feeling of overcoming adversity. With this in mind, this profile may experience DDS as an assistance option, an alternative that undermines their ability to have things done by themselves.

"He tries to cope with difficulties with the help of friends and family. But not with the digital services. (Comment: He strives to make clear that he is independent. He even highlights that he went on the Santiago de Compostela pilgrimage on his wheelchair)". -- P4_NU_01 -

In this effort for autonomy associated to reduced mobility, the purchase of large amounts may be a strategy to avoid the frequent help of others, as indicated in this verbatim:

"When the quality of food is not compromised, as in the case of bottled water, he can order a whole pallet of water (144 drums of 5 litres each, according to the respondent). He tries not to get his family involved, and that's why he orders big quantities of this type of products. Same with the packs of milk. In this way, he saves time and travel time. But he recognizes this behaviour only for those products for which one doesn't care about quality, one doesn't care whether the product was locked in a truck out in the sunshine for long". -- P4_NU_01 -

Limitations: Besides the strict focus on the disability, this profile is appealed (or not) by a service for the same reasons as everybody else: the desire of being in contact with the salesman, of being personally in the store, of wanting to favour the little shops or wanting to avoid the commercial chains.

"He asserts that he likes researching about the products he consumes. Going to the proximity store and finding out what the origin of the food is, if it came from Guadarrama hills or from what else. That gives him more confidence". -- P4_NU_01 --

A general idea that appears across respondents is that DDS are associated with chains of food (sometimes fast food), which questions their quality. There are associations and positionings that DDS apps should break in order to expand and grow.

"He prefers taxi apps than ridesourcing (Uber, Cabify) for the same reason that he prefers small shops rather than large chain stores: in order to favour the small business owner". -- P4_NU_01 --

People with mobility difficulties tend not to focus on their physical problems to justify choices. This is a way of building a self-image that is comfortable for them. One of the respondents went shopping by bus, carrying a bag with him. But limitations to this proposal appear when the person lives far away or in isolated urbanizations. In this case, personal mobility is more difficult (and an adjusted car for disabled is a great luxury) and the need for DDS increases.

"At the same time, he has the problem that he lives in an urbanization (suburban area). So, he is not willing to pick the bus to go only for a bottle of bleach. He perceives this as a problem". -- P4_NU_01 --

Requirements: possibility of having quality references of the app and its supply, maybe comments and ratings of previous users. Riders looking tidy and treating the food with care ("not leaving the food under the sunshine and leaving"), being polite and educated.

Socially isolated (unwanted loneliness)

Capabilities: this group shows a tendency towards limiting the use of digital delivery apps because the activities that these services replace (shopping, cooking) are part of their leisure, their enjoyment of time, activities that are core in their everyday life. This could be seen in the following verbatim:

"Whenever she doesn't use the app is because she has food at home and enjoys cooking" -- P4_U_02 --

There is a sense and feeling of thriving for autonomy that is shared with the previous profile of mobility/people with reduced vision. Probably, offering an interpretation, isolated people mask their loneliness in a quest for independence as a defensive strategy. So, the importance of "doing things by yourself" is also highlighted in this profile.

"Doesn't like to order food, neither getting the food delivered at home. She feels she can do it by herself". - P4_NU_03 -

One positive aspect is that this profile shows a relatively good assessment of La Pájara with regards to the digital usability of the platform. Some of the comments from this group ponder the responsiveness of the app, the error messages being clear and specific, the simplicity and inclusion of pictures among others.

Limitations: nourishing the idea that vulnerable users feel especially vulnerable towards risks of the platform, in this profile there is a high level of sensitivity towards bringing the credit card information. It was possible to detect a level of avoidance of the DDS because of the fear of paying with a credit card online, and the preference of paying cash.

"She is afraid of paying on the phone. Sometimes she refrains from ordering things so no to provide the credit card number; she doesn't know about the matter and she prefers not to do it. She doesn't view it as a simple thing. She pays cash most of the time". -- P4_NU_03 --

This idea is common to many profiles and not specific to this one, but the sense of isolation also remarks the feeling of being alone against the threats. In a wider look, it is possible to identify a general sensitivity towards providing any kind of information.

"She doesn't tend to give personal data, she considers ostracist. Doesn't understand apps" -- P4_NU_05 --

Of course, bank data or credit card data is the number one fear, but also giving the real name or identity and the storage of previous purchases. There is even one respondent who is afraid of providing their address and floor, even when this is required for the fulfilment of the service.

A limitation that this profile finds in the app of La Pájara is geographical coverage and variety and options of food.

Requirements: main requirement of this group has to do with improving data privacy and security. This can be done by offering to the user a clear list of which data is stored and for how long; designing the terms and conditions section with checkboxes instead of the contract-type text;

including certificates of data privacy to give users more peace of mind; offering the option of paying cash and, finally, creating fake IDs to deliver to.

For this profile, enlarging geographical coverage and food options is important. The last point implies more restaurants included and more variety of types of food.

Not connected people

Capabilities: the first thing that should be pointed out of this profile is that its “disconnection” goes hand in hand with their social awareness; their thoughts about responsibility of consumers and distinction between commercial platforms and those with social goals. It is as if part of this disconnection was voluntarily assumed, framed by an ideological position towards the commercial aspect of the ubiquitous connectivity. This feature can be of interest to a cooperative such as La Pájara if they exploit the contrast between commercial apps vs socially responsible apps.

This profile tends to value social commitment and highly worth the discourse of ethics and principles of La Pájara. They show disconformity with commercial DDS because of the labour relations that are typical of these apps and the work ethics that they exhibit. They hold a bad image of Glovo and Deliveroo (the main competition of La Pájara) and many avoid ordering by these apps. This reluctance sometimes extends to other digital apps such as Amazon, which is mentioned in the course of interviews with this profile. The whole frame should be taken as potential for an app with the characteristics of La Pájara.

Since this section is about capabilities, it should be said that disconnection is not always and entirely a disability but, in many cases, part of a lifestyle. Typical of this profile is not caring about the quality of their phone equipment or not spending so much time on it. In other cases, disconnection might be related to low digital skills. There are no problems of usability concerning La Pájara: they tend to regard the La Pájara-CoopCycle app as clean, agile, immediate and easy. So, just to highlight it, in this group avoidance of other apps, social awareness and lifestyle in general appear high in the ranking of mentions.

Limitations: this profile shows a concern about data privacy and security similar to the profile of unwanted loneliness (many participants correspond to both groups). There appear fears that have to do with contact (again, the reluctance to ubiquity), as seen in this verbatim:

“It is very sensitive that you have to leave your phone number and your name. Especially the phone, since once a restaurant called me by mistake. This was too much for the respondent” -- P4_U_04 --

Another thing, even when there is a positive image of La Pájara, it is found again a remarkable thrive for autonomy and a close association between the idea of ordering delivery and being sick or disable. This is a very interesting finding: one of the most relevant limitations towards the incorporation of DDS doesn't have to do with the digital interface itself, but comes a step before; it has to do with the mental positioning of delivery. The autonomy seeker/ disconnected profiles associate delivery with lack of autonomy, sickness or disability. Meanwhile, the socially/COVID isolated profile rather has an attitude towards DDS of “not for me”, or they associate delivery to luxury, gourmet, businessman. These limitations are not in the contact with the app but rather

before it. They are in the mind of users and potential users and determine attitudes and inclinations to this app.

Requirements: mainly measures to guarantee confidence at the time of providing personal information. Similar measures to those of the previous profile. Similarly, communication about social aims of the app is important because there is trust by contiguity: those users that value social awareness and consider that these values are present in La Pájara, tend to trust more their data management aspects.

Low-income

Capabilities: this profile is very wide and includes many characteristics of other profiles. As capabilities it should be mentioned that, despite the economic status, there is a familiarity with technology and use of apps. There seems to be a good evaluation of the digital usability of La Pájara app. Nevertheless, when interviewing stakeholder who works with exclusion, he referred than in more extreme cases of poverty there are problems with equipment, that do not have enough space to accommodate new apps, and with connectivity, since they tend to have phone plans with a limited pack of data.

In this profile, it is also clear the avoidance of commercial apps and the awareness on the ethical purposes of La Pájara is clearly and highly worth. There is a feeling of empathy with the riders and their working conditions.

"The rival firms do not discriminate how much the restaurant receives and how much the rider gets" -- P4_U_02 --

Limitations: as it is possible to see in the interviews, low-income people perceive delivery services as expensive, as something for other types of people. In this profile the code "delivery is expensive" had 13 mentions, and was the second most referred to after "sensitivity to credit card data", which is common to all profiles.

"He considers that delivery services can charge him a high price" -- P4_NU_01 --

"Restaurants offered by La Pájara are not cheap and fast food, and in an economic emergency there are not many reasonable options" -- P4_U_06 --

From these comments and many others, it is observed that La Pájara is attached to all the categories of delivery, and cannot so far differentiate. La Pájara is generally perceived as not having economic options and being expensive, along with the whole category.

"It may have more approval with other collectives rather than with low income people. It's difficult that they resource La Pájara to get food". -- P4_ST_05 --

The stakeholder commented that in cases where individuals do not have a job or have a low-quality job, they have a lot of spare time but they lack money, and this equation is a great barrier to access the kind of services here proposed. Many people view this service as fit for those who lack time and have enough money.

"The first attitude is 'This is out of my reach'. Many of them have spare time and don't have money. These apps tend to be useful for people that have money and lack time" -- P4_ST_05 --

Requirements: this profile requires in the first place low budget options which they currently cannot find. It is a process of changing the positioning of the category, the idea they have in their minds about what delivery is and what needs it covers. They need different types of payments allowed. Many of the low-income people, especially if they are migrants, do not have a bank account and need to pay cash. Like the stakeholder referred, if low-income people live in institutions or in dwelling shared with many other homes and people, the rider would have difficulties to contact them. Besides, some low-income people will feel very much exposed if they receive a call which is acknowledged by the whole place. So, it is better if there is the possibility of direct contact with the rider in order to arrange the details of the food handing-in.

Another requirement mentioned is not to have a limit amount for the purchase so not to exclude potential low budget buyers.

"The minimum order is 10 euros, I think many would give other priorities to this whole sum" -- P4_ST_05 --

There is a common requirement for low income/older people/people with reduced vision/cognitive impaired and is directly linked to the physical interface. Riders should introduce themselves to reduce uncertainty; they should speak clearly and slow; they should wear uniforms so they are easily and quickly recognized. There should be a previous contact between the rider and the user (a phone call) in order to arrange details that are difficult to establish through the app. The physical interface behaves as a label of confidence, so riders should look tidy and neat to consolidate this concept.

COVID-19 confined people

Capabilities: this category is close to older people who feel at risk or vulnerable in the face of the pandemics, and people with previous health conditions that avoid going out and interaction in the public space, as much as possible. They value the possibility of getting help with the shopping, and many of them already have this practice before the pandemics (not necessarily digital, rather having store employees to deliver their shopping).

"Most of the older people have stores they trust, nearby. Groceries, fish stores, butcher's. Because they established links of trust, these stores tend to take the food to their homes". -- P4_ST_01 --

The other side of the coin is that old generations tend to be less flexible to change incorporated habits and value human contact much more than new generations. So, even when they are used to having their shopping carried for them, this does not imply a direct path to the use of DDS. That path should be built and learned. Even the emergence of COVID crisis may imply a push towards an increase of DDS usage, but also a rise in the health concerns about being in touch with the rider, especially sensitive for population at risk.

Many people in this profile experienced during the lockdowns a detachment and disconnection with their relatives. Relatives may have been an important pillar of their lives beforehand.

"Older women live the current situation as plain risk. They avoid using the public transit and some are not even being visited by relatives. So, to send things to relatives or friends, from home to home, like a cake. It's a way of being close". -- P4_ST_01 --

This recognition opens new possibilities for DDS, as a way of vulnerable populations exchanging with cared people without facing avoidable risks. In this line, delivery should be thought of as a wider service of courier rather than restricting it to food. There is a need of having products brought home especially when focusing on the essentials.

"It could be useful to buy medicine and other purchases". -- P4_ST_01 --

Many older people with special diets have customized caterings during the lockdown, and a DDS could be of use if it was presented as tailored caterings for special nourishment needs. Anyway, La Pájara is not yet perceived in this way.

The main problem of this profile arises with the required digital skills, as it will be examined. But the positive thing is that older people are already acquainted with basic digital tools, such as WhatsApp, which many of them use to talk to relatives and friends. Many of them have had incentives to learn new digital skills to stay connected to people they care about and are eager to learn new abilities. There are many scenarios in which knowing how to use the smart phone changes the quality of life for older people.

"Some of these women have gone through digital literacy courses, they are eager to know how to buy things on the Internet, from tickets to the cinema up to some special offer. Or making appointments to the doctor". -- P4_ST_01 --

Limitations: digital skills is the main limitation for this profile, principally composed of older people. Although they know some basic digital tools, for example, WhatsApp or email, they may have serious trouble downloading an app or exploring a new platform. They value alternatives, such as having a phone number to call in case of doubts.

Another limitation is that they only use the services that they have reasons and evidence to trust. They are not so inclined to explore new things. Receiving a positive comment of somebody they trust is crucial to the start up.

"They trust the word of mouth. They need somebody to recommend the service, those who deliver can rip them off. They don't trust as long as it is recommended. Trust is very relevant". -- P4_ST_01 --

Another limitation: many older people are not willing to try new food because of their health problems. Some have allergies or diabetes and they do not know what their body reaction will be to new food. They have to be sure that what they order complies with the health specification. Besides, away from jobs or academic activities, cooking is part of the way they spend their time, it might be a core activity for this profile. So, replacing the food they prepare might not be especially attractive for this segment.

But besides these aspects, the positioning of the app is again crucial. older people tend to have an attitude of "not for me" when told about the app. They associate the use of DDS with a younger and wealthier public, with people busier or businessmen. Or they associate DDS with gourmet

food, special occasions (not every day) or people who want to try new dishes. The profile does not feel appealed by the concept of DDS, and these associations are difficult to break.

Requirements: the app should provide and clearly identify different uses: courier, delivery of prepared food, delivery of shopping. This wider offer could be of interest for the profile. The app should have an intuitive flow, with many images and large fonts, to facilitate readability. The main info should be clearly stated at the beginning: timetable and prices. This is a concern shared with other profiles. There were many complaints about missing info of opening hours and days at the beginning. There were also complaints about a lack of visual aids and images, which is especially important for cognitive impaired and older people. English or foreign words should be kept aside from the interface since they may be confusing for these profiles.

There is a suggestion by a stakeholder of adding alternatives to communication besides the app. This is because of difficulties downloading apps, to learn how to use them, or having inadequate phone equipment or lack of space to download it. Giving the alternative of ordering by WhatsApp or even through a phone call may be a good option.

"Rather than an app, a WhatsApp number to make orders, because it's the tool they know. Both alternatives should be offered. Even as a third option, a phone number for the small minority that doesn't use either app nor WhatsApp". -- P4_ST_01 --

The human contact is important for this group, not only to make the order but also to arrange details of the hand in. Since it is possible that this profile wants to avoid contact with the rider, it could be useful that users receive a call where they could arrange where the delivery would be left, whether the rider may come in or rather stay out of the building, leave it in the lift or at the entrance gate etc. This is also useful for safety concerns, which are especially sensitive for older people and women.

There are other little resources that may help older people as well as cognitive impaired population: a completion bar that anticipates how many steps are ahead to finish the process of purchase (every hint that works on anticipation and creation of certainties is welcome), a help room or FAQ, the possibility of creating a chat room for people who need help but cannot speak.

4.5 Berlin pilot (P5). On-demand ride-sharing into multimodal route planning

4.5.1 Themes identified

In the Berlin pilot (P5) six themes have been identified. In the following sections they are described in details and correspondent dimensions, nets, and codes are mentioned.

Theme 1. CHILD-FRIENDLY SERVICE

<p>P5.Th1. CHILD-FRIENDLY SERVICE</p>	<p>The theme child-friendly service appears many times covering different dimensions. It implies three main aspects: 1) The equipment, 2) The driver and 3) The operation. <u>Finding:</u> before ordering a ride-sharing or taxi service, there are many details that a mother needs to know in advance. Mainstream services tend to forget to provide these details and are usually designed for people with no children.</p>	
<p>CAPABILITIES</p>	<p>LIMITATIONS</p>	<p>REQUIREMENTS</p>
<ul style="list-style-type: none"> • The service deals with many of the uncertainties present in public transport • A door-to-door concept can be relevant to mothers, as long as it covers certain special needs. • If these needs are not met, women find that public transport is even more flexible (e.g., space in the vehicle) • Service can support on daily planning with features such as pre-booking. • Service is flexible and convenient. 	<p>Three types of limitation:</p> <ol style="list-style-type: none"> 1. Equipment: absence of child seats (more than one and in different sizes), base for the child seat, space for stroller or quality seat belts etc. 2. Driver: the driver does not show tolerance with children, is disturbed by delays, does not offer help. Treats a mother as any other user. 3. Operation: the car is not punctual, it does not offer time-flexibility (mothers tend to have delays), does not follow safe and attractive routes, does not offer a safe spot for boarding. <p>Also:</p> <ul style="list-style-type: none"> • Not enough information provided by the application. 	<ul style="list-style-type: none"> • Promote the service as child-friendly • Offer the option of driver’s assistance. In that case, the driver sent by the app would be only those available to assist the parent. • Have the right equipment, this implies, as it appeared in the interviews, different sizes of child seats. • Offer the option of calling the driver (for example, if additional time needed, or whether to ask about functionalities in the car) • Save routes, because mothers with children tend to repeat them (e.g., to the doctor, to the pharmacy and son on) • Identify safe spots for boarding (e.g., a quiet side street instead of a multi-lane avenue) • Possibility of booking in advance

In Berlin the theme of child-friendly service was identified. When a ridesharing service would be inclusive for caregivers of children, their needs should be reflected in different aspects of the

operations such as the information provided by the app and the way it is channelled. These aspects were mentioned by stakeholders, users and non-users during the interviews and should be taken into consideration in order to be inclusive and fulfil the needs of the Berlin pilot user profile.

Concerning the capabilities, it was identified that ridesharing, as a flexible service that brings people from door-to-door, can support caregivers on planning their regular activities and for different trip purposes. For example, to bring children to school, or when they have extra activities during the week or even for going to doctor’s appointments. To support caregivers planning, ridesharing services often offer the possibility of booking a ride in advance, allowing caregivers to plan their activities ahead by booking their ride with anticipation.

A ridesharing service could be considered inclusive and child-friendly when some specific aspects in the operations are considered. For example, the service should have the right child seat, the driver should be able to support the caregiver entering the car; there should be enough space in the vehicle for carrying bags and possibly a stroller; the vehicle should be able to park on a safe space so the on/off boarding with children occur safely; more time for the on/off boarding should be considered when with children and the service should be an affordable option, by offering a family fare or be included in the public transport subscriptions.

Moreover, all these aspects should be informed through the digital interface. If this information is not clear, it might be seen as a limitation for caregivers to use the service. The digital interface should inform the user clearly about what is included in the service and what kind of support, equipment and space they can expect. The need of clarity in the digital interface is reinforced by the fact that caregivers lack time, time to go through, explore and understand how the service works and what is included. This is why a user-friendly digital interface is required.

This theme was built with the following codes:

Needs/ Net: time constraint	Usability of physical interface/ Net: manners and treatment
More time flexibility when travelling with children	Have the right equipment for children
No needs for mother addressed	Not enough child seats
Usability of digital/ Net: lack of information	Need more space in the car
Child's age allowed	Service does not accept delays
Driver support	Usability of digital/ Net: ease of use
Info about space for stroller	Booking for the whole family is complicated
Doesn't know if they have child seat	

Table 26. Dimensions, nets, and codes used to build the P5.Theme 1. CHILD-FRIENDLY SERVICE

Theme 2. SOCIAL PRESSURE/ VIEW ON CHILDREN

<p>P5.Th2 SOCIAL PRESSURE/ VIEW ON CHILDREN</p>	<p>Respondents are interested in the image and the reaction that others have about their children. Whether their children disturb, whether they can delay the service for other users, how others interact or do not interact with them. So, the care is not only about the child itself but as well about the relations with the social environment.</p>	
	<p>Finding: At the time of contracting a service, there is an interest in the others and in the social context that this service will be able to offer.</p>	
<p>CAPABILITIES</p>	<p>LIMITATIONS</p>	<p>REQUIREMENTS</p>
<p>Respondents are aware of the disturbance that their children may generate to others.</p>	<ul style="list-style-type: none"> ● Mothers experiment anxiety, anticipating the reactions of others before they occur. ● The type of travel requires flexibility, not only from the mother but from the driver and all the passengers. 	<ul style="list-style-type: none"> ● The possibility of calling the driver or contacting him to warn him or let him/her know about contingencies. ● The app should give the option of selecting “service with children”, indicating the number of children and the age. In that way, the app arranges: <ol style="list-style-type: none"> a. Direct a car with the proper equipment for the demand, b. Direct a car whose driver is tolerant to children and willing to provide the required assistance. c. Notify the remaining passengers of the service in case any would like to step out. ● Possibility of booking in advance ● Ways of speeding up the onboarding and offboarding. For example, a scanner of a credit card.
<p>The digital interface can facilitate that all the people hold the same information, so every passenger can make decisions accordingly.</p>		

How the presence of children is perceived by drivers and other passengers is a relevant limitation expressed by the interviewees. Caregivers of children expressed they would feel pressured by the fact that they might be delaying the ride when onboarding with children. Preparing their seat, fasten the child and packing takes longer than a person alone. They fear people would start making comments while they wait, creating a social pressure. Therefore, it is required that the service is promoted as a service for everyone, a service that is child-friendly, not only for the

comprehension that caregivers with children might take longer to enter the car, but also to be tolerant to children inside the car, another concern expressed by users and non-users.

This theme was built with the following codes, nets and dimensions:

Attitudes and perceptions/ Net: social tolerance to children
Not know how people will react to children
Strangers should be more patient
Doesn't feel welcome
Tolerant driver
Usability of digital interface/ Net: Lack of information
Driver support

Table 27. Dimensions, nets, and codes used to build the P5.Theme 2. SOCIAL PRESSURE/ VIEW ON CHILDREN

Theme 3. A MODE IN A NETWORK WITH MANY OPTIONS

<p>P5.Th3 A MODE IN A NETWORK WITH MANY OPTIONS</p>	<p>It seems for Berlin (more than in other pilots) that the service is overlapping with other quality options of mobility. Public transport and even bikes appear as valid alternatives for caregivers. At the same time, cars appear as an option specially for more than one child. It does not seem “out of the pocket”.</p>	
	<p>Finding: Some respondents even consider that public transport is the best alternative for avoiding worrying about the children's interaction with others, the space etc. Many respondents see the ridepooling service potentially integrated into the public network of transport</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<p>Ridepooling offers a door-to-door service which may have more adaptations than the public transport which is inflexible.</p> <p>At the same time, there is a perception of higher safety than cycling, especially with small babies.</p>	<p>There is a great offer of many quality alternatives of mobility that seem to provide utility as high as a door-to-door service:</p> <ol style="list-style-type: none"> Public transport: for many respondents, it is easier to carry a stroller into a tram or subway than on a ridepooling car. The user just walks to the 	<ul style="list-style-type: none"> Possibility of integrating the service to the public transport network. Communicating intermodality. Offer longer onboarding time to provide a plus with respect to public transport. Establish personal contact points of the service that provide information and clear doubts about the service for caregivers Highlight that the service allows to

	<p>station and does not have to wait nor leave other people waiting.</p> <p>2. Private cars: those who see it as the best alternative are people who do not rely on public transport and find bikes inadequate or not safe enough. It is more mentioned for chained trips such as mobility of care.</p> <p>3. Bicycles: are seen as fast, cost-saving, replacing physical exercise. The adaptation to children is present in the use of cargo bikes.</p> <p>4. Walking and micro mobility: for short distance, when kindergarten or groceries' is not far.</p> <p>Complaints about the service not running outside the city centre.</p>	<p>skip the problem of finding space to park.</p> <ul style="list-style-type: none"> ● An experienced driver which offers attractive routes can be superior to a private car. ● Enlarge area of coverage ● Enlarge service to allow chained trips/ several stops
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For the respondents of Berlin, quality services of transport facilitate that mobility is not a restriction to the provision of care. It was found that there is a high dispersion, many alternatives are seen as viable and parenthood does not appear as an event that introduces the dependence on private motorization. This implies that ridepooling for care finds an important competition, but it has the opportunity of highlighting multimodality as their strength. Those who prefer public transport remark that it is easy to walk to the station and take the tram or subway without waiting or making other people wait. It is a clear sign that frequencies are not bad. Private car is valued because of its autonomy and the potential for chained trips; cycling is valuable by their speed and cost-saving while walking is especially appreciated by those trips close from origin.

The main point is that the service should focus on those aspects that differentiate them from other modes. Some suggestions from respondents may be of interest: offering longer onboarding

time (maybe 1 or 2 minutes), offering attractive routes to be a superior alternative than private cars, or contact points to engage and generate closeness with the respondent.

This theme was built with the following codes, nets and dimensions:

Goals and values/ Net: Lifestyle	Safety perception
Prefers to take private car	Not more safe than public transport
Prefers public transport	Accessibility and inclusion/ suggestions
Uses public transport	Offer longer onboarding time
Uses bike	Offer personal contact
Uses other mobility	Needs/ Net: area of operation
Prefers walking	Not useful a service that runs in the centre
Does not use any app for daily mobility	Not operating in her area
Make clear the service will save parking space	
Better routes could replace private car	

Table 28. Dimensions, nets, and codes used to build the P5.Theme 3. A MODE IN A NETWORK WITH MANY OPTIONS

Theme 4. IDENTITY OF MOTHER ABOVE OTHER IDENTITIES

Theme 4 IDENTITY OF MOTHER ABOVE OTHER IDENTITIES	Respondents show more concerns about road safety and data security of their children than any other concern about themselves. There are no signs that they see possible attacks for being a woman as a threat.	
	<u>Finding:</u> when mothering, the identity “mother” is over other identities that woman can assume and shape the perception of reality.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
There is a special concern about the road safety of kids, that, as a side effect, also impacts on the safety perception of the caregiver.	The mother is more sensitive about children's information in possession of the app, than about her own personal data. With regards to safety perception, women do not recognize any physical threat except for the damage to their child in a car accident. They think mainly in terms of motherhood needs. They	Communicate the understanding of these specific needs and the weight of the “mother” identity.

	assess the service by these standards as if there were no other dimensions involved.	
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This is a theme which is rather built by those things that are not said, omitted, rather than what was currently explained. There is not a special focus on the interaction of the woman with the driver, although there is a care about the interaction between the driver and the child. In the same way, strangers are no longer those who you may encounter, threateningly in the public space, but those who may negatively interact with your child. The personal information about the child got several mentions, while the personal information of the woman (except bank information) was not as sensitive as the previous. There is a transfer of certain fears from the woman to the child, which justify these answers.

Data privacy and security	Needs
Sensitivity about child's information	Need of the mother addressed
Safety perception	
Road safety for being in a car	

Table 29. Dimensions, nets, and codes used to build the P5.Theme 4. IDENTITY OF MOTHER ABOVE OTHER IDENTITIES

Theme 5. SERVICE CHOICE AS A PERSONAL STATEMENT

P5.Th4 SERVICE CHOICE AS A PERSONAL STATEMENT	Many of the positive verbatims value aspects of social and environmental contributions attributed to the app. There are mentions about ridepooling that reduces the need for a private car, the need for parking, the traffic and the CO2 emission. The fact that drivers are not independent contractors is seen such as a benefit.	
	The act of consumption is more than a provision of a service. It entails a message, a statement about personal values, views, lifestyles and concerns. A high level of climate change, social, and ethical awareness was found among the users.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
There is a clear environmental and community awareness of the need of reducing the number of private cars.	Private cars are the main “target”, the consumption to be reduced. But at the same time the one that offers some aspects which are particularly convenient to women carrying many children: door-to-door,	<ul style="list-style-type: none"> ● Highlight the environmental and social values behind the service. ● Communicate the social project behind the service and the benefits of workers. ● Communicate ride-sharing/ ridepooling as a complement of bikes or public transport.
There is also a social interest in the service provider not having		

independent contractors as drivers. And it being part of the public transport network.	space, avoidance of strangers, the right number and size of child seats etc.	
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Goals and values/ Net: Environmental awareness	No need for search for parking
Reduce traffic	Can reduce CO2
No need of private car	Social pressure against private car
Willingness to avoid private car	

Table 30. Dimensions, nets, and codes used to build the P5.Theme 5. SERVICE CHOICE AS A PERSONAL STATEMENT

Theme 6. COVID-19 CRISIS

<p>P5.Th6 COVID-19 CRISIS</p>	<p>COVID-19 crisis puts transport under the spotlight. The reactions are diverse: while an opportunity window opens for ridepooling because of the avoidance of public transport, some concerns about little space and enclosed spaces are a barrier for the use of this service.</p>	
	<p>Finding: COVID generates new fears regarding the proximity to others, the strangers, the unknown.</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<p>The avoidance of public transport is an extended behaviour in the interviews.</p> <p>It offers an opportunity for ridepooling. The said behaviour is also expressed in the fact of former users of public transport, now walking more.</p>	<ul style="list-style-type: none"> • People are more sensitive about spending time with strangers. There are many doubts about them: you don’t know who they’d been with, whether they washed their hands, whether they are COVID-deniers or resist the safety measures. • There are general fears about enclosed 	<ul style="list-style-type: none"> • Establish a COVID protocol and communicate it. • Guarantee a vehicle occupation that allows keeping social distance between passengers. • In times of pandemic, passengers feel safer with greater vehicles.
<p>Users believe safety measures are feasible</p>		

and effective in ridepooling vehicles.	spaces	
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There are many respondents who consider that ridepooling is a good alternative to private cars in times of COVID-19. The element they require most about the service is space to comply with social distance. This requirement appears even more often than sanitation, which is not really mentioned. So, there is a kind of push: there is a new fear regarding public transport, more people walking and the competition of private cars capturing some of this public. But, the positive aspect is that users believe that safety measures are possible and effective and that ride-sharing is a good alternative to private vehicles in times of COVID crisis.

Perception of COVID crisis (positive)	Perception of COVID crisis (negative)
Safe if social distance can be kept	Avoid public transport
If safety measures are kept	Fear of not knowing who is/was in the car
Alternative to private car in COVID crisis	Fear of entering enclosed spaces
Safer than public transport	

Table 31. Dimensions, nets, and codes used to build the P5.Theme 6. COVID-19 CRISIS

4.5.2 Capabilities, limitations and requirements by pilot’s pilot profile characteristics

After the thematic analysis, the Berlin pilot identified capabilities, limitations and requirements to use ridesharing services based on each characteristic that belongs to the pilot user profile. These are: women, caretakers of children, with reduced mobility, lack of digital skills (although owning a smartphone) and living in peri-urban areas.

Women

Capabilities: women use public transport more than men, mostly because of the economic gap resulting from women’s primary care roles and the impact this has on employment. As passengers of public transport, women have diverse needs regarding safety, security or comfort. A ridesharing service integrated into the public transport network seems to provide a safety perception among users and non-users interviewed. Many stated they feel safe using a service that is part of public service, in which drivers are employees and not independent contractors. Also, the fact that people have to register their contact in the application seems to be an aspect that support their safety perception, as in the following verbatims:

“It feels secure if it’s from the city, because it’s clear who is responsible. It should be the same in regard to the digital service provider.” --P5_NU-01--

“(..) because it’s digital it gives a feeling of safety more than if you would just take a car on the street. Because it is in some way a controlled service, that nobody will ride you outside the city.” -- P5-U-03 --

Frequently, women have to adjust their travel behaviour to avoid certain spaces or situations. The flexibility and convenience of a ridesharing service, that can bring them from door to door is an aspect that support their needs and was highlighted in the verbatim below:

"It's almost like your own car that takes you where you want to go. It is also more flexible."--P5-ST-02--

Moreover, the cost of the service plays an important role, especially for care-givers that are on maternity leave, work part-time or have other people to financially support. The cost of a ride using ridesharing services varies depending on the business approach. Software providers, transport service operators and the local transport authority are responsible for setting up the costs for the end-user. Users interviewed in Berlin highlighted the service is cheaper than taxi, while non-users could imagine using it if the service is integrated into the public transport fare system.

Overall, there is a positive feeling towards the ridesharing service from women. Beyond the perception of being a convenient, flexible and safe service, the environmental aspects of the concept of pooling were also mentioned:

"In general, it is nice, it pools people together, it can be cheaper and more effective, it helps reduce traffic and CO2 emission" -- P5-U-01 --

Limitations: the fact that a digital ridesharing is a new service in the market, it can be a limitation for women that never heard about it from people they know, as stated in the verbatim below:

"Women are more reserved when it comes to new technology. Women usually refer services to friends and family but are reserved when it comes to the unknown". -- P5-ST-01 --

Furthermore, an aspect of the potential barrier relates to the punctuality of the service and ride confirmation. A ride that is delayed or cancelled might increase the unsafe feeling depending on where the user is located at which time of the day.

When booking a ride, ridesharing applications provide users a timeframe in which the vehicle is expected to arrive, but because rides are connected in order to pool passengers, the timeframe is sensitive and it may be adjusted depending on traffic conditions and other issues, for example, if other passengers cancel their ride or are delayed, affecting the arrival time and sometimes leading to cancelations. Both aspects of ride punctuality and confirmation plays into the reliability of the service as it can be seen below:

"If the purpose is to go to the airport, she would need the certainty to get a ride, which ridepooling [TL1] cannot provide, it takes time". -- P5-U-01 --

Requirements: for the ridesharing service to fit into women diverse travel behaviour, it was suggested to be integrated into the public transport network and tariff, in which it would provide them support on chained journeys or connect them to the closest public transport stations. Therefore, ridesharing services that are able to show other mobility connections would support their needs, by showing different possibilities to plan their journey on a platform they are familiar with.

As mentioned before, women are especially sensitive to arrival and drop-off times due to safety reasons and tackling these would increase the reliability for them to use the service. On top of that, although many interviewees mentioned they trust drivers because they are employees and not independent contractors, the ability to rate and choose drivers was raised.

"Important to see which kind of driver is coming, they should be able to choose the driver, for example, only women or choose their favourite drivers. It's a sign of confidence when you order something you prefer." -- P5-St-02 --

Because digital ridesharing is a new service and as explained above, it can be a barrier for women, alternative ways of reaching out to them were raised, such as offer tutorials, local events, video guidelines as it can be seen in the verbatims below:

"Users need on top of security and affordability, also simplicity. The service has to be simple. For example, first offer a short introduction to explain how the service and system works, understand the barriers of the system, where the service operates. Afterwards, it is really easy to manage " -- P5-ST-02 --

"Need maybe a guideline for the first use or tutorial via YouTube". -- P5-ST-03 --

Caregivers of children

Capabilities: caregivers of children have regular activities that require more stops and chained journeys, such as bringing children from and to school or other activities, doctors' appointments, groceries and etc. Ridesharing services can be adapted to support such activities in daily, weekly or individual situations, releasing work from caregivers or supporting their planning.

When the service has the right equipment for children and is an affordable option, it is a convenient support for caregivers of children. Different trip purposes were mentioned as it can be seen below:

"Ridepooling could support her in the weekly activities, for when the children have to go to another neighbourhood and it is far " -- P5-NU-03 --

"If she would go to the doctor, she would only carry the child seat and no stroller." -- P5-U-01 --

"In general, she thinks if the service can provide the right equipment, she can imagine it would be very much used for longer distances " -- P5-NU-03 --

Service features, such as being able to book a ride in advance can support caregivers on their daily planning:

"Especially when you are going to do something with kids, there is a lot of time management involved. For her, she would need to know when she will be picked up and where and need to know in advance." -- P5-NU-04 --

Limitations: as mentioned before, caregivers of children have regular activities that require different stops and a lot of planning beforehand, meaning that time is a very important aspect for their daily needs. While they need flexibility to deal with unpredicted delays, they also need a service to be punctual, because they often have other people depending or waiting for them. These contradictory aspects of time can be both seen in the verbatims below:

"Punctuality - women have the pressure when going and coming back from work. Children don't like to be the last one, you cannot be late." -- P5-ST-04 --

"At the same time, with children it is difficult to be just on time. Some flexibility here will be good, because children are not so predictable." -- P5-ST-05 --

For caregivers, children's safety is their highest priority. It is a limitation to use a ridesharing service if these are not able to provide the right equipment and enough space in the vehicle, as well as clear information in the digital application of how to travel with children, as stated in the examples below:

"First reason she does not use it anymore is because these cars do not have child seats. She needs 2 child seats or before she needed a baby and child seat, which these cars don't have". -- P5-NU-01 --

"Children need different seats and normally ridepooling cars do not have that." -- P5-ST-05 --

"feel unwelcome, isn't clear enough how it can be used with small children - not enough information given". -- P5-U-02 --

Another aspect that was detected as a limitation to use the service is the social pressure caregivers perceive of entering the car with children. As much as a ridesharing service can provide flexibility and comfort for caregivers traveling with children, these services are less anonymous because you share a ride with strangers in a vehicle. Most vehicles used in Germany for ridesharing are minivans of 6-8 seats or vehicles of 4-seats. Interviewees expressed they would feel uncomfortable for taking longer to onboard the car with children. First, the caregiver or driver has to install the child seat, make sure the child is properly fastened, if there is a stroller, it has to be folded and put inside the trunk and finally enter the vehicle. The process repeats when they arrive at their destination.

"During this I would feel uncomfortable because for sure people will start making comments while they wait inside". -- P5-U-03 --

Moreover, not only they feel the pressure for delaying the service, they worry about how people would react and interact with small children inside vehicle, as is seen in the verbatim below:

"In the public transport, children are not always silent and although some people react with empathy, others feel disturbed. She can imagine inside a small ridepooling car would be the same." -- P5-U-03 --

Both these perceptions feed into an attitude that the service is not made for care-givers, but only for young people, expressed in the following verbatims:

"She hasn't taken a ride for more than one year (since the birth of the baby)". -- P5-U-01 --

"It is a different thing when you are alone, when you want to go out at night, if you have many appointments and public transport is too far away. But as a family traveling with a small kid, she would not use it." -- P5-NU-04 --

Requirements: to address the barriers pointed out in the latter, suggestions were made by the interviewees on what is required for them to feel welcome and the service can address their

needs. Good marketing to change the mind-set not only of the care-givers, but also people that use the service regularly so there is a general awareness of the service being inclusive.

"Needs a good marketing and image in society. Needs to be explained to everyone - needs to change the mind-set in everyone". -- P5-U-02 -

"There must be a tolerance regarding other people, other people usually don't tolerate smaller children e.g., when crying. Therefore, it must be clear that when sharing the ride, people don't mind children". -- P5-ST-01 -

Further information can be provided through the digital application to clarify what equipment the vehicle has and what to expect when booking a ride with children. Suggestions such as, be able to add child age information, know if the car will have the right child seat, if the driver will support the on/off boarding, offer a service that is more personal, a contact they can reach out for questions or delays, or save time by adding to favourites their home or work address.

"As a mom it would be great if I can go to the app and I can add that I'm with children, one is a baby, one has 5 years old, then I see that a car would be available, for example, in 20 min. But I would have all and then I have no stress to carry things with me". -- P5-U-03 --

"Home address would be practical to provide because the app could already see the starting point and then she could type "go home" or "got to work". But it should be optional." -- P5-NU-01 --

People lacking of digital skills (although owning a mobile phone)

Capabilities: people lacking digital skills are people who for any reason have low familiarity with the digital world. Such people are hardly aware of available services and, in some cases, they are only familiar with devices which are not powerful enough to run the latest digital mobility applications, such as ridesharing services. However, ridesharing services often offer other forms of booking, such as phone or web booking to include people that are not familiar with the technology or do not have access to smartphones.

Limitations: within this profile, it is observed people that have a smartphone, but suffer from not having enough storage space for updating their applications and that might pose a barrier to use ridesharing services. Interviewees highlighted they often don't have enough space in their phone to update apps, as seen in the verbatim below. Additionally, this limitation is increased for caregivers of children that often lack time to manage their phone storage and free space for app updates.

"She has 7 mobility apps on her phone, which she hasn't used for a long time because they need updating". -- P5-NU-01 --

Requirements: alternatives have been raised by interviewees on what is required to include people with lack of digital skills, considering they have access to smartphones. It is very important to have a user-friendly design, without overwhelming the user with information. Taking into consideration caregivers that lack time, the application needs to be generally practical and easy to use.

"It needs to be practical. It has to look good and to be extremely user friendly". -- P5-ST-01--

Alternative ways for reaching out to this profile characteristic were pointed out. For example, add personal contact points or promote the service offline. These personal interactions can take place in a local event or call-centre to facilitate the understanding of the service from a different perspective and users can have direct access to support. Also, flyers were raised as a good alternative to understand the service first before users start using the application first.

“Proactive meetings where people can meet and exchange with a tablet or show on their phone. It's nice to have it in mind to have a personal contact. It's easier than just reading an email or push mail notification. Establish contact points, where people can go and know more about the service and can explain the service for them.” – P5-ST-02 --

“The flyer would be good because she can have a look at it whenever she has time, because if she would only hear or see somewhere about such service, she will not look for it or take the time to register.” –P5-NU-01 --

People living in peri-urban or rural areas

Capabilities: this characteristic focus on people that live in peri-urban locations or rural areas and encounter barriers to digital mobility services or access to transport infrastructure and/or to reliable digital network connections.

Ridesharing services can be applied to tackle different use cases and the mobility in peri-urban areas is one of them. Ridesharing can provide first/last mile service connecting people to the closest transport station or operate a local service. For example, interviewees expressed they see the service as a good alternative when going to the city centre or traveling longer distances:

“She rarely gets out of the region. So, ridepooling could be an alternative when she goes to the city, which normally is too far to go with the bike and for the same reason would not use the public transport.” -- P5-NU-01 --

Limitations: not only digital connectivity is reduced in peri-urban locations, but also many digital services do not operate in these areas. One of the barriers of accessing ridesharing service is that many focus on running their operations in the city centre, where there is a higher probability of pooling and not extending it to peri-urban or rural areas. This geographical limitation can be seen in the verbatims below:

“with ridepooling you could get to the station faster, but it doesn't run in her area. “ -- P5-U-03 --

“For her a limitation is that there is no ridepooling in the area.”-- P5-U-03 --

It is relevant to highlight that there are many pilot projects in Germany testing use cases that focus on the needs of peri-urban and rural areas.

Requirements: the first step required to include people living in peri-urban locations, is to run a service in their residential region. The service may vary from only bringing people to the closest public transport station or running locally. Overall, interviewees suggested that the service needs more attractive routes to support their travel needs, as seen in the verbatim below:

“needs to have attractive routes which will help with the child care etc.” -- P5-U-02 --

4.6 Budapest complementary case study for Antwerp, Madrid and Berlin pilots

4.6.1 Specific purpose of Budapest interviews

The case study of Budapest is focused on the investigating the inclusiveness of the public Transport journey planner app *BKK Futár* app. In this context, the fieldwork including the Semi-structured interviews taken by the INDIMO partner serves multiple purposes. First of all, it is complementing the fieldwork and the thematic analysis performed in the five INDIMO pilots. Secondly, it contribute to identify needs and requirements of users and no-users' target-groups towards digital mobility services. Concretely, they feed the themes emerged by the analysis of the fieldwork in three INDIMO pilots (e.g. Antwerp, Madrid, and Berlín) for the three target-groups of 1) people with reduced mobility; 2) people with reduced vision-both characteristics of the Antwerp and Madrid user profiles- and 3) caregiver people that characterize the Berlin pilot profile.

The analysis of these interviews follows two different approaches: Task 1.2 assesses general usability and knowledge gap of digital mobility services in Budapest, while Task 1.3 analyses the Semi-Structured interviews and contributes to the identification of capabilities, limitations, and requirements of the three mentioned target groups of people.

The thematic analysis performed in Budapest and presented in this section complements three main themes identified in Antwerp, Madrid and Berlin pilots that include: 1. impaired/ elders-friendly service similar to the Berlin theme "child friendly service; 2. physical barriers analogue to one of the Madrid themes, and 3. COVID-19 crisis, that is common theme among all three pilots of Antwerp, Madrid and Berlin.

4.6.2 Themes identified

The Budapest case study contributed to identify three themes that are described in the following section with the correspondent dimensions, nets, and codes.

First, the theme of impaired/elders-friendly service was identified. When a public transport route planning service would be inclusive for caregivers of impaired/elders, the needs of both impaired/older people and caregivers needs should be reflected in various aspects of the operations such as the information provided by digital mobility service and the way how it is channelled. These aspects were mentioned by users and non-users during the interviews and should be taken into consideration to create an inclusive digital mobility solution.

Theme 1. IMPAIRED/ ELDERS-FRIENDLY SERVICE SIMILAR TO THE BERLIN THEME "CHILD FRIENDLY SERVICE.

<p>Bud.Th1. IMPAIRED/ ELDERS- FRIENDLY SERVICE</p>	<p>The theme impaired/elders-friendly service is characterized by two main aspects: 1) The information availability and 2) The operation of the digital service. <u>Finding:</u> before ordering a public transport service, there are many details that a caregiver of an impaired/elders needs to check in advance. They vary according to the cared people’s characteristics and the condition of the operation of the service (e.g. if it is accessible to a wheelchair, for example). Most of the route planning digital services provide this kind of information but the more details available the better it is.</p>	
<p>CAPABILITIES</p>	<p>LIMITATIONS</p>	<p>REQUIREMENTS</p>
<ul style="list-style-type: none"> • Usage of digital mobility service without any difficulties and a general good experience with their use. • Service is flexible and convenient when the provided information provides the needs and the journey planning can be done in advance. 	<p>Two types of limitation appear:</p> <ol style="list-style-type: none"> 1. The information availability: when this information is missing, then users tend to avoid travel in shared or public transport and rely on private modes. 2. The operation of the mobility service: continuous update and maintenance of the database accordingly with the operational changes are essential, for allowing the usability of the public transport. 	<ul style="list-style-type: none"> • Offer the possibility of keeping the previous journeys planned because impaired/elder people together with their respective caregivers tend to repeat the same journeys (e.g., to the health center, to the pharmacy or to visit some friend) • Possibility of booking in advance

In this case capabilities are defined by the abilities of both, the caregivers and the impaired/elders people. The public transport journey planning of BKK Futár app support caregivers on better planning their trips specially when they are accompanying impaired/elders’ people in their daily activities such as to go to the doctors, to buy food or visit some friends. The analysis of the Budapest interviews show that the use experience of the public transport journey planning is generally good, thanks to its capacity of providing the needed information for planning the caregivers trips in advance.

This theme was built-up based on connecting the following dimensions, nets, and codes:

Usability of digital/ Net: lack of information	Usability of digital/ Net: ease of use
Info about space for wheelchairs	Booking in advance is complicated
Info about levels at stops, or if the vehicle used in operation is low-floor	

Table 32. Dimensions, nets, and codes

Theme 2. PHYSICAL BARRIERS

Bud.Th2 PHYSICAL BARRIERS	Mainly focused on the interaction with the infrastructure condition and the means of operation of the service, e.g. vehicles and equipment.	
	<u>Finding:</u> needs vary according to the capabilities of both the impaired/elders’ people and the caregivers. The limitations mostly concern the physical service itself instead of the digital functionalities connected to the operation.	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Services are accessible and convenient when the infrastructure is available and the operation of the physical service meet the needs . In this context, the caregiver and the impaired/elder person can easily plan the trip in advance. General good experience with the usability service provided. 	<p>Two types of limitations appear:</p> <ol style="list-style-type: none"> The transport mode chosen or the specific vehicle type: wheelchair users and other people who have difficulties to move on uneven surface or on stairs prefer modes and vehicles which provide easy alighting and boarding (trains vs. buses, low-floor buses, etc.). The physical conditions of the transport service operation is essential for the usability of public transport and the digital functionality need to be constantly updated accordingly with the maintenance or the reconstruction of public transport stops. 	<ul style="list-style-type: none"> Offer real-time information about public transport stops and vehicles type and their equipment. Zooming option can also be a solution for partially visually impaired people. Constant updates of the database for easily plan the trips.

A public transport route planning service could be considered inclusive and free of physical barriers when both the infrastructure and the operation of the service are constantly integrated in the digital mobility service. Furthermore, any change concerning these aspects should be integrated in real-time in the digital interface. When this integration is missed or the update information is not clear, a limitation appears for people with reduced mobility and vision and for

their caregivers. The need of clarity in the digital interface is reinforced by the fact that caregivers have usually a non-profit job with limited financial and digital data availability. The following table includes the dimensions, nets and codes used to build this theme:

Usability of physical interface/ Net: infrastructure and equipment available
Have accessible infrastructure at stops and stations (level free, elevators, etc.)
In-vehicle space for wheelchairs
Have the right equipment for impaired/elders (e.g. low-floor or wheelchairs ramp)
Needs/ Net: budget constraint
Insufficient mobile subscriptions limit caregivers’ access to digital mobility solutions

Table 33. Dimensions, nets, and codes

Theme 3. COVID-19 CRISIS

Bud.Th3 COVID-19 CRISIS	<p>Also in the Budapest case, the COVID-19 scenario produced changes in behaviours, limiting the use of public transport and hinges on the assistance of others for orientation or overcoming obstacles.</p>	
	<p>Finding: Mobility of impaired groups of people is more restricted.</p> <p>Avoiding public transport because of the COVID exposure implies new difficulties for the everyday mobility of impaired people who choose routes where they know they have higher probabilities of getting assistance, when they travel alone.</p>	
CAPABILITIES	LIMITATIONS	REQUIREMENTS
<ul style="list-style-type: none"> Also in the Budapest case, target groups develop strategies to still get help, now respecting social distance. They count on the support of stable networks of friends and relatives, and on their own caregivers. There is less need to go out for activities, relying more on online alternatives for avoiding personal contacts. 	<ul style="list-style-type: none"> There are limitations when not having an available group of friends/relatives or a caregiver person who support the everyday activities. COVID restrictions limited the use of public transport and consequently of the associated digital journey planner. 	<ul style="list-style-type: none"> Communicate compliance with COVID protocols

The outbreak seems to have a moderate impact on travel behaviour of impaired people, with half of the interviewed that declare to not have changed their habits due to COVID-19 crisis. As in Antwerp and in Madrid, also in the Budapest case, the non-users that usually require help from others now rely more on themselves when they need to accessing public transport for carrying out their daily activities. This aspect makes them more vulnerable. In many cases, they had to adjust their schedule for relying on the support of friends, relatives or their caregivers or making the choice of switching to car use, when they have one.

This theme was built-up on the following dimensions, nets and codes:

Perception of COVID crisis/ Negative	Perception of COVID-19 crisis/ Positive
Hygiene: avoiding contact with other people	More is available online/ more online events to attend
Harder to get help	Distance between you and others/ No clear impact
Dependent on oneself/ Higher feeling of isolation	

Table 34. Dimensions, nets, and codes

4.6.3 Capabilities, limitations and requirements complemented by Budapest use cases fieldwork

People with reduced mobility (complementing Antwerp and Madrid fieldwork)

Capabilities: Speaking of a diverse group of people, level of autonomy and transport options vary highly between individual users. In general, those who are able to drive a car usually travel only by car, and those who cannot drive are left with only the option of public transport or special carrier (caregiving transport) services. They usually try to manage their issues (shopping, leisure, healthcare, etc.) individually and have no problem to use most digital mobility applications.

“I mostly use public transport and for nearby destinations, walking. Because of the Covid-19, nowadays I use cars (as passenger) more often.” -- MBE-NU-i15

“I use (BKK Futár – PT) app when riding public transport; app addresses all my needs that I have about it.” - MBE-U-i21

Limitations: As the group contains wheelchair users and other people who have difficulties to move on uneven surface or on stairs, they prefer vehicles which provide easy alighting and boarding. Therefore, their limitations mostly concern the physical service itself instead of the application connected to it.

“I mostly use public transport, but only accessible vehicles and stops – which is a hard limit for me. If an accessible route is not available, I sometimes use a transport service with a caregiver.” -- MBE-U-i13

This also limits the options they would like to use, as buses are usually accessible by the aid of the driver.

"I prefers fixed-rail systems as I don't need assistance for using them." -- MBE-U-i13

Many applications offer also e-ticketing but miss the option to purchase discount tickets for specific groups (elderly, disabled, etc.).

"I use (e-ticketing) where I can, but in many cases it is not an option. In many cases discount tickets for elderly cannot be purchased as e-ticket." -- MBE-U-i15

Requirements: Users usually preferred the route planner and routing options of mobility applications finding these as the most useful functions.

"Main advantage of navigation is the assistance all along the route until the destination." -- MBE-U-i14

Generally, finding an accessible route or travel option is the key for people with reduced mobility, as alighting and boarding are crucial. Any additional information regarding accessibility is welcome in such applications. Continuous update and maintenance on database and operational changes are essential, as vehicle change (from low-floor to high-floor) or reconstruction of stops can affect the usability of public transport.

"I use (BKK Futár – PT app) for most travel, but especially at unknown places. Needs it to find accessible route. I am satisfied with that, it indicates accessibility well in almost every cases." -- MBE-U-i13

People with reduced vision (complementing Antwerp and Madrid fieldwork)

Capabilities: As the degree of impairment varies among the related group, their autonomy also shows different patterns. In general, most people with reduced vision can and do travel alone, especially on known routes. They usually use walking and public transport as any other mode requires some level of sight.

"I use public transport and sometimes walk. I have a guide-dog, therefore I use only low-floor vehicles, and metro stations where I can avoid escalators (normal stairs are OK)." -- MBE-U-i21

An alternative mode can be taxi and ride-hailing services (Uber, etc.) but not everyone can afford them. Their most common purposes are going to work and leisure, but many of them do shopping alone.

Limitations: An increasing number of the group uses DMS and DDS solutions, but there are still many obstacles in accessibility and in the price of suitable devices.

"I find such services useful in general; the obstacle is accessibility, and the price of suitable devices." -- MBE-NU-i32

Zooming option can also be a solution for partially visually impaired people. Application updates are also risky as any habitual finger movements can activate totally different functions if the user interface were redesigned.

"But in general, many apps have lack of zooming function which would help a lot for people with reduced sight in searching." -- MBE-U-i21

"Disadvantage: after update, some errors may occur (e.g. labels, element descriptions – which could be read by screen reader software – are missing)." -- MBE-U-i22

Requirements: Almost every user preferred the route planner option in the mobility application. As a person with reduced sight, they must get real-time information in which halt the public transport vehicle is, as stop announcement is not reliable – also buses do not stop at every halt, only when there are alighting or boarding passengers. Other functions can be misleading or hardly usable for this group, especially maps or not text-based information (e.g. pictures).

"I have found some imperfection regarding accessibility: sometimes element descriptions/labels – which could be read by screen reader software – are missing, especially after updates." -- MBE-U-i22

"Map view is not useful for me and a bit embarrassing (as it not handled by screen reading software)." -- MBE-U-i23

"I finds complicated to search for particular stops or routes, therefore I have to define my favourite ones (but this solves the difficulty)." -- MBE-U-i24

Caregivers (complementing Berlin fieldwork)

Capabilities: caregivers are people who do not have direct physical restriction when they travel, but usually have needs for specific information, especially when they travel with the person they are caring for. This information varies according to the cared people's attributes (caregivers of people with reduced mobility, reduced vision and intellectually disabled were interviewed).

"Previously, I used mainly public transport (bus and train) and only sometimes car. I was satisfied with travel times and had discounts on fares. I also helped others in travelling by public transport." -- MBE-U-i31

They usually use digital mobility applications without any difficulties and have generally good opinion about the usability of these apps.

"I uses (BKK Futár – PT) app when riding public transport; app addresses all my needs that I have about it." -- MBE-U-i12

Limitations: when travelling as assistants, specific issues can arise. Cared people can be more sensitive to the type of vehicles (bus vs tram, low-floor vs high-floor, etc.) according to their level of disability. Travelling with a group of disabled people can be especially problematic, as they need more available space and usually adequate number of seatings. Short transfer time between vehicles can also be an issue.

"Another important function at caregiving is to see whether the vehicle will be low-floor or not." -- MBE-U-i31

As caregiving is usually a non-profit job, there are caregivers with limited financial opportunities, who cannot afford to have sufficient mobile subscriptions, limiting their access to digital mobility solutions.

“I have public transport app but use rarely as my mobile internet connection is limited.” -- MBE-NU-i11

Requirements: Caregivers are usually satisfied with mobility applications, they find them very useful during caregiving activities (going to a new address, travelling with disabled people, etc.)

“I use app when riding public transport. My most common way of use is to check actual departure times (which are the most important for her), because this makes my travel more calculable, waiting more comfortable, route planning (the choice between alternatives) easier and also helps to catch connections if I have to hurry at a transfer.” -- MBE-U-i31

Specific requirements for future applications are to give more detailed data of their service in order to aid vehicle selection of caregivers travelling with disabled people (for example crowdedness of public transport vehicles – which can also be useful for everyone in times when social distancing is a clear issue).

“I would welcome if I could see the actual usage of vehicles.” -- MBE-U-i31

4.7 Summary of thematic analysis and main findings

An extensive work, both across time and space, allowed us to collect inputs from users, non-users and stakeholders of the target-group population associated with the design of digital mobility and digital delivery services. This was carried along by conducting semi-structured interviews and the creation of a Community of Practices for each pilot, both appropriate spaces to build confidence and rapport with the protagonists in order to collect their views and opinions in an accurate form. An analysis was conducted to understand the main features of the different profiles of target population and their capabilities, limitations and requirements with regards to the presented digital technology. Long paragraphs have been devoted to the comprehension of these vulnerable-to-exclusion populations, their approaches and behaviours towards technology and the possible implications this holds for the design of digital applications. A summary of the themes built in this section and the main findings in terms of capabilities, limitations and requirements for each pilot and each identified theme is presented in the following table.

Pilot Theme	Findings on capabilities, limitations, and requirements
Emilia Romagna-Digital barriers	For certain groups, tech is seen as a problem to get across, rather than as a facilitator. There is a combination of generational issues with idiosyncratic aspects of life in rural areas

Pilot Theme	Findings on capabilities, limitations, and requirements
Emilia Romagna – Geographical and infrastructure issues	This service can shorten distances. At the same time, it is clear from the responses that in rural areas the connection to the Internet is poorer. Because of idiosyncratic elements, devices may not be updated.
Emilia Romagna – Fears (distrust on data management)	Special concerns about the use of the data for receiving unsolicited commercial information, and sensitivity about financial data (credit card number, bank account and so on)
Emilia Romagna – Cultural and ethnic identity aspects	This theme encompasses favourable points (there is a need and interest of foreign people on courier and delivery systems) and barriers (language and cultural barriers).
Emilia Romagna – Allocation of time	There are two important claims when it comes to time allocation: saving time and allowing a flexible use of time.
Antwerp – Difficult experience of crossings	The restriction depends on a number of factors and contexts (weather conditions, state of public infrastructure, obstacles, type of impairment), although a personality trait (curious, explorative, not afraid to ask for help to strangers) is also involved.
Antwerp – Universal or population-focused design?	The question to what extent the design choices made during the smart traffic light development will benefit all people with an impairment or will only be helpful to a certain group.
Antwerp – Stigmas and stereotypes	This population desires not to be labelled by their condition. Some aesthetic characteristics of the proposed paths, particularly artefacts, contribute to the labelling because of the visibility of the solution.
Antwerp- Scepticism about its effectiveness	The main perceived obstacles to effectiveness are: lack of quality public space surrounding the traffic lights; lack of a uniformed vision and deployment (fragmentation); uniformity not restricted to one city; fear of misuse by non-target groups making the device lose credibility.
Antwerp-COVID-19 crisis (with Budapest case study inputs)	Mobility of these groups is restricted and hinges on the assistance of others for orientation or overcoming obstacles. Because of fear of COVID exposition, now they rely more on themselves
Galilee- Cultural barriers that limit women ride-sharing	The presence of a strong social norm implies that women need to ask for familiar approval to ride a vehicle with others than members of the family. In this context, the family of the women are part of the decision process and may limit the user's autonomy.

Pilot Theme	Findings on capabilities, limitations, and requirements
Galilee- Fears about security	The greatest fears of the potential users are related to security: the possibility of threats such as being followed, being attacked, harassed or insulted.
Galilee- Digital barriers	A profile of potential users that exhibit characteristics close to the Emilia Romagna case: low-connected rural villages with populations accustomed to do things in the traditional way.
Galilee- Difficulties to adapt the map to geographical reality	Some characteristics of the land and its history and the customs of inhabitants make the mapping complex. The matching between the geographical space, its nomenclature, the practical use of this nomenclature by the users and the digital mapping is key to develop this project.
Galilee-Ride-sharing as potential substitute of public transport	The type of everyday use, work and study use that the ride-sharing receives, approaches it to the role of public transit. Where there is transport poverty, ride-sharing quickly replaces the role of public transit, being more flexible than taxi services.
Galilee- COVID-19 crisis	Similar to Berlin, fears of sharing enclosed space with strangers and perception of enlarged COVID exposure. This “fear of sharing” merges with cultural barriers and social norm of disapproval of women sharing spaces with strangers without family consent.
Madrid – Fears	Fears arise from a lack of knowledge about how things work. Usage should be treated simultaneously as a process of learning.
Madrid – Search for autonomy	The thrive for autonomy is a common theme to all, but especially in cases of reduction of mobility and vision. Seen as a way of personal realization and feeling of overcoming adversity.
Madrid - “Not for me”	Topic related to individuals that do not even consider the possibility of ordering food through an app. Not appealed by the claim.
Madrid – Physical barriers (with Budapest case study inputs)	COVID-19 brought new concerns about contact. Security is mainly present for women, and also implies interaction with the rider.
Madrid – Digital barriers	Related to the age of people and to level of disconnection, but not only. There’s a recognition that digital skills is a new literacy and there’s a willingness to adopt tools.
Madrid – Cognitive barriers	It is a great barrier for usability of digital tools, but there are different grades of capability.

Pilot Theme	Findings on capabilities, limitations, and requirements
Madrid – Graphic barriers	For people with reduced vision, it is one of the main reasons for not enjoying online purchase and rather preferring shopping at the store.
Madrid – Service choice as a personal statement	The act of purchase is more than a provision of goods. It entails a message, a statement about personal values, views, lifestyles and concerns.
Madrid- COVID-19 crisis (with Budapest case study inputs)	Pandemics and lockdowns bring about reasons for both increasing and decreasing food delivery orders. There's not a unique response.
Berlin – Children-friendly service (with Budapest case study inputs)	Before ordering a ride-sharing or taxi service, there are many details that a mother needs to know in advance. Mainstream services tend to forget to provide these details and are usually designed for people with no children.
Berlin – Social pressure/ view on children	Users are interested in the image and the reaction that others have about their children. Whether their children disturb, whether they can delay the service for other users, how others interact or do not interact with them.
Berlin – A mode in a network with many options	The service is overlapping with other quality options of mobility. Public transport and even bikes appear as valid alternatives for mothers.
Berlin – Identity of mothers above other identities	When mothering, the identity of mother is over other identities and shapes the perception of reality.
Berlin – Service choice as a personal statement	Several respondents value social and environmental aspects related to the app
Berlin – COVID-19 crisis (with Budapest case study inputs)	While an opportunity window is offered to ride-sharing for avoiding public transport, some concerns appear about little space and enclosed spaces and are identified such as a barrier for the use of this service.

Table 35. Summary of main findings on capabilities, limitations, and requirements for each pilot

Finally, another way of summarizing the findings of the thematic analysis is by organizing identified themes according to the lower or higher significance of both digital or physical interfaces. There are some themes more related to the digital aspects and some themes more related to the physical aspects of the DDS/DMS (and some other themes that are rather cultural

and do not have much to do with either the digital nor the physical interface of a potential service).

		Physical interface	
		Low significance	High significance
Digital interface	High significance	<ul style="list-style-type: none"> • Digital barriers • "Not for me" • Graphic Barriers • Cognitive barriers 	<ul style="list-style-type: none"> • Fears • Universal or population-focused design? • Allocation of time. • Scepticism about its effectiveness. • Search for autonomy. • Child friendly service. • A mode in a network with many options.
	Low significance	<ul style="list-style-type: none"> • Culture and ethnic identity aspects. • Stigmas and stereotypes • Purchase as a personal statement • Social pressure / view on children. • Identity of mother above other identities 	<ul style="list-style-type: none"> • Physical barriers • Geographical and infrastructure issues • Difficult experience of crossings • COVID-19 crisis

Table 36. Digital and physical aspects of the identified themes

The table above shows this draft analytical result. Sometimes a cross-fertilization between digital and physical interfaces could improve the use of DDS and DMS: fear of physical contact during the Pandemic crises could be solved by a lockers system such as showed in the previous sections.

4.8 Common themes to various pilots: points of contact

Some common themes may be established for pairs or groups of pilots. In this section they are presented through Venn diagrams and relevant inputs for subsequent analysis are identified.

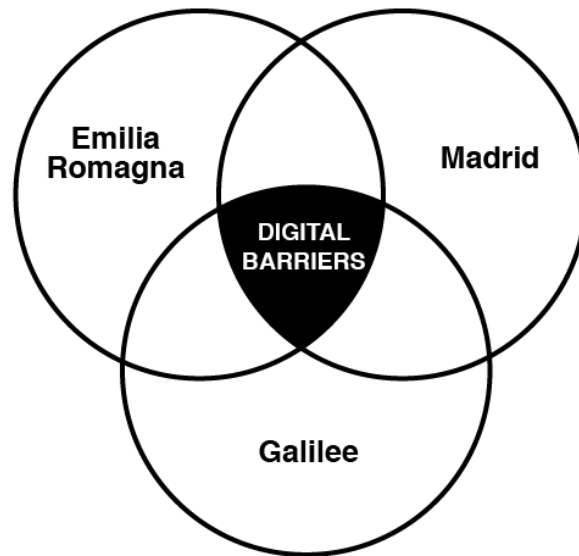


Figure 6. Common theme to various pilots: DIGITAL BARRIERS

Digital barriers were found as a common theme for Emilia Romagna, Galilee and Madrid. In all these fieldworks' analysis, people with low digital skills were found. They, in their everyday life, use digital tools in a very limited way. Socially isolated and low digital skills target-groups in Madrid and a population of older people living in rural communities share common features: a large part of their lifetime they could interact with their environment without resorting to technological abilities; they have low familiarity with the world of apps and do not feel confident with their use; they need assistance of others to use apps, their use tends to need be systematically guided.

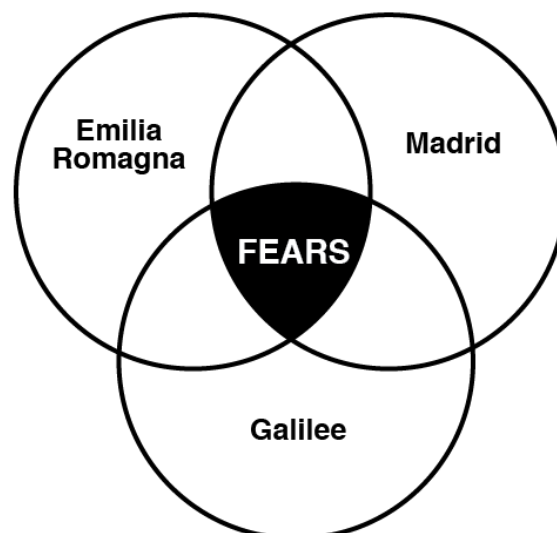


Figure 7. Common theme to various pilots: FEARS

The fears towards technology appear as a result of the lack of knowledge, experience and time spent with digital functionalities. The worst-case scenario of these fears leads us to distrust on data management, which is highlighted both in the case of Madrid and Emilia Romagna. The number one fear is related to the provision of financial status or credit card information. But then

there appear other issues related to privacy, for example, being afraid of companies and brand bombing the person with undesired communications. In the case of Galilee fears are related to the threat of physical attacks and to the hostile environment for women.

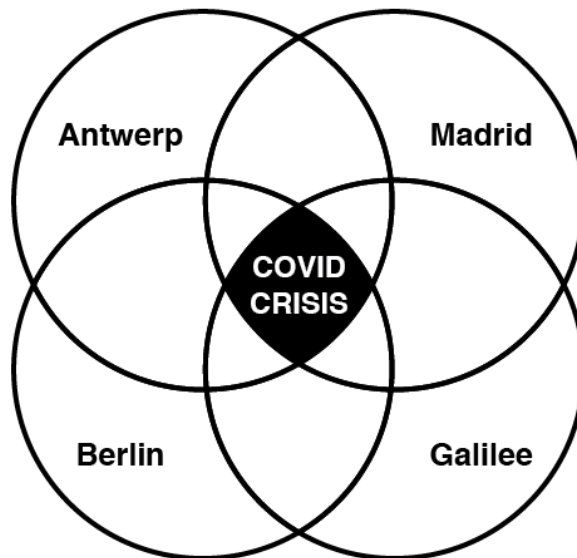


Figure 8. Common theme to various pilots: COVID CRISIS

COVID crisis is a key theme in four of the pilots: Antwerp, Madrid, Berlin and Galilee. Of course, it is a topic raised in the Emilia Romagna interviews, but the nature of the locker, which implied the avoidance of contact with any people, resulted in the fact that there were not as many considerations and concerns about COVID as in the remaining pilots. In Antwerp, the problem is that the targeted populations are very dependent on other people's help for their everyday mobility. And the emergence of COVID implied that not so many people were willing to help in the street. The question that appears is how to continue providing assistance to cross the street or overcome obstacles and at the same time keep the social distance. The lack of assistance during this context may be a disincentive to go out of home. There might also appear some concerns from the impaired person about a stranger touching the wheelchair or any part of their body. Assistance opens a window to COVID exposure. The case of Berlin and Galilee are quite related: ridepooling means the possibility of sharing the vehicle, a small enclosed space, with other passengers and a driver. It means using a vehicle and not knowing who was there before, how the vehicle has been sanitized. This raises questions about the possibility of COVID exposure within the vehicle. At the same time, in the mind of the respondents, public transport is an additional source of fears, for which ridepooling might be, if protocols are complied, an optimal replacement of public transport in times of pandemics. Finally, in the same way that in Antwerp, Berlin and Galilee mobility requires some kind of contact with other people (be it by-passer or the driver), in the case of Madrid delivering services represent a source of contact with a worker (the rider) or the possibility of reducing the likelihood of a more intense contact (for example, replacing consumption at a restaurant).

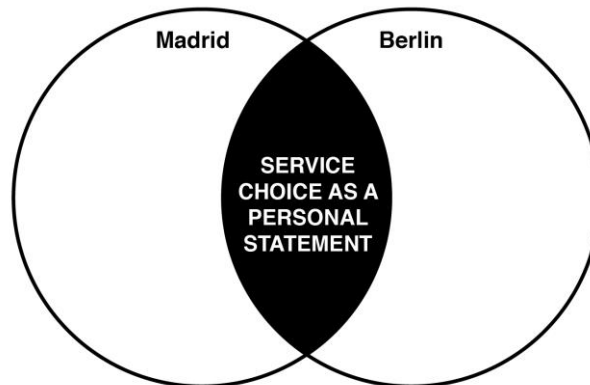


Figure 9. Common theme to various pilots: SERVICE CHOICE AS A PERSONAL STATEMENT

A common theme that links Madrid with Berlin was identified, in relation to the awareness of the consumer or user. It is present in both pilots and it seems that it is not just another conditioning factor, but a true driver of choice. In the case of Madrid, one of the most mentioned items is that, if ordering food, you would rather do it with a social project than with a big commercial platform. This concern mainly moves around the labour rights of riders (in many large platforms riders work as independent contractors, which hides a dependent work relationship). But there are also concerns about avoiding fast food, buying in a more conscious way, knowing the people behind the products and the guarantees of quality. This is not far from the Berlin case. In Berlin what is at stake is a fully aware choice of mobility. The negative impacts of private motorization are mentioned during the interviews. Ridepooling is chosen, among other things, because it is a good replacement of car ownership when you have to transport with children, because it is a good replacement of car ownership in times of COVID or just to contribute to the traffic reduction or to avoid looking for public space. There is an awareness of the effects that a user's personal choices of mobility have on the broader community, and it is valued at the time of choosing.

Of course, not all pilots share themes. Each pilot has its own design and digital application, with its own functionalities. Around this design and the corresponding targeted population, a whole world of symbols and meaning is erected. The focus and the relevant topics change from one pilot to the other, although there are clear points of contact. In any case, the general feeling is that we are in a transitional era when people attached to call centres assistance and completely digital native persons coexist. Therefore, DMS and DDS can penetrate the daily life only when accompanied by guidance and assistance analogical tools.

After exposing the main themes that emerge from our analysis work, providing a framework for the understanding of barriers and facilitators of the digital tools' adoption, it is now relevant to look at the capabilities, limitations and requirements associated to different characteristics present in the selected vulnerable-to-exclusion populations.

5 Results

This section collects the results raised from the whole research, gathering in a synthetic way the following elements: (a) the role of digital apps for satisfying mobility of care needs; (b) the inputs

collected from the user experience for the Digital Mobility Toolbox that will be worked out in the rest of WPs of INDIMO project; and finally, (c) the main requirements for digital and graphic interface of the apps (and target group populations more sensitive to the specific requirements).

5.1 The role of digital apps for mobility of care

Another common aspect is related with the mobility of care including trips purposes as accompanying dependent persons (e.g. children, impaired and elders), going to the hospital, buying food or medicaments. DMS and DDS seem to be essential for covering this gendered mobility in all five pilots: access to e-commerce goods in Emilia Romagna, safely crossing streets in Antwerp, achieving essential key life activities in Galilee, using a food delivery service for covering needs of people with disability in Madrid and take-care of their children when traveling in Berlin. This relevant finding means that still transport system is lacking services and infrastructures adequate to satisfy these needs of mobility of caring and especially vulnerable-to-exclusion groups of people have the hope that DMS and DDS can be useful for meeting their needs. But for this to happen, minimum levels of urban and transport infrastructure (i.e., the names of the local streets in Galilee or the managed walk sides in Antwerp) must exist to enable the penetration of the digital tools and their improvement to make them accessible to vulnerable-to-exclusion people.

Mobility of care is a category that is gaining momentum (de Madariaga, 2013; Di Ciommo et al, 2020) and reflects the growing awareness that transport planning of the past addressed mainly the commuting type of trip, the pendular pattern of mobility that linked the households with the central places of work. In the present, there is a greater sensitivity regarding the provision of mobility alternatives for activities that does not quite fit in the model of commuting and are relative to providing care to others, relative or friends, or to oneself. This mobility, therefore, covers the needs of leaving the children at school, visiting the doctor or the pharmacists’, catering food for the family, accompanying a person with reduced mobility or vision to their destinations, among others ends. It is a reality that has always existed but it was somehow hidden. This topic, in a more direct or indirect way, appear in the interviews and provide evidence about the importance of digital services to contribute to the needs related to this type of mobility. Therefore, it is interesting to examine the role of mobility of care in the mind of the users of each of the pilots and the potential contributions of the digital services in each case.

Needs
Reaching remote areas
Goals and values/ Net: lifestyle
Relieve relatives from errands
To send money to their countries
Receive correspondence and parcels

Table 37. Codes that refer to mobility of care: P1. Emilia Romagna

In the pilot of Emilia Romagna, we can include within the category of mobility of care, the movement of parcels and mails that are crucial for: 1) older people living in areas of relative geographical isolation and with complex logistics; 2) foreign people that exchange parcels and

money with people at their home towns. In this case, mobility is not only a personal activity but it also implies the movement of objects when this is a way of communication or exchange with relatives or acquaintances. The app in this scenario could shorten distances and make people closer. Another point observed in this case includes the errands made by relatives. Accessing not only to parcels but offering additional benefits (errands, paperworking, payments etc) in the same point of service may relieve relatives from taking over these responsibilities, which is a central part of the mobility of care.

Assistance/ Net: From family or friends	Assistance/ Net: mobility trainers
Improve walking experience	To explore the neighbourhood
Look up route together	To learn new routes
If too difficult, will call a friend	

Table 38. Codes that refer to mobility of care: P2. Antwerp (with Budapest inputs)

In the case of Antwerp, people with reduced mobility or reduced vision have friends and relatives incorporated to their daily routine. Sometimes, being accompanied by others is a way of easing up the route, avoiding obstacles or gaining orientation. Some other times, family members or mobility trainers are summoned to help them explore or memorize new areas or routes. The idea of accompanying someone to satisfy a need by completing a trip is clearly indicative of the mobility of care. In this case, the people with disability may find that the advantages that technology renders in terms of orientation, route planning, guidance to the movement, ability to sensor the environment and improved interaction with the surroundings, may offer the opportunity to rely less often on the aid of others and gain autonomy.

Goals and values	Assistance
Going to medical services	Sometimes helped others
Family visits	

Table 39. Codes that refer to mobility of care: P3. Galilee

In Galilee, mobility of care occupies a space in the mind of interviewees who find a clear benefit of using ride-sharing services to go to medical services or visit their family (which could be considered within this category of mobility when the user is the provider of care to their family). The respondents mention that sometimes they help others to travel. The lack of coverage of public transport and the sprawl of villages and urban centres make these services very important for some of the purposes of mobility of care, specially receiving health caring.

Needs	Need/Net: regularity
Need assistance to shop	Need a service for everyday meals
Assistance	They receive delivery only through institutions
Sometimes they helped others	
They (children with cognitive impairments) are very controlled by parents	

Table 40. Codes that refer to mobility of care: P4. Madrid (with Budapest inputs)

Madrid is an interesting case of how apps have a potential, not yet exploited, of contributing to the caring activity. There were observed needs regarding catering food for others, usually at the distance, and sometimes for especially vulnerable-to-exclusion groups. This was the case of

parents that would like to diversify the menus and food intake of their cognitively impaired daughters and sons. But, delivery apps are still identified as for “especial occasions” or “to pumper oneself/ avoid cooking” and are not seen as a regular provision for populations and contexts that require the said regularity. Sometimes, concerns about the price or the type of food also arose during the interviews.

Assistance for shopping was also mentioned in the case of people with reduced vision. In that case, delivery apps could be of great value, and even relieve other relatives from transporting themselves to assist, as long as other obstacles were removed. Typically, people with reduced vision find difficulties in complex web menus or screens that are not user friendly, if it lacks voice-assistance or lack many other items already covered in this document.

Needs	Usability of physical interface
No needs of mother addressed	Have right equipment
Time constraint	Needs attractive routes
On/Off boarding should be in safe location	Needs more space in the car
Usability of digital interface/ Net: Lack of information	Not enough child seats
Doesn't know if they have child seat	Attitudes and perceptions/ Net: social tolerance to children
Pre-book ride	Not know how people will react to children
Enough space for stroller	Strangers should be more patient
Driver support	Doesn't feel welcome
Child's age allowed	Tolerant driver
Accesibility and inclusiveness/ Suggestions	
Offer personal contact	
Ability to provide child's info	
Be able to call the driver	

Table 41. Codes that refer to mobility of care: P5. Berlin (with Budapest inputs)

Berlin is the pilot where mobility of care is more relevant and present, since women caregivers were central actors in this observation. Many of the respondents were women on their post-pregnancy leave, most of them understood mothering requirements as central, shaping their choice of mobility. In this pilot it is clearly observed that established mobility services do not cover the needs of caregivers. They behave as if the “typical” trip was only an individual trip. This implies a gender-bias: since an unequal society assigns the role of caregiving more often to the woman, the typical trip is not targeting her needs; it implies accepting an assigned distribution of roles as a standard for designing services. Because the offer of ridesharing/ridesourcing mobility is denser during peak hours and in the night hours for recreational purposes, family trips are not completely considered, as an interviewee explained. But we could mention that the elements that should be addressed by DMS to be fit for mobility of care are diverse: 1) inclusion of physical elements that enable the care of another person, e.g. child seats, space for strollers, adjustable seat belts etc., 2) training the driver who has to be receptive to the needs of a caregiver, e.g. offering help, being time-flexible, 3) working on the tolerance of all the occupants of the vehicle to children, 4) Generating the communication channels that a caregiver needs to adjust details (because there are more details to adjust when one is in charge of another person)

and, finally, 5) that the service communicates and addresses caregivers, so all the incorporations and improvements are clearly manifested.

Mobility of care in the complementary interviews of Budapest

In the case of Budapest, caregiver was a category where interviews were directed. One finding was that, even when physical obstacles were removed from the system, there is an intense need of special information by the caregiver. For instance, the high-floor might be a problem with certain disabilities. But an additional problem encountered by caregivers is not finding information about this characteristic of the vehicles in a given segment and mode of the transport network. They also mention the difficulty of accompanying more than one person, since issues with the required space and the availability of seats arise. Another important point is that many caregivers lack economic resources to have a complete Internet subscription that will allow them to access to digital mobility solutions or route planners in a continuous way when they are out travelling. This highlights the importance of limiting the complexity of apps, so they are not resource-consuming. The main concerns of caregivers are related to the availability of information to plan the route when in charge of another person. It seems that when looking after a person with specific requirements, information is key to enable the correct choices of mobility. Lack of information could be as restrictive as inadequate infrastructure is.

5.2 Inputs for Digital Mobility Toolbox

From all the collected material, it was possible to extract the main inputs that will hereafter feed the elaboration of a Universal Design Manual (UDM), a Universal Interface Language (UIL), Guidelines for Cybersecurity tool (GC) and Policy evaluation tool (PE). Since many of the inputs may belong to multiple tools, this listing is set in a table that indicates their correspondence.

If the input is related to the inclusion of certain functionalities either in the digital or physical interface of the service, as well as offering more alternatives, it was included in the UDM column. If the input is related to the graphic design and items of the iconic language, it was included in the UIL. If the input has to do with preventing cyber-attacks and maintaining the privacy and data integrity of the users, it was included in the column CG. Finally, if the input is related to broader public policies that can accompany the success in the introduction of the digital services, and these are under the responsibility of local or national authorities, it was included it in the PE column.

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
Accessibility				
Involve target groups throughout the process.	x	x	x	x
Add an assistance chat for people who	x			

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
cannot speak.				
Confirmation of purchase by parents/warning message (for cognitively impaired children)	x		x	
Include auto-filling/ suggestions by the app (for visually and cognitively impaired)	x			
Add a voice-assisted menu (for people with reduced vision)	x			
Include a sound to confirm the user's actions (for people with reduced vision)	x			
Uniformed icons and spatial organization, for instance, breakfast food on top, lunch in the middle, dinner on the bottom (for people with reduced vision) (ONLY FOR FOOD DDS)		x		
Uniformed shapes of the packages, for instance, main dish in squared package, side-dish in a round package (for people with reduced vision) (ONLY FOOD DDS)		x		
Avoid automatic updating of the version (people with reduced vision may find labels or buttons missing or in different position)	x	x		
Include information about child seat and extra space in the vehicle (ONLY DMS)	x			x
Include route planners with real time info (so blind people can trust them to get off the bus/train) (ONLY DMS)	x			
Enable longer on/off boarding time with children (ONLY DMS)	x			
Extend length of light according to user's needs and indicate how much time of green is left (ONLY FOR TRAFFIC LIGHTS)	x			x
Communicate status of lights (red/green) to users (ONLY FOR TRAFFIC LIGHTS)	x			
Offer the user extra info on the quality of the road (ONLY FOR TRAFFIC LIGHTS)	x			

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
Install system on meaningful road from user perspective (ONLY FOR TRAFFIC LIGHTS)				x
Preferably, no action demanded from user (ONLY FOR TRAFFIC LIGHTS)	x			
Integrate smart traffic lights in route planners such as Google Maps (ONLY FOR TRAFFIC LIGHTS)	x			x
Traffic lights should have auditive signal so people with reduced vision places themselves in the surroundings (ONLY FOR TRAFFIC LIGHTS)	x			
Accompany the installation of smart traffic lights with works of urban rehabilitation and modernization, focusing especially on crossings				x
Inclusiveness				
Create help button	x	x		
Include introductory tutorials	x			
Error detection and help offer	x			
There should be no foreign words on the platform.	x	x		
There should be no minimum amount of purchase.	x			
Availability of language choices (considering foreign people)	x			
School to support service introduction				x
Possibility of booking service in advance (important for people with children) (ONLY DMS)	x			
Workflow				
The app should give the option of selecting "service with children" (ONLY DMS), indicating the number of children and the age. In that way, the app arranges: <ol style="list-style-type: none"> 1. Direct a car with the proper equipment for the demand, 	x			

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
<p>2. Direct a car whose driver is tolerant to children and willing to provide the required assistance.</p> <p>3. Notify the remaining passengers of the service in case any would like to step out.</p>				
Allow registering through social networks (such as Facebook)	x			
Very important information such as the working hours of the app and the contact phone should appear very big at the beginning.	x	x		
Step-by-step flow solved with questions (1. What's your address? - filters the stores nearby- 2. What type of food do you want to have? - filters the corresponding food-, 3. How would you like to pay? etc) (ONLY FOOD DDS)	x			
Every store and dish should be accompanied by an image. (ONLY FOOD DDS)	x	x		
Many visual aids (for instance, every payment method should have an icon).	x	x		
Include the possibility of viewing user's ratings.	x	x		
There should be a completion bar, so people not familiar with apps do not feel anxious nor uncertain about the end.	x	x		
There should be a calculator that tells the user at every point of the process how much they are adding up. (ONLY DDS)	x	x		
Autocompletion with the past order/service, with the possibility of modifying it.	x			
At the end, the user should be asked for suggestions or complaints.	x			
The day after the order, the app should mail the user and require them to rank and	x			

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
comment about the restaurant/service.				
Multifunctionally: the app should also allow the user to pay bills, charge mobile phone cards and collect parcels (ONLY LOCKER DDS)	x			
Direct contact				
Humans behind; there should always be the possibility of getting human assistance.	x			
Alternative channels to order: WhatsApp number or phone number.	x			
Possibility of calling the rider/driver to arrange a place of pick up, or clearing doubts.	x			
As long as it is possible, assign the same rider/driver to the same client in recursive orders/services.	x			
Presence of a trusted human guide at the point of the locker (ONLY FOR LOCKER DDS)				
Establish personal contact points of the service that provide information				
Privacy and data security				
Certifications of privacy and good practices for handling credit card info.			x	
Checklist of what data is stored and for how long.			x	
Terms and conditions summarized in checkboxes			x	
Use a code to deliver instead of the real identity of the user (pick up a person, for DMS)			x	
Allow payment alternatives, especially cash but also digital wallets payments (such as PayPal).			x	
Feedback, such as notifications and warnings, to reassure online payments.			x	

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
Safety				
Identify safe spots for boarding (e.g a quiet side street instead of a multi-lane avenue) (ONLY FOR DMS)	x			x
Security				
Include emergency button in case of physical/ sexual attack	x	x		
More options				
Some system of lockers for the user when they are out of home. (FOR DDS)	x			
Enlarge geographical coverage.	x			
Enlarge food options (vegetarian, healthy etc). (ONLY FOR FOOD DDS)	x			
Separate regular orders from special occasions. (ONLY FOR FOOD DDS)	x			
Options for courier and fresh-food delivery and not only cooked food. (ONLY FOR FOOD DDS)	x			
Include service in existing platforms of transport (ONLY FOR DMS)	x			
Physical interface				
Riders/drivers should have a uniform (to be easily identified).	x			
Riders/drivers should be tidy.	x			
Riders/drivers should have good manners. They should introduce themselves and know the user's name.	x			
Riders/drivers should speak slowly and in a clear way.	x			
Riders/drivers should call the user some minutes before arriving to ask whether the user has an intercom or whether they should announce it by a phone call.	x			
Strategic placement of lockers at point of aggregation of communities in rural areas (e.g., local bar) (ONLY FOR LOCKER DDS)	x			x

	Universal Design Manual - UDM	Universal Interface Language - UIL	Guidelines for Cybersecurity - GC	Policy evaluation - PE
Location of lockers should maximize time of service (beyond working hours) (ONLY FOR LOCKER DDS)	x			
Drivers should offer support when necessary (for example, when passenger has a child) (ONLY FOR DMS)	x			x
Communications				
Importance of local peer volunteers as trusted communicators	x			
Create a positive attitude through communication	x	x		
Highlight the environmental and social values behind the service.	x			
Communicate the social project behind the service and the benefits of workers.	x			
Do not communicate ride-sharing/ ridepooling as a replacement of bikes or public transport, but as a complement.	x			
The graphic interface should look that is made for everyone, not only young people		x		
Promote the services “offline”: events and flyers	x			
COVID-19 related				
Establish a COVID-19 protocol and communicate it.	x	x		x
Others				
It should be clear if the app in Play Store or Apple Store is for riders/drivers or end-users	x			
Partnership with local associations	x			
At the beginning providing service for free as incentive to clear out doubts	x			

Table 42. Inputs for Digital Mobility Toolbox

5.3 Main requirements for digital and graphic interface of the apps (and target groups more sensitive to the requirement)

The following tables presents a summary of the main user/non users' needs and the requirements identified by population groups that are more sensitive to them. While space and time are traditional threads for capturing needs in transport and mobility (i.e. origin-destination, distance length, time-saving etc..), the third thread 'human contact' appears as clear need for the usage of the DMS and DDS apps. A relevant number of inclusiveness requirements deals with this aspect that becomes a "must" for the extension of the digitalization in mobility.

Needs threads	Characteristics	P1 EMILIA ROMAGNA	P2 ANTWERP	P3 GALILEE	P4 MADRID	P5 BERLIN
SPACE	<p>Space is both a condition and a constraint to mobility.</p> <p>The overlapping of spatial obstacles is a fundamental driver of mobility choices</p>	<p>Environment characterized by scattered rural villages</p> <p>Logistic problems linked to spatial configuration; involve a great amount of effort to pick up parcels: barrier to the satisfaction of needs</p>	<p>People with reduced mobility or vision find obstacles in the physical environment.</p>	<p>Lack of adequate transport modes and connectivity in the Arab rural villages</p> <p>A hostile atmosphere prevents women to ride the public transit</p> <p>Mobility apps difficulty to match the digital mapping with the real geography.</p>	<p>There are needs related to the geographical coverage of the service.</p> <p>They affect people living in suburban areas who are most concerned with an easy access to stores.</p>	<p>People living in peripheral areas find problems of service coverage.</p> <p>There are also concerns about the safety and attractiveness of the routes and the spots for onboarding.</p>
TIME	<p>Time is a valuable resource and the importance of making a good use of it appears in the different pilots</p>	<p>A locker for logistics allows a flexible and efficient use of time by the users.</p>	<p>Extension of time to cross, the possibility of adapting time to target-group needs.</p> <p>There's a different perceived time for each person.</p>	<p>The app gives an orientation to time allocation: for instance, it makes universities or education centers closer to women.</p>	<p>An app of food delivery may be time saving.</p> <p>It allows to give a different quality to time: time to relax instead of time to cook; a gained time instead of a time devoted to a domestic task.</p>	<p>Time needs to be flexible: (because children's needs are more unpredictable) And driver should be punctual</p>

Needs threads	Characteristics	P1 EMILIA ROMAGNA	P2 ANTWERP	P3 GALILEE	P4 MADRID	P5 BERLIN
HUMAN CONTACT	<p>Digital tools are something little familiar for a great variety of the groups.</p> <p>Human contact is a requirement to overcome some of the fears contained in the digital domain.</p>	<p>An assistant at the locker spot will be helpful to overcome digital-skills-related problems.</p> <p>The importance of personal training is also remarked.</p>	<p>People with reduced vision or mobility are depending on the help of passersby. This assistance narrowed due to fears raised by the COVID pandemics</p>	<p>Having direct contact with the driver is a requirement to trust him, to overcome fears related with physical insecurity</p>	<p>The possibility of ordering food through WhatsApp or arranging details of delivery through a call to the rider were very frequents claims to the service</p>	<p>There was a request of humanity directed to the driver: women need drivers to care about the needs of a mother and to help her onboard and offboard</p>

Table 43. Needs, user/non users capabilities and requirements

Table 44 presents how each of the main requirements for the design of DMS and DDS is sensitive to groups of population vulnerable-to-exclusion. Even when the concept of universal design implies that all interventions on a digital interface should facilitate and consider the needs of any type of user, there are some aspects that raise more concern to certain groups.

Table 44. Requirements for DMS/DDS by user profiles

Requirements	Reduced mobility	Reduced vision	Older people	Non-connected	Socially isolated	Cognitive impairment	Low income	Peripheric Peri-urban Rural area	Women	Ethnic minorities	Foreign people / Migrants	Care-givers	COVID-19 confined
ACCESSIBILITY													
Anticipation and control over the graphic interface: <ul style="list-style-type: none"> Uniformed icons and spatial organization Avoid automatic updating of the version (labels or button may be missing afterwards) 		x	x	x		x							
Include map visualization with the real time position of driver/rider						x			x				
Matching the digital mapping with the real geography										x			
Attracting routes/locations to support educational and caring mobility needs (i.e. trips chain)								x	x				
MORE OPTIONS													
Options for courier and not only cooked food (ONLY FOR DDS)					x								x
INCLUSIVENESS													
Humans behind; there should always be the possibility of getting human assistance.	x	x	x	x	x	x	x		x		x		x
Possibility of calling the rider to arrange place of pick up (either to facilitate mobility or avoid exposure)	x		x										x
There should be no foreign/technical words on the platform			x			x	x				x		
Availability of language choices										x	x		
WORKFLOW													
Very important information (i.e. working hours, contact phone) should appear very big at the beginning	x	x	x	x	x	x	x		x		x		x

Requirements	Reduced mobility	Reduced vision	Older people	Non-connected	Socially isolated	Cognitive impairment	Low income	Peripheric Peri-urban Rural area	Women	Ethnic minorities	Foreign people / Migrants	Care-givers	COVID-19 confined
Many visual aids (for instance, every payment method should have an icon).		x	x	x		x							
Include the possibility of viewing user's ratings.	x	x	x	x	x	x	x		x		x		x
A completion bar, so people not familiar with apps do not feel anxious nor uncertain about the end.			x	x		x							
There should be a calculator or estimator of the order/trip price.			x	x		x	x						
Error detection (by the system) and help offer			x	x		x							
To clarify what equipment the vehicle has and what to expect when booking a ride with children or with disable people												x	
To be able to add child age information, know if the car will have the right child seat												x	
Adding to favourites their home or work address												x	
PRIVACY AND DATA SECURITY													
Terms and conditions summarized in checkboxes	x	x	x	x	x	x	x		x		x		x
SECURITY													
Include emergency button in case of physical/sexual attack			x						x				
PHYSICAL INTERFACE													
Riders/ drivers should introduce themselves and know the user's name. Possibility of uniform.			x			x							
COMMUNICATIONS													
The graphic interface should look that is made for everyone, not only young people			x										
COVID-19 RELATED													
Establish a COVID-19 protocol and communicate it.	x	x	x	x	x	x	x		x		x		x

6 Lessons learned

Conducting the field work implied a good number of challenges and obstacles that had to be overcome. It also meant a great personal and professional satisfaction for us, the researchers. We were welcomed with gratitude by all the participants, users, non-users, people working on institutions; they felt and expressed that the research team was working for them, to improve their conditions of accessibility and inclusion. The conversations were focused on the problems and participants were eager to contribute and to find common solutions to common problems. The same feeling arose from the Community of Practices where all the practitioners were enthusiastic about their participation and have a certainty about the need for spaces to talk about these issues. They were executive and practical and had a great awareness of what was at stake. The future approaches us at high speed and the community will have to face challenges regarding many social practices.

In relation to sampling and recruiting for the interviews, the overlapping of a disability or physical difficulty with the profile of users of an app with a limited penetration in the general population of Madrid, implied a great challenge for recruiting. The potential of apps as a way of reducing barriers for vulnerable populations does not imply that there is a current practice shaped by this trend. So, it was not easy to recruit vulnerable populations that at the same time were users of the app (let alone frequent users of the app). When finding a low-income person who was at the same time a user of the app, it was not someone in extreme poverty, but rather some young unemployed or with low level of productive activity that shared the digital involvement patterns of their generation, although not seriously materially deprived. The overlapping of users and people with reduced vision was another challenge because of the singularity of the search related to a product with a low penetration in the general population, and the additional fact that people with reduced vision are reluctant to screens.

At the time of conducting the interviews, many non-users have a very low familiarity with any type of digital delivery services or digital mobility services. As a result, the interview had resources for hypothesis, conjectures, and possible scenarios for respondents to talk about their beliefs and feelings about technology. With regards to users, sometimes they talked freely about their concerns and interests on general digital services, or general characteristics of technology in services. Thus, the researcher should drive them back into the focus on the tested app. Another point to remark is that some disable people, as a way or reaffirming their autonomy, tend not to include their disability in their explanations or justifications of choices and behaviours. So, there was a work of the researcher to reconnect the vulnerability condition with the decisions of the users.

There is a general feeling of having completed a good fieldwork. The great number of verbatims and codes produced and captured in this deliverable anticipates a high level of inputs for clear guidelines for the INDIMO Digital Mobility toolbox. The recursive appearance of beliefs, motivations and feelings shared by several respondents make us think that there are social

representations and images about digital services that should be considered at the time of designing technology for end-users.

7 New insights and conclusions

Conducting the fieldwork implied a good number of challenges and obstacles that had to be overcome. It also meant a great personal and professional satisfaction for us, the researchers. We were welcomed with gratitude by all the participants, users, non-users, people working on institutions; they felt and expressed that the research team was working for them, to improve their conditions of accessibility and inclusion. The conversations were focused on the problems and participants were eager to contribute and to find common solutions to common problems. The same feeling arose from the Community of Practices where all the practitioners were enthusiastic about their participation and have a certainty about the need for spaces to talk about these issues. They were executive and practical and had a great awareness of what was at stake. The future approaches us at high speed and the community will have to face challenges regarding new social practices within the acceptance and usability of digital mobility services and digital delivery services.

Digital gender divide

A lot has been researched on the gender-biased of transport planning and the experiences of women regarding violence and sexual harassment that have limited their access to mobility and, hence, to opportunities (Law, 1999; Dunckel Graglia, 2016). Nevertheless, the emergence of services of ridesharing, ride hailing and ridepooling open a new field of research in which there are not many researches aiming at the barriers and incentives that face women for using these services. Most of these studies have found that men use ridesharing and ridesourcing services more often than women (Rayle et al, 2016 and De Souza et al, 2018). This may be motivated by the fact that women do not want to commit on a trip with a stranger, or because ride hailing firms face a great number of harassment and discrimination charges.

But concerning the barriers for women using ridesharing, there is limited research spotting women beyond the threats and the violence they face when in the public space. An important finding of our research shows that when women were parenting, their identities of mother were above other identities. Women are more concerned about the safety and security of their children than about their own safety and security. An important insight of our study is to show that regular mobility services address a "male individual" user and do not contemplate the specific needs of caregivers in charge of dependents. This is an aspect of the mobility that sometimes is obscured: transporting with others, either children or older people imply special requirements that cover many areas: type of vehicles, equipment, onboarding and offboarding spots, routes, the attitude of personnel, the attitude of other passengers, the information available, the communication of the mobility company.

Another new insight of our study is that the literature about mobility apps tends to consider a "universal user", ignoring or underestimating the fact that there are cultural barriers that prevent women from participating in shared mobility. Our study shows that in Arab communities in the

Middle East there is community and family disapproval of women sharing a vehicle with people other than members of their family, as an item that builds up the idea of “honesty” in this environment. These cultural barriers for the use of mobility services are rarely central in previous studies, since transport is often approached from a technical and engineering perspective. Most often, literature about inclusiveness in digital mobility services deal with disability, age, gender, level of skill and education, but not as frequent with cultural environments. This is a new insight rendered by our research.

A good deal of the literature points out the advantages on flexibility and security that ridesharing and ride hailing apps offer for women. Blumenberg (2004) affirms that having access to a car during off-peak hours when public transport services are often scarce or unreliable is an advantage especially benefited by women. The security concerns at night and the contribution of mobility apps to that aspect is also covered by Schulz and Gilbert (1996) and Law (1999). A new insight of our study is that many women while parenting find ridesharing convenient because they have concerns about the reaction of other passengers to the presence of their children in the public transport.

Mobility and physical disabilities

Physical impairment has a long tradition in the literature identified as a barrier to the access and use of mobility services (Clifton and Lucas, 2004; Currie and Senbergs, 2007). A lot of papers focus on the set of abilities and skills required by the user to effectively profit from these services. The literature emphasizes that the presence of a barrier to mobility may affect the number of opportunities a person can reach and imply wider socioeconomic impacts.

With regards to the benefits that mobility and delivery services offer to people with reduced mobility, it is often mentioned that drivers and riders will help users that require assistance. Because fares tend to be lower than taxi's, ride hailing, and ridesharing can improve the autonomy of people with physical impairments.

Nevertheless, a new insight of our study is that many people with reduced mobility are eager to show that they can have things done by themselves and may visualize the services of an app (for example, a service of food delivery) as an assistance that undermines their autonomy and their ability to solve issues on their own. Assistance appears as a two-fold aspect: as favouring autonomy or intruding in it; both as empowering and as undesired assistance. This has been long developed in our theme for Madrid, “Search for autonomy” and brings the focus on what levels of assistance are desired by different segments of population.

Smart traffic lights and disable people

Most of the articles on this topic focus on capacity building or teaching pedestrians with special needs (see for example Thomson et al, 2005). Commonly, there are proposals of classroom-based methods to learn how to cross, virtual reality simulations, task analysis and feedback (Wright and Wolery, 2011; Wright and Wolery, 2014; Percer, 2009). But most of the responsibility is put on the shoulders of those who are most vulnerable at a crossing scenario: pedestrians and pedestrians with impairment. In the same line, many of the pilots and academic works on smart traffic lights focus on traffic flow management or tackle the issue of emergency response vehicles and their priority. The studies reviewed have connection with fluidity of vehicles

circulation and there are not many articles that view smart traffic lights from the point of view of the pedestrians. This way of thinking the traffic is so rooted that, like it was found in the present research, vulnerable users incorporate this view when recognizing feelings of guilt for “stopping or delaying the traffic”. This is a new insight that the present study casts light on. It was also found that there is no accessibility solution that is only a technological solution. In the case of Antwerp, if smart traffic lights were not accompanied by repairing and maintenance works in the surroundings of the crossing, the innovation would be perceived as “just another gadget”. This is a reminder to avoid the excessive techno-optimism and to bear in mind that digital approaches to problems always have a physical interface which has an important weight on the nature of the problem.

Another thing to notice is that when thinking about technology facilitating the life of people with impairment, most of the proposals concentrate on smart home technology, home appliances, house lighting and so on (Allen, 1996; Helal and Mann, 2005). This implies that most of these projects picture the person with disability in the private domain, probably because it is easier to adjust in that space. But when it comes to generating accessibility in the public domain through technology, the difficulty is recognized and the proposals are much more limited in scope (see as example, Oliveira Neto, 2018). Our pilot is innovative for approaching the smart traffic lights system from the point of view of the vulnerability and not to optimize flows, and because it is seen from the testimony of users that the main problems, where apps should make a difference, arise in the public domain.

Foreign people as central public users of DDS

It is common to find in public policies, academic writing, and civil organizations proposals the approach of migrants as a vulnerable group who are often depicted undifferentiated from the low-income segment of population. A part of the literature focuses on the inclusion of migrants, how to facilitate their integration to the receiving society. In this way, a negative meaning is built surrounding this population. The new insight of the present research is to identify the potentiality of foreign people as central users of the locker system of parcel delivery. It was seen in the elaboration of Emilia Romagna pilot that there is an unmet need of the foreign people regarding the simplification of their exchanges with their families in their hometown. It appears in the interviews that foreign people very often receive parcels, for example, with local ingredients to prepare traditional food of their hometown or exchange money or other products with their families in their countries of origin. DDS offer a possibility of simplifying and enhancing this operation that is part of the life of someone settling down in a foreign country. Foreign people are presented in this way as potential users and participants of a new experience.

Non-connected people

There has been a lot written about the digital inclusion of older people and people with low-digital skills. There is a recognition that there is an ongoing process of population ageing and, along with it, a challenge for older people to incorporate digital tools to sustain independent living and take advantage of opportunities for societal engagement (Boulton-Lewis et al, 2007; Loos 2012). One of the ways the present research goes beyond the bulk of the literature is that it does not consider older people as a homogenous group. We found that many of the characteristics of low connectivity ascribed to older people were in fact idiosyncratic elements of specific contexts. This is the case of the examined rural areas where old mobile equipment

(which blocks the possibility of a successful download of a new app) was associated with a more traditional mindset and the attachment to the “old way” of doing things. An idiosyncratic resistance typical of an environment goes far beyond the age cohort.

Part of the literature, such as Loos (2012) recognizes, as we did, that a lack of Internet experience during an earlier stage of life proves to be one of the reasons for older citizens not taking up digital tools. But most of the literature focuses on the approach of human-centred design which visualizes the app as a product that must meet the needs and capabilities of the user experience. Nevertheless, this approach mainly covers the feedback given by the app (through sounds, tones, pop-ups) but does not emphasize sufficiently the importance of the humans behind all the digital interfaces, the need of direct contact with other humans, to give confidence and empower the user.

Another insight that we find is that older and socially isolated people interviewed had some contact with digital tools, mainly instant chatting with their families. The use of Whatsapp was paradigmatic. But we discovered that a mechanical adoption of a specific tool does not mean a broad and flexible skill towards technology. Performing mechanically steps that have been memorized (for example, sending a message through Whatsapp) does not mean the capability to solve a problem in the digital environment, for example, finding an app, downloading, registering, checking in and starting using it.

This conclusion has presented the most original insights identified through the fieldwork analysis based on the thematic analysis and related to the previous literature review. They confirm that target-groups of populations vulnerable-to-exclusion are mainly related with gender, mobility and physical disabilities and foreign people and ethnic minorities characteristics. Older people do not appear as a homogenous group. We found that many of the characteristics of low-connectivity traditionally ascribed to older people and non-digital native were in fact idiosyncratic elements of specific contexts (i.e. rural context) more than the age per se. In addition, this research points out that vulnerable-to-exclusion groups as foreign people and migrants can become the central public of Digital Delivery Service, once the apps become more inclusive and deal with language barriers, for example.

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Annex A1: Procedure and protocol for data collection tools

This Annex describes the procedure and protocol concerning the tools used for data collection from users and from non-users within the five INDIMO pilots², which are a part of the living laboratory of information of INDIMO.

Semi Structured Interviews preparation

The SSI preparation will include:

- Number of interviews to be carried out by each pilot:
 - 10 interviews to non-users of Digital Mobility Services (DMS) or Digital Delivery Services (DDS)
 - 5 interviews to users of DMS/DDS
- June 29-30 2020: e-training meetings with pilots' leaders and interviewers.
- Interviewees recruitment:
 - Contact pilots' stakeholders for recruiting interviewees (users and profile fit non-users). These stakeholders include NGO, public servant, policy makers, pilots' app developers, etc.
- Consent to participate in the study:
 - Prior to the interview session, the participants will sign an Informed Consent Form (see attachment). (If it is possible have the participants send the signed form by e-mail a couple of days before the interview).
- Interview duration: 1.5 hours.
- Interview documentation: sessions will be recorded (audio and/or video).
- Time frame for interviews: 1 month (including contact participants and compile responses). The pilots' leaders should start contacting stakeholders not later than June 24 2020.
- Due dates for sending the responses: July 31 2020 - at least 10 interviews. Data collection completion by August 15th 2020.
- Data collection analysis between July 15th to September 4th 2020.

Semi Structured Interview (SSI) procedure and protocol

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

² More details on the pilot projects are described in D3.1, 'Pilot handbook'

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone. (i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview (see also section 2.1).

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Carry out the Semi Structured Interviews

As the introduction to the interview is completed and the consent form is signed, the interview will start the interview. It will include a set of open-ended questions based on the dimensions for data collection from users and from profile fit non-users which were developed in task 1.1 (presented in D1.1).

The interviewer should be familiar with the dimensions and keep them in mind when presenting the questions. A checklist of the aspects to be covered during the interview will be provided. The interviewer should guarantee that each point in the checklist has been addressed without guiding the

Annex A2: Collection of Pilot specific SSI and Stakeholders interviews questionnaires

SSI debriefing template (Pilot 1 – Users)



Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

● Introduction to the interview.

1 - L'intervistatore si presenta brevemente

Salve. Sono [nome e cognome] e lavoro per [nome organizzazione] che è partner di un progetto europeo chiamato INDIMO.

2- L'intervistatore contestualizza l'intervista introducendo brevemente il progetto e i suoi principali obiettivi:

INDIMO è un progetto finanziato dall'Unione Europea che intende migliorare l'accessibilità e l'inclusione sociale dei servizi di mobilità digitale. [Il principale obiettivo del progetto è quello di rompere le

barriere che le persone devono affrontare per accedere ai servizi di mobilità digitale].

I servizi di mobilità digitale sono tutti quei servizi che facilitano la mobilità di persone e merci attraverso l'uso della tecnologia e di applicazioni su dispositivi quali Smartphone, Tablet, ecc. (Es. applicazioni che consentono: la condivisione di veicoli o corse per raggiungere un determinato luogo; la pianificazione di percorsi; la consegna di merci su richiesta; armadietti digitali per la consegna di pacchi, ecc.).

Nell'ambito del progetto, 15 partner di diversi paesi (Belgio, Francia, Germania, Ungheria, Israele, Italia, Spagna) stanno lavorando insieme per sviluppare una serie di strumenti che aiuteranno i fornitori di servizi, gli sviluppatori e le autorità locali a migliorare i servizi di

mobilità digitale esistenti, emergenti e futuri estendendo la loro accessibilità a più ampio numero di utenti possibile. Una particolare attenzione sarà rivolta alle categorie di cittadini considerate più vulnerabili, a causa di difficoltà fisiche, cognitive, socio-economiche, educative, di competenza digitale, linguistiche, di età e genere, ecc. che impediscono loro l'accesso ai servizi di cui stiamo parlando. Per rendere possibile il raggiungimento di tale obiettivo è necessario conoscere gli utenti attuali e futuri di questi servizi, in particolare coloro che hanno esigenze specifiche da prendere in considerazione. Questo è il motivo per cui, per noi e il progetto, è molto importante l'intervista che faremo insieme.

3 - L'intervistatore:

[3.1] introduce l'intervista e i suoi obiettivi principali

In questa intervista vorremmo raccogliere il suo punto di vista e la sua esperienza su diversi aspetti rilevanti per il nostro progetto, tra cui:

- le sue esigenze e bisogni rispetto ai suoi spostamenti quotidiani e al modo in cui le vengono recapitati i beni/ merci che acquista;*
- le sue difficoltà nell'utilizzare servizi connessi all'uso di tecnologie e applicazioni digitali (ad es. Smartphone);*
- le sue preoccupazioni in materia di sicurezza, efficacia o qualità di questo tipo di servizi.*

[3.2] spiega come verrà effettuata l'intervista

Il colloquio consiste in una serie di domande che ci aiuteranno a discutere apertamente su alcuni argomenti riguardanti i servizi di

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mobilità digitale di cui abbiamo parlato. L'intervista durerà circa 1,5 ore.

[3.3] se non è stato fatto prima dell'intervista tramite e-mail, descrivere il modulo di consenso informato (ICF) in presenza. Leggi con l'intervistato il contenuto principale del ICF riguardante le questioni relative alla raccolta, al trattamento e alla protezione delle informazioni nel rispetto della segretezza/ privacy (i.e. l'anonimizzazione delle informazioni raccolte, il modo in cui le informazioni verranno trattate e archiviate, ecc.). In questa fase è necessario chiedere all'intervistato se accetta la registrazione audio dell'intervista, specificando che le informazioni possono essere pubblicate in report di progetto, articoli di riviste, presentazioni di conferenze, ecc., ma – in ogni caso - proteggendo il suo anonimato. [Il modulo di consenso informato deve essere firmato prima di iniziare il colloquio].

Tutte le informazioni raccolte nell'intervista saranno rese anonime per proteggere la sua privacy. Le chiedo cortesemente di registrare l'audio della nostra intervista in modo tale da ricordare meglio quello che mi racconterà e per poterci lavorare in modo più accurato. L'intervista registrata verrà conservata in un archivio sicuro di progetto e trattata secondo l'attuale Regolamento Ue 2016/679 dell'Unione Europea sulla protezione dei dati.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P4 for USER	
1. Obiettivi nell'utilizzare servizi di mobilità digitale + 2. Accessibilità e inclusione: motivazioni per non utilizzare servizi di mobilità digitale	
1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)	
<input type="checkbox"/>	Q1. Quali sono le sue abitudini rispetto all'acquisto di beni di vario tipo? (ad es. si reca direttamente nel negozio; acquista telefonando al negozio senza andarci di persona; chiede ad altri di fare acquisti per lei; non fa molti acquisti, ecc.)
<input type="checkbox"/>	<i>How do you usually obtain food or other goods? (e.g. going to the supermarket, asking others to buy food and other goods for me, etc.)</i>
<input type="checkbox"/>	Q2. Che tipo di servizi o modalità utilizza per la consegna a casa dei prodotti acquistati? (ad es. chiede al negoziante di consegnarlo direttamente a casa; lo porta direttamente lei a casa; chiede a suoi familiari/ conoscenti/ di passare a prendere quanto acquistato in negozio e di recapitarlo a casa sua, ecc.). Per quale motivo preferisce questa modalità di consegna rispetto ad altre?
<input type="checkbox"/>	<i>What kind of services or methods do you use to deliver the food / products purchased to your home? (For example, ask the grocer to deliver it directly to your home; take it directly to your home; ask your family / acquaintances / to pick up what they bought at the store and deliver it to your home, etc.). Why do you prefer this delivery method over others?</i>
<input type="checkbox"/>	Q3. Quando utilizza applicazioni per organizzare la consegna dei prodotti che acquista? In quali situazioni?
<input type="checkbox"/>	<i>When do you use apps to order delivery of food or to organize the picking of your goods? In what situations?</i>
<input type="checkbox"/>	Q3.1 Per quale motivo le utilizza? (ad es. convenienza, confort, per risparmiare tempo e soldi, per la propria salute, ecc.)
<input type="checkbox"/>	<i>Why do you use it? (convenience, comfort, time saving, personal health, ...)</i>
<input type="checkbox"/>	Q4. Quando non utilizza queste applicazioni? In quali situazioni?
<input type="checkbox"/>	Q4.1 Per quale motivo non le utilizza?
<input type="checkbox"/>	<i>When do you not use the app? In what situations? Why you do not use it?</i>

Questions for P4 for USER

3. Bisogni connessi all'uso di servizi di mobilità digitale + 1. Valore nell'utilizzare servizi di mobilità

3. Needs + 1. Value of using the digital mobility service

- Q5. Pensando alla sua esperienza e alle sue attività quotidiane, quali sono i suoi principali bisogni rispetto alla consegna dei prodotti che acquista o della corrispondenza che richiede firma o pagamento? Ritieni che il servizio offerto dall'installazione del locker digitale nella sua città soddisfi i suoi bisogni?**
- Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights) and your access to goods needs (i.e. Digital lockers, delivery of food)? Do these DMS/DDS services address your needs?*
- Quali altri bisogni non soddisfa questo servizio?**
- What other needs this service does not satisfy?*

- Q6. Secondo la sua esperienza, quali sono i principali vantaggi offerti dall'installazione del locker digitale nella sua città?**
- Q6.1 E quali i principali svantaggi, se ci sono?**
- According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?*

4. Descrizione del flusso di azioni compiute per utilizzare il servizio di mobilità digitale

4. Description of the workflow when using the digital mobility service

- Q7. Sempre secondo la sua personale esperienza, mi può descrivere passo dopo passo – dall'inizio alla fine – la sequenza di azioni che compie per utilizzare il locker digitale?**
- Please, according to your experience, can you describe step by step (beginning to end) the process of using ride sharing, smart traffic lights, digital goods lockers, ordering food through a specific Digital Delivery Service (DMS/DDS)?*

5. Usabilità dell'interfaccia digitale del servizio + 8. Difficoltà, limitazioni, sfide e vincoli

5. Usability of the service's digital interface + 8. Difficulties, limitations, challenges and constraints

- Q8. Pensa che l'applicazione scaricata sul suo Smartphone e collegata al locker digitale sia semplice da utilizzare? Per quale motivo?**
- Do you think that this app is easy to use? Why?*

Questions for P4 for USER **Q8.1 Se no, quali sono le principali difficoltà che incontra nell'utilizzare l'applicazione? (vedi la lista sotto)**

Aspetti di usabilità dell'interfaccia digitale da tenere in considerazione nel formulare la domanda (da non suggerire – usare come categorie di riferimento):

- Facilità d'uso:
 - Interfaccia chiara e facilmente comprensibile;
 - Semplice da imparare e utilizzare;
 - flusso e processo d'uso logico e adeguato;
 - ecc.
- *Human computer interaction style*
 - sono disponibili istruzioni rispetto all'ordine di azioni suggerite per l'uso del servizio;
 - l'interfaccia digitale fornisce feedback all'utente in base alle azioni compiute;
 - supporto alle decisioni;
 - ecc.
- Accessibilità e inclusione:
 - consente l'uso del servizio da parte di categorie vulnerabili (anziani, chi ha barriere linguistiche, chi manca di competenze digitali, ecc.);
- Tolleranza degli errori;
- Interfaccia di coordinamento comoda e intuitiva all'interno dell'applicazione;
- Viene offerta l'opzione di contatto diretto con l'operatore.

 If not, what are the difficulties of using the digital interface of the app? (see list) **Q8.2 Quali sono le funzionalità dell'applicazione collegate al locker digitale che reputa più importanti e utili? Per quale motivo?** *Which functionalities of the app are most useful/ important to you?* **Q8.3 Quali sono le funzionalità dell'applicazione collegate al locker digitale meno importanti e utili? Per quale motivo?** *Which functionalities of the app are least useful/ important to you?*

Questions for P4 for USER

6. Usabilità dell'interfaccia fisica del servizio

6. Usability of the service's physical interface

 Q9. Incontra nessuna difficoltà quando usa l'interfaccia fisica del servizio/ locker digitale? Se sì, ci può fornire qualche esempio?

Aspetti di usabilità dell'interfaccia fisica da tenere in considerazione nel formulare la domanda (da non suggerire – usare come categorie di riferimento):

- Facilità d'uso:
 - Collocazione appropriata
 - Semplice da utilizzare;
 - Ha una grafica intuitiva
 - i comandi per l'accesso alle operazioni sono semplici da comprendere
 - le componenti tecnologiche di cui è dotato sono ben visibili e facilmente usabili
 - il display è sufficientemente ampio e nitido
- Accessibilità e inclusione:
 - consente l'uso del servizio da parte di categorie vulnerabili (anziani, chi ha barriere linguistiche, chi manca di competenze digitali, ecc.);
 - le dimensioni delle celle sono adeguate ad ogni esigenza
 - il numero verde dell'assistenza clienti è sempre ben visibile
- Interazione con agenti di servizio (ad. incaricato della consegna):
 - i comandi per l'accesso alle operazioni dedicate agli addetti alle consegne sono semplici da comprendere

 Do you face any difficulties when you use the physical interface of the DMS/DDS? If yes, can you provide some examples?
7. Abilità/ competenze

7. Skills / capabilities

 Q10. Secondo lei, che tipo di abilità e competenze le persone dovrebbero avere per utilizzare il locker digitale intelligente e la relativa applicazione?

Tipi di abilità e competenze da tenere in considerazione nel formulare la domanda (da non suggerire – usare come categorie di riferimento):

- Competenze digitali, legati all'uso della tecnologia (smartphone e tablet in particolare)

Questions for P4 for USER

- Conoscenze specifiche, ad es.:
 - Linguistiche
 - Leggere una mappa in internet
 - Terminologia specialistica e standard digitali
- Abilità cognitive (ad es. memorizzazione delle info; capacità di concentrazione/ attenzione, ecc.)
- Livello di educazione
- Abilità fisiche
 - Essere fisicamente in forma (in grado di camminare per una certa distanza, scendere le scale, trasportare merci, ecc.)
 - Abilità visuo-spaziali

According to your use experience, what skills or capabilities people have to have to be able to use the app? (see list)

10. Self-use, assistere gli altri o uso di gruppo

10. Self-use, assist other or group use

Q11. Di solito utilizza il locker digitale e l'applicazione da sola/o o con l'aiuto di altri? Oppure è lei ad aiutare altri ad utilizzarli? Ha mai contattato l'assistenza clienti? Mi può raccontare alcuni esempi?

Do you use the app alone or with the help of others? Do you help others to use the app? Can you provide some examples?

11. Fiducia, tutela dei dati personali e percezione della sicurezza delle informazioni

11. Trust, perception of personal data privacy and security

Q12. Parlando in generale, quali informazioni lei reputa più private e sensibili? Le condividerebbe utilizzando un servizio online (ad es. età, genere, nome, etc.)? Perché?

Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?

Q13. Di cosa ha bisogno per sentirsi sicura/o nell'utilizzare un servizio digitale o nell'installare un'applicazione sul suo dispositivo (telefono, Tablet, computer, ecc.)? (ad es. un modulo di consenso informato chiaro e comprensibile, la possibilità di scegliere quali dati condividere, standard di sicurezza, acquisto dell'App gratuita, ecc.)

Questions for P4 for USER

What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)

Q14. Con quale frequenza legge le autorizzazioni necessarie prima di installare un'applicazione?

How often do you read the required app permissions before installing an app?

Q15. Si è mai rifiutata/o di installare un'applicazione? Per quale motivo?

Have you ever refused to install an app you want? Why?

Q16. Sta attualmente utilizzando (o ha utilizzato in passato) un antivirus o un anti-malware sul suo device (Smartphone, Tablet, ecc.)? Per quale motivo?

Are you currently using (or have previously used) antivirus or anti-malware apps on your device?

Q17. Quante volte il suo device (Smartphone, Tablet, ecc.) è stato infettato da un virus o malware?

How many times has your device been infected with a virus or malware?

Q18. Pensando nello specifico al servizio di consegna di cui abbiamo parlato finora (locker digitale e relativa applicazione), ha nessuna preoccupazione rispetto alla sicurezza e alla riservatezza delle informazioni personali che introduce nell'app quando la utilizza?

Se sì, quale?

Q18.1 Se no, perché?

Thinking about the specific service of food delivery, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?

12. Percezione della sicurezza

12. Safety perception

Q19. Ritiene che si corrano dei rischi nell'utilizzare questo tipo di servizi e applicazione?

Do you think there is any risk in using this kind of app?

Questions for P4 for USER**14. Attitudini, emozioni, preferenze e opportunità + 9. Percezione dell'utente delle richieste d'uso del servizio e delle sue capacità di soddisfare le richieste**

14. Attitudes, feelings/ emotions, preferences and opportunities + 9. User's perception of the service use demands and their ability to meet the demands

- Q20. Parlando in generale, cosa ne pensa di questo servizio?**
- Q20.1 Incontra le sue aspettative? Perché?**
- Q20.2 Le piace? La soddisfa? Oppure le provoca frustrazione? Mi può spiegare meglio?**
- Q20.3 Ha fiducia nel servizio e in chi lo eroga?**
- Q20.4 Pensa che lo utilizzerà frequentemente?**
- Q20.5 Preferisce altri servizi simili in alternativa? Quali ad esempio?**
- Q20.6 Pensa che ne consiglierà l'utilizzo ad amici conoscenti o familiari?**
- Q21. Potrebbe dire che questo servizio è stato progettato per rispondere ai suoi bisogni?**
- Q22. Che suggerimenti può proporre per migliorare il servizio in modo tale che riesca a soddisfare meglio le sue necessità?**
- Q22.1 Che cosa migliorerebbe dell'interfaccia utente (app del locker digitale)?**
- Generally speaking, what do you think of this service?*
- Does it meet your expectations? Why?*
- Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?*
- Do you have trust in the service and in who provides it?*
- Do you think you will use it frequently?*
- Do you prefer other similar services as an alternative? Which for example?*
- Do you think it will recommend its use to acquaintances or friends?*
- Could you say that this service was designed to meet your needs?*
- What suggestions can you offer to improve the service so that it can better meet your needs?*

Questions for P4 for USER

What would you improve about the user interface?

13. Percezione della resilienza del servizio in relazione all'emergenza Covid-19

13. Perception of the service's resilience to crisis like Covid-19

Q23. Pensa che il servizio/ locker digitale e app di cui abbiamo parlato finora sia una buona soluzione in relazione alla situazione attuale causata dal Covid-19? Perché?

Did you change your habits with regards to use this DMS/DDS because of the Coronavirus crisis? How?

Data of the interviewee

Interview done with (the pilot's specific profile characteristics):

Healthy food delivery users

- Permanently impaired or with disabilities
- Socially isolated (unwanted loneliness)
- Not-connected people (e.g. Low digital skills, lower technology availability)
- Low income
- COVID19 isolated with none or reduced number of daily trips allowed

For the interviewee please specify:

Name / fictional name			
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate		
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____		
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years
How many units in your building?			

Total duration (minutes)

Final interviewer comments:



SSI debriefing template (Pilot 1 – Non users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

• Introduction to the interview.

1 - L'intervistatore si presenta brevemente

Salve. Sono [nome e cognome] e lavoro per [nome organizzazione] che è partner di un progetto europeo chiamato INDIMO.

2- L'intervistatore contestualizza l'intervista introducendo brevemente il progetto e i suoi principali obiettivi:

INDIMO è un progetto finanziato dall'Unione Europea che intende migliorare l'accessibilità e l'inclusione sociale dei servizi di mobilità digitale. Il principale obiettivo del progetto è quello di rompere le barriere che le persone devono affrontare per accedere ai servizi di mobilità digitale.

I servizi di mobilità digitale sono tutti quei servizi che facilitano la mobilità di persone e merci attraverso l'uso della tecnologia e di applicazioni su dispositivi quali Smartphone, Tablet, ecc. (Es. applicazioni che consentono: la condivisione di veicoli o corse per

raggiungere un determinato luogo; la pianificazione di percorsi; la consegna di merci su richiesta; armadietti digitali per la consegna di pacchi, ecc.).

Nell'ambito del progetto, 15 partner di diversi paesi (Belgio, Francia, Germania, Ungheria, Israele, Italia, Spagna) stanno lavorando insieme per sviluppare una serie di strumenti che aiuteranno i fornitori di servizi, gli sviluppatori e le autorità locali a migliorare i servizi di mobilità digitale esistenti, emergenti e futuri estendendo la loro accessibilità a più ampio numero di utenti possibile. Una particolare attenzione sarà rivolta alle categorie di cittadini considerate più vulnerabili, a causa di difficoltà fisiche, cognitive, socio-economiche, educative, di competenza digitale, linguistiche, di età e genere, ecc. che impediscono loro l'accesso ai servizi di cui stiamo parlando. Per rendere possibile il raggiungimento di tale obiettivo è necessario conoscere gli utenti attuali e futuri di questi servizi, in particolare coloro che hanno esigenze specifiche da prendere in considerazione. Questo è il motivo per cui, per noi e il progetto, è molto importante l'intervista che faremo insieme.

3 - L'intervistatore:

[3.1] introduce l'intervista e i suoi obiettivi principali

In questa intervista vorremmo raccogliere il suo punto di vista e la sua esperienza su diversi aspetti rilevanti per il nostro progetto, tra cui:

- le sue esigenze e bisogni rispetto ai suoi spostamenti quotidiani e al modo in cui le vengono recapitati i beni/ merci che acquista;*
- le sue difficoltà nell'utilizzare servizi connessi all'uso di tecnologie e applicazioni digitali (ad es. Smartphone);*
- le sue preoccupazioni in materia di sicurezza, efficacia o qualità di questo tipo di servizi.*

[3.2] spiega come verrà effettuata l'intervista

Il colloquio consiste in una serie di domande che ci aiuteranno a discutere apertamente su alcuni argomenti riguardanti i servizi di mobilità digitale di cui abbiamo parlato. L'intervista durerà circa 1,5 ore.

[3.3] se non è stato fatto prima dell'intervista tramite e-mail, descrivere il modulo di consenso informato (ICF) in presenza. Leggi con l'intervistato il contenuto principale del ICF riguardante le questioni relative alla raccolta, al trattamento e alla protezione delle informazioni nel rispetto della segretezza/ privacy (i.e. l'anonimizzazione delle informazioni raccolte, il modo in cui le informazioni verranno trattate e archiviate, ecc.). In questa fase è necessario chiedere all'intervistato se accetta la registrazione audio dell'intervista, specificando che le informazioni possono essere pubblicate in report di progetto, articoli di riviste, presentazioni di conferenze, ecc., ma – in ogni caso - proteggendo il suo anonimato.

D1.3 User's capabilities and requirements | version 2.0

[Il modulo di consenso informato deve essere firmato prima di iniziare il colloquio].

Tutte le informazioni raccolte nell'intervista saranno rese anonime per proteggere la sua privacy. Le chiedo cortesemente di registrare l'audio della nostra intervista in modo tale da ricordare meglio quello che mi racconterà e per poterci lavorare in modo più accurato. L'intervista registrata verrà conservata in un archivio sicuro di progetto e trattata secondo l'attuale Regolamento Ue 2016/679 dell'Unione Europea sulla protezione dei dati.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P4 for NON-USER

1. Obiettivi/ valore nell'utilizzare servizi di mobilità + 2. Accessibilità e inclusione: motivazioni per non utilizzare servizi di mobilità digitale

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- Q1. Quali sono le sue abitudini rispetto all'acquisto di beni di vario tipo? (ad es. si reca direttamente nel negozio; acquista telefonando al negozio senza andarci di persona; chiede ad altri di fare acquisti per lei; altri si occupano di comprarle ciò di cui ha bisogno senza chiederle nulla perché sanno ciò di cui ha bisogno; non fa molti acquisti, ecc.)**
- How do you usually obtain food or other goods? (e.g. going to local shops, to the supermarket, asking others to buy food and other goods for me, etc.)*
- Q2. Che tipo di servizi o modalità utilizza per la consegna a casa dei prodotti acquistati? (ad es. chiede al negoziante di consegnarlo direttamente a casa; lo porta direttamente lei a casa; chiede a suoi familiari/ conoscenti/ di passare a prendere quanto acquistato in negozio e di recapitarlo a casa sua, ecc.). Per quale motivo preferisce questa modalità di consegna rispetto ad altre?**
- What kind of services or methods do you use to deliver the food / products purchased to your home? (For example, ask the grocer to deliver it directly to your home; take it directly to your home; ask your family / acquaintances / to pick up what they bought at the store and deliver it to your home, etc.). Why do you prefer this delivery method over others?*
- Q3. Ha mai utilizzato o sentito parlare di servizi digitali, in internet, per acquistare e farsi recapitare a casa i suoi acquisti? Per esempio un servizio come Amazon (o Joyjar), di cui forse ha sentito parlare, che le consente di acquistare diversi tipi di prodotti online, in internet, e di recapitarli direttamente a casa sua, fornendo un recapito.**
- Have you ever used (or heard about of) the digital delivery applications/services to order delivery of food or to organize the picking of other goods you buy? For example, a service that offer you the possibility to buy at different stores such as Amazon, to get a prepared dish from one of your local restaurants (e.g. Deliveroo, Uber eats, etc.) or to choose a place for receiving goods in order to pick them at your convenience.*

Questions for P4 for NON-USER

- Q3.1. Se sì, quali servizi/ negozi in internet le è capitato di utilizzare? In quali circostanze? Che cosa ne pensa di questi servizi che ha utilizzato in internet? (usare la tabella di seguito)**
- If yes, which ones? In what situations? What do you think about the digital mobility applications/ services that you happened to use? (fill following table)*

DMS/DDS usato <i>[esempi da D1.1, Tabella 8]</i>	Situazioni	Opinione
Condivisione del veicolo (bicicletta, auto, moto, scooter, ecc.)		
Applicazioni digitali per trovare parcheggio		
Sistemi di biglietteria e prenotazione elettronica (applicazioni mobili, web e terminali)		
Pianificatori di percorsi multimodali (per esempio, <i>Google Maps, Mappy, Citymapper, Moovit</i>)		
Pianificatori di percorsi unimodali (per esempio, <i>Waze, TomTom, Routenet</i>)		
Prenotazione veicolo con conducente <i>Uber, Cabify, etc.</i>)		
Piattaforme per la condivisione dei percorsi (per esempio, <i>Blablacar</i> o simili)		

Questions for P4 for NON-USER

Lockers/Armadietti con applicazione digitale per la ricezione di pacchi		
Consegna del cibo a domicilio (ad esempio, <i>UBER Eats, Deliveroo, La Pajara-Coopcycle</i>)		
Semafori intelligenti e inclusivi (ad es. Adattati alla velocità di marcia della persona che attraversa)		
...		
<input type="checkbox"/> Q3.2 Se no, perché non li ha mai utilizzati? <input type="checkbox"/> <i>If not, why you do not use them?</i> <input type="checkbox"/>		
3. Bisogni connessi all'uso di servizi di mobilità digitale+ 1. Valore nell'utilizzare servizi di mobilità 3. Needs + 1. Value of using the digital mobility service		
<input type="checkbox"/> Q4. Tenendo in considerazione le sue abitudini rispetto all'acquisto di beni/ prodotti di diverso tipo, in che misura ritiene che servizi di consegna basati sull'uso di applicazioni da utilizzare tramite il suo telefono cellulare potrebbero aiutarla? Che tipo di esigenze – ancora non soddisfatte – l'aiuterebbero a soddisfare? <input type="checkbox"/> <i>Taking into consideration your typical access to food and goods, how digital delivery services could help you? What (unmet) needs could they satisfy?</i>		
<input type="checkbox"/> Q5. Per esempio, che cosa ne pensa di un servizio che le consentirebbe di avere nella sua città un locker digitale che le permette di spedire e ritirare i pacchi in autonomia, in sicurezza ed in orari convenienti, di ritirare la corrispondenza che richiede firma senza che sia necessaria la sua presenza fisica (ad es. Posta raccomandata) o di effettuare autonomamente pagamenti, (ad es. bollettini postali, ricarica del credito telefonico e ricarica prepagata delle carte prepagate Postepay, ecc.)? Lei potrebbe comunicare con questo locker attraverso un'applicazione		

Questions for P4 for NON-USER

gratuita sul suo telefono cellulare/tablet che le consentirebbe di effettuare facilmente le operazioni descritte in totale indipendenza/autosufficienza.

Una notifica di consegna ricevuta sul suo smartphone/ tablet l'avviserebbe della presenza di una spedizione in una cella del locker e lei, aprendo l'APP PT visualizzerebbe il QrCode necessario per effettuare il ritiro. Per ritirare il pacco basterebbe recarsi presso il locker e scansionare il QRCode tramite il lettore ottico integrato nel locker che abilita l'apertura della cella contenente il pacco.

In modo simile, una notifica la avviserebbe della consegna di una raccomandata. Accettando la raccomandata tramite APP PT, questa sarà depositata nel locker e lei potrà ritirarla successivamente, previa apposizione della sua Firma Digitale Remota direttamente in APP PT. La Firma Digitale Remota garantisce la piena equipollenza legale della nuova modalità di recapito.

- Introduction to functionality of the INDIMO DDS: getting food from a variety of local restaurants or local stores delivered at your home by bicycle*

14. Attitudini, emozioni, preferenze e opportunità

14. Attitudes, feelings/ emotions, preferences and opportunities

- Q6. Come si sentirebbe nell'utilizzare un servizio come quello che le ho appena descritto? Le piacerebbe? Si sentirebbe a suo agio nell'utilizzarlo? Oppure crede che avrebbe delle difficoltà? Mi può spiegare meglio la sua risposta?*

Altre domande che potrebbero essere correlate, per esplorare meglio questa dimensione:

- Che cosa, in particolare, le potrebbe piacere di questo nuovo servizio? Oppure Che tipo di difficoltà crede che potrebbe avere?*
- ¿Perché?*
- How would you feel about using a service like the one I just described? Would you like it? Would you feel comfortable using it? Or do you think you would have difficulties? Can you explain your answer?*
- What would you like in particular about a new service like that? Or, what kind of difficulty do you think you might have?*
- Why?*

4. Description of the workflow when using the digital mobility service

(no question for non-user)

5. Usability of the service's digital interface

Questions for P4 for NON-USER

(no question for non-user)

6. Usability of the service's physical interface

(no question for non-user)

7. Abilità / competenze.

7. Skills / capabilities

Q7. Secondo lei, che tipo di abilità e competenze le persone dovrebbero avere per utilizzare servizi mediati dalla tecnologia come quello di cui abbiamo parlato finora?

Tipi di abilità e competenze da tenere in considerazione nel formulare la domanda (da non suggerire – usare come categorie di riferimento):

- Competenze digitali, legati all'uso della tecnologia
- Conoscenze specifiche, ad es.:
 - Linguistiche
 - Leggere una mappa in internet
 - Terminologia specialistica e standard digitali
- Abilità cognitive (ad es. memorizzazione delle info; capacità di concentrazione/ attenzione; orientamento)
- Livello di educazione
- Abilità fisiche
 - Essere fisicamente in forma (in grado di camminare per una certa distanza, scendere le scale, trasportare merci, ecc.)
 - Abilità visuo-spaziali

What skills or capabilities people should have, to be able to use a digital mobility application / digital delivery service / smart and inclusive traffic lights such as those we mentioned before?

8. Difficoltà, limitazioni, sfide e ostacoli

8. Difficulties, limitations, challenges and constraints

Se l'intervistata/o non ha mai utilizzato un DMS/DDS:

Q8. Le capita di utilizzare/ utilizza alcune applicazioni sul suo telefono cellulare, come WhatsApp, Messenger, ecc.?

If interviewee has never used a DMS/DDS:

Questions for P4 for NON-USER

Do you use applications in your phone such as WhatsApp, Messenger, etc.?

Q8.1 Quali sono le principali difficoltà, limiti, sfide e ostacoli nell'utilizzare questo tipo di applicazioni, nel caso in cui ci siano? [oppure, nel caso in cui l'intervistata/o abbia già utilizzato DDS - vedi risposte alle Q3 e Q3.1/ Q3.2 - fare domanda specifica sulla sua esperienza d'uso degli specifici DDS di cui ha parlato sopra]

Esempi di difficoltà, limitazioni, sfide e ostacoli da tenere in considerazione nel formulare la domanda (da non suggerire – usare come categorie di riferimento):

- Difficoltà, limitazioni, sfide e ostacoli relative all'interfaccia fisica del servizio (presenza delle necessarie infrastrutture, sicurezza, disponibilità, accessibilità);
 - Difficoltà, limitazioni, sfide e ostacoli relative all'interfaccia digitale del servizio, ad es.:
 - hardware;
 - software;
 - connettività;
 - sicurezza informatica;
 - usabilità (facilità d'uso, interfaccia chiara e facilmente comprensibile, semplice da imparare, flusso e processo d'uso logico e adeguato);
 - stile *human computer interaction* (sono disponibili istruzioni rispetto all'ordine di azioni suggerite per l'uso del servizio);
 - l'interfaccia digitale fornisce feedback all'utente in base alle azioni compiute;
 - supporto alle decisioni;
 - consente l'uso del servizio da parte di categorie vulnerabili (anziani, chi ha barriere linguistiche, chi manca di competenze digitali, ecc.);
 - tolleranza dell'errore;
 - interazione con agenti di servizio (interfaccia di coordinamento comoda e intuitiva all'interno dell'applicazione);
 - qual è più grande punto dolente legato all'uso di questo servizio (incertezza rispetto all'ottenere il servizio desiderato o sulla qualità del servizio, ecc.)
 - Altre difficoltà, limitazioni, sfide e ostacoli
- What are the difficulties, limitations, challenges and constraints of using these kind of applications [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.], if any?*

10. Self-use, assistere gli altri o uso di gruppo

10. Self-use, assist other or group use

Questions for P4 for NON-USER

Se l'intervistata/o non ha mai utilizzato un DMS/DDS:

- Q9. Di solito utilizza le applicazioni di cui abbiamo parlato (WhatsApp, Messenger, APP di Poste Italiane, ecc.) da sola/o o con l'aiuto di altri? Oppure è lei ad aiutare altri ad utilizzarle? Mi può raccontare alcuni esempi?**

Nel caso in cui l'intervistata/o abbia già utilizzato DDS, riferirsi ad essi nel momento in cui si rivolgono le domande di cui sopra

- Do you use the digital services [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.] alone or with the help of others? Do you help others to use these digital services? Can you provide some examples?*

11. Fiducia, tutela dei dati personali e percezione della sicurezza delle informazioni

11. Perception of personal data privacy and security

- Q10. Parlando in generale, quali informazioni lei reputa più private e sensibili? Le condividerebbe utilizzando un servizio online (ad es. età, genere, nome, etc.)? Perché?**

- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, etc.)? Why?*

- Q11. Di cosa ha bisogno per sentirsi sicura/o nell'utilizzare un servizio online/ mediato dalla tecnologia o nell'installare un'applicazione sul suo dispositivo (telefono, Tablet, computer, ecc.)? (ad es. un modulo di consenso informato chiaro e comprensibile, la possibilità di scegliere quali dati condividere, standard di sicurezza, qualcuno che possa guidarla ed istruirla nell'utilizzo, ecc.)**

- What do you need to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, someone who can guide and instruct you in its use, etc.)*

12. Percezione di sicurezza

12. Safety perception

- Q12. Ritiene che si corrano dei rischi nell'utilizzare servizi per la consegna degli acquisti come quelli di cui abbiamo parlato? (riferirsi al locker digitale 178escritto in precedenza)**

- Do you think there are any risks in using the digital delivery services we discussed before?*

13. Percezione della resilienza del servizio in relazione all'emergenza Covid-19

13. Perception of the service's resilience to crisis like Covid-19

Questions for P4 for NON-USER

- Q13. Pensa che un servizio per la consegna degli acquisti come quelli di cui abbiamo parlato finora (riferirsi al locker digitale descritto in precedenza) potrebbe essere una buona soluzione in relazione alla situazione causata dal Covid-19? Perché?***
- Do you think that a digital service like the DMS/DDS/smart and inclusive traffic lights would have been a good solution to solve your (or others') mobility/delivery problems during the Coronavirus crisis? Why?***

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Healthy food delivery users

- Permanently impaired or with disabilities
- Socially isolated (unwanted loneliness)
- Not-connected people (e.g. Low digital skills, lower technology availability)
- Low income
- COVID19 isolated with none or reduced number of daily trips allowed

For the interviewee please specify:

Name / fictional name			
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate		
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____		
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years
How many units in your building?			

Total duration (minutes)

Final interviewer comments:



Stakeholder interview debriefing template (Pilot 1)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

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- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

D3.4: Present the ambition of your pilot in order to give the stakeholder a concrete idea about what the INDIMO pilot is about and how the interview with her/him is relevant for the pilot and the project.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions <u>Emilia Romagna stakeholder</u>	
1. Dimension: Goals/Obiettivi	
<input type="checkbox"/>	1. Question in English language
<input type="checkbox"/>	<i>Q1 : According to you, for which purpose(s)(elderly people and foreigners living in a rural community) could use the service (deliver/receive parcels, signed correspondence, payment)?</i>
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	<i>Q1: Secondo lei, quali potrebbero essere i motivi per cui le persone anziane/gli stranieri che vivono in aree rurali come Monghidoro, potrebbero essere interessati a usare i servizi offerti dal locker digitale (ad es. ricezione e spedizione di pacchi, ritiro della corrispondenza firmata, ricariche postepay/ telefoniche)?</i>
2. Needs/Bisogni	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	<i>Q2: Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?</i>
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	<i>Q2: In che modo il servizio potrebbe rispondere ai bisogni degli anziani/ stranieri che vivono in aree rurali (al fine di introdurre tecnologie digitali per consentire l'e-commerce)?</i>
3. Workflow /Processo	

Questions Emilia Romagna stakeholder
 Question in English language

-
- Q3:**
- What procedure will elderly people and foreigners living in rural communities have to follow in order use the digital locker. Please describe it step-by-step*

 Translation of question into local language

-
- Q3:**
- Secondo la sua conoscenza del gruppo di riferimento (i.e. anziani/ stranieri), quale potrebbe essere una procedura efficace che consenta agli anziani/ stranieri delle aree rurali di accedere al servizio? Quali potrebbero essere i passaggi principali o i principali punti di contatto con il servizio?*

4. Usability of the digital interface/Usabilità dell'interfaccia digitale
 Question in English language

-
- Q4:**
- Which aspect/part of the digital interface of the proposed service will have to be particularly easy for elderly people and foreigners living in rural communities to use?*
-
-
- Q5:**
- What kind of user support mechanisms should be provided by the service to elderly people and foreigners living in rural communities?*
-
-
- Q6:**
- What are the main accessibility and inclusivity tools or improvements for specific elderly people and foreigners living in rural communities that the service should provide?*

 Translation of question in local language

-
- Q4:**
- Secondo la sua conoscenza del gruppo di riferimento (i.e. anziani/ stranieri), quali aspetti dell'interfaccia digitale del locker digitale dovrebbero essere particolarmente facili da utilizzare?*
-
-
- Q5:**
- Quali altri tipi di supporto dovrebbero essere offerti in maniera complementare al servizio (agli anziani/ stranieri che vivono in comunità rurali)?*
-
-
- Q6:**
- Quali miglioramenti/strumenti di accessibilità e inclusività potrebbero essere inclusi in questo tipo di servizio pensando agli anziani/ stranieri (che vivono in comunità rurali)?*

5. Usability of the physical interface/ Usabilità dell'interfaccia fisica

Questions Emilia Romagna stakeholder
 Question in English language

Sometimes digital mobility services have a physical dimension, for example in case of ordering a taxi via an app, the interaction with the driver is part of the physical experience of the service as there is a person-to-person interaction. We understand it thus a physical object that is used as part of the digital service or the involvement of humans in the service.

- Q7:** *Which aspects of the physical interface of the locker must be easy to use for vulnerable people?*
- Q8:** *Will there be a need for interaction with service agents? If so, when do you think they'll need it? (Before, during, after) Should they be able to send feedback/ask questions? How to organise that interaction?*

 Translation of question into local language

A volte i servizi di mobilità digitale hanno una dimensione fisica, per esempio, nel caso della prenotazione di un taxi via app, l'interazione con il taxista è una parte dell'esperienza fisica del servizio. La dimensione fisica, dunque, può riferirsi sia a un oggetto fisico che viene utilizzato come parte del servizio digitale o al coinvolgimento di operatori nell'uso del servizio da parte dell'utente.

- Q7:** *Tenendo conto di quanto detto, quali aspetti dell'interfaccia fisica del locker digitale dovrebbero essere particolarmente facili da utilizzare (per gli anziani/ stranieri che vivono in comunità rurali)?*
- Q8:** *Crede che sia opportuno offrire la possibilità agli utenti di cui stiamo parlando (anziani/ stranieri) di avere un contatto diretto con l'operatore del servizio? In tal caso, quando ritiene che ne avrebbero bisogno (i.e. prima/dopo/durante l'erogazione o uso del servizio)? Gli utenti dovrebbero essere in grado di inviare feedback o fare domande? Come si potrebbe organizzare questa interazione?*

6. Skills and capabilities / Capacità e abilità
 Question in English language

- Q9:** *What are the skills and knowledge that are needed by elderly people and foreigners living in rural communities to use this service?*
- Q10:** *In your opinion, which of the skills and knowledge are harder to achieve for elderly people and foreigners living in rural communities?*

 Translation of question into local language

- Q9:** *Quali abilità e conoscenze dovrebbero avere gli anziani/ stranieri che vivono in aree rurali per poter utilizzare i servizi del locker digitale?*
- Q10:** *Secondo lei quali, tra queste abilità e conoscenze, sono più difficili da conseguire per la nostra fascia di utenza?*

Questions Emilia Romagna stakeholder

7. Perception of use demands of the service / Percezione delle richieste all'utente da parte del servizio

- Question in English language**
- Q11:** *With which service demands do you think (vulnerable category) will have most problems?*
- Q12:** *What are the activities/interactions required by the service causing more issues to vulnerable users?*

- Translation of question into local language**
- Q11:** *Con quali richieste del servizio pensa che gli utenti di cui stiamo parlando avrebbero maggiori problemi?*
- Q12:** *Quali sono le attività/ interazioni richieste per usare il servizio che potrebbero causare maggiori problemi agli utenti vulnerabili?*

8. Self use, assist, group use /Utilizzo in modalità self, assistenza, uso di gruppo

- Question in English language:**
- Q13:** *Is support needed for a specific segment of (vulnerable category)? How can the assistance be best organised?*

- Translation of question into local language**
- Q13** *Pensando alla nostra utenza di riferimento (anziani/ stranieri che vivono in aree rurali, crede che sia necessario un qualche tipo di supporto all'uso del servizio? Come può essere organizzata tale assistenza?*

9. Perception of personal data privacy and security

- Question in English language:**
- Q14:** *Do elderly people and foreigners living in rural communities have specific concerns with sharing personal data to the service?*
- Q15:** *What trust mechanisms should be in place on the service for elderly people and foreigners living in rural communities?*

- Translation of question into local language**

Questions Emilia Romagna stakeholder

- Q14:** *Crede che le persone anziane e gli stranieri residenti in aree rurali abbiano delle specifiche preoccupazioni relative alla condivisione dei dati personali per l'utilizzo del servizio? Quali, ad esempio?*
- Q15:** *Quali strategie/ modalità dovrebbero essere messe in atto per aumentare la fiducia nel servizio pensando alle particolari fasce di utenza di cui stiamo parlando?*

10. Difficulties, limitations, challenges and constraints / Difficoltà, limitazioni, sfide e vincoli
Question in English language

- Q16:** *What will be the major constraints for elderly people and foreigners living in rural communities when using the service?*

 Translation of question into local language

- Q16:** *Secondo lei, quali potrebbero essere le principali difficoltà e ostacoli incontrati dagli anziani/ stranieri residenti in aree rurali nell'utilizzo del servizio?*

11. Attitudes, feelings/ emotions, preferences and opportunities
 Question in English language

- Q17:** *Do you think that elderly people and foreigners living in rural communities will stand positive towards the proposed service? If this is the case, on which aspects in particular are they having a positive stance? If this is not the case, why is this so?*

 Translation of question into local language

- Q17:** *Pensa che le persone anziane/ stranieri residenti in aree rurali avranno un atteggiamento positivo verso il servizio proposto? Lo apprezzeranno? Se sì, quali aspetti potrebbero essere apprezzati di più? Se no, per quale motivo?*

12. Reliability and trust/ Affidabilità e fiducia
 Question in English

- Q18:** *Do you believe that the reliability of the information that vulnerable users obtain and the trustworthiness of the provider (keep promises, keep consumers' interests in mind) is important for (vulnerable category)? Why (not?)*

Questions Emilia Romagna stakeholder
 Question into local language:
 Q18: *Ritiene che l'affidabilità delle informazioni ottenute dagli utenti e la fiducia verso il provider del servizio (i.e. Poste Italiane), sia importante per le persone anziane/ stranieri che vivono nelle aree rurali? Per quale motivo?*

13. Perception of the service's resilience to crisis like Covid-19

 Question in English

Q19: *If there would be an outbreak of COVID in the future, how can the service be best prepared for guaranteeing a proper functioning and delivering services to elderly people and foreigners living in rural communities?*

 Question into local language

Q19: *Nel caso in cui la situazione Covid19 diventi di nuovo critica, come potrebbe essere migliorato il servizio per garantirne un adeguato funzionamento nell'emergenza e per continuare ad essere erogato alle utenze delle zone rurali (in particolare agli anziani/ stranieri)?*

 14 T1.4 User group questions
 Question in English
 Q20: *Does this app/service answers to the needs of the groups you represent?*
 Question in local language
 Q20: *Secondo lei, il locker digitale risponde alle esigenze del gruppo di utenti che rappresenta?*
 Se, no perché?
 Se sì, in cosa nello specifico?
 Question in English
 Q21: *Were user groups consulted during development or afterwards (co-creation)? How diverse was this user group? Did this information lead to any changes?*

Not applicable to the pilot ER

Questions Emilia Romagna stakeholder

<input type="checkbox"/> Question in local language <input type="checkbox"/> Q21: <i>I gruppi di utenti che rappresenta sono stati consultati durante lo sviluppo del servizio o successivamente (in un processo di co-creazione)? Quanto era diversificato questo gruppo di utenti? Le informazioni e suggerimenti raccolti hanno portato a qualche cambiamento?</i>	Not applicable to the pilot ER
<input type="checkbox"/> Question in English <input type="checkbox"/> Q22: <i>Rate the services between 1 and 5, ranging from very bad to very good. What were the strong/weak points.</i>	Not applicable to the pilot ER
<input type="checkbox"/> Question in local language <input type="checkbox"/> Q22: <i>Provi a valutare il servizio da 1 a 5, laddove 1 sta per "pessimo" e 5 per "ottimo". Inoltre, indichi i punti forti e deboli del servizio.</i>	Not applicable to the pilot ER

Data of the interviewed stakeholder.

Interview done with (the pilot's specific profile characteristics):

Organisation:

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Area of specialisation				
Aim of organisation/area of activity	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city		<input type="checkbox"/> Other _____	

Total duration (minutes)

Final interviewer comments:

SSI debriefing template (Pilot 2 – Users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

• Introduction to the interview.

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Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P2 for USER

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- Translation of question into local language***
- What are the main purposes of your daily activities (study, food shops, care-giving, work, leisure, visiting family, pharmacy, ...)?*
- Translation of question into local language***
- Which mobility service or goods delivery service you use for achieving your activities*

Questions for P2 for USER

When formulating the questions below, please refer to any of the DMS/DDS of the list:

DMS/DDS used [examples from D1.1, Table 8]	Situations	Opinion/Satisfaction
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		
E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		

- Translation of question into local language**
- Do you use any digital mobility applications/services (DMSs) to manage and plan your daily trips for achieving your activities?*
- When do you use DMSs? In what situations?*

Questions for P2 for USER

- Why do you use DMSs? (convenience, comfort, time saving, personal health, ...)*
- Are you satisfied with the current mobility services you use?*

- Translation of question into local language**
- When do you not use the DMSs? In what situations? Why you do not use them?*

3. Needs + 1. Value of using the pilot specific digital mobility service

- Translation of question into local language**
- Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?*

- Translation of question into local language**
- What other needs this service does not satisfy?*

- Translation of question into local language**
- According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?*

4. Description of the workflow when using the digital mobility service

- Translation of question into local language**
- Please, according to your experience, can you describe step by step (beginning to end) the process of using the DMS?*

 5. Usability of the service's digital interface

- Translation of question into local language**

Questions for P2 for USER
 Do you think that this DMS is easy to use? Why?
 Translation of question into local language
 If not, what are the difficulties of using the digital interface of the DMS? (see list below)

Usability aspects of the digital interface to be taken into consideration when formulating the question (not to be suggested - to be used as reference categories):

- Ease of use
 - Clear interface
 - Easy to learn and use
 - Workflow (begin to end) logical and adequate to the process of use
 - Etc.
- Human computer interaction style
 - Availability of instructions regarding the recommended order of actions
 - Feedback provided in accordance with user actions
 - Decision support
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills)
- Tolerance for errors
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Convenient coordination interface
 - Intuitive within-application
 - An option for direct contact provided

 Translation of question into local language
 Which functionalities of the DMS are most useful/ important to you?
 Translation of question into local language


Questions for P2 for USER

- Which functionalities of the DMS are least useful/ important to you?

 6. Usability of the service's physical interface

- Translation of question into local language**

- Do you face any difficulties when you use the physical interface of the DMS? If yes, can you provide some examples? By means of a physical interface, we refer to the non-digital aspects of the service (for example, the vehicles, the driver, the hardware of the traffic lights, etc.)

Refer to usability aspects of the physical interface:

- Ease of use
 - Convenient location
 - Easy to use
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills, cultural barriers)
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Intuitive
 - The nature of the interaction is defined according to the process and is clear to both parties
 - Etc.

7. Skills / capabilities

- Translation of question into local language**

- According to your use experience, what skills or capabilities people have to have to be able to use the DMS? (e.g. add a checklist)

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards
- Cognitive skills

Questions for P2 for USER

- Level of education
- Physical abilities
 - Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
 - Visual ability

10. Self-use, assist other or group use

 Translation of question into local language
 Do you use the DMS alone or with the help of others? Do you help others to use the app? Can you provide some examples?

11. Perception of personal data privacy and security

 Translation of question into local language
 Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?
 Translation of question into local language
 What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)
 Translation of question into local language
 How often do you read the required app permissions before installing an app?
 Translation of question into local language
 Have you ever refused to install an app you want? Why?
 Translation of question into local language
 Are you currently using (or have previously used) antivirus or anti-malware apps on your device?
 Translation of question into local language

Questions for P2 for USER

How many times has your device been infected with a virus or malware?

Translation of question into local language

Thinking about the specific DMS, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?

If so, which one?

If not, why not?

12. Safety perception

Translation of question into local language

Do you think there is any risk in using this kind of app?

14. Attitudes, feelings/ emotions, preferences and opportunities

Translation of question into local language

Generally speaking, what do you think of this service?

Does it meet your expectations? Why?

Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?

Do you have trust in the service and in who provides it?

Do you think you will use it frequently?

Do you prefer other similar services as an alternative? Which for example?

Do you think it will recommend its use to acquaintances or friends?

Would you say that this service was designed for addressing your needs?

What suggestions can you offer to improve the service so that it can better meet your needs?

What would you improve about the user interface?

Questions for P2 for USER

13. Perception of the service's resilience to crisis like Covid-19

- Translation of question into local language***
- Did you change your habits with regards to use this DMS because of the Coronavirus crisis? How?*
 - Service changes during the crisis
 - Different user needs because of the crisis
 - Advantages/ disadvantages of the service during the crisis
 - Return to service routine after the crisis
 - Suggested changes

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Vulnerable pedestrians

- Age: older (over 60)
- Permanently impaired or with disabilities: visual disability, wheelchair mobility

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time)			
	<input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____			
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years	
	<input type="checkbox"/> Other _____			

Total duration (minutes)

Final interviewer comments:



SSI debriefing template (Pilot 2 – Users)

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- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P2 for USER

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- Translation of question into local language***
- What are the main purposes of your daily activities (study, food shops, care-giving, work, leisure, visiting family, pharmacy, ...)?*
- Translation of question into local language***
- Which mobility service or goods delivery service you use for achieving your activities?*

Questions for P2 for USER

When formulating the questions below, please refer to any of the DMS/DDS of the list:

DMS/DDS used	Situations	Opinion/Satisfaction
[examples from D1.1, Table 8]		
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		
E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		

- Translation of question into local language**
- Do you use any digital mobility applications/services (DMSs) to manage and plan your daily trips for achieving your activities?*
- When do you use DMSs? In what situations?*

Questions for P2 for USER

- Why do you use DMSs? (convenience, comfort, time saving, personal health, ...)*
- Are you satisfied with the current mobility services you use?*

 Translation of question into local language

- When do you not use the DMSs? In what situations? Why you do not use them?*

3. Needs + 1. Value of using the pilot specific digital mobility service

 Translation of question into local language

- Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?*

 Translation of question into local language

- What other needs this service does not satisfy?*

 Translation of question into local language

- According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?*

4. Description of the workflow when using the digital mobility service

 Translation of question into local language

- Please, according to your experience, can you describe step by step (beginning to end) the process of using the DMS?*

 5. Usability of the service's digital interface
 Translation of question into local language

- Do you think that this DMS is easy to use? Why?*

 Translation of question into local language

- If not, what are the difficulties of using the digital interface of the DMS? (see list below)*

Questions for P2 for USER

Usability aspects of the digital interface to be taken into consideration when formulating the question (not to be suggested - to be used as reference categories):

- Ease of use
 - Clear interface
 - Easy to learn and use
 - Workflow (begin to end) logical and adequate to the process of use
 - Etc.
- Human computer interaction style
 - Availability of instructions regarding the recommended order of actions
 - Feedback provided in accordance with user actions
 - Decision support
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills)
- Tolerance for errors
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Convenient coordination interface
 - Intuitive within-application
 - An option for direct contact provided

Translation of question into local language

Which functionalities of the DMS are most useful/ important to you?

Translation of question into local language

Which functionalities of the DMS are least useful/ important to you?

 6. Usability of the service's physical interface

Translation of question into local language



Questions for P2 for USER

- Do you face any difficulties when you use the physical interface of the DMS? If yes, can you provide some examples? By means of a physical interface, we refer to the non-digital aspects of the service (for example, the vehicles, the driver, the hardware of the traffic lights, etc.)*

Refer to usability aspects of the physical interface:

- Ease of use
 - Convenient location
 - Easy to use
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills, cultural barriers)
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Intuitive
 - The nature of the interaction is defined according to the process and is clear to both parties
 - Etc.

7. Skills / capabilities

- Translation of question into local language***

- According to your use experience, what skills or capabilities people have to have to be able to use the DMS? (e.g. add a checklist)*

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards
- Cognitive skills
- Level of education
- Physical abilities
 - Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
 - Visual ability

10. Self-use, assist other or group use



Questions for P2 for USER

- Translation of question into local language**
- Do you use the DMS alone or with the help of others? Do you help others to use the app? Can you provide some examples?*

11. Perception of personal data privacy and security

- Translation of question into local language**
- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?*
- Translation of question into local language**
- What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)*
- Translation of question into local language**
- How often do you read the required app permissions before installing an app?*
- Translation of question into local language**
- Have you ever refused to install an app you want? Why?*
- Translation of question into local language**
- Are you currently using (or have previously used) antivirus or anti-malware apps on your device?*
- Translation of question into local language**
- How many times has your device been infected with a virus or malware?*
- Translation of question into local language**
- Thinking about the specific DMS, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?*

Questions for P2 for USER

- If so, which one?*
- If not, why not?*

12. Safety perception

- Translation of question into local language***
- Do you think there is any risk in using this kind of app?*

14. Attitudes, feelings/ emotions, preferences and opportunities

- Translation of question into local language***
- Generally speaking, what do you think of this service?*
- Does it meet your expectations? Why?*
- Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?*
- Do you have trust in the service and in who provides it?*
- Do you think you will use it frequently?*
- Do you prefer other similar services as an alternative? Which for example?*
- Do you think it will recommend its use to acquaintances or friends?*
- Would you say that this service was designed for addressing your needs?*
- What suggestions can you offer to improve the service so that it can better meet your needs?*
- What would you improve about the user interface?*

13. Perception of the service's resilience to crisis like Covid-19

- Translation of question into local language***
- Did you change your habits with regards to use this DMS because of the Coronavirus crisis? How ?*
- **Service changes during the crisis**

Questions for P2 for USER

- Different user needs because of the crisis
- Advantages/ disadvantages of the service during the crisis
- Return to service routine after the crisis
- Suggested changes

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Vulnerable pedestrians

- Age: older (over 60)
- Permanently impaired or with disabilities: visual disability, wheelchair mobility

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time)			
	<input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____			
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years	
	<input type="checkbox"/> Other _____			

Total duration (minutes)

Final interviewer comments:



SSI debriefing template (Pilot 3 – Users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone. (i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing

and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

D1.3 User's capabilities and requirements | version 2.0

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P2 for USER

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- Translation of question into local language***
- What are the main purposes of your daily activities (study, food shops, care-giving, work, leisure, visiting family, pharmacy, ...)?*
- Translation of question into local language***
- Which mobility service or goods delivery service you use for achieving your activities?*

Questions for P2 for USER

When formulating the questions below, please refer to any of the DMS/DDS of the list:

DMS/DDS used [examples from D1.1, Table 8]	Situations	Opinion/Satisfaction
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		
E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		

- Translation of question into local language**
- Do you use any digital mobility applications/services (DMSs) to manage and plan your daily trips for achieving your activities?*
- When do you use DMSs? In what situations?*

Questions for P2 for USER
 Why do you use DMSs? (convenience, comfort, time saving, personal health, ...)
 Are you satisfied with the current mobility services you use?
 Translation of question into local language
 When do you not use the DMSs? In what situations? Why you do not use them?

3. Needs + 1. Value of using the pilot specific digital mobility service

 Translation of question into local language
 Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?
 Translation of question into local language
 What other needs this service does not satisfy?
 Translation of question into local language
 According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?

4. Description of the workflow when using the digital mobility service

 Translation of question into local language
 Please, according to your experience, can you describe step by step (beginning to end) the process of using the DMS?

 5. Usability of the service's digital interface
 Translation of question into local language
 Do you think that this DMS is easy to use? Why?
 Translation of question into local language
 If not, what are the difficulties of using the digital interface of the DMS? (see list below)

Questions for P2 for USER

Usability aspects of the digital interface to be taken into consideration when formulating the question (not to be suggested - to be used as reference categories):

- Ease of use
 - Clear interface
 - Easy to learn and use
 - Workflow (begin to end) logical and adequate to the process of use
 - Etc.
- Human computer interaction style
 - Availability of instructions regarding the recommended order of actions
 - Feedback provided in accordance with user actions
 - Decision support
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills)
- Tolerance for errors
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Convenient coordination interface
 - Intuitive within-application
 - An option for direct contact provided

Translation of question into local language

Which functionalities of the DMS are most useful/ important to you?

Translation of question into local language

Which functionalities of the DMS are least useful/ important to you?

 6. Usability of the service's physical interface

Translation of question into local language

Questions for P2 for USER

- Do you face any difficulties when you use the physical interface of the DMS? If yes, can you provide some examples? By means of a physical interface, we refer to the non-digital aspects of the service (for example, the vehicles, the driver, the hardware of the traffic lights, etc.)*

Refer to usability aspects of the physical interface:

- Ease of use
 - Convenient location
 - Easy to use
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills, cultural barriers)
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Intuitive
 - The nature of the interaction is defined according to the process and is clear to both parties
 - Etc.

7. Skills / capabilities

- Translation of question into local language***

- According to your use experience, what skills or capabilities people have to have to be able to use the DMS? (e.g. add a checklist)*

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards
- Cognitive skills
- Level of education
- Physical abilities
 - Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
 - Visual ability

10. Self-use, assist other or group use

Questions for P2 for USER

- Translation of question into local language**
- Do you use the DMS alone or with the help of others? Do you help others to use the app? Can you provide some examples?*

11. Perception of personal data privacy and security

- Translation of question into local language**
- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?*
- Translation of question into local language**
- What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)*
- Translation of question into local language**
- How often do you read the required app permissions before installing an app?*
- Translation of question into local language**
- Have you ever refused to install an app you want? Why?*
- Translation of question into local language**
- Are you currently using (or have previously used) antivirus or anti-malware apps on your device?*
- Translation of question into local language**
- How many times has your device been infected with a virus or malware?*
- Translation of question into local language**
- Thinking about the specific DMS, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?*

Questions for P2 for USER

- If so, which one?*
- If not, why not?*

12. Safety perception

- Translation of question into local language***
- Do you think there is any risk in using this kind of app?*

14. Attitudes, feelings/ emotions, preferences and opportunities

- Translation of question into local language***
- Generally speaking, what do you think of this service?*
- Does it meet your expectations? Why?*
- Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?*
- Do you have trust in the service and in who provides it?*
- Do you think you will use it frequently?*
- Do you prefer other similar services as an alternative? Which for example?*
- Do you think it will recommend its use to acquaintances or friends?*
- Would you say that this service was designed for addressing your needs?*
- What suggestions can you offer to improve the service so that it can better meet your needs?*
- What would you improve about the user interface?*

13. Perception of the service's resilience to crisis like Covid-19

- Translation of question into local language***
- Did you change your habits with regards to use this DMS because of the Coronavirus crisis? How ?*
- **Service changes during the crisis**

Questions for P2 for USER

- Different user needs because of the crisis
- Advantages/ disadvantages of the service during the crisis
- Return to service routine after the crisis
- Suggested changes

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Informal ride sharing users

- Ethnic minority man/women
- Residing in the periphery
- Insufficient public transport services
- Language barrier
- Lack of digital skills

For the interviewee please specify:

Name / fictional name					
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality	
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate				
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time)				
	<input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____				
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years		
	<input type="checkbox"/> Other _____				

Total duration (minutes)

Final interviewer comments:

SSI debriefing template (Pilot 3 – Non users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P3 for NON-USER		
1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>What are the main purposes of your daily mobility (study, food shopping, accompanying dependent person, work, leisure, visiting family, pharmacy)?</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>What kind of transport mode do you usually use to carry out your daily activities (e.g. walking, car, public transportation – tram, metro, etc.)? Why?</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Have you ever used digital mobility applications/ services to manage and plan your daily trips? For example, a service that helps you to walk the minimum distance, to find a taxi ride, a public bicycle available near you or to know when the next bus will arrive, etc. (e.g. google maps, citymapper, transport authorities local apps, etc.)</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>If yes, which ones? In what situations? What do you think about the digital mobility applications/ services that you used?</i>		
DMS/DDS used [examples from D1.1, Table 8]	Situations	Opinion
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		

Questions for P3 for NON-USER

E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		
<input type="checkbox"/> <i>Translation of question into local language</i>		
<input type="checkbox"/> <i>If not, why you do not use them?</i>		
3. Needs + 1. Value of using the digital mobility service		
<input type="checkbox"/> <i>Translation of question into local language</i>		
<input type="checkbox"/> <i>Taking into consideration the activities you perform on daily basis; how digital mobility services could help you? What (unmet) needs could they satisfy?</i>		
<input type="checkbox"/> <i>Translation of question into local language</i>		

Questions for P3 for NON-USER

- Introduction to functionality of the INDIMO DMS: getting or providing informal rides among towns by linking 'suppliers' (drivers) and 'customers' (passengers)*

14. Attitudes, feelings/ emotions, preferences and opportunities

- Translation of question into local language***
- How would you feel about using a service like the one I just described? Would you like it? Would you feel comfortable using it? Or do you think you would have difficulties? Can you explain your answer?*
- What would you like in particular about a new service like that? Or, what kind of difficulty do you think you might have?*
- Why?*

4. Description of the workflow when using the digital mobility service

(no question for non-user)

5. Usability of the service's digital interface

(no question for non-user)

6. Usability of the service's physical interface

(no question for non-user)

7. Skills / capabilities

- Translation of question into local language***
- What skills or capabilities people should have, to be able to use a digital mobility application / digital delivery service / smart and inclusive traffic lights such as those we mentioned before?*

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards

Questions for P3 for NON-USER

- Cognitive skills
- Level of education
- Physical abilities
 - Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
 - Visual ability

8. Difficulties, limitations, challenges and constraints

 Translation of question into local language

If interviewee has never used a DMS/DDS:

-
- Do you use applications in your phone such as WhatsApp, Messenger, etc.?*

 Translation of question into local language

-
- What are the difficulties, limitations, challenges and constraints of using these kind of applications [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.], if any?*

Example of difficulties, limitations, challenges and constraints (not to be suggested - use as reference categories):

- Difficulties, limitations, challenges and constraints related to the physical interface of the service (infrastructure, safety, availability, accessibility)
- Difficulties, limitations, challenges and constraints related to the digital interface of the service:
 - hardware;
 - software;
 - connectivity;
 - cyber security;
 - usability (ease of use, clear interface, easy to learn, workflow, logical and adequate to the process of use);
 - human computer interaction style (availability of instructions regarding the recommended order of actions);
 - feedback provided in accordance with user actions;
 - decision support;
 - adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills);
 - tolerance for errors;
 - interaction with service agents (convenient coordination interface, Intuitive within-application);

Questions for P3 for NON-USER

<ul style="list-style-type: none"> - Biggest pain point related to the use of this service (uncertainty about obtaining the right services or about the quality of them, etc.) • Other difficulties, limitations, challenges, and constraints
10. Self-use, assist other or group use
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Do you use the digital services [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.] alone or with the help of others? Do you help others to use these digital services? Can you provide some examples?</i>
11. Perception of personal data privacy and security
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, etc.)? Why?</i>
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>What do you need to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)</i>
12. Safety perception
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Do you think there are any risks in the digital mobility services we discussed before?</i>
13. Perception of the service's resilience to crisis like Covid-19
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Do you think that a digital service like the DMS/DDS/smart and inclusive traffic lights would have been a good solution to solve your (or others') mobility/delivery problems during the Coronavirus crisis? Why?</i>

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Informal ride sharing users

- Ethnic minority man/women
- Residing in the periphery
- Insufficient public transport services
- Language barrier
- Lack of digital skills

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____			
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years	

Total duration (minutes)

Final interviewer comments:

Stakeholder interview debriefing template (Pilot 3 Galilee)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

D3.4: Present the ambition of your pilot in order to give the stakeholder a concrete idea about what the INDIMO pilot is about and how the interview with her/him is relevant for the pilot and the project.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions <u>Galilee stakeholder</u>	
1. Goals/	
<input type="checkbox"/>	1. Question in English language
Q1 According to you, for which purpose(s) are [vulnerable category] using the service? (Please complete the category for your pilot)	
<input type="checkbox"/>	Translation of question into local language
2. Needs/	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	Q2: How should the service address the needs of (vulnerable to exclusion category) to order a ride?
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	
3. Workflow /	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	Q3: What procedure/sequence/workflow will (vulnerable to exclusion category) have to follow for ordering a ride? Please describe it step-by-step
<input type="checkbox"/>	Translation of question into local language
4. Usability of the digital interface/	

Questions Galilee stakeholder

- Question in English language**
- Q4:** Which aspect/part of the digital interface of the proposed service will have to be particularly easy for (vulnerable to exclusion category) to use? Which aspects of the digital interface of the service are they having trouble with? (Use an example to illustrate this question)
- Q5:** What kind of user support mechanisms should be provided by the app to (vulnerable to exclusion category)?
- Q6:** What are the main accessibility and inclusivity tools or improvements for specific (vulnerable to exclusion category) that the service should provide?

- Translation of question in local language**

5. Usability of the physical interface/

- Question in English language**
- Sometimes digital mobility services have a physical dimension, for example in case of ordering a taxi via an app, the interaction with the driver is part of the physical experience of the service as there is a person-to-person interaction. We understand it thus a physical object that is used as a part of the digital service or the involvement of humans in the service.
- Q7:** Which aspects of the physical interface must be easy to use for vulnerable to exclusion people?
Which aspects of the physical interface of the service are they having trouble with? (Use an example to illustrate this question)
- Q8:** Will there be a need for interaction with service agents? If so, when do you think they'll need it? (Before, during, after) Should they be able to send feedback/ask questions? How to organize that interaction?

- Translation of question into local language**

6. Skills and capabilities /

- Question in English language**
- Q9:** What are the skills and knowledge that are needed by (vulnerable to exclusion category) to use this service?
- Q10:** In your opinion, which of the skills and knowledge are harder to achieve for (vulnerable to exclusion category)?

Questions Galilee stakeholder
 Translation of question into local language
7. Perception of use demands of the service /
 Question in English language
 Q11: *With which service demands (from the users) do you think (vulnerable to exclusion category) will have most problems? Give examples.*
 Q12: *What are the activities/interactions required by the service causing more issues to vulnerable to exclusion users?*
 Translation of question into local language
 esta funcionalidad? ¿Entienden el mecanismo?
8. Self use, assist, group use /
 Question in English language:
 Q13: *What kinds of vulnerable to exclusion users are requiring support or assistance? Is it easy to provide assistance to vulnerable to exclusion users? Make some examples derived from direct or indirect experienced*
 Translation of question into local language
9. Perception of personal data privacy and security /
 Question in English language:
 Q14: *Do (vulnerable to exclusion category) have specific concerns with sharing personal data in the app?*
 Q16: *What would be the major concerns of (vulnerable to exclusion category) with sharing personal data?*
 Q17: *What trust mechanisms should be in used for ensuring (vulnerable to exclusion category) trust and willingness to share personal data?*
 Translation of question into local language
10. Difficulties, limitations, challenges and constraints /

Questions Galilee stakeholder
Question in English language

- Q17:** *What will be the major challenges of (vulnerable to exclusion category) when using the service?*

- Translation of question into local language**

11. Attitudes, feelings/
 Question in English language

- Q18:** *Do you think that (vulnerable to exclusion category) will stand positive towards the proposed service? If this is the case, on which aspects in particular are they having a positive stance? If this is not the case, why is this so?*

- Translation of question into local language**

12. Reliability and trust/
 Question in English

- Q19:** *Do you believe that the reliability of the information that vulnerable to exclusion users obtain and the trustworthiness of the provider (keep promises, keep consumers' interests in mind) is important for (vulnerable to exclusion category) ? Why (not?)*

- Question into local language:**

12. Perception of the service's resilience to crisis like Covid-19/ COVID-19
 Question in English

- Q18:** *Do you think the COVID-19 crisis has influenced the use of the service by (vulnerable to exclusion category)? How? How can the service mitigate this impact on (vulnerable to exclusion category) in the future?*

- Question into local language**

13. T1.4 Questions for user group

- Question in English**

Questions Galilee stakeholder

- Q19:** *Does this app/service answers to the needs of the groups you represent?*
- Question in local language**
- Question in English**
- Q20:** *Were user groups consulted during development or afterwards (co-creation)? How diverse was this user group? Did this information lead to any changes?*
- Question in Local Language**
- Question in English**
- Q21:** *Rate the services between 1 and 5, ranging from very bad to very good. What were the strong/weak points.*
- Question in local language**

Data of the interviewed stakeholder.

Interview done with (the pilot's specific profile characteristics):

Organisation:

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Area of specialisation				
Aim of organisation/area of activity	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city		<input type="checkbox"/> Other _____	

Total duration (minutes)

Final interviewer comments:

SSI debriefing template (Pilot 4 – Users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – La persona entrevistadora se presenta brevemente

Hola. Soy [nombre y apellido] y trabajo para [nombre de la organización] que es socio de un proyecto europeo llamado INDIMO.

2- La persona entrevistadora contextualiza la entrevista presentando brevemente el proyecto y sus objetivos principales:

INDIMO es un proyecto financiado por la Unión Europea que tiene como objetivo mejorar la accesibilidad y la inclusión social de los servicios de movilidad digital.

Los servicios de movilidad digital son todos aquellos servicios que facilitan la movilidad de personas y bienes mediante el uso de tecnología y aplicaciones en dispositivos como teléfonos inteligentes, tabletas, etc. (por ejemplo, aplicaciones que permiten: compartir vehículos o viajes para llegar a un lugar determinado; planificar rutas; entregar mercancías a domicilio; taquillas digitales para la entrega de paquetes, etc.).

Como parte del proyecto, 15 socios de diferentes países (Bélgica, Francia, Alemania, Hungría, Israel, Italia, España) están trabajando juntos para desarrollar un conjunto de herramientas que ayudarán a los proveedores de servicios, desarrolladores y autoridades locales a mejorar los servicios de movilidad digital existentes, emergentes y futuros ampliando su accesibilidad a tantas personas usuarias como sea posible. Se prestará especial atención a las categorías de categorías de ciudadanía más vulnerables, debido a las dificultades físicas, cognitivas, socioeconómicas, educativas, digitales, lingüísticas, de edad y género, etc. que les impide acceder a los servicios de los que estamos hablando. Para hacer posible este objetivo, es necesario conocer a las personas usuarias actuales y futuras de estos servicios, en particular aquellas que tienen necesidades específicas a considerar. Esta es la razón por la cual la entrevista que haremos juntos es muy importante para nosotros y para el proyecto.

3 – La persona entrevistadora:

[3.1] presenta la entrevista y sus objetivos principales

En esta entrevista nos gustaría reunir su punto de vista y experiencia sobre varios aspectos relevantes para nuestro proyecto, que incluyen:

- sus necesidades y requisitos con respecto a sus movimientos diarios y la forma en que se le entregan comida/alimentos/productos que compra;
- sus dificultades para utilizar servicios relacionados con el uso de tecnologías y aplicaciones digitales (por ejemplo, teléfonos inteligentes);
- sus inquietudes con respecto a la seguridad, eficacia o calidad de este tipo de servicio.

[3.2] explica cómo se llevará a cabo la entrevista

La entrevista consta de una serie de preguntas que nos ayudarán a conversar abiertamente sobre algunos temas relacionados con los servicios de movilidad digital de los que hemos hablado. La entrevista durará aproximadamente 1-1,5 horas.

[3.3] si no se realizó antes de la entrevista por correo electrónico, describa el formulario de consentimiento informado (ICF) presente. Lea con la persona entrevistada el contenido principal de la ICF con respecto a los temas relacionados con la recopilación, el procesamiento y la protección de la información con respecto al secreto / privacidad (es decir, el anonimato de la información recopilada, la forma en que la información será tratada y almacenada, etc.) En esta etapa, es necesario preguntarle a la persona entrevistada si acepta la grabación de audio de la entrevista, especificando que la información puede publicarse en informes de proyectos, artículos de revistas, presentaciones de conferencias, etc., pero, en cualquier caso, protegiendo su anonimato.

[El formulario de consentimiento informado debe firmarse antes de comenzar la entrevista].

Toda la información recopilada en la entrevista se hará anónima para proteger su privacidad. Le pido amablemente que grabe el audio de nuestra

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entrevista para recordar mejor lo que me dirá y poder trabajar con mayor precisión. La entrevista grabada se guardará en un archivo de proyecto seguro y se tratará de acuerdo con el Reglamento vigente de la UE 2016/679 de la Unión Europea sobre protección de datos, detallado en el consentimiento informado que otorgó.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P4 for USER

1. Objetivos / propósitos / valor de la utilización del servicio de movilidad digital + 2. Accesibilidad e inclusión: razones para no utilizar el servicio de movilidad digital

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- ¿Cómo suele obtener comida/alimentos u otros productos? (por ejemplo, yendo al supermercado, pidiendo a otros que me compren comida y otros productos, etc.)*
- How do you usually obtain food or other goods? (e.g. going to the supermarket, asking others to buy food and other goods for me, etc.)*
- ¿Qué tipo de servicios o métodos utiliza para entregar comida/alimentos/productos comprados a su casa? (por ejemplo, le pide al tendero que lo entregue directamente a su casa; lo lleva directamente a su casa; le pide a sus familiares / conocidos / que recojan lo que compraron en la tienda y que lo entreguen a su casa, etc.). ¿Por qué prefiere este método de entrega sobre otros?*
- What kind of services or methods do you use to deliver the food / products purchased to your home? (For example, ask the grocer to deliver it directly to your home; take it directly to your home; ask your family / acquaintances / to pick up what they bought at the store and deliver it to your home, etc.). Why do you prefer this delivery method over others?*
- ¿Cuándo y en qué situaciones usa aplicaciones digitales (por ejemplo, como La pájara-Coopcycle) para pedir comida / alimentos / otros productos?*
- When do you use apps to order delivery of food or to organize the picking of your goods? In what situations?*
- ¿Por qué las usa? (conveniencia, comodidad, ahorro de tiempo, salud personal, ...)*
- Why do you use it? (convenience, comfort, time saving, personal health, ...)*
- ¿Cuándo no usa la aplicación? ¿En qué situaciones? ¿Por qué no la usa?*
- When do you not use the app? In what situations? Why you do not use it?*

3. Necesidad + 1. Valor de utilizar el servicio de movilidad digital



Questions for P4 for USER

3. Needs + 1. Value of using the digital mobility service

- Pensando en su experiencia y en sus actividades diarias, ¿cuáles son sus necesidades de acceso a comida/alimentos/otros productos? ¿Los servicios de entrega digital como La Pájara-Coopcycle responden a sus necesidades?***
- Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights) and your access to goods needs (i.e. Digital lockers, delivery of food)? Do these DMS/DDS services address your needs?*

- ¿Qué otras necesidades no satisface este servicio?***
- What other needs this service does not satisfy?*

- Según su experiencia, ¿cuáles son las principales ventajas del servicio? ¿Y cuáles son las principales desventajas, de existir alguna?***
- According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?*

4. Descripción de pasos a seguir para utilizar aplicación de un servicio digital de movilidad

4. Description of the workflow when using the digital mobility service

- Por favor, según su experiencia, ¿puede describir paso a paso (de principio a fin) el proceso al usar el servicio de pedido de comida a través de La Pájara-CoopCycle?***
- Please, according to your experience, can you describe step by step (beginning to end) the process of using ride sharing, smart traffic lights, digital goods lockers, ordering food through a specific Digital Delivery Service (DMS/DDS)?*

5. Utilización de la interfaz digital del servicio + 8. Dificultades, limitaciones, desafíos y restricciones

5. Usability of the service's digital interface + 8. Difficulties, limitations, challenges and constraints

- ¿Crees que esta aplicación (su interfaz digital) es fácil de usar? ¿Por qué?***
- Do you think that this app is easy to use? Why?*

- Si no es así, ¿cuáles son las dificultades para usar la interfaz digital de la aplicación? (véase la lista a continuación)***

Al formular la pregunta, referirse a los aspectos de usabilidad de la interfaz digital:

- Facilidad de uso
- Interfaz clara

Questions for P4 for USER

- Fácil de aprender y usar
- Pasos a seguir (de principio a fin) lógicos y adecuados al proceso de utilización
- Etc.
- Estilo de interacción de la persona-aplicación
 - Disponibilidad de instrucciones sobre el orden de actuación recomendado
 - Cómo la app reacciona a las acciones del usuario
 - Apoyo a la decisión
 - Etc.
- Accesibilidad e inclusión
 - Ajustes para apoyar a los grupos destinatarios vulnerables o en riesgo de exclusión (mayores, barrera lingüística, falta de conocimiento digital)
- Tolerancia a los errores
- Interfaz digital con los con agentes de servicio (por ejemplo, conductores, repartidores, etc.)
 - Cómoda interfaz de coordinación
 - Intuitivo cuando se utiliza
 - Una opción para contactar directamente con quien proporciona el servicio
 - Etc.

If not, what are the difficulties of using the digital interface of the app? (see list)

¿Qué funciones de la aplicación son más útiles/importantes para usted?

Which functionalities of the app are most useful/ important to you?

¿Qué funciones de la aplicación son menos útiles/importantes para usted?

Which functionalities of the app are least useful/ important to you?

6. Utilización de la interfaz física del servicio
6. Usability of the service's physical interface

Questions for P4 for USER

- ¿Tiene alguna dificultad al usar la interfaz física del servicio digital? Con interfaz física nos referimos a los aspectos no digitales del servicio (por ejemplo, el repartidor que entrega a domicilio, sus vehículos, sus condiciones laborales, las etiquetas de los embalajes, etc.) Si es así, ¿puede darnos algunos ejemplos?***

Referirse a aspectos de usabilidad de la interfaz física:

- Facilidad de uso
 - La entrega se realiza en una ubicación conveniente
 - Las etiquetas son fáciles de leer
 - Etc.
- Accesibilidad e inclusión
 - Se realizan ajustes o detalles para apoyar a los grupos destinatarios vulnerables o en riesgo de exclusión (mayores, con barrera lingüística, falta de conocimiento digitales, barreras culturales, etc.)
- Interacción con agentes de servicio (por ejemplo, conductores, repartidores, agencia de alquiler)
 - Interacción amable y trato humano
 - Intuitivo
 - La naturaleza de la interacción se define según el proceso y es clara para ambas partes
 - Etc.

- Do you face any difficulties when you use the physical interface of the DMS/DDS? If yes, can you provide some examples?***

7. Habilidades / capacidades.

7. Skills / capabilities

- De acuerdo con su experiencia de uso, ¿qué habilidades o capacidades deben tener las personas para poder usar la aplicación?***

Por ejemplo:

- Habilidades digitales
- Conocimientos:
 - Idioma de la aplicación
 - Leer un mapa
 - Terminología y estándares digitales

Questions for P4 for USER

- Habilidades cognitivas (por ejemplo, almacenamiento de información; habilidades de concentración / atención, etc.)
- Nivel educativo
- Habilidades físicas
 - Estar en forma (capaz de caminar por una cierta distancia, bajar las escaleras, llevar carga, etc.)
 - Habilidades visuales
 - Habilidades espaciales

According to your use experience, what skills or capabilities people have to have to be able to use the app? (see list)

10. Uso propio, ayuda a otros o uso en grupo

10. Self-use, assist other or group use

¿Utiliza la aplicación sola/solo o con la ayuda de otros? ¿Ayuda a otros a usar la aplicación? ¿Alguna vez ha contactado al servicio de atención al cliente? ¿Puedes darnos algunos ejemplos?

Do you use the app alone or with the help of others? Do you help others to use the app? Can you provide some examples?

11. Confianza, percepción del usuario de privacidad de los datos y seguridad

11. Trust, perception of personal data privacy and security

En general, ¿cuál es el tipo de datos que considera más sensibles para proteger su privacidad? ¿Qué datos estaría dispuesto a compartir cuando utilice un servicio en línea (por ejemplo, nombre, edad, sexo, etc.)? ¿Por qué?

Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?

¿Qué necesita para sentir seguridad al usar un servicio digital o al instalar una aplicación en su dispositivo? (por ejemplo, un formulario de consentimiento claro, la posibilidad de elegir los datos que se quieren compartir, el estándar de seguridad, etc.)

What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)

¿Con qué frecuencia lee los permisos necesarios de las aplicaciones antes de instalarlas?

Questions for P4 for USER

- How often do you read the required app permissions before installing an app?*
- ¿Alguna vez se ha negado a instalar una aplicación que quieres? ¿Por qué?***
- Have you ever refused to install an app you want? Why?*
- ¿Utiliza actualmente (o ha utilizado anteriormente) antivirus o antimalware en su dispositivo?***
- Are you currently using (or have previously used) antivirus or anti-malware apps on your device?*
- ¿Cuántas veces ha sido infectado su dispositivo con un virus o malware?***
- How many times has your device been infected with a virus or malware?*
- Pensando en el servicio específico de entrega de comida/alimentos La Pàjara-CoopCycle, ¿tiene alguna preocupación sobre la seguridad y la privacidad de la información personal que introduce en la aplicación cuando la utiliza?***
- ¿si es que sí, cuál?***
- ¿si es que no, por qué?***
- Thinking about the specific service of food delivery, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?*
- If so, which one?*
- If not, why not?*

12. Percepción de la seguridad

12. Safety perception

- ¿Cree que hay algún riesgo en el uso de este tipo de aplicación?***
- Do you think there is any risk in using this kind of app?*

14. Actitudes, sentimientos/emociones, preferencias y oportunidades + 9. Percepción sobre los requerimientos del servicio y su capacidad de cumplirlos

14. Attitudes, feelings/ emotions, preferences and opportunities + 9. User's perception of the service use demands and their ability to meet the demands

Questions for P4 for USER

- En general, ¿qué opina de este servicio?*
 - ¿Cumple con sus expectativas? ¿Por qué?*
 - ¿Le gusta? ¿Le satisface? ¿O le causa frustración? ¿Me puede explicar mejor?*
 - ¿Confía en el servicio y en quién lo proporciona?*
 - ¿Cree que lo usará con frecuencia?*
 - ¿Prefiere otros servicios similares como alternativa? ¿Cuál por ejemplo?*
 - ¿Cree que recomendará su uso a conocidos o amigos?*
 - ¿Podría decir que este servicio fue diseñado para satisfacer sus necesidades?*
 - ¿Qué sugerencias puede ofrecer para mejorar el servicio para que pueda satisfacer mejor sus necesidades?*
 - ¿Qué mejoraría de la interfaz de usuario?*
 - Generally speaking, what do you think of this service?*
 - Does it meet your expectations? Why?*
 - Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?*
 - Do you have trust in the service and in who provides it?*
 - Do you think you will use it frequently?*
 - Do you prefer other similar services as an alternative? Which for example?*
 - Do you think it will recommend its use to acquaintances or friends?*
 - Could you say that this service was designed to meet your needs?*
 - What suggestions can you offer to improve the service so that it can better meet your needs?*
 - What would you improve about the user interface?*
-
- ¿Diría que esta aplicación DDS fue diseñada para atender sus necesidades?*

Questions for P4 for USER

- Would you say that this DMS/DDS app was designed for addressing your needs?*
- ¿Qué sugerencias tiene para mejorar el servicio para que se adapte mejor a sus necesidades? O ¿Qué mejoraría en esta aplicación DDS?*
- What suggestions do you have to improve the service to fit better for your needs? Or What would you improve in this DMS/DDS app?*

13. Percepción de la resistencia del servicio a las crisis como Covid-19

13. Perception of the service's resilience to crisis like Covid-19

- ¿Cambió sus hábitos en cuanto al uso de éste DDS debido a la crisis del Coronavirus? ¿Cómo?*
 - Los cambios en el servicio durante la crisis
 - Diferentes necesidades de los usuarios debido a la crisis
 - Ventajas/desventajas del servicio durante la crisis
 - Volver a la rutina de servicio después de la crisis
 - Cambios sugeridos
- Did you change your habits with regards to use this DMS/DDS because of the Coronavirus crisis? How?*

Data of the interviewee

Interview done with (the pilot's specific profile characteristics):

Healthy food delivery users

- Permanently impaired or with disabilities
- Socially isolated (unwanted loneliness)
- Not-connected people (e.g. Low digital skills, lower technology availability)
- Low income
- COVID19 isolated with none or reduced number of daily trips allowed

For the interviewee please specify:

Name / fictional name					
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality	
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate				
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____				
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years		

Total duration (minutes)

Final interviewer comments:



SSI debriefing template (Pilot 4 – Non users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – La persona entrevistadora se presenta brevemente

Hola. Soy [nombre y apellido] y trabajo para [nombre de la organización] que es socio de un proyecto europeo llamado INDIMO.

2- La persona entrevistadora contextualiza la entrevista presentando brevemente el proyecto y sus objetivos principales:

INDIMO es un proyecto financiado por la Unión Europea que tiene como objetivo mejorar la accesibilidad y la inclusión social de los servicios de movilidad digital.

Los servicios de movilidad digital son todos aquellos servicios que facilitan la movilidad de personas y bienes mediante el uso de tecnología y aplicaciones en dispositivos como teléfonos inteligentes, tabletas, etc. (por ejemplo, aplicaciones que permiten: compartir vehículos o viajes para llegar a un lugar determinado; planificar rutas; entregar mercancías a domicilio; taquillas digitales para la entrega de paquetes, etc.).

Como parte del proyecto, 15 socios de diferentes países (Bélgica, Francia, Alemania, Hungría, Israel, Italia, España) están trabajando juntos para desarrollar un conjunto de herramientas que ayudarán a los proveedores de servicios, desarrolladores y autoridades locales a mejorar los servicios de movilidad digital existentes, emergentes y futuros ampliando su accesibilidad a tantas personas usuarias como sea posible. Se prestará especial atención a las categorías de categorías de ciudadanía más vulnerables, debido a las dificultades físicas, cognitivas, socioeconómicas, educativas, digitales, lingüísticas, de edad y género, etc. que les impide acceder a los servicios de los que estamos hablando. Para hacer posible este objetivo, es necesario conocer a las personas usuarias actuales y futuras de estos servicios, en particular aquellas que tienen necesidades específicas a considerar. Esta es la razón por la cual la entrevista que haremos juntos es muy importante para nosotros y para el proyecto.

3 – La persona entrevistadora:

[3.1] presenta la entrevista y sus objetivos principales

En esta entrevista nos gustaría reunir su punto de vista y experiencia sobre varios aspectos relevantes para nuestro proyecto, que incluyen:

- sus necesidades y requisitos con respecto a sus movimientos diarios y la forma en que se le entregan comida/alimentos/productos que compra;
- sus dificultades para utilizar servicios relacionados con el uso de tecnologías y aplicaciones digitales (por ejemplo, teléfonos inteligentes);
- sus inquietudes con respecto a la seguridad, eficacia o calidad de este tipo de servicio.

[3.2] explica cómo se llevará a cabo la entrevista

La entrevista consta de una serie de preguntas que nos ayudarán a conversar abiertamente sobre algunos temas relacionados con los servicios de movilidad digital de los que hemos hablado. La entrevista durará aproximadamente 1-1,5 horas.

[3.3] si no se realizó antes de la entrevista por correo electrónico, describa el formulario de consentimiento informado (ICF) presente. Lea con la persona entrevistada el contenido principal de la ICF con respecto a los temas relacionados con la recopilación, el procesamiento y la protección de la información con respecto al secreto / privacidad (es decir, el anonimato de la información recopilada, la forma en que la información será tratada y almacenada, etc.) En esta etapa, es necesario preguntarle a la persona entrevistada si acepta la grabación de audio de la entrevista, especificando que la información puede publicarse en informes de proyectos, artículos de revistas, presentaciones de conferencias, etc., pero, en cualquier caso, protegiendo su anonimato.

[El formulario de consentimiento informado debe firmarse antes de comenzar la entrevista].

Toda la información recopilada en la entrevista se hará anónima para proteger su privacidad. Le pido amablemente que grabe el audio de nuestra

D1.3 User's capabilities and requirements | version 2.0

entrevista para recordar mejor lo que me dirá y poder trabajar con mayor precisión. La entrevista grabada se guardará en un archivo de proyecto seguro y se tratará de acuerdo con el Reglamento vigente de la UE 2016/679 de la Unión Europea sobre protección de datos, detallado en el consentimiento informado que otorgó.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P4 for NON-USER

1. Objetivos / propósitos / valor de la utilización del servicio de movilidad digital + 2. Accesibilidad e inclusión: razones para no utilizar el servicio de movilidad digital

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- ¿Cómo suele obtener comida/alimentos u otros productos? (por ejemplo, yendo a las tiendas locales, al supermercado, pidiendo a otros que le compren comida y otros productos, etc.)*
- How do you usually obtain food or other goods? (e.g. going to local shops, to the supermarket, asking others to buy food and other goods for me, etc.)*
- ¿Qué tipo de servicios o métodos utiliza para entregar comida/alimentos/productos comprados a su casa? (por ejemplo, le pide al tendero que lo entregue directamente a su casa; lo lleva directamente a su casa; le pide a sus familiares / conocidos / que recojan lo que compraron en la tienda y que lo entreguen a su casa, etc.). ¿Por qué prefiere este método de entrega sobre otros?*
- What kind of services or methods do you use to deliver the food / products purchased to your home? (For example, ask the grocer to deliver it directly to your home; take it directly to your home; ask your family / acquaintances / to pick up what they bought at the store and deliver it to your home, etc.). Why do you prefer this delivery method over others?*
- ¿Ha utilizado alguna vez (o has oído hablar de) las aplicaciones/servicios digitales para solicitar la entrega de comida/alimentos o para organizar la recogida de otros productos que compra? Por ejemplo, un servicio que le ofrece la posibilidad de comprar en diferentes tiendas como Amazon, de obtener un plato preparado en uno de sus restaurantes locales (por ejemplo, Deliveroo, Uber eats, etc.) o de elegir un lugar de recepción de mercancías para recogerlas cuando le convenga.*
- Have you ever used (or heard about of) the digital delivery applications/services to order delivery of food or to organize the picking of other goods you buy? For example, a service that offer you the possibility to buy at different stores such as Amazon, to get a prepared dish from one of your local restaurants (e.g. Deliveroo, Uber eats, etc.) or to choose a place for receiving goods in order to pick them at your convenience.*

Questions for P4 for NON-USER

- Si es así, ¿cuáles? ¿En qué situaciones? ¿Qué opina de las aplicaciones/servicios de movilidad digital que ha utilizado por casualidad? (usar tabla abajo)*
- If yes, which ones? In what situations? What do you think about the digital mobility applications/ services that you happened to use? (fill following table)*

DMS/DDS usado [ejemplos de D1.1, Tabla 8]	Situaciones	Opinión
Compartir vehículos (bicicleta, coche, moto, patinete, etc.)		
Aplicaciones digitales para encontrar aparcamiento		
Sistemas de billetes y reserva electrónica (aplicaciones móviles, web y terminales)		
Planificadores de rutas multimodales (por ejemplo, <i>Google Maps, Mappy, Citymapper, Moovit</i> , las apps de la <i>EMT</i> o del <i>CRTM</i>)		
Planificadores de rutas unimodales (por ejemplo, <i>Waze, TomTom, Routenet</i>)		
Reserva de trayecto (por ejemplo, <i>Uber, Cabify</i> , etc.)		
Plataformas para compartir viajes (por ejemplo, <i>Blablacar</i> o similares)		
Taquillas con aplicación digital para la recepción de paquetes		

Questions for P4 for NON-USER

	Entrega de comida a domicilio (por ejemplo, <i>UBER Eats, Deliveroo, La Pajara-Coopcycle</i>)		
	Semáforos inteligentes e inclusivos (p.e. adaptado a la velocidad de caminata de la persona que cruza)		
	...		
<input type="checkbox"/> <i>Si no, ¿por qué no las usa?</i> <input type="checkbox"/> <i>If not, why you do not use them?</i>			
3. Necesidad + 1. Valor de utilizar el servicio de movilidad digital 3. Needs + 1. Value of using the digital mobility service			
<input type="checkbox"/> <i>Teniendo en cuenta su acceso habitual a comida / alimentos y otros productos, ¿cómo podrían ayudarle los servicios de entrega digital? ¿Qué necesidades (no satisfechas) podrían satisfacer?</i> <input type="checkbox"/> <i>Taking into consideration your typical access to food and goods, how digital delivery services could help you? What (unmet) needs could they satisfy?</i>			
<input type="checkbox"/> <i>Presentación de la funcionalidad de INDIMO DDS (La Pájara-CoopCycle): conseguir comida preparada de una variedad de restaurantes locales o productos de tiendas locales entregados en su casa en bicicleta en unos horarios preestablecido que a usted le convengan, en la puerta de su casa, garantizando la cadena del frío.</i> <input type="checkbox"/> <i>Introduction to functionality of the INDIMO DDS: getting food from a variety of local restaurants or local stores delivered at your home by bicycle</i>			
14. Actitudes, sentimientos/emociones, preferencias y oportunidades 14. Attitudes, feelings/ emotions, preferences and opportunities			
<input type="checkbox"/> <i>¿Cómo se sentiría al usar un servicio como el que le acabo de describir? ¿Le gustaría? ¿Se sentiría cómodo/a usándolo? ¿O cree que tendría dificultades? ¿Puedes explicar tu respuesta?</i>			

Questions for P4 for NON-USER

- ¿Qué le gustaría en particular de un nuevo servicio como ese? O bien, ¿Qué tipo de dificultad cree que podría tener?*
- ¿Por qué?*
- How would you feel about using a service like the one I just described? Would you like it? Would you feel comfortable using it? Or do you think you would have difficulties? Can you explain your answer?*
- What would you like in particular about a new service like that? Or, what kind of difficulty do you think you might have?*
- Why?*

4. Descripción de pasos a seguir para utilizar aplicación de un servicio digital de movilidad

4. Description of the workflow when using the digital mobility service

(no question for non-user)
5. Utilización de la interfaz digital del servicio + 8. Dificultades, limitaciones, desafíos y restricciones

5. Usability of the service's digital interface

(no question for non-user)
6. Utilización de la interfaz física del servicio

6. Usability of the service's physical interface

(no question for non-user)
7. Habilidades / capacidades.

7. Skills / capabilities

- ¿Cuáles serían las habilidades que usted cree necesitar para utilizar este tipo de servicios mediados por la tecnología como él que hemos mencionado anteriormente?*

Tipos de habilidades y competencias a tener en cuenta al formular la pregunta (no se debe sugerir, utilizar como categorías de referencia):

- Habilidades digitales
- Conocimientos:
 - Idiomas
 - Leer un mapa
 - Terminología y protocolos digitales

Questions for P4 for NON-USER

- Habilidades cognitivas
- Nivel educativo
- Habilidades físicas
 - Estar en forma (capaz de caminar por una distancia, bajar las escaleras, llevar carga, etc.)
 - Habilidad visual

What skills or capabilities people should have, to be able to use a digital mobility application / digital delivery service / smart and inclusive traffic lights such as those we mentioned before?

8. Dificultades, limitaciones, desafíos y restricciones

8. Difficulties, limitations, challenges and constraints

Si la persona entrevistada nunca ha usado un DMS / DDS:

¿Utiliza aplicaciones en tu teléfono como WhatsApp, Messenger, etc.?

If interviewee has never used a DMS/DDS:

Do you use applications in your phone such as WhatsApp, Messenger, etc.?

¿Cuáles son las dificultades, limitaciones, desafíos y restricciones de la utilización de este tipo de aplicaciones [el DMS/DDS indicado anteriormente por el entrevistado O los servicios digitales generales como WhatsApp, Messenger, etc.], si las hay?

Ejemplo de dificultades, limitaciones, desafíos y restricciones (no se debe sugerir, utilizar como categorías de referencia):

- Dificultades, limitaciones, desafíos y restricciones relacionadas con la interfaz física del servicio (infraestructura, seguridad, disponibilidad, accesibilidad)
- Dificultades, limitaciones, desafíos y restricciones relacionadas con la interfaz digital del servicio:
 - hardware;
 - software;
 - conectividad;
 - seguridad cibernética;
 - facilidad de uso (facilidad de uso, interfaz clara, fácil de aprender, flujo de trabajo, lógico y adecuado al proceso de uso);
 - estilo de interacción entre la persona y la aplicación (disponibilidad de instrucciones sobre el orden de acciones recomendadas);
 - cómo la app reacciona a las acciones del usuario;

Questions for P4 for NON-USER

- apoyo a la decisión;
 - ajustes para apoyar a los grupos destinatarios vulnerables o en riesgo de exclusión (mayores, barrera lingüística, falta de conocimiento digital);
 - la tolerancia de la app a los errores;
 - interacción con los agentes de atención al usuario (interfaz de coordinación conveniente, intuitiva dentro de la aplicación);
 - El elemento más problemático relacionado con el uso de este servicio (incertidumbre sobre la obtención de los servicios adecuados o sobre el tiempo, la calidad de los mismos, etc.)
 - Otras dificultades, limitaciones, desafíos y restricciones
- What are the difficulties, limitations, challenges and constraints of using these kind of applications [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.], if any?*

10. Uso propio, ayuda a otros o uso en grupo

10. Self-use, assist other or group use

- ¿Utiliza los servicios digitales [DMS/DDS indicado anteriormente por el entrevistado O los servicios digitales generales como WhatsApp, Messenger, etc.] solo o con el apoyo de otros? ¿Ayuda a otros a utilizar estos servicios digitales? ¿Puede dar algunos ejemplos?*
- Do you use the digital services [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.] alone or with the help of others? Do you help others to use these digital services? Can you provide some examples?*

11. Confianza, percepción del usuario de privacidad de los datos y seguridad

11. Perception of personal data privacy and security

- En general, ¿cuál es el tipo de datos que considera más sensibles para proteger su privacidad? ¿Los compartiría cuando utilice un servicio en línea (por ejemplo, nombre, edad, sexo, etc.)? ¿Por qué?*
- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, etc.)? Why?*
- ¿Qué necesita para sentir seguridad cuando usa un servicio digital o instala una aplicación en su dispositivo? (por ejemplo, un formulario de consentimiento claro, la posibilidad de elegir qué datos desea compartir, el estándar de seguridad, alguien que pueda guiarla en el uso, etc.)*
- What do you need to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, someone who can guide and instruct you in its use, etc.)*

Questions for P4 for NON-USER**12. Percepción de la seguridad**

12. Safety perception

- ¿Cree que hay algún riesgo en el uso de los servicios de entrega digital que hemos discutido antes?*
- Do you think there are any risks in using the digital delivery services we discussed before?*

13. Percepción de la resistencia del servicio a las crisis como Covid-19

13. Perception of the service's resilience to crisis like Covid-19

- ¿Cree que un servicio digital como el DDS comentado anteriormente habría sido una buena solución para resolver sus problemas de movilidad/entrega (o los de otros) durante la crisis del Coronavirus? ¿Por qué?*
- Do you think that a digital service like the DMS/DDS/smart and inclusive traffic lights would have been a good solution to solve your (or others') mobility/delivery problems during the Coronavirus crisis? Why?*

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

Healthy food delivery users

- Permanently impaired or with disabilities
- Socially isolated (unwanted loneliness)
- Not-connected people (e.g. Low digital skills, lower technology availability)
- Low income
- COVID19 isolated with none or reduced number of daily trips allowed

For the interviewee please specify:

Name / fictional name					
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality	
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate				
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____				
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years		

Total duration (minutes)

Final interviewer comments:



Stakeholder interview debriefing template (Pilot 4 Madrid)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

D3.4: Present the ambition of your pilot in order to give the stakeholder a concrete idea about what the INDIMO pilot is about and how the interview with her/him is relevant for the pilot and the project.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions <u>Madrid stakeholder</u>	
1. Goals/ objetivos y propósitos	
<input type="checkbox"/>	1. Question in English language
Q1 According to you, for which purpose(s) are [vulnerable category] using the service? (Please complete the category for your pilot)	
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	P1 De acuerdo a su mirada, ¿para qué propósito/s están los (categoría vulnerable) usando el servicio?
2. Needs/necesidades	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	Q2: Which needs of the (specific category) is the service addressing?
<input type="checkbox"/>	Q3: Are [vulnerable category] using alternative services (apps, tools, services) to satisfy some specific needs the service is supposed to address?
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	P2: ¿A qué necesidades de la (categoría vulnerable) se orienta el servicio?
<input type="checkbox"/>	P3: ¿Los (categoría vulnerable) usan servicios alternativos (apps, herramientas, servicios) para satisfacer alguna necesidad específica que el servicio se orienta a cubrir?
3. Workflow /Dimensión flujo de trabajo	
<input type="checkbox"/>	Question in English language
Q4: What is the procedure [vulnerable category] usually follow while using your service to have food or goods delivered?	

Questions **Madrid stakeholder**
 Translation of question into local language

P4: ¿Cuál es el procedimiento que (categoría vulnerable) usualmente siguen para usar su servicio para recibir envíos de comida u otros productos?

4. Usability of the digital interface/Dimensión interfaz de usabilidad digital
 Question in English language

Q5: Which aspects of the digital interface of the service are vulnerable people considering easier to use? Which aspects of the digital interface of the service are they experiencing difficulties instead? (Use an example to illustrate this question)

Q6: Are vulnerable people satisfied with the support provided by the app? What further support would they need before, during and after contacting the customer service? Which are the best aspects? What should be improved?

Q7: What specific adjustments of the service do [vulnerable category] require for improved accessibility and inclusivity?

 Translation of question in local language

P5: ¿Cuáles aspectos de la interfaz digital del servicio consideran los usuarios vulnerables más fácil de usar? ¿Con cuáles aspectos de la interfaz digital del servicio experimentan dificultades? (use un ejemplo para ilustrar esta cuestión)

P6: ¿Las personas vulnerables están satisfechas con la ayuda brindada por la app? ¿Qué otra asistencia necesitan antes, durante y luego de contactar al servicio de asistencia al usuario? ¿Cuáles son los aspectos positivos? ¿Qué debería mejorarse?

P7: ¿Qué ajustes específicos del servicio las categorías vulnerables requieren para tener mayor accesibilidad e inclusividad

5. Usability of the physical interface/ Dimensión usabilidad de la interfaz física
 Question in English language

Sometimes digital mobility services have a physical dimension, for example in case of ordering a taxi via an app, the interaction with the driver is part of the physical experience of the service as there is a person-to-person interaction. We understand it thus a physical object that is used as part of the digital service or the involvement of humans in the service.

Questions Madrid stakeholder

- Q8:** Which aspects of the physical interface (physical object or active human features of a service offering) do vulnerable people find easy to use? Which aspects of the physical interface do vulnerable people find difficult to use? Do they get enough support while they are using it? Is there a way they can provide feedback or ask for assistance?

Translation of question into local language

- En muchas ocasiones, en los servicios de movilidad digital, por ejemplo en el caso de solicitar un taxi a través de una app, la interacción con el conductor es parte de la experiencia física del servicio en la medida en que existe una interacción persona a persona. Incluimos en este concepto a un objeto físico que es usado como parte de un servicio digital o el involucramiento de humanos en el servicio.
- P8:** ¿Qué aspectos de la interfaz física (objeto físico o aspectos propios de la actividad humana del servicio ofrecido) las personas vulnerables encuentran fáciles de usar? ¿Qué aspectos de la interfaz física las personas vulnerables encuentran difíciles de usar? ¿Encuentran suficiente asistencia mientras lo están usando? ¿Existe la forma de que puedan dejar su comentario o solicitar asistencia?

6. Skills and capabilities / habilidades y capacidades

Question in English language

Q9: Which skills and knowledge should a vulnerable person have in order to use the service? Which are the features causing more issues to users while using your service?

Translation of question into local language

- P9:** ¿Cuáles habilidades y conocimiento una persona vulnerable debería poseer con el fin de usar el servicio? ¿Cuáles son los aspectos que causan mayores problemas a los usuarios mientras usan el servicio?

7. Perception of use demands of the service / percepción de los requerimientos del servicio

Question in English language

- Q10:** With which service interaction activity do you think vulnerable people are having most problems?
- Q11:** If the app can learn from previous searches or interactions or preferences, can (vulnerable category) make use of this functionality? Do they understand the mechanism behind it?

Translation of question into local language

Questions Madrid stakeholder

- P10:** *¿Con cuál actividad de interacción del servicio las personas vulnerables están teniendo más problemas?*
- P11:** *Si la app puede aprender de búsquedas previas o interacciones o preferencias, ¿puede la (categoría vulnerable) hacer uso de esta funcionalidad? ¿Entienden el mecanismo?*

8. Self use, assist, group use /uso propio, asistencia a otra persona o en grupo.

- Question in English language:**
- Q12:** *What kinds of vulnerable users are requiring support or assistance? Is it easy to provide assistance to vulnerable users? Make some examples derived from direct or indirect experienced*

 Translation of question into local language

- P12:** *¿Qué tipos de usuarios vulnerables requieren ayuda o asistencia? ¿Es fácil dar asistencia a usuarios vulnerables? Produzca algunos ejemplos derivados de la experiencia directa o indirecta.*

9. Perception of personal data privacy and security / confianza, privacidad de datos personales y seguridad en el manejo de la información.

- Question in English language:**
- Q13:** *Do vulnerable people have specific concerns in sharing personal data with the service?*
- Q14:** *What can be done to improve vulnerable people's trust in the service/ the service provider?*

 Translation of question into local language

- P13:** *¿Las personas vulnerables tienen preocupaciones específicas en relación con compartir datos privados con el proveedor de servicio?*
- P14:** *¿Qué se puede hacer para mejorar la confianza de las personas vulnerables en el servicio /en el proveedor de servicio?*

10. Difficulties, limitations, challenges and constraints / desafíos, limitaciones, oportunidades y cambio
Question in English language

- Q15:** *What are the main difficulties and challenges for vulnerable people while using the service?*

Questions Madrid stakeholder

- Translation of question into local language**
- P15:** *¿Cuáles son las principales dificultades y desafíos para las personas vulnerables mientras usan este servicio?*

11. Attitudes, feelings/ actitud

- Question in English language**
- Q16:** *Are (vulnerable category) standing positive towards the service.?*

- Translation of question into local language**
- P16:** *¿La (categoría vulnerable) tiene una actitud positiva hacia el servicio?*

12. Reliability and trust/ confiabilidad del servicio

- Question in English**
- Q17** *Do (vulnerable category) find that the service is reliable, what concerns the information provided on the digital mobility service, the service agents involved or by the service in general (in meeting its promises)?*

- Question into local language:**
- P17** *¿La (categoría vulnerable) encuentra que el servicio es confiable, en lo que respecta a la información entregada en los servicios de movilidad digital, al personal de atención al usuario o al sistema en general (en cumplir con su promesa)?*

12. Perception of the service's resilience to crisis like Covid-19/ COVID-19

- Question in English**
- Q18:** *Do you think the COVID-19 crisis has impacted (vulnerable category) that would have otherwise used the service? How can the service be best organized to mitigate this impact on (vulnerable category) of such an event in the future?*

- Question into local language**
- P18:** *¿Considera que la crisis del COVID-19 ha tenido un impacto en la (categoría vulnerable) que hubiera de otra forma usado el servicio? ¿Cómo puede organizarse mejor el servicio para mitigar el impacto sobre la (categoría vulnerable) de un evento semejante en el futuro?*

Questions Madrid stakeholder**13. T1.4 Questions for user group**

- Question in English**
- Q19: Does this app/service answers to the needs of the groups you represent?**
- Question in local language**
- Question in English**
- Q20: Were user groups consulted during development or afterwards (co-creation)? How diverse was this user group? Did this information lead to any changes?**
- Question in Local Language**
- Question in English**
- Q21: Rate the services between 1 and 5, ranging from very bad to very good. What were the strong/weak points.**
- Question in local language**

Data of the interviewed stakeholder.

Interview done with (the pilot's specific profile characteristics):

Organisation:

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Area of specialisation				
Aim of organisation/area of activity	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city		<input type="checkbox"/> Other _____	

Total duration (minutes)

Final interviewer comments:

SSI debriefing template (Pilot 5 – Users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P2 for USER

1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)

- Translation of question into local language***
- What are the main purposes of your daily activities (study, food shops, care-giving, work, leisure, visiting family, pharmacy, ...)?*
- Translation of question into local language***
- Which mobility service or goods delivery service you use for achieving your activities?*

Questions for P2 for USER

When formulating the questions below, please refer to any of the DMS/DDS of the list:

DMS/DDS used [examples from D1.1, Table 8]	Situations	Opinion/Satisfaction
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		
E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		

- Translation of question into local language**
- Do you use any digital mobility applications/services (DMSs) to manage and plan your daily trips for achieving your activities?*
- When do you use DMSs? In what situations?*

Questions for P2 for USER
 Why do you use DMSs? (convenience, comfort, time saving, personal health, ...)
 Are you satisfied with the current mobility services you use?
 Translation of question into local language
 When do you not use the DMSs? In what situations? Why you do not use them?

3. Needs + 1. Value of using the pilot specific digital mobility service

 Translation of question into local language
 Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?
 Translation of question into local language
 What other needs this service does not satisfy?
 Translation of question into local language
 According to your experience, what are the main advantages of the service? And what are the main disadvantages, if any?

4. Description of the workflow when using the digital mobility service

 Translation of question into local language
 Please, according to your experience, can you describe step by step (beginning to end) the process of using the DMS?

 5. Usability of the service's digital interface
 Translation of question into local language
 Do you think that this DMS is easy to use? Why?
 Translation of question into local language
 If not, what are the difficulties of using the digital interface of the DMS? (see list below)

Questions for P2 for USER

Usability aspects of the digital interface to be taken into consideration when formulating the question (not to be suggested - to be used as reference categories):

- Ease of use
 - Clear interface
 - Easy to learn and use
 - Workflow (begin to end) logical and adequate to the process of use
 - Etc.
- Human computer interaction style
 - Availability of instructions regarding the recommended order of actions
 - Feedback provided in accordance with user actions
 - Decision support
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills)
- Tolerance for errors
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Convenient coordination interface
 - Intuitive within-application
 - An option for direct contact provided

Translation of question into local language

Which functionalities of the DMS are most useful/ important to you?

Translation of question into local language

Which functionalities of the DMS are least useful/ important to you?

 6. Usability of the service's physical interface

Translation of question into local language

Questions for P2 for USER

- Do you face any difficulties when you use the physical interface of the DMS? If yes, can you provide some examples? By means of a physical interface, we refer to the non-digital aspects of the service (for example, the vehicles, the driver, the hardware of the traffic lights, etc.)*

Refer to usability aspects of the physical interface:

- Ease of use
 - Convenient location
 - Easy to use
 - Etc.
- Accessibility and inclusion
 - Adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills, cultural barriers)
- Interaction with service agents (e.g. drivers, delivery person, rental agency)
 - Intuitive
 - The nature of the interaction is defined according to the process and is clear to both parties
 - Etc.

7. Skills / capabilities

- Translation of question into local language***

- According to your use experience, what skills or capabilities people have to have to be able to use the DMS? (e.g. add a checklist)*

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards
- Cognitive skills
- Level of education
- Physical abilities
 - Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
 - Visual ability

10. Self-use, assist other or group use



Questions for P2 for USER

- Translation of question into local language**
- Do you use the DMS alone or with the help of others? Do you help others to use the app? Can you provide some examples?*

11. Perception of personal data privacy and security

- Translation of question into local language**
- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, ect.)? Why?*
- Translation of question into local language**
- What do you need in order to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)*
- Translation of question into local language**
- How often do you read the required app permissions before installing an app?*
- Translation of question into local language**
- Have you ever refused to install an app you want? Why?*
- Translation of question into local language**
- Are you currently using (or have previously used) antivirus or anti-malware apps on your device?*
- Translation of question into local language**
- How many times has your device been infected with a virus or malware?*
- Translation of question into local language**
- Thinking about the specific DMS, do you have any concern about the security and privacy of the personal information that you introduce in the app when you use it?*

Questions for P2 for USER

- If so, which one?*
- If not, why not?*

12. Safety perception

- Translation of question into local language***
- Do you think there is any risk in using this kind of app?*

14. Attitudes, feelings/ emotions, preferences and opportunities

- Translation of question into local language***
- Generally speaking, what do you think of this service?*
- Does it meet your expectations? Why?*
- Do you like it? Does it satisfy you? Or does it cause you frustration? Can you explain me better?*
- Do you have trust in the service and in who provides it?*
- Do you think you will use it frequently?*
- Do you prefer other similar services as an alternative? Which for example?*
- Do you think it will recommend its use to acquaintances or friends?*
- Would you say that this service was designed for addressing your needs?*
- What suggestions can you offer to improve the service so that it can better meet your needs?*
- What would you improve about the user interface?*

13. Perception of the service's resilience to crisis like Covid-19

- Translation of question into local language***
- Did you change your habits with regards to use this DMS because of the Coronavirus crisis? How ?*
- **Service changes during the crisis**

Questions for P2 for USER

- Different user needs because of the crisis
- Advantages/ disadvantages of the service during the crisis
- Return to service routine after the crisis
- Suggested changes

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

On demand ride sharing users

- Care-takers of children/ impaired/ elders
- Gender: women
- Lack of services (reduced mobility)
- Lack of digital skills (although owning a mobile phone)
- Residing in peripheral locations

For the interviewee please specify:

Name / fictional name					
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Age		Nationality	
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate				
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time)				
	<input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____				
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years		
	<input type="checkbox"/> Other _____				

Total duration (minutes)

Final interviewer comments:

SSI debriefing template (Pilot 5 – Non users)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

Hi! I am [name] and I work for [organisation name] - a partner of a European project called INDIMO.

2- The interviewer contextualizes the interview by shortly introducing the project and its main purposes to the interviewee, e.g.:

The INDIMO is a project funded by the EU. It aims to increase the accessibility and social inclusion of digital mobility services. The project aims to break the barriers that people face in accessing digital mobility services.

Digital mobility services are all those services that ease the mobility of people and goods through the use of apps on your smartphone.(i.e. vehicle or ride sharing, route planners, on-demand goods delivery, smart boxes for parcel delivery, etc.).

Within the project, a consortium of 15 partners from different countries (i.e. Belgium, France, Germany, Hungary, Israel, Italy, Spain) are working together to develop a set of tools that aims to support the growth of existing and emerging digital mobility services to a variety of populations especially for those who are vulnerable-to-exclusion due to physical, cognitive or

socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

3 – The interviewer:

[3.1] introduces the interview and its main objectives

In this interview we would like to collect several feedbacks on relevant aspects. For example:

- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

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Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions for P3 for NON-USER		
1. Goals /purposes of using the service + 2. Accessibility and inclusion: reasons for not using the service (for profile fit non-users only)		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>What are the main purposes of your daily mobility (study, food shopping, accompanying dependent person, work, leisure, visiting family, pharmacy)?</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>What kind of transport mode do you usually use to carry out your daily activities (e.g. walking, car, public transportation – tram, metro, etc.)? Why?</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>Have you ever used digital mobility applications/ services to manage and plan your daily trips? For example, a service that helps you to walk the minimum distance, to find a taxi ride, a public bicycle available near you or to know when the next bus will arrive, etc. (e.g. google maps, citymapper, transport authorities local apps, etc.)</i>		
<input type="checkbox"/> Translation of question into local language <input type="checkbox"/> <i>If yes, which ones? In what situations? What do you think about the digital mobility applications/ services that you used?</i>		
DMS/DDS used	Situations	Opinion
[examples from D1.1, Table 8]		
Vehicle sharing (bike, car, e-scooter, e-step, etc.)		
Digital parking applications		

Questions for P3 for NON-USER

E-ticketing and booking systems (mobile, web and terminal applications)		
Multimodal route planners (e.g. Google Maps, Mappy)		
Ride hailing (e.g. Uber, Lyft)		
Ridesharing platforms (e.g. Drivy, Ride Connect)		
Unimodal route planners (e.g. Waze, TomTom, Routenet)		
Smart boxes for parcel delivery		
On-demand freight delivery (e.g. UBER Eats, Deliveroo, Coopcycle)		
Smart and inclusive traffic lights		
...		
<input type="checkbox"/> <i>Translation of question into local language</i>		
<input type="checkbox"/> <i>If not, why you do not use them?</i>		
3. Needs + 1. Value of using the digital mobility service		
<input type="checkbox"/> <i>Translation of question into local language</i>		
<input type="checkbox"/> <i>Taking into consideration the activities you perform on daily basis; how digital mobility services could help you? What (unmet) needs could they satisfy?</i>		
<input type="checkbox"/> <i>Translation of question into local language</i>		
<input type="checkbox"/> <i>Introduction to functionality of the INDIMO DMS: obtaining on-demand ride pooling service integrated into multimodal route planning</i>		

Questions for P3 for NON-USER

14. Attitudes, feelings/ emotions, preferences and opportunities

- Translation of question into local language**
- How would you feel about using a service like the one I just described? Would you like it? Would you feel comfortable using it? Or do you think you would have difficulties? Can you explain your answer?*
- What would you like in particular about a new service like that? Or, what kind of difficulty do you think you might have?*
- Why?*

4. Description of the workflow when using the digital mobility service

(no question for non-user)

5. Usability of the service's digital interface

(no question for non-user)

6. Usability of the service's physical interface

(no question for non-user)

7. Skills / capabilities

- Translation of question into local language**
- What skills or capabilities people should have, to be able to use a digital mobility application / digital delivery service / smart and inclusive traffic lights such as those we mentioned before?*

Types of skills and abilities to consider when formulating the question (not to be suggested - use as reference categories):

- Digital skills
- Knowledge:
 - Languages
 - Read a map
 - Terminology and digital standards
- Cognitive skills
- Level of education
- Physical abilities

Questions for P3 for NON-USER

- Physically fit (able to walk for a distance, go down the stairs, carry freight, etc.)
- Visual ability

8. Difficulties, limitations, challenges and constraints

 Translation of question into local language

If interviewee has never used a DMS/DDS:

-
- Do you use applications in your phone such as WhatsApp, Messenger, etc.?*

 Translation of question into local language

-
- What are the difficulties, limitations, challenges and constraints of using these kind of applications [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.], if any?*

Example of difficulties, limitations, challenges and constraints (not to be suggested - use as reference categories):

- Difficulties, limitations, challenges and constraints related to the physical interface of the service (infrastructure, safety, availability, accessibility)
- Difficulties, limitations, challenges and constraints related to the digital interface of the service:
 - hardware;
 - software;
 - connectivity;
 - cyber security;
 - usability (ease of use, clear interface, easy to learn, workflow, logical and adequate to the process of use);
 - human computer interaction style (availability of instructions regarding the recommended order of actions);
 - feedback provided in accordance with user actions;
 - decision support;
 - adjustments for supporting vulnerable to exclusion target groups (older age, language barrier, lack of digital skills);
 - tolerance for errors;
 - interaction with service agents (convenient coordination interface, Intuitive within-application);
 - Biggest pain point related to the use of this service (uncertainty about obtaining the right services or about the quality of them, etc.)
- Other difficulties, limitations, challenges, and constraints

Questions for P3 for NON-USER

10. Self-use, assist other or group use

- Translation of question into local language**
- Do you use the digital services [the DMS/DDS indicated previously by interviewee OR the general digital services such as WhatsApp, Messenger, etc.] alone or with the help of others? Do you help others to use these digital services? Can you provide some examples?*

11. Perception of personal data privacy and security

- Translation of question into local language**
- Generally speaking, what is the type of data you consider most private and sensitive? Will you share it when using an online service (e.g. name, age, gender, etc.)? Why?*
- Translation of question into local language**
- What do you need to feel secure when using a digital service or installing an app on your device? (e.g. a clear consent form, the possibility of choosing which data want to share, security standard, etc.)*

12. Safety perception

- Translation of question into local language**
- Do you think there are any risks in the digital mobility services we discussed before?*

13. Perception of the service's resilience to crisis like Covid-19

- Translation of question into local language**
- Do you think that a digital service like the DMS/DDS/smart and inclusive traffic lights would have been a good solution to solve your (or others') mobility/delivery problems during the Coronavirus crisis? Why?*

Data of the interviewee.

Interview done with (the pilot's specific profile characteristics):

On demand ride sharing users

- Care-takers of children/ impaired/ elders
- Gender: women
- Lack of services (reduced mobility)
- Lack of digital skills (although owning a mobile phone)
- Residing in peripheral locations

For the interviewee please specify:

Name / fictional name				
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	Nationality
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate			
Current socio-professional category	Worker <input type="checkbox"/> +35 hours <input type="checkbox"/> 25-34 hours <input type="checkbox"/> <24 hours - Student <input type="checkbox"/> full time <input type="checkbox"/> part time (<50% of time) <input type="checkbox"/> Unemployed - <input type="checkbox"/> Retired - <input type="checkbox"/> Other _____			
Current residence	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city <input type="checkbox"/> Other _____	Duration of current res.	<input type="checkbox"/> <1 year <input type="checkbox"/> 1-5 years <input type="checkbox"/> 6-10 years <input type="checkbox"/> >10 years	

Total duration (minutes)

Final interviewer comments:

Stakeholder interview debriefing template (Pilot 5 Berlin)

Interviewer	
Media of interview	<input type="checkbox"/> online via _____ <input type="checkbox"/> in person <input type="checkbox"/> by phone

Date	
Recorded?	<input type="checkbox"/> No <input type="checkbox"/> Yes

Introduction to the interview.

1 – The interviewer shortly introduces her/himself

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socio-economic barriers. To make it possible, the project partners need to know the users of these services, especially the ones who has specific needs to be taken into consideration. That's why this interview with you it is very important for us and for our project.

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- *your needs concerning how you move for your activities or how goods are delivered to you*
- *your difficulties when using a digital service with your smartphone*
- *your concerns about safety, security, the effectiveness, or the quality of the services obtained by these kind of Digital Mobility Solutions*

[3.2] explains how the interview will be carried out

The interview will consist of a set of open questions that will guide an open discussion about some topics concerning digital mobility services. The interview will last for about 1.5 hours.

[3.3] if it is not done before the interview, by email, describe the informed consent form (ICF). Read with the interviewee the main content of privacy issues (i.e. anonymization of information collected, how the information will be treated and stored, etc.). In this phase it is necessary to ask the interviewee if he/she agrees to audio recording of interview, specifying that the information collected may be published in project reports, journal articles, conference presentations, etc. while protecting the participants' anonymity.

Informed consent form needs to be signed before starting the interview.

All information collected in the interview will be anonymised to protect your privacy and for this reason:

- *here is the ICF that you already signed [OR]*
- *I need you to carefully read and sign this ICF*

I kindly ask you to audio record our interview to better analyse the data. The audio recorded interview will be stored in a secure repository according to GDPR regulation and INDIMO Data Management plan (INDIMO D 6.1).

D3.4: Present the ambition of your pilot in order to give the stakeholder a concrete idea about what the INDIMO pilot is about and how the interview with her/him is relevant for the pilot and the project.

Interview questions.

Please, include notes concerning how the interview has been carried out, pointing out difficulties, misunderstanding, notes “on the margins”...

Questions <u>Berlin stakeholder</u>	
1. Goals/ Ziele	
<input type="checkbox"/>	1. Question in English language
<input type="checkbox"/>	Q1: <i>According to you, for which purpose(s)(elderly people and foreigners living in a rural community) could use the service (deliver/receive parcels, signed correspondence, payment)?</i>
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	Q1: <i>Nach Ihrer Meinung, für welchen Zweck könnte der Dienst von (benachteiligte Kategorie) genutzt werden, um eine Fahrt zu bestellen?</i>
2. Needs/Bedürfnisse	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	Q2: <i>Thinking about your experience and your daily basis activities, what are your mobility needs (e.g. ride sharing, crossing traffic lights)? Do the DMS service address your needs?</i>
<input type="checkbox"/>	Translation of question into local language
<input type="checkbox"/>	Q2: <i>Wie sollte der Dienst auf die Bedürfnisse von (benachteiligte Kategorie) eingehen, um eine Fahrt zu bestellen</i>
3. Workflow /Arbeitslauf	
<input type="checkbox"/>	Question in English language
<input type="checkbox"/>	Q3: <i>What procedure will elderly people and foreigners living in rural communities have to follow in order use the digital locker.Please describe it step-by-step</i>



Questions Berlin stakeholder

- Translation of question into local language**
- Q3:** *Welches Verfahren muss die (benachteiligte Kategorie) eingehalten werden, um eine Fahrt zu bestellen? Bitte beschreiben Sie das Verfahren Schritt für Schritt.*

4. Usability of the digital interface/Benutzerfreundlichkeit der digitalen Schnittstelle

- Question in English language**
- Q4:** *Which aspect/part of the digital interface of the proposed service will have to be particularly easy for elderly people and foreigners living in rural communities to use?*
- Q5:** *What kind of user support mechanisms should be provided by the service to elderly people and foreigners living in rural communities?*
- Q6:** *What are the main accessibility and inclusivity tools or improvements for specific elderly people and foreigners living in rural communities that the service should provide?*

- Translation of question in local language**
- Q4:** *Welcher Aspekt/Teil der digitalen Schnittstelle des vorgeschlagene Dienst muss für die (benachteiligte Kategorie) besonders einfach zu benutzen sein?*
- Q5:** *Welche Art von User-Support-Mechanismen sollte die Anwendung für (benachteiligte Kategorie) bereitstellen?*
- Q6:** *Welches sind die wichtigsten Zugänglichkeits- und Inklusionstools oder -verbesserungen für bestimmte (benachteiligte Kategorie), die der Dienst bieten sollte?*

5. Usability of the physical interface/ Benutzerfreundlichkeit der physische Schnittstelle

- Question in English language**

Sometimes digital mobility services have a physical dimension, for example in case of ordering a taxi via an app, the interaction with the driver is part of the physical experience of the service as there is a person-to-person interaction. We understand it thus a physical object that is used as part of the digital service or the involvement of humans in the service.

- Q7:** *Which aspects of the physical interface of the locker must be easy to use for vulnerable people?*

Questions Berlin stakeholder

- Q8:** *Will there be a need for interaction with service agents? If so, when do you think they'll need it? (Before, during, after) Should they be able to send feedback/ask questions? How to organise that interaction?*

Translation of question into local language

Manchmal haben digitale Mobilitätsdienste eine physische Dimension, z.B. im Falle der Bestellung eines Taxis über eine App, ist die Interaktion mit dem Fahrer Teil der physischen Erfahrung des Dienstes, da es eine Interaktion von Person zu Person gibt. Wir verstehen darunter ein physisches Objekt, das als Teil des digitalen Dienstes oder der Einbeziehung von Menschen in den Dienst verwendet wird.

- Q7:** *Welche Aspekte der physischen Schnittstelle müssen für benachteiligte Personen leicht zu benutzen sein?*

Q8: Wird eine Interaktion mit dem Fahrer erforderlich sein? Wenn ja, wann werden sie diese Ihrer Meinung nach benötigen? (Vorher, während, nachher) Soll der Fahrer in der Lage sein, Feedback/Fragen zu senden? Wie soll diese Interaktion organisiert werden?

- end, nachher) Soll der Fahrer in der Lage sein, Feedback/Fragen zu senden? Wie soll diese Interaktion organisiert werden?*

6. Skills and capabilities / Fähigkeiten und Kompetenzen

Question in English language

- Q9:** *What are the skills and knowledge that are needed by elderly people and foreigners living in rural communities to use this service?*

- Q10:** *In your opinion, which of the skills and knowledge are harder to achieve for elderly people and foreigners living in rural communities?*

Translation of question into local language

- Q9:** *Welche Fähigkeiten und Kenntnisse benötigt die (benachteiligte Kategorie) diesen Dienst zu nutzen?*

- Q10:** *Nach Ihrer Meinung, welche der Fähigkeiten und Kenntnisse sind schwieriger zu erreichen für (benachteiligte Kategorie)?*

7. Perception of use demands of the service / Wahrnehmung der Nutzungsanforderungen der Dienst

Question in English language

Questions Berlin stakeholder
 Q11: *With which service demands do you think (vulnerable category) will have most problems?*
 Q12: *What are the activities/interactions required by the service causing more issues to vulnerable users?*
 Translation of question into local language
 Q11: *Bei welchen Dienstleistungsanforderungen werden Ihrer Meinung nach (benachteiligte Kategorie) die meisten Probleme auftreten?*
 Q12: *Welche Aktivitäten/Interaktionen sind für die Dienstleistung erforderlich, die bei benachteiligten Nutzern mehr Probleme verursachen?*
8. Self use, assist, group use /Selbstnutzung, Assistenz, Gruppennutzung
 Question in English language:
 Q13: *Is support needed for a specific segment of (vulnerable category)? How can the assistance be best organised?*
 Translation of question into local language
Q13: *Ist Unterstützung für ein bestimmtes Segment von (benachteiligte Kategorie) erforderlich? Wie kann die Hilfe am besten organisiert werden?*
9. Perception of personal data privacy and security / Vertrauen, Schutz personenbezogener Daten und Informationssicherheit
 Question in English language:
 Q14: *Do elderly people and foreigners living in rural communities have specific concerns with sharing personal data to the service?*
 Q15: *What trust mechanisms should be in place on the service for elderly people and foreigners living in rural communities?*
 Q16: *What would be the major concerns of elderly people and foreigners living in rural communities with sharing personal data to the service?*
 Translation of question into local language
 Q14: *Haben die (benachteiligte Kategorie) besondere Sorgen gegen die Weitergabe persönlicher Daten an den Dienst?*
 Q15: *Welche Vertrauensmechanismen sollte es für den Dienst geben (benachteiligte Kategorie)?*
 Q16: *Was wären die Hauptanliegen von (benachteiligte Kategorie) bei der Weitergabe personenbezogener Daten an den Dienst?*
10. Difficulties, limitations, challenges and constraints / Schwierigkeiten, Einschränkungen, Herausforderungen und Zwäng
Question in English language


Questions Berlin stakeholder

Q17: *What will be the major constraints for elderly people and foreigners living in rural communities when using the service?*

Translation of question into local language

Q17: *Was werden die wichtigsten Einschränkungen für (benachteiligte Kategorie) bei der Nutzung des Dienstes sein?*

11. Attitudes, feelings/ Einstellung

Question in English language

Q18: *Do you think that elderly people and foreigners living in rural communities will stand positive towards the proposed service? If this is the case, on which aspects in particular are they having a positive stance? If this is not the case, why is this so?*

Translation of question into local language

Q18: *Glauben Sie, dass die (benachteiligte Kategorie) der vorgeschlagenen Dienstleistung positiv gegenüberstehen wird? Wenn dies der Fall ist, zu welchen Aspekten nehmen sie insbesondere eine positive Haltung ein? Wenn dies nicht der Fall ist, warum ist dies der Fall?*

12. Reliability and trust/ Verlässlichkeit und Vertrauen

Question in English

Q19: *Do you believe that the reliability of the information that vulnerable users obtain and the trustworthiness of the provider (keep promises, keep consumers' interests in mind) is important for (vulnerable category)? Why (not?)*

Question into local language:

Q19: *Sind Sie der Meinung, dass die Zuverlässigkeit der Informationen, die benachteiligte Nutzer erhalten, und die Vertrauenswürdigkeit des Anbieters (Versprechen einhalten, Verbraucherinteressen berücksichtigen) für (benachteiligte Kategorie) wichtig ist? Warum (nicht?)*

12. Perception of the service's resilience to crisis like Covid-19/ COVID-19

Question in English

Q20: *If there would be an outbreak of COVID in the future, how can the service be best prepared for guaranteeing a proper functioning and delivering services to elderly people and foreigners living in rural communities ?*

Question into local language

Questions Berlin stakeholder

Q20: Falls es in Zukunft zu einem Ausbruch von COVID-19 kommen sollte, wie kann der Dienst am besten darauf vorbereitet werden, ein ordnungsgemäßes Funktionieren zu gewährleisten und Dienstleistungen für (benachteiligte Kategorie) zu erbringen?

 13. T1.4: User group questions
 Question in English

Q21: Does this app/service answers to the needs of the groups you represent?

 Question in local language
 Question in English

Q21: Were user groups consulted during development or afterwards (co-creation)? How diverse was this user group? Did this information lead to any changes?

 Question in local language
 Question in English

Q22: Rate the services between 1 and 5, ranging from very bad to very good. What were the strong/weak points.

 Question in local language

Data of the interviewed stakeholder.

Interview done with (the pilot's specific profile characteristics):

Organisation:

For the interviewee please specify:

Name / fictional name	<input type="text"/>					
Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female	Age	<input type="text"/>	Nationality	<input type="text"/>
Level of education	<input type="checkbox"/> Elementary school <input type="checkbox"/> Secondary school <input type="checkbox"/> Higher education <input type="checkbox"/> University/Graduate <input type="checkbox"/> Post-Graduate					
Area of specialisation	<input type="text"/>					
Aim of organisation/area of activity	<input type="checkbox"/> Rural village <input type="checkbox"/> Small mid-size town <input type="checkbox"/> Large city		<input type="checkbox"/> Other _____			

Total duration (minutes)

Final interview

Annex A3: Characterization of pilots' interviewed persons

The following table describes the pilot's interviewed persons (including their anonymised ID).

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P1-NU-1	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Male	+75	Retired	University studies	Rural
P1-NU-2	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Female	66-75	Retired	Elementary school	Rural
P1-NU-3	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Female	+75	Retired	University studies	Rural
P1-NU-4	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Migrant	Non-user	Female	18-35	Unemployed	University studies	Rural
P1-NU-5	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Male	66-75	Retired	Secondary school	Rural



# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
		commerce in rural areas							
P1-NU-6	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Male	+75	Retired	University studies	Rural
P1-NU-7	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Migrant	Non-user	Female	18-35	Unemployed	Secondary school	Rural
P1-NU-8	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Migrant	Non-user	Female	36-45	Worker hours +35	High education	Rural
P1-NU-9	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people	Non-user	Female	75+	Retired	Elementary school	Rural
P1-NU-10	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Migrant	Non-user	Female	18-35	Unemployed	Secondary school	Rural
P1-ST-1	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people/Migrants	Stakeholder: Monghidoro Municipality	Female	46-55	n/a	University studies	Rural

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P1-ST-2	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people/Migrants	Stakeholder: LEPIDA	Female	n/a	n/a	n/a	From large cities to rural villages
P1-ST-3	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people/Migrants	Stakeholder: CMBO	Male	n/a	n/a	n/a	n/a
P1-ST-4	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people/Migrants	Stakeholder: Bocciofila	Female	n/a	n/a	n/a	n/a
P1-ST-5	Emilia Romagna	Digital technology enable commerce rural areas to e-in	Older people/Migrants	Stakeholder: AiBi	n/a	n/a	n/a	n/a	n/a
P2-NU-1	P2 Antwerp	Inclusive traffic lights	Reduced vision	Non-user	Male	36-45	Worker hours +35	University studies	Large city
P2-NU-2	P2 Antwerp	Inclusive traffic lights	Reduced mobility (manual wheelchair)	Non-user	Female	46-55	Worker hours 24-35	High education	Periurban
P2-NU-3	P2 Antwerp	Inclusive traffic lights	Reduced mobility (manual wheelchair)	Non-user	Female	36-45	Full student time	University education	Large city
P2-NU-4	P2 Antwerp	Inclusive traffic lights	Reduced vision	Non-user	Female	36-45	Worker hours +35	University studies	Large city
P2-NU-5	P2 Antwerp	Inclusive traffic lights	Reduced vision (bad sight, not blind)	Non-user	Female	36-45	Unemployed	University studies	Small Mid-size town

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P2-NU-6	P2 Antwerp	Inclusive traffic lights	Reduced vision (bad sight, not blind)	Non-user	Male	35-45	Worker +35 hours	University studies	Small Mid-size town
P2-NU-7	P2 Antwerp	Inclusive traffic lights	Reduced mobility (manual wheelchair)	Non-user	Female	18-35	Worker +35 hours	High education	Rural
P2-NU-8	P2 Antwerp	Inclusive traffic lights	Reduced mobility (electric wheelchair)	Non-user	Male	18-35	Unemployed	High education	Peri-urban
P2-NU-9	P2 Antwerp	Inclusive traffic lights	Reduced mobility (manual wheelchair)	Non-user	Male	46-55	Self-employed	University studies	Large city
P2-NU-10	P2 Antwerp	Inclusive traffic lights	Reduced mobility (manual wheelchair and assistance dog)	Non-user	Female	36-45	Worker +35 hours	University studies	Large city
P2-NU-11	P2 Antwerp	Inclusive traffic lights	Older people	Non-user	Female	66-75	Retired	High education	Large city
P2-ST-1	P2 Antwerp	Inclusive traffic lights	Reduced vision	Stakeholder: Light & Love	n/a	n/a	n/a	n/a	n/a
P2-ST-2	P2 Antwerp	Inclusive traffic lights	Reduced mobility	Stakeholder: KVG	n/a	n/a	n/a	n/a	n/a
P2-ST-3	P2 Antwerp	Inclusive traffic lights	Older people	Stakeholder: Ludo Geukens from VIEF	Male	66-75	Retired	Secondary school	n/a
P2-ST-4	P2 Antwerp	Inclusive traffic lights	Reduced mobility	Stakeholder: FVG	n/a	n/a	n/a	n/a	n/a
P2-ST-5	P2 Antwerp	Inclusive traffic lights	Older people	Stakeholder: Vlaamse Ouderenraad (Flemish Elderly Council)	n/a	n/a	n/a	n/a	n/a

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P3-U-1	Galilee ³	Informal ride-sharing in ethnic towns	Women Ethnic minority	User	Female	36-45	Worker hours +35	Post-graduate	Large city
P3-U-2	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	User	Female	66-75	Retired	High education	Large city
P3-U-3	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	User	Female	18-35	Worker hours +35	Univeristy studies	Large city
P3-U-4	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	User	Female	46-55	Worker hours +35	Post-graduate	Large city
P3-NU-1	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Unemployed	University	Rural
P3-NU-2	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Worker hours +35	Post-graduate	Rural
P3-NU-3	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	56-65	Retired	Post-graduate	Rural
P3-NU-4	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Unemployed	University studies	Large city
P3-NU-5	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Worker hours +35	University studies	Large city

³ The Arab women interviewed live in the geographical periphery of Israel's main metropolitans (e.g. Tel Aviv, Haifa, Jerusalem). These residing communities can be categorized as rural villages, small mid-size and large cities as well.

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P3-NU-6	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	46-55	Unemployed	University studies	Large city
P3-NU-7	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Worker +35 hours	University studies	Small Mid-size town
P3-NU-8	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Worker +35 hours	University studies	Small Mid-size town
P3-NU-9	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	18-35	Unemployed	University studies	Large city
P3-NU-10	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	Non-user	Female	56-65	Retired	High education	Rural
P3-U-5	Galilee	Informal ride-sharing in ethnic towns	Women Ethnic minority	User	Female		Worker +35 hours	Post-graduate	Small Mid-size town
P3-ST-1	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	Stakeholder: Anat Bonstien - Prime Minister Office - Smart Mobility Initiative	Female	36-45	Employed (Smart mobility)	Post-graduate	Rural
P3-ST-2	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	Stakeholder: Shay Shofer Chief Scientist Israel Ministry of Transport	Male	46-55	Employed (Advanced Driver Assistant System, physics)	Post-graduate	State wide
P3-ST-3	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	Stakeholder: Ramy Troty Ad & Marketing Company. Was	Male	36-45	Employed (International Marketing and Advertisement)	University studies	Large city

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
				involved in Launch of App					
P3-ST-4	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	Stakeholder: Robert Ishaq Transport Planner. Involved in App development	Male	46-55	Employed (Transport planning)	Post-graduate	Large city
P3-ST-5	Galilee	Informal ride-sharing in ethnic towns	Informal ride-sharing users	Stakeholder: Hajar Abu Salih from Kayan. Feminist Arab Women	Female	18-35	Employed (Social work, Arab women in Israel)	University studies	Rural
P4-U -1	Madrid	Cycle logistics platform for delivery	Low income Socially isolated COVID isolated	User	Male	18-35	Worker between 24 and 35 hours	University studies	Large city
P4-U -2	Madrid	Cycle logistics platform for delivery	Low income Socially isolated COVID isolated	User	Male	18-35	Worker +35 hours	University studies	Large city
P4-U -3	Madrid	Cycle logistics platform for delivery	Low income Women COVID isolated	User	Female	18-35	Unemployed	Post-graduate	Large city
P4-U -4	Madrid	Cycle logistics platform for delivery	Women Not-connected COVID isolated	User	Female	36-45	Self-employed	University studies	Large city
P4-U -5	Madrid	Cycle logistics platform for delivery	Women Low income Migrant	User	Female	18-35	Self-employed	Post-graduate	Large city
P4-U -6	Madrid	Cycle logistics platform for delivery	Old Not-connected Low income	User	Male	46-55	Worker +35 hours	University studies	Large city
P4-NU -1	Madrid	Cycle logistics platform for delivery	Permanently impaired Low income COVID isolated	Non-user	Male	56-65	Retired	High education	Rural

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P4-NU -2	Madrid	Cycle logistics platform for delivery	Permanently impaired Low income COVID isolated	Non-user	Male	36-45	Worker +35 hours	High education	Large city
P4-NU -3	Madrid	Cycle logistics platform for delivery	Socially isolated Non-connected Low income	Non-user	Female	66-75	Retired	High education	Large city
P4-NU -4	Madrid	Cycle logistics platform for delivery	Permanently impaired Low income Not-connected	Non-user	Female	36-45	Unemployed	University studies	Large city
P4-NU -5	Madrid	Cycle logistics platform for delivery	Permanently impaired Socially isolated Not-connected	Non-user	Female	56-65	Retired	High education	Large city
P4-NU -6	Madrid	Cycle logistics platform for delivery	Low income COVID isolated	Non-user	Female	18-35	Worker +35 hours	Post-graduate	Large city
P4-ST-1	Madrid	Cycle logistics platform for delivery	Not-connected people	Stakeholder: Nuria Sánchez from Andaira Coop.	Female	36-45	n/a	Post-graduate	Large city
P4-ST-2	Madrid	Cycle logistics platform for delivery	Reduced mobility (cognitive impairment)	Stakeholder: Samuel Aporta from ASINDOWN- "with Mobility disability"	Male	36-45	n/a	Post-graduate	Large city
P4-ST-3	Madrid	Cycle logistics platform for delivery	Reduced mobility (cognitive impairment)	Stakeholder: María Luisa Jiménez from Down Madrid	Female	56-65	n/a	University studies	Large city
P4-ST-4	Madrid	Cycle logistics platform for delivery	Reduced vision	Stakeholder: Concepción Blocona Santos from ONCE	Female	56-65	n/a	University studies	Large city

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P4-ST-5	Madrid	Cycle logistics platform for delivery	Low income	Stakeholder: Victor Rodríguez Pelarda from Caritas	Female	56-65	n/a	University studies	Large city
P4-ST-6	Madrid	Cycle logistics platform for delivery	All impairments	Stakeholder: David Zanoletty from Once Foundation	Male	46-55	n/a	University studies	Large city
P5-U -1	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Lack of services Residing in peripheral locations	User	Female	18-35	Other: maternity leave	University studies	Peri-urban
P5-U -2	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Lack of services	User	Female	18-35	Other: maternity leave	University studies	Large city
P5-U -3	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Lack of services Residing in peripheral locations	User	Female	Unkn wn	Other: maternity leave	University studies	Rural

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P5-NU -1	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Lack of digital skills Residing in peripheral locations	Non-user	Female	36-45	Work hours 25-34	University studies	Peri-urban
P5-NU -2	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Residing in peripheral locations	Non-user	Female	36-45	Other: maternity leave	University studies	Peri-urban
P5-NU -3	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Residing in peripheral locations	Non-user	Female	36-45	Unemployed	University studies	Peri-urban
P5-NU -4	Berlin	On-demand ride-sharing integrated into	Care-givers of children/ impaired/ older people	Non-user	Female	18-35	Worker hours 25-34	University studies	Peri-urban

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
		multimodal route planning	Women						
P5-NU -5	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women	Non-user	Female	18-35	Worker hours +35	University studies	Peri-urban
P5-NU -6	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women Lack of digital skills Residing in peripheral locations	Non-user	Female	36-45	Unemployed	University studies	Peri-urban
P5-NU -7	Berlin	On-demand ride-sharing integrated into multimodal route planning	Care-givers of children/ impaired/ older people Women	Non-user	Female	36-45	Worker hours +35	High education	Unknown
P5-ST-1	Berlin	On-demand ride-sharing integrated into multimodal route planning	Gender: women	Stakeholder: Katja Diehl from door2door/She drives mobility	Female	n/a	Employed (Mobiity for Women)	Post-graduate	n/a
P5-ST-2	Berlin	On-demand ride-sharing integrated into multimodal route planning	On demand ride-sharing users. Gender: women	Stakeholder: Friedda Bellmann From Vorn	Female	n/a	Employed (Human-centered design)	Post-graduate	n/a

# ID	Pilot Project Owner	Pilot Name	INDIMO profile	Category	Gender	Age	Socio professional category	Education level	Residence
P5-ST-3	Berlin	On-demand ride-sharing integrated into multimodal route planning	On demand ride-sharing users. Gender: women	Stakeholder: Nadja Berseck From Radbahn	Female	18-35	Employed (Mobility Expert Focused on User-Centered Research)	Post-graduate	n/a
P5-ST-4	Berlin	On-demand ride-sharing integrated into multimodal route planning	On demand ride-sharing users. Gender: women	Stakeholder: Lieke Ypma From HelloImpact	Female	n/a	Employed (design engineering, user-centered strategist)	Post-graduate	n/a
P5-ST-5	Berlin	On-demand ride-sharing integrated into multimodal route planning	On demand ride-sharing users. Gender: women	Stakeholder: Ana Lucia Camacho - Women mobility expert - TU Berlin	Female	18-35	Employed (Transport planning/ mobility of women and unpaid workers)	Post-graduate	Peri-urban
MBE-NU-i11	Budapest	n/a	Care-giver for reduced mobility/vision	Non-user	Female	50-60	n/a	Secondary school	Large city
MBE-NU-i15	Budapest	n/a	Reduced mobility	Non-user	Female	66-75	Worker less 24 hours	Higher education	Large city
MBE-NU-i32	Budapest	n/a	Reduced vision	Non-user	Male	60-70	Worker less 24 hours	University graduate	Large city
MBE-U-i12	Budapest	n/a	Care-giver for reduced mobility/vision	User	Female	36-45	Worker more 35 hours	Secondary school	Large city
MBE-U-i13	Budapest	n/a	Reduced mobility	User	Female	46-55	Unemployed	Secondary school	Large city
MBE-U-i14	Budapest	n/a	Reduced mobility	User	Male	66-75	Worker less 24 hours	Secondary school	Large city
MBE-U-i21	Budapest	n/a	Reduced vision	User	Female	36-45	Worker more 35 hours	Higher education	Large city

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MBE-U-i22	Budapest	n/a	Reduced vision	User	Male	36-45	Worker less 24 hours	Secondary school	Large city
MBE-U-i23	Budapest	n/a	Reduced vision	User	Female	18-35	Worker 25-34 hours	Higher education	Large city
MBE-U-i24	Budapest	n/a	Reduced vision	User	Male	36-45	n/a	n/a	n/a
MBE-U-i25	Budapest	n/a	Care-giver for reduced mobility/vision	User	Female	36-45	Worker 25-34 hours	Secondary school	Small/mid-sized town
MBE-U-i31	Budapest	n/a	Care-giver for reduced mobility/vision	User	Female	n/a	n/a	n/a	n/a