Mobility as a Service in a multimodal European cross-border **Corridor** (**MyCorridor**)

Deliverable D6.2:
Pilot results consolidation

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Abbreviation List

Abbreviation	Definition
cr	confirmation rate
.csv	comma-separated values
.xlsx	Excel Spreadsheet XML
API	Application Programming Interface
AT	Austria
CZ	Czech Republic
EU	European Union
FCD	Floating Car Data
GPS	Global Positioning System
GR	Greece
iOS	Internetwork Operating System
IT	Italy
ITS	Intelligent Transportation System
JSON	JavaScript Object Notation
km	kilometres
LTZ	Limited traffic zone
MaaS	Mobility as a Service
NL	Netherlands
NS	Nederlandse Spoorwegen
OWL	Web Ontology Language
RDW	Rijks Dienst Wegverkeer
SUS	System usability score
SVV	Salzburger Verkehrsverbund
TLA	Traffic Light Assist
TM	Traffic Management
TM	Traffic Management
TMC	Traffic Management Centre
ÖBB	Österreichische Bundesbahnen
UI	User Interface
VAO	Verkehrsauskunft Österreich
WP	Work Package

Executive Summary

The aim of this Deliverable is to present the results of the iterative and multi-faceted evaluation process of the Service Registration Tool and the MyCorridor application that has been conducted with service providers and travellers in the two evaluation rounds in five sites across Europe that were held in the project. In **Chapter 1** the purpose of the document, the intended audience, the interrelations with other work packages and stakeholders in the MaaS ecosystem and the objectives of the evaluation activities are presented.

Chapter 2 introduces the methods that were applied for the evaluation of the developed app and the participants that took part in this evaluation process. Further, the research questions, i.e., the hypotheses that were defined in Deliverable 6.1 (evaluation framework and experimental plans) are repeated here for ease of reference and to provide a complete picture. An overview of the used instruments follows along with the collected data per pilot site on travellers and service providers. As an introduction to the statistical analyses, the process of data preparation is explained, as that was necessary pre-work for the subsequent analysis. A core part of the evaluations were the conducted statistical analyses, based on the questionnaire and interview results from travellers and service providers in both pilot rounds. The framework conditions of the applied statistical analyses are presented in this Chapter, which concludes with the limitations of the studies that were identified in the conduction of the two iteration phases.

A brief overview of the pilot sites is provided in **Chapter 3**. The recruitment, engagement and incentivisation methods are described in **Chapter 4**. The focus of these two chapters is on the presentation of the actual implementation in the five pilot sites (Austria, Czech Republic, Greece, Italy, and the Netherlands).

In **Chapter 5** the results from the first lab-based evaluation phase (141 users in total consisting of 5 service providers, 17 stakeholders and 119 travellers in co-design sessions) are presented. It starts with a presentation of the results from the traveller questionnaires (moderated and controlled user testing) and is followed by the service provider (unmoderated, remote and contextual user testing) results. Subsequently, the hypotheses for the travellers and service providers are answered. Finally, results-derived recommendations are presented that were utilised and contributed to an improved version of the app and the service registration tool in the second pilot round. Analogous to the previous chapter, **Chapter 6** then presents the results of the second iteration (206 users in total consisting of 15 service providers, 166 travellers, and 25 attendees in the focus groups). In **Chapter 7**, the key results of these two iteration phases are highlighted in a concise way (aggregating the feedback of 347 users in total).

Chapter 8 gives an overview of the strength and weaknesses of the five pilot sites and recommendations for further improvements. Furthermore, the operational features homogeneity, the integration quality of the services and the interoperability and data interfaces are presented.

The deliverable concludes with **Chapter 9** with the lessons learnt from the conduction of those two evaluations phases and presents recommendations for further improvements from the traveller's point of view, for the analysis of MaaS data and finally addresses MyCorridor's role in maximizing MaaS adaption and policy making.

In the **Annex** the plots from all the statistical evaluations for the first and second evaluation period for travellers and service providers are displayed along in-depth analyses of the user feedback collected through the MyCorridor Feedback Tool. The Annex also includes the Android and iOS user manuals that were created for the participants.

One of the key challenges in the conduction of the second pilot evaluation phase was the Covid-19 pandemic that in turn created a delay and postponement in the analysis and consequently also in the analysis of the results. Consequently, there was also a delay in the finalisation of this Deliverable.

1 Introduction

In the MyCorridor project two iterative and multi-faceted evaluation phases were conducted. The main target groups of the evaluation process were clustered around two major user clusters: service providers and travellers.

The first iteration phase with travellers took place in spring 2019 in a lab-based setting and had the objective to test: a) the functionalities of MyCorridor front-end & back-end modules and b) the User Interface (UI) and key functionalities aspects along with the information architecture of the travellers' preference menu. The second iteration had the aim to test the MyCorridor app in a semi real-world setting, to demonstrate the functionality of the optimised MyCorridor front-end & back-end modules, the benefits arising the attraction of external service providers. From the user perspective, the 2nd iteration' aim was to test the usability and acceptance aspects of the app with a special focus on personalisation, gathering further insight about MaaS paradigm overall for further consideration beyond the project and its concrete outcomes.

The aim of the service provide evaluation was to test the Service Registration Tool that has been developed within the project. In the first iteration phase the integration of five internal services took place, in the second iteration a total of 15 services has been integrated.

In both iteration phases, a lot of data was collected from the travellers and the service providers to evaluate the developed MyCorridor app and to be able to draw conclusions and recommendations for further research projects and activities in the MaaS ecosystem. The presentation of the extensive and diverse results is at the core of this Deliverable. The number of users participating in the various evaluation activities is shown below:

1st phase
Overall, 5 service providers in first and second phase, 17 stakeholders and travellers in the co-design sessions, 119 users in the usability sessions in the first phase ($N_{Total\ (1st\ phase)}$ = 141).
2nd phase
15 service providers in the second phase, 166 travellers, 25 attendees in travellers focus groups ($N_{Total\ (2nd\ phase)}$ = 206). The stakeholder focus groups are discussed and presented in D6.3 and are not considered in D6.2.
In total, 347 people participated in the user experience activities of MyCorridor.
The 166 travellers in the 2nd phase conducted a total of 934 trips with the MyCorridor app.

1.1 Purpose of the document

This Deliverable (D6.2) presents the results of the two conducted pilot iterations for travellers and service providers, including the results of various questionnaires that have been used to gather extensive information, of the conducted traveller focus groups in the pilot sites, mobile analytic results coming from the logged data of the MyCorridor App use and feedback from the traveller feedback module. A second aim is to answer to the hypotheses that were defined in D6.1. The final part comprises harmonised results, the lessons learnt and recommendations for further improvements from a traveller's point of view and for analysing MaaS data and furthermore, the role of MyCorridor in maximising MaaS adoption and policy making.

1.2 Intended audience

This document is used to present the evaluation activities of the two evaluation phases with travellers and service providers within the MyCorridor project. It is intended to be used by all

MyCorridor partners so that they can see what their work has led to and what results have been achieved during the course of the MyCorridor project.

This is a public document. As such, it is of potential interest to all MaaS stakeholders (researchers, end-users, service providers, aggregators, policy makers, authorities and deployers) looking to exploit or deploy MaaS and MyCorridor-like schemes and solutions or to conduct further research in this domain.

1.3 Key interrelations and document structure

Within the two pilot phases, the different components of the MyCorridor app developed in some of the other WPs were tested:

- the Service Registration Tool that was developed within WP3;
- the testing scenarios per pilot site included the services registered as part of WP4;
- the MyCorridor mobile application and user interfaces (UIs) that were developed within WP5 (in Android and iOS operating systems);
- incentives and payment strategies proposed within WP7;

In addition, the results are based on the pilot site plans developed in A6.1 and described in the associated Deliverable D6.1 and its subsequent update (it includes refined plans for the conduction of the second phase). The pilots were implemented in A6.2, the results of which are now described in this Deliverable. Furthermore, impacts are also assessed on the basis of these results, which are assessed in A6.4 and presented in D6.3.

1.4 Objectives

The overall objectives of the two iteration phases were the following:

- To collect pilot data through specifically designed tools (objective & subjective), that will be statistically as well as in-depth processed and consolidated across MyCorridor sites;
- To plan and execute the evaluation of the MyCorridor system with developers/service providers and all types of travellers in two iteration rounds.

Specific objectives of task A6.3 were the following:

- Provide insights in the conduction of the two iteration phases for all pilot sites, including the implementation, the strength and weaknesses and the lessons learnt;
- Get feedback from the usability sessions of the first evaluation round for an optimisation and further improvement of the application for the second iteration;
- Conduct statistical evaluations of the questionnaire results from travellers and service providers for the first and second pilot iteration in order to provide key performance indexes;
- Answer the hypotheses based on those results;
- Analyse the results from the user focus groups, the in-depth user diaries and the feedback tool from the second pilot round;
- Consolidation and harmonisation of the pilot site results;
- Provide key results for both pilot iteration phases;
- Review of the operations discipline of each pilot in relation to proposal framework in order to insure harmonised operation on the following three levels: operational features homogeneity, services homogeneity, integration quality, interoperability;
- Summarise lessons learnt from the conduction of the two evaluation rounds with travellers and service providers and provide recommendations for further improvements;

- Describe MyCorridor's role in maximizing MaaS adoption and policy making with focus on the travellers' perspective.

2 Description of applied methodology

2.1 Design

The evaluation framework was firstly founded on four facets: **a) co-design sessions with stakeholders** (i.e. the workshop held in Rome early in the life of the project) and two **participatory sessions with travellers** held in Greece during the first 18 months of the project to facilitate the design and information architecture of the MyCorridor mobile app, **b) controlled and moderated usability testing with travellers** and **unmoderated remote testing with service providers**, and **c) final semi-real user experience phase** conducted with users taking real trips, **d) virtual focus groups** conducted at each pilot site with **stakeholders** (the results are presented and discussed in D6.3, as they serve the objectives of the impact assessment and **travellers** (presented in section 6.1.7).

The evaluation framework was secondly conducted in three dimensions: **a) use of the MyCorridor mobile app** (Android and iOS) by travellers, **b) use of the Service Registration Tool (SRT)** by service providers, and **c) utilisation of the MyCorridor platform** (i.e. use of the MyCorridor app, the SRT, the backend mechanism and ecosystem (i.e., the platform with its content/ services and its population of main actors), and active involvement of stakeholders (e.g., governmental agencies, urban planners, service aggregators, public and private transportation organisations and companies, policy and insurance agencies, data controllers, etc.).

The evaluation framework along with the Key Performance Indicators (KPIs) as well as the hypotheses and the respective plans are discussed in-depth in D6.1 and its subsequent update.

2.2 Participants

This section provides an overview of the demographic and socio-economic characteristics of the participants on country level and across all pilot countries, respectively for the first and second pilot iteration for travellers and service providers.

2.2.1 Demographics and background information of travellers from the 1st iteration phase

Figure 20 illustrates the distribution of gender in the survey. We find that Austria, Greece and Italy have a balanced gender ratio, whereas the Czech Republic and the Netherlands have a much higher proportion of male. Overall, we find that 60% of all participants are male, compared to 40% of female participants.

Figure 21 shows the educational attainment of the respondents. We find that among all respondents, 73% have a higher education, 23% have a secondary education and 4% are classified as other education. In contrast, according to Eurostat (2020a)[1], 27.1% of 15 to 64 years old have a higher and 46.5% a secondary education among the EU-27 in 2018. Therefore, the sample is not representative for the average user in terms of education. In terms of education, the sample represents rather early

[1] Source: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=EDAT_LFS_9903&lang=en

technology users. These users are characterised by the fact that they tend to use the latest technologies or product variants compared to the rest of society (Rogers, 1962).[2]

The living situation of the respondents is illustrated in Figure 22. Across all countries, the majority of respondents (44%) live with a spouse or partner, 27% with family or friend and 28% in single households. This value is similar to the data provided by Eurostat (2020b)[3], which show that 33.2% of the people in the EU-27 live alone in 2018. However, the results vary among countries and show no homogenous picture. In Austria for example 60% of the respondents live alone, whereas in the Czech Republic 84% live with a spouse or partner. Therefore, we see that the respondents in the respective countries were not selected representatively to the EU -27 Eurostat picture. However, we have to keep in mind that this picture is not representative of each country.

Figure 23 shows the income situation of the respondents. The values show the combined household income before transfers and taxes. We find that about one third have a household income between 20,000 and 49,999€. Moreover, 18% have an income below 20,000€ and 11% above 49,999€. However, 29% refused to answer this question and 6% did not know. Interestingly, in the Czech Republic all respondents refused to answer this question. Greece shows the lowest income of all countries, whereas Austria, Italy and the Netherlands show a similar picture of their income situation. It should be noted, however, that incomes are not adjusted to the purchasing power of the individual countries and the results are therefore not clearly comparable.

Figure 24 shows that all of the respondents, except one person in Greece, have more than 5 years of experience with PCs. Thus, we find that computer literacy is at a high level for 99% of the respondents.

Figure 25 illustrates the age distribution of the respondents per country. The Netherlands have no middle-aged respondents between 35 and 55 years old. Moreover, the respondents in Austria tend to be younger compared to the other countries. However, in total we find a left-centred distribution of age.

Figure 26 shows the primarily used devices of the respondents. Overall, more than two third of the respondents use an Android operating system, 25% use an iOS and 5% use a Windows operating system.

In summary, the sample of respondents has a higher proportion of men than the total population. Moreover, persons with higher education are overrepresented in the sample. Furthermore, 99% of all respondents have more than 5 years of experience with PCs. In addition, the sample has a median age of 32 years, which is quite young as the median age in the EU in 2018 is 43.1 years according to Eurostat (2020c).[4]

2.2.2 Demographics and background information of travellers from the 2nd iteration phase

This subsection provides an overview of the demographic and socio-economic characteristics of the participants from the pilot round 2 across all countries, and respectively for the mainstream users and the in-depth users.

Figure 181 illustrates the distribution of users among the different countries participating at pilot round 2, with a prevalence of overall users in Austria (32%) and Greece (30%).

[2] Rogers, Everett M. (1962). Diffusion of Innovations. Free Press of Glencoe, Macmillan Company.
[3] Source: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_lvph02&lang=en
[4] Source: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_pjanind

Figure 182 illustrates the distribution of gender in the survey. We find that the gender ratio is quite the same in both mainstream users and in-depth users. Overall, we find that 72% of all participants are male, compared to 24% of female participants.

Figure 183 illustrates the age distribution of users. Mainstream users have a wider and more symmetrical distribution, with the 36-45 category being the most common, while deep users have an asymmetrical distribution with only 3 age categories represented and the 26-35 category being the most common. Overall, we find a left-centred distribution of age.

Figure 184 shows the educational attainment of the respondents. We find that overall, 81% have a higher education (higher than secondary and postgraduate), 18% have a secondary education and 3% elementary education. We find similar distributions if we analyse the data for mainstream users and in-depth users.

Figure 185 illustrates the living situation of the users. Overall, the majority of users (67%) live with a spouse or partner (39% with kids), 13% with family or friend and 12% in single households. While mainstream users have a similar distribution, this varies when looking at in-depth users, where a larger proportion live in single households (23%) compared to living with family or friends (5%).

Figure 186 shows the number of cars per household. Overall, 87% of users have at least one car per household, and only 13% of the users do not have a car. All in-depth users have at least one car.

In summary, the sample of users has a high proportion of men and people with higher education continue to be overrepresented in the pilot round 2 sample. Furthermore, the sample still has a younger average age than the EU in 2018.

2.2.3 Demographics and background information of service providers from both iteration phases

The following subsection provides information about the socio-economic and demographic characteristics of the service providers of the first and second pilot site. A total of 5 experts (all internal to the project) participated in the first round and 15 experts in the second round (14 external service providers, 1 internal service provider). Figure 27 shows that in the first round there was exactly one person per country. Figure 187 illustrates that in the second round, Greece has the highest number with 6, followed by Austria with 4, the Czech Republic with 3 and Italy and the Netherlands with 1 person each. Interestingly, Figure 28 shows that in the first round 100% of the respondents were male. In the second round, Figure 188 illustrates that 80% were male while there were only 6.7% female participants. However, 13.3% preferred not to state their gender in the second round. Furthermore, Figure 29 and Figure 189 indicate that the average age among the respondents is around 45 years in both rounds, which probably means that our sample comprises experienced senior employees.

In terms of technical skills, in the first round, Figure 30 shows that two respondents have no programming experience, while one respondent has more than 10 years of experience and two respondents have less than 5 years of experience. In the second round, Figure 190 illustrates that 46.6% of the respondents have no programming experience, while 40% have more than 10 years of experience and 6.7% have between 5 and 10 years or less than 5 years of experience.

Interestingly, we find several areas of expertise among the respondents. In the first round, Figure 31 indicates the respondents work in sales, traffic management, data analysis, accounting and transport engineering. In the second round, Figure 191 shows that respondents work mainly in IT (40%), followed by mobility (33.3%), public administration (13.3%), finance and sales (6.7% each).

In summary, it can be said that among the service providers, men are overrepresented in the sample. The average age is around 45 years and there are respondents from different disciplines and with and without programming skills in the sample.

2.3 Research questions

In the following section the research questions and the hypotheses that were initially presented in D6.1 (see D6.1, section 3.2) are repeated for ease of reference. One of the main objectives of this deliverable is to provide answers to the research questions and hypotheses. Furthermore, section 2.4 provides an overview of the collected data per pilot site.

Theses hypotheses will be addressed in the first and second evaluation phases with travellers and service providers. For each hypothesis the success criterion and measurement indicators are noted.

Hypotheses for the traveller evaluation

1. The MyCorridor platform is easy to use.
    a. Ease of use measured at the end of each completed scenario and overall usability scale (> 60% for the 1st iteration and > 70% for the 2nd phase).
2. The MyCorridor platform is useful (i.e., useful because they will save time and effort in travel planning).
    a. Usefulness measured at the end of each completed scenario and overall usability scale (> 60% for the 1st iteration, not evaluated in the 2nd phase).
3. The MyCorridor platform is usable
    a. The MyCorridor platform is highly usable (> 55% in the 1st phase and > 70% in the 2nd phase).
4. The travellers are successful in completing the scenarios per storyboard and user group.
    a. Success ratio in scenario completion (> 60% in the 1st phase and > 70% in the 2nd phase).
    b. Error percentage (< 5% in the 1st phase and < 2% in the 2nd phase).
    c. Issues encountered but not being easily resolved with the development team (less than 5 major and 7 minor in the 1st phase and less than 3 major and 5 minor in the 2nd phase).
5. Personalisation of offered services is effective (> 75% in the 1st phase and > 85% in the 2nd phase).
    a. Effectiveness
    b. Efficiency
    c. Highly tailored to their needs
6. Travellers are positive towards MaaS technologies (> 60% in the 1st phase and > 75% in the 2nd phase).
    a. Acceptance increases totally from baseline and 1st phase by 10%

b. Attitude towards MaaS technologies is positive

Hypotheses for the service provider evaluation

1. The Service Registration Tool is easy to use.
    a. Ease-of-use measured at the end of each completed scenario and overall usability scale (> 60% for the 1st iteration and > 70% for the 2nd phase).
2. The Service Registration Tool is useful.
    a. Usefulness measured at the end of each completed scenario and overall usability scale (> 60% for the 1st iteration and > 70% for the 2nd phase).
3. The service registration tool is usable (> 55 points in the 1st phase and > 70 points in the 2nd phase).
    a. The Service Registration Tool is highly usable.
4. The service providers are successful in completing the registration process.
    a. Success ratio in scenario completion (> 60% in the 1st phase and > 70% in the 2nd phase).
    b. Failure ratio in scenario completion (< 10% in the 1st phase and < 5% in the 2nd phase).
    c. Error percentage (< 5% in the 1st phase and < 2% in the 2nd phase).
    d. Issues encountered but not resolved with the development team (less than 5 major and 7 minor in the 1st phase and less than 3 major and 5 minor in the 2nd phase).

2.4 Instruments and collected data

2.4.1 Used instruments for the evaluations

The following table provides an overview of the instruments used in the implementation and conduction of the two pilot rounds as well as the main content that was covered using this instrument, the data collection method, which hardware and software were used, the formats in which the results are available as well as the software programme used for the evaluations. Extensive information with detailed descriptions of the instruments can be found in Deliverable 6.1.

Table 1: Overview of instruments used in the implementation and conduction of the two pilot rounds in all pilot sites

Instrument	Main content	Data collection method and software used	Hardware used	Format of evaluations	Software used for the evaluations
Service providers (1st and 2nd round)					
Baseline interview	- background information - previous experience / current	Questionnaire as google docs	--	.xlsx or .csv files	Statistics software R

Instrument	Main content	Data collection method and software used	Hardware used	Format of evaluations	Software used for the evaluations
	behaviour - constraints / cost / value - risk / impact				
Service Registration Tool and Post Questionnaire	- Service registration Tool use and performance - Use of supportive documentation - learnability - sustainability and maintainability - installability - changeability - effort - usability	Online service registration tool and questionnaires as google docs	--	.xlsx or .csv files	Statistics software R
Service provider diary	- Scenario completion - Usability problems - Usability problem severity level - Errors - Error severity level - Error nature - Suggestion for solutions - Duration of the session	Questionnaires in Excel	PC of the test persons	xlsx or .csv files	Statistics software R
Travellers (1st round)					
Baseline interview	- Background information - Mobility wants & needs - Online consumer experience - MaaS awareness - MyCorridor platform pre-acceptance	Questionnaire as print-out	--	.xlsx or .csv files	Statistics software R
Pre-testing questionnaire	- Background information - Computer literacy	Questionnaire as print-out	--	.xlsx or .csv files	Statistics software R

Instrument	Main content	Data collection method and software used	Hardware used	Format of evaluations	Software used for the evaluations
	- Online consumer attitude and behaviour - Online shopping needs and wishes - MaaS awareness - MyCorridor platform pre-acceptance				
Face-to-face usability sessions (lab-based tasting)	- Completion of three different scenarios using the MyCorridor App - Gathering of usability metrics like completion rates, usability problems, scenario completion time, scenario level satisfaction, errors, page views/clicks	Face-to-face interviews; MyCorridor App, video recordings, personal observations from the facilitator, Mobizen mirroring app	Smartphone (Android or iOS) of the participants, two cameras for the recordings, facilitator laptop, mobile testing sled	.xlsx or .csv files	Statistics software R
Post-scenario questionnaire	- Evaluation of the App - Interaction - Value - Usability - Acceptance	Questionnaire as a print-out	--	.xlsx or .csv files	Statistics software R
Post-testing questionnaire	-	Questionnaire as print-out	--	.xlsx or .csv files	Statistics software R
Facilitator diary (incl. post-evaluation)	- Emotion heuristics - Issues encountered - Observation notes from think aloud protocol - Scenario completion time - Score - Number of attempts	Questionnaire in Excel	PC of the facilitator	.xlsx or .csv files	Statistics software R

Instrument	Main content	Data collection method and software used	Hardware used	Format of evaluations	Software used for the evaluations
Travellers (2nd round)					
Pre-testing questionnaire for mainstream users	- Easiness to use the App - Usefulness of the App - Social desirability	Online Questionnaire in Typeform	Smartphone (Android or iOS) of the participants	.xlsx or .csv files	Statistics software R, Excel evaluations
Pre-testing questionnaire for in-depth users	- Easiness to use the App - Usefulness of the App - Social desirability	Online Questionnaire in Typeform	Smartphone (Android or iOS) of the participants	.xlsx or .csv files	Statistics software R, Excel evaluations
Post-testing questionnaire for mainstream users	- Attitude towards PT, sharing modes and general mind-sets - perceived accessibility to local transport - perceived accessibility to innovative mobility services - perceived overall trustworthiness, safety and security when using transport services	Online Questionnaire in Typeform	Smartphone (Android or iOS) of the participants	.xlsx or .csv files	Statistics software R, Excel evaluations
Post-testing questionnaire for in-depth users	- Attitude towards PT, sharing modes and general mind-sets - perceived accessibility to local transport - perceived accessibility to innovative mobility services - perceived overall trustworthiness, safety and security when	Online Questionnaire in Typeform	Smartphone (Android or iOS) of the participants	.xlsx or .csv files	Statistics software R, Excel evaluations

Instrument	Main content	Data collection method and software used	Hardware used	Format of evaluations	Software used for the evaluations
	using transport services				
Weekly diaries from in-depth users	- Trip information - Motivation for MyCorridor App use - Experiences - Satisfaction level with the App - Time of task completion	Questionnaire in Excel	PC of the participants	.xlsx or .csv files	Statistics software R
Real-world App Testing	- Different scenarios per pilot site	MyCorridor App	Smartphone (Android or iOS) of the participants	Logged data as .csv files	Statistics software R
Traveller focus group discussions					
Focus group discussion	- personalised travelling preferences - packages - behavioural change - learning curve	Open and closed-ended questions; Mentimeter[5]; online video communication tools (e.g., GoToMeeting, Zoom, etc.)	Smartphone (Android or iOS) of the participants	Qualitative/summaries prepared by pilot site leaders based on circulated template	Thematic analysis/ Word
User feedback					
Prompted questions while using the app	- Easiness to use - Satisfaction with the App - Level of happiness when using the App - Improvement of the traveller experience	Integrated traveller feedback module in the MyCorridor App	Smartphone of the participants	.xlsx or .csv files	Excel evaluations

2.4.2 Collected data from travellers

In the first iteration phase, a maximum of 25 travellers participated at each pilot site during a period of two months (April –May 2019) in the traveller evaluation. Background information of the identified users was collected before any testing took place, also with the consideration of their mobility patterns and choices. Users varied in age, type of user cluster, ICT literacy and education, occupational background, nationality, income and vehicle use.

The users were loosely matched to the testing scenarios with the sole aim to collect meaningful and appropriate data, aiming for users to fully realize the potential of the offered services through this

[5] *An interactive presentation tool that can be used to conduct live polls, see www.mentimeter.com*

single digital platform with diverse mobility choices (i.e., from daily travelling routines (commuter) to special occasions (tourists)).

The first round of testing was conducted with service providers and travellers from various groups (e.g., businesspersons, tourists, commuters, etc.) to ensure positive, comfortable, and convenient traveller experience and high usability of the MyCorridor platform.

Services and business providers had the opportunity to test and use our easy and quick integration process into the MyCorridor platform and be part of our community and growing ecosystem.

In the first iteration phase, the pilot site leaders were asked to carry out the following tasks in order to collect the necessary data for the intended evaluations.

- Pre-evaluation: Completion of baseline interview (5 persons per pilot site) and pre-questionnaire (20 persons per pilot site)
- Usability testing:
    - Testing of 3 scenarios with the MyCorridor App: registration, setting-up an account, "MyPack" or "MaaS on the go" scenarios (25 persons per pilot site)
    - Completion of a short questionnaire upon completion of each scenario (25 persons per pilot site)
- Post-evaluation: completion of post-questionnaire by all test users (25 persons per pilot site)

The following table gives an overview of the actual number of users that participated in the first pilot round and the number of interviews and respectively questionnaires that were in fact completed per pilot site and in total.

Table 2: Number of users and questionnaire results per pilot site and questionnaire type from the 1st phase

Pilot site	Baseline Interview	Pre-questionnaire	Post-questionnaire	Scenario-based tasks	Task- based questions	Total No[6]
AT	5	20	25	25	25	**25**
IT	7	18	25	25	25	**25**
NL	21	0	21	21	21	**21**
GR	8	16	23	23	23	**23**
CZ	25	25	25	25	25	**25**
Total No[7]	**66**	**79**	**119**	**119**	**119**	**119**

In the second iteration phase the data was collected from a total of 166 users that undertook 934 trips during the evaluation period. The data that was used from the travellers was:

- Logged data from the trips with the MyCorridor app;
- Questionnaire data from several surveys that were conducted at the beginning, during and at the end of the evaluation period;
- Results from traveller focus groups;
- Results from diaries from the in-depth user;
- Results from the feedback tool.

[6] *Total number of users tested per pilot site*
[7] *Total number of completed questionnaires*

Not all users who completed the trips, completed also the questionnaires and this is the reason why the numbers are presented in two separate tables (Table 3 and Table 4, respectively).

Table 3: Number of users and questionnaire results per pilot site and questionnaire type from the 2nd iteration phase

Pilot site	Pre-questionnaires (mainstream)	Pre-questionnaires (in-depth users)	Post-questionnaires (mainstream)	Post-questionnaires (in-depth users)
AT	38	10	16	4
IT	17	4	6	6
NL	16	0	11	4
GR	39	6	40	6
CZ	16	0	14	0
Total	**126**	**20**	**87**	**20**

Table 4: Number of users and number of conducted trips per pilot site

Pilot site	Number of trips	Number of users
AT	475	50
IT	74	13
NL	28	8
GR	200	69
CZ	157	26
Total	**934**	**166**

2.4.3 Collected data from service providers

The following table gives an overview of the number of participants that took part in the service provider evaluations in the first and second evaluation phase per pilot site.

Table 5: Number of users per pilot site for the 1st and 2nd iteration

Pilot site	1st phase	2nd phase
AT	1	4
IT	1	1
NL	1	1
GR	1	6
CZ	1	3
Total	**5**	**15**

2.5 Process of data preparation

The data preparation process was a time-consuming, but at the same time very crucial task that needed much attention, so that a database of good and uniform quality could be achieved. The steps of the data preparation process are explained below.

First, it was necessary to collect the data from pilot site leaders for pilot rounds 1 and 2 from the traveller and the service provider evaluations. Before transmission the answers had to be translated from the native language into English by the pilot site leaders. In a further step, these data sets were quality-checked and harmonised to allow for analysis between countries. After the quality check, the data sets from all pilot sites were aggregated into one overall file per task for the required evaluations.

Another challenge was the descriptive analysis of open questions, which made it necessary to group the respondents' answers into clusters that could be analysed and visualised in a representative way. Due to hundreds of different answers, many clusters had to be formed manually.

Furthermore, many of the answers were not complete or incorrectly filled in, which required great effort to prepare the data for evaluation. In addition, we analysed many matrix questions where respondents were able to give an approval or agreement rate to a question. In each case there were between 5 and 10 possible answers, which had been manually converted into a range between 0 to 100%. Moreover, the respondents had to answer closed questions with predefined answer options. The variety of questions made it impossible to automate the process of plot generation, which in turn required considerable manual work.

2.6 Statistical analyses

The statistical analyses were applied for the evaluation of the questionnaire results for travellers and service providers in both evaluation phases as well as for the in-depth user diaries from the second evaluation round. To analyse the data different descriptive methods were used, depending on the nature of the problem illustrated in Table 6.

Table 6: Statistical analyses

Type of question	Type of evaluation
Demographic data, background information, closed and open questions.	Percentage of the total sample
Questions for which an approval or agreement value is given	Average approval rate, average agreement score, etc.
Service Registration Tool is usable (Hypothesis 2)	System usability score (SUS)
Questions regarding the effectiveness and efficiency of the app. (Hypothesis 5)	Effectiveness and efficiency metrics according to http://ui-designer.net/usability/efficiency.htm
Success or failure ratio	Calculation of the ratios

Demographic data, background information, closed and open questions

For the evaluation of demographic data, background information and for questions where several answer options could be chosen from, we calculate the share of each class in the total sample. The same applies to open questions, where we first divide the answers into groups and then calculate the respective shares.

Questions for which an approval or agreement value is given

Moreover, in many questions the participants were asked to rate a statement according to a predefined scale, for example from "strongly disagree" to "strongly agree", etc. To evaluate these questions, we decided to compute an average approval/agreement rate/score to the respective statements. For example, the respondents were asked how often they buy mobility products online. The respondents had five possible answers from "*not often at all"* to "*extremely often".* To provide a compact analysis of this question we compute an average approval rate. To do so, we give each possible answer a value from 0 (lowest approval rate - not often at all) to 4 (highest approval rate - extremely often) and take the average for each pilot country. We then divide this average value by the value for the highest approval rate (which in this example would be 4). For a better interpretation, we multiply this value by 100. As a result, we get a value between 0 (lowest approval rate – "*not often at all"*) to 100 (highest approval rate – "*extremely often*").

System usability score (SUS)

Furthermore, to answer the third hypothesis of the first and second pilot round it is claimed that the Service Registration Tool is usable. To answer this question, we apply the SUS introduced by Brook in the first (travellers and service providers) and second (service providers) pilot round.[8] This method consists of ten items illustrated in **Table 7**, which are answered with a Likert scale with five options ranging from "strongly disagree" to "strongly agree". We rate each answer option with one to five points starting with one point for "strongly disagree" (worst option) up to five points for "strongly agree" (best option). Then we add up the points for each of the ten items and multiply this sum by 2.5. As a result, we receive a usability score for each respondent ranging from 0 (worst) to 100 (best).

Table 7: Items for creating the system usability scale

No.	Items for creating the system usability scale
1	I think that I would like to use this Service Registration Tool frequently.
2	I found the Service Registration Tool unnecessarily complex.
3	I thought the Service Registration Tool was easy to use.
4	I think that I would need the support of a technical person to be able to use this Service Registration Tool.
5	I found the various functions in this Service Registration Tool were well integrated.
6	I thought there was too much inconsistency in this Service Registration Tool.
7	I would imagine that most people would learn to use this Service Registration Tool very quickly.
8	I found the Service Registration Tool very cumbersome to use.
9	I felt very confident using the Service Registration Tool.
10	I needed to learn a lot of things before I could get going with this Service Registration Tool.

Effectiveness and efficiency

To calculate effectiveness, we divide the number of successful tasks by the total number of tasks of a scenario and take the average over all respondents.

To calculate the relative overall efficiency, we add up the time spent by each respondent on each successfully completed task per scenario. We then take the sum over all respondents and divide this value by the total time spent on the scenario. The result is the quotient of the time spent on

[8] *For a detailed discussion about the SUS see, among others, Brooke, J. (2013). SUS - a retrospective. Journal of Usability Studies.*

successfully completing tasks in a scenario and the total time spent on the scenario (UI Designer 2020).[9]

Calculation of the success and failure ratios

From the diaries of the facilitators we calculated the failure and success rate. Therefore, we used a simple approach that considers each task as either: failure, partial success/skipped or success. When calculating the failure rate, we assign the following points to each group: failure = 1; partial success/skipped = 0.5; success = 0. Finally, we take the average per scenario and then calculate the average over all users from one country. This gives the average failure rate. When the completion rate is calculated, the values are assigned in reverse order: Failure = 0; partial success/skipped = 0.5; success = 1.

2.7 Limitations in the conduction of the two pilot studies in the pilot sites

Lab-based testing (1st pilot evaluation phase)

Originally it was intended that the application in the first evaluation round would be a mock-up. However, this plan had been changed and an actually functional prototype was available from the very beginning of the evaluation phase in order to get more valuable results. At this stage however, the prototype had not reached the final intended form of the app which was constantly further developed over the course of the following months. As such, the first testing phase took place whilst the development of the MyCorridor app was in process and therefore, some functionalities were not fully functional or deployed yet. Further, at this stage of the development process only a selected number of services was available per pilot site hence that also prevented full functionality at this stage of the project, which was anyway out of the scope for this evaluation phase.

Real-world testing (2nd pilot evaluation phase)

In the second testing phase the number of services that were included in the MyCorridor platform was clearly expanded compared to the first testing phase. Still, fully open and real-life testing was not possible because, despite huge efforts made by the pilot sites, not all pilot sites were able to bring in mobility services. In Austria and the Czech Republic, mobility services were successfully integrated. However, since the number of mobility services was limited the full MaaS paradigm could not be deployed and tested through the application in all pilot sites. To avoid disappointment among the test persons, they were informed in advance that this was a research project and that further developments would be made to improve the app's functionalities throughout the duration of the project. They were also informed that only selected offers were included in the app.

At the beginning of the planned testing phase in February/March 2020, the Covid-19 pandemic set in. The restrictions this placed on the implementation of the second pilot phase were massive. In March 2020, complete lockdowns came into effect in all pilot sites. As a result, the second test phase had to be suspended and postponed until June 2020. In June, conditions had improved, but it was still not a "normal" summer and later respectively autumn. The following restrictions, which had an impact on the implementation of the second pilot phase, were noticeable and in force:

- many people worked in a home office, which reduced the number of trips they made every day;

[9] *For a detailed discussion on how effectiveness and efficiency are calculated, see: http://ui-designer.net/usability/efficiency.htm*

- students learned via distance learning and therefore did not need to travel from their homes to the university;
- the test persons stated that they switched to cycling to avoid the use of public transport, indicating that the mobility behaviour of the test persons had changed considerably due the pandemic;
- Travelling across borders was limited or at times impossible due to the travel bans respectively restrictions imposed by the governments of the pilot countries;

From September onwards, partial or full lock downs were again in force in some of the pilot sites, which reduced the number of journeys even further also in autumn. All of these reasons reduced the participants' possibilities to use and test the app to the extent it was planned for.

3 Pilot site descriptions

In D6.1, section 4, the multi-faceted and iterative evaluation for the MyCorridor is described in detail. Thus, this section will only focus on the actual implementation and the results of the two evaluation periods and describe the impacts of the Covid-19 pandemic.

The first evaluation phase took place as planned, focussing on usability testing and getting feedback from the test users through questionnaires for further improvements of the app for the second evaluation phase, the

In the second evaluation phase the interaction from the participants was solely through the mobile MyCorridor application. In the first phase of the second iteration phase the users received a link to download the application to their smartphones. Later on, Android and iOS versions of the application were available in the respective app stores. Further, all questionnaires for the in-depth and mainstream users were administered online. The following bullet points show the interaction process of the travellers of the second iteration phase.

- User completed online consent form;
- User completed the pre-questionnaire;
- They registered to use the mobile apps;
- They completed the feedback tool questions;
- User completed the post-questionnaires;
- Focus groups using the Mentimeter for intermediate feedback were conducted.

The only interaction that took not place virtually through the MyCorridor application was the completion of the in-depth diaries from the selected in-depth users, they were completed using Excel sheets.

For user support a Social Management System has been set up as a Help Desk by MapTM in order to provide live interaction with test users and assistance if they need help[10]. This Help Desk is accessible via WhatsApp, Facebook and Twitter. For the users it was not necessary to create a separate account. In the backend was a logging tool implemented, that tracked the reported issues from the users.

[10] See https://socialtrafficmanagement.nl/mycorridor/

Figure 1: Help Desk landing page,

© MAP traffic management

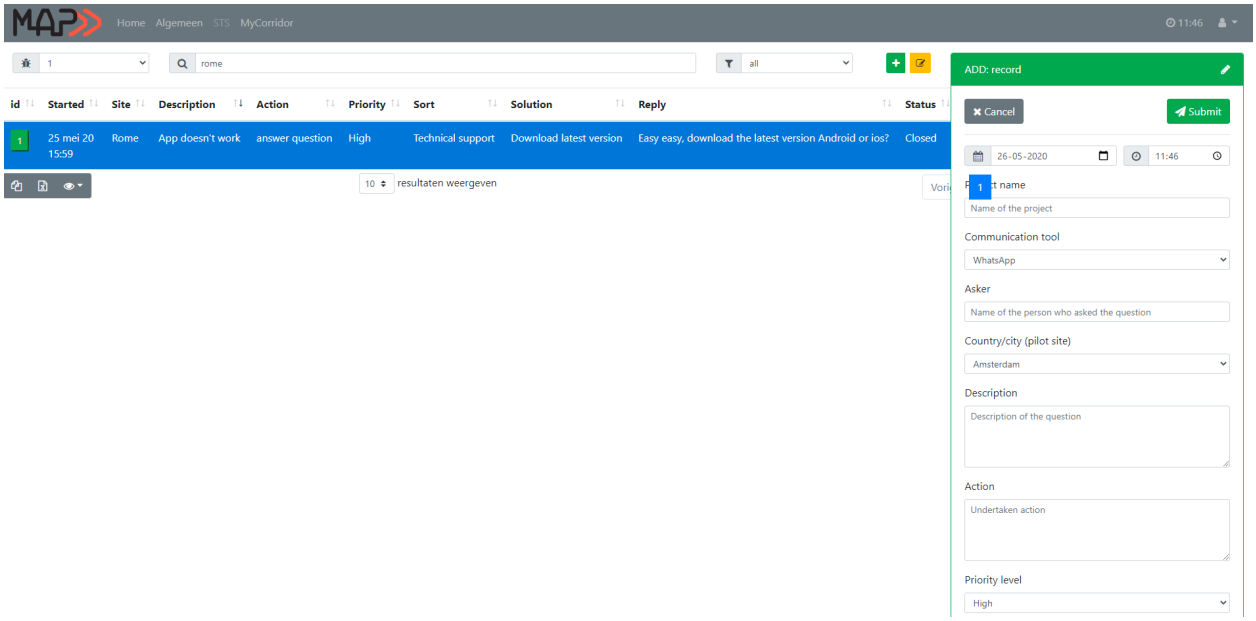

Figure 2: Screenshot of the backend tool for logging the questions and answers of the reported issues

© MAP traffic management

In the tables on the services that are provided in the subsections below it can be seen, that Added Value Services (please refer to D4.1 for a detailed description of the Added Value Services) were used in Greece, the Netherlands and Czech Republic. These services provided added value information regarding live music, weather, arts and entertainment, food, drinks, outdoor activities, transportation, shopping and medical centres. These services had to be enabled by the participants since they were complementary services and subsequently it was the decision of users whether they wanted to test these services or not. In MyCorridor, Added Value Services are offered aggregated

through the Added Value Services API, supported with information coming from three open APIs. The MyCorridor app retrieved information from those information providers and provided them through push notifications. The push notifications could be enabled or disabled in the user profile by the users themselves.

Originally, it was planned that the MyCorridor app can only be used by participants on predefined and selected routes. Therefore, in the preparation phase of D6.1, the routes were identified and described by the respective participants. However, this changed in the course of the app's further development and the app could be used freely by the participants on all the routes they travelled in the given pilot areas. Therefore, descriptions of the selected routes used by the participants are not provided in the following sections.

3.1 Austria

The Austrian pilot site was led by Salzburg Research and focused on services in the Federal State of Salzburg as well as in the City of Salzburg. The regional capital of Austria, located at the border to Germany, is a tourist attraction throughout the year. The city, which is a home to 150.000 inhabitants, also accommodates several universities. Therefore, many employees and students, as well as tourists are commuting to and from the city on a regular basis.

The implementation of the **first iteration phase** is described in detail below using the pilot site Austria as an example, but the process was very similar in the other four pilot sites.

The first round of testing was conducted between April 9th and May 27th, 2019 with 25 participants in Salzburg. The preparatory work for the usability test sessions was manifold and included the following activities:

- developing a storyboard for the testing scenarios;
- translations for the MyCorridor App (German to English and vv.);
- buying the necessary equipment for the usability test session
- development of a 3D printing for the mobile testing sled and printing the model;
- recruitment one additional person for the conduction of both pilots (in the Austria pilot site);
- translation of recruitment information;
- creating a project introductory presentation for the participants, including all necessary information relevant to them for the usability testing
- preparing the informed consent form for the participants;
- recruitment of 25 participants

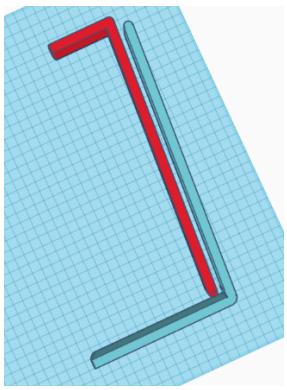

Figure 3: 3D printing model for the mobile testing slide for the smartphone to get a bird's eye view

© Salzburg Reserach

The usability sessions took place in one of the meeting rooms of Salzburg Research that was specially prepared for those sessions. The following equipment was used for the conduction of the usability sessions:

- 2 Logitech webcams for audio- and video recording (to record videos of the interactions on the smartphones and faces of the test persons while they are performing the tests);
- 1 facilitators laptop;
- Recording of data with Mobizen Mirroring App;
- Mobile testing sled (to have a bird's eye view of the participants' activities on the smartphone) ;
- Android Smartphone: Samsung Galaxy S5 Neo (that was provided from the facilitator for all users for the conduction of the test);

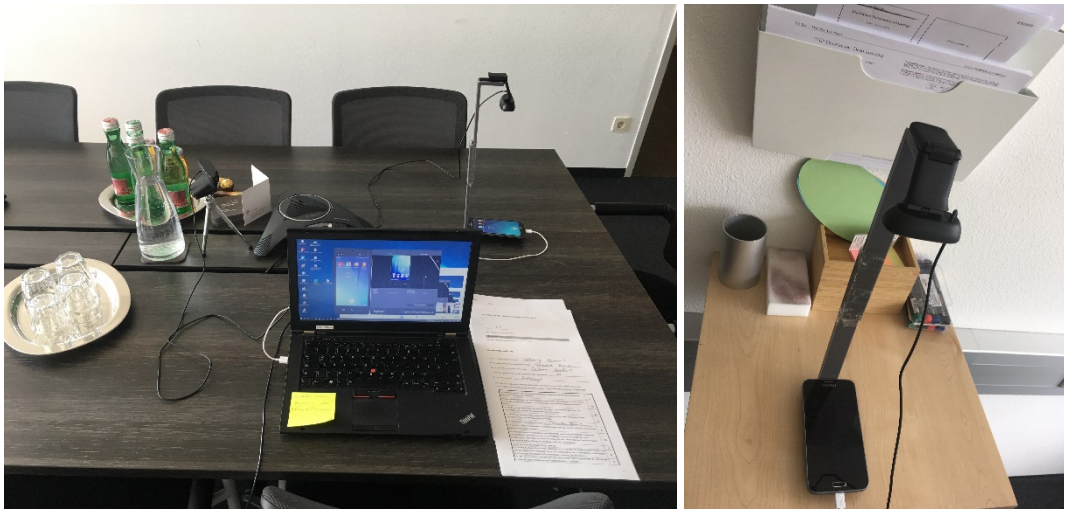

Figure 4: Set-up for the usability session in the office of Salzburg Research

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The sequence of the usability sessions, all of them were 1:1 sessions, was the following:

1. Welcoming of the participants
2. Signing of the informed consent form
3. Introduction and project presentation by the facilitator
4. **Pre-Evaluation:**
   Baseline interview (N=5) OR
   Pre-Questionnaire (N=20)
5. **Evaluation of the MyCorridor App by conduction the following three scenarios**
   Scenario 1: Registration
   Post-scenario evaluation questions
   Scenario 2: Setting-up MyAccount
   Post-scenario evaluation questions
   Scenario 3: MyPacks (N=13) or MaaS on the go (N=12)
   Post-scenario evaluation questions
   Post-scenario-completion questionnaires
6. **Post-Evaluation**
   Post-Questionnaire
7. De-Briefing and good bye

The duration of a usability testing session was between 60 and 75 minutes.

For scenario "3" of the MyCorridor App evaluation the participants were given various simulated mobility scenarios with a local context (for a full description of the scenarios please refer to D6.1), which were solved by the test persons with the help of the MyCorridor app. The evaluation of the MyCorridor App was also video recorded by the facilitator so that the results as well as interactions, gestures, facial expressions, thoughts spoken aloud, etc. could be evaluated afterwards.

As already mentioned in section 2.7, originally it was intended that the application in the first evaluation round would be a mock-up. However, this plan had been changed and an actually functional prototype was available from the very beginning of the evaluation phase in order to get more valuable results. At this stage however, the prototype had not reached the final intended form of the app which was constantly further developed over the course of the following months.

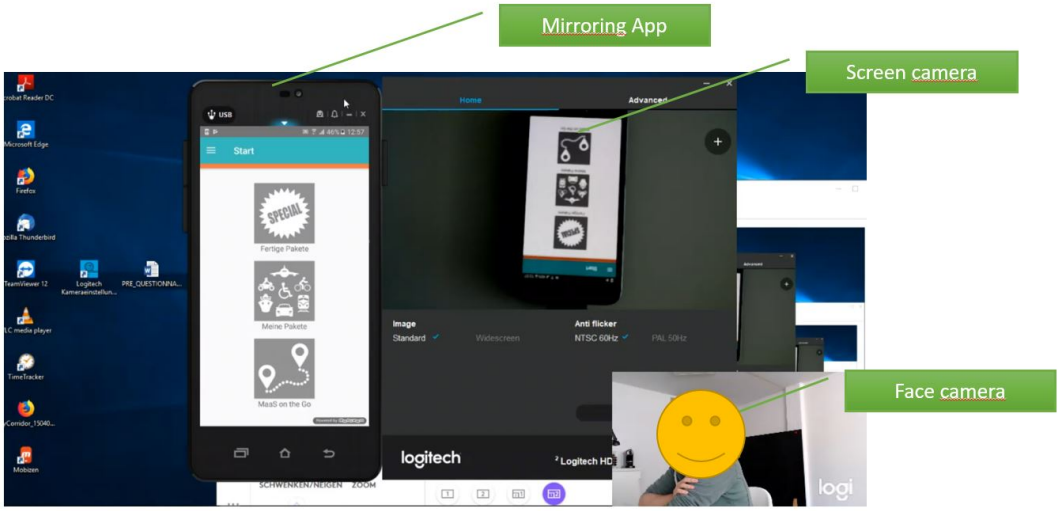

Figure 5: Display of the facilitator's screen during the usability session

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During the test session, the facilitator observed the participants very closely and kept a so-called think-aloud protocol. After each usability session, the notes were transferred to the facilitator diary and the results of the video evaluations were also transferred to this diary. In detail, the following observations were recorded in the facilitator diary:

- Time completion rate per task
- Number of clicks to complete a task
- Pathway that the participant used to solve the task
- Number of attempts needed to solve the task
- Score (success/partial success/failure)
- Usability problems (nature and severity)
- Errors (nature and severity)
- Suggestion for solutions
- Other observations

All results of the traveller usability testing sessions have been used to answer to the hypotheses (see Chapter 2.3). Further, the collected feedback was very valuable for the improvement of the MyCorridor App, which has been incorporated by the development teams for both the Android and the iOS version, into the new versions of the App which were used for the 2nd pilot phase. The improvements that have been made between the two iteration phases are described in Chapter 5.1.8).

In the **second iteration phase** the tests took place under semi-real circumstances. The second round was aiming to evaluate the ease of use, usefulness, usability, acceptance and experience of the MyCorridor mobile application through semi-real-life use for a period of six months in the five pilot sites and, though this, to achieve acquiring valuable knowledge that would convey as lessons learned for the potential of the MaaS paradigm in transport.

As the implementation of the second pilot round was very different in each pilot site, the following description refers only to the pilot site Austria. The implementation in the other pilot sites follows in the following sub-chapters.

This time, 60 participants were recruited to test the MyCorridor app for functionality and on their daily routes. Salzburg borders directly to Germany and has always had close ties with the neighbouring Bavarian communities. In this light, many people regularly cross the border between Austria and Germany for professional or private reasons using different means of transport.

The following scenarios were tested in the second pilot round by the recruited users in the City of Salzburg, in the Federal state of Salzburg and between Austria and Germany.

- commutes to work;
- commutes to the university;
- journeys for leisure purposes;
- cross-border journeys between Austria and Germany (was limited due to Covid-19 travel bans respectively restrictions).

In all scenarios the test persons used either mobility services, infomobility services or traffic management services or a combination of those. The following table provides an overview of the services that were actually tested during the second pilot round in Austria. Apart from those services also the VAO (traffic information Austria platform) was a service that has been integrated for the Austrian pilot. VAO is a core part of the hybrid trip planner and it has been integrated to cover the area of Austria in order to enable multimodal trip planning in Austria. The VAO trip planning has practically been used in all trips that have been made in Austria and was seamlessly integrated into the hybrid trip planner of the MyCorridor platform. Therefore, it is not identified as a service per se (though it clearly is), and hence, is not recorded as such in the logged data. The users are unaware of which trip planner is being used in the backend as each trip planner is selected automatically based on the geographical region of the search in question.

Table 8: Services used in the Austrian pilot site

Type of Service	Name of the Service	Service provider	Absolute usage number of the services	Relative usage share
Infomobility	Park and Ride in Salzburg	City of Salzburg	56	6.9%
Mobility	Salzburg Public Transport	Salzburger Verkehrsverbund GmbH	316	38.6%
Traffic Management	SWARCO Traffic Flow	SWARCO	110	13.5%
	SWARCO Traffic Incidents	SWARCO	53	6.5%
	TomTom Traffic Flow	TomTom	162	19.8%
	TomTom Traffic Incidents	TomTom	121	14.8%

The following images provide some insights on the real-world testing in Salzburg.

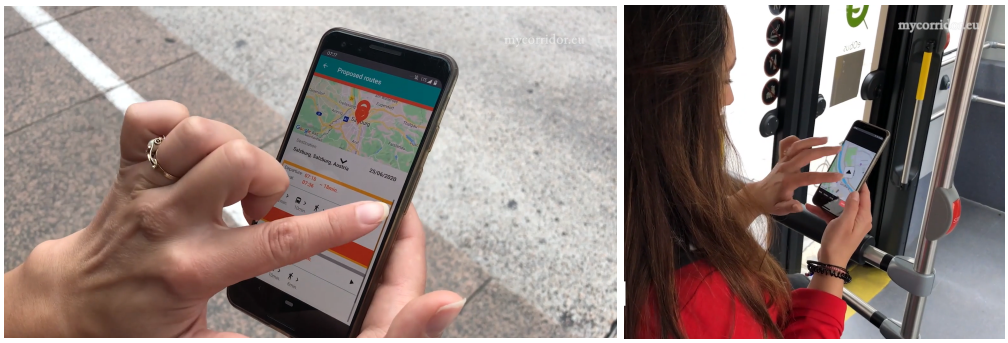

Figure 6: Images from the conduction of the second pilot round in Salzburg

© Salzburg Reserach

3.2 Czech Republic

The Czech pilot site was led by CHAPS and was intended to be based on a combination of public transport and traffic management services, mainly on local journey planner IDOS (infomobility), interurban and international bus reservation and ticketing system for AMSBus and partner's traffic management and routing services. Additionally, the development team implemented added value services, Prague P+R occupation information and also a Prague Zoo events feed. The conduction of the multimodal trips within wider Prague and Brno areas and also intercity journeys, for which the use of the AMSBus intercity coach system was planned, turned out to be challenging due to the Covid-19 pandemic, therefore mainly car trips to work and other necessary trips within wider Prague and Brno areas have been tested by using the services presented in the following table.

Table 9: Services used in the Czech pilot site

Type of Service	Name of the Service	Service provider	Absolute usage number of the services	Relative usage share
Added Value	AddedValueServices	MyCorridor	3	1.3%
Mobility	AMSBus	CSAD SVT Praha s.r.o.	38	15.9%
Traffic Management	TomTom Traffic Flow	TomTom	117	49.0%
	TomTom Traffic Incidents	TomTom	81	33.9%

3.3 Greece

The Greek pilot was led by AMCO and included the cities Korinthos and Loutraki. Services of the Korinthos Intercity Bus Company S.A. were included, which executes the route between the two cities, as well as the Bike Sharing System that is operated by the municipality of Loutraki and parking space availability information. The main feature of the Greek pilot site is that the route between Korinthos and Loutraki is being served by many buses daily and since the distance is not very long (20 km) many passengers are using it.

The scenario that was tested at the Greek pilot site was the following:

- passengers from Korinthos takes the bus to Loutraki using the MyCorridor app;
- at Loutraki, the passenger rents a bike from the bike sharing system and uses it for commuting in the city;

The following table provides an overview of the services that were actually tested during the second pilot round in Greece.

Table 10: Services used in the Greek pilot site

Type of Service	Name of the Service	Service provider	Absolute usage number of the services	Relative usage share
Added Value	AddedValueServices	MyCorridor	10	2.6%
Mobility	KorinthosIntercityBusCompany	Municipality of Loutraki	188	48.2%
	Loutraki Bike Sharing	Municipality of Loutraki	188	48.2%
Traffic Management	TomTom Traffic Flow	TomTom	2	0.5%
	TomTom Traffic Incidents	TomTom	2	0.5%

3.4 Italy

The Italian pilot was led by RSM. Rome is a city with one of the highest car ownerships within Europe, so the private mode of transport remains one of the most used. For this reason and also due to a lack of included mobility services into the MyCorridor platform, the pilot testing in Italy focused on the traffic information and traffic management services for the private mode. In addition, because of the Covid-19 pandemic many people were not willing to use the public transport offers in Rome. Even persons, who use the public transport under normal circumstances on a regular basis, preferred using a car or any other private transport mode if they had access to it. In addition, because of home office working policies from the majority of the companies, traffic has seen a great reduction, so people were more inclined to use their car when they had to move around Rome.

The scenarios that were tested were mainly the ones of commuting to work, journeys for work reasons, and journeys for private reasons.

Table 11: Services used in the Italian pilot site

Type of Service	Name of the Service	Service provider	Absolute usage number of the services	Relative usage share
Traffic Management	LTZ	RSM	44	16.4%
	SWARCO Traffic Incidents	SWARCO	56	20.9%
	TLA	SWARCO	39	14.6%
	TomTom Traffic Flow	TomTom	70	26.1%
	TomTom Traffic Incidents	TomTom	59	22.0%

Figure 7: Image from the conduction of the first pilot round in Rome

© MyCorridor/RSM

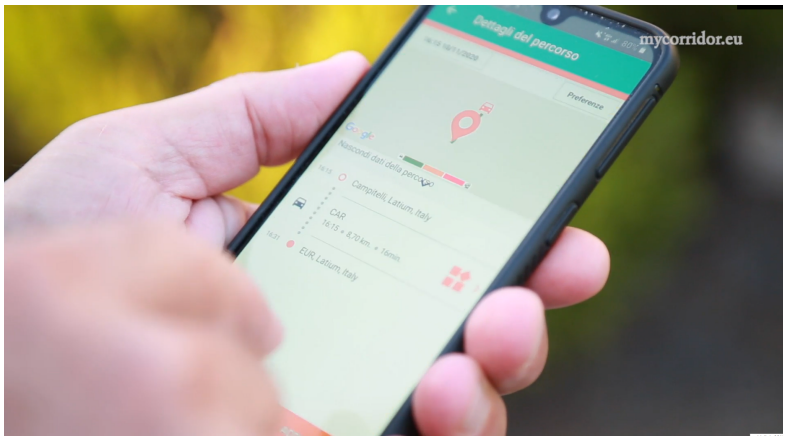

Figure 8: Image from the conduction of the second pilot round in Rome

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3.5 Netherlands

The Amsterdam pilot was led by MapTM. Amsterdam is the capital and most populous city of the Netherlands, home to around 2.5 million inhabitants in its metropolitan area. Located in the heart of the economically strong Randstad region, Amsterdam is considered as a hub for businesses and tourism alike. Thanks to its large port and direct train connections to all major Dutch cities, as well as a dense network of local and regional trains, Amsterdam infrastructure is used by many commuters.

The first round of testing was conducted in spring 2019 with 21 participants, who were given various simulated mobility scenarios in Amsterdam. These tasks had to be solved with the help of the MyCorridor prototype version that was available at this stage of the project.

In the second pilot round tests were based on real-world-scenarios, in which participants were asked to test the MyCorridor app for functionality and usability over a period of time. In these tests, participants were invited to use the MyCorridor for their daily commutes to work, to university and for leisure travels to the Johan Cruyff Arena, a main destination for concerts and sport events in Amsterdam. As well as to test a cross-border scenario from Amsterdam to Prague.

COVID-19 was a major drawback for the Amsterdam pilot. The travels towards the Johan Cruyff Arena stopped with no concerts and sports events. The cross-border scenario was not possible because of travel restrictions. Finally, there was less public transport and many people did work from home. The services that were tested where all related to traffic management. The competitive MaaS environment in the Netherlands would require a solid business plan for transport organisations to be willing to participate. Unfortunately they did not see the pilot testing with less than 60 users as a motivation to participate and to bring in their mobility services.

Eventually the team of the Dutch pilot site started testing with private trips. Employees from MapTM where recruited as test users and began testing the app. A second group was recruited via social media posts, website and sharing the download link to friends and family. The recruited users encountered problems with the application due to failing navigation in some cases that were progressively optimised to the extent possible though. Users needed explaining of the app in person for a good understanding, as it was the case in all the rest of the pilot sites, where workshops were organised for this purpose, but this was the intended strategy for the Dutch pilot site where the focus was on recruiting via social media and direct downloads of the app. In the end that resulted in many downloads of the app but only a small number of users. The amount of downloads suggests that there is a market for MaaS apps in the Netherlands and MapTM managed to attract many people, with just the advertising and news messages on the website of MapTM and in social media channels alone. After that, unfortunately, the users could not be motivated to test the app.

The following table provides an overview of the services that were tested during the second pilot round in the Netherlands.

Table 12: Services used in the Dutch pilot site

Type of Service	Name of the Service	Service provider	Absolute usage number of the services	Relative usage share
Added Value	AddedValueServices	MyCorridor	20	22.5%
Infomobility	Dynamic Parking Availability	RDW	8	9.0%
	NS_API	NS	4	4.5%
	Static Parking Availability	RDW	9	10.1%
Traffic Management	SWARCO Traffic Incidents	SWARCO	8	9.0%
	TomTom Traffic Flow	TomTom	22	24.7%
	TomTom Traffic Incidents	TomTom	18	20.2%

4 Recruitment, engagement and incentivisation methods

In section 5 in Deliverable 6.1 the intended recruitment, engagement and incentivisation monitoring and strategies have been described in detail. In this section it is now described how the pilot site applied those strategies in their implementation of the two pilot rounds. The following input has been reported by the individual pilot site leaders.

4.1 Austria

At the Austrian pilot site, the participants for both pilot rounds were recruited by using the following mixture of recruitment procedures:

- Salzburg Research referred to its large and well-established network in the mobility area in order to inform the stakeholders of the conduction of the two pilot studies and to ask the stakeholders if they want to participate.
- Salzburg Research also used its good connections to the local University and to the University of Applied Sciences in order to recruit students for the two pilot phases.
- Further, work colleagues, friends and family members were informed about the project and asked for their participation.
- Word-of-mouth, mostly in the environment of work colleagues, friends and family, was also used to recruit further participants for the two studies.

The channels used for recruitment were newsletters from well-known companies and institutions, the social media channels of Salzburg Research, direct email communication with the individuals as well as personal contact by phone or at professional or private meetings.

The main targeted user groups in both pilot phases were employees and students that commute. Originally, tourists were also intended to be one of the target groups for the second pilot phase however, due to the Covid-19 pandemic and the strong travel bans or restrictions, no tourists could be recruited for the testing purposes. A major aim in the recruitment process was to reflect the diversity of the different user groups. In order to achieve this aim and to get the most representative results possible, the selection of the participants was based on gender, age, work, education, and social class.

For the first pilot round, the laboratory study, 25 test persons could be recruited applying the above described recruitment methods. The recruitment of 60 test persons for the second test phase proved to be a little more difficult, as test persons had to be recruited for a test period of several months. For various reasons (e.g., moving to another city in the near future, finishing their studies with unknown plans for the time afterwards, work and life situation has changed, etc.), it was not possible for some of the requested persons to participate over a longer period of time. In the end, however, 60 test persons were successfully recruited for the second test phase, comprising 50 mainstream and 10 in-depth users.

In the second pilot phase, the test persons in Salzburg were able to make full use of the Salzburg Transport Association's offers, i.e. they could buy tickets for bus and train in Salzburg via the MyCorridor app. They did not have to pay for the tickets, which was also part of the incentive strategy. In order to avoid fraud and an uncontrolled and unlimited use of the tickets, it was a framework condition of the Salzburg Transport Association that the names of the test persons were stored in the

backend of the MyCorridor app, so that only the 60 recruited test persons had access to the free offer of the Salzburg Transport Organisation.

In Salzburg, a stepwise roll-out of the second pilot phase began in February 2020. However, due to the Covid-19 pandemic, the pilot phase had to be interrupted in March and could only be resumed in June. In June, however, not all of the originally recruited 60 test persons were available for testing purposes any longer. Reasons for this were, for example: some persons moved to another city, students were in their hometown and not in Salzburg during the summer months, or a prioritised use of the bicycle as the main means of transport during the summer months. A few new participants could be recruited in the summer months ending up with 50 persons that actively tested the MyCorridor app. In addition, the pandemic also changed the mobility behaviour of the test persons and, on the one hand, drastically reduced the number of trips and, on the other hand, the test persons now used the bicycle or walked more often for safety and hygiene reasons instead of using public transport services in the city.

As incentives, two different tools were used: on one hand, the use of the entire range of services offered by the Salzburg Transport Association was free of charge for all participants. On the other hand, as a compensation for their efforts, the participants received a gift voucher worth 20 Euros for shops in Salzburg's old town.

In relation to engagement strategies, a personal approach was primarily followed in Salzburg. The test persons were contacted regularly by email or telephone to obtain feedback on their experiences or to discuss any problems or challenges they had in using the app. Feedback or problems were forwarded directly to the development team to solve the problem as quickly as possible and bring about an improvement. The direct and personal contact also motivated the test persons to continue using the app. This was an important aspect, especially in the second test phase, which lasted several months.

The recruitment of participants for the service provider study was based on the services that were integrated into the platform and on experts in the MaaS environment who already had experience with MaaS applications and could therefore assess the MyCorridor Platform well. Further, they could also learn from the implementation in the MyCorridor project and draw their own benefits from it. As the testing of the service providers was very similar in both phases and the duration of the test was limited to about one hour, no engagement and incentivisation strategies were necessary.

4.2 Czech Republic

The users for the first pilot round were recruited from work colleagues and their networks (families, friends). For the second pilot round the original plan was to recruit participants via various channels and from several networks, only on voluntary basis. This strategy was interrupted by the COVID-19 pandemic as CHAPS decided not to ask anyone to conduct unnecessary trips by means of public transport (this also led to a loss of potential of the major local mobility service on which the majority of scenarios was intended to be based). Finally, the pilot users were recruited from colleagues (which were not working on this project) and their personal networks, so they were able to responsibly manage most conducted trips.

For the service provider evaluation during the first round, internal services were evaluated. For the second round, three services were integrated, when two were open source so evaluation was conducted with colleagues (both of them were naïve to the MyCorridor project). The last evaluation was conducted with Czech Railways personnel.

4.3 Greece

The Greek pilot site followed the following recruiting procedures: For the first iteration phase 10 test persons were recruited among the AMCO employees for the travellers' evaluation. In the second iteration phase the first step was to recruit 31 pilot users out of the 44 people who work at AMCO's factory, which is in Korinthos. The second step was to recruit the remaining users, by trying to find passengers at the Korinthos bus stations who were waiting for the bus to Loutraki. AMCO provided a short training session for five employees at the Korinthos intercity bus station, so that they were able to support the ad hoc recruitment of travellers at this bus station. Those five employees are on site on a regular basis as they are working there for eight hours per day. The training was done, and the employees started the ad-hoc recruitment of travellers. During the first day of the recruitment, it has been realized that the recruitment of random passengers was quite difficult for several reasons: e.g., some of them did not have an email address which was a prerequisite for the participation in the pilot or some of them didn't have any data plan in order to download the app from Google Play. After this experience AMCO changed the strategy and followed an alternative approach. The Korinthos Intercity Bus Operator has a bus station and offices in Loutraki. Some of the employees of the operator who work at Korinthos offices are travelling to Loutraki several times per day, for work-related issues. What AMCO did was to recruit 29 of them so that they could use the App on their commutes between the office and the city.

In general, the recruitment for the two traveller evaluation rounds went well, apart from the fact that some users that participated in the 2nd round of pilots have not completed all the questionnaires. The biggest challenge encountered in the recruiting was the difficulty to convince passengers at the bus stop to use the MyCorridor application. That is why AMCO decided to recruit AMCO's and Korinthos Bus Operator's employees. Because of that, Covid-19 did not have a big impact on the recruitment of the pilot users.

The service providers were customers from AMCO which agreed to participate in the pilot evaluation.

4.4 Italy

The users were recruited among colleagues of the Italian companies RSM, TTS and SWARCO and some friends and relatives participated in the pilot testing.

The recruitment strategies used for travellers for the Italian pilot site in the first evaluation round were based on the possible future real-life testing in evaluation round two. RSM tried to enrol users that would continue participating in the project also in the second round and that would travel often (for example commuters for work/study).

So, work colleagues working in TTS, RSM, SWARCO or other working contacts have been recruited by contacting them by e-mail and/or phone. Also, because there are constant research exchanges with the universities in Rome (in particular Sapienza and Tor Vergata), the main contacts were engaged to organize sessions with students directly at the universities.

For all the user groups (colleagues, working contacts, students) involved in the first evaluation, a "user group session" was undertaken during which the project was illustrated, explaining it in detail by giving a presentation. In the second part of the session, it was explained to the users how the test will be conducted and they were provided with all information needed. In the third part of the session, the users did the test in turns (going through the consent form, pre-questionnaires, MyCorridor app testing and post-questionnaires).

Generally, the different user sessions of the first round went well, people completed the test with some difficulties in some cases but the facilitators could react properly to explain or prompt the users so that they could proceed and complete the planned tasks.

In the second round, because of the Covid-19 pandemic, some of the user categories enrolled for the first round couldn't be confirmed, especially the university students since they changed to distance learning and didn't have to travel to the Universities anymore. Also, some of the working contacts, because of the smart working policies placed in force by many companies during the lockdowns and even further on, travelled much less or not at all.

Given the organization that was set up regarding the users that tested the MyCorridor app during the first round no plans for dropouts were made. Therefore, the strategy had to be changed and RSM tried to engage colleagues and friends where it was known that they would be travelling, despite the prevailing circumstances. Before engaging mainstream users, RSM started testing the app both personally and with some in-depth users. Problems were experienced during this first testing phase of the second round, including for example crashing of the app and issues with recalculation of the itinerary. As long as there was a restricted number of users, a one-to-one assistance could be provided by the pilot site leader for each of the users. When the user numbers increased only a little or no personal assistance could be given anymore and, therefore, some of the users tended to not use the app since it was not self-explaining to them.

The whole testing process was mainly concluded with users with which RSM had direct contacts and therefore, they were able to follow them thoroughly their progress and outputs.

4.5 Netherlands

The team of MapTM started testing with private trips. Colleagues where recruited as test users and began testing the app. A second group was recruited via social media posts, website and sharing the download link to friends and family. The second group of recruited users had major problems with the application. The Dutch site that did not intend to familiarise users with the application through workshops and rely only downloaded applications in order to evaluate the MaaS paradigm in a free competing context. This made the engagement more difficult though and, unfortunately, resulted in many downloads of the app and in a small number of actual users. The reasons for that were already explained in section 3.5.

5 Results 1st pilot iteration phase

In the following sections, the results from the first iteration phase are presented. For reasons of better readability, all figures are added in the Annex at the end of this Deliverable and are quoted in the text.

5.1 Evaluation results from the travellers

Before starting the analysis, it is necessary to mention there were variations in the sample size between the pilot sites, which is indicated separately in each figure (n).

5.1.1 Results from the baseline interviews

This subsection presents the results of the 66 baseline interviews for each country and across all countries. Table 2 shows that the number of participants varies among the analysed countries. We see that in Austria 5, in Italy 7 and in Greece 8 people took part in the baseline interview. In the Czech

Republic and the Netherlands, on the other hand, 25 and 21 persons respectively are included in the sample. In the Czech Republic, all participants participated in the baseline interviews and answered the pre-questionnaires. In the Netherlands all the respondents participated in the baseline interview but did not answer the pre-questionnaires. Therefore, the aggregated results (across all countries) are biased by these two countries.

The analysis of the baseline interviews included 19 questions. For a better overview, only the most important results are discussed. However, all results in form of plots can be found in Annex 1.

Figure 32 shows which means of transport the respondents usually use during their day. We note that the results vary from country to country. This can be explained by the different transport services between the cities in which the respondents live. However, we note that **the car is the most used means of transport as it is used by 32%, followed by bus and bicycle with 23% each**.

Figure 33 shows the average level of satisfaction with the different modes of transport. Across all countries, we find that **cycling and rail are the modes of transport with the highest average satisfaction rate**[11], while **car sharing, and carpooling are the least attractive means of transport**.

Figure 34 shows how often online trip planners and mobile devices are used by the respondents. The value ranges from 36% in the Czech Republic to 95% in the Netherlands and an aggregated value of 68 across all countries.

Figure 35 illustrates which online trip planners are used by the respondents. We find that the answers highly depend on the supply of online trip planners in the respective countries. Therefore, we can conclude that **84% of the respondents use local online trip planners, followed by google maps with 71%**. Figure 36 illustrates that if respondents do not use an online travel planner, this is because they do not travel much or already know their routes well.

Figure 37 shows the problems respondents usually face when using online services to plan their travel. In Greece, most respondents were confronted with technical problems, while in the Czech Republic and Italy respondents are most concerned with a lack of transport services. On the contrary, in Austria and in the Netherlands the most frequent answer is that there are no major problems. Across all countries, we find that around **26% of respondents have no problems with their online devices followed by a too small offer of transportation modes (22%) and technical problems (18%).**

Respondents were also asked to describe an event where MyCorridor would be useful for carrying out a desired action. Figure 38 shows that across all countries the **majority (50%) of respondents answered that the app helps them to fulfil special wishes**. Moreover, respondents answered that the **app helps them to travel abroad (17%) and to plan their holiday (12%)**.

Figure 39 illustrates the biggest challenges of the respondents when planning a trip. **For 38% of the respondents, it is a problem to find a cheap and comfortable trip**. People were also asked which service they would like someone to create. Figure 40 shows that the most frequently mentioned answer **(56%) is that they want to search for their journey offline**.

Figure 41 shows that the percentage of respondents who have heard of MaaS ranges from 16% in the Czech Republic to 80% in Austria. **Across all countries, 42% of the participants have heard of MaaS before**. Furthermore, Figure 42 shows the reason why the respondents have already heard of

[11] *For an explanation of how this average score is calculated, please see section 0 (Questions for which an approval or agreement value is given)*

the app. The results show that the most frequent answer **(56%) is that they have already worked within the MaaS ecosystem**.

Another question to the respondents was what kind of mobility products they buy. Figure 43 illustrates that the most frequently given answers were **train and airplane tickets with 53% each**.

Figure 44 shows the most satisfactory online shopping experiences of the respondents. It can be noted that about one quarter are **satisfied with the payment, the online ticket, and the fast and easy booking** respectively.

Figure 45 illustrates the most frustrating online shopping experiences of the respondents. We find that over all countries **32% of the answers are related to frustrating experiences with services, followed by functional (27%) and payment (15%)** issues.

Figure 46 shows that the majority of respondents **(48%) buy their tickets on websites for intermodal travel planning.**

Figure 47 illustrates which engines the respondents use to search for tickets. We find that, most respondents **search their tickets with intermodal trip planning websites (35%),** meta-search machines for price comparison (30%), route planning systems (27%) and websites of train companies (24%).

Figure 48 shows what the respondents think positively or negatively about the app. We note that, across all countries, the most frequently mentioned positive answer (**73%) is that you can buy an all-in-one ticket with MyCorridor**. On the other hand, the most frequent negative answer (30%) is that the respondents do not trust the app that is quite natural for a research application given in a mobility context (MaaS) that users are not in general familiar with.

Furthermore, Figure 49 illustrates the preferred way of receiving information about a product. We find that about **39% of all respondents prefer to receive information by reading**, followed by watching (20%) and practicing (15%).

Finally, in the last question of the baseline interview, the respondents were asked about their most burning question regarding the application. In total, Figure 50 shows that the **respondents are most concerned (29%) about whether more means of transport** will be available in the final version to make it really valid.

In summary, we find that **the most used means of transport among the respondents is the car**, while bicycle and train show the highest satisfaction rate. In addition, the results show that finding **cheap and convenient travel is most important to respondents**, and that about 42% of the sample have heard of MaaS. In addition, **train and plane tickets are the most purchased tickets online**. The most frequently given positive answer regarding MyCorridor is that **respondents like the feature of buying an all-in-one ticket**, while about a third of respondents do not trust the app.

We thus note that the idea of MaaS overall and applications like MyCorridor still needs some promotion, as MaaS is known by less than every second respondent in our sample. Furthermore, **one of the main challenges would be to increase trust in apps like MyCorridor, which would increase the likelihood of success. Still, this requires an overall familiarisation of public with MaaS that will take inevitably some time and is not dependent on the project**; which has been already more challenging due to COVID-19 related challenges. However, **respondents show interest in the offer of an all-in-one ticket to provide a cheap and convenient travel experience**.

5.1.2 Results from the pre-questionnaires

Table 2 shows that the number of respondents ranges from 16 in Greece to 25 in the Czech Republic and is 79 at aggregated level. As noted above already, we also see that users from the Netherlands did not participate in the preliminary questionnaires as the pilot side leader decided to focus on the baseline interviews.

Figure 51 shows the percentage of respondents who have heard of MaaS. We find that the results range from 16% in the Czech Republic to 44% in Italy. A total of **32% of respondents have heard of MaaS**. Figure 52 provides information on where respondents have heard about MaaS and shows that around 36% have read about it in the press.

Figure 53 illustrates that around **83% of the respondents buy mobility products online**.

Figure 54 shows how often respondents buy mobility products online. We find that the average score[12] ranges between 36 in Greece and 69 in Austria. Across all countries, the average score is 50, indicating that respondents are **moderately likely to buy mobility products online**.

Figure 55 analyses which types of products the respondents usually buy online. All countries combined, **train (46%), air (39%) and bus (20%) tickets are most often purchased online**.

Figure 56 illustrates which online retailers or shops are used by the respondents. The results indicate that **41% of the respondents use online shops of train companies**, which is the most frequently given answer. This value is followed by retail shops of **airlines (29%) and intermodal trip planning companies (25%).**

Figure 57 gives an overview about the biggest concerns about buying products online. We find that with **34% most users are concerned about payment**. This result is mainly influenced by the high values in Greece (58%) and Italy (65%).

Figure 58 shows how convenient it is for respondents to buy products online from a company they know. The average values range from 73% in Greece to 93% in the Czech Republic. All countries combined, we see a value of **75%, which indicates that respondents feel quite comfortable.**

Moreover, the respondents were asked how confident they are that their personal information will be kept confidential when purchasing products online. Figure 59 shows that the respondents are rather **moderately confident** in this question, as the average value **across all countries is 54%.**

Figure 60 shows the confidence rate of the respondents that their payment information will be kept confidential when purchasing products online. Interestingly, compared to the similar question in Figure 59, the value for Austria increases by about 11 points, while the other countries show almost the same confidence rates.

In addition, the respondents were asked how often their privacy concerns prevent them from buying products online. Figure 61 shows a value of 22% across all countries, suggesting **that privacy concerns do not prevent people from buying products online**.

Figure 62 illustrates which payment method respondents use most frequently when buying products online. We note that payment behaviour varies greatly from country to country. In Austria and Italy, the most common method of payment is by credit card, while respondents in the Czech Republic prefer the debit card and in Greece PayPal. Across all countries, however, we note that the most

[12] *For an explanation of how this average score is calculated, please see section 2.6 (Questions for which an approval or agreement value is given)*

commonly used payment method is the **credit card (37%), followed by the debit card (35%) and PayPal (25%).**

Figure 63 shows, which websites the respondents prefer to buy from a person or organisation they do not know. All countries combined, **42% of respondents feel comfortable with Amazon**, followed by **EBay with 19%**. Interestingly, 12% of respondents do not buy products if they do not know the person or organisation selling the product.

Figure 64 illustrates how often the respondents buy products because they have a points card from the store. The highest approval rate is found in the Czech Republic with an average value of 35% and the lowest in Greece with a value of 18%. All countries combined, we have a value of 27%, which leads us to believe that a points' card is a rather weak argument for respondents to buy in a corresponding shop.

Respondents were also asked what kind of mobility products they need but cannot find online. Figure 65 shows that people have **problems with finding multimodal services (17%), offline services (13%) and tickets for multiple transport (12%**). All countries combined, however, 58% of the respondents gave no answer to this question.

Figure 66 shows what respondents do when they cannot find mobility products online. We find that across all countries, about 75% of the respondents did not answer this question. However, about 9% responded that they search the Internet or conduct offline research.

Furthermore, Figure 67 shows whether the respondents find mobility products immediately when shopping online. The approval rate ranges from 38% in Greece and 75% in Austria and has a value of 64% across all countries.

Figure 68 illustrates the results for the question of whether respondents want to read detailed information on the use of mobility products. Here we find a value of 63% across all countries.

In addition, respondents were asked whether their mobility needs are covered by online shopping. Figure 69 shows a score of 60% across all countries, indicating a moderate approval rate for this question.

A significantly higher value with 76% across all countries is found in Figure 70, where the respondents were asked whether they could find products at any time, 24 hours a day.

In addition, Figure 71 illustrates the results on the question of whether it is easy for the respondents to select online and to make comparisons with other mobility products. We find that the average score ranges from 27% in Greece to 66% in the Czech Republic. However, across all countries, a score of 54% shows a moderate approval rate.

Interestingly, the design of the MyCorridor is assessed differently in the countries studied. In Figure 72, the average rating for the question of whether the design of MyCorridor helps in the search for mobility products ranges from 54% in Italy to 88% in Greece. At the aggregated level, however, an average score of 68% indicates a moderate approval rate.

Figure 73 shows if the respondents prefer to buy on a website/with an app that offers security and easy navigation and order. About this question, we find a high approval rate with a value of 84%, across all countries.

Figure 74 shows whether the layout of the app helps respondents to find and select the right product when shopping online. Here we find an average approval rate of 75% across all countries.

Figure 75 shows whether the respondents agree with the statement: I believe that familiarity with the app before the actual purchase reduces the risk of online shopping. We find a high approval rate of 77% for this question. The same conclusion applies in Figure 76, where respondents were asked whether they would prefer to buy from a website/application that offers them high-quality information (80%).

Respondents were also asked whether online shopping takes less time. Figure 77 shows that the results vary considerably from country to country, from 69% in the Czech Republic to 90% in Greece. In Figure 78 and Figure 79 we see the approval rate for a similar question: (54%) Online shopping does not waste time and (55%) I have the feeling that evaluating and selecting a mobility product takes less time when shopping online. Here we find the highest average score for Greece and the lowest for Austria.

Figure 80 and Figure 81 show how safe the respondents feel. Interestingly, when the respondents were asked if they feel safe and secure when shopping online in Figure 80, we find the lowest average score in Greece (50%). However, if they were asked if online shopping protects their security, Greece has the highest approval rate (70%). Furthermore, Figure 82 shows that respondents, across all countries, have a very high approval rate when asked if they would like to shop online at a trusted site.

In addition, Figure 83 shows the respondents' answers as to whether using MyCorridor could improve their travel experience. The results vary from 59% in the Czech Republic to 84% in Italy. All countries combined, we find a score of 71%.

The question of whether interacting with MyCorridor requires much of my mental effort is assessed differently in each country. Figure 84 shows that the values range from 57% in Greece to 77% in the Czech Republic.

Finally, respondents were asked whether they thought they would find MyCorridor pleasant to use. Figure 85 shows that the results vary greatly from country to country, ranging from 49% in the Czech Republic to 71% in Italy.

In summary, we find that about a third of the sample has already heard of MaaS and that 83% of the respondents buy mobility products online. Therefore, similar as in the baseline interview **we find that the idea of MaaS needs to be more promoted**. Furthermore, train and plane tickets are the most frequently purchased tickets. About one third of the sample is concerned with the payment process of MyCorridor. However, **if the respondents are familiar with the company, 75% of them feel comfortable buying online.** So the issue of trust could be addressed if respondents know more about who is behind MyCorridor and who offers it. We also find that **respondents find it important to buy on websites that are easy to navigate and have a proper design.** We also find a moderate approval rate when respondents are asked if it is pleasant to use MyCorridor. The next subchapter aims to check the practicality of MyCorridor and can provide an idea on how to increase the pleasantness of using the app.

5.1.3 Post-scenario evaluation

The following subsection presents the results of the usability study (i.e., the lab-testing session) where the participants were asked to complete three different scenarios using the MyCorridor app.

In D6.1, *section 3.2.2.6 Testing scenarios*, the storyboards for the testing scenarios for the first evaluation round with travellers are described in detail. For every pilot site three to four scenarios were developed that the participants had to accomplish during the lab-testing session. Scenarios 1 (registration) and 2 (setting-up of an account) were the same for all participants across all pilot sites. The general idea of scenario 3 (using MaaS on the Go or MyPacks) was also the same for all

participants however, it was put into a local context so that the participants could emphasise with the situation more easily. The steps for the optimal execution of the tasks were defined in advance. This was the benchmark that was used for the comparisons with the participants.

Scenario 1 - Registration

Figure 86 presents the results of how easy it was to complete the first scenario. Interestingly, the results vary tremendously from country to country, ranging from 67% in the Netherlands to 94% in Austria. All countries combined, we have **a value of 83**%. Figure 87 shows why the respondents did not consider it easy to complete the scenario. The most common response across countries **(55%) was that the design of the scenarios suffered from unclear options.** The options were though on purpose unclear at some points, to identify suspected usability and user experience issues.

Figure 88 presents how useful the registration procedure for the respondents is. Among the countries, it is least useful for the respondents of the Czech Republic (63%) and most useful for the participants of the Netherlands (79%). Across all countries, we find **a good assessment of the usefulness, with a value of 72**%. In Figure 89 we see why the respondents think that the registration procedure is not useful. The most common response **(82%) was that the registration process makes no sense to them**.

Scenario 2 – Setting up an account

The respondents were asked how easy it was for them to set up a personal account. Figure 90 illustrates that it was least easy for the respondents in the Netherlands (54%) and most easy for respondents of the Czech Republic (76%). Figure 91 shows that the respondents think that it is not easy to set the account because the design and options are not clear and understandable.

Respondents were also asked how useful the account settings and preferences in MyCorridor are. Figure 92 shows that the Czech respondents show the lowest approval rate (68%), while the Greek show the highest approval rate (82%). To the question why the account settings and preferences are not useful, the most common answer is that the **process is too difficult (79%)**.

Scenario 3 – MaaS on the Go / MyPacks

Figure 94 shows the approval rate to the question of how easy was it to create an own MaaS on the Go Mobility Token / MyPacks. We find the lowest rate in Austria (56%) and the highest in the Netherlands (70%). All countries combined, we find **a moderate agreement level of 63%**. Figure 95 shows that when it was difficult to create a mobility token, the most frequent answer was that **organizing the trip was too difficult (73%)**.

Furthermore, the respondents were asked how useful the MyPacks/MaaS in the Go menu is. Figure 96 shows that approval rates vary between 56% in the Czech Republic and 77% in Austria. Most respondents, who think that it is rather difficult, believe that this is because the process is not intuitive.

In summary, we note that if it is difficult for respondents to complete the scenarios, this is due to the design of the app and unclear options, however the ratings are acceptable and quite high for a first version. Furthermore, respondents find it difficult to organize a trip. The results show that the most important points according to the pre-questionnaire, the simplicity of navigation and a good design of the app, are not yet fulfilled.

5.1.4 Results from the facilitator diaries

As described in section 3.1 all the facilitators in the pilot sites kept facilitator diaries that they used for their observations that they made during the lab-based user sessions in the first pilot evaluation round. The results of the facilitator diaries are presented below.

Figure 98 shows that the number of major issues by scenario varies tremendously from country to country. In scenario 1 we find 13 major issues in Austria and 0 for Italy.[13]

Figure 99 illustrates the average number of failures per scenario. We find that in all countries the average number of failures is lowest in scenario 1. Interestingly, Austria has the highest average number of failures in all scenarios, indicating that respondents in Austria seem to have the greatest problems in completing the scenarios. This conclusion is underlined by the results in Figure 100, where we see that **Austria has the lowest average completion rate for all scenarios**.

The number of average clicks per scenario is analysed in Figure 101. The results show that the number of clicks correlates with the task. However, Austria shows the highest average number of clicks for all scenarios except for scenario 1. In scenario 2, the Austrian respondents needed twice the number of clicks compared to the Italians. For scenario 3b, the Austrian participants needed three times as many clicks compared to the Italian participants to complete the scenario.

Figure 102 shows that the average failure rate[14] in all scenarios is highest in Austria, which underlines the significant problems faced by the Austrian respondents. Consequently, Figure 103 shows the average success rate, which are merely the mirror values of the average failure rate. Figure 104 illustrates the average time needed for each scenario, which varies significantly among the analysed countries.

In summary, we find the biggest problems in completing the respective scenario in Austria, which has the highest average number of failures and the highest average failure rate of all countries.

5.1.5 Results from the post-questionnaires

In Table 2 we see that we have a total of 119 respondents who participated in the post-questionnaires.

Figure 105 shows that respondents do not fully understand what they can do with MyCorridor. The average approval rate[15] ranges from 57% in Greece to 76% in Austria and shows a value of 68% across all countries.

Figure 106 illustrates that respondents also do not fully agree that they can find what they want in the MyCorridor app. Here the Netherlands have the lowest approval rate with a value of 42%. The value at the aggregated level has a **moderate approval rate of 55%**.

However, Figure 107 shows that the respondents on average do not think that the app loads too slowly.

In addition, Figure 108 shows that respondents are not quite sure whether MyCorridor is easy to use on their first visit, with an average approval rate of 59% at an aggregated level.

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[13] *Major issue = Visible to both, user cannot complete the task without assistance.*
[14] *The calculation of success and failure ratios is explained in section 2.6.*
[15] *For an explanation of how this average score is calculated, please see section 0 (Questions for which an approval or agreement value is given).*

The results in Figure 109 shows whether clicking on links gives the respondents the expected results. We find a moderate agreement rate to this question, ranging from 50% in the Czech Republic and 74% in Greece. The same conclusion applies in Figure 110, where respondents answered to the question whether the organisation of the information on the screen of the system is clear.

Moreover, the respondents were asked how satisfied they are with the use of MyCorridor. Figure 111 illustrates that satisfaction varies from country to country. In the Czech Republic we find an approval rate of 41% and in Greece of 75%, with a **moderate value of 58% across all countries**.

Figure 112 shows that lower satisfaction can mostly be explained by technical problems and the user-unfriendliness of MyCorridor. However, we assume that the varying offer of different transport modes and competing applications between countries also have an influence on the different satisfaction rates.

However, Figure 113 shows that **usability is the most common answer (33%) of respondents to explain what they like best about MyCorridor, followed by the fact that the app is simple and fast (28%) and that they like the idea of MaaS (24%).**

Figure 114 illustrates the results for the question of what respondents like least about MyCorridor. Here the most frequent answers were that there are missing options (38%) and that there are technical problems (23%).

Figure 115 shows for whom, in the opinion of the respondents, it might be interesting to use MyCorridor. The most common answers are: all types of travellers (64%) and students/young people (19%).

We have also analysed the question of whether respondents would recommend MyCorridor to a friend. Figure 116 shows that in the Netherlands 35% of respondents would recommend MyCorridor to a friend, while in Greece 100% of respondents would do so. Across all countries, **about 75% would recommend MyCorridor to a friend**.

According to Figure 117, the most frequent given answer is why people would not recommend MyCorridor because it is not well developed (60%) and too cumbersome (40%). Here one has to have in mind that the app was the result of a research project and not a fully deployed commercial application. The sometimes high expectations of the users may have led to distortions here. Respondents were also asked to whom exactly they would recommend it. Figure 118 shows that friends (41%) and people who like to travel (35%) are the most frequent answers.

Furthermore, the respondents were asked whether MyCorridor is easy to use. In Figure 119 we see a value of 72% across all countries, which indicates a relatively high approval rate for this question. However, according to Figure 120, the question whether the respondents could quickly find what they need on MyCorridor has a slightly smaller approval rate of 65% across all countries.

In Figure 121, we see that the respondents with an approval rate of **61% react rather sceptically to the question whether they like using MyCorridor.** Figure 122 shows the results for the question whether MyCorridor is easy to navigate. To this question, we have an agreement rate of 68%.

Furthermore, the respondents were asked whether they would like to shop mobility products with MyCorridor. Figure 123 shows that the agreement rate for this question ranges between 63% in Italy and 87% in Greece and that we have a value of 70% across all countries. We also analysed the responses to the question whether MyCorridor corresponds to what users expect from the app. Figure 124 shows an approval rate ranging from 45% in the Czech Republic to 72% in Greece. The result across all countries shows a moderate agreement rate of 61%.

In addition, the participants responded to the question whether they could rely on the information they get from MyCorridor. In Figure 125, we find an agreement rate of 64% across all countries.

In Figure 126 we see the results to the question whether the respondents would feel safe if they would buy mobility tokens on MyCorridor. Across all countries, we find an agreement rate of 70%, ranging from 62% in the Netherlands to 76% in Greece. Slightly lower agreement rates (67%) are calculated when respondents were asked whether they considered the information on MyCorridor valuable (67%) in Figure 127 or whether it is very likely that they would recommend MyCorridor to a friend or colleague (69) in Figure 128.

Furthermore, Figure 129 shows that we find an approval rate of 74% for the question whether the respondents will probably visit the MyCorridor platform in the future.

Figure 130 illustrates whether the respondents find MyCorridor attractive. The results range[16] tremendously from 45% in the Czech Republic and 75% in Greece and show a moderate agreement rate of 62% across all countries.

Figure 131 shows the agreement rates to the question whether the respondents think that MyCorridor is useful for their daily activities. Again, approval rates vary widely from country to country, ranging from 42% in the Czech Republic to 71% in Italy.

According to the results in Figure 132, respondents show a **fairly high approval rate of 71% across all countries when asked whether they believe that interacting with MyCorridor does not require much of their mental effort**. The same conclusion applies when we analyse the results in Figure 133. Here we have an agreement rate of 72% across all countries for the question of whether you could use MyCorridor if someone demonstrated how to do it.

Figure 134 shows the agreement rate when the respondents were asked whether they think that they have the resources, skills and knowledge necessary to use MyCorridor. To this question we find a high agreement rate with a value of 85%, which implies a rather considerable confidence of users in using digital applications for their mobility.

Figure 135 shows the approval rate for the question of whether respondents find the process of using MyCorridor pleasant. Interestingly, the Czech Republic shows a very low approval rate of 48%, compared to Austria, Greece and the Netherlands, which have approval rates above 70%.

In Figure 136, respondents show an approval rate of 72% when asked whether they consider themselves spontaneous when using a mobile phone. The Czech (45) respondents see themselves as being significantly less spontaneous than the Greek (89%).

However, Figure 137 shows that the Greeks (38%) have the lowest approval rate when asked whether they would describe themselves as creative in using a mobile phone, while the Italians have the highest approval rate (81%). To the question in Figure 138, whether respondents would describe themselves as playful when using a mobile phone, the same order applies, and the Greeks (29%) have the lowest approval rate, while the Italians have the highest (75%) approval rate.

Figure 139 shows the results to the question whether the respondents would describe themselves as unoriginal when using a mobile phone. Here we see a rather low agreement rate of 41% across all countries.

Furthermore, the respondents were asked whether they fell uncomfortable with mobile phones. Figure 140 illustrates that the approval rate for this question is very low, ranging from 2% in Greece to 29% in Italy. This finding indicates that users fell comfortable using mobile phones. The overall

[16] *As the Netherlands have in total two responses to this question it is not considered.*

agreement rate across all countries is 16. Figure 141 illustrates a rather moderate agreement rate of 54% when asked whether respondents feel that people they care about should use MyCorridor.

Furthermore, Figure 142 shows, with a value of 90%, that most of the respondents strongly agree to the question whether they use MyCorridor voluntarily. In addition, the results in Figure 143 show that respondents tend to moderately agree that MyCorridor is useful for their work (46%).

However, Figure 144 shows that respondents are more likely to agree with the question whether the quality of the output they receive from MyCorridor is high (65%).

In addition Figure 145 shows whether it is difficult for respondents to explain why MyCorridor can be advantageous or not. In this case, a high agreement rate would mean that it is difficult for respondents to explain the benefits of MyCorridor. The results show a value of 31%, which means that respondents have no difficulty explaining the advantages of the app.

Finally, in the last question of the post-questionnaire, respondents were asked whether they would use MyCorridor if they had access to it. The results vary considerably between countries, ranging from 53% in the Czech Republic to 86% in Greece. All countries combined, the approval rate is 75%.

In summary, the results suggest that respondents do not fully understand MyCorridor and are not able to find what they want on the app. In addition, MyCorridor does not seem to be easy to use on the first visit, which corresponds to the observation that the organisation on the screen is not well structured. In addition, respondents feel that MyCorridor is suitable for all types of travellers and around 75% would recommend it to a friend. However, the respondents who would not recommend the app do so because the app is not well developed. In addition, we find a moderate approval rate when respondents are asked whether they trust the app or feel safe when buying tickets. Interestingly, respondents show a high approval rate when asked if they have the necessary skills to use the app. However, we find that respondents are not aware of the quality of the output the app produces. Finally, the results show that most respondents have no difficulty explaining the benefits of MyCorridor.

Based on the findings of the post-questionnaires we find that MyCorridor should be explained more in detail to possible users. In addition, **the design and the usability of MyCorridor should be increased.** This could **increase their confidence in the app and show them the benefits of using this kind of app**. Nevertheless**, the objective of this first evaluation round was to gather qualitative feedback from the users in order to exactly optimise the application**. The prototype version provided was only a first functional version lacking services and a lot of features that were later added and was provided to explain the users the MaaS and MyCorridor concept. **This justifies the most of the low rates given in several topics.**

5.1.6 Answering to the hypotheses

Before we start analysing the hypotheses, it is necessary to explain when a hypothesis can be confirmed and when we have to reject it. First, a hypothesis consists of several questions that are analysed. We analyse all the questions that make up a hypothesis and show whether a certain predefined threshold is reached, taking into account all respondents in the sample in all countries. However, we will also discuss the results at national level. Finally, a hypothesis can be confirmed if more than 50% of the questions reach the required thresholds. Example: Hypothesis 1 consists of nine questions and can be confirmed if at least 5 questions reach the predefined thresholds.

Hypothesis 1: The MyCorridor platform is easy to use.

The first hypothesis is that MyCorridor is easy to use. Therefore we classified the questions related to this hypothesis into two groups. In the first group, we present the questions related to the usability

measured at the end of each completed scenario. The second illustrates the questions related to the general usability scale. For both categories, we assume an average value of more than 60% to confirm hypothesis 1.

Figure 147 shows the results for the first group. All countries combined, the threshold of 60% is reached for all three questions. In addition, all countries reach the threshold at national level, with the exception of Austria on the question of creating a mobility label and the Netherlands on the question of creating an account.

To answer the hypothesis regarding the overall usability scale, we need to analyse Figure 148 and Figure 149.

Figure 148 shows that we have to reject the first hypothesis for the following two questions: (1) It is easy to find what I want on MyCorridor and (2) It is easy to use MyCorridor on your first visit. However, the threshold has been reached for the question whether it is easy to understand what I can do with MyCorridor.

In addition, according to the results in Figure 149 we can confirm the first hypothesis for the following three questions: (1) I could use MyCorridor if someone showed me how to do it, (2) It is easy to navigate within MyCorridor and (3) MyCorridor is easy to use.

In summary, across all countries, Table 13 shows that hypothesis 1 can be confirmed for seven out of nine questions respectively statements. Thus, hypothesis 1 can be confirmed for around 78% of the questions, with confirmation rates ranging from 55% to 83% among the questions.

Table 13: Traveller results for Hypothesis 1 for the 1st pilot round (across all pilot sites)

Hypothesis 1: The MyCorridor platform is easy to use.	Confirmation (>60%)/ Rejection (≤ 60%)
How easy was it to complete the scenario?	Confirmed (83%)
How easy was it to create your own Pack Maas on the go Mobility Token?	Confirmed (63%)
How easy was it to set your account	Confirmed (68%)
It is easy to find what I want on MyCorridor	Rejected (55%)
It is easy to understand what I can do with MyCorridor	Confirmed (68%)
It is easy to use MyCorridor on your first visit	Rejected (59%)
I could use MyCorridor if someone showed me how to do it	Confirmed (71%)
It is easy to navigate within MyCorridor	Confirmed (69%)
MyCorridor is easy to use	Confirmed (72%)

Hypothesis 2: The MyCorridor platform is useful.

The second hypothesis is that the MyCorridor platform is useful. Again, we group the questions associated with this hypothesis into two groups. The first group of questions is asked at the end of each scenario and the second group of questions is about the general usability scale.

To confirm this hypothesis for the first group, the following three questions need to have an approval rate above 60%. (1) How useful are the account settings and preferences, (2) How useful is the MyPack/MaaS on the go menu and (3) How useful is the registration procedure. The hypothesis can

be confirmed for all countries except Greece in the second question. Across all countries, however, the threshold is reached for all three questions.

The second group relates to questions of the general usability scale. Figure 151 shows that the hypothesis can be confirmed for the following two questions: (1) I can quickly find what I need on MyCorridor and (2) The information on MyCorridor is valuable. However, we have to reject the hypothesis when it comes to the question: I find MyCorridor is useful for my daily activities.

The results in Figure 152 also refer to the overall usability scale. We find that we have to reject the second hypothesis for the question: In my job, the use of the MyCorridor platform is relevant. However, we can confirm the hypothesis for the following two questions: (1) I would have difficulty explaining why MyCorridor can be beneficial or not[17] and (2) In my job the use of MyCorridor platform is relevant.

In summary, across all countries, Table 14 shows that hypothesis 2 can be confirmed for five out of eight questions respectively statements. Thus, hypothesis 2 can be confirmed for around 63% of the questions, with confirmation rates ranging from 31% to 73% among the questions.

Table 14: Traveller results for Hypothesis 2 for the 1st pilot round (across all pilot sites)

Hypothesis 2: The MyCorridor platform is useful.	Confirmation (> 60%)/ Rejection (≤ 60%)
How useful are the account settings and preferences?	Confirmed (73%)
How useful is the MyPack/Maas on the go menu?	Confirmed (66%)
How useful is the registration procedure?	Confirmed (72%)
I can quickly find what I need on MyCorridor.	Confirmed (66%)
I find MyCorridor is useful for my daily activities.	Rejected (56%)
The information on MyCorridor is valuable.	Confirmed (67%)
I would have difficulty explaining why MyCorridor can be beneficial or not.	Rejected (31%)
In my job, the use of MyCorridor platform is relevant.	Rejected (46%)

Hypothesis 3: The MyCorridor platform is useable.

The third hypothesis is that the MyCorridor platform is usable. To confirm this hypothesis, we assume an approval rate of over 55% for the questions in Figure 153. We find that we can confirm the hypothesis for the following four questions: (1) I have the necessary resources, skills and knowledge necessary to use MyCorridor, (2) The organization of information on the system screen is clear and (3) When I click on links, I get what I expect and (4) MyCorridor loads too slowly.[18]

In summary, across all countries, Table 15 shows that hypothesis 3 can be confirmed as all questions reach the required threshold. Thus, hypothesis 3 can be confirmed for around 100% of the questions, with confirmation rates ranging from 29%* to 86% among the questions.

[17] *For question (1) we assume an inverted scale, because in this case a higher value is better.*
[18] *For question (4) we assume an inverted scale, because in this case a higher value is better.*

Table 15: Traveller results for Hypothesis 3 for the 1st pilot round (across all pilot sites)

Hypothesis 3: The MyCorridor platform is useable.	Confirmation (> 55%)/ Rejection (≤ 55%)
I have the resources, skills and knowledge necessary to use MyCorridor.	Confirmed (86%)
The organisation of information on the system screen is clear.	Confirmed (59%)
When I click on links, I get what I expect.	Confirmed (62%)
MyCorridor loads too slowly.[19]*	Confirmed (29%)

Hypothesis 4: The travellers are successful in completing the scenarios per storyboard and user group.

Hypothesis 4 is that the travellers are successful in completing the scenarios. To confirm this question we assume a success ratio above 60% in scenario completion. Moreover, the failure percentage is assumed to be below 5%. It is also assumed that there are less than 5 major and 7 minor problems per scenario and for all users in a country.[20]

To compute the success/failure ratio we follow the same approach as in section 2.6. In addition, each user is evaluated about his or her problems after the completion of a scenario.

Figure 154 shows that the hypothesis can be confirmed for each country and across all countries. The same conclusion applies to the analysis of the average success rate per user group in Figure 155, except for users with low IT skills.

On the other hand, Figure 156 illustrates that we have to reject the hypothesis, since the average failure ratio across all countries is above 5%. However, the Czech Republic reaches the threshold in the first and second scenarios and Greece in the first and third scenarios.

Figure 157 shows the results for the average failure rate per user group. Across all countries, we have to reject the hypothesis for all user groups. The only user group below the 5% threshold is the "spontaneous users" in Greece. Furthermore, the highest average failure rate is found for users with low IT skills.

Figure 158 shows that the hypothesis can be confirmed for all scenarios when calculating the average major[21] issues of the countries studied. On the national level, however, the hypothesis must be rejected for at least one country per scenario.

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*[19] * In this context a higher agreement rate would mean that the Service Registration Tool is difficult to use. Therefore, we decided to confirm the hypothesis should be confirmed if the agreement rate is below 45% for this question.*

*[20] The gravity of the issues are defined as follows: **Minor issue**: it does not affect the completion of the task but it is visible to either you or the user. **Moderate**: It is visible to both (user/facilitator) and creates either frustration or confusion to the user to complete the task. **Major**: Visible to both, user cannot complete the task without assistance.*

[21] Major problems were, for example:

- *Navigation problems*
- *Design problems*
- *Technical problems*

Figure 159 illustrates the number of minor[22] issues per scenario and country. We note that across all countries we have to reject the hypothesis for the first scenario, while for the other scenarios the threshold has been reached.

In summary, across all countries, Table 16 shows that we have to reject hypothesis 4 regarding the average failure ratio per scenario and user group. However, it can be confirmed regarding major and minor issues and the average success ratio per scenario and user group. As a result, we find no clear result whether this hypothesis can be confirmed as it can be confirmed for around 50% of the questions.

Table 16: Traveller results for Hypothesis 4 for the 1st pilot round (across all pilot sites)

Hypothesis 4: The travellers are successful in completing the scenarios per storyboard and user group.	Confirmation/Rejection
Average success ratio per scenario (all scenarios): > 60%	Confirmed (Average of 86%)
Average success ratio per user group (all user groups): > 60%	Confirmed, except for users with low IT skills (Average of 82%)
Average failure ratio by scenario (all scenarios): < 5%	Rejected (Average of 14%)
Average failure ratio by user group (all user groups): < 5%	Rejected (Average of 18%)
Less than 5 major issues (all scenarios)	Confirmed (Average of 3.55)
Less than 7 minor issues (all scenarios)	Confirmed, except for scenario 1 (Average of 4.25)

Hypothesis 5: Personalisation of offered services is effective.

Hypothesis 5 is that the personalisation of offered services is effective. Therefore, we calculate the effectiveness and efficiency of the scenario completion.[23] To confirm hypothesis 5 we assume a threshold or 75% for each index.

Figure 160 shows that in total, across all countries, we can confirm the effectiveness hypothesis. In contrast, Figure 161 reveals that, in terms of overall efficiency, we can only confirm the hypothesis for scenario 1.

To confirm this hypothesis, we also analyse all the questions that indicate whether MyCorridor is highly tailored to the needs of the respondents: (1) I can rely on the information I get on my MyCorridor, (2) I enjoy using MyCorridor, (3) I would like to shop mobility products with MyCorridor and (4) How satisfied were you with the use of MyCorridor? We see the results in Figure 162 and Figure 163 and conclude that the hypothesis must be rejected for all four questions, across all countries. For Greece, however, we can confirm the hypothesis for two out of the four questions.

In summary, across all countries, Table 17 shows that we have to reject hypothesis 5 regarding efficiency and for all analysed questions. However, Hypothesis 5 can be confirmed about effectiveness. In addition, the hypothesis must be rejected regarding all four question that show if MyCorridor is highly tailored to the needs of the respondents. Therefore, hypothesis 5 must be

[22] *Minor problems were, for example:*
- *User did not understand the task*
- *Navigation problems*
- *Technical problems*
- *User interface problems*
- *Problems of understanding*

[23] *For a detailed discussion on how effectiveness and efficiency are calculated, see: http://ui-designer.net/usability/efficiency.htm*

rejected, as 5 out of 6 questions do not reach the required threshold. Thus, hypothesis 5 can be confirmed for around 17% of the questions, with confirmation rates ranging from 58% to 83% among the questions.

Table 17: Traveller results for Hypothesis 5 for the 1st pilot round (across all pilot sites)

Hypothesis 5: Personalisation of offered services is effective.	Confirmation (> 75%)/ Rejection (≤ 75%)
Effectiveness (all scenarios)	Confirmed (Average of 83%)
Efficiency (all scenarios)	Rejected, except for scenario 1 (Average of 66.5%)
I can rely on the information I get on MyCorridor.	Rejected (64%)
I enjoy using MyCorridor.	Rejected (61%)
I would like to shop with MyCorridor.	Rejected (70%)
How satisfied were you with the use of MyCorridor?	Rejected (58%)

Hypothesis 6: Travellers are positive towards MaaS technologies.

Hypothesis 6 is that travellers are positive towards MaaS technologies. We therefore analyse questions about the acceptance of MaaS in Figure 164 and Figure 165.

In Figure 164 we analyse the agreement rate for the following questions: (1) I will probably visit the MyCorridor platform in the future, (2) It is very likely that you will recommend MyCorridor to a friend or colleague and (3) MyCorridor keeps the promises it makes to me. Across all countries, we find that the threshold for all three questions has been reached. The same applies at national level, with the exception of Greece, which does not reach the threshold for two of the three questions.

Figure 165 analyses the agreement rate of the following questions: (1) I would feel safe if I bought mobility tokens on MyCorridor, (2) If I had access to MyCorridor, I would use it and (3) People I care about would think I should use MyCorridor. Across all countries, we have to reject the hypothesis for question 3 but can confirm it for the remaining two questions. On the national level, however, all questions can be confirmed, except the second for the Czech Republic and the third for Austria and the Czech Republic.

In summary, across all countries, Table 18 shows that hypothesis 6 can be confirmed as 5 out of 6 questions reach the required threshold. Thus, hypothesis 6 can be confirmed for around 83% of the questions, with confirmation rates ranging from 54% to 75% among the questions.

Table 18: Traveller results for Hypothesis 6 for the 1st pilot round (across all pilot sites)

Hypothesis 6: Travellers are positive towards MaaS technologies.	Confirmation (> 60%)/ Rejection (≤ 60%)
I will probably visit the MyCorridor platform in the future.	Confirmed (75%)
It is very likely that you will recommend MyCorridor to a friend or colleague.	Confirmed (70%)
MyCorridor keeps the promises it makes to me.	Confirmed (61%)
I would feel safe if I bought mobility tokens on MyCorridor.	Confirmed (70%)

If I had access to MyCorridor, I would use it.	Confirmed (75%)
People I care about would think I should use MyCorridor.	Rejected (54%)

5.1.7 Interpretation of the results

The results of the baseline survey show that although the car is the most used means of transport, respondents are most satisfied when they use the bicycle or the train. Furthermore, **the most important thing for respondents when choosing their mode of transport is that it is cheap and convenient**. So, we see some potential for apps like MyCorridor if they offer a cheap and convenient combined transport service. This gap could well be closed by applications like the MyCorridor app.

The results from the pre-questionnaires make it clear that around 83% of respondents already buy mobility products online. However, with 75% of respondents stating that they feel comfortable buying online if they know the company, **its reputation appears to be an important consideration in the large-scale roll-out of apps such as MyCorridor.** In addition, respondents state that it is important for them that such an app is easy to navigate and has a good design.

However, it seems that MyCorridor still has potential on these two points, as the results of the post-scenario evaluation show that it is difficult for respondents to complete the scenarios due to an unclear design and options. This finding is underlined by the results from the post-questionnaires, where the respondents state that it is not easy for them to find what they want on the app because the information on the screen is not well structured. Improving these points is one of the most important points to make apps like MyCorridor successful in the future.

In the administered questionnaires, the question items of SUPR-Q (2020) percentile ranks standardised questionnaire were used, which measure the usability (16%), trust (18%), loyalty (22%) and appearance (29%) with percentile ranks, which place the tested technology in comparison to existing commercial online sites. In other words, it benchmarks the user experience with the MyCorridor app with other commercial products, and it is found to be **better than 21% of them**. As the calculation algorithms are under license, we can only present the final outcome here and not the actual process, which is conducted through a(n) (under license) spreadsheet template. This process has been replicated in the second phase, so there is a result for the second phase as well. This is a standardised questionnaire and methodology that can be applied at any level of the process as long as we have a functional prototype. We were not planning to have any further usability testing taking place for the remaining duration of the project; therefore it acted as a safeguard for the functions that have already been developed and integrated. The finding is **mediocre in case of the MyCorridor app was already a product in the market, but for a research prototype the finding is positive, and it shows that the application could be a valuable addition to the transportation market.**

5.1.8 Improvements that have been conducted for the preparation for pilot round 2

With regards to improvements for the MyCorridor app, the pilot site leaders reported any arising problems to the developers so that the problems could be dealt with as quickly as possible and ideally be solved in a short time. These problems were systematically recorded, rated according to the severity of the problem and prioritised on this basis. Between the first and second test phase, the following improvements were made to the MyCorridor app.

The primary improvements made were to restructure the travel preferences menu, remove some of the options and leave only the important ones to avoid creating a 'very heavy' menu. In addition, additional functions were fully implemented for the second pilot round. In the development process

the feedback that was provided from the pilot tests and the issues that came up have been taken into consideration. Improvements have been made for the following aspects: i) Green Packs, ii) My trips, iii) My packs, iv) My rewards, the loyalty scheme, v) Surveys, vi) Help Centre, vii) Payment process, viii) Navigation, ix) Integration of Karhoo external car service provider, xi) Push notification support, xii) GUI enhancements and modifications. The improved versions of the MyCorridor App applications have eventually been made available in Google Play Store (2020) (Android version) and iOS Store (2002) (iOS version) in view of the second real life evaluation round.

5.2 Evaluation results from the service providers

In the following sections, the results from the service provider evaluations from the first pilot iteration is presented by answering to the hypotheses that were defined in D6.1. The underlying data sets that were used for those evaluations are the results from the baseline interviews, from the post-questionnaires and from the diaries that the participants kept during the evaluation process.

5.2.1 Answering the hypotheses

In answering the service provider hypothesis, we follow the same approach as in analysing the results of the travellers. Thus, we have decided to confirm a hypothesis when a certain predefined threshold is reached, considering all respondents in the sample in all countries. Due to the sample of five respondents will mainly be discussed overall and on national level only when appropriate.

Hypothesis 1: The Service Registration Tool is easy to use.

The first hypothesis is that the Service Registration Tool is easy to use. To confirm this hypothesis we assume an average value of more than 60%.

With a value of 65%, Figure 166 shows a moderate approval rate of the respondents regarding the question whether the service registration tool is easy to navigate. However, the first hypothesis can be confirmed with this question, as the value is above the threshold of 60%.

In addition, Figure 167 shows the respondents answers to yes/no questions. To confirm the hypothesis in this context, we aim for more than 60% of respondents to answer no. We find that we can confirm the hypothesis for the following question: (1) Did you contact directly the development team for help? However, we must reject the hypothesis regarding the following questions: (1) Did it take more effort to register your service on the Service Registration Tool than originally planned? (2) Did it take more time to register the service than originally planned or anticipated to?

As shown in the previous figure, Figure 168 shows answers to yes/no questions. However, in this context, the hypothesis can be confirmed if more than 60% of the respondents answer yes. We find that this threshold is reached for the following question: (1) Was it easy to locate the field explanation. On the other hand, the hypothesis must be rejected if the respondents were asked the following question: (2) Was it easy to test the correctness of the registration process.

In Figure 169 six questions are analysed, whereby the hypothesis can be confirmed for the following three questions: (1) How easy was it to learn to use the Service Registration Tool? (2) How straightforward was it to meet the pre−requisites for the integration to MyCorridor? (3) How straightforward was the registration process? Consequently, three questions do not reach the 60% threshold: (1) How straightforward is it to modify service information after integration to address issues? (2) How straightforward is it to modify the service information after integration to modify functionality? (3) How straightforward is it to modify the service information after integration to add new functionality?

Finally, respondents were asked to indicate their agreement rate on the following seven questions:

- I felt very confident using the Service Registration Tool.
- I found the Service Registration Tool unnecessarily complex.
- I found the Service Registration Tool very cumbersome to use.
- I needed to learn a lot of things before I could get going with this Service Registration Tool.
- I think that I would need the support of a technical person to be able to use this Service Registration Tool.
- I thought the Service Registration Tool was easy to use.
- I would imagine that most people would learn to use this Service Registration Tool very quickly.

Figure 170 illustrates that all of these seven questions must be rejected.

Overall, we find that 13 out of the 19 questions do not reach the required threshold, which leads us to the assumption that we must reject the following hypothesis: The service registration tool is easy to use. Thus, hypothesis 1 can be confirmed for around 32% of the questions, with confirmation rates ranging from 40% to 100% among the questions.

Table 19: Service provider results for Hypothesis 1 for the 1st pilot round

Hypothesis 1: The Service Registration Tool is easy to use.	Confirmation (> 60%)/ Rejection (≤ 60%)
Please rate the ease of navigation of the Service Registration Tool.	Confirmed (65%)
Did it take more effort to register your service on the Service Registration Tool than originally planned?	Rejected (40%)
Did it take more time to register the service than originally planned or anticipated to?	Rejected (60%)
Did you contact directly the development team for help?	Confirmed (80%)
Was it easy to locate the field explanations?	Confirmed (100%)
Was it easy to test the correctness of the registration process?	Rejected (60%)
How easy was it to learn to use the Service Registration Tool?	Confirmed (70%)
How straightforward is it to modify service information after integration to address issues?	Rejected (50%)
How straightforward is it to modify the service information after integration to modify functionality?	Rejected (50%)
How straightforward is it to modify the service information after integration to add new functionality?	Rejected (55%)
How straightforward was it to meet the pre−requisites for the integration to MyCorridor?	Confirmed (65%)
How straightforward was the registration process?	Confirmed (75%)
I felt very confident using the Service Registration Tool.	Rejected (50%)
I found the Service Registration Tool unnecessarily complex.*[24]	Rejected (40%)
I found the Service Registration Tool very cumbersome to use.*	Rejected (45%)
I needed to learn a lot of things before I could get going with this Service Registration Tool.*	Rejected (40%)

[24] * In this context a higher agreement rate would mean that the Service Registration Tool is difficult to use. Therefore, we decided to confirm the hypothesis should be confirmed if the agreement rate is below 40% for these four questions.

I think that I would need the support of a technical person to be able to use this Service Registration Tool.*	Rejected (40%)
I thought the Service Registration Tool was easy to use.	Rejected (50%)
I would imagine that most people would learn to use this Service Registration Tool very quickly.	Rejected (50%)

Hypothesis 2: The Service Registration Tool is useful.

Hypothesis 2 is that the Service Registration Tool is useful. To confirm this hypothesis, a threshold value of more than 60% must be reached.

In Figure 171 indicates the agreement rate to the following question: (1) Will you recommend MyCorridor to other colleagues not related to the project or other service providers? We note that the hypothesis must be rejected because the approval rate does not reach the 60% threshold.

Furthermore, we analyse yes/no questions in Figure 172. In order to confirm the hypothesis, the aim in this context is that as many respondents as possible answer yes. We illustrate that hypothesis can be confirmed for the questions: (1) Did the documentation provide clear and high-level support? (2) Did the field explanations provide the type of information you need? (3) Was the example helpful? However, we must reject the hypothesis for the following questions: (1) Is the documentation appropriate for the work you are carrying out? (2) Is the documentation structured for the work you are carrying out?

In addition, in Figure 173 we analyse the answers of the respondents to yes/no questions. In this context, we can confirm the hypothesis if more than 60% of the respondents answer no. We find that the hypothesis can be confirmed for the following question: (1) Do other registration tools of service providers cover topics or aspects that are missing from this registration tool? In addition Figure 174 we find that the hypothesis can be confirmed for the following question: (1) How useful did you find the available resource (i.e. the example)?

Overall, Table 20 shows that 6 out of the 9 questions do not reach the required threshold, which lead to the assumption that we can confirm the hypothesis: The service registration tool is easy to use. Thus, hypothesis 2 can be confirmed for around 67% of the questions, with confirmation rates ranging from 50% to 100% among the questions.

Table 20: Service provider results for Hypothesis 2 for the 1st pilot round

Hypothesis 2: The Service Registration Tool is useful.	Confirmation (> 60%)/ Rejection (≤ 60%)
Will you recommend MyCorridor to other colleagues not related to the project or other service providers?	Rejected (50%)
Did the documentation provide clear and high-level support?	Confirmed (80%)
Did the field explanations provide the type of information you need?	Confirmed (80%)
Is the documentation appropriate for the work you are carrying out?	Rejected (60%)
Is the documentation structured for the work you are carrying out?	Rejected (60%)
Was the example helpful?	Confirmed (80%)
Do other registration tools of service providers cover topics or aspects that are missing from this registration tool?	Confirmed (100%)

How useful did you find the available resource (i.e. the example)?	Confirmed (70%)

Hypothesis 3: The Service Registration Tool is useable.

The third hypothesis claims that the Service Registration Tool is usable. To answer this question, we apply the SUS introduced by Brook.[25] For a detailed description of the approach see section 0. To confirm this hypothesis, the score must be above 55 points. Figure 175 shows that the threshold is reached for all respondents, ranging from 62 points in Italy to 78 points in the Czech Republic and the Netherlands. Across all countries, the SUS score reaches 70 points. Thus, we find that hypothesis 3 can be confirmed.

Table 21: Service provider results for Hypothesis 3 for the 1st pilot round

Hypothesis 3: The Service Registration Tool is useable.	Confirmation (> 55 points) Rejection (≤ 55 points)
Austria	Confirmed (72 points)
Czech Republic	Confirmed (78 points)
Greece	Confirmed (62 points)
Italy	Confirmed (60 points)
Netherlands	Confirmed (78 points)
Overall	Confirmed (70 points)

Hypothesis 4: The Service Providers are successful in completing the registration process.

The fourth hypothesis is that the Service Providers are successful in completing the registration process.

To answer this hypothesis, we analysed whether the respondents were able to complete the scenarios successfully. When calculating the completion rate, we only took into account tasks that were 100 percent successfully completed. Figure 176 shows that the hypothesis can be confirmed for all countries except for Italy. Furthermore, we find a completion rate of around 79% at the aggregate level and can therefore confirm this hypothesis.

In addition, Figure 177 shows the failure ratio for scenario completion. To confirm this hypothesis, the failure ratio must be below the 10% threshold. To calculate the failure ratio, only completely failed tasks are considered. We find that the hypothesis can be confirmed for the Czech Republic and Greece, while it must rejected for Austria, Italy and the Netherlands. Furthermore, the hypothesis must be rejected at the aggregated level.

To confirm hypothesis 4, the error rate per respondent must be below five percent. To calculate the error rate, we have weighted the errors according to their severity. An error considered "high" is counted as 3, a "moderate" error as 2 and a "low" error as 1. We aggregate the weighted errors by person and divide them by the total number of tasks. As a result, the percentage of errors can be higher than 100% if many "high" errors are made. Figure 178 shows that the hypothesis can only be confirmed for Greece but must be rejected for the other countries. All countries combined, the

[25] *For a detailed discussion about the SUS see, among others, Brooke, J. (2013). SUS - a retrospective. Journal of Usability Studies.*

average percentage of errors reaches 33%, which means that we have to reject the hypothesis at an aggregated level.

To answer this hypothesis, we also analysed the problems that occurred but were not solved with the development team. To confirm the hypothesis, there must be no more than 5 major and 7 minor issues. Figure 179 illustrates the number of major[26] issues and shows that the hypothesis can be confirmed for all countries except Austria. Moreover, Figure 180 indicates the number of minor[27] issues and shows that the hypothesis can be confirmed for all countries. Thus, hypothesis 4 can be confirmed for around 60% of the questions. Table 22 shows that hypothesis 4 can be confirmed as only 2 out of 5 questions reach the required threshold. Thus, hypothesis 4 can be confirmed for around 60% of the questions.

Table 22: Service provider results for Hypothesis 4 for the 1st pilot round

Hypothesis 4: The service providers are successful in completing the registration process.	Confirmation/Rejection
Success ratio in scenario completion (>60% in 1st phase)	Confirmed (79%)
Failure ratio in scenario completion (<10% in 1st phase)	Rejected (16%)
Error percentage (<5% in 1st phase)	Rejected (33%)
Issues encountered but not resolved with the development team: less than 5 major issues	Confirmed (1.2)
Issues encountered but not resolved with the development team: less than 7 minor issues	Confirmed (1.6)

5.2.2 Improvements that have been conducted for the preparation for pilot round 2

Regarding improvements of the service provider tool, this was based on the feedback that was received from the service providers and the pilot site leaders. The following improvements were made to the Service Registration Tool: For entering the location where a service operates, a list with the name 'Level' was added with two available options 'Country' and 'City'. If the user chooses 'Country', he/she can start entering the name of the country in the corresponding input form. Respectively, if the user chooses 'City' he/she can type the name of the city where the service operates. Auto-completion functionality is also supported in both cases. Another important improvement made was the provision of functionality for uploading API documentations as documents (e.g. in pdf format). Thus, service providers can easily upload to the Service Registration Tool any API documentation files they have available in order to assist the integration of their services into the MyCorridor platform. Finally, minor changes were made in the UI (User Interface) of the Service Registration Tool to improve the user experience.

[26] *Major problems were, for example:*
- *No product was selectable.*
- *Lack of granularity in the selection options.*
- *Parameters cannot be specified.*
- *Unclear options.*

[27] *Minor problems were, for example:*
- *Unclear options*
- *Lack of granularity in the selection options*
- *Complicated design*
- *Technical problems*

6 Results 2nd pilot iteration phase

In the following section the results from the second pilot phase from the traveller and service provider evaluations are presented.

6.1.1 Mobile analytic results - evaluation of the logged user data

To provide a deeper understanding of how the MyCorridor application works, we offer several analyses of the logged data for each country separately and in aggregated form. First, we present the number of users and trips. Furthermore, we analyse the distribution of users and trips over the evaluation period. We also analyse different travel characteristics such as the average duration, distance and number of transfers of a trip. Furthermore, we analyse the distribution of service clusters used by the participants.

In total, Figure 192 shows that 160 individual users made 934 trips with the MyCorridor application. However, if we group the individual users by country, the total is 166. This is due to the fact that some users have used the app in more than one country and therefore cannot be clearly assigned to one country. The number of trips varies from country to country, ranging from 475 (51%) in Austria to 28 (3%) in the Netherlands. The same applies to the number of different users, ranging from 69 (42%) in Greece to 8 (5%) in the Netherlands.[28]

Figure 193 and Figure 194 show the development of the number of users and trips during the observation period. Week 0 represents the trips made in the first roll-out of the second evaluation phase in Austria between February and May 2020. The main test period ranges from week 1, which starts on 15/06/2020, to week 20, which ends on 31/10/2020.

Regarding the number of users, we note that Austria starts with the highest number of users of all countries after the first testing phase in week 0 and steadily increases its number during the main test phase. Greece shows a significant increase from week 4 to week 15, after which no more users were recruited to use the app. Italy and the Czech Republic increased their number of users slightly during the observation period. The Netherlands recruited its last new users in week 16. Regarding the number of trips, we find a similar development to the number of users. However, Austria shows the highest number of trips from week 0 to week 20.

Furthermore, Figure 195 illustrates the average number of service modes used per trip and user. Greece shows the highest average number of service modes by trip (1.94) and user (1.88). Furthermore, the Netherlands have an average number service modes per trip of 1.07 and by user of 1.12. Austria has an average number of service modes by users of 1.2, while Italy and the Czech Republic show an average of one for trips and users, respectively. **Overall, we find an average number of service modes by trips of 1.21 and users of 1.48.**

Figure 196 shows that the average journey time ranges from 25 minutes in Italy to 80 minutes in Greece. Overall, the **average journey time in all countries is 38 minutes**.

[28] It should be noted that in the case of Greece, 188 out of 200 trips do not provide information on trip duration or distance. Thus, a total of 12 trips can be used to calculate the average distance and duration, as no local data are available. In addition, the Netherlands provides 3% of the total trips and 5% of the total users. Therefore, the results of Greece and the Netherlands are prone to outliers.

Figure 197 shows the average trip length for the countries analysed. Greece has by far the longest average trip length with an average of around 117 km per trip. The other countries have average trip lengths ranging from 16 km in Italy to 44 km in the Netherlands. The **average of all trips is around 29 km**.[29]

Figure 198 illustrates the average number of transfers made by respondents per trip. Respondents in Greece and Italy have an average number of transfer operations of 0. Austria shows the highest value with 1.9 average transfer operations, followed by an average of 0.4 transfer operations in the Czech Republic and in the Netherlands. The **average number of transfers is 1.1 among all countries**.

Figure 199 indicates the relative share of service clusters used per trip for each country. We note that the distribution of service clusters varies considerably from country to country. In Austria and the Czech Republic, the categories *mobility* and *traffic management* are most commonly used. In Greece, 96% of trips were made using the *green package (combination of mobility, infomobility, and added value services)* category, while in Italy (100%) and the Netherlands (54%) most of the trips were made using the *traffic management* category.

If we analyse all trips together, we find that the category *traffic management* (54%) is most often used, followed by *green packs* (i.e., combination of all categories; 21%) and *mobility services* (20%). *Infomobility services* are used in 4% of all trips, followed by the category *added value services* with 2%.

Figure 200 combines the service cluster categories *mobility*, *traffic management*, *added value* and *infomobility* into one category: *Maas on the go*. This category is compared with the category *green packs*. We find that *green packs* are only used in Greece, where they account for about 96% of all trips. Among all countries, *green packs* account for about 21% whereas it has to be noted that *green packs* were only offered in Greece.

Further, the number of cross-border trips was also evaluated. A total of 16 cross-border trips were registered, the majority of which took place between Austria and Germany. These are broken down in detail as follows:

- Austria – Germany: 7
- Germany – Austria: 8
- Czech Republic – Austria: 1

The original idea was to test the concept of cross-border travel with the MyCorridor app, which also offers an interesting added value in the eyes of the users. However, these tests were only possible to a very limited extent or not at all in times of the Covid-19 pandemic due to the partly very restrictive travel restrictions. Because of this, the number of cross-border journeys is very limited.

Finally, the analyses also showed that 76% of the participants carried out the tests with a smartphone with an Android operating system and 24% had an iOS operating system (Google Firebase, 2020).[30]

[29] It should be noted that for Greece the results of average length and distance are based on 12 trips and are therefore sensitive to extreme observations.
[30] Source: https://console.firebase.google.com/

6.1.2 Results from the online pre-questionnaires

This subsection presents the results of the 148 pre-questionnaires across all countries (126 mainstream users and 22 in-depth users). As already pointed out in the demographics and background information overall, and for mainstream users (see Figure 181) we find that the number of participants varies among the countries (around 30% for Austria and Greece, and around 12% for Italy, Netherlands, and Czech Republic). For in-depth users, we see that nearly half of them are from Austria.

Figure 201 shows how many users (in percent) have a travel card or have subscribed to some kind of mobility service (car sharing, car-pooling, etc.) and we find that **most of the users (56%), especially mainstream users, do not have any of the above (travel card and/or subscription)**. This finding is consistent with the fact that most of the users have at least one car per household (see Figure 186). Among the **in-depth users we see that half of them have a travel card**.

Figure 202 shows which combination of transport modes the respondents usually use for their most frequent journey and we find that the **car is the mode that is mostly used as it is used by 71% of all users, followed by walking (61%) and bus (42%)**. Similar distributions are found for mainstream users and for in-depth users, even so for the **latter ones the walking percentage has a lower value**. Walking did not appear as such a high option in the 1st round results; therefore we suspect that this finding might be related to the effects of the COVID situation to transportation choices.

It must be pointed out that most of the users indicated that they use more than one transport mode for their most frequent journey (78% overall), walking is generally included among multiple modes (see Figure 203). Although, only 55% of the in-depth users use more than one mode, while the rest (45%) uses only one mode, which is mostly the car. For the mainstream users, **17% use only one mode, and even among them the largest share is car usage**.

The most frequent journey is for commuting as it is shown in Figure 204, where we find that **88% of the users** (i.e., 87% of the mainstream and 95% of the in-depth respondents) **use the combination of modes indicated before for "commuting for work/study"**.

Overall, the distance for the most frequent journey is equally distributed among the values provided as possible answers (from 2-5 km to over 30 km, as it can be seen in Figure 205). Furthermore, the time spent is symmetrically distributed (see Figure 206). **93% of the overall users need less than one hour for their trip, while more than 50% need between 20 and 45 minutes**. We find a similar distribution for the mainstream users, while for the in-depth users around 50% need between 30 and 60 minutes. Moreover, for in-depth users the distribution is asymmetrical to the right (higher values of time spent).

Figure 207 illustrates the assessment given by the users for the existing modes of transport and the aspects related to these. **For both mainstream and in-depth users, we find that they rate conventional transport modes highly attractive, while sharing modes are the least attractive.** Furthermore, the results show high satisfaction for personal safety and transport security during the journey, followed by general comfort. A **lower rating is shown for the trustworthiness of transport services.**

The **use of MaaS products is attractive** to users because (see Figure 208) **all modes of transport can be used with just one ticket (47% overall, 44% mainstream users, 64% in-depth users)**, followed by the possibility to switch from private to public transport without having to think about it (19% overall, 21% mainstream users, 9% in-depth users). Figure 209 shows though that **most of the users have never used a MaaS application before (85% overall, 83% mainstream users, 95% in-depth users).**

When asked how the respondents think the MyCorridor mobile app will be (see Figure 210), in-depth users express an average rating of all the three aspects (easy to use, useful for organizing my trips, a positive experience), while mainstream users appear to be a little more confident.

6.1.3 Results from the online post-questionnaires

The following subsection presents the results of the participant's assessment of the MyCorridor app based on their experiences of the app during the second evaluation round. Not all participants who completed the pre-questionnaires also completed the post-questionnaires, so the sample sizes of mainstream, in-depth and total users are slightly reduced.

Figure 211 shows the first part of the users' rating. Mainstream users tend to have a more positive rating. They are **neutral in terms of recommending the app to others and in terms of the overall experience of using the MyCorridor app**. They show a lower rating when asked if they like the app and use it frequently or will continue to use the app. In contrast, in-depth users have a low rating when asked to recommend the app and on their overall experience with the MyCorridor app. Furthermore, in-depth users show a very low rating when asked if they like the app and would use it often or will continue to use it.

When users are asked more absolute questions to rate the app (see Figure 212), the average rating drops, in some cases to minimum values for in-depth users.

Figure 213 shows the results of the users' evaluation of the app in terms of its overall usability. As in the previous evaluation, **in-depth users have a lower rating of each aspect compared to mainstream users, who seem to have a more neutral attitude**. For both, the average rating is not satisfactory, especially in relation to the features and functions that users would like to see in the app.

Figure 214 shows additional evaluation of the app's usability aspects. The rating is by average higher than the previous ones for both mainstream users and in-depth users, who are both neutral in rating that it is easy to navigate the app or that it is easy to use. There is a slightly lower rating for assessing how useful the app is in organising trips and for the time spent on planning. The rating is lower for aspects related to the attractiveness of the app.

Figure 215 shows the participants' assessment of the services provided by the app, and both mainstream users and in-depth users have a low rating for the promotion/incentives and the innovative transport services provided by MyCorridor. In addition, a higher rating is given when it comes to conventional transport services. **Participants gave an essentially neutral assessment of the safety, comfort and trustworthiness of transport, while mainstream users gave a more positive assessment.**

What makes MyCorridor app most attractive to users (see Figure 216) are the same aspects that emerged in the pre-surveys on MaaS attractiveness, namely the **ability to use all modes of transport with just one ticket** (35% overall, 34% mainstream users, 45% in-depth users), followed by the ability to switch from private to public transport without giving it much thought (18% overall, 18% mainstream users, 15% in-depth users).

Figure 217 shows that the users who participated in the second pilot round have used services that they generally use, **only 12% overall have tried services that they have not used in the past**.

While mainstream users would use MyCorridor app even if it did not offer promotions or incentives, in-depth users would not use MyCorridor app if it did not offer promotions or incentives (see Figure 218). However, all users say that the journeys they have made with the app have had no promotion (see Figure 219).

Finally, **most of the users say they know about the environmental benefits of MaaS (75% overall, 79% mainstream users, 55% in-depth users).**

6.1.4 Answering the Hypothesis

Before we start analysing the hypotheses, it is necessary to explain when a hypothesis can be confirmed and when we have to reject it. First, a hypothesis consists of several questions that are analysed. We analyse all the questions that make up a hypothesis and show whether a certain predefined threshold is reached, taking into account all respondents in the sample in all countries. Finally, a hypothesis can be confirmed if more than 50% of the questions reach the required thresholds. Example: Hypothesis 1 consists of seven questions and can be confirmed if at least four questions reach the predefined thresholds.

Hypothesis 1: The MyCorridor platform is useful.

The first hypothesis is that the MyCorridor platform is easy to use. To confirm this hypothesis we assume an average value of more than 70% for more than half of the specific questions related to the general usability scale. The questions were evaluated separately for mainstream and in-depth users.

Figure 221 shows the overall usability scale for each specific question both for the mainstream users and in-depth users, and these are all below the 70% threshold for which each question would have been confirmed. Table 23 shows that all the specific questions related to the general usability scale are rejected. Thus, hypothesis 1 must be rejected, with confirmation rates ranging from 31% to 60% among the questions.

Table 23: Traveller results for Hypothesis 1 for the 2nd pilot round

Hypothesis 1: The MyCorridor platform is useful.	Confirmation (> 70%)/ Rejection (≤ 70%)
I think MyCorridor app will be easy-to-use (mainstream users)	Rejected (60%)
It is easy to navigate within the MyCorridor app (mainstream users)	Rejected (48%)
The MyCorridor app is easy to use (mainstream users)	Rejected (49%)
I think MyCorridor app will be easy-to-use (in-depth users)	Rejected (50%)
It is easy to navigate within the MyCorridor app (in-depth users)	Rejected (33%)
The MyCorridor app is easy to use (in-depth users)	Rejected (31%)

Hypothesis 2: The MyCorridor platform is useful.

The second hypothesis has not been considered in the second evaluation round because the focus was on the completion of scenarios during the lab-testing session. However, to enable an easy comparison between the evaluation rounds we do not change the numbering of the hypotheses and keep the numbering.

Hypothesis 3: The MyCorridor platform is useable.
The third hypothesis is that the MyCorridor platform is usable. Again, to confirm this hypothesis we assume an average value of more than 70% for more than half of the specific questions related to the general usability scale for both, mainstream users and in-depth users.

Figure 222 shows the results for the overall usability questions for the mainstream users, and we find that all the questions have to be rejected since none of them reaches the 70% threshold.

Figure 223 shows the results for the overall usability questions for the in-depth users. We find that all the questions have to be rejected since none of them reaches the 70% threshold either.

Table 24 shows that hypothesis 3 must be rejected since all the specific questions related to the general usability scale for both the mainstream users and the in-depth users are rejected, with confirmation rates ranging from 23% to 58% among the questions.

Table 24: Traveller results for Hypothesis 3 for the 2nd pilot round

Hypothesis 3: The MyCorridor platform is useable.	Confirmation (> 70%)/ Rejection (≤ 70%)
I think MyCorridor app will be useful for organizing my trips (mainstream users).	Rejected (58%)
The design of the app makes it easy for me to find what I am looking for (mainstream users).	Rejected (48%)
The MyCorridor app is useful in organizing my trips (mainstream users).	Rejected (39%)
It takes less time to plan my trips (mainstream users).	Rejected (33%)
Overall, using MyCorridor was a positive experience (mainstream users).	Rejected (46%)
I think MyCorridor app will be useful for organizing my trips (in-depth users).	Rejected (53%)
The design of the app makes it easy for me to find what I am looking for (in-depth users).	Rejected (26%)
The MyCorridor app is useful in organizing my trips (in-depth users).	Rejected (24%)
It takes less time to plan my trips (in-depth users).	Rejected (23%)
Overall, using MyCorridor was a positive experience (in-depth users).	Rejected (29%)

Hypothesis 4: The travellers are successful in completing the scenarios per storyboard and user group.

Hypothesis 4 is that the travellers are successful in completing the scenarios per storyboard and user group. To confirm this hypothesis we assume a rate of over 70% of successfully completed trips. Moreover, the failure percentage is assumed to be below 2%. It is also assumed that there are less than 3 major and 5 minor problems per scenario and for all users in total.

Figure 224 shows the success rate, which is calculated as the ratio of successfully completed trips to all trips. We note that hypothesis 4 can be confirmed for the Czech Republic, Greece and Italy but must be rejected for Austria and the Netherlands. **At the aggregated level, however, we reach 66% and must reject the hypothesis.**

To calculate the average failure rate, we divided the number of reported errors in the second phase by the number of users. It is necessary to mention that only errors from the Austrian pilot site were reported in the specific table that was set up for this purpose. Therefore, we divided the total number of errors (26) by the number of Austrian users (50), which results in an error percentage of 52% in Figure 225. Consequently, we have to reject the hypothesis regarding the error percentage.

With regard to major and minor issues, in the second phase testing there have been three unresolved major issues, and three unresolved minor issues, for all users overall, so the hypothesis must be rejected for major and minor problems.

Of the three major issues that were not solved, two were related to the journey planner. It was observed by iOS and Android users that the direct/fastest connection was not always displayed or was not always ranked as the first option. The second issue was that already used addresses in the trip search were not saved. The third major issue that wasn't solved was related to ticketing problems with the Salzburg Transport Association in Salzburg, since users sometimes got tickets that were not valid for some legs of the journey respectively the tickets were not displayed correctly in the app.

Of the three minor issues, the first issue is related to iOS where it was not possible to set intermediate stops. The second minor issue is that in some cases the app crashed and the journey was ended before the user reached the destination. The third issue is about the pop-up questions that are related to the trip experience that were showing up too early, in some cases even before the user had pushed the "start trip" button. Also, car users cannot answer questions during the trip, so it would be better to postpone them to the end of the trip experience.

In summary, Table 25 shows that we have to reject hypothesis 4 since it has to be rejected for all the aspects, the average success rate, the average failure ratio per scenario, the major issues and the minor issues. Thus, hypothesis 4 must be rejected for all questions, with confirmation rates ranging from 52% to 66% among the questions.

Table 25: Traveller results for Hypothesis 4 for the 2nd pilot round

Hypothesis 4: The travellers are successful in completing the scenarios per storyboard and user group.	Confirmation/Rejection
Average success ratio (> 70% in 2nd phase)	Rejected (66%)
Average failure ratio (< 2% in 2nd phase)	Rejected (52%)
Issues encountered but not resolved with the development team: less than 3 major issues	rejected
Issues encountered but not resolved with the development team: less than 5 minor issues	rejected

Hypothesis 5: Personalisation of offered service is effective.

Hypothesis 5 is that the personalisation of offered services is effective. This is why we calculate the effectiveness and efficiency of traveling with MyCorridor.[31] Unlike in the first round, we use the logged data that gives us information about the booking process within the MyCorridor platform. To calculate effectiveness, we have excluded the deleted trips from our database and take the ratio of successfully completed trips to all trips.[32] To calculate the relative overall efficiency, we take the ratio of the time required by users who have successfully completed a trip to the total time required by all users.

To confirm hypothesis 5 we assume a threshold of 85% for each index.

Figure 226 illustrates that we have to reject hypothesis 5 for all countries, as the effectiveness rate ranges from 57% in Austria to 80% in Greece. Across all countries, we have an effectiveness rate of

[31] *For a detailed discussion on how effectiveness and efficiency are calculated, see: http://ui-designer.net/usability/efficiency.htm*

[32] *Please note that the only difference between success rate and effectiveness is that we do not include deleted trips in the latter.*

67%, which is well below the 85% threshold. Figure 227 shows the results for relative overall efficiency and that we must reject hypothesis 5 for all countries and at the aggregate level. Relative overall efficiency is highest in the Czech Republic and Italy (81%) and lowest in Greece (44%). At the aggregated level, we have a value of 61% and clearly do not reach the threshold of 85%.

To confirm this hypothesis, we also analyse all the questions that indicate whether MyCorridor is highly tailored to the needs of the respondents: (1) The MyCorridor app has all the features and functions that you would ever want, (2) The MyCorridor app's capabilities meet my requirements. We see the results in Figure 228 and conclude that the hypothesis must be rejected for all questions, for both mainstream and in-depth users.

In summary, Table 26 shows that we have to reject hypothesis 5 since as it is rejected regarding all the aspects, effectiveness, efficiency, and the questions related to "tailoring". Thus, hypothesis 5 must be rejected for all questions, with confirmation rates ranging from 21% to 67% among the questions.

Table 26: Traveller results for Hypothesis 5 for the 2nd pilot round

Hypothesis 5: Personalisation of offered services is effective.	Confirmation (> 85%)/ Rejection (≤ 85%)
Effectiveness (all scenarios)	Rejected (67%)
Efficiency (all scenarios)	Rejected (61%)
The MyCorridor app has all the features and functions that you would ever want (mainstream users).	Rejected (28%)
The MyCorridor app's capabilities meet my requirements (mainstream users).	Rejected (36%)
The MyCorridor app has all the features and functions that you would ever want (in-depth users).	Rejected (21%)
The MyCorridor app's capabilities meet my requirements (in-depth users).	Rejected (26%)

Hypothesis 6: Travellers are positive towards MaaS technologies.

Hypothesis 6 is that travellers are positive towards MaaS technologies. It should be mentioned that according to the research questions in section 2.3 it was planned to control whether the acceptance towards MaaS technologies increases by 10% from the baseline and the 1st round to the 2nd round. However, we concluded that it is not possible to perform this analysis as we do not have a homogeneous sample and the same questions in both evaluation rounds. We therefore analyse questions about the acceptance of MaaS in Figure 229, Figure 230 and Figure 231.

In Figure 229, Figure 230 we analyse the acceptance of MaaS by looking at the agreement rate, respectively for the mainstream users and the in-depth users, for the following questions: (1) How likely are you to recommend MyCorridor to a friend or a colleague?, (2) I can't live without the MyCorridor app on my phone, (3) The MyCorridor mobile app is the best app I've ever used, (4) I can't imagine a better app than this one and (5) I would never delete the MyCorridor app. We find that the threshold for all the questions has not been reached, for both the mainstream users and the in-depth users.

Figure 231 shows the attitude towards MaaS by looking at the agreement rate of the following questions for both the mainstream users and the in-depth users: (1) I think MyCorridor app will be a positive experience and (2) The MyCorridor app is delightful. We find that we have to reject the hypothesis for all the question.

In summary, Table 27 shows that Hypothesis 6 has to be rejected since all the questions have been rejected, with confirmation rates ranging from 6% to 60% among the questions. When analysing this result, it is **important to point out that we also found in our results (especially in the first round) that there is potential for MaaS and apps like MyCorridor in general**. However, **users tend to have a negative bias towards the app due to technical and usability problems**, which led to the results in hypothesis 6. However, this does not mean that users are negatively disposed against MaaS.

Table 27: Traveller results for Hypothesis 6 for the 2nd pilot round

Hypothesis 6: Travellers are positive towards MaaS technologies.	Confirmation (> 75%)/ Rejection (≤ 75%)
How likely are you to recommend MyCorridor to a friend or a colleague? (mainstream users)	Rejected (47%)
I can't live without the MyCorridor app on my phone (mainstream users).	Rejected (12%)
The MyCorridor mobile app is the best app I've ever used (mainstream users).	Rejected (11%)
I can't imagine a better app than this one (mainstream users).	Rejected (12%)
I would never delete the MyCorridor app (mainstream users)	Rejected (21%)
Everyone should have the MyCorridor app (mainstream users)	Rejected (23%)
How likely are you to recommend MyCorridor to a friend or a colleague? (in-depth users)	Rejected (32%)
I can't live without the MyCorridor app on my phone. (in-depth users)	Rejected (6%)
The MyCorridor mobile app is the best app I've ever used. (in-depth users)	Rejected (14%)
I can't imagine a better app than this one. (in-depth users)	Rejected (14%)
I would never delete the MyCorridor app. (in-depth users)	Rejected (10%)
Everyone should have the MyCorridor app (mainstream users)	Rejected (9%)
I think MyCorridor app will be a positive experience. (mainstream users)	Rejected (60%)
The MyCorridor app is delightful. (mainstream users)	Rejected (41%)
I think MyCorridor app will be a positive experience. (in-depth users)	Rejected (53%)
The MyCorridor app is delightful. (in-depth users)	Rejected (29%)

In the administered questionnaires, the question items of SUPR-Q (2020) percentile ranks standardised questionnaire were used, which measure the usability (17%), trust (16%), loyalty (18%) and appearance (26%) with percentile ranks and places the technology in comparison to other commercial sites. In other words, it benchmarks the user experience with other commercial products, and it is found to be **better than 19% of them**. The finding is again mediocre in case the MyCorridor app was already a product in the market, but for a research prototype the finding is positive and it shows that the application could be a valuable addition to the transportation market.

Although, the application has been significantly improved compared to the 1st pilot phase, the benchmarking is slightly lower, indicating that the role of integrated services negatively affects the results and further improvements are needed for the next steps of commercialisation.

6.1.5 Results from the user feedback

The user feedback, collected through the Travelers' Feedback Module, which was integrated to the personalised MyCorridor application is presented here (please refer to D3.2 for the description of the Travelers' Feedback Module). User feedback was collected about the users' experience with the application, with the undertaken tips, the services used and are available in the MyCorridor MaaS app. The questions about user experience were the following and would randomly pop-up while using the app:

- How satisfied are you with the app?
- How happy using the app makes you?
- How much your traveller experience has improved by using the app?
- How easy was it to use the app?

Users were able to provide a 5-point Likert scale rating to express their experience, either as an answer to the questions or as a rating of the app, the service they used or the trip they made, as well as leave comments. A thorough analysis of the results is presented in the following paragraphs. Further in-depth analysis per month, performed for each of the objects of evaluations (i.e., MyCorridor application, trips taken, services used) and the 4 question items mentioned above can be found in Annex 1, section 1.3. The added value of the Travellers Feedback Tool is the fact that the user provides feedback while using the app; therefore, these findings have high face and contextual validity.

6.1.5.1 General information

Altogether, the feedback module gathered 212 replies and 65 comments of all different categories. The number of replies and comments per category are provided in tables 1 and 2 accordingly.

Table 28: Replies per category

Replies per category	Amount	Comments per category	Amount
Question	118	Question	29
App	28	App	14
Service	48	Service	14
Trip	18	Trip	8

In the analysis conducted, the average value and standard deviation are presented in every step, as well as a boxplot graph. A boxplot is often used for displaying the distribution of data on a five data summary: minimum, first quartile, median, third quartile and maximum.

6.1.5.2 Analysis per object of evaluation

6.1.5.2.1 Experience with the MyCorridor app

The analysis begins with the first category, namely the questions. From the 118 replies collected, the mean value, along with standard deviation, was **3.77±1.47**, suggesting that users had a rather satisfying experience with the app. Figure 9 shows how the mean ratings changed for every month the application was running as a pilot (February-October 2020). The red dashed line depicts the evolution of the mean value of ratings over the months. There is a variance of values over the months, most presenting high ratings, from 3 to 5, except for the last month, where the ratings are much lower, with a mean value of 2.4.

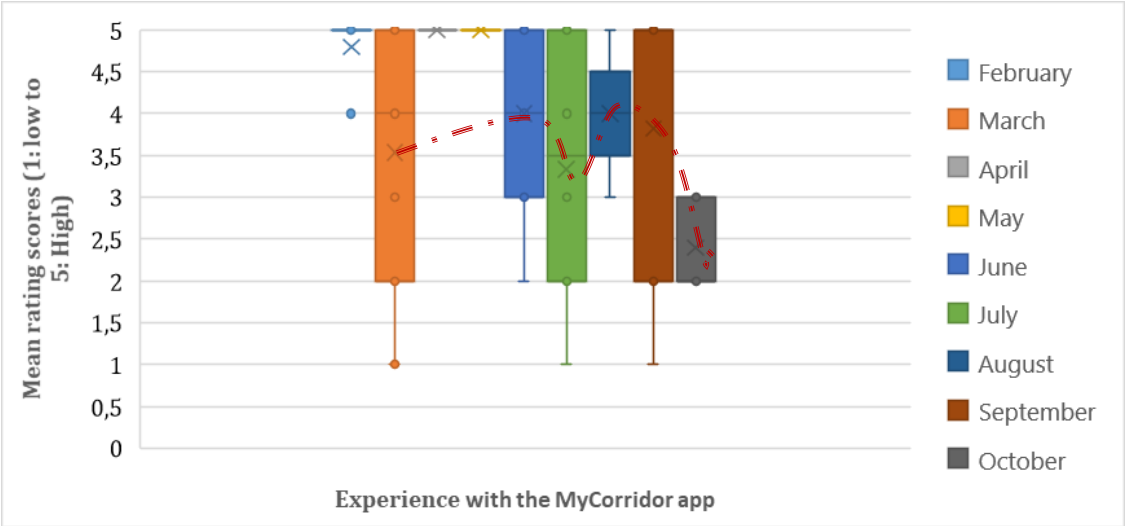

Figure 9: Experience with MyCorridor per user testing month

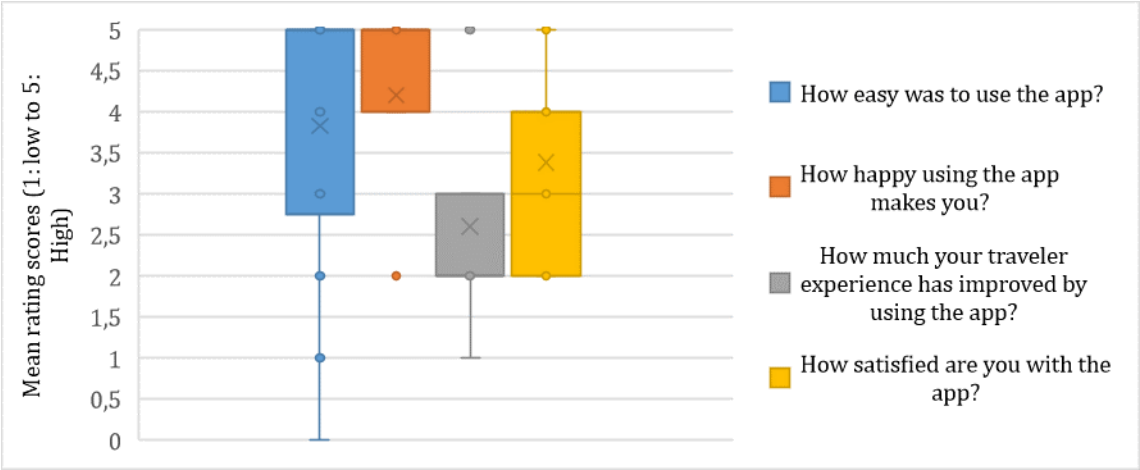

Figure 10: Mean ratings of easiness, happiness, satisfaction and travelling experience improvement when using the MyCorridor app

Since there are different questions in this section, a separate analysis was conducted for every question:

- **How easy was to use the app?** From the 79 replies collected, the mean value, along with standard deviation, was **3.87±1.51**, suggesting that most users found the app easy to use.
- **How happy using the app makes you?** From the 5 replies collected, the mean value, along with standard deviation, was **4.20±1.30**, suggesting that the app was enjoyed by almost all of the users.
- **How much your traveler experience has improved by using the app?** From the 5 replies collected, the mean value, along with standard deviation, was **2.60±1.52**, suggesting that the app did not have a significant impact on users' travelling experience and has not changed their travelling behaviour and choices. This is in anticipated finding, as there is a certain selection of services offered at each site. **How satisfied are you with the app?** From the 13 replies collected, the mean value, along with standard deviation, were **3.38±1.19**, suggesting that users were slightly above average satisfied with the app.

Overall, the collected feedback suggests that the app is easy to use and makes users happy, while their travelling experience was not significantly improved. Their satisfaction can be characterized as average.

6.1.5.2.2 The MyCorridor App

The next category of the analysis is the app rating. Following the same procedure, from the 28 replies collected, the mean value, along with standard deviation, was **4.64±0.91**, expressing a high acceptance by the users.

6.1.5.2.3 The offered services

The next category of the analysis is the service rating. Following the same procedure, from the 48 replies collected, the mean value, along with standard deviation, was **3.40±1.65**, suggesting that the services users used were satisfying.

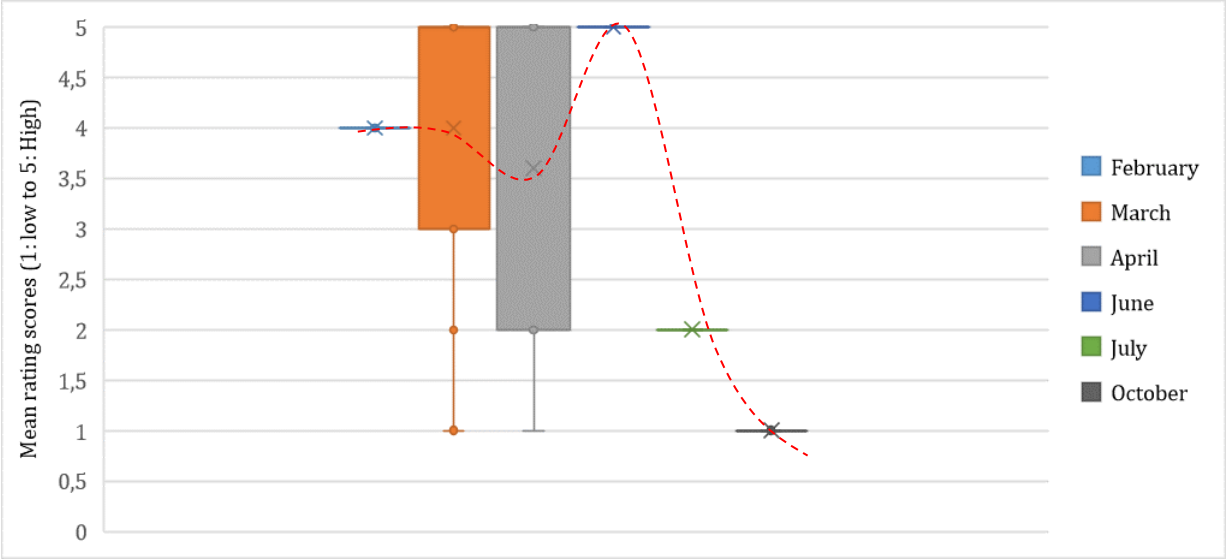

Figure 11: Mean rating of services per month

While during February and June there are absolute high ratings; 4 and 5 accordingly, in July and October we notice low ratings of 2 and 1 from users. March and April gather a variety of ratings instead. There were no ratings registered during August and September (Figure 11).

6.1.5.2.4 Experience during the trip

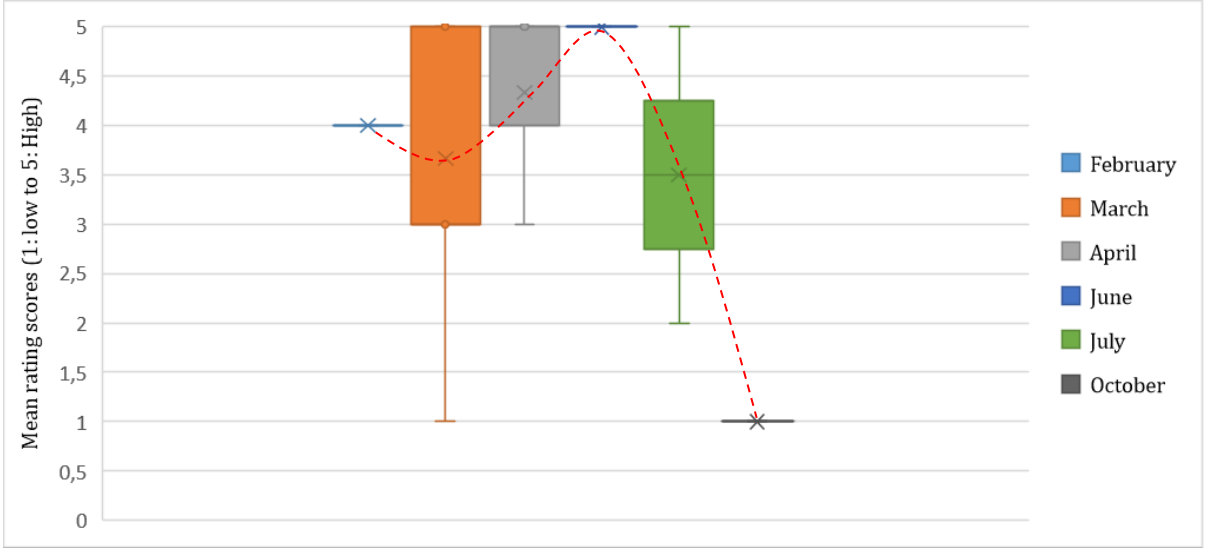

Figure 12: Mean ratings of trip experience per month

From the 18 replies collected, the mean value, along with standard deviation, was **3.56±1.54**, suggesting a mediocre rating experience for the trips taken. While there was medium to high ratings from February to July, during October a decline to low ratings 1 is noticed (Figure 12).

6.1.5.3 Per pilot site

Since the pilots took place in five different countries, there is an interest in viewing the users' feedback in each country. The categories for which question ratings and feedback were collected are the following: a) questions and b) trips. It is important to note though that it was not possible to identify the origin of many responses, so the overall analysis was based on the whole feedback and per pilot site only for the ratings and comments provided in the native language of the pilot site.

6.1.5.3.1 Austria

a) **Questions:** Out of 20 replies, the mean value, along with standard deviation, was **2.19±0.75**, suggesting that the most users were not content overall with the app. Most users in Austria did not have a satisfying experience, which is also expressed by some comments: "Screen in car navigation should not be locked automatically", "entered start and end locations should not vanish when changing travel favourites", etc.

b) **Trips:** There were only two replies in German about the trip. The one was extremely high (5/5) while the other pretty low (2/5), (**3.50 ±2.12**). Each came along with a comment: "*Position Indicator does not move along the route while driving. Screen becomes black/ phone locked." and "Navigation didn't work. The displayed position has not changed during the journey*" accordingly.

6.1.5.3.2 Czech Republic

a) **Questions:** All of the seven users seem to have claimed that they found the app easy to use, since the mean value and standard deviation values were **5.00±0.00**.

b) **Trips:** Only one user rated his/her trip with the highest rating (5/5).

6.1.5.3.3 Greece

a) **Question:** The two users who rated the app, claimed it was extremely easy to use (5/5).
Trips: Three users rated their trip and the mean value and standard deviation values were **3.67±1.15**, meaning that users had a roughly satisfying trip.

6.1.5.3.4 Italy

a) **Questions:** The only user who answered how easy the app was, found it very easy (5/5).
b) **Trips:** Two users rated their trip with 3/5. No comments were left.

6.1.5.3.5 The Netherlands

a) **Questions:** Both users found the app **extremely easy to use**, which is obvious from the values of mean and standard deviation, which are **5.00±0.00**.
b) **Trips:** Four users rated their trip and the mean value, along with standard deviation, was **4.75±0.50**, meaning that the majority of them were significantly satisfied by their trips.

6.1.5.4 Help Desk Assistance

The Help Desk, that has been set-up by MapTM, for live interaction with the test users and user assistance, was not used by the participants. All of the users preferred the direct contact with the respective contact points in the pilot sites, which was often easier, more personal and assistance could be provided in the native language.

6.1.6 Experiences from the in-depth users

The recruited in-depth users were asked to keep a diary where they can report specific aspects of their journeys, e.g., purpose of journey, likes/dislikes of the specific journey, delays, problems encountered, mood, evaluate each journey experience as a whole, and in general, add thoughts about each specific journey they make. The diaries were Excel spreadsheets with input options for each week of the second pilot phase.

A total of 22 in-depth users was recruited over all pilot sites, 15 of whom filled out diaries in which they recorded their experiences. Before the start of the test phase, the in-depth users were advised on how to make the diary entries. Nevertheless, the quality of the entries and the amount of feedback varied greatly among the pilot sites. Some of the diary entries were made continuously over a longer period of time, others only occasionally or for a short period of time. Some of the entries were very precise and the experiences were described extensively in the open-ended questions, whereas in some cases the results were reported in a short form with only little information. In the following paragraphs the experiences of the in-depth users from each pilot site are summarized. The input has been provided by the pilot site leaders.

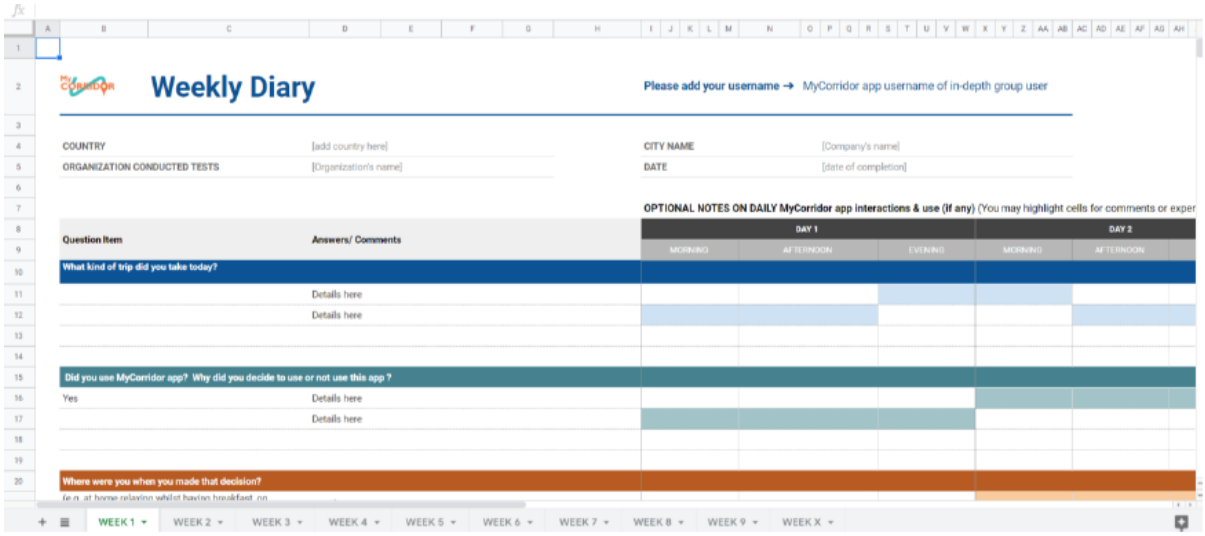

Figure 13: The in-depth user diary

6.1.6.1 Statistical evaluations of the in-depth user diaries

The following subsection shows the analysis of the in-depth user diaries. Figure 232 shows how the trips are distributed among the pilot countries. We find that Austria has with 82 trips around 51% of all diary entries, followed by the Netherlands (20%), the Czech Republic (19%) and Italy (10%). Greece has not delivered any data on the online diaries.

Figure 233 illustrates the distribution of trips among weekdays. We find that the **entries of the in-depth users were mostly made on working days ranging between 14% on Tuesdays and 23% on Mondays.** On the weekend we have few entries with 1% on Saturdays and 3% on Sundays.

Figure 234 shows that **most trips were made in the morning (34%)**, followed by the afternoon (11%) and the evening (7%). However, for 47% of the trips we have no information on when the trip was made.

Figure 235 shows for which type of trips MyCorridor was used. We find that respondents used the **MyCorridor app for commuting to work in 72%** of the cases, followed by the answer none (14%) and private trips (9%). These results are understandable, as we see in Figure 233 that most entries were made on working days.

Figure 236 illustrates why respondents use the app. The results show that the majority (53%) of the trips were made for testing purposes. For 37% of the trips, we do not have an answer to this question. The following most common answers were: **ticket purchase** (19%), **navigation** (7%), quality check of the app (3%) and out of interest (1%).

Figure 237 shows the place where the respondents filled in the diary. We find that 40% were at home, 28% at work and 7% in the car. In addition, 15% did not answer this question and 10% gave answers that could not be clustered.

Figure 238 illustrates how respondents rate their experience with the MyCorridor app. The results show that around **43% found the experience frustrating** and for 22% it was not possible to use the app. However, **14% said they had a good experience and 11% were successful in navigating**. In addition, 21% did not give an answer to this question.

Figure 239 indicates how satisfied users were with their experience of the MyCorridor app. We note that the most common response was very dissatisfied with 37%. In addition, 9% of user entries show a dissatisfying experience, 22% were neutral and 12% were satisfied with their experience.

Building on the previous question, Figure 240 shows why respondents are satisfied or dissatisfied. The results show that 41% did not answer this question. In addition, 30% answered that the process was not user-friendly and 24% said that successful use was not possible and the app crashed.

Furthermore, respondents were asked how long it took to complete their interaction. Figure 241 shows that the most common answer is 0 to 5 minutes with 49%. However, 25% did not provide any information on this question. Around 9% answered that the process was not completed, while for 7% the process took too long. In addition, for 5% of respondents, the interaction took more than 5 minutes.

When asked what caused the interaction process to take that amount of time, we have no clear results. Figure 242 shows that 80% of the respondents did not give any information on this question. In addition, around 6% answered that they needed several attempts or that the app crashed during the interaction process. Other responses were: it depends on the saved routes (5%), there are long loading times (5%) and that the user interface is confusing (4%).

Figure 243 shows the results for the question **whether respondents' trips took longer compared to other travelling / mobile apps they currently use. Around 34% answered "No" to this question**, while 18% answered yes. In 5% of the cases, the navigation process was not possible. However, around 43% of respondents did not give an answer to this question.

Furthermore, respondents were asked about possible suggestions for improving MyCorridor. Figure 244 shows that **37 % of the users made technical suggestions**. In addition, 20% suggested that more options should be implemented, followed by increased reliability, a better user interface (11%) and a smoother ticket purchasing process. However, 44% of users did not give an answer to this question.

6.1.6.2 Austria

At the beginning of the test phase, short introductory workshops were held with the in-depth users at the premises of Salzburg Research in order to introduce the users to the project, to explain the objectives of the study and to explain the most important functionalities of the MyCorridor app. On this occasion, the users were asked to fill in the consent form and the pre-questionnaires. The in-depth users were also asked to keep a diary of their experiences with the MyCorridor app and to submit it weekly to SRFG on Fridays. The weekly submission served on the hand to check the quality of the incoming data and on the other hand to ensure that potential problems could be passed on to the development team immediately and problems could thus be solved promptly.

In Austria ten in-depth users participated in the second testing period, six of them filling out the diaries on a regular basis. Four of the users filled out their diaries for several weeks, namely for four, nine and two of them for 14 weeks respectively. Two of the users provided entries for one week of testing each.

The basic idea of the MyCorridor app and the fact, that it could be used across borders, met great approval and interest among the in-depth users. The in-depth users stated that they used the app mainly for navigation purposes and for the use of the public transport in Salzburg, including purchase of tickets for the public transport. In addition, the users appreciated that their suggestions for improvement had been directly implemented by the developer teams. Any problems that have been reported by the users was forwarded to the development team so that they could incorporate the feedback directly. After some improvements were made the in-depth users stated that the quality of the navigation tool is satisfactory: "The app now works well for navigation purposes".

On the other hand, it was noted that the usability functions of the MyCorridor app have to be further improved: They wanted a clearer interface with a more straightforward and intuitive use. Several technical problems arose during the test phase, which were noted by the users.

Many suggestions for improvement were directly implemented during the test phase (e.g., automatic rotation of the screen, prevention of the automatic screen lock, etc.). A specific suggestion for the improvement of a specific function would be improve the display of the results of the routing search.

6.1.6.3 Czech Republic

The Czech pilot site did not have any in-depth users. However, two mainstream users provided diaries and filled them for ten respectively five weeks. The users were asked to use the MyCorridor app for their standard travels instead of common commercial apps. Due to the Covid-19 lockdown situation the majority of users eventually tested mainly the drive mode (i.e. MaaS on the Go) option of the app.

The users were impressed by the modern design and the settings. In particular, the possibility of combining a large number of travel modes was highlighted as a positive feature. The drive mode of the app was also convincing.

Room for improvement has been recognised in the usability functions of the MyCorridor app, in the amount of search results and in the loading speed of the app. Every now and then there were problems with the display of routes or specific functions such as resetting the password, or the "via"-function did not work.

6.1.6.4 Netherlands

The willingness to participate as in-depth user was very low in the Netherlands. The app was not as user friendly as expected and the possibilities where limited. For example, planning public transport wasn't possible outside of the pilot city of Amsterdam. This was making it hard to find in-depth users, because people would need to have a departure address and arrival address within Amsterdam.

MapTM could find two in-depth users that agreed to test the app. MapTM started by giving a presentation on the project and about the app and explained how to use the app. Because both of the test users did not live in Amsterdam, they tried using car navigation as public transport planning was not giving any results.

MapTM had contact with both in-depth users every Friday. This has been done for eight weeks in a row. Both users saw potential for improvement in aspects mainly related to the navigation issues (it is reminded that this was the main type of service experienced by the Dutch users as no mobility services were available for the specific site and, also, the Karhoo service that was available the very last period of the project was not finally tested). As such, and indeed, the navigation functionality – based on the API provided by TomTom but further implemented by CERTH – was indeed very weak in many cases, especially in the Dutch (and the Italian) site. In specific, users fairly often criticized about the app crashing and the incorrect navigation (sending back to starting point, wrong GPS location and the app was not centred on the current location). They would mention that it was not easy to move the map or restart the app while driving. It has been agreed that users would start the app before departure and try to do the trip. Users would not try to restart the app when it would crash or something would go wrong. Therefore, the total amount of executed trips was low. Significant effort has been put – from the development team that came from CERTH – to progressively surpass those issues but though this has been possible in some cases, it was not always feasible due to inherent problems in the API.

When MapTM evaluated the app with the in-depth users they would always mention the benefits they would have expected. Planning, booking and paying in a single app. Interestingly, they would compare different components of the app with existing apps. For example, navigation services from the MyCorridor app with the (other to the project) navigation offers from TomTom, Google or Here. Public transport planning was compared with offers from 9292 or NS. The booking service would be compared with the services from the NS app and the Gaiyo MaaS app. They expected the MyCorridor app and the Gaiyo app to be quite similar, though this should not be rather the case, with MyCorridor being a research initiative

6.1.6.5 Italy

At the Rome pilot site were five users recruited for in-depth testing of the MyCorridor app.

Four of the users filled the diaries and provided them in a row for several weeks. One of the participants paused once in between during the test phase. However, the users mainly tested the app for a continuous period during which they reported their experiences by posting messages on a chat that was set-up with in-depth users. The experiences were then transferred to the diaries.

The in-depth users at the Rome pilot site used the MyCorridor app mainly for trip planning and navigation with the private car, as no other mobility services were present in the site and used the infomobility services that the app proposed for this mode.

The experience of the participants showed that they had difficulties using the app without prior explanations on the functionality of the app. It took the users a while to understand that navigation started only if they chose the option "MyTrips" and that they had to select the modes they preferred (they thought the modes would be selected by default; most probably, the users did not use the user manual provided in the application).

Then, for most of the time they used the app, it crashed whenever they used some other app at the same time or when they received a call. One of the issues that was pointed out by nearly all the in-depth users was that the navigation information given in advance were too much (3 or 4 directions given in advance also if far away) and would be confusing if the user did not know the route that s/he was travelling on. Another issue pointed out by nearly all the in-depth users was that the zoom of the map was not dynamic, it did not adapt to the current location and was too "far away", making the map not effectively usable since the details needed for the trip could not be seen well.

In general, the in-depth users found many points that need to be improved to make the app a comparable tool with other, already existing options.

6.1.6.6 Greece

In Greece no in-depth users could be recruited for testing purposes, the focus was placed on recruiting mainstream users.

6.1.6.7 Overall findings from the in-depth user experiences

All in all, one can say that the users across all pilot sites found the **basic idea of a cross-border travel app appealing and good. The main advantage is seen in the fact that planning, booking and purchasing mobility products are possible within one single app.** During the test period, the app was used at all pilot sites for different purposes: for navigation in the car, for travel planning in advance and for public transport including purchasing tickets. Overall, however, there is still room for improvement for many features of the app. Technical problems sometimes led to "frustrating experiences" that lasted for several days when the problem could not be solved easily. However, when the problems, which were reported to the contact points at the pilot sites, were resolved, there was positive feedback from the test persons.

As already mentioned, the basic concept of MyCorridor was rated as fairly positive across all pilot sites and led to positive feedback. Most of the negative comments across all pilot sites were related to usability and technical problems that were mostly related to navigation (as explained above, through iterative optimisation was held in this regard during the pilots, some –inherent to TomTom API issues – were not possible to be solved by CERTH). Users often pointed out that they wanted a clearer, simpler and more intuitive UI, which is quite understandable as the MyCorridor application UI cannot be compared to commercial MaaS applications UIes that users may be familiar with or aware of already.

Among the optimisation that took place, it was also achieved that the application would not collapse when other applications are used at the same time. Recommendations for further improvements for the MyCorridor app are:

- Further technical improvements to increase the robustness reliability of the app.
- More options shall be implemented; this would be feasible in a commercial deployment – unlike the current proof of concept – that would allow the deployment of more mobility

services in order to offer the real MaaS paradigm (that was not feasible in all sites of MyCorridor).
- Further improvement of the UI so that the app is clearly structured and more intuitive to use.
- A smoother ticketing purchase is desirable (reduction in the number of necessary steps that are needed for the purchasing process).
- Improvement of the GPS-function to get more reliable traffic jam information.
- Improvement of individual functions of the app, like for example include the routing option "via", resetting the password should be easily possible, provide "earlier" and "later" options when displaying the results of routing searches.

6.1.7 Traveller focus group results

The travellers focus groups were (virtually) conducted per pilot site between November 11th and 24th, 2020 and each lasted between 60 and 90 minutes with overall 25 attendees. The main thematic/ question areas were the following:

a) Type, period and duration the MyCorridor app was used
b) Personalised travelling preferences: travelling habits, modes and use of MaaS in everyday life
c) Use of MaaS packages
d) Sharing of the best and worst experiences
e) Learning curve (each attendee drew a line to show how easy or difficult it was to learn to use the MyCorridor app and how much learning was necessary before its use was beneficial for the traveller)

The analysis aimed to find common and pertaining topics across the pilot sites that would highlight the subjective results and/ or explain some of them, especially the lower ratings.

a) Type, period and duration the MyCorridor was used

Most travellers used the MaaS on the Go package option because the services were offered through this option.

Austrian site: All participants reported that they almost exclusively used the option "MaaS on the go". During the test period, none of the participants used a different MaaS app. At the end of the test period, one of the participants continued to occasionally use the MyCorridor app.

Dutch site: The fact that owned transport modes (i.e., car) are included in the app is an advantage over existing ones but users found it difficult to navigate, so they used it mostly once.

Greek site: The route the users used was from the green Packs Korinthos – Loutraki and back. They used the app for two to four days. They used KTEL (interurban coach) and bicycle and they also had available parking in the token. After their participation in the pilots the users did not use the application any longer. Two users said that the app needs more transportation modes available. If the users would have to travel physically today – because of COVID-19 - three mentioned they would try to avoid it or if it was important, they would prefer to use their own car, so they won't have to share a transport mode with someone else. Two users said that they would use public transport (with health measures in place). One user said that they prefer to take their own car for their everyday activities.

Italian site: Participants to the focus group were the in-depth users for Rome's pilot site. They mainly used 'MaaS on the go' to commute from home to work and sometimes for personal reasons. They have been using the app for two months, some of them more frequently than others. They have not been using the MyCorridor app anymore since the end of testing. Some participants mentioned they

could not use it anymore because one loses a lot of time for planning, considering that itineraries sometimes are confusing makes it not reliable, graphically not attracting and not readable, and not responding immediately to route changes. They have not been using any other MaaS application but have been using other applications to organize their trips (e.g., Google Maps, Waze, others).

No discussion on this topic was held in Czech Republic site.

b) Personalised travelling preferences: Travelling habits, modes and use of MaaS in everyday life

Austrian site: Three of the participants have set their travel preferences to public transport during the test phase. These participants criticized that a "bicycle" option did not exist among the preferred means of transport and therefore, their chosen preferences did not quite correspond to reality. The fourth participant chose the option individual transport as the preferred means of transport. The use of the MyCorridor app has not affected their car use and has not triggered any changes. Three of the participants stated that they did not have a distinct opinion about MaaS prior to the testing period because they were not remarkably familiar with the concept. However, the introductions and explanations by the MyCorridor team and the use of the app raised their interest. The **MaaS concept in general and the idea of MyCorridor as such is seen as interesting and future-oriented, especially for vacation or business trips**, to avoid having to install the local city or regional apps to be able to use the local means of transport. The participants assume that the broad introduction of such a MaaS app could reduce the use of rental cars and make car-sharing offers in foreign cities/countries easier accessible. However, the app was also subject to criticism. At this stage of the (technical) development process, it is seen as challenging that such an app is offered on a cross-border level because that makes it difficult and complicated. To improve the app, the participants suggested that bicycles and e-scooters should also be added as an option for the preferred means of transport, which would be particularly useful in urban areas.

Czech Republic site: Attendees have diverse mobility profiles, with some staying at home, two using public transportation and one mentioned that he/she has to use a taxi to commute because of the COVID situation, meaning profiles are affected by external factors not considered some time ago, e.g., last year. One user mentioned that he/she is open to new and alternative transport modes and he/she would be excited to try them out. Users who do not travel a lot or have a routine which does not require an application, they seem not to be interested in using a MaaS app, especially an older user said that it will not fit their profile, as their aim is to get to the grocery store just around the corner. But for those who travel frequently and to unfamiliar destinations, the MaaS app is an attractive option, especially for those who seem to be early adopters or who already use travelling apps. Long distance travelling (e.g., cross-borders), car-sharing, ride-sharing and parking space reservation seems to be the best candidates for attractive services in Prague. Users suggested that some functions/preferences that they would like to have, and they are not now available are the option to share their tickets with other people, e.g., their relatives. The latter seems important for older users and families, e.g., when the parents want to buy a ticket for a child and send it to them. Another option they would like to have is a wallet with credit, so they can charge the wallet themselves and the option to change already purchased tickets. Further, it would be good if one could report low quality of services directly through the app and have access to traffic data. Attendees mentioned that **low costs and receiving the best prices in the market would attract them to use shared mobility products**, however only one mentioned that he/she would be interested in using a combination of public and private transportation. **Users believe that public transportation will be the form of transportation that will survive in the COVID era and MaaS will exist but the form it will take depends on how hygiene measures will be managed in transportation.** The situation is still uncertain and therefore trends are difficult to be revealed. People work more from home now and if this becomes a new work establishment, then commuting will be affected.

Dutch site: Users agree that they would use the app if it was further improved. If it included all modes, payment methods and timetables it would be remarkably interesting for them to use it, as it could potentially replace many of the apps they currently use. An attendee mentioned that he/she uses one specific app for money management of their OV-chipkaart (mobility pass for PT in the Netherlands), then he/she uses 9292 for trip planning in PT, and for train journeys he/she uses the NS app (Dutch Train operator). This last one, shows to him/her to some extend the availability of connecting mobility modes like bikes, taxi and bus at stations. But he/she cannot book this via the app. Besides these they use specific apps like Lime and MoBike to be able to use mobility systems in places where these are supported. Converting these apps to one, would be ideal for him/her, and potentially for many others. The other users agree, most functionalities are already available via websites or different apps. **The main benefit would be using all those different functions within one app.**

Greek site: All the users' preferred travel style in their everyday life is a car or public transport. Sometimes they also use a taxi. Two users mentioned that the app is helpful if they want to organize a trip because there are lot of preferences they could match. Three users pointed out that for everyday activities it is difficult to use the app, as there are not a lot of transportation modes available matching their everyday needs. Within the Maas experience two users pointed out that they considered it to be more environmentally friendly using a bike more often and this would be a nice 'eco promotion' for a touristic seaside city like Loutraki. A user mentioned that the added value services should be more evident or obvious and open to companies and touristic shops to easily advertise their products through the added value services. All users agreed that COVID-19 has affected their travelling preferences, especially those related to their everyday activities. Most users prefer to use their own car because they feel safer in times of the pandemic. Two users said that in the world of MaaS there should be changes for people to use different transportation modes under a COVID safe framework.

Italian site: The participants used their car as their travelling preference. The use of the app did not affect the way they organised their trips and the use of the private car. Neither did the use of the app affect the opinion on MaaS but at least made them aware of the MaaS concept. **Although getting to know MaaS, they do not think this would change their travelling preferences or patterns.** Some of them do not know which preference they would like to have, some of them are missing the PT and sharing and bike (showing elevation and time lost at nodes, with intermodality indications), although their propensity to use shared mobility products is rather low. COVID has not changed the travel habits for most of the participants of the focus group since they all have been using the car to commute, except for those who used PT and now are using mainly the car to commute from home. One attendee pointed out that the COVID emergency has limited the movement of people to only carry out the essential trips and limited the use of sharing services. MaaS will change - depending on the evolution of the COVID emergency - but it might be **important to consider health-related factors, e.g., capacity of vehicle and how many people are using PT (overcrowding) or other services. MaaS might be a key factor in differentiating people's mobility.**

c) Use of Packages

Austrian site: In Salzburg, the extensive offer of the Salzburg Transport Association was integrated into the MyCorridor app. This offer was well received and used by the participants in general (not only the in-depth users). Apart from that, there are no mobility offers, such as car or bike sharing, available in Salzburg that could have been integrated into the MyCorridor app as further mobility offers. In this respect, no combinations of different mobility offer could be provided. However, the focus group generally **found the idea of MaaS-packages appealing** and could think of the following purposes of use for which it would be attractive to offer Maas packages:

- Monthly/annual subscriptions for the local public transport system.

- Packages for vacation travels (i.e., offering something like a "mobility credit" for short-term parking, car-sharing, bike-sharing, Taxi rides, etc.).
- Packages or some kind of subscriptions for short-term parking, bike rental, car sharing or taxi **rides, on a national and international level.**

Czech Republic: No responses were collected.

Dutch pilot site: Users mentioned they did not use the packages because they thought they did not work (i.e., there are no mobility products in the Dutch site) and because often after selecting services, the app crashes and/or does not provide the result which was expected.

Greek site: Users discussed what the term of packages meant to them: A set of services related to the preferences of the client, including gifts or redeem points they could use in another trip. Also, it can be a set of personalized services in daily activities and a set of transportation services. Additionally, a package can be created for families (like a pack) or a business package (especially for frequent travellers). Additionally, a user pointed that until today a major constraint of these **travel packages is that they do not take into consideration the needs of people with disabilities.** The package five of the users would prefer for their everyday activities is a package which is shorter in distance and it costs less. One user suggested for the app that it would be useful for university students, in case they life far from the university, to find the fastest route or get options for car-sharing/pooling with other people until they arrive at their destination.

Italian site: Participants thought that the term package is not the best for Italian language and something like *carnet* or combination of trips might be better. They have been looking at the package part during the focus group, as they did not really understand at first what is the reason for differentiating 'Green Packages' from other packages since, to them, the possible modal shift that a MaaS app should bring is already a" green" choice in the view of the participants (though this is not entirely true). As pointed out before, participants would use packages regarding sharing mobility products and/or PT. The participants are not using MaaS products/packages so no comparison is possible with other kind of applications, although they pointed out that the **packages would be attractive and useful to them if they could save time on the trip, save money on tickets, and if they could provide additional information other apps would not have.**

d) Sharing of best and worst experiences

Austrian pilot site: The following points were seen as positive by the participants: the basic idea behind the app, the integration of Salzburg's offers as well as the overview for tracking their journeys, i.e., that the history of the journeys is still available at a later date. The participants also liked the presentation of the routes on the map. It was also positively noted that real tickets could be bought and used during the test period and that this never caused any problems with public transport staff. All participants considered the usability of the app to need improvement. To understand and use the app, an initial explanation was necessary. The use of the app was less intuitive, even if the logic was understood; the handling remained somewhat complicated and time-consuming.

Greek site: Users did not mention bad experiences, but they thought a 'lighter' version might be more attractive to users, as this one has many features, and you have to familiarise with it before you try it out. Four of the users noted: the **mobility token is a helpful and very interesting concept** because they can have one ticket for three services. Also, a user pointed that he/she would like to schedule his trip and to have the possibility to turn on a notification from the app on his/her email one day before the trip. In addition, another user suggested to offer availability of offline maps (a possibility to download the map and use it without data).

Czech Republic site: Users were aesthetically satisfied with the app and they believe the options to search for different transport measures is its primary strength. Another user mentioned that he/she

found parking space near his/her home he/she did not know it existed because of using the app and this was a great and long-term gain.

Dutch pilot site: The diversity in travelling preferences is a good experience and the possibility to have a loyalty scheme already integrated. This MaaS app concept is very good. However, users mentioned the problems they encountered with app crashes and the navigation services. Some users mentioned that some features are hidden in the menus and sometimes difficult to find. Users mentioned having bad experiences with crashes and losing navigation information, so they had to reset the route. However, another user mentioned that more services should be added along with traffic jam information.

Italian pilot site: During testing participants experienced different problems with the app (crashing, no re-routing, too much information in advance, no dynamic zoom while navigating, no TLA service provision) so they did not have the "best experience". They all agreed that the worst experience they had was that the app crashed while using it because of an incoming call or an incoming message from a messaging service. Once the crashing problem was solved, the re-routing issue remained a big problem (sometimes the app did not do the right re-routing suggesting itineraries not coherent with the road). Also, too much information was given all together combined with a not dynamic zoom of the navigation tool that caused confusion among the participants.

f) The learning curve

The diagrams, i.e. the learning curves of the participants, which were drawn by them on a whiteboard (via www.ziteboard.com) during the focus group discussion are not presented in this section.

Austrian, Dutch and Greek site: The learning curve was described by all participants as initially steep and then it flattened out. As already mentioned, the introductions during the initial workshops were essential to understand the app. Over time, the effort flattened out as, on the one hand, the most popular routes could be saved within the app and, on the other hand, the usage processes and patterns were then known. No learning curves were provided by the Czech Republic site.

Italian site: The general outcome from the participants is that the app is not easy to learn. Some aspects, if not clearly indicated by the pilot test leader, were difficult to understand how they were to be used (such as travel preferences that had to be set before planning or trips that have to be activated by going in 'MyTrips'). It took longer to learn but it takes long also to use it currently, since trip planning and buying services takes some time. However, we have also to take into consideration that the Italian pilot site users could not test or use a mobility service and therefore they used only traffic management services, which, of course, is not the only primary focus and goal of this or any MaaS application.

6.2 Evaluation results from the service providers

In the following section the results from the service provider evaluation of the 2nd pilot phase are presented by answering the hypotheses that were defined for this purpose. In the second pilot round a total of 15 service providers participated in evaluation process.

6.2.1 Answering the hypotheses

To confirm the following hypotheses a certain predefined threshold has to be reached. To calculate these thresholds, we take all respondents in the sample in all countries into account. However, due to the sample size of 15 respondents the results will be discussed overall and at a national level only when appropriate.

Hypothesis 1: The Service Registration Tool is easy to use.

The first hypothesis is that the Service Registration Tool is easy to use. To confirm this hypothesis we assume an average value of more than 70%. Figure 245 shows that, regarding the question whether the business registration tool is easy to navigate, the hypothesis can be confirmed with a value of 75%.

In addition, Figure 246 shows the respondents' answers to yes/no questions. To confirm the hypothesis, more than 70% of the respondents have to answer no. We find that we can confirm the hypothesis for all three questions: (1) Did you contact directly the development team for help? (2) Did it take more effort to register your service on the Service Registration Tool than originally planned? (3) Did it take more time to register the service than originally planned or anticipated to?

Again, Figure 247 shows answers to yes/no questions. In this context, the hypothesis can be confirmed if more than 70% of respondents answered yes. We find that this threshold is reached for the following two questions: (1) Was it easy to locate the field explanation? (2) Was it easy to test the correctness of the registration process?

In Figure 248 we analysed six questions to determine whether the respondents were able to show their approval ranging from *not at all* (0%) to *extremely* (100%). The hypothesis can be confirmed for one of the six questions: (1) How easy was it to learn to use the Service Registration Tool? On the other hand, the threshold is not reached for the following five questions (1) How straightforward was it to meet the pre−requisites for the integration to MyCorridor? (2) How straightforward was the registration process? (3) How straightforward is it to modify service information after integration to address issues? (4) How straightforward is it to modify the service information after integration to modify functionality? (5) How straightforward is it to modify the service information after integration to add new functionality?

Finally, Figure 249 shows the respondents' agreement rate to seven questions. We can confirm the hypothesis for the following questions: (1) I felt very confident using the Service Registration Tool, (2) I thought the Service Registration Tool was easy to use, (3) I would imagine that most people would learn to use this Service Registration Tool very quickly.

According to the respondents' approval rate, the following four questions should be rejected: (1) I found the Service Registration Tool unnecessarily complex? (2) I found the Service Registration Tool very cumbersome to use? (3) I needed to learn a lot of things before I could get going with this Service Registration Tool? (4) I think that I would need the support of a technical person to be able to use this Service Registration Tool? However, in the context of these four questions a higher value means that the app would be difficult to use. Therefore, we assume that we can confirm the hypothesis when the approval rate is below a threshold of 30%. Consequently, we decided to confirm the hypothesis about these four questions.

Overall, Table 29 shows that 14 out of the 19 questions reach the required threshold, which lead to the result that we can confirm the following hypothesis: The service registration tool is easy to use. Thus, hypothesis 1 can be confirmed for around 74% of the questions, with confirmation rates ranging from 53% to 100% among the questions.

Table 29: Service provider results for Hypothesis 1 for the 2nd pilot round

Hypothesis 1: The Service Registration Tool is easy to use.	Confirmation (> 70%)/ Rejection (≤ 70%)
Please rate the ease of navigation of the Service Registration Tool	Confirmed (75%)

Did it take more effort to register your service on the Service Registration Tool than originally planned?	Confirmed (80%)
Did it take more time to register the service than originally planned or anticipated to?	Confirmed (80%)
Did you contact directly the development team for help?	Confirmed (100%)
Was it easy to locate the field explanations?	Confirmed (100%)
Was it easy to test the correctness of the registration process?	Confirmed (93%)
How easy was it to learn to use the Service Registration Tool?	Confirmed (78%)
How straightforward is it to modify service information after integration to address issues?	Rejected (55%)
How straightforward is it to modify the service information after integration to modify functionality?	Rejected (58%)
How straightforward is it to modify the service information after integration to add new functionality?	Rejected (53%)
How straightforward was it to meet the pre−requisites for the integration to MyCorridor?	Rejected (57%)
How straightforward was the registration process?	Rejected (68%)
I felt very confident using the Service Registration Tool.	Confirmed (73%)
I found the Service Registration Tool unnecessarily complex.[33]	Confirmed (18%)
I found the Service Registration Tool very cumbersome to use.*	Confirmed (15%)
I needed to learn a lot of things before I could get going with this Service Registration Tool. *	Confirmed (7%)
I think that I would need the support of a technical person to be able to use this Service Registration Tool.*	Confirmed (22%)
I thought the Service Registration Tool was easy to use.	Confirmed (75%)
I would imagine that most people would learn to use this Service Registration Tool very quickly.	Confirmed (78%)

Hypothesis 2: The Service Registration Tool is useful.

Hypothesis 2 is that the Service Registration Tool is useful. To confirm this hypothesis, a threshold value of more than 70% must be reached.

Figure 250 indicates an agreement rate of 57% to the following question: (1) Will you recommend MyCorridor to other colleagues not related to the project or other service providers? Consequently, we must reject the hypothesis.

In addition, Figure 251 shows the respondents' answers to yes/no questions. To confirm the hypothesis, more than 70% of the respondents have to answer yes. We find that the hypothesis can be confirmed for the following five questions: (1) Did the documentation provide clear and high-level support? (2) Did the field explanations provide the type of information you need? (3) Was the example helpful? (4) Is the documentation appropriate for the work you are carrying out? (5) Is the documentation structured for the work you are carrying out?

Furthermore, Figure 252 shows the yes/no answers to the following question: (1) Do other registration tools of service providers cover topics or aspects that are missing from this registration tool? As 80% of the respondents answered with no, we can confirm this hypothesis

[33] ** In this context a higher agreement rate would mean that the Service Registration Tool is difficult to use. Therefore, we decided to confirm the hypothesis should be confirmed if the agreement rate is below 30% for these four questions.*

In addition, Figure 253 illustrates that we must reject the hypothesis for the following question: (1) How useful did you find the available resource (i.e. the example)?

Overall, Table 30 shows that we can confirm 6 out of the 8 questions, which leads to the assumption that we can confirm the following hypothesis: The service registration tool is easy to use. Thus, hypothesis 2 can be confirmed for around 75% of the questions, with confirmation rates ranging from 57% to 87% among the questions.

Table 30: Service provider results for Hypothesis 2 for the 2nd pilot round

Hypothesis 2: The Service Registration Tool is useful	Confirmation (> 70%)/ Rejection (≤ 70%)
Will you recommend MyCorridor to other colleagues not related to the project or other service providers?	Rejected (57%)
Did the documentation provide clear and high-level support?	Confirmed (80%)
Did the field explanations provide the type of information you need?	Confirmed (87%)
Is the documentation appropriate for the work you are carrying out?	Confirmed (87%)
Is the documentation structured for the work you are carrying out?	Confirmed (87%)
Was the example helpful?	Confirmed (80%)
Do other registration tools of service providers cover topics or aspects that are missing from this registration tool?	Confirmed (80%)
How useful did you find the available resource (i.e., the example)?	Rejected (62%)

Hypothesis 3: The Service Registration Tool is usable.

The third hypothesis aims to answer the hypothesis whether the Service Registration Tool is usable. As in the first pilot, we apply the SUS introduced by Brook.[34] For a detailed description of the approach see section 2.60. To confirm this hypothesis, the score must be above 70 points.

Figure 254 shows that the hypothesis can only be confirmed for the Czech Republic, while it must be rejected for the remaining countries and at the aggregated level. Thus, we find that hypothesis 3 has to be rejected for around 83% of the questions, ranging from 60 points in Italy to 77 points in the Czech Republic.

Table 31: Service provider results for Hypothesis 3 for the 2nd pilot round

Hypothesis 3: The Service Registration Tool is useable.	Confirmation (> 70 points) Rejection (≤ 70 points)
Austria	Rejected (68 points)
Czech Republic	Confirmed (77 points)
Greece	Rejected (64 points)
Italy	Rejected (60 points)
Netherlands	Rejected (68 points)
Overall	Rejected (67 points)

[34] *For a detailed discussion about the SUS see, among others, Brooke, J. (2013). SUS - a retrospective. Journal of Usability Studies.*

Hypothesis 4: The service providers are successful in completing the registration process.

The fourth hypothesis is that the service providers are successful in completing the registration process.

In calculating the completion rate, only tasks that were 100 % completed were taken into account. To confirm the hypothesis the completion rate must be higher than 70%. According to the results in Figure 255, we can confirm the hypothesis for all countries and have a completion rate of around 96% at the aggregated level.

Figure 256 shows the failure ratio for scenario completion. To confirm the hypothesis, the failure ratio must be below 5%. When calculating the failure ratio, we only consider completely failed tasks. We find that the hypothesis can be confirmed for all countries except Greece, which shows a failure ratio of 14.3%. Interestingly, Italy is the only country without any error and therefore has a failure rate of 0%. At the aggregated level, we find a failure rate of 4.4%.

To confirm the hypothesis, the error rate per respondent must be below the threshold of two percent. The error rate is based on weighted errors. An error classified as "high" is counted as 3, a "moderate" error as 2 and a "low" error as 1. The weighted errors are aggregated by person and then divided by the total number of tasks. So, if there are many "high" errors, the percentage of errors can be higher than 100%. Figure 257 shows that the hypothesis can be confirmed for Greece, Italy and the Netherlands but must be rejected for Austria and the Czech Republic. Furthermore, across all countries, the average percentage of errors reaches 5%. Thus, we must reject the hypothesis at an aggregated level.

Furthermore, we analysed the problems that occurred but were not solved by the development team. To confirm the hypothesis, there must be no more than 3 major and 5 minor issues. Figure 258 indicates the number of major[35] issues and shows that the hypothesis can be confirmed at the aggregated level. In addition, Figure 259 illustrates the number of minor[36] issues and shows that the hypothesis can be confirmed at the aggregated level.

Overall, **Error! Reference source not found.** illustrates that we can confirm 4 out of the 5 questions (80% of all questions), which leads to the assumption that we can confirm the following hypothesis: The service providers are successful in completing the registration process.

Table 32: Service provider results for Hypothesis 4 for the 2nd pilot round

Hypothesis 4: The service providers are successful in completing the registration process.	Confirmation/Rejection
Success ratio in scenario completion (>70% in 2nd phase)	Confirmed (96%)
Failure ratio in scenario completion (< 5% in 2nd phase)	Confirmed (4.4%)
Error percentage (< 2% in 2nd phase)	Rejected (5%)

[35] *Major problems were, for example*
- *Users were confused*
- *Navigation problems*
- *Design problems*

[36] *Minor problems were, for example*
- *User interface problems*
- *Design problems*

Issues encountered but not resolved with the development team: less than 3 major issues in the 2nd phase	Confirmed (1)
Issues encountered but not resolved with the development team: less than 5 minor issues in the 2nd phase	Confirmed (2.2)

6.3 Comparisons with the first phase

This subsection aims to compare the findings between the first and the second pilot evaluation iterations.

6.3.1 Service providers

Hypothesis 1: The Service Registration Tool is easy to use.

In the first phase, the first hypothesis - the service registration tool is easy to use - should be confirmed by the results of 6 out of 19 questions. Thus, in the first round, hypothesis 1 can be confirmed for around 32% of the questions, with confirmation rates ranging from 40% to 100% among the questions. This number increased to 14 out of 19 questions in the second phase. Thus, in the second phase, hypothesis 1 can be confirmed for around 74% of the questions, with confirmation rates ranging from 53% to 100% among the questions. The hypothesis had to be rejected in the first phase, however, could be confirmed in the second phase. Interestingly, for ten questions, for which we must reject the hypothesis in the first phase, we can confirm the hypothesis in the second phase. For two questions, however, the hypothesis is confirmed in the first phase, but rejected in the second phase.

Hypothesis 2: The Service Registration Tool is useful.

To analyse the second hypothesis – the service registration tool is useful - respondents were asked to answer eight questions. In the first phase, five of these questions indicate that the hypothesis can be confirmed. Thus, in the first phase, hypothesis 2 can be confirmed for around 67% of the questions, with confirmation rates ranging from 50% to 100% among the questions. In the second phase we find that seven out of eight questions lead to the assumption that the hypothesis can be confirmed. Thus, in the second phase, hypothesis 2 can be confirmed for around 75% of the questions, with confirmation rates ranging from 57% to 87% among the questions. Therefore, the hypotheses could be confirmed in both phases however, with stronger evidence in the second phase.

Hypothesis 3: The Service Registration Tool is usable.

The third hypothesis – the service registration tool is usable – could be confirmed for all countries in the first phase, ranging from 62 points in Italy to 78 points in the Czech Republic and the Netherlands. In the second phase, however, this applies to only one of the five countries. Thus, we find that in the second phase, hypothesis 3 has to be rejected for around 83% of the Countries, ranging from 60 points in Italy to 77 points in the Czech Republic. For Austria, the Czech Republic and the Netherlands the SUS score decreased, while the only increase was observed in Greece. This negative development, together with the raising of the required threshold, leads us to a worse result in the second phase.

Hypothesis 4: The service providers are successful in completing the registration process.

The fourth hypothesis – the service providers are successful in completing the registration process – can be confirmed according to the positive results for three out of five questions in the first phase. Thus, hypothesis 4 can be confirmed for around 60% of the questions. In the second phase we find even stronger evidence to confirm the hypothesis, as four of the five questions (80% of all questions) reach the required threshold.

6.3.2 Travellers

Hypothesis 1: The MyCorridor platform is easy to use.

In the first phase, the first hypothesis - the service registration tool is easy to use - can be confirmed for seven out of nine questions. Thus, in the first phase, hypothesis 1 can be confirmed for around 78% of the questions, with confirmation rates ranging from 55% to 83% among the questions. However, in the second phase this hypothesis must be rejected for all six questions, with confirmation rates ranging from 31% to 60% among the questions.. The questions whether MyCorridor is easy to navigate and easy to use where both confirmed in the first round but rejected in the second round.

Hypothesis 2: The MyCorridor platform is useful.

In the first round, the second hypothesis - the MyCorridor platform is useful - can be confirmed as five out of eight questions reach the required threshold. Thus, in the first phase, hypothesis 2 can be confirmed for around 63% of the questions, with confirmation rates ranging from 31% to 73% among the questions. In the second evaluation round, however, no questions were asked about this hypothesis, so that no comparison between the evaluation rounds is possible.

Hypothesis 3: The MyCorridor platform is useable.

With regard to hypothesis 3, we find a significant difference between the first and the second evaluation round. In the first round all questions reach the required threshold. However, in the second evaluation round we have to reject all questions, with confirmation rates ranging from 23% to 58% among the questions. Hence, in the second round, respondents answered less positively to the question whether the MyCorridor platform is usable.

Hypothesis 4: The travellers are successful in completing the scenarios per storyboard and user group.

In the first round of evaluation, we find no clear results as to whether hypothesis 4 can be rejected or confirmed. In the second round, however, we have to reject all questions related to this hypothesis, with confirmation rates ranging from 52% to 66% among the questions. The average success rate can be confirmed in the first round, but must be rejected in the second round. The same is true for major and minor issues, where the threshold is reached in the first round but not in the second. However, the average failure rate is not met in either the first or the second round of evaluation. Consequently, respondents are less successful in completing the scenarios in the second round than in the first round.

Hypothesis 5: Personalisation of offered services is effective.

The fifth hypothesis – the personalisation of offered services is effective - must be rejected for the first and the second round. Therefore, in the first round, hypothesis 5 can be confirmed for around 17% of the questions, with confirmation rates ranging from 58% to 83% among the questions. In the second round, hypothesis 5 must be rejected for all questions, with confirmation rates ranging from 21% to 67% among the questions. However, in the first evaluation round, the app reaches the threshold in terms of effectiveness, which is no longer the case in the second round. Similar to before, the threshold in terms of efficiency is reached in the first round, which is not true for the second round any more.

Hypothesis 6: Travellers are positive towards MaaS technologies.

We can clearly confirm the sixth hypothesis in the first round, where five out of six questions reach the threshold. Thus, in the first phase, hypothesis 6 can be confirmed for around 83% of the questions, with confirmation rates ranging from 54% to 75% among the questions. However, the picture has changed significantly in the second round of evaluation, where none of the questions reach the required threshold, with confirmation rates ranging from 6% to 60% among the questions. Thus, in the second round, respondents are less positive about MaaS technologies than in the first round.

7 Key results from both iteration phases

In the MyCorridor project two iterative and multi-faceted evaluation phases were conducted. The main target groups of the evaluation process were clustered around two major categories: service providers and travellers.

In the **first iteration phase** one internal **service provider** per pilot site participated in the evaluation phase in order to test the integration of their mobility service into the MyCorridor platform using the developed Service Registration Tool. The service provider evaluation was remote, unmoderated and contextual and comprised two steps: In a first step, the service providers were asked about their professional background, their current and previous relevant experience and their expectations of the Service Registration Tool as well as the corresponding process by means of an online questionnaire before the process started. The second step was to register one of their own mobility services using the developed Service Registration Tool at their own time and pace. In parallel the service providers were asked to complete a short diary where they could report any issues they encountered and the time it took them to complete the service registration process. Based on those answers the defined hypotheses were answered.

The following internal services were chosen to be integrated into the MyCorridor platform for this test purpose in the first iteration phase:

- Austria: travel time calculation service (based on floating car data from Salzburg)
- Netherlands: shared bike service from *OV fiets* (a bike rental company)
- Greece: bus service from Korinthos bus company
- Czech Republic: AMSBs booking and ticketing platform
- Italy: car sharing service from RSM

The **second iteration** phase also extended to the integration of external services and comprised the following services per pilot site:

- Austria: Salzburg Transport Association SVV, public transport API from the national railway company ÖBB, EVIS Austria, parking information Salzburg
- Czech Republic: P&R service, Prague zoo events, Czech Railway mobility API
- Greece: bus services from Loutraki and Korinthos
- Netherlands: planning and booking API of NS (the national railway company)
- Italy: LTZ Access Control Information (parking in Rome)

The four hypotheses in Table 31 were addressed in the first and second evaluation phase with the service providers. The success criterion and measurement indicator for the 1st and 2nd iteration were different and are noted in the parenthesis in Table 31. The results show that for the first iteration phase we can confirm three out of the four hypotheses. The three hypotheses: (2) the service

registration tool is useful, (3) the service registration tool is usable and (4) the service providers are successful in completing the registration process, can be confirmed. The first hypothesis – the service registration tool is easy to use – has to be rejected. In the second iteration phase three out of the four hypotheses can be confirmed again, however this time the participants confirmed that it was easy to use the Service Registration Tool and rejected the hypotheses that the Service Registration Tool is useable.

Table 33: Results of the Hypotheses for service providers in the 1st and 2nd iteration phase

Service Provider Hypothesis	Confirmation / Rejection	
	1st phase	2nd phase
H1: The Service Registration Tool is easy to use. (ease-of –use > 60% in 1st phase and > 70% in the 2nd phase)	Rejected confirmation rate (cr):[37] 32%, range[38]: 40% to 100%	Confirmed cr: 74% range: 53% to 100%
H2: The Service Registration Tool is useful. (> 60% in 1st phase, > 70% in the 2nd phase)	Confirmed cr: 67% range: 50% to 100%	Confirmed cr: 74% range: 53% to 100%
H3: The Service Registration Tool is useable. (> 55% in 1st phase, > 70% in 2nd phase).	Confirmed cr: 70% range: 60% to 78%	Rejected cr: 17% range: 60% to 70%
H4: The service providers are successful in completing the registration process a) success ratio in scenario completion (>60% in 1st phase and >70% in the 2nd phase) b) failure ratio in scenario completion (<10% in 1st phase and < 5% in 2nd phase) c) error percentage (< 5% in 1st phase and < 2% in second phase) d) Major / minor issues encountered but not being easily resolved with the development team (less than 5 major and 7 minor in the 1st phase and less than 3 major and 5 minor in the 2nd phase phase)	Confirmed cr: 60% range: not useful in this case	Confirmed cr: 80% range: not useful in this case

The **traveller** evaluation process comprised a controlled and lab-based testing session in the **first iteration phase**. Each session followed a standardised procedure where users were on the one hand asked to complete questionnaires at the beginning and at the end of the session and on the other hand were asked to complete scenarios based on storyboards that had a local context. A mixture of usability and user experience methods were selected for this first iteration phase.

In total, between 21 and 25 persons per pilot site participated in the first iteration phase. The results from the baseline interviews show that the most used means of transport among the respondents is the car, while bicycle and train show the highest satisfaction rate. In addition, the results show that finding a cheap and convenient travel mode is most important to respondents, and that about 42% of the sample have heard of MaaS before. In addition, train and plane tickets are the most commonly purchased tickets online. **The most frequently given positive answer regarding MyCorridor is that respondents like the feature of buying an all-in-one ticket**, while on the contrary about a third of respondents do not show a high level of trust in the app.

From the answers of the pre-questionnaires we can conclude that about a third of the participants has already heard of MaaS and that 83% of the respondents are used to buy mobility products online.

[37] *cr = confirmation rate*
[38] *Ranging from x% to x% among the questions*

Furthermore, train and plane tickets are the most frequently purchased tickets. About one third of the participants showed some concern with the intended payment process of the MyCorridor app. However, if the respondents are familiar with the organisation, 75% of them feel comfortable buying products online. Further, the participants find it important to buy on websites that are easy to navigate and have a proper design. We found a moderate approval rate when respondents were asked if it is pleasant to use the MyCorridor platform.

When it comes to the evaluation of three scenarios (registration, setting up an account and using either "MaaS on the Go" or "MyPacks") we got the following results: the average score over all pilot sites for the easiness of the registration process was 83%[39] and the average score for the usefulness of the registration process was 72%[40]. The results for setting up an account show an average score for the easiness and an average score of 73% for the usefulness. When it comes to creating an own MaaS pack or using MaaS on the Go the average score for the easiness of this process was 63% and for the usefulness 66%. Overall, the analysis of the scenarios showed that registration and setting-up an account are generally considered as useful options but the design of the app and some unclear options made it difficult for the respondents to complete the scenarios. This finding is also underlined by the results of the post-questionnaires, where the respondents declared that they were not able to find what they wanted in the MyCorridor app. This could be due to the observation that respondents feel that the app is not very easy to use on their first visit and that the information on the screen is not very well structured. Nevertheless, 75% of the respondents state that they would recommend the app to a friend.

This criticism on the App was taken seriously by the app's developer teams to make the app more user-friendly for the second test phase. Additional functions were fully implemented for the second pilot round. In the development process the feedback that was provided from the pilot tests and the issues that came up have been taken into consideration. Improvements have been made for the following aspects:

- Green Packs
- My trips
- My packs
- My rewards, the loyalty scheme
- Surveys
- Help Centre
- Payment process
- Navigation
- Integration of Karhoo external car service provider
- Push notification support
- GUI enhancements and modifications

The improved versions of the MyCorridor App applications have eventually been made available in Google Play Store (2020) (Android version)[41] and iOS Store (iOS version)[42].

The **second iteration phase** was a semi-real testing experience with **real travellers** and consequently completely different than the first evaluation phase. In this final evaluation phase the improved and final version of the one-stop-shop app with all integrated services was tested by recruited travellers in the five pilot sites. The second iteration phase was supposed to be conducted in spring 2020. However, due to the Covid-19 pandemic and the severe restrictions in the pilot sites,

[39] *0 = not easy to use at all, 100 = very easy to use*
[40] *0 = not useful at all, 100 = very useful*
[41] *Please refer to https://play.google.com/store/apps/details?id=certh.gr.mycorridor*
[42] *Please refer to https://apps.apple.com/us/app/mycorridor/id1525696822*

the start of the test phase had to be postponed to June. Only the Austrian pilot site was able to start the test phase at the end of February 2020, before it also had to be suspended in March due to a complete lockdown. The second test phase was then conducted from 15 June to 31 October 2020 in all pilot sites. However, the constraints due to Covid-19 were also strongly felt during this period, as the mobility behaviour of the participants was different then under normal circumstances. From September onwards, the governments in the pilot sites also gradually reintroduced more severe restrictions, which significantly reduced the number of trips made by the recruited persons or made them resort to different modes of transport than they would choose under normal circumstances.

The overall results across all pilot sites show that **160 participants** were finally recruited and they conducted **934 trips** using the MyCorridor app.

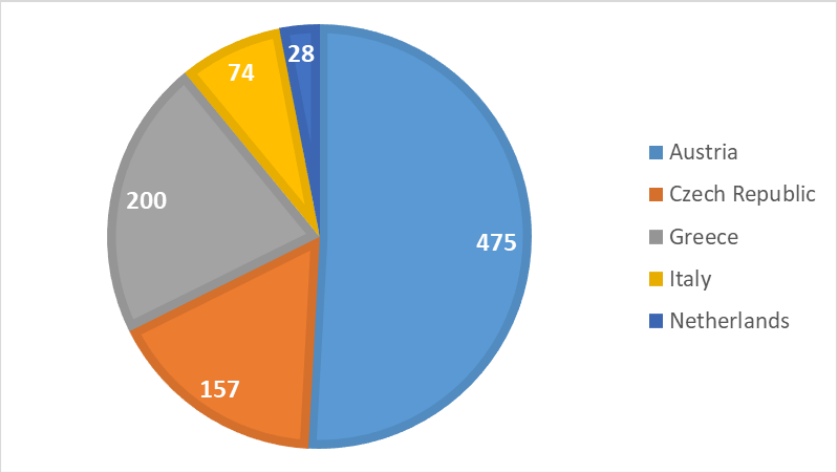

Figure 14: Number of conducted trips with the MyCorridor App during the second iteration phase per pilot site

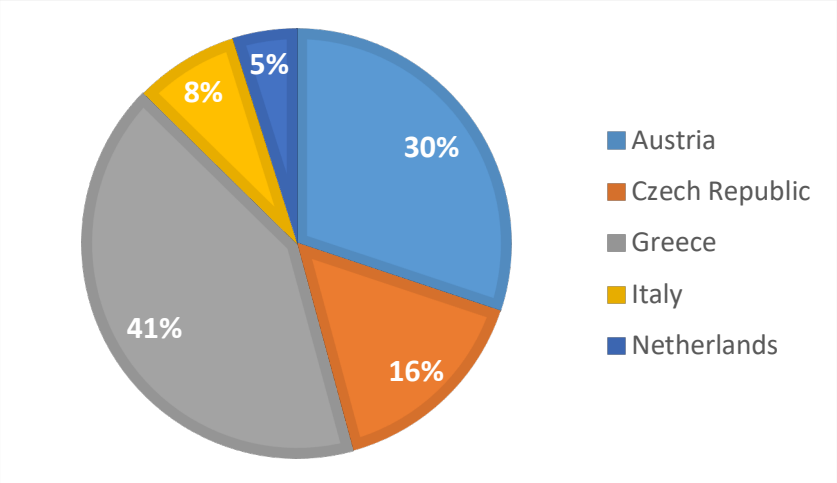

Figure 15: Share of test users in the second iteration phase per pilot site

To provide a deeper understanding of how the MyCorridor application works, we conducted several analyses of the logged data in an aggregated form. The results show that the average journey time ranges from **25 minutes to 80 minutes.** Overall, the **average journey time in all countries is 38 minutes**. Further, the **average trip length amounts to 29 km**, with the **average trips lengths ranging from 16 to 117 km** between pilot sites. The logged data also show that the average number of transfers made is 1.1 among all countries over all participants. Figure 16 the relative share of service clusters that were used by the participants in the second iteration phase. **The most**

frequently used service clusters were traffic management services (53%) followed by green packs (21%) and mobility services (20%).[43] In Figure 17 it can be seen that the majority of the users used the Maas on the Go option (79%), while 21% used the offered green packs.[44] Further, it **has been analysed that overall 16 cross-border trips were conducted** by the test persons, the majority of which took place between Austria and Germany. The original idea was to test the concept of cross-border travel with the MyCorridor app, which also offers an interesting added value in the eyes of the users. However, these tests were only possible to a very limited extent or not at all in times of the Covid-19 pandemic due to the partly very restrictive travel restrictions. Because of this, the number of cross-border journeys is very limited. The analyses also showed that **76% of the participants carried out the tests with a smartphone with an Android operating system and 24% had an iOS operating system** (Google Firebase, 2020). [45]

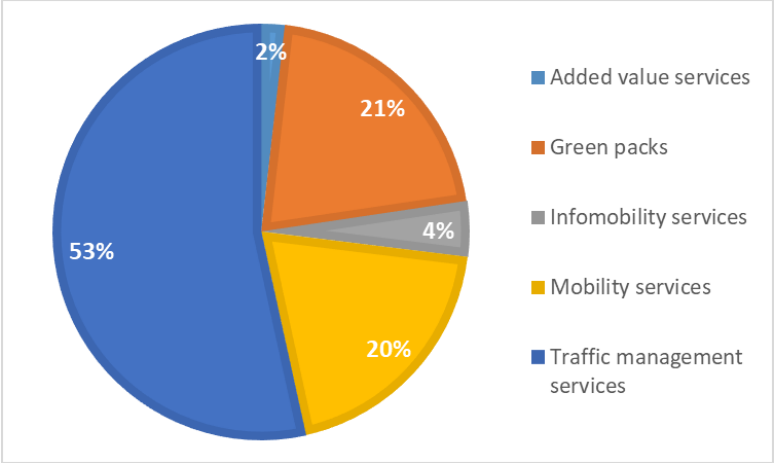

Figure 16: Relative share of service clusters that were used in the second iteration phase

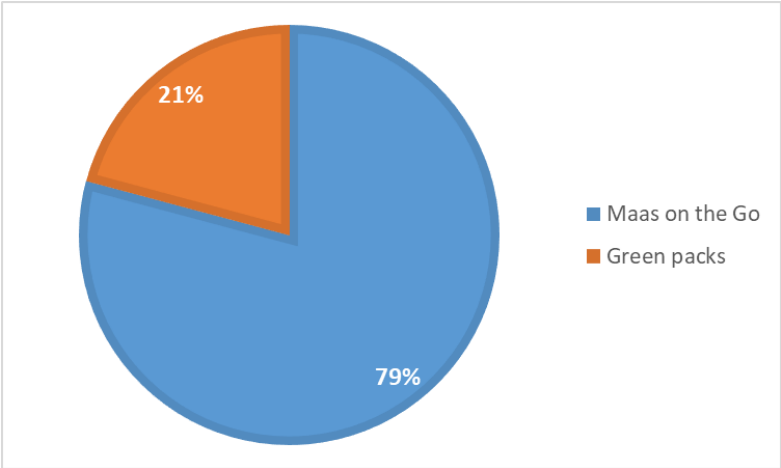

Figure 17: Relative share of the type package that was chosen by the participants in the second iteration phase

[43] *Here has to be noted that mobility services were only available in Austria and in the Czech Republic.*
[44] *It has to be noted here that the Green Packs were only offered in Greece.*
[45] *Source: https://console.firebase.google.com/*

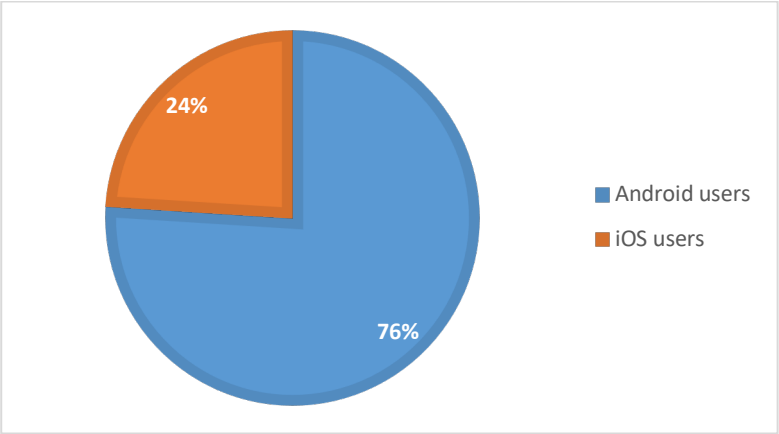

Figure 18: Relative share of operating systems on the smartphones of the users

In the second evaluation phase the users were divided into mainstream and in-depth users and the results of the questionnaires were analysed separately for those two user groups and overall for all pilot sites. The in-depth users were asked to give deeper insights into their impressions and experiences by answering more questions in the context of the pre- and post-questionnaires, by writing a diary with their experiences and at the end of the second pilot phase they were invited to participate in a focus group discussion where they could share their experiences as well.

The results from the pre-questionnaires show that most users across all pilot sites use the car as their only mode of transport for their most frequent trip or for a combination of two or more modes (including walking). The answers given by users about distance and time spent during their most frequent trip, which they make mainly for commuting, are consistent with the results of the analysis of the logged data.

A very high percentage of users say they have never used a MaaS app before, so subsequently the testing of the MyCorridor app might be more difficult than using a normal app, as not all aspects of MaaS were very clear to the users. The approach to the MyCorridor app was neutral for the in-depth users and slightly more confident for the mainstream users.

At the end of the second test phase, an evaluation of the MyCorridor app and in general of the whole experience was requested from the users in the post-questionnaires. Mainstream users tended to have a more positive rating than in-depth users, and, by average, the rating of all aspects is neutral for mainstream users (about 50% of the average rating), while the rating is lower for in-depth users.

The rating is higher for general aspects of the app (ease of use and overall experience), but gets lower when it comes to specific technical issues, such as features and functions that users would want in the app, the usefulness of the app for organising trips and the time spent on planning. The average rating is not satisfactory in terms of the app's graphics and attractiveness.

The reasons expressed in the pre-questionnaires as to why users were most attracted to MaaS were confirmed after the test phase for the MyCorridor app, with the ability to use all modes of transport with just one ticket being the most important, followed by the ability to switch from private to public transport modes without having to think about it. Most of the users tested the app with their conventional means of transport and only a small percentage used the new services.

In summary, user evaluation seems to be biased by testing a product that is not fully developed in the way that users would want it to be, but at the same time it seems that users would be very positive about the MaaS product if the development standard was high. This indicates that the expectations

for a MaaS app are generally very high and that users do not distinguish between already long-established and new, innovative functions which are still in the development phase.

Also for the travellers a set of six hypotheses was defined to get insights on the usability and usefulness of the MyCorridor app. For the first iteration the results of the post-questionnaires and of the facilitator diaries were used to answer to the hypotheses. In total four out of six hypotheses can be confirmed, while one does not show a clear result and one must be rejected.[46] For the second iteration the results of the post-questionnaires and the logged data (i.e. the data resulting from the conducted test drives by the test persons) were used as basis for the evaluations. It can be seen in the table below that for the second round all hypothesis had to be rejected. Again, we specified that a hypothesis is confirmed if more than 50% of the questions that make up a hypothesis meet the required threshold.

Table 34: Results of the Hypotheses for travellers in the 1st and 2nd iteration phase

Traveller Hypothesis	Confirmation / Rejection	
	1st iteration phase	2nd iteration phase
H1: The MyCorridor platform is easy to use. (confirmation > 60% in 1st phase and >70% in 2nd phase)	Confirmed cr[47]: 78% range[48]: 55% to 88%	Rejected cr: 0% range: 31% to 60%
H2: The MyCorridor platform is useful. (confirmation > 60% in 1st phase)[49]	Confirmed cr: 63% range: 31% to 73%	Not available in the 2nd iteration phase
H3: The MyCorridor platform is useable. (confirmation > 55% for 1st phase and >70% in 2nd phase)	Confirmed cr: 100% range: not useful in this case	Rejected cr: 0 range: 23%to 58%
H4: The travellers are successful in completing the scenarios per storyboard and user group. a) success ratio in scenario completion (> 60% in 1st phase and >70% in 2nd phase) b) error percentage (<5% in 1st phase and < 2% in 2nd phase) c) Major / minor issues encountered but not being easily resolved with the development team (less than 5 major issues and 7 minor issues in the 1st phase and less than 3 major and 5 minor in the second phase)	unclear cr: 50% range: not useful in this case	Rejected cr: 0% range: 52% to 66%
H5: Personalisation of offered services is effective. a) Effectiveness (>75% in the 1st phase and >85% in the 2nd phase) b) Efficiency (>75% in the 1st phase and >85% in the 2nd phase) c) Highly tailored to their needs (>75% in the 1st phase and >85% in the 2nd phase)	Rejected cr: 17% range: 58% to 83%	Rejected cr: 0% range: 21% to 67%
H6: Travellers are positive towards MaaS technologies. a) acceptance increases total from baseline and 1st phase by 10%(> 60% in the 1st phase and > 75% in the 2nd phase) b) attitude towards MaaS technologies is positive for 75% in the 2nd phase and for of users/travellers	Confirmed cr: 83% range: 54% to 75%	Rejected cr: 0% range: 6% to 60%

[46] *A hypotheses is confirmed when more than 50% of the underlying questions meet the required threshold.*
[47] *cr: confirmation rate*
[48] *Ranging from x% to x% among the questions.*
[49] *This hypothesis refers to the testing in the laboratory environment in the first pilot round and was not applied in the second pilot round.*

As mentioned above, the in-depth users were asked to keep diaries and report their experiences with the MyCorridor application on their journeys. The results from the questionnaires are also reflected in the answers of the diaries. All in all, one can say that the in-depth users across all pilot sites found **the basic idea of a cross-border travel app very appealing and good. The main advantage is seen in the fact that planning, booking and purchasing mobility products is possible within a single app and that it can be used across borders. Room for further improvements is seen in the usability of the app, to make it clearer, simpler and more intuitive to use, in the functionally of the GPS and in individual functions such as the routing results or the resetting of the password.**

User feedback was overall positive and higher compared to the aggregated post-questionnaires' results. It appears that the use of navigation support was mostly related to negative responses for the reasons explained earlier. The latter is also supported by the focus group discussion, where users mentioned that their worse experiences involved the navigation support. **A major lesson learnt is that the integration of navigation support services requires a parallel and a separate evaluation phase/layer to validate its efficiency and effectiveness and this is only possible through real, consecutive, and repeated trips to be taken by an adequate number of users.** COVID-19 negatively affected any such potential endeavour, and hence emulated s/w alternatives were utilised, which could partially and isolatedly address and partially solve the arising issues.

Nevertheless, travellers strongly believe that the MyCorridor application **has two strong points: a) the provision for personalised MaaS ticketing through elaborate travelling preferences menu and b) the combination of owned, shared and public transportation means within and without a country and hence can become a competitive product.** Finally, diverse travelling requirements have arisen during the focus group discussions, even among the same group, which shows that COVID-19 does not primarily affect the need for alternative travelling options for older travellers but mostly for the workforce and early technology adopters. **Health and safety are important factors for the mobility of all travellers, but the purpose of travelling remains the defining factor.**

8 Harmonisation and optimisation of results

8.1 Strengths and weaknesses of the pilot sites and the MyCorridor App

In the following sub-sections the strengths and weaknesses of the five pilot sites are summarized. The input was provided by the five pilot site leaders.

8.1.1 Austria

One of the main strengths of the pilot site was the integration of the services of the Salzburg Transport Association (SVV), which includes virtually all public transport services in the city of Salzburg as well as in the province of Salzburg. The test persons were able to use the full range of services from the Salzburg Transport Association as well as further services that were provided for the Salzburg pilot site, like e.g. the VAO, the parking information, TM2.0 services and thus to test this components of the app. This range of services allowed for the MyCorridor app to be used and tested in its true sense as a MaaS app.

Another strength of the pilot site is the good connection to the mobility community as well as to the universities, which made it possible to successfully recruit the necessary test persons for the first and second round of the pilot.

Furthermore, another strength of the pilot site was the high number of test persons who were recruited for the tests and who fed back their experiences extensively to the pilot site leaders. This enabled continuous improvements to be made to the app.

From Salzburg Research's point of view, it was also an advantage that other projects in the MaaS context could be developed based on the experiences from the MyCorridor projects. SRFG was able to learn a lot from the experiences in MyCorridor and can build on this to take further steps.

One of the biggest challenges in the whole process was the integration of decent number of mobility services in order to provide an attractive and ideally all-encompassing offer so that the users can take real advantage of the usage of the MyCorridor App. After extensive negotiations, SRFG succeeded in integrating especially the locally important offer of the Salzburg Transport Association into the app.

The impact of Covid-19 also led to severe restrictions in Salzburg and therefore, the app could not be tested as planned across the border to Germany due to the travel bans respectively restrictions that were in place for a long time in 2020.

One disadvantage of Salzburg is that there are no public sharing offers (e.g. for car or bike sharing) available that could have been integrated into the MyCorridor app. This would have made the app even more attractive.

It has been seen that the expectations for MaaS app are very high and that the benchmark for this are already available (commercial) products, even if the offers cannot be directly compared. The test persons were open to testing new offers, but at the same time they expect a very good functionality of the product combined with a high user-friendliness.

8.1.2 Czech Republic

The main strength of the Czech pilot site was that the mobility service AMSBus, that offers wide range of bus carriers and routes, could be integrated into the MyCorridor app. However, due to the Covid-19 pandemic many people switched to using their private cars when they had to conduct travels so the drive mode option was widely tested in the Czech Republic.

One of the weaknesses was that Czech people are conservative in their travelling (planning) habits and they stick to well-known modes and applications that have been proven for many years and where they have personal experience. Further, shared mobility is still considered as a business that is targeting mainly the tourist that are visiting the Czech Republic however, it would be one of the core features of a MaaS application.

Also the Czech Republic was heavily impacted by the Covid-19 pandemic and hence, the restrictions in almost all public sectors were also strongly noticeable in the area of mobility. In concrete terms, this meant that many people made their journeys by bicycle and the use of public mobility services declined.

The findings that can be drawn from the tests with the in-depth users are as follows: MaaS applications have to be simple, straightforward and with only one main common flow, users on their own does not understand multiple processes (flows). Despite the fact that personalisation is widely considered as a significant benefit, this cannot be based on a profile setup (which would make application installation unbearable complex) but on user data analysis. Here we need to note that for successfully personalised app platform usage data from a huge audience has to be collected.

8.1.3 Greece

The strength of the Greek pilot site was that the transportation service has a lot of users and also the fact that AMCO was able to recruit their own employees as well as the operator's employees, who travel frequently for business reasons.

The weaknesses of the pilot site was that it was not easy to recruit random passengers, for several reasons, as described above.

The lessons learned is that in order for a MaaS application to succeed, it must integrate as many public transport operators as possible and also the app has to very user friendly.

8.1.4 Italy

Considered the given limitations due to the Covid-19 pandemic, having recruited users among colleagues has given the possibility to have a systematic use of the MyCorridor app for testing and a direct feedback of all the issues that the users encountered during their trips done with the app. This made it possible to report directly to the development team as soon as particular issues occurred. Hence, some of them could be solved or improved in a short time.

During the real-world testing phase some challenges were observed in Rome. The traffic information services and traffic management services that the users virtually bought (i.e. without paying) via the MyCorridor app did not work correctly. In some cases, the services were not available in areas where they should have been available, in some cases the services appeared at a time when then current position of the users did not match the indicated position in the App. Sometimes traffic information was provided that did not relate to the current position of the users. Based on these issues the additional value, that a MaaS app should provide compared to a "normal" navigation app, could not be seen an appreciated by all test users in Rome. This also resulted in fairly negative evaluations of the app.

Looking at the experience from the conduction of the Italian pilot with the MyCorridor app it can be seen that some difficulties were encountered in the whole process (from the integration of external services in the app to the final testing round) and we understand that the implementation of a MaaS product must be well planned starting from the selection of services to be included in the product. The service providers must be willing, because of their propulsion or because of regulations set by the administration, to provide and exchange data with the platform, and must be willing to provide a full integration of the service.

For future MaaS applications, it is important that a MaaS app offers services that show a clear added value compared to pure navigation apps and that the provided information is correct and always available. Further, it is also very important that the app is easy to use and clearly structured, so that users feel confident when using the app and can rely on the quality of the services.

8.1.5 Netherlands

The strength of our pilot site would have been the large amount of users. Most events in the Johan Cruijff Area are attended by 56.000 or more visitors. Cancelling events and the lack of clarity on using the app the first time, made this point the weaknesses of our pilot site.

The fast development of MaaS solutions in the Netherlands made it possible to compare the MyCorridor app and development to new MaaS apps. This was within our pilot site the largest strength. We learned a lot from this comparison and we found out that a good business plan is one of the most important things to start with when adding services to the application.

One of the largest lessons we learned in the whole process is the value of integration of the large number mobility services in order to provide an attractive and ideally all-encompassing offer so that the users can take real advantage of the usage of MaaS applications that was not feasible in the project.

8.2 Operational features homogeneity

Starting from its design phase, MyCorridor aims to offer a similar service quality for all the different types of services in each pilot site. In this context, the same philosophy has been adopted and the same integration steps have been followed for all services and service categories across all sites. However, it should be clarified that the final result that reaches the user is highly dependent on each individual in terms of quality, availability, stability and limitations. Thus, users may experience differences while using different services in different pilot sites.

More specifically, mobility services could differ in the way they provision the mobility token to the end users. For example, some services represent the generated mobility token as a QR code, which can be easily stored in users' phones, while others produce a PIN code, such as a four-digit number that can be used to unlock a bike from a bike rental lot. Moreover, the amount of time required for the provision of the mobility token could vary from service to service. Some back-offices may create a ticket instantly, while others may need more time in order to perform all the necessary operations for their internal ticket generation process. All these can result in variations in the service quality users get in different pilot sites.

Since MyCorridor acts as an integrator and does not intervene in the way the individual service providers develop and offer their services, it is not possible to achieve a 100% level of service features homogeneity. However, this is a limitation that applies not only to the MyCorridor project but also to all existing MaaS platforms. Further adaptations and acceptance of common interfaces and data formats are required from the service providers involved in MaaS in order to overcome these issues.

8.3 Integration quality

Regarding the integration of the different individual services, MyCorridor has adopted an end-to-end integration approach through the use of a well-defined RESTful API. Several interfaces have been developed for the successful integration of the individual services, taking into account the services' different data schemas. In order to make all these different services available to the end users in a common way and format, common characteristics among the different services of each service category (i.e. Mobility, Infomobility, Traffic Management and Added Value) have been identified. These similar characteristics constituted the basis upon which a set of common interfaces has been developed in order to provide for each service category the same type of information to the end users across all pilot sites. Thus, a user will get the same kind of information, no matter where he/she is located.

At operational level though, differences can arise in the quality of the services across different pilot sites. These differences concern both services of the same type coming from different service providers, as well as services of the same provider that are available in more than one pilot sites. For example, regarding services of the same type, there can be a bus service operating in a specific pilot site that offers a bigger number of connections for a larger set of origin-destination points compared to a similar service that operates in a different pilot site. In addition, the quality of services coming from the same provider can also differ from site to site due to the number and reliability of the data sources that are available in each region. For example, Traffic Management service providers, such as TomTom, are able to provide results of better quality to users located in Netherlands, where there

is a plethora of map and traffic data available, in comparison to users in Greece, where the availability of traffic data and traffic management infrastructure is more limited.

Therefore, it is clear that even if the integration of a service in the MyCorridor platform is smooth and flawless, the results the users get are highly dependent on the individual services and the resources these services have available in each region. Even for the same service, users can experience variations in the quality of the results across different pilot sites.

8.4 Interoperability and data interfaces

The MyCorridor platform has been designed and implemented by taking into account the guidelines provided by MaaS Alliance. The MaaS Alliance is a public-private partnership creating the foundations for a common approach to MaaS, unlocking the economies of scale needed for successful implementation and take-up of MaaS in Europe and beyond. The main goal is to facilitate a single, open market and full deployment of MaaS services. The MaaS Alliance has published a set of guidelines for the design of the key aspects needed to sustain a MaaS ecosystem, in the context of the implementation of the legal framework (Directive 2010/40/EU) that was adopted by the European Union on 07 July 2010, to accelerate the deployment of the ITS across Europe.

The MyCorridor MaaS API provides interfaces, for all the aspects identified within the MyCorridor ecosystem (e.g. trip planning, booking and payment), that integrate seamlessly similar services coming from different providers. These interfaces are based on the JSON format, a format that is well known and widely used due to its advantages in terms of flexibility, data portability, interoperability, and data transmission performance. All the data models in MyCorridor system are represented and processed as JSON objects. An attempt has also been made to represent the Service data model as an OWL ontology. Ontologies are tools that can be used to improve communication and achieve interoperability among software systems. OWL ontologies in particular, represent a concept by a class, and a realization of a class is an instance (or object or individual). In OWL, a class is represented by a noun and may be a subclass of another class, inhering characteristics from its parent superclass. Additionally, in an OWL ontology, the classes have characteristics, i.e. directed binary relations that specify some attributes which are true for instances of the classes. These characteristics are called properties, and in OWL, they are represented as verbs. Figure 1 presents the Service ontology created in the context of MyCorridor, whereas Figure 2 the corresponding Service JSON schema.

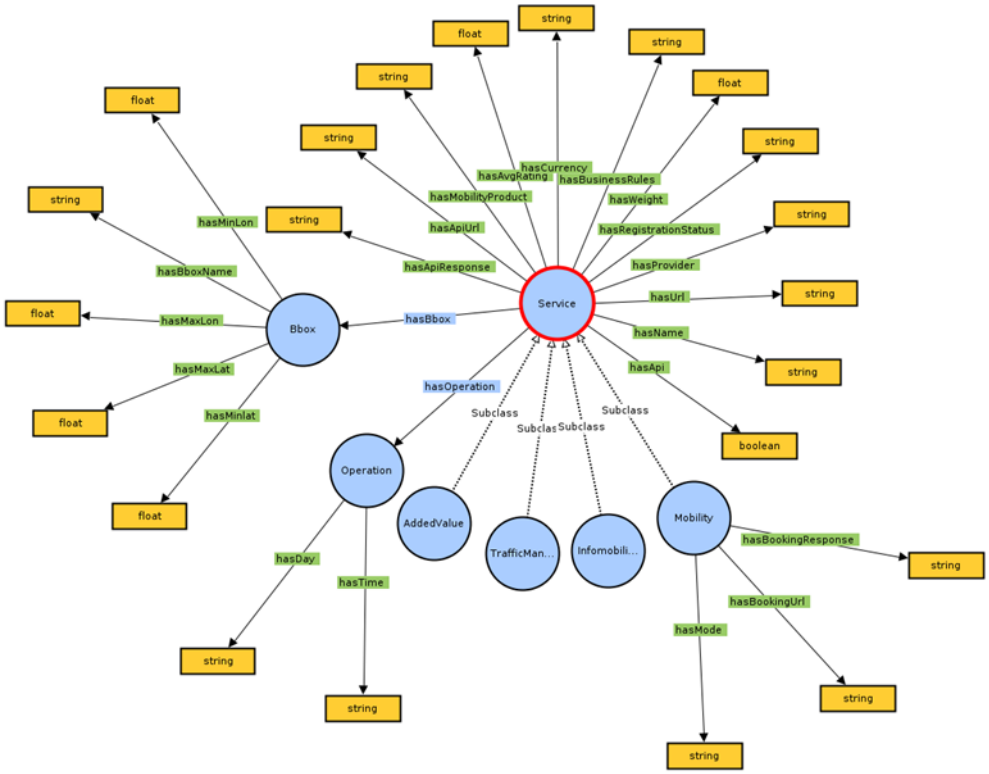

Figure 19: Service OWL ontology

An illustration of the Service JSON schema can be found in the Annex in section 1.4.

9 Conclusions

9.1 Lessons learnt: recommendations for further improvements (including trends in technology and operational features)

The approach of multiple stages of iterative user input has proved essential in shaping the user interface for MaaS applications. The approach taken in MyCorridor is similar to that advocated in ISO92410-210 'User Centred Design', with user evaluation at both a formative and summative stage.

The results and lessons learned address technical, operational, and business aspects from the project (whereas the business aspect will mainly be addressed in D6.3 from a stakeholder perspective).

One observation is that no aspect of a MaaS product can be taken in isolation. Even if the novelty and innovation is in a specific function (e.g., in terms of mobility packs and ticketing), other functions such as mapping and routing must be in place, robust and of a high quality, for user acceptance. This is also reflected in the finding that the integration of a large number of mobility services is essential in order to provide an attractive and ideally all-encompassing offer so that users can take real advantage of the usage of the MaaS applications. A MaaS product will lose attractiveness if it doesn't offer the whole range of mobility services available in the city/region an especially if it does not include the innovative mobility services such as car-sharing, car-pooling, etc. Also trust among all stakeholders was identified as being key to MaaS' success, especially when it comes to payment functions. The issue of trust could be addressed by providing more information on MaaS in general and also by providing more information on the MyCorridor app specifically. The studies have also revealed that the concept of MaaS still needs some promotion as it was not very well known to the majority of the users. It must still become tangible for the users what advantages such an application can actually bring them. Meeting this need can also increase confidence in the app.

For users it is also very important that the MaaS application is easy to use, clearly structured and intuitive, so that users feel confident when using the app and can rely on the quality of the services. From the conduction of the second pilot phase, we have seen that users are now used to a very high standard from various commercial providers on the market and expect a perfectly functioning app with impeccable usability. The "normal" functionalities were partly in the foreground of the evaluation and not the advantages or the additional benefits offered by the MaaS app. A MaaS app has to be an innovative and up to date application that includes the latest developments. This indicates that the expectations for a MaaS app are generally very high and that users do not distinguish between already long-established and new, innovative functions which are still in the development phase.

For future MaaS applications, it is important that a MaaS app offers services that show a clear added value compared to pure navigation apps and that the provided information is correct and always available. A MaaS app should bring advantages to the users in terms of costs and time spent travelling. It is important for each involved actor in the MaaS ecosystem clearly to know the benefit that MaaS will bring to them – this certainly involves both the users as well as service providers.

The quality of the offers has a great influence on the daily mobility decisions. A MaaS app offered in the region of the user is certainly not the only decision criterion, but it is one factor that is taken into consideration in the daily decisions of selecting which means of transport and route to use. If a good quality MaaS offer is available, it can positively influence the decision towards environmentally friendly, shared mobility offers. This is especially true when it comes to travelling across borders, when one often lacks the detailed information for local mobility offers in the destination country. The

studies have shown that users would be keen to use a MaaS app when they are travelling abroad or when they are planning their holidays and think that it would be beneficial if they could use an all-in-one ticket option. A good and comprehensive MaaS application could close this gap.

Local variation is substantial - not just in terms of local transport provision but in the specific needs and expectations of users for that locality, both in terms of journeys and in terms of how they want to consume their mobility. For example, countries and cities vary in terms of the relevance of supporting rural users.

From the service provider's point of view, data transferability between functions and transport services is critical and must be seamless - noted both in terms of user feedback and in the perceptions of transport stakeholders (see D6.3) - while this is a technical challenge, success in this arena can ensure the usability of the product as a whole. To achieve this, a technical solution has to be in place that operates across national borders. Therefore, an open, fair and transparent data governance system is needed. In addition, the use of a common MaaS API has to be used for the integration of services in order to achieve a high level of technological readiness. A further trend in technology that can be used in the near future will be the usage of NFC technology for the validation of mobility tokens in a MaaS platform.

In terms of operational features the MaaS products should have integrated a trip planning engine that is able to find all the available mobility services in the region of the user including all the possible alternatives that can be taken into consideration for a trip from A to B. In order to achieve this, as already mentioned, all mobility offers of the region must be available in the app. This also includes that regulations and policies are in place that encourage service providers to join the MaaS platform.

In times of the Covid-19 pandemic, mobility behaviour has changed in that the number of daily journeys has been fundamentally reduced, private cars are used more than public or shared mobility services again than under "normal" circumstances, and journeys across national borders are not possible or only possible to a very limited extent. This doubles the challenge for MaaS – not only are people using public transit less, they are even less disposed to experiment and try new offerings or alternatives to their usual journey plans. Nevertheless, it is important to continue working on the topic of MaaS, as it pursues a long-term vision and perspective that cannot be implemented in the short term. In the future, public, shared and easily accessible mobility services will (hopefully) take on a central role again. The topic is not only essential for individuals but for the topic of mobility as a whole.

In times of the Covid-19 pandemic a MaaS app could also offer the additional service of providing information on the occupancy rate of the mobility offers. Further, also the indication of available “single-user” mobility services (such as scooter sharing or bike sharing) could be an important information and convince people to use this specific offer. That would bring an added-value for these special times and provide a direct benefit for the users.

Overall, MaaS will be one of the key innovations to shape the mobility of the future in years to come and has the potential to optimise the mobility system, positively impacting the traveller’s journeys by offering multimodal transport solutions. To succeed, MaaS solutions will have to be user centric, open, complementary, and scalable.

Finally, the rollout of MaaS has moved in a short space of time from a vision to a reality. Users therefore have high expectations of what MaaS can do for them, and how any one MaaS service compares with a number of MaaS alternatives in the market. This means MaaS provision of the future needs to be of a high quality both in terms of transport provision, and in application user experience. Also, the importance of incentive needs to be considered when testing with users as this increases the attractiveness to participate.

9.2 Recommendations for analysing MaaS data

For future studies on MaaS platforms, a larger sample could be used so that more data is available, especially if one wants to make country-specific evaluations, derivations, and comparisons. This would require a significantly larger sample per country.

This sample should also be as heterogeneous as possible, so that, for example, women, young and older people, etc. are represented in sufficient numbers, as the mobility behaviour of these groups certainly differs from other users' groups. This could then be used to evaluate the user-friendliness, acceptance, satisfaction, etc. per user group and, based on the results, implement appropriate improvements so that the MaaS application has a high level of attractiveness for as many user groups as possible.

In future MaaS studies, it should also be ensured that similar spatial structures are compared with each other and that a distinction is made between applications in large cities and rural regions, for example. The characteristics of the mobility sector in these areas are very different and so are the requirements for a MaaS application.

Even though personalisation of MaaS offers is widely considered as a significant benefit, this cannot be based on the user profile setup (which would make such an application installation unbearable complex) but on user data analysis. Here it is important to note that a successfully personalised MaaS platform has to collect usage data from huge audience.

9.3 MyCorridor's role in maximizing MaaS adoption & policy making

MaaS is an attempt to bring together different mobility services and offers in order to increase the personalisation, flexibility and freedom for travellers. The pilots proved that, despite MaaS being a complex concept with several barriers, it is a viable solution for the future of mobility. Travellers admitted that MaaS is easily understandable concept that however, still needs promotion, has to be based on wide range of services (complete inventory) and has to be straightforward, user friendly with understandable front-ends. From the user's point of view, the idea that an application can be used across borders is very appealing. This promises simplifications if the implementation is good.

MyCorridor paved the way for cross-border MaaS by setting an example of how transport services can be integrated into a single mobile application that provided personalised services and single access payment and tokens for their trips. One of the main roles in this project was to introduce the participants to the idea of MaaS and to explain what opportunities are opened up by such innovative mobility products. It has been important to study and analyse the business model of a MaaS product and to identify how many stakeholders are involved in the process. It is clear that there must be benefits for the users to adopt MaaS products and these can be delivered to the users only if a specific set of regulations, policies and measures are defined for the city/area/region where the product will be operational.

From the tests we realized that the MyCorridor application contributes significantly to the philosophy of mobility as a service and combines multiple transport options, based on the user needs. On the part of users there is a willingness to use and test MaaS products that offer several mobility tokens in a single transaction as long as long as a good quality of the application can be ensured. One of the biggest challenges was to gather as many services as possible in MyCorridor to meet the needs and expectations of all users. This is also a key criterion for high acceptance from the user's point of view.

With regards to policy implications resulting from MyCorridor it can be said that MaaS should also be recognised as part of the wider toolkit for urban planning, at least in policy terms. Policy experts

are needed in every major city to look closely at growth of MaaS and the impact that passenger transport can have on urban areas in terms of congestion, emissions and safety. This is especially important in already congested urban environments. One of the innovations in MyCorridor is the use of TM 2.0, a traffic and congestion management tool, which hopefully will balance the convenience for the traveller with the wider need to keep transit moving across cities.

Further, Policy needs to be in place to support common APIs at a cross-national level. This not only encourages and enables cross border journeys, it also supports a common experience when people are using MaaS in different cities.

Another requirement is, that Policy needs to balance a common approach with the local distinctions and preferences of cities and countries - for example, some cities are more mature in their MaaS deployment, or in their deployment of mobility services. There is also a distinction between those cities that are driven by a private transport market and those that are more tuned to public transit operators.

Finally it can be said, that the MaaS concept is now well understood within the transport sector and beyond, with government bodies across the EU showing interest and pushing discussions and policies, which could drive MaaS deployment. There is a great shift across Europe from how things stood at the beginning of this project in 2017.

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1 Annex

1.1 Plots 1st Pilot

1.1.1 Participants: Demographics and background information

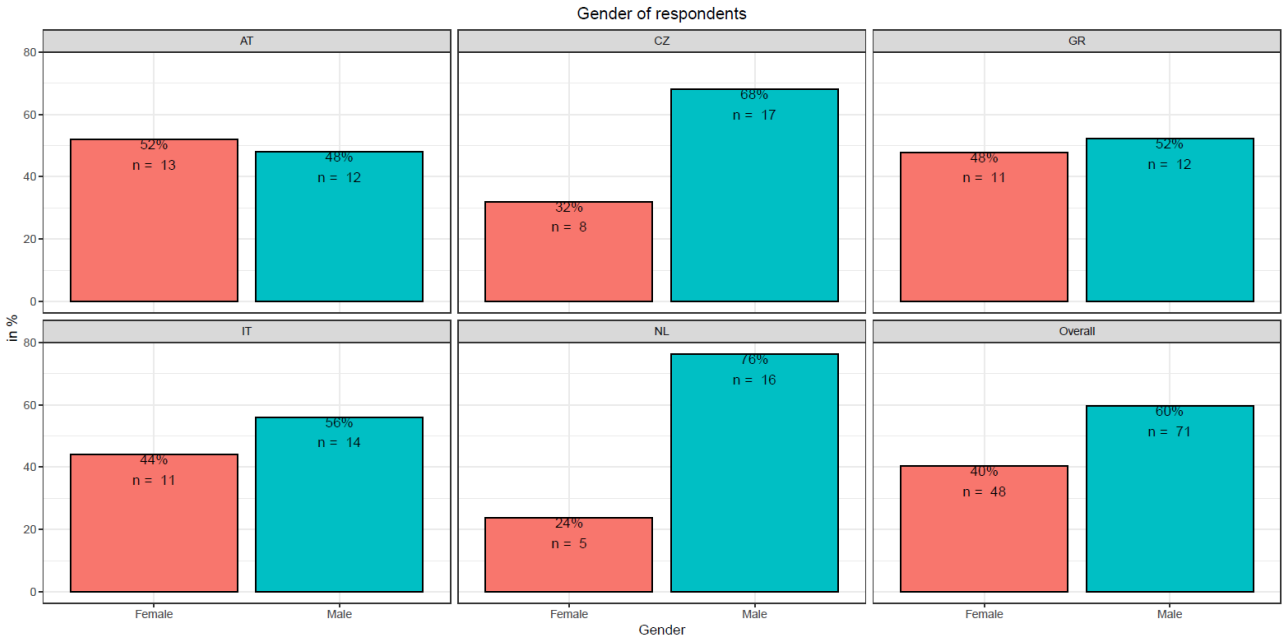


Figure 20: Gender of respondents, overall and per country. Ratio in percent and absolute numbers (n).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723384

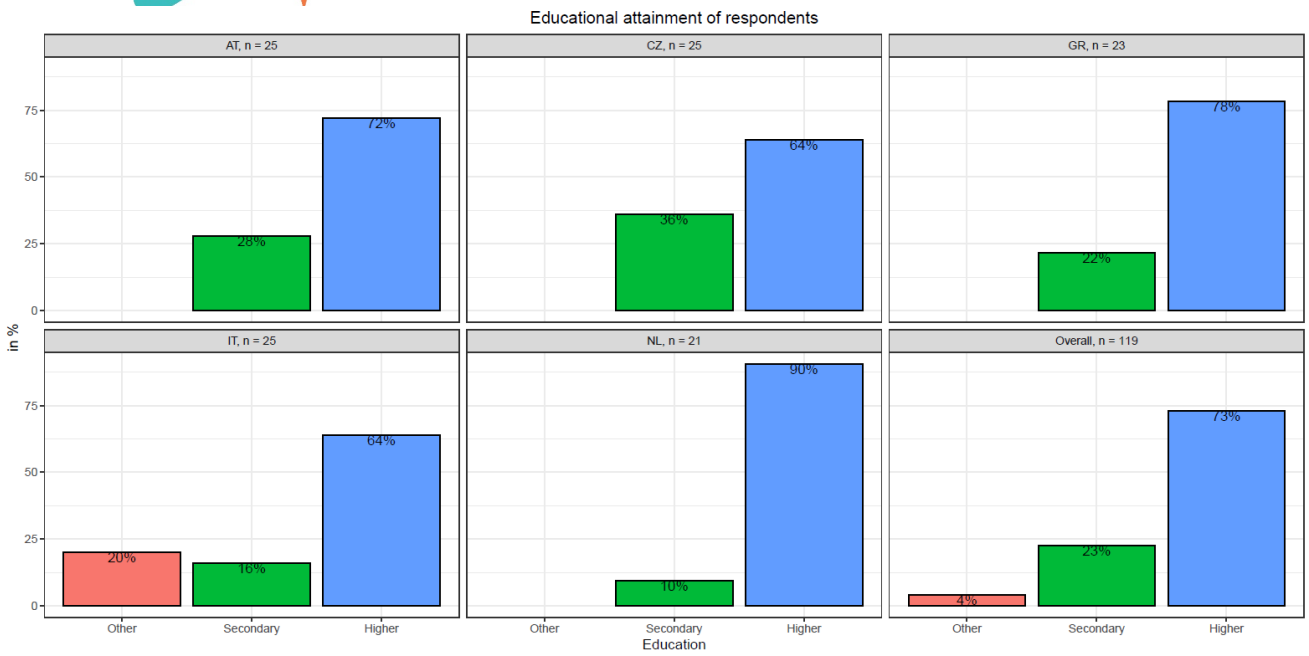


Figure 21: Educational attainment of respondents, overall and per country. In percent.

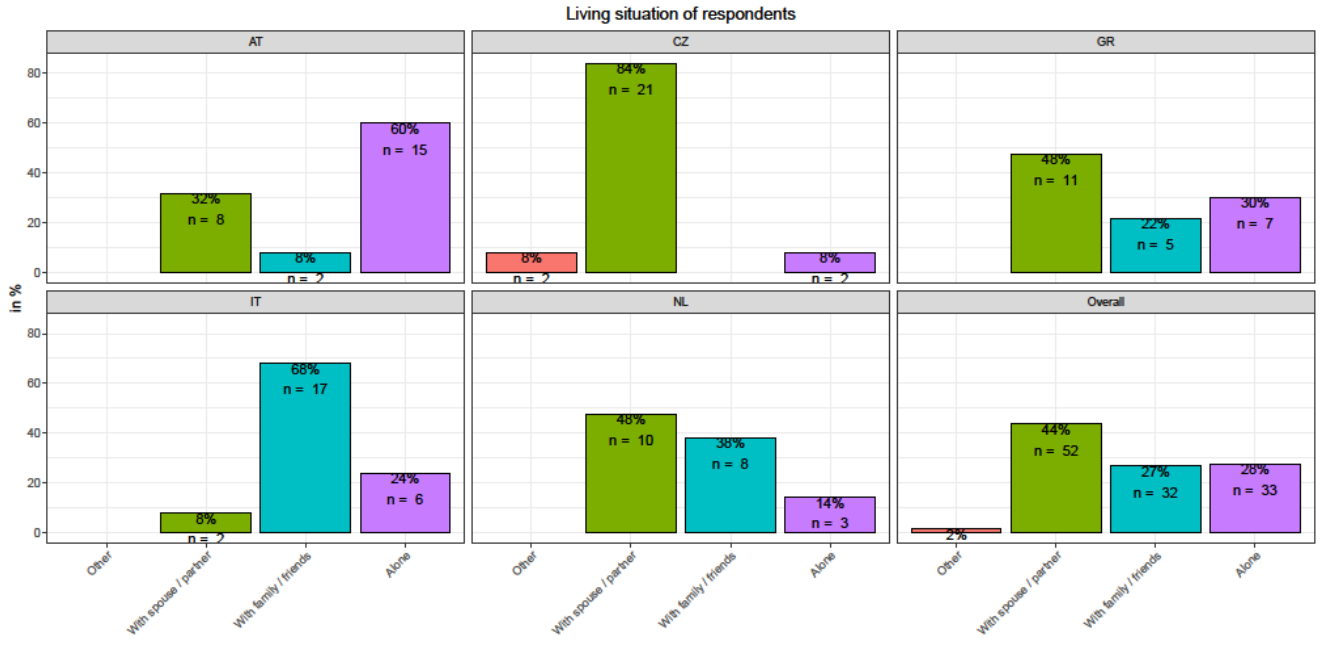


Figure 22: Living situation of respondents, overall and per country. Ratio in percent and absolute numbers (n).

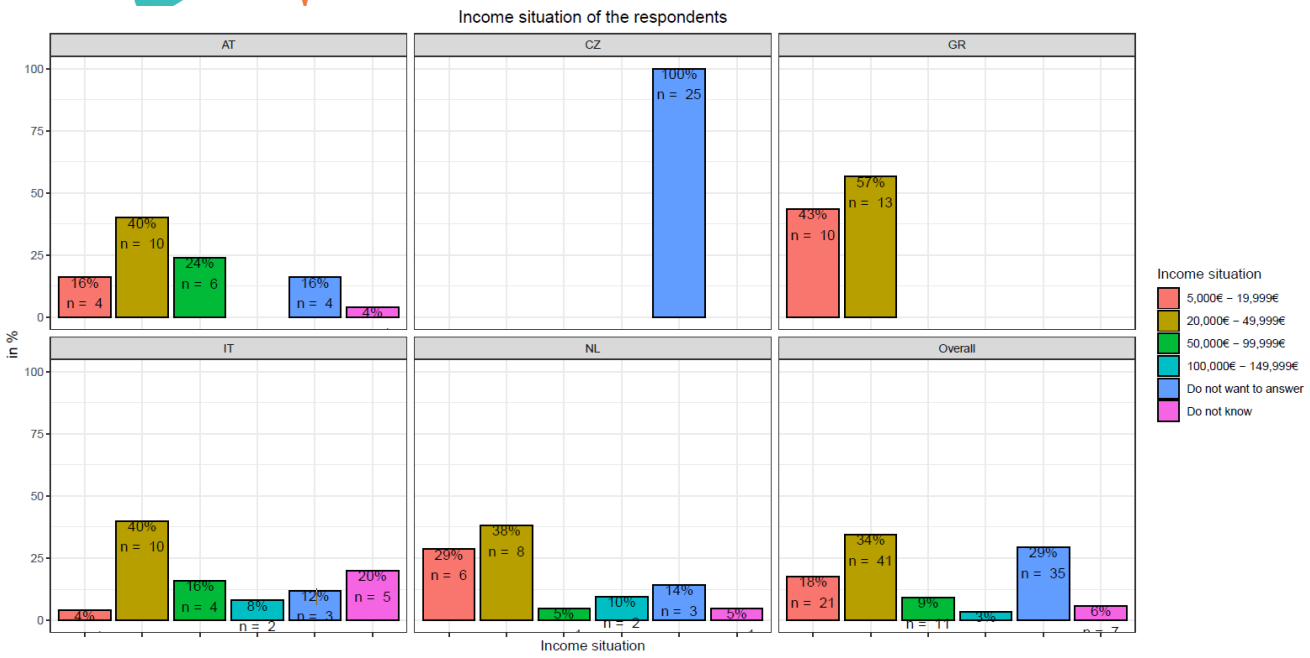


Figure 23: Income situation of respondents, overall and per country. Ratio in percent and absolute numbers (n).

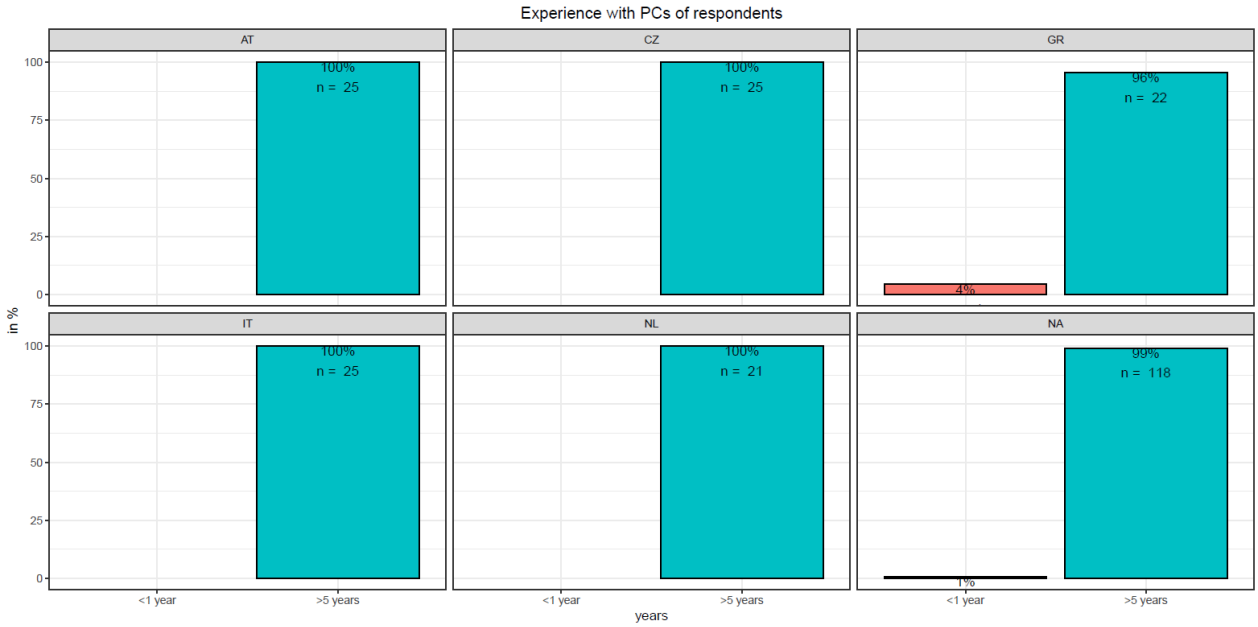


Figure 24: Experience with PCs of respondents, overall and per country. Ratio in percent and absolute numbers (n).

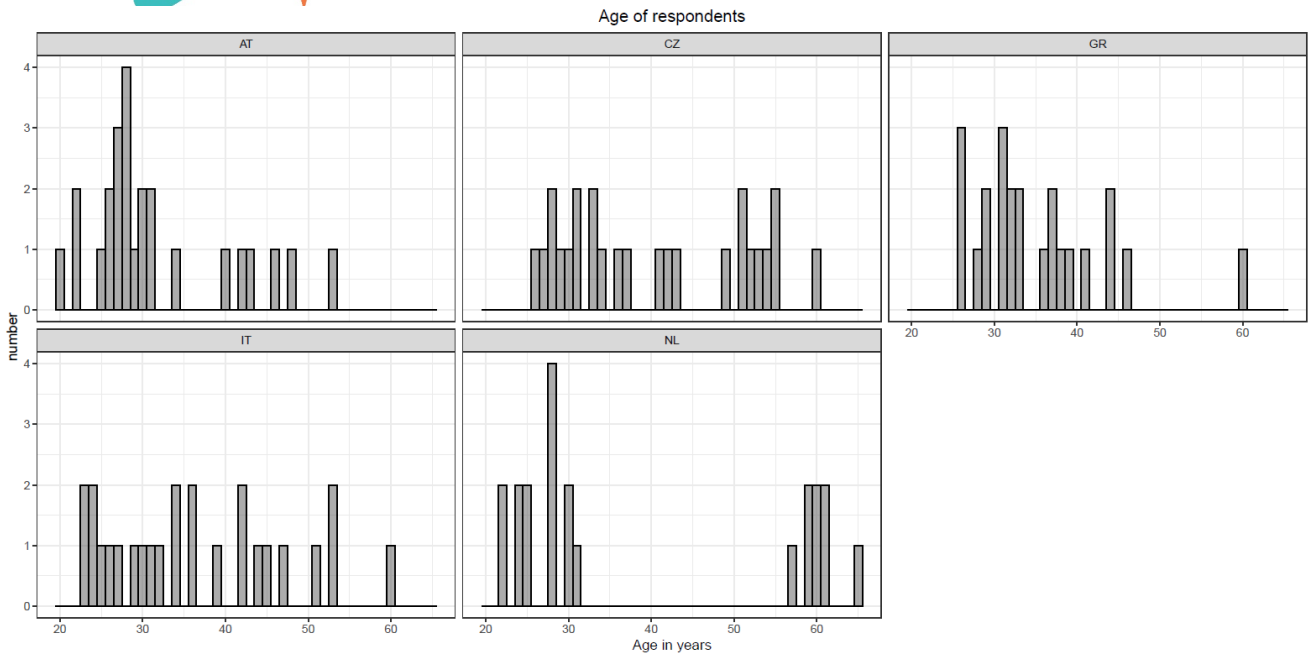


Figure 25: Distribution of age among respondents, per country. Ratio in percent and absolute numbers (n).

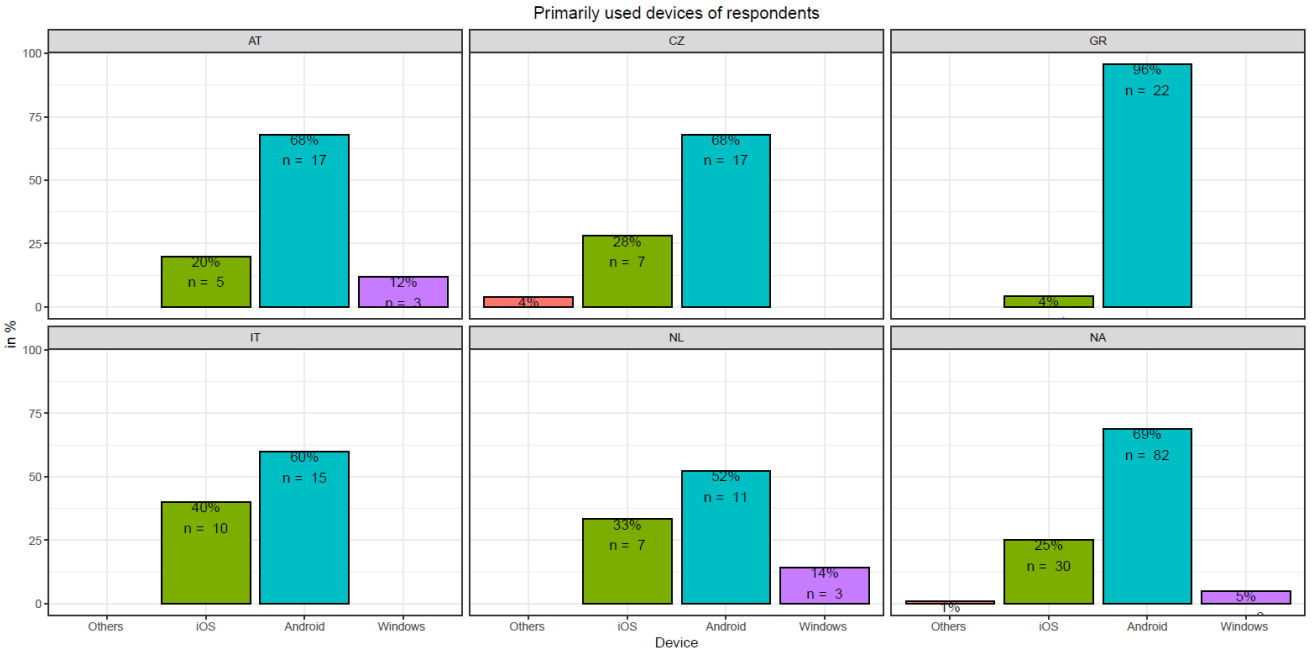


Figure 26: Primarily used devices of respondents, overall and per country. Ratio in percent and absolute numbers (n).

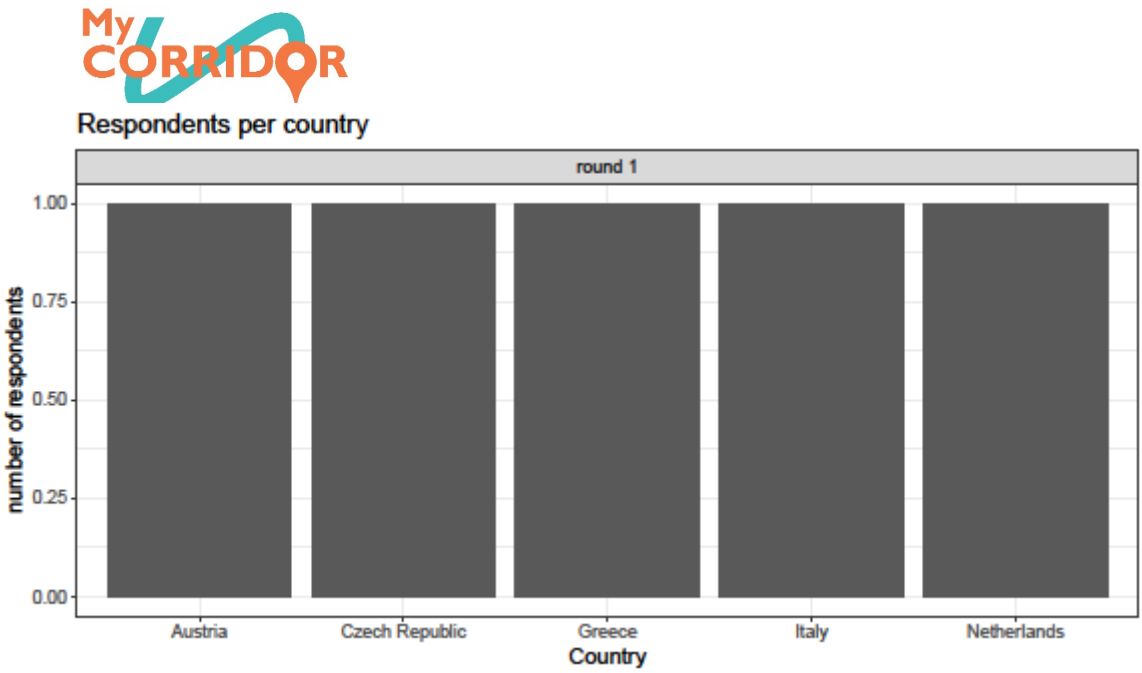


Figure 27: Service Provider round 1 - Respondents per country

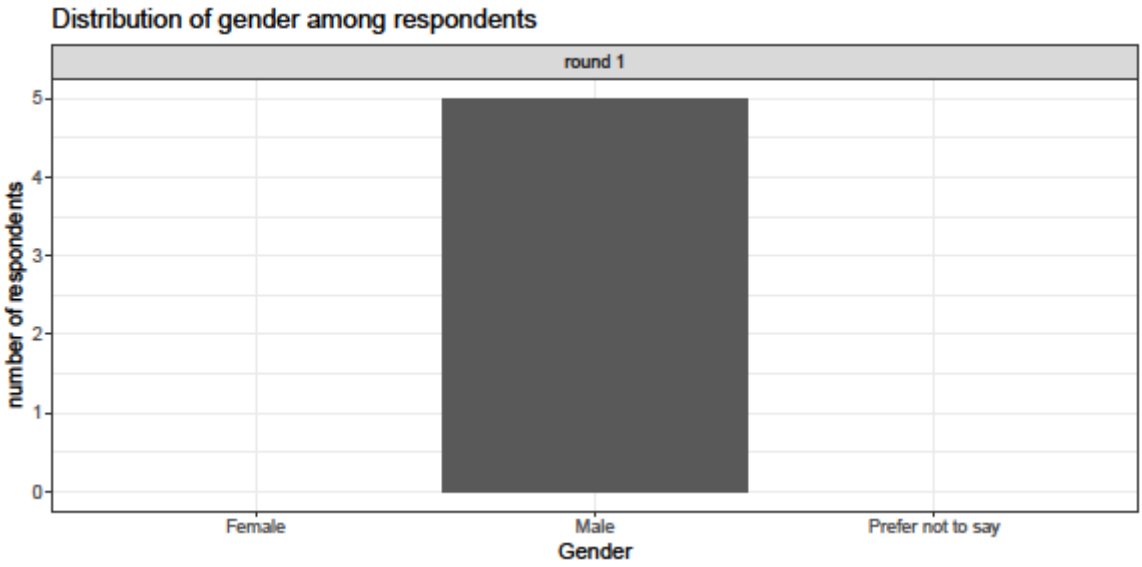


Figure 28: Service Provider round 1 - Distribution of gender among respondents

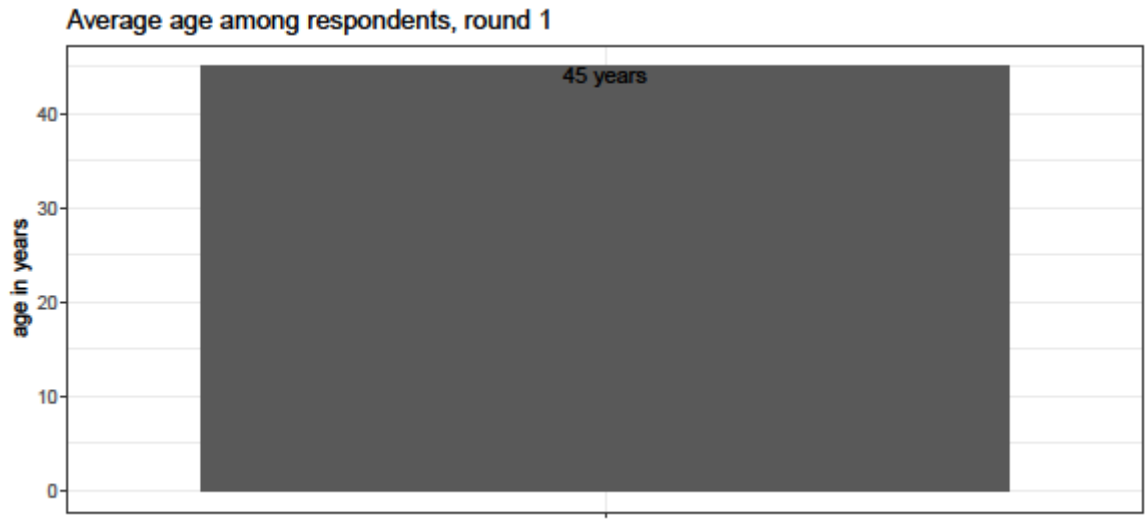


Figure 29: Service Provider round 1 – Average age among respondents

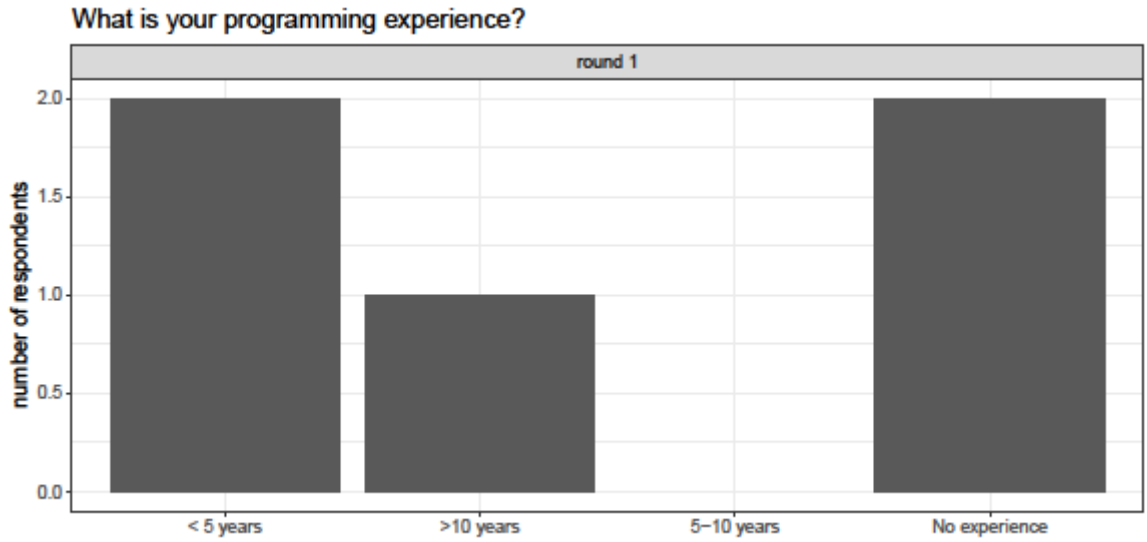


Figure 30: Service Provider round 1 - What is your programming experience?

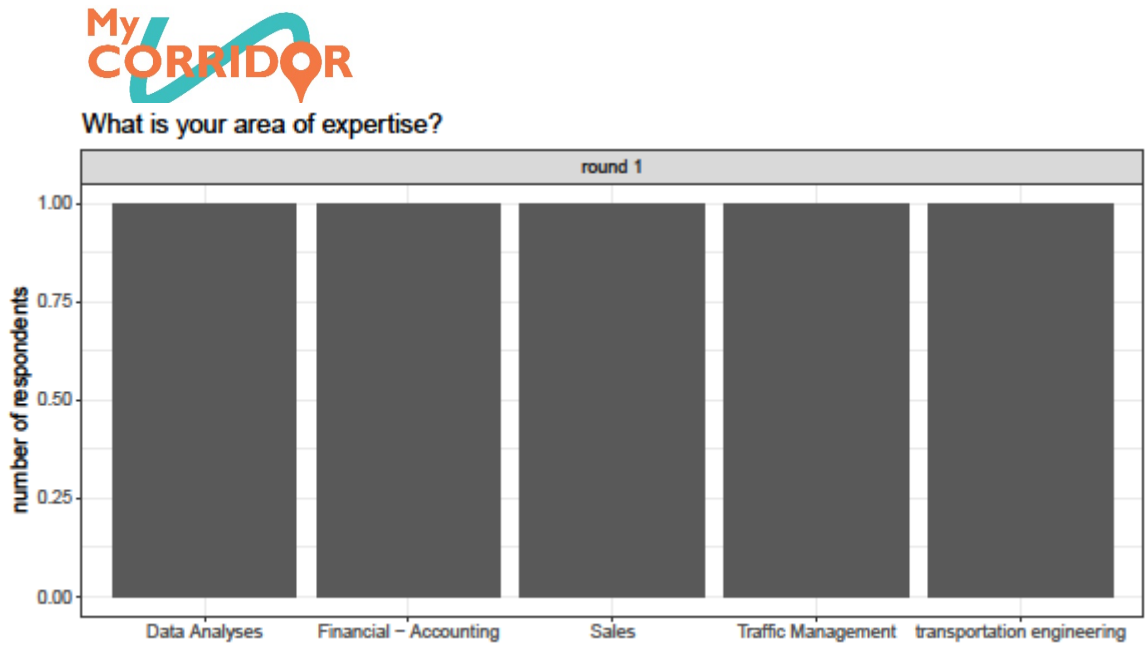


Figure 31: Service provider round 1 – What is your area of expertise?

1.1.2 Results from the Baseline interviews

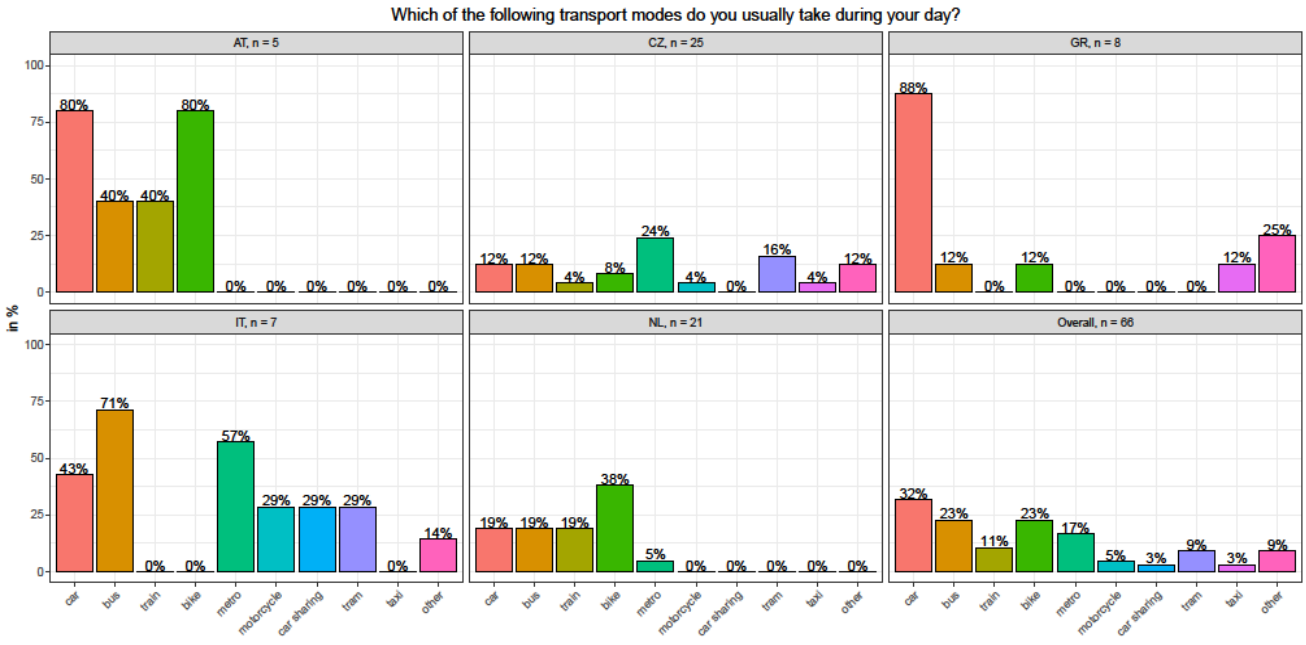


Figure 32: Which of the following transport modes do you usually take during your day? In percent.

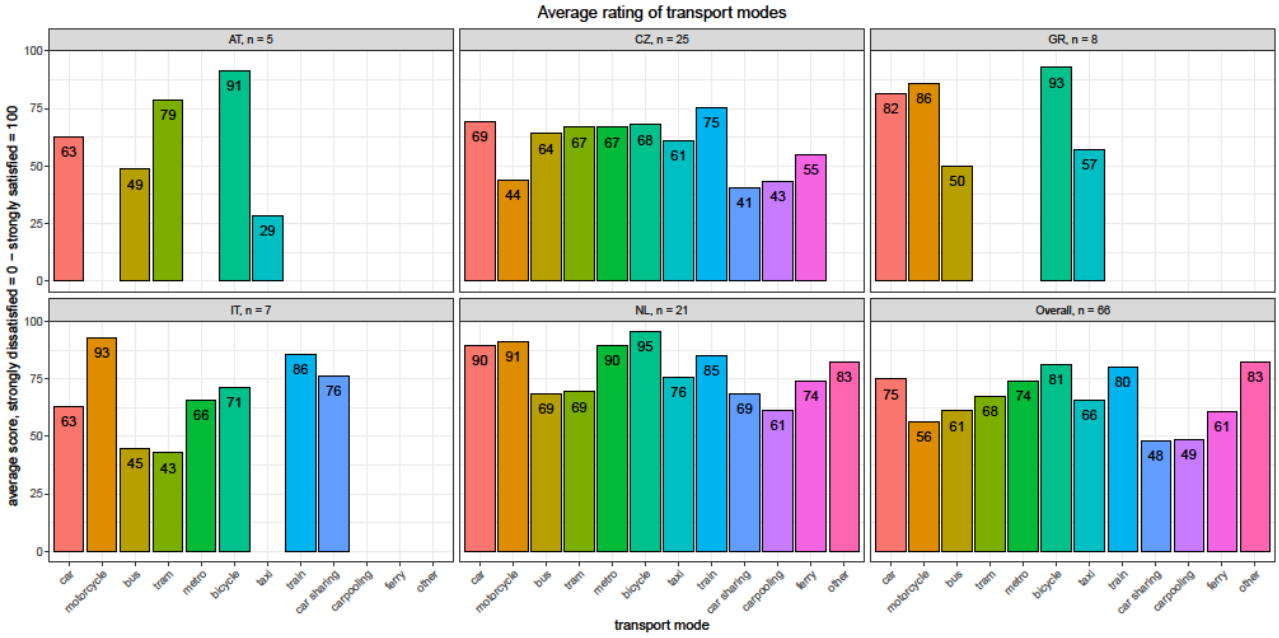


Figure 33: How would you assess your satisfaction with your existing means of transport? Please rate all means of transport you use, average values.

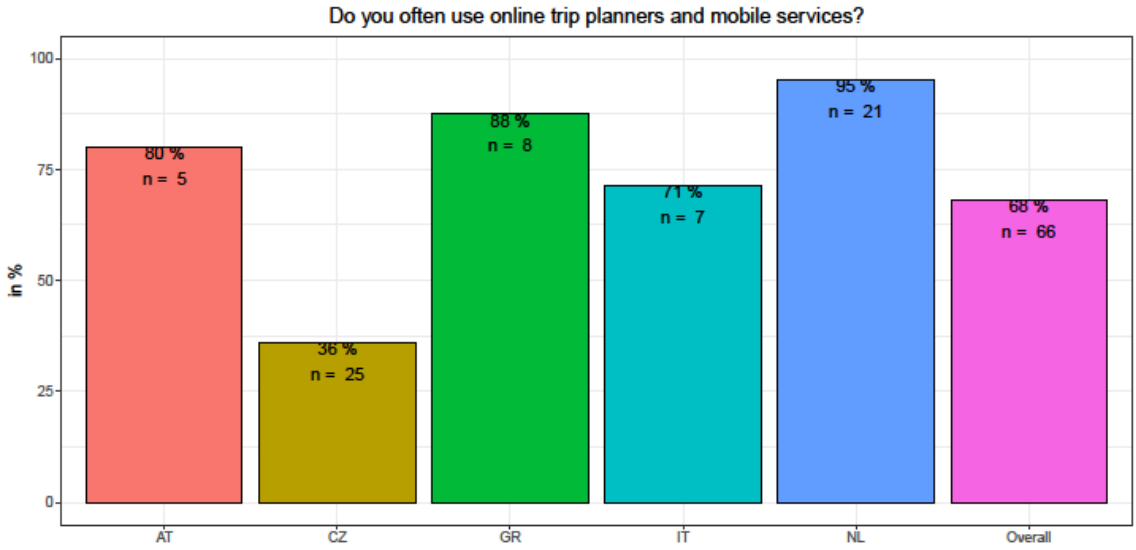


Figure 34: Do you often use online trip planners and mobile services?

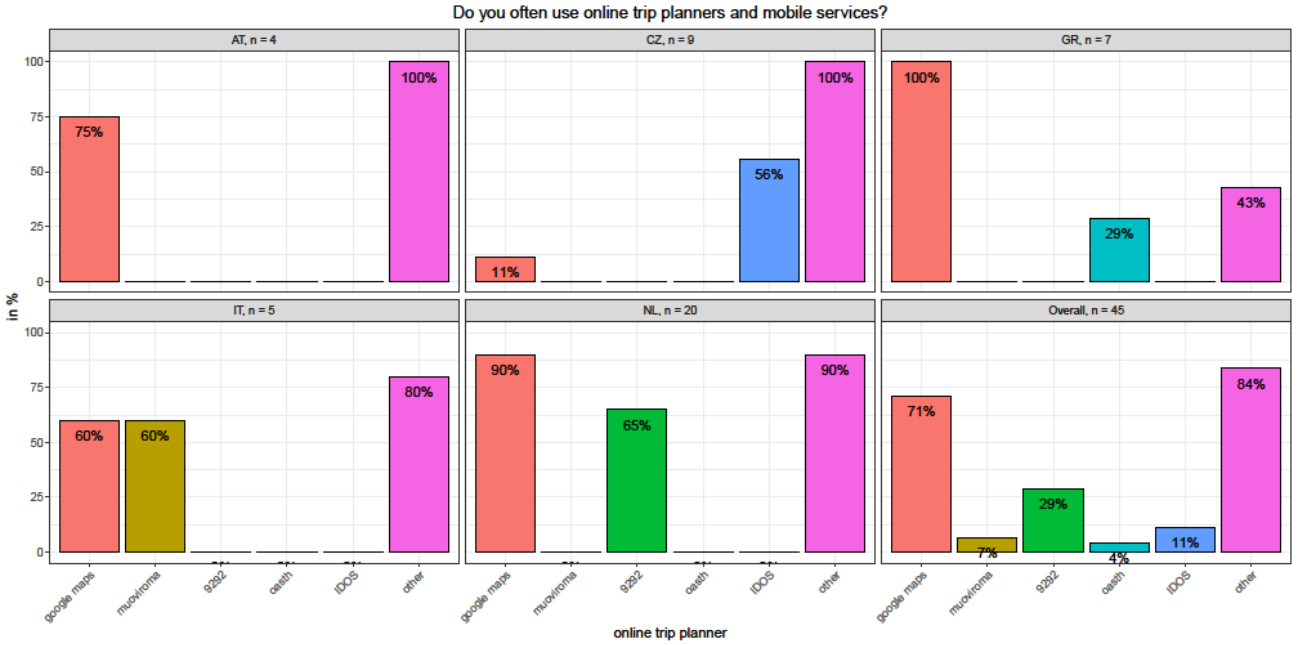


Figure 35: Do you often use online trip planners and mobile services? If answered yes: which ones? in percent.

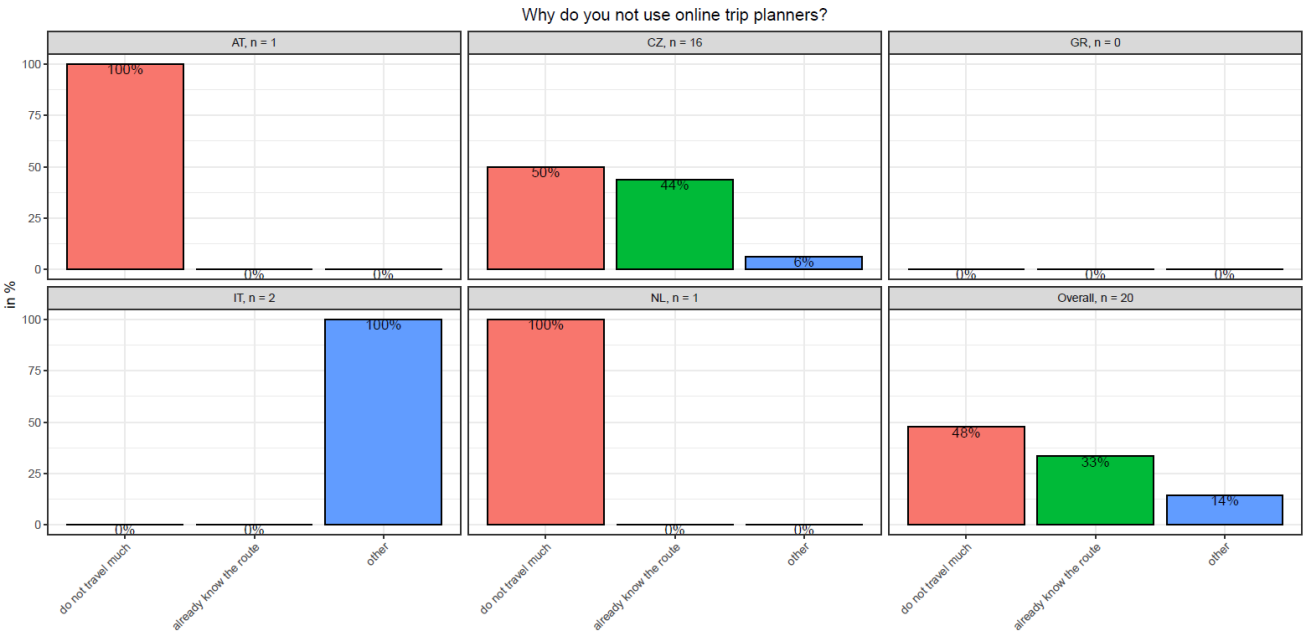


Figure 36: Do you often use online trip planners and mobile services? If answered no: Why not? In percent.

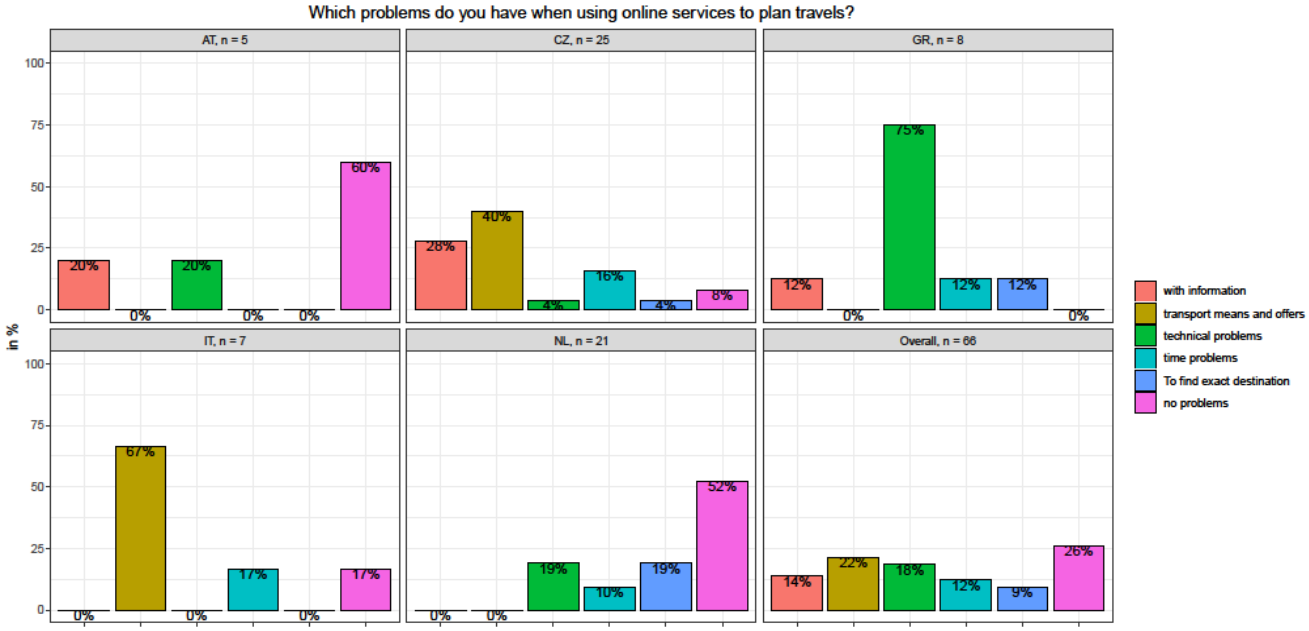


Figure 37: Which problems do you have when using online services to plan travels? In percent.

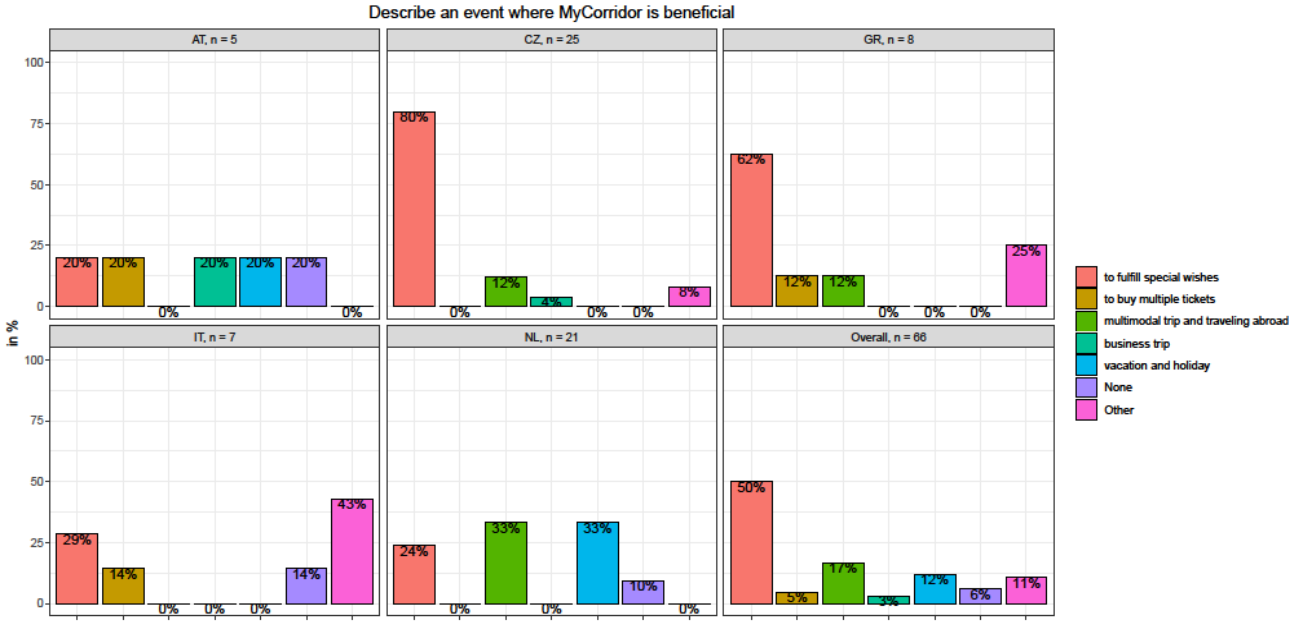


Figure 38: Describe an event when MyCorridor is beneficial

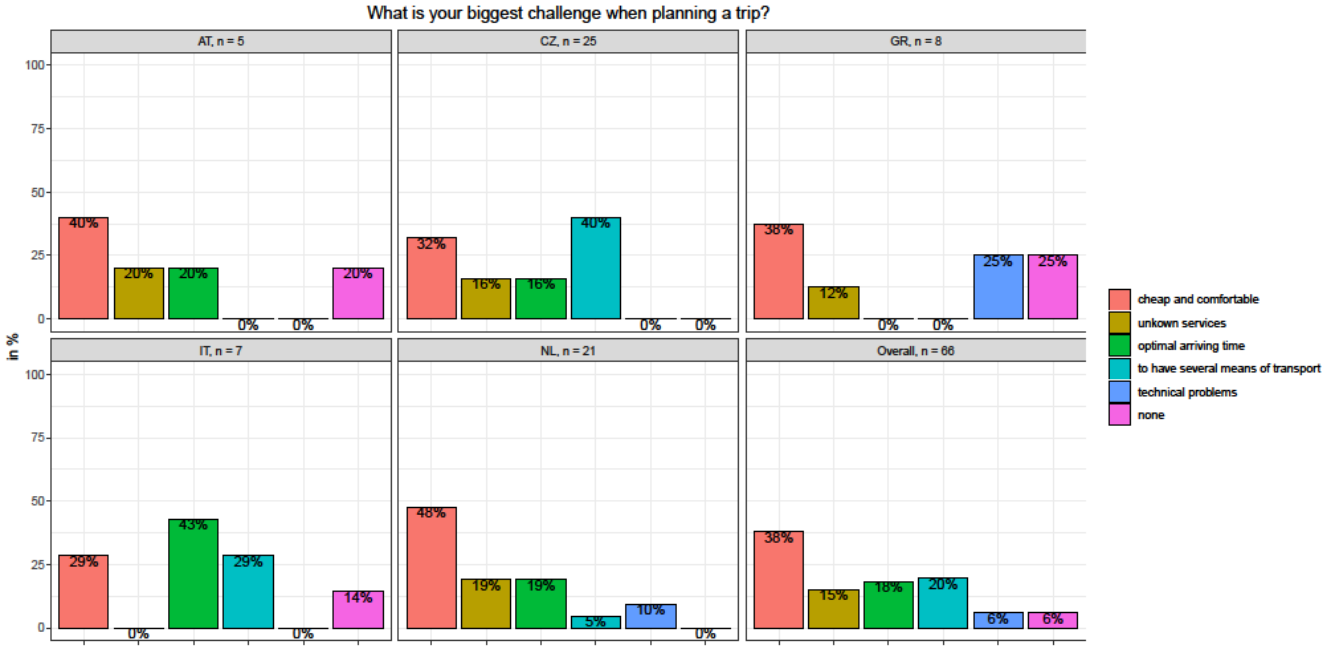


Figure 39: What is your biggest challenge when you are planning to travel?

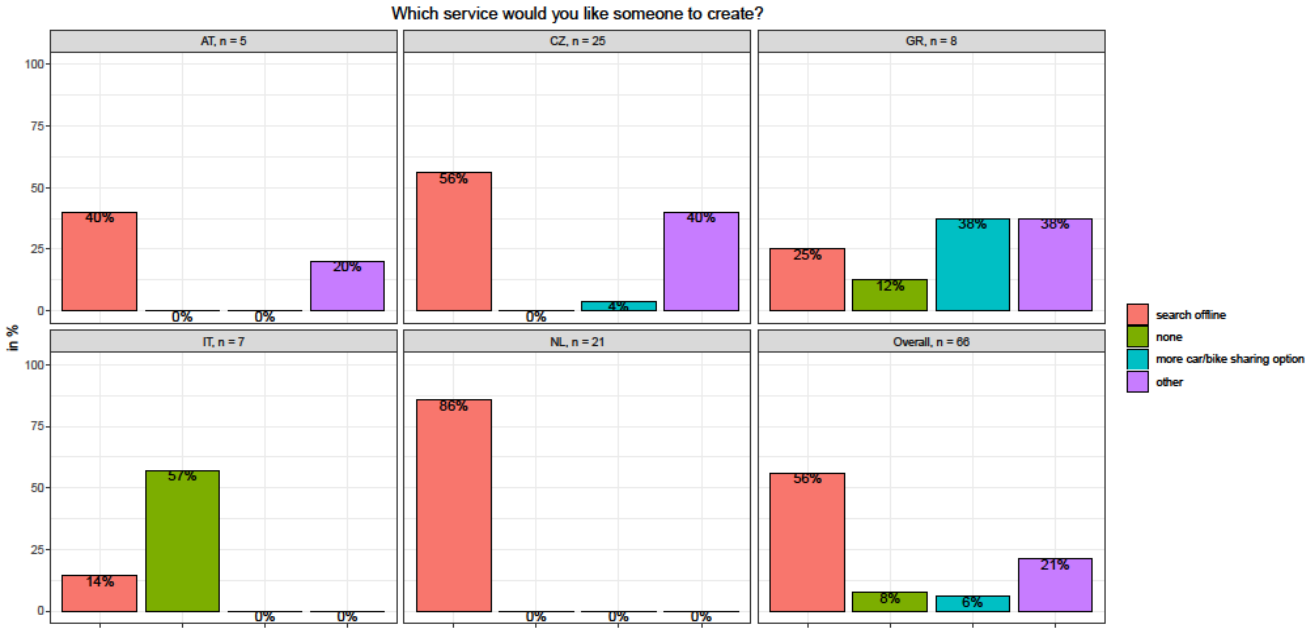


Figure 40: What is not out there? Which product/service/tool/app would you like someone to create? In percent.

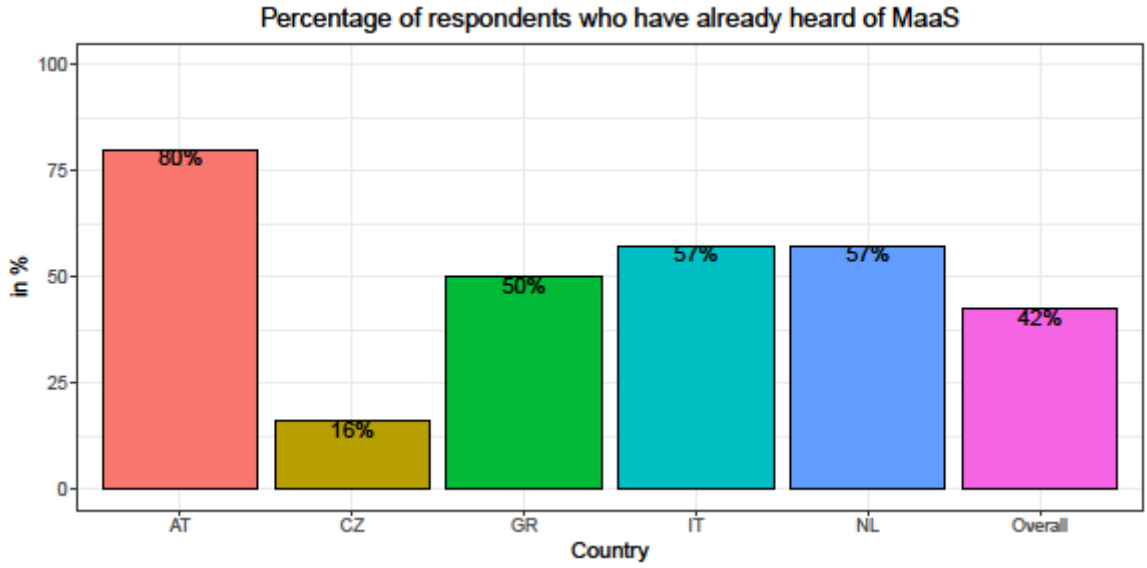


Figure 41: Have you heard of MaaS (Mobility as a Service) before?

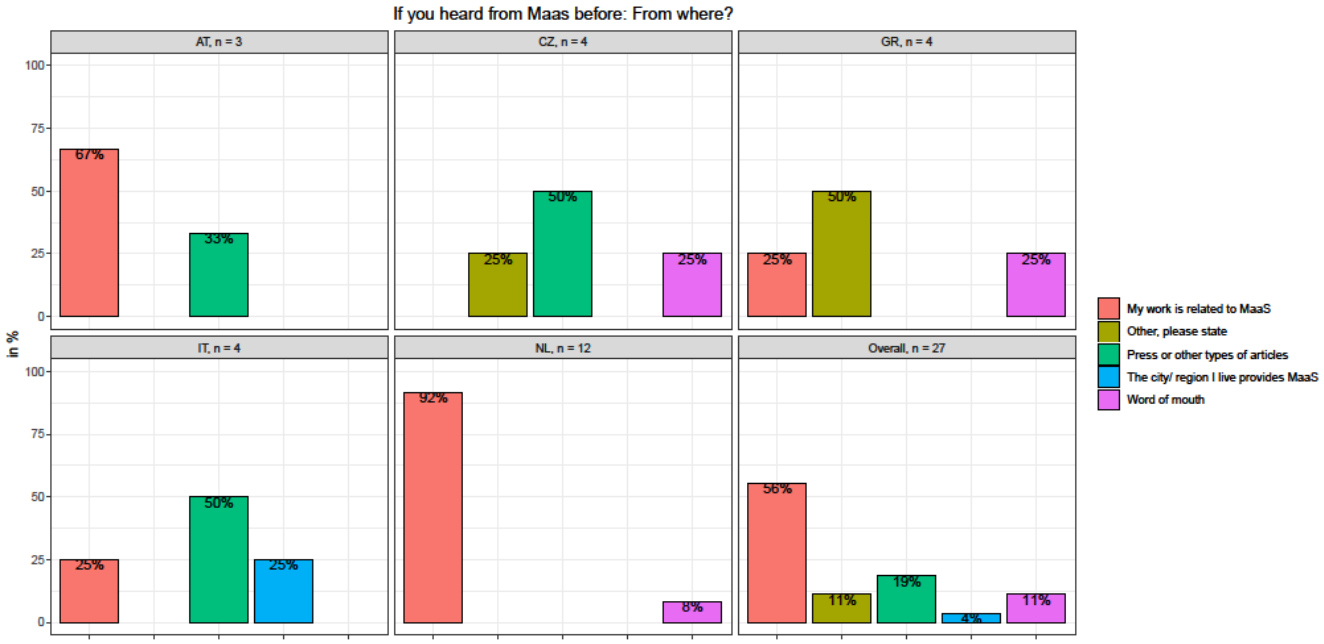


Figure 42: If you have heard about MaaS before: From where? In percent.

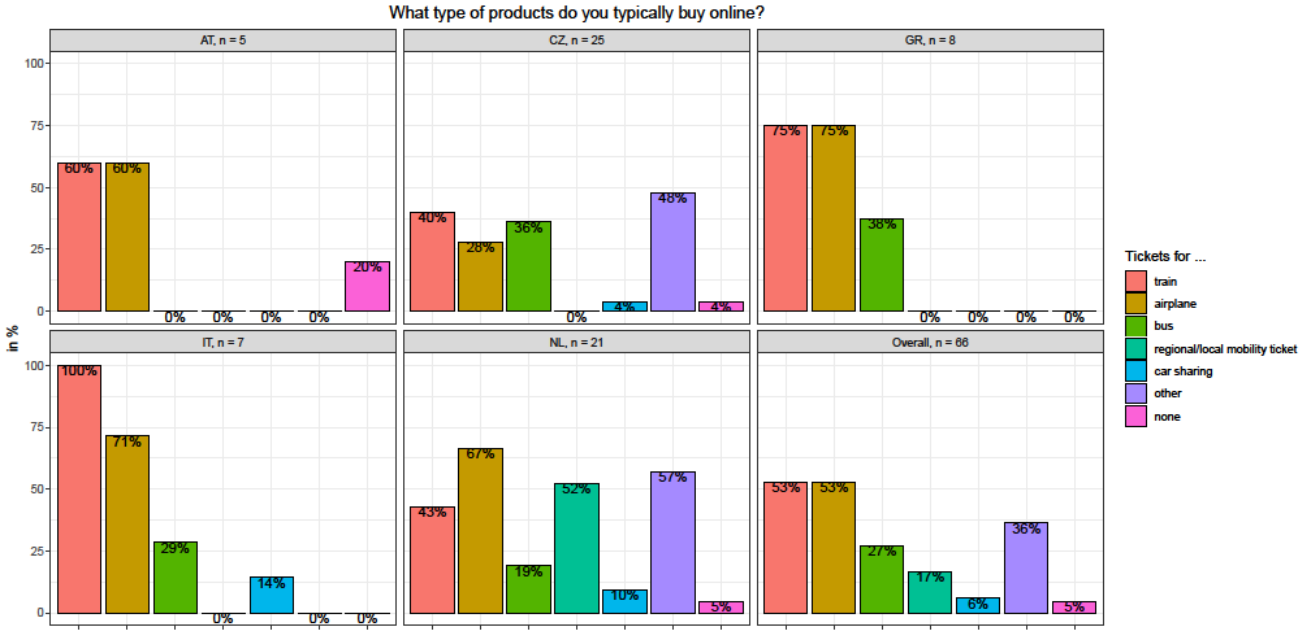


Figure 43: What kind of mobility products do you shop online? In percent.

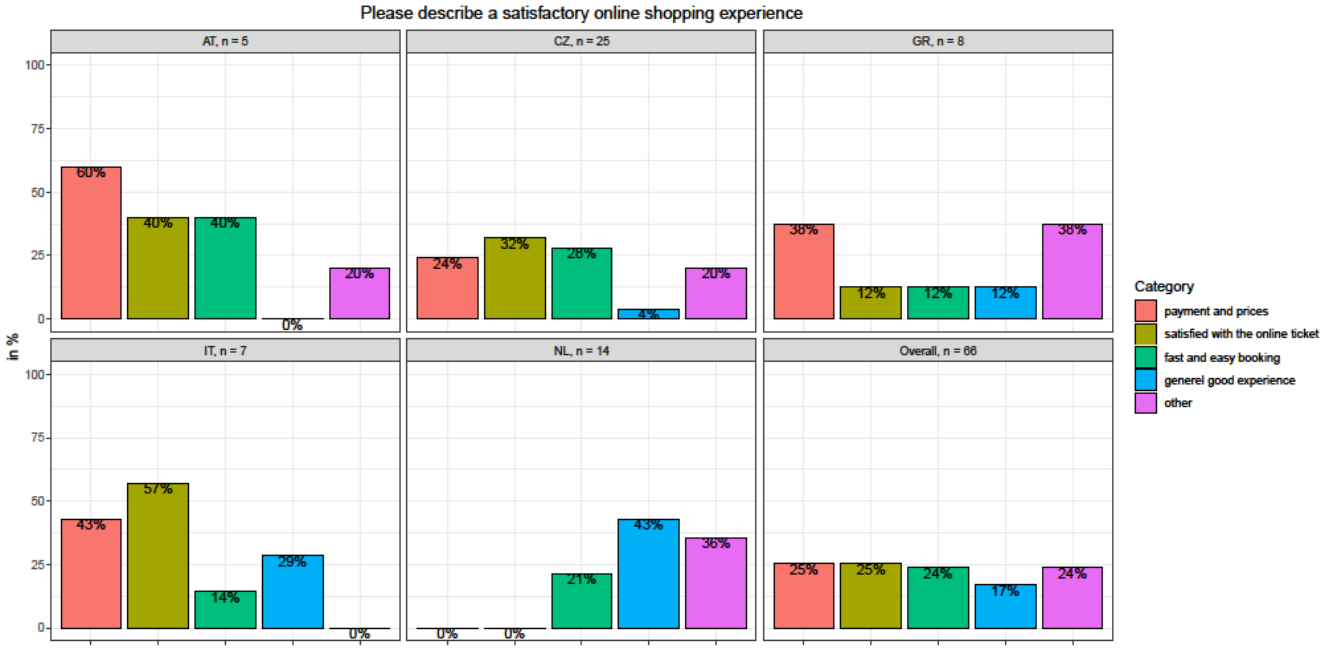


Figure 44: Please describe a satisfactory online shopping experience for mobility products. In percent.

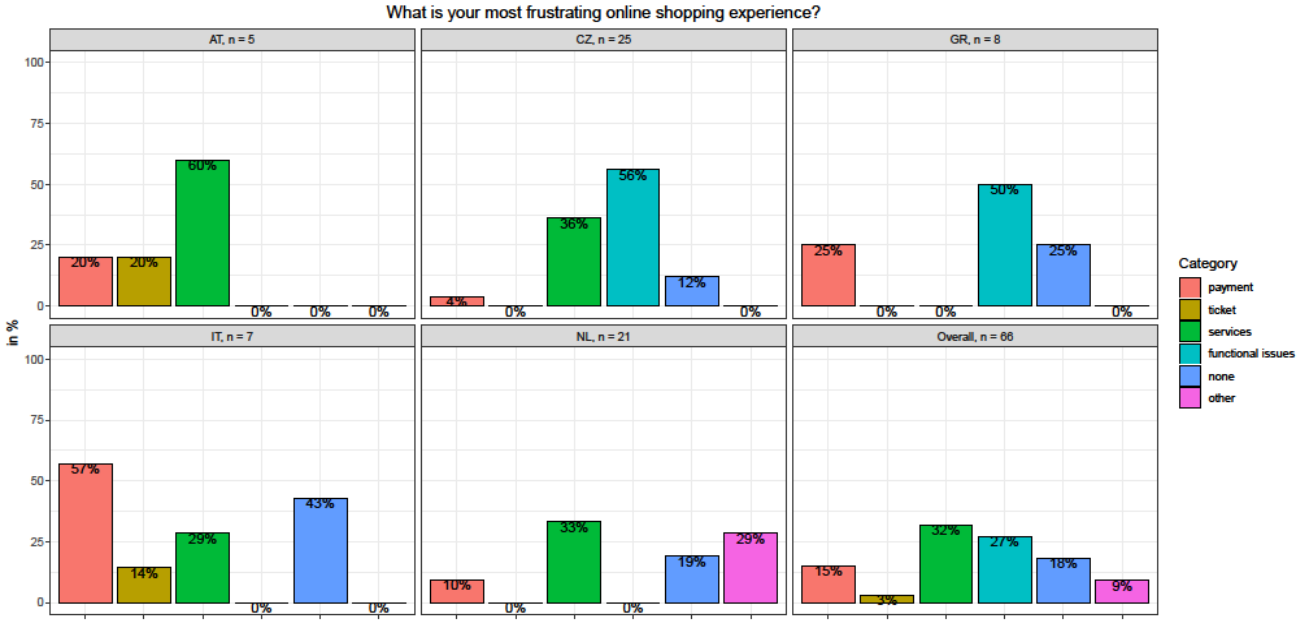


Figure 45: Please describe a frustrating online shopping experience for mobility products. Divided into categories, in percent.

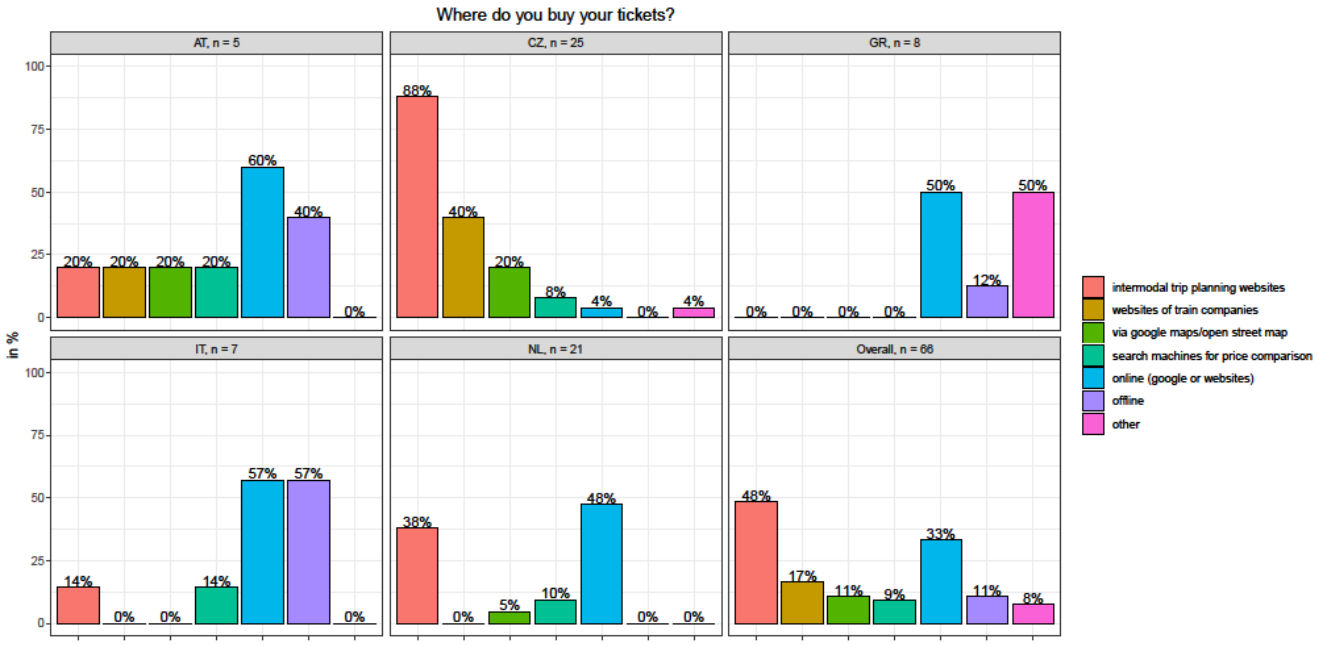


Figure 46: Where do you buy your tickets?

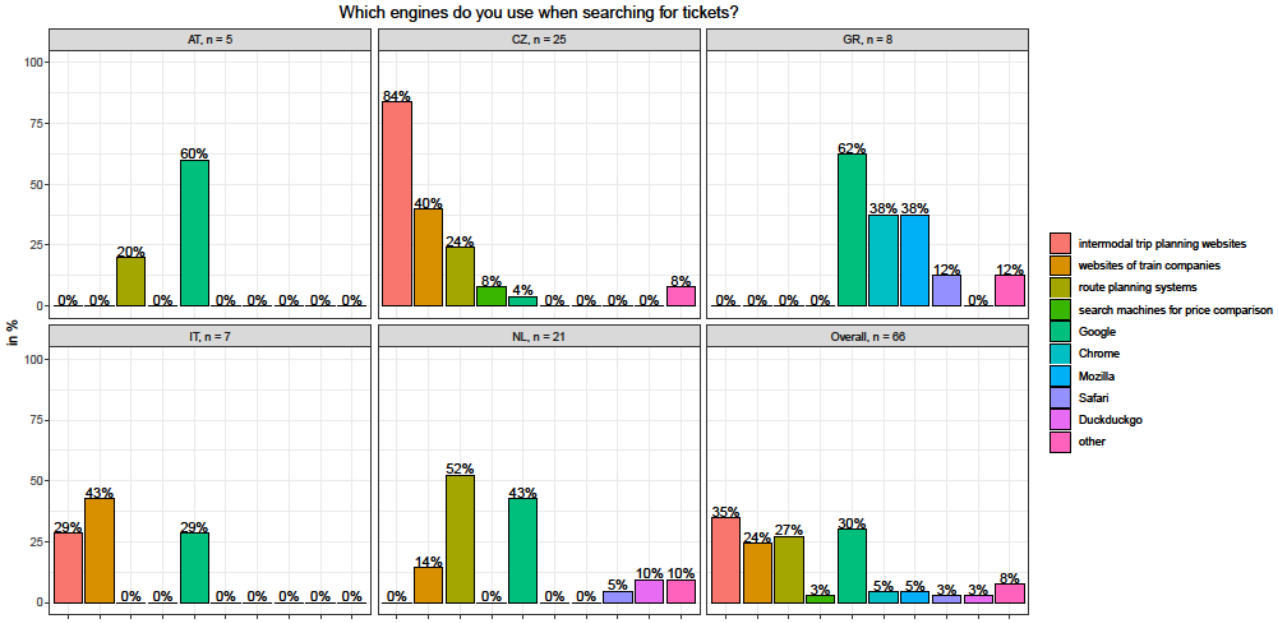


Figure 47: Which engines do you use when searching for tickets?

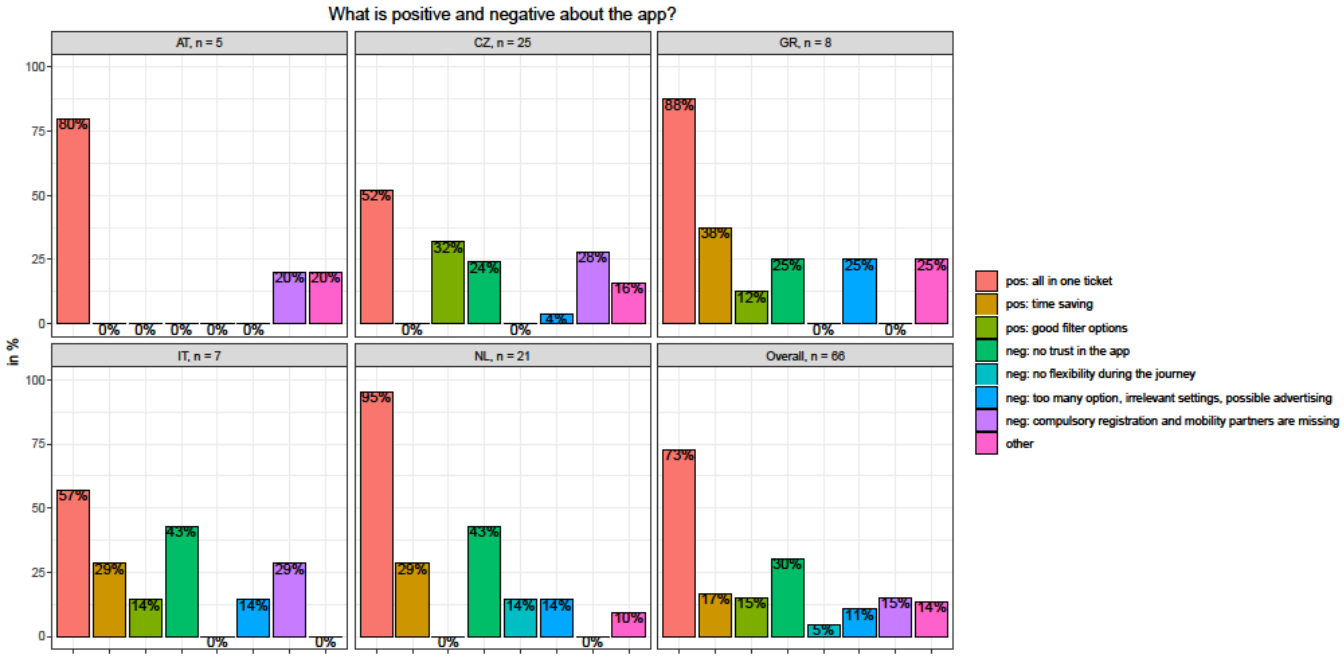


Figure 48: What is positive/negative about the app? In percent.

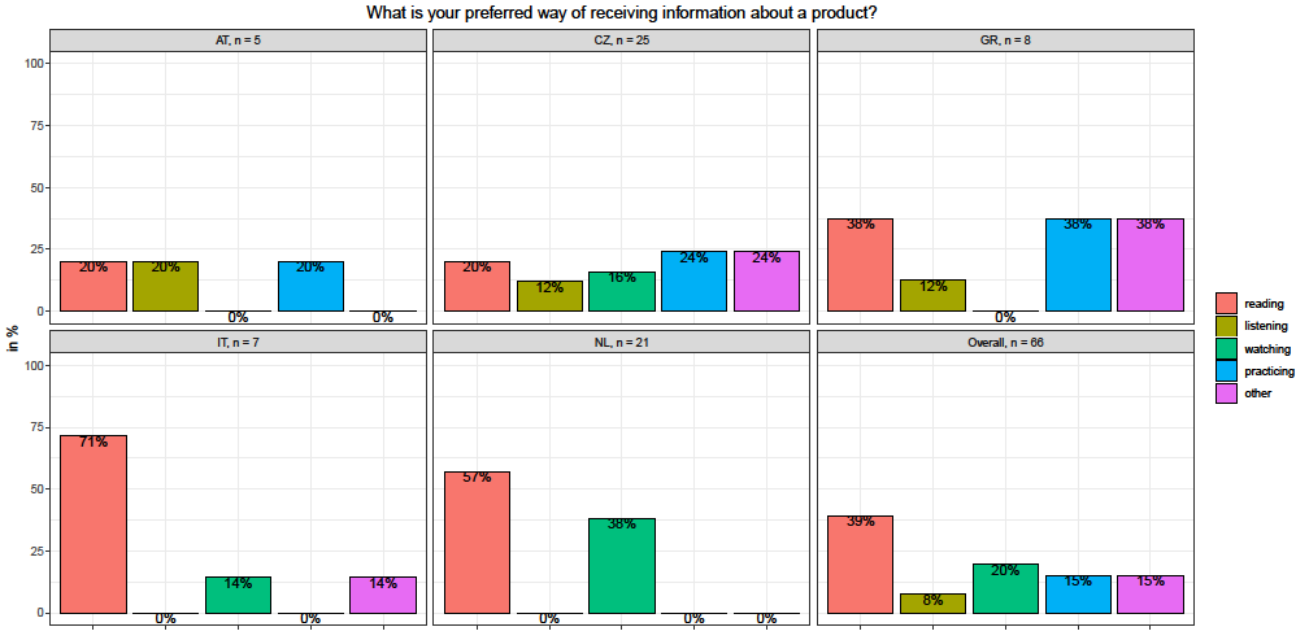


Figure 49: What is your preferred method of receiving information about a product?

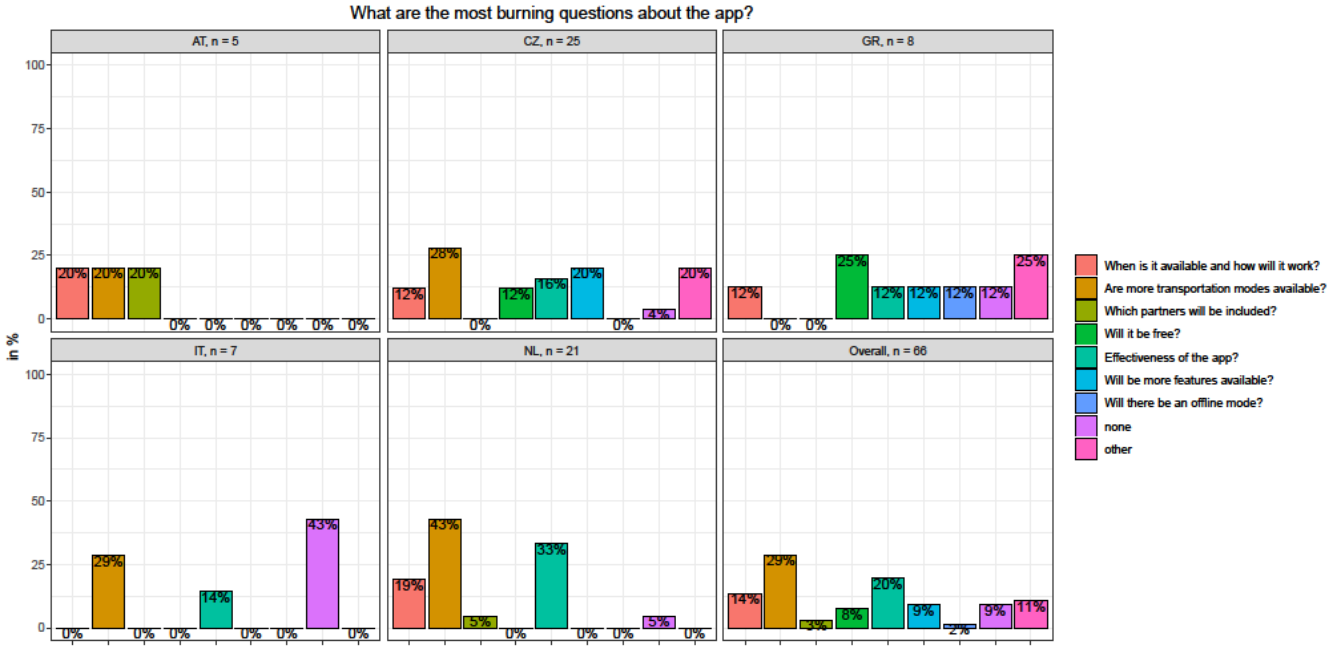


Figure 50: What are your most burning questions about MyCorridor mobile app?

1.1.3 Results from the Pre-questionnaires

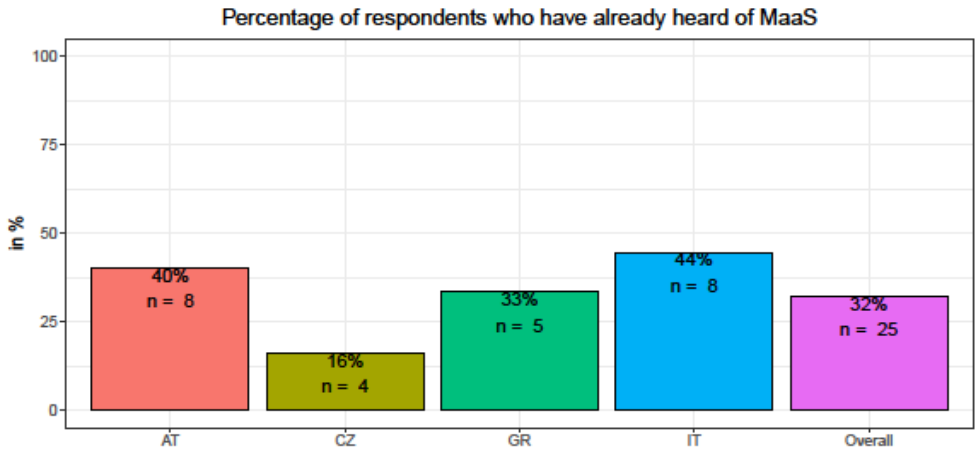


Figure 51: Have you heard of MaaS (Mobility as a Service) before? In Percent.

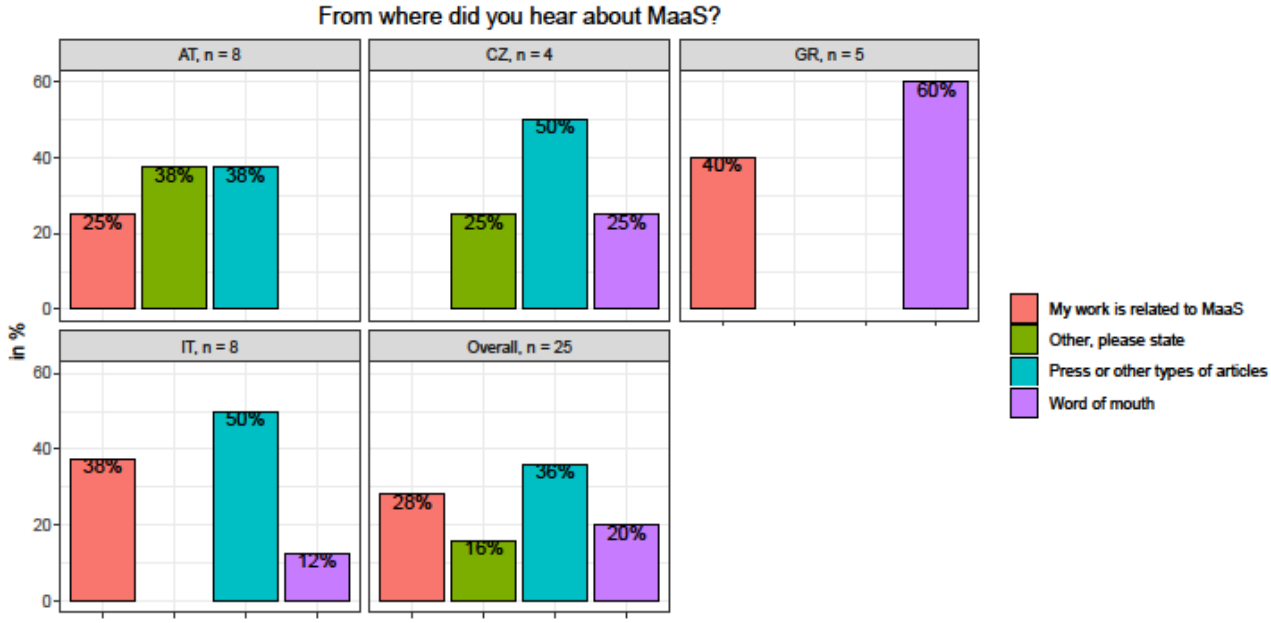


Figure 52: If you have heard about MaaS before, from where? In percent.

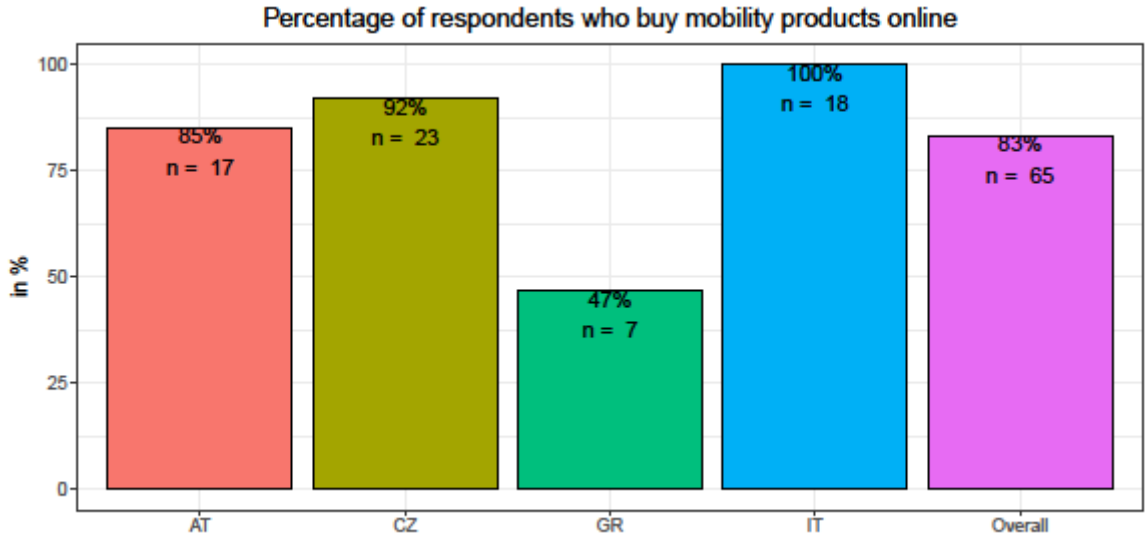


Figure 53: Do you buy mobility products online? In percent.

Figure 54: How often do you buy products online?

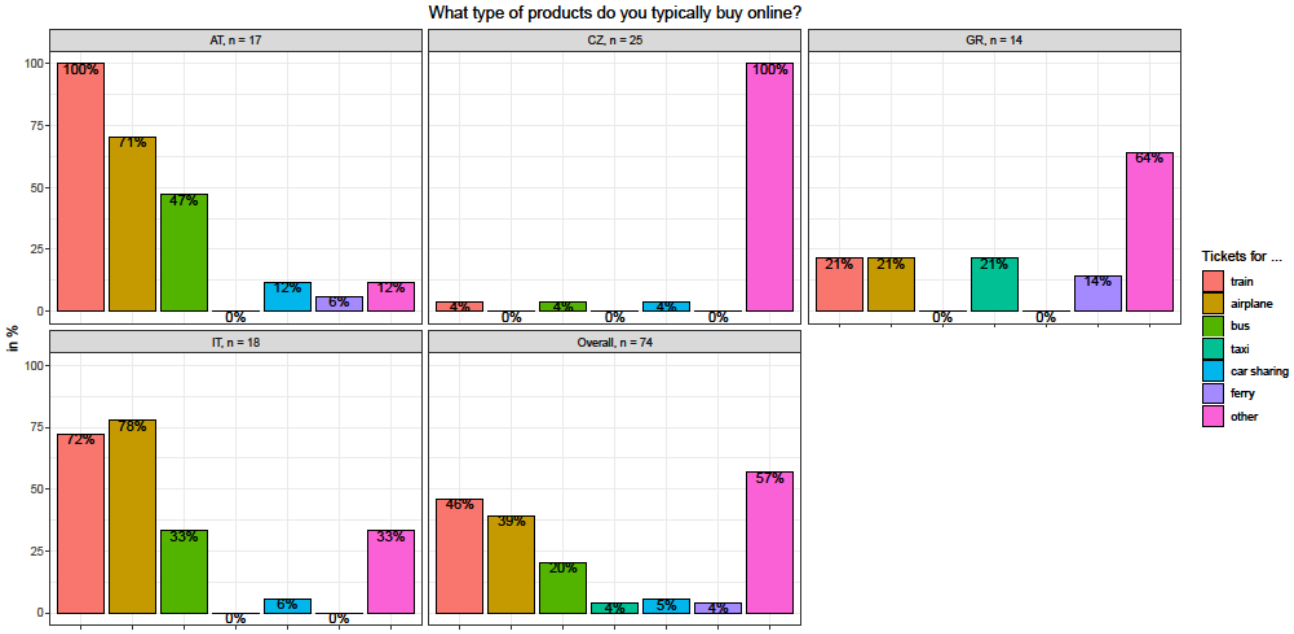


Figure 55: What type of products do you typically buy online?

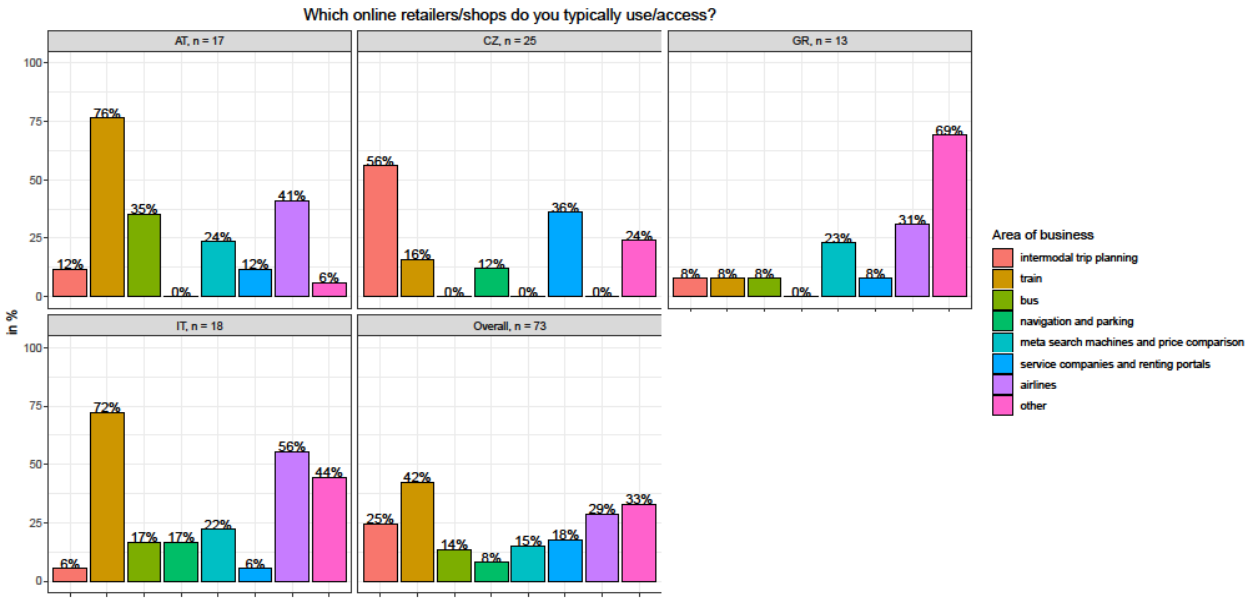


Figure 56: Which online shops do you normally use?

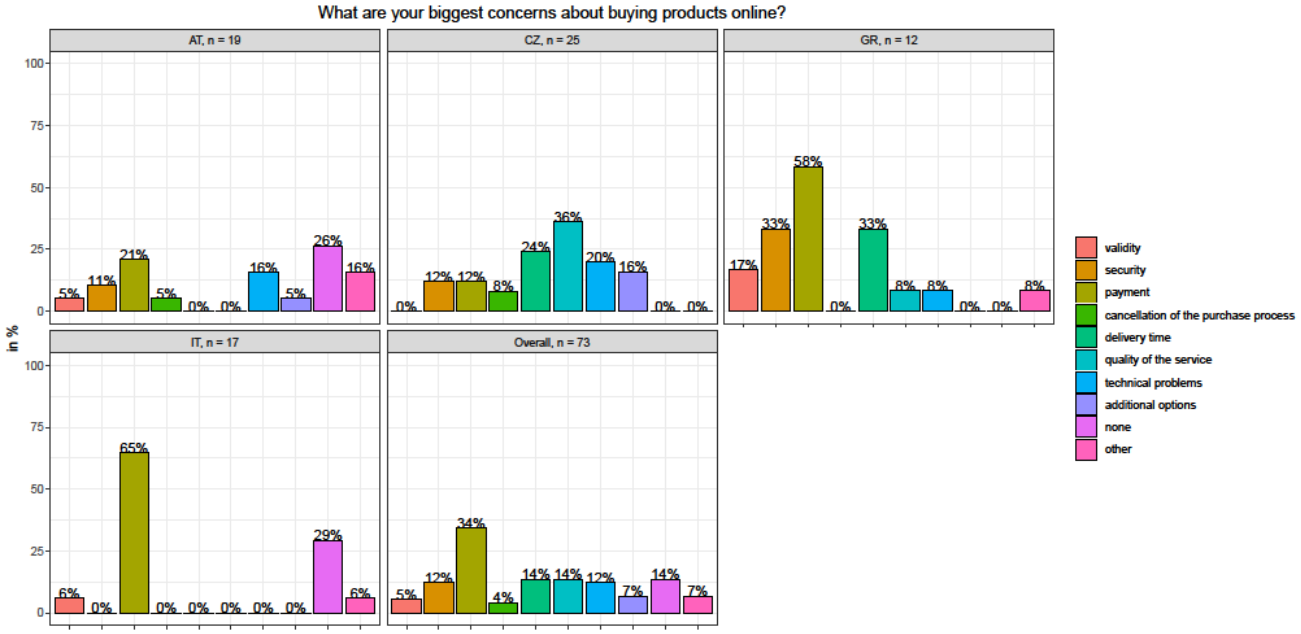


Figure 57: What are your biggest concerns when buying products online?

Figure 58: How convenient is it for you to buy products online from a company you know?

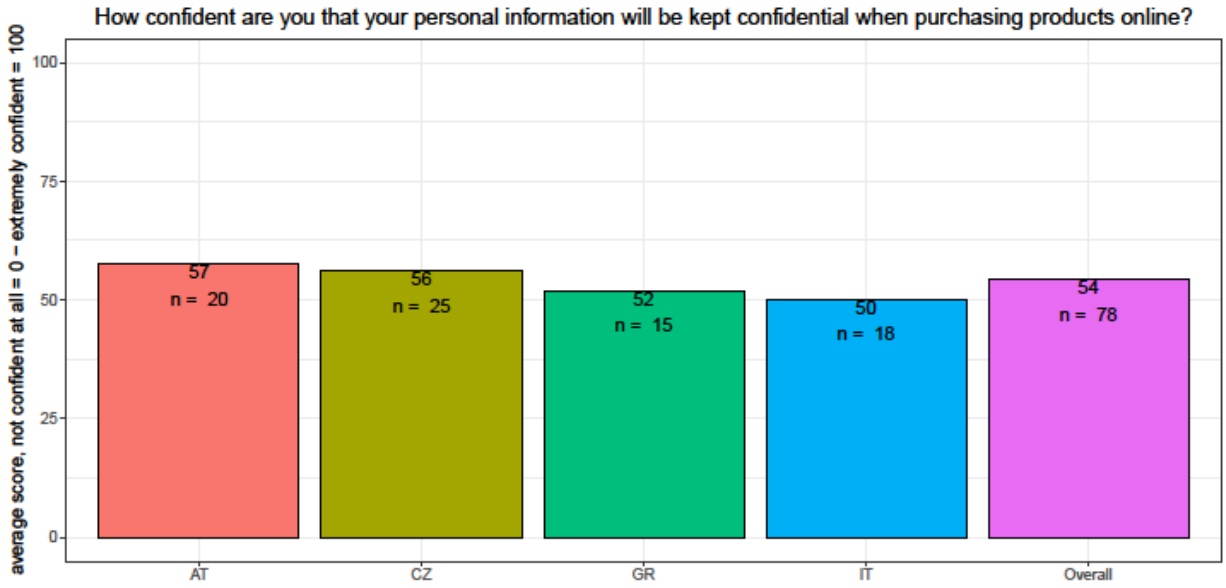


Figure 59: How confident are you that your personal information will be kept confidential when purchasing products online?

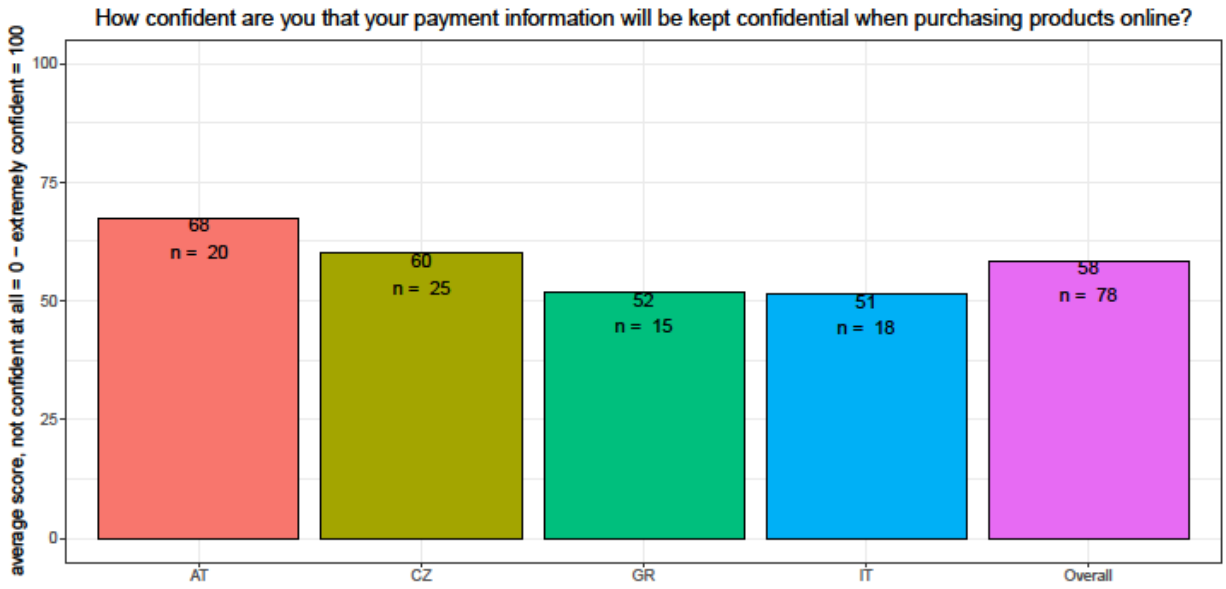


Figure 60: How confident are you that your payment information will be kept confidential when purchasing products online?

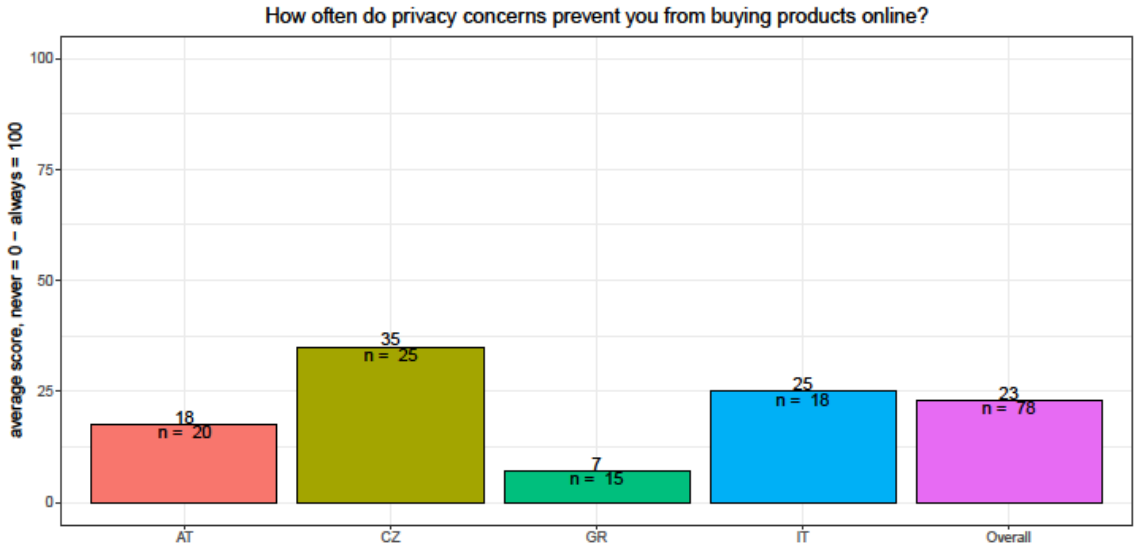


Figure 61: How often do privacy concerns prevent you from buying products online?

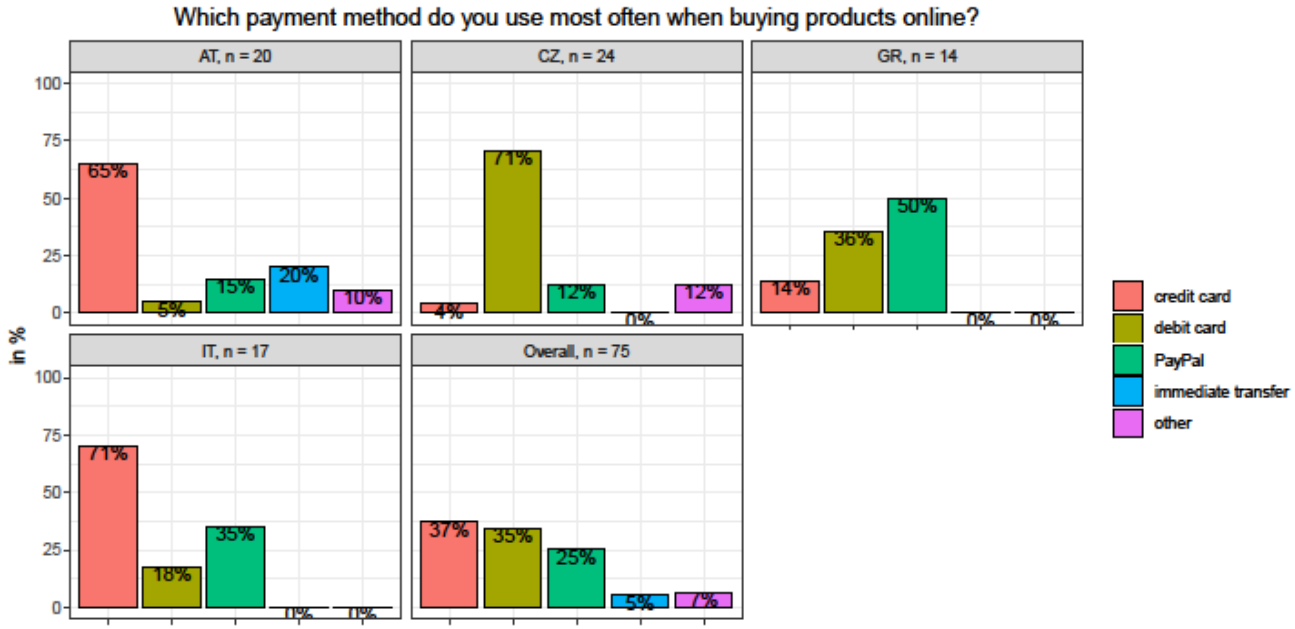


Figure 62: Which payment method do you use most often when buying products online? In Percent.

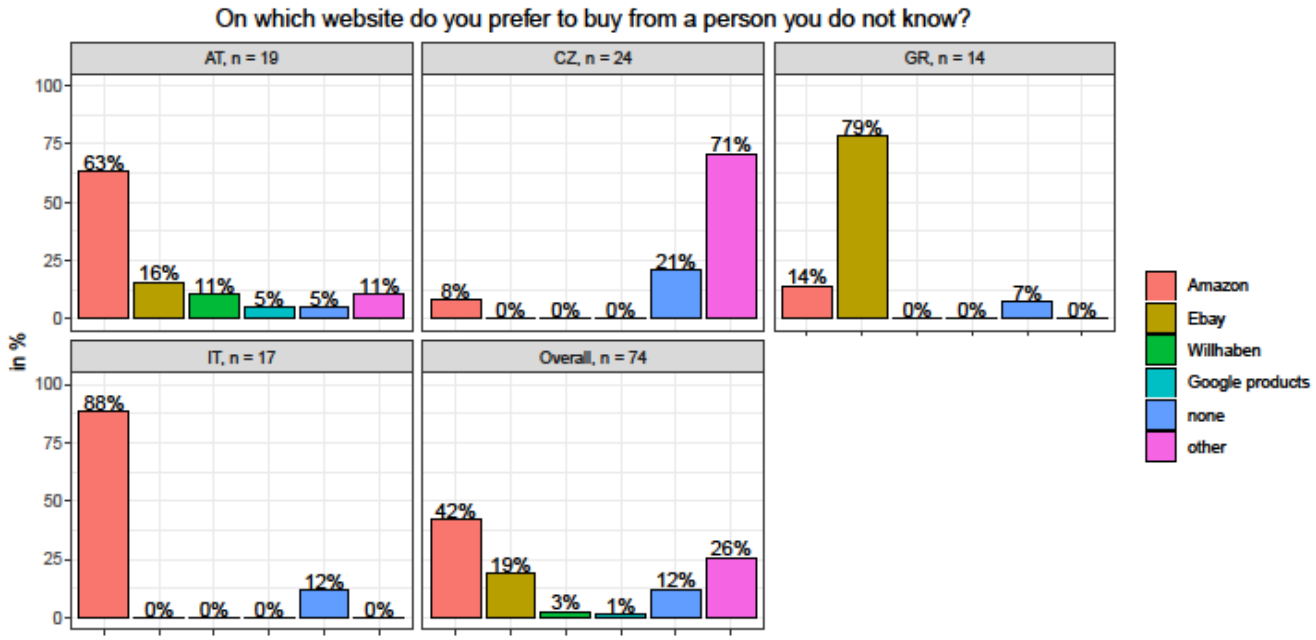


Figure 63: On which website do you prefer to buy from a person you do not know?

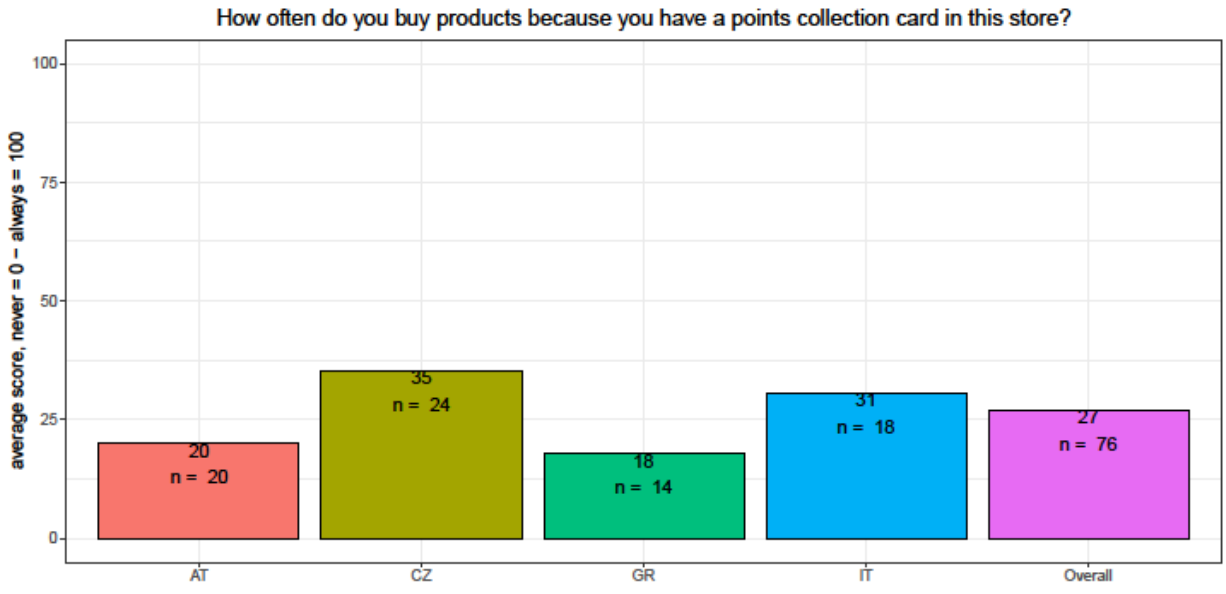


Figure 64: How often do you buy products because you have a points collection card in this store?

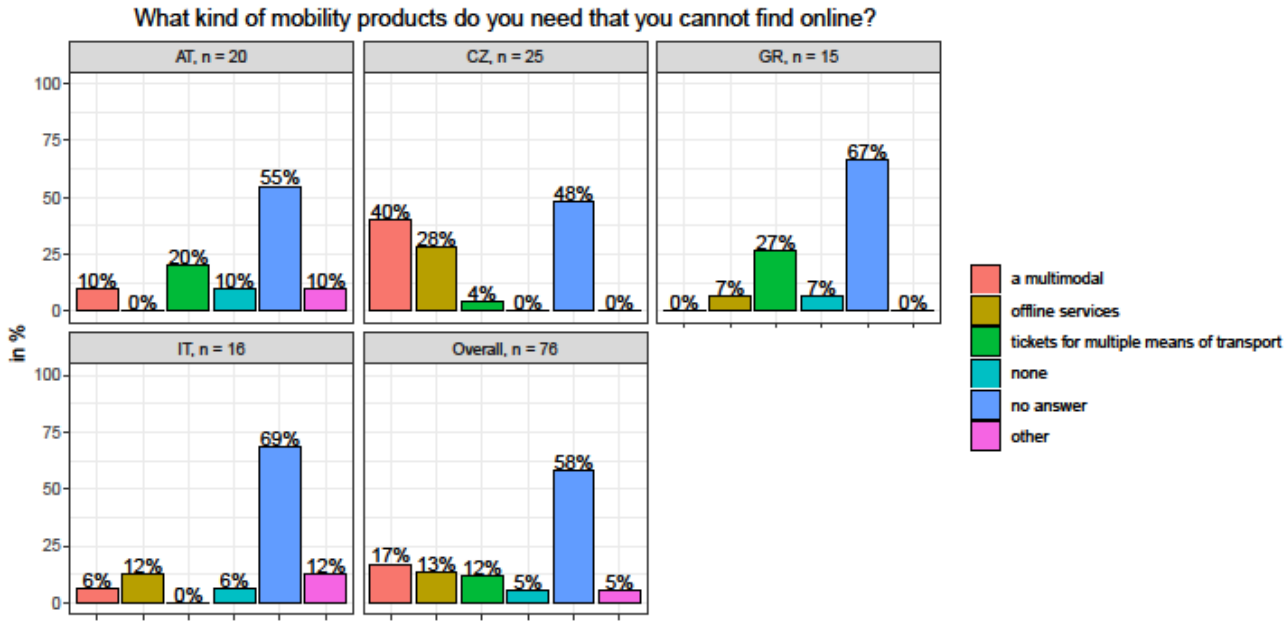


Figure 65: What kind of mobility products do you need that you cannot find online?

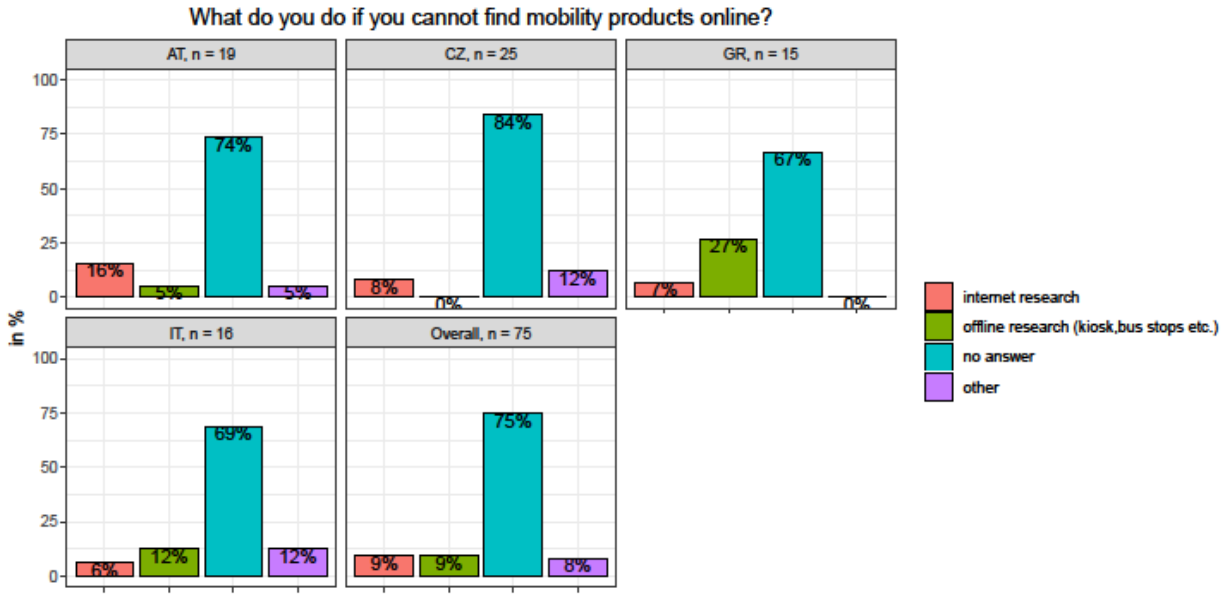


Figure 66: What do you do if you cannot find mobility products online?

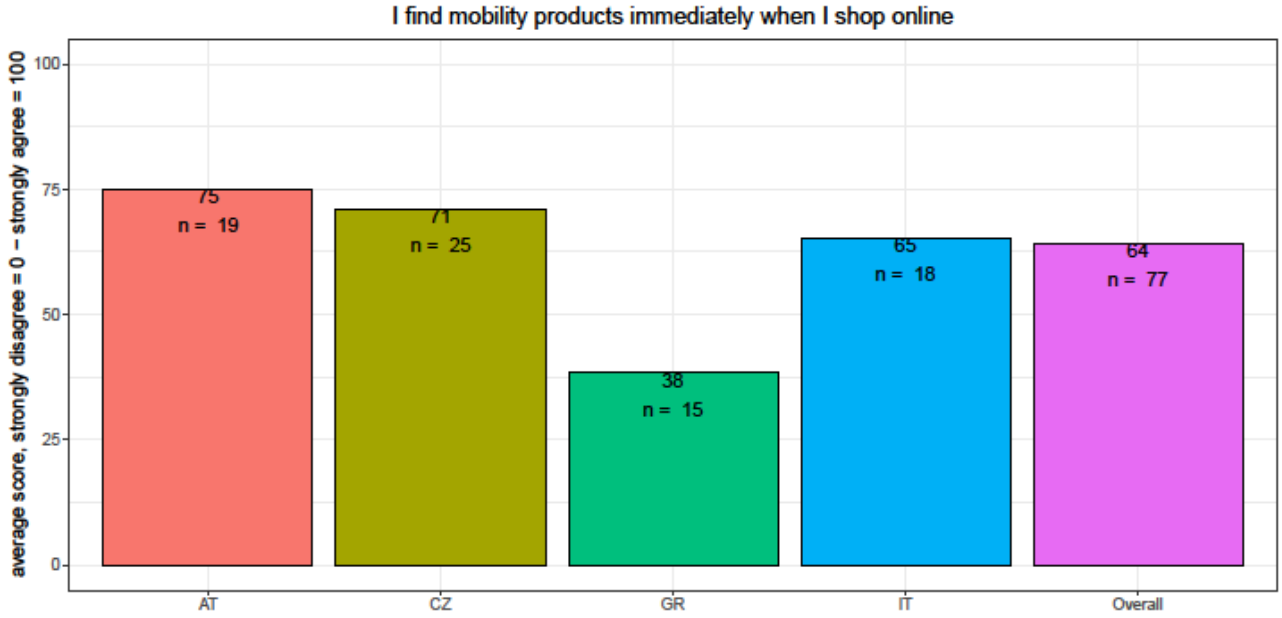


Figure 67: I find mobility products immediately when I shop online

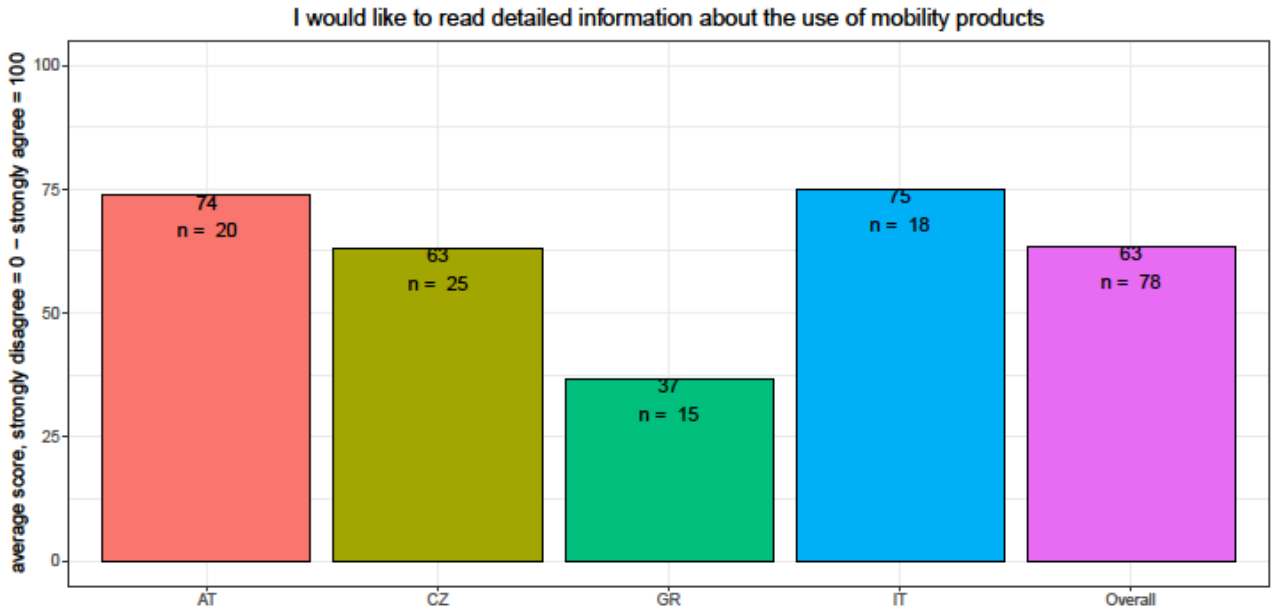


Figure 68: I would like to read detailed information about the use of mobility products

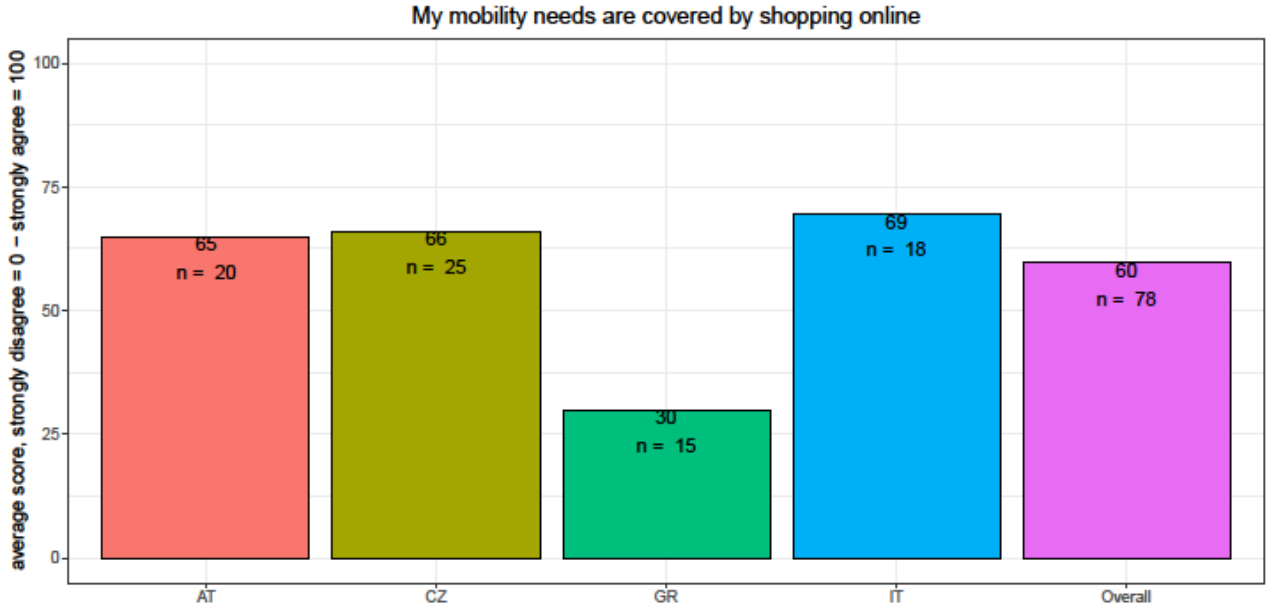


Figure 69: My mobility needs are covered by shopping online

Figure 70: I can find products at any time, 24 hours a day

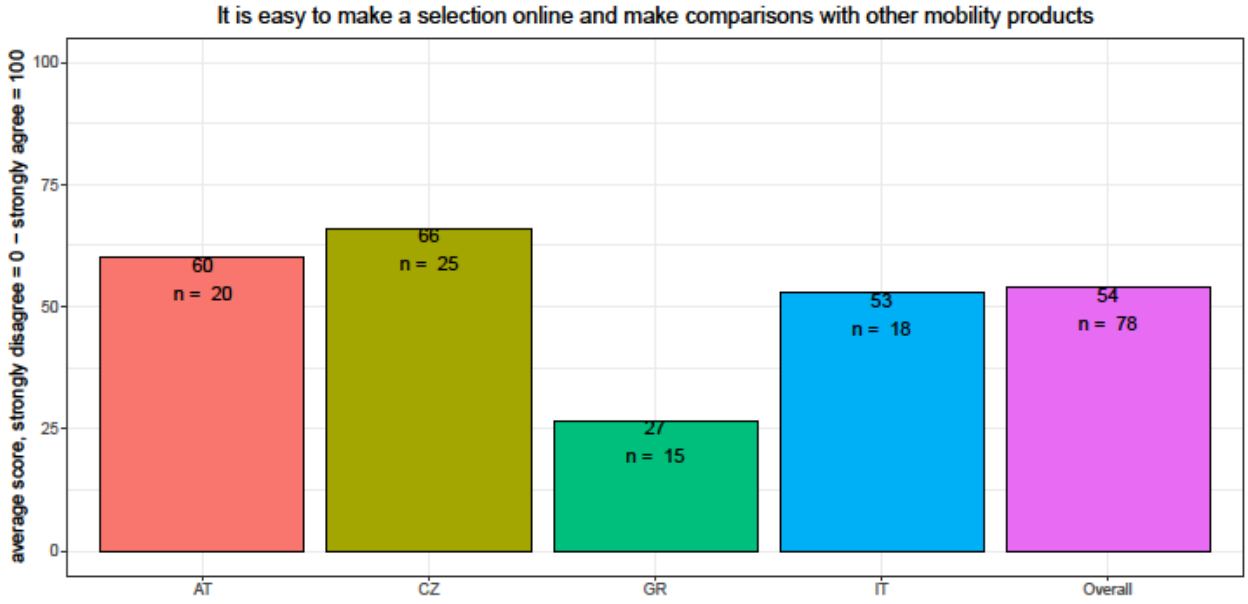


Figure 71: It is easy to make a selection online and make comparisons with other mobility products.

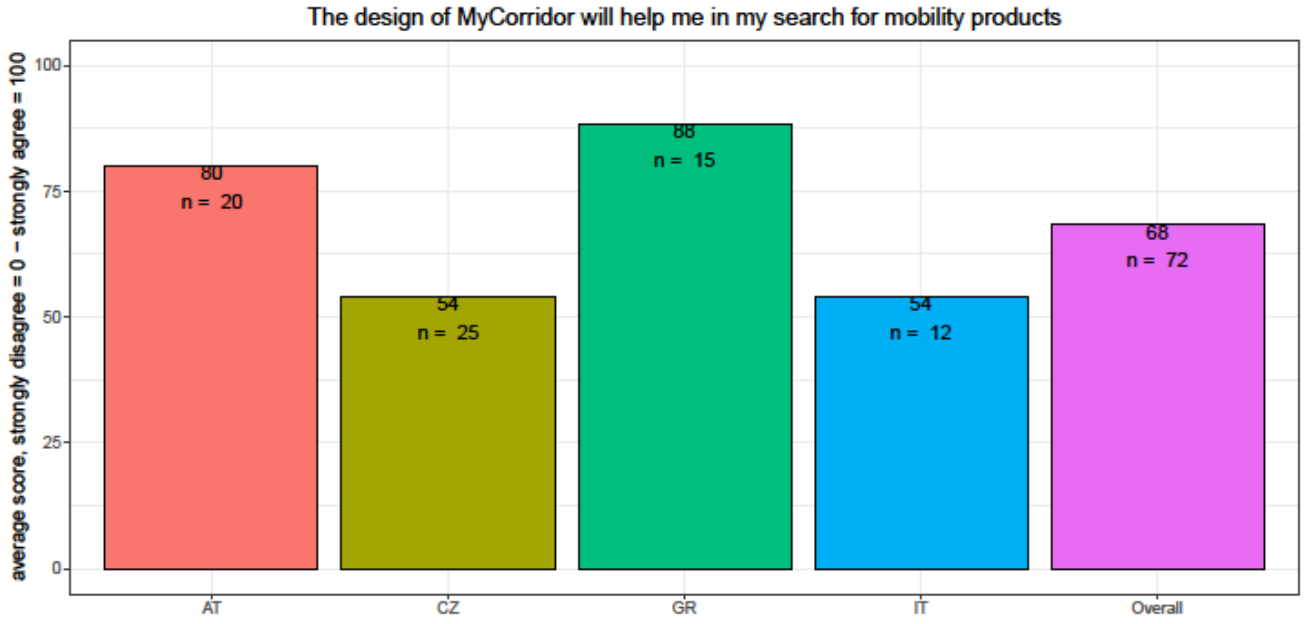


Figure 72: The design of MyCorridor will help me in my search for mobility products

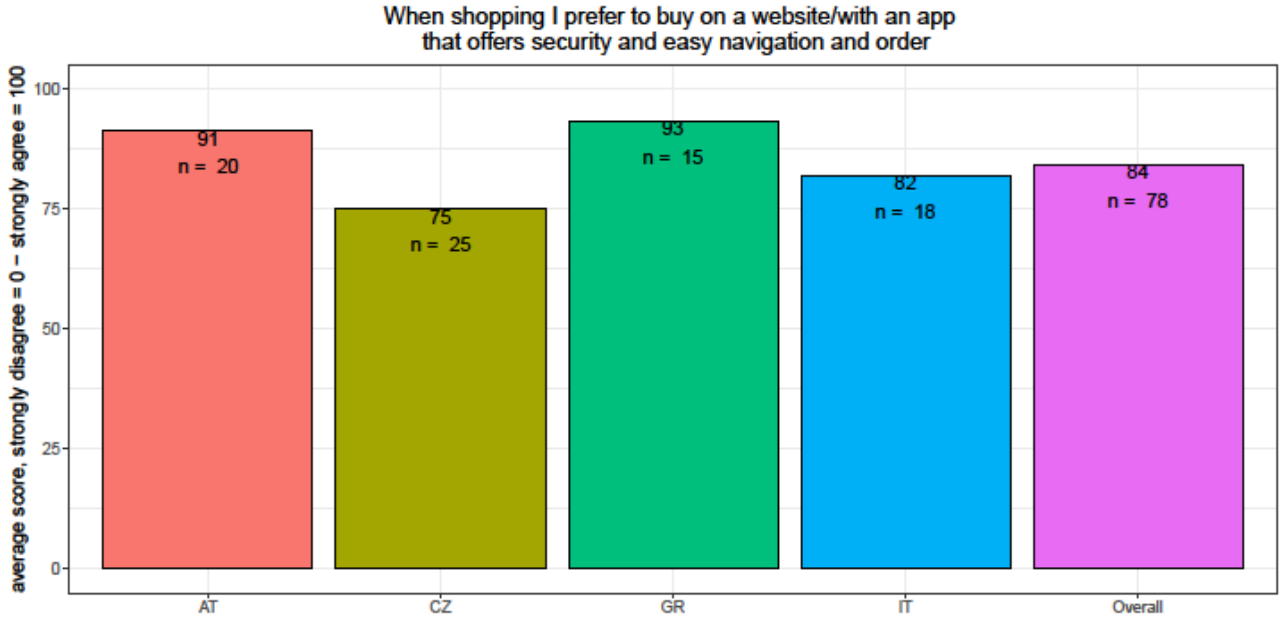


Figure 73: When shopping I prefer to buy on a website/with an app that offers security and easy navigation and order

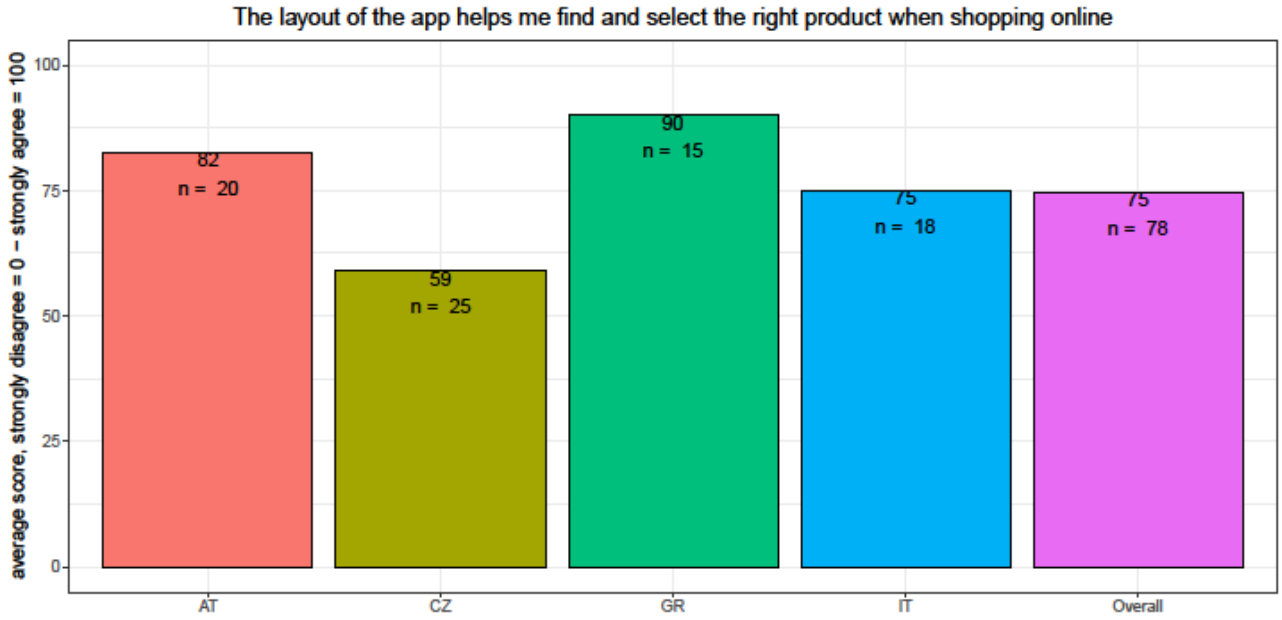


Figure 74: The layout of the app helps me find and select the right product when shopping online

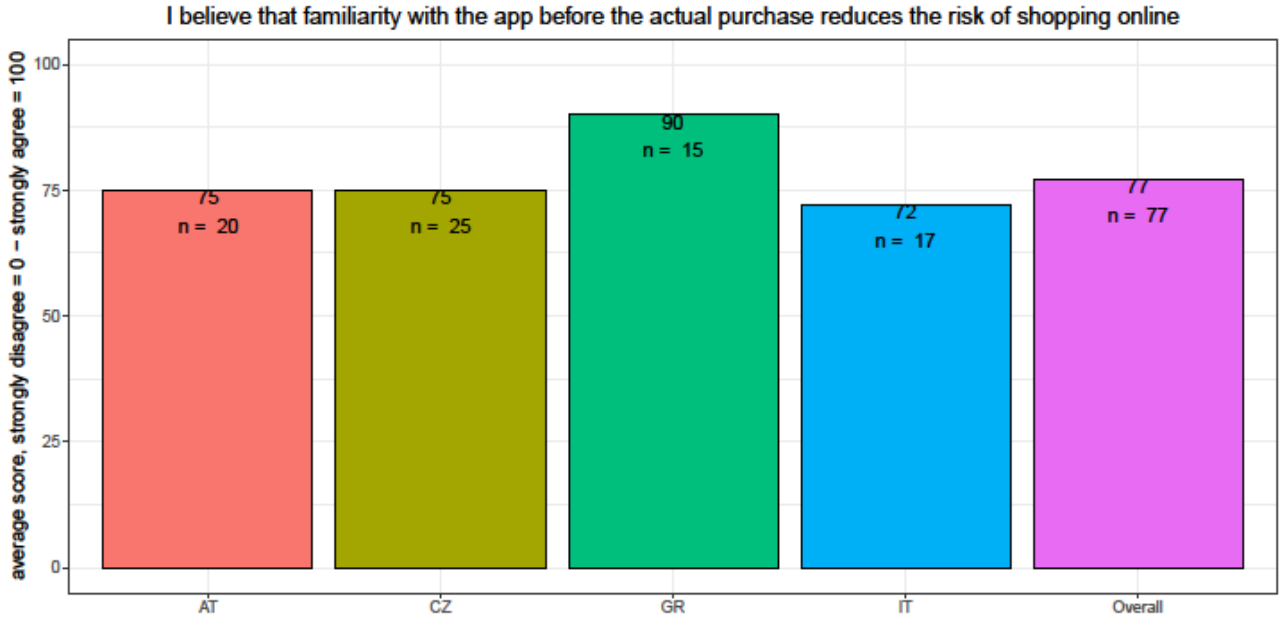


Figure 75: I believe that familiarity with the app before the actual purchase reduces the risk of shopping online

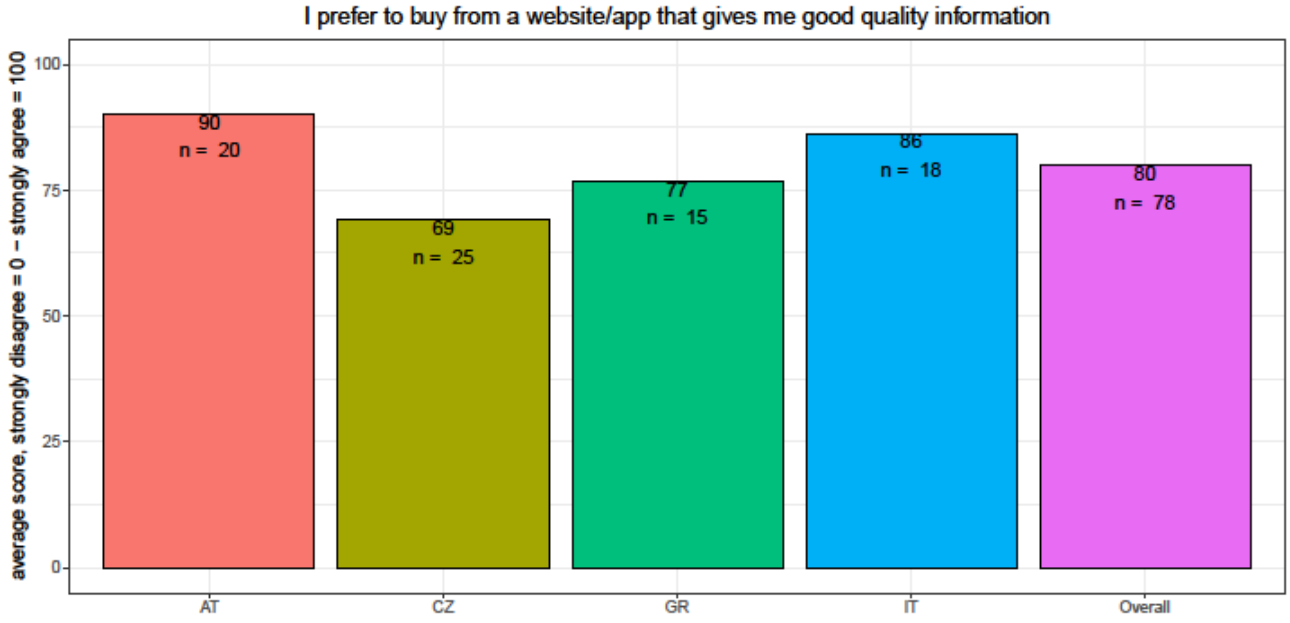


Figure 76: I prefer to buy from a website/app that gives me good quality information

Figure 77: Online shopping takes less time to purchase

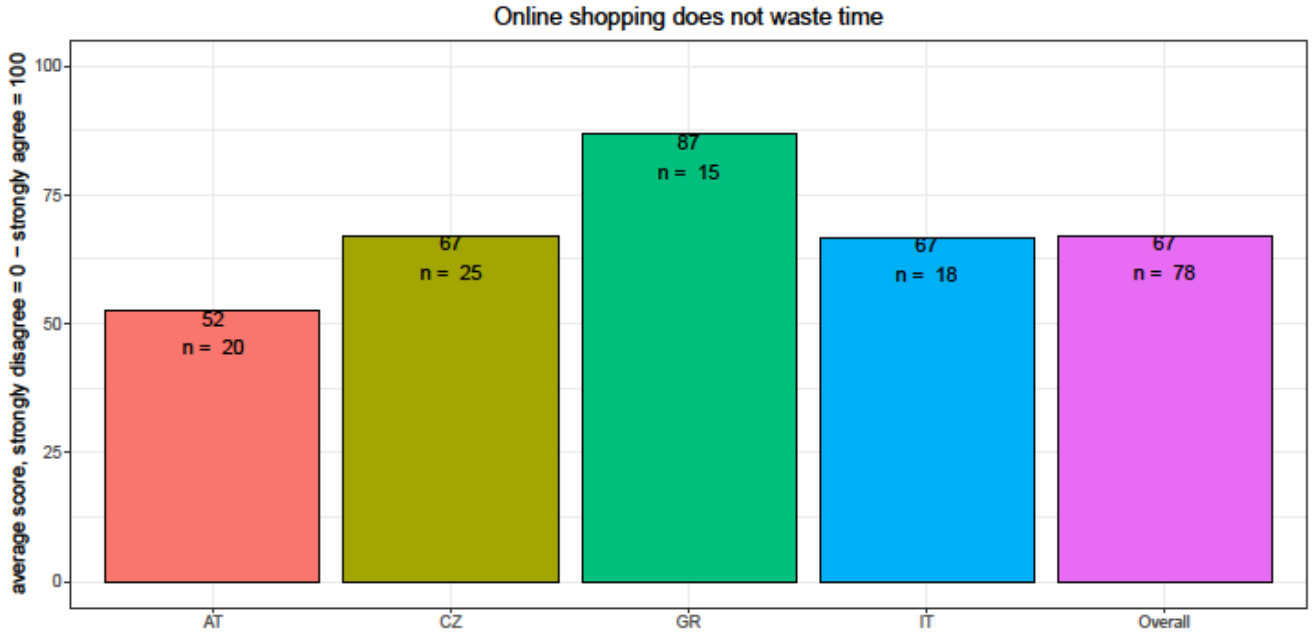


Figure 78: Online shopping does not waste time

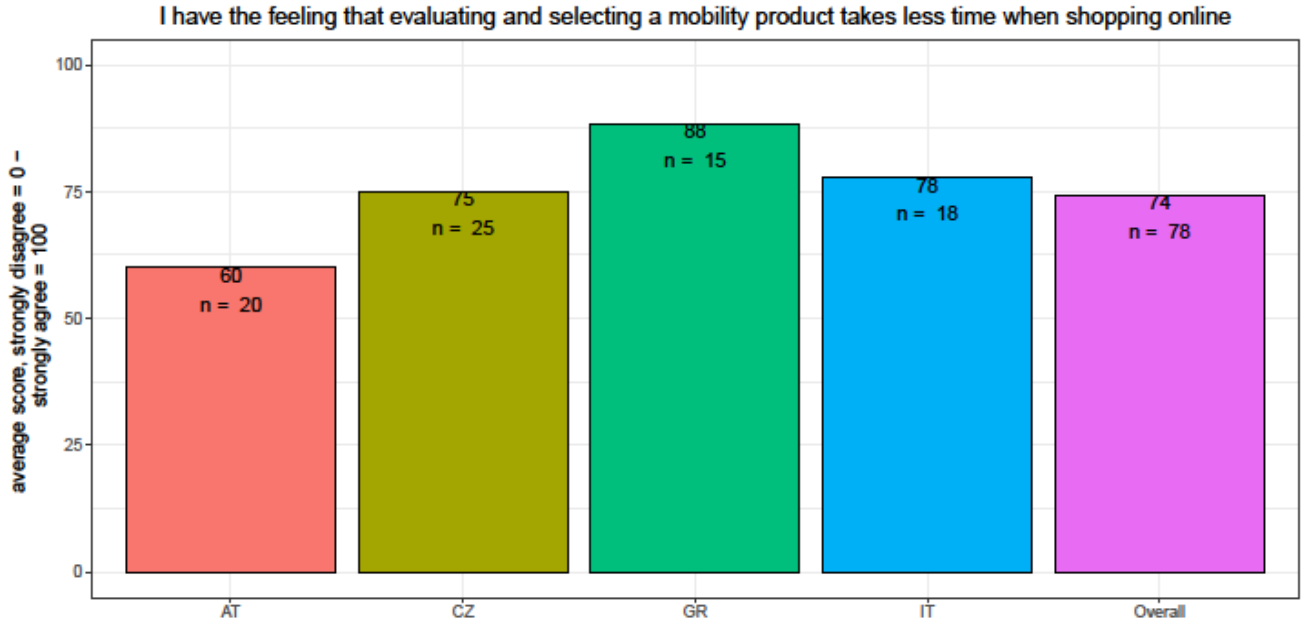


Figure 79: I have the feeling that evaluating and selecting a mobility product takes less time when shopping online

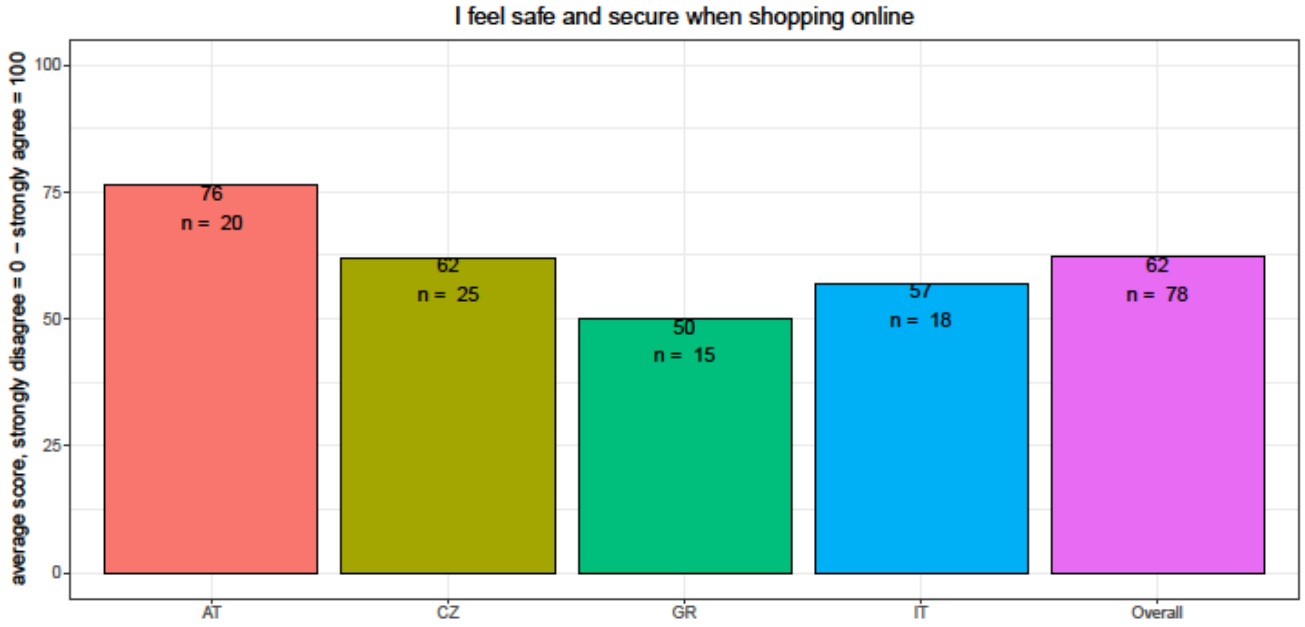


Figure 80: I feel safe and secure when shopping online

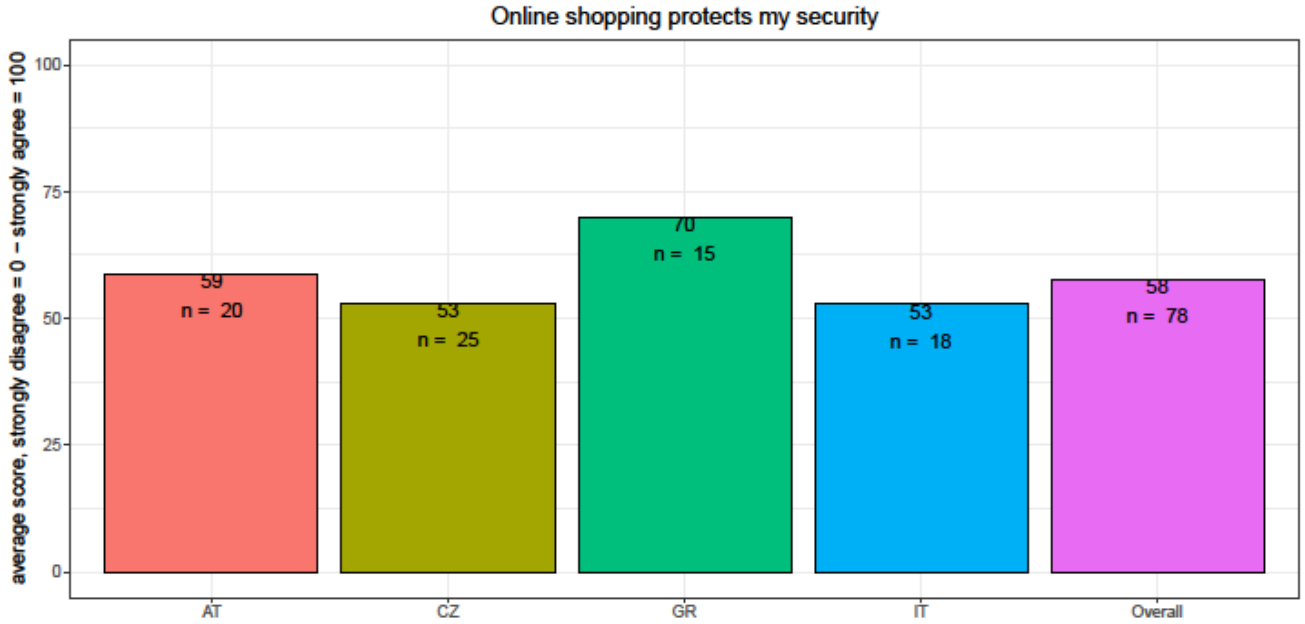


Figure 81: Online shopping protects my security

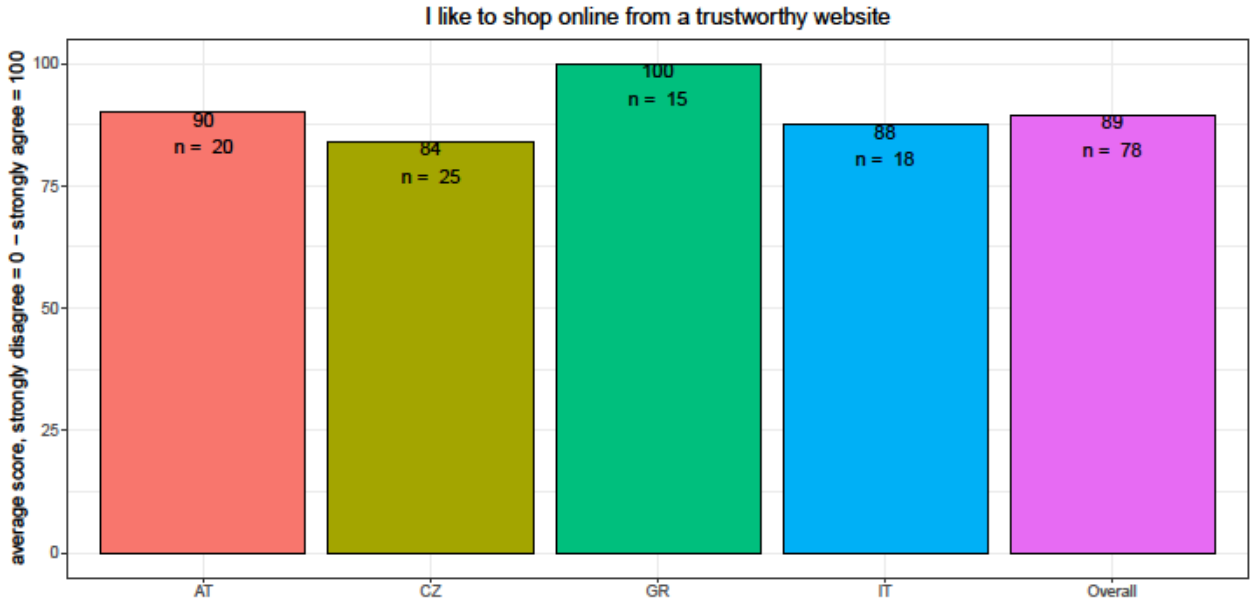


Figure 82: I like shopping online from a trusted website

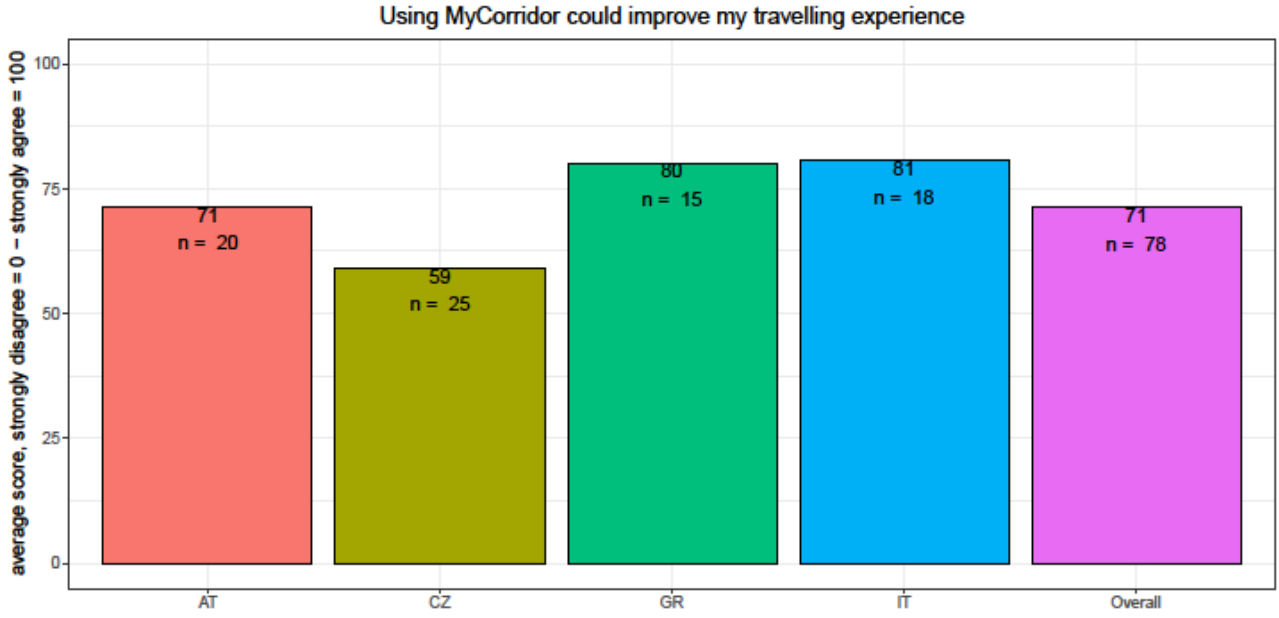


Figure 83: Using MyCorridor could improve my travelling experience

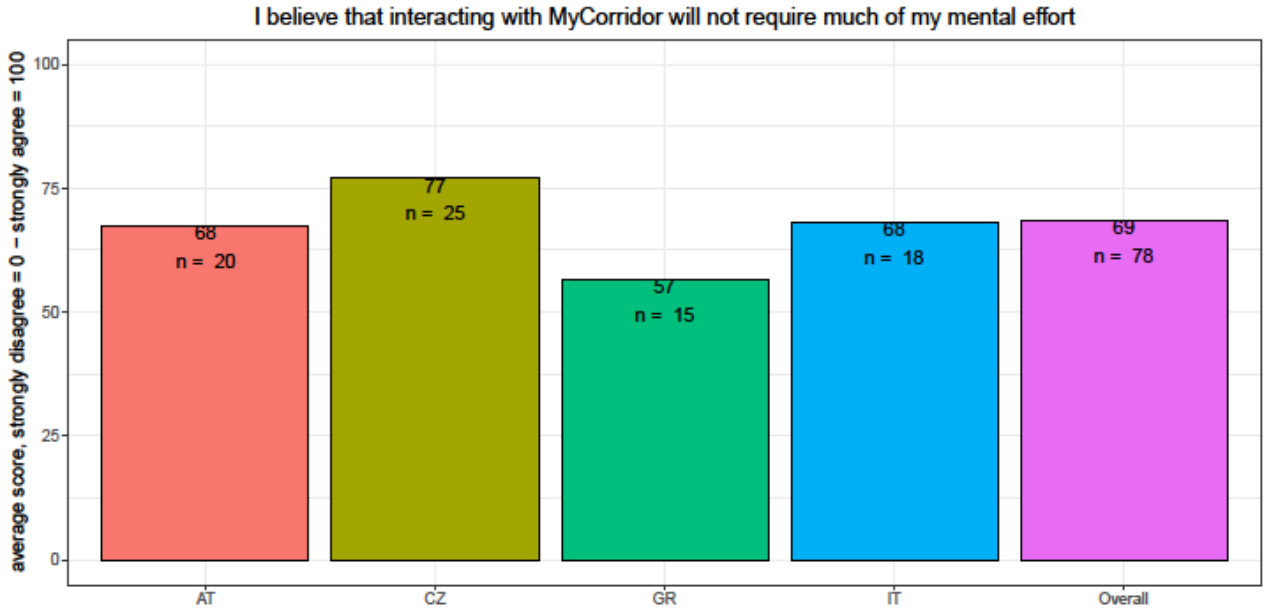


Figure 84: I believe that interacting with MyCorridor will not require much of my mental effort

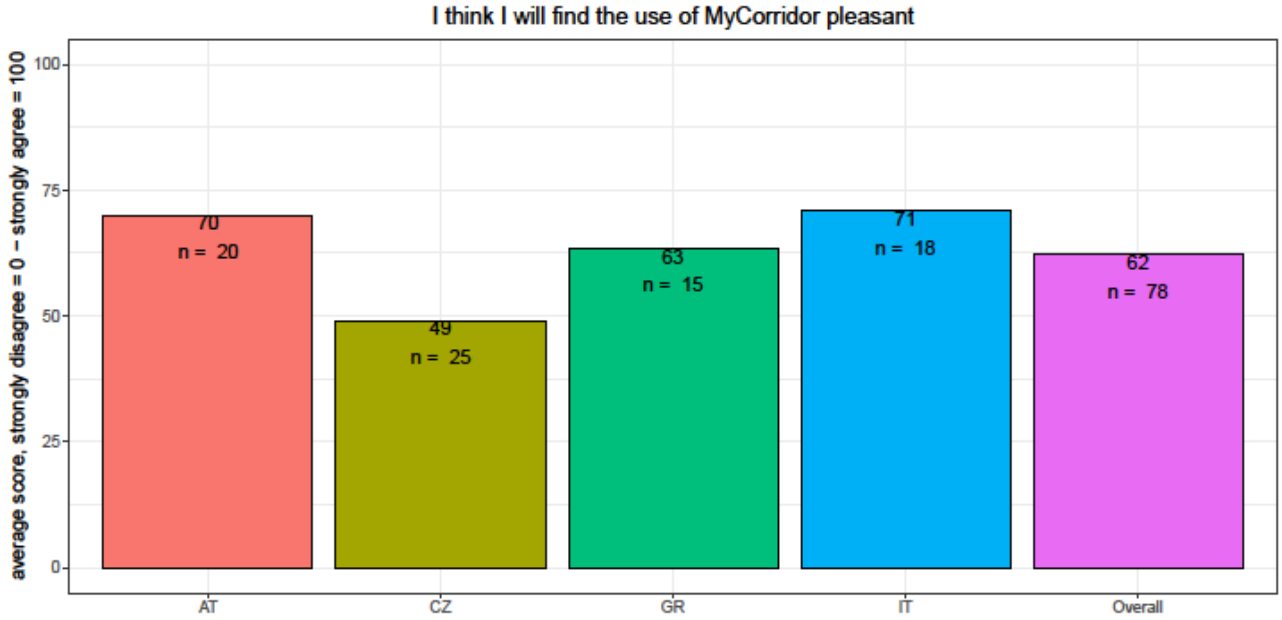


Figure 85: I think I will find the use of MyCorridor pleasant

1.1.4 Post-scenario evaluation

Scenario 1 – Registration

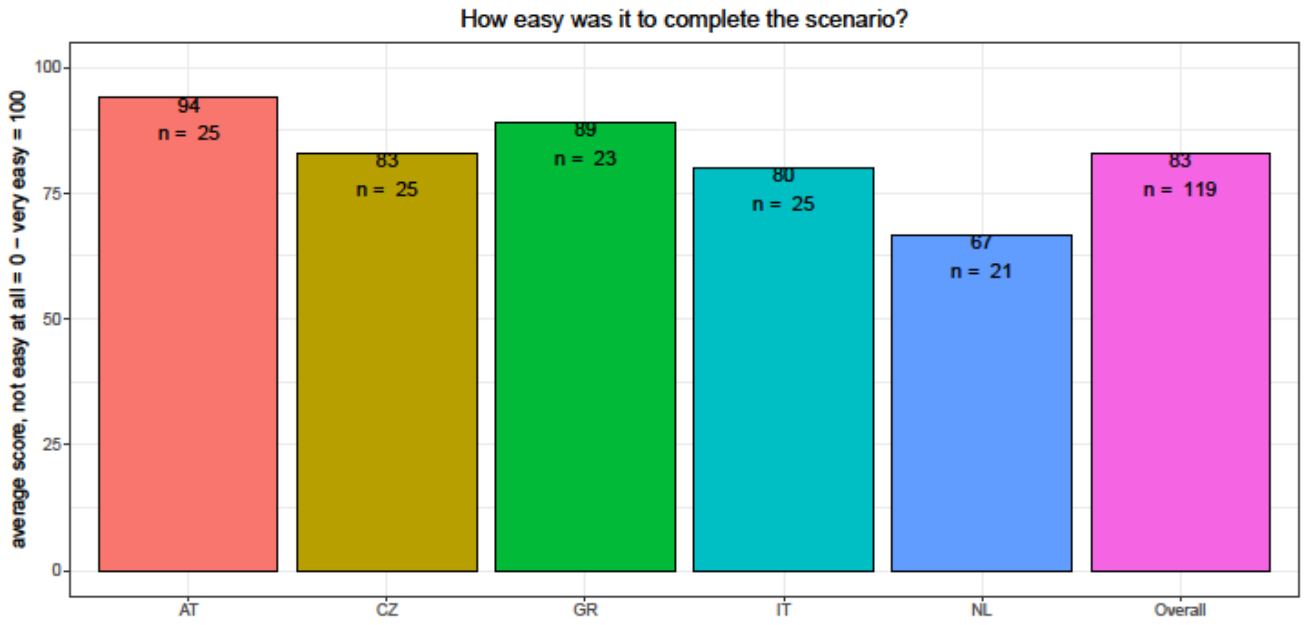


Figure 86: How easy was it to complete the scenario?

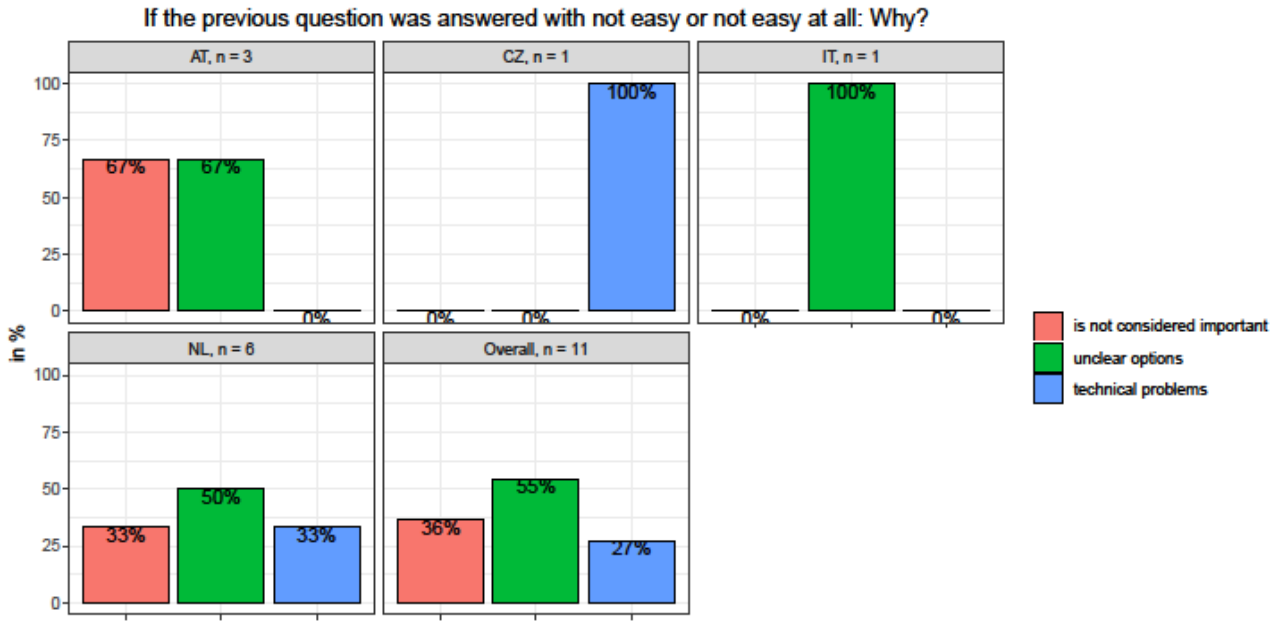


Figure 87: If the previous question was answered with not easy or not easy at all: Why?

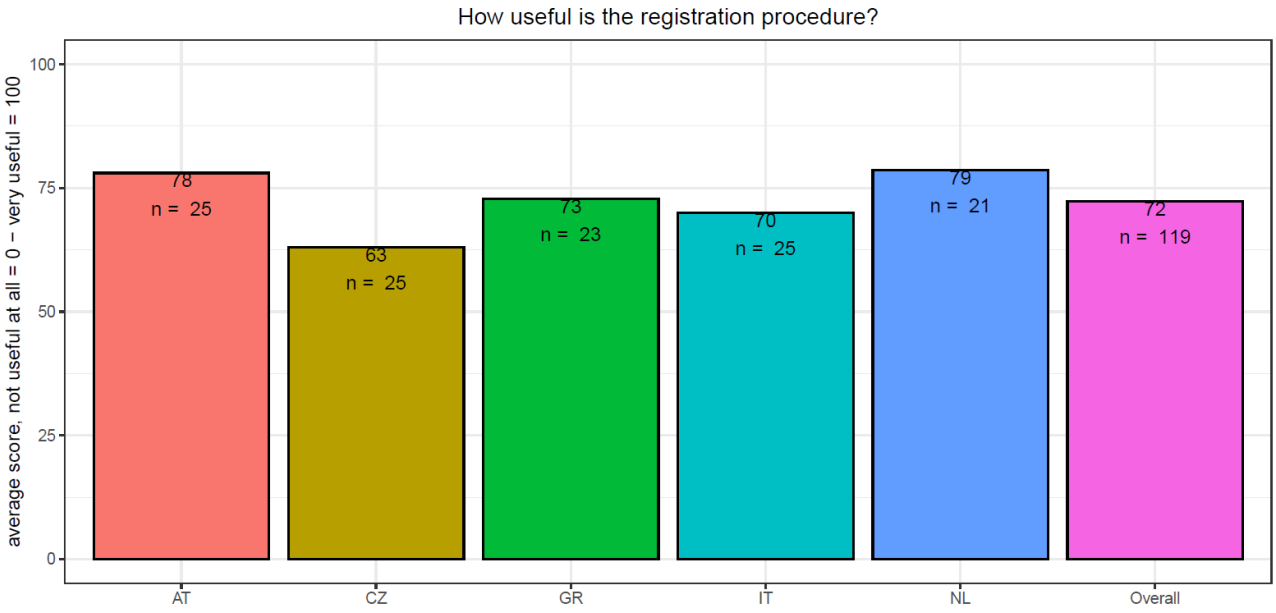


Figure 88: How useful is the registration procedure?

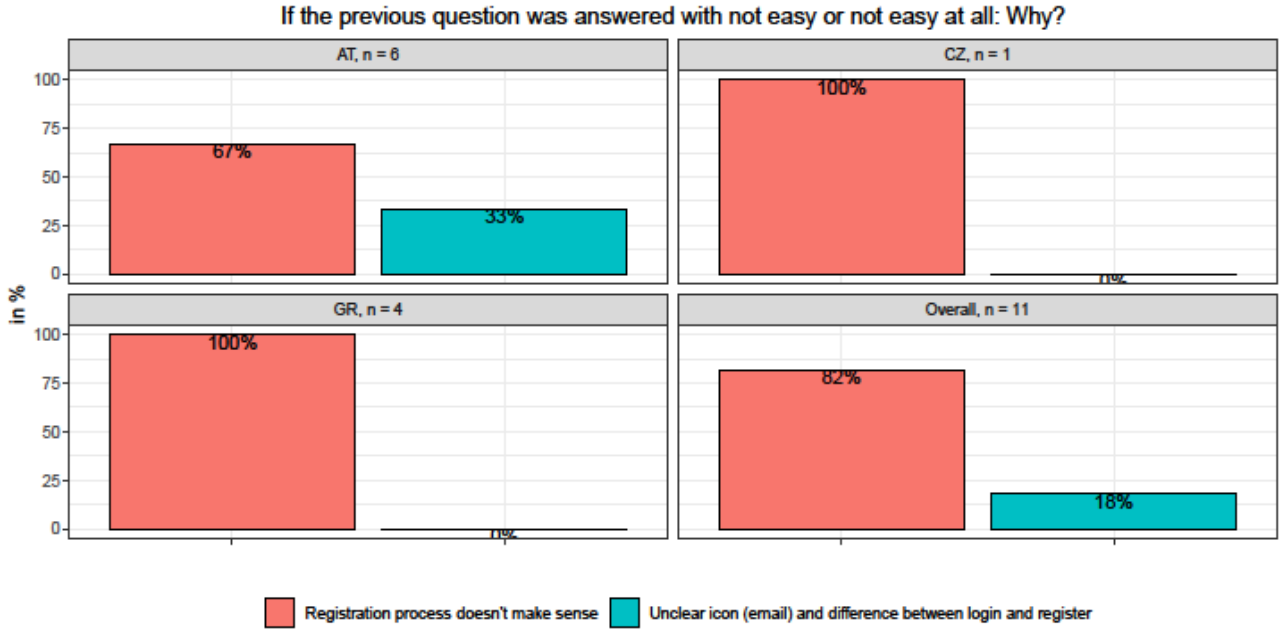


Figure 89: If the previous question was answered with not easy or not easy at all: Why?

Scenario 2 – Setting up an account

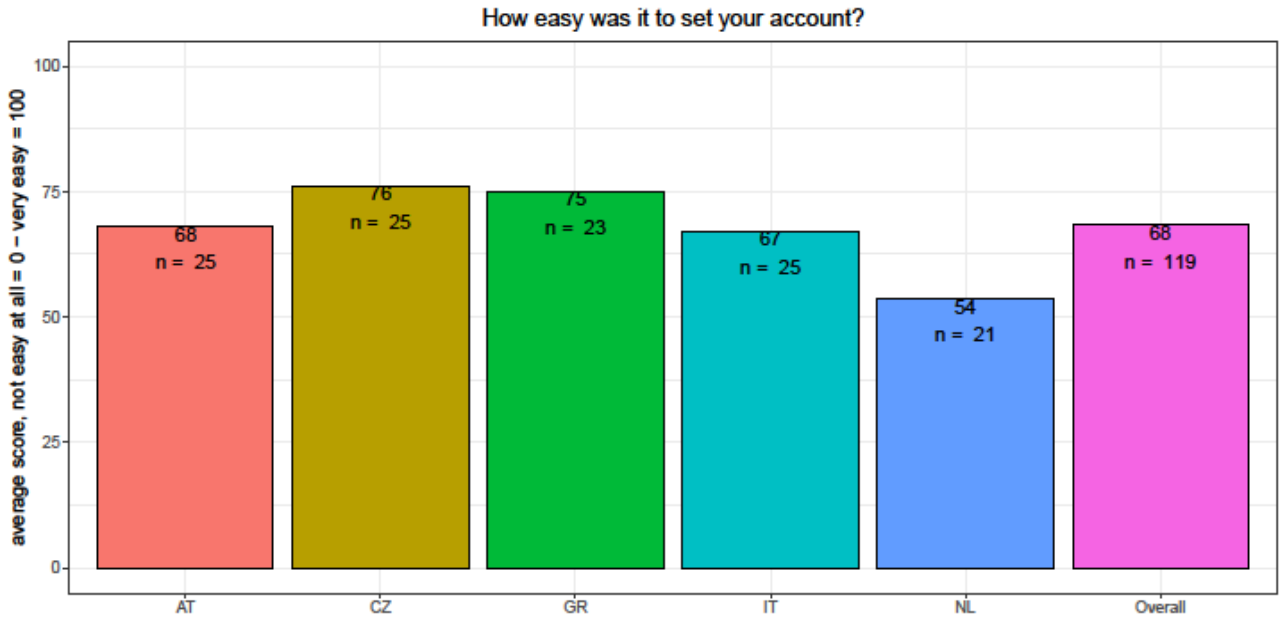


Figure 90: How easy was it to set your account?

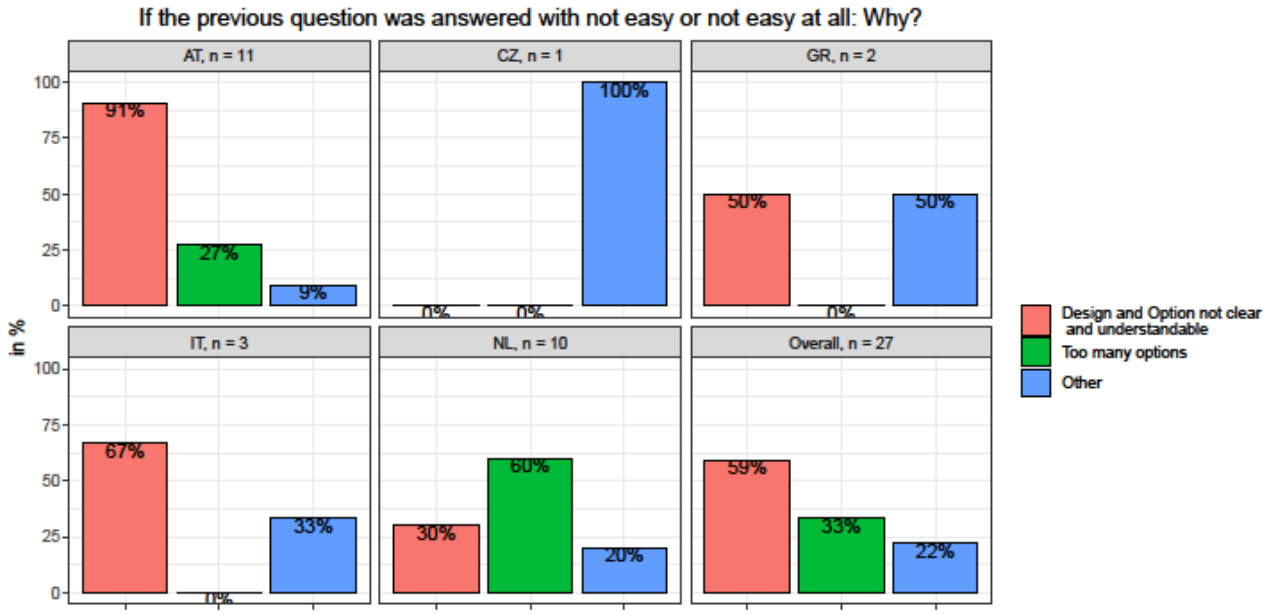


Figure 91: If the previous question was answered with not easy or not easy at all: Why?

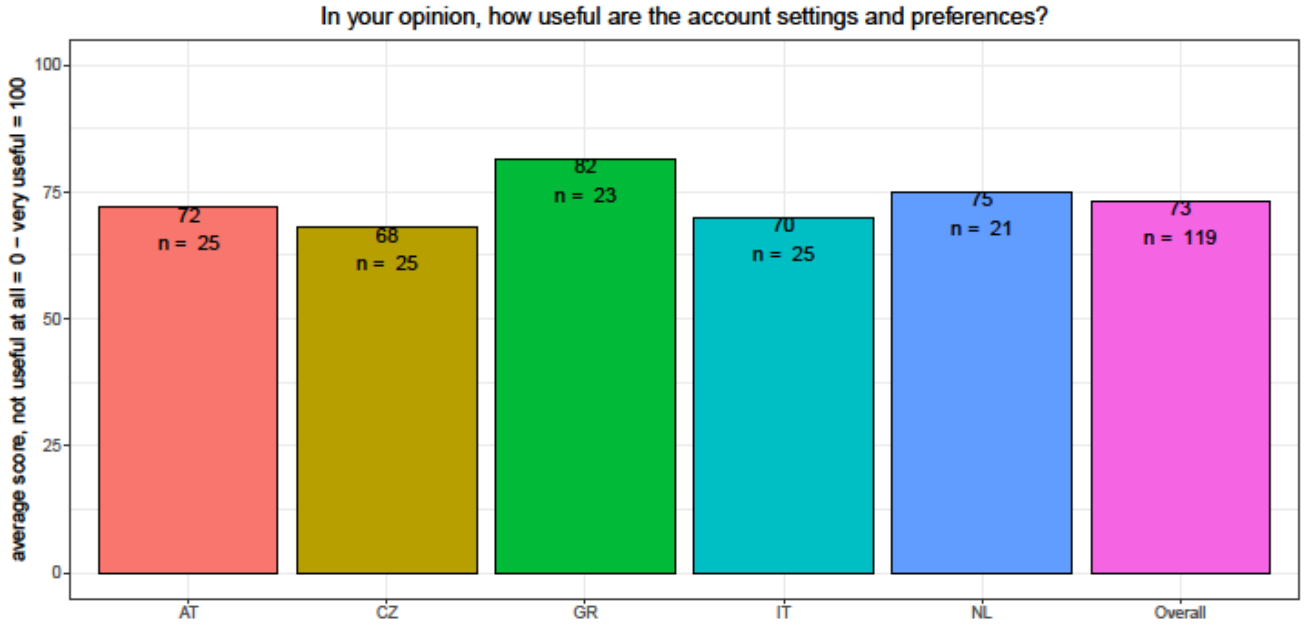


Figure 92: In your opinion, how useful are the account settings and preferences?

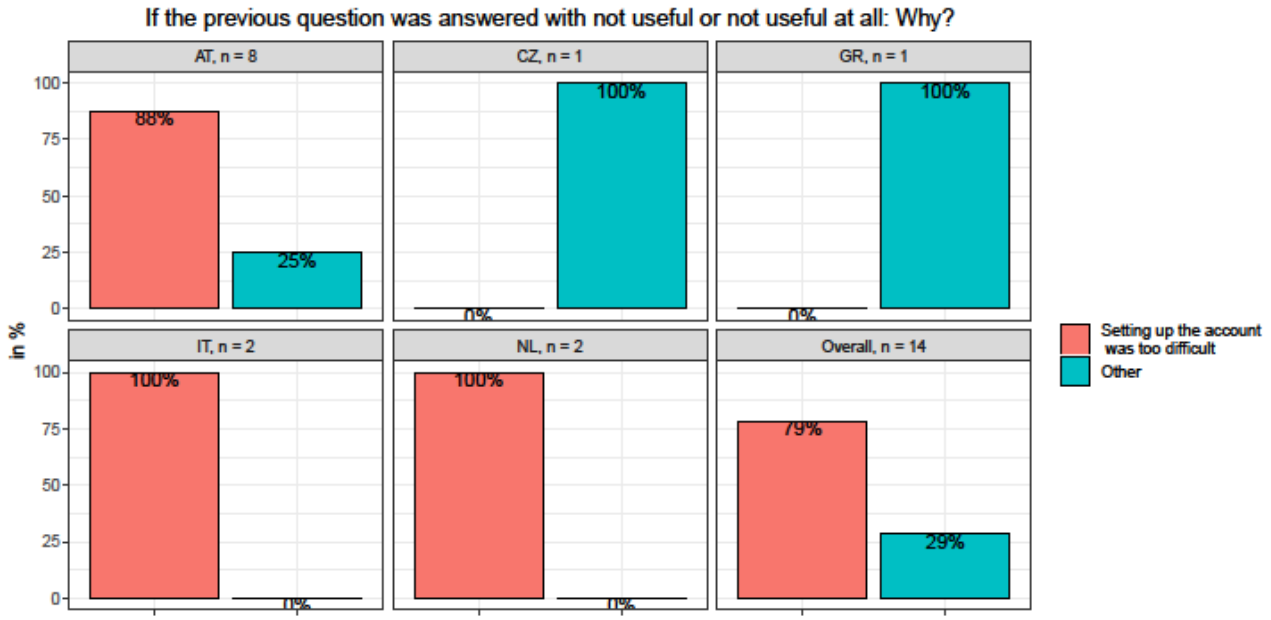


Figure 93: If the previous question was answered with not useful or not useful at all: Why?

Scenario 3 – MaaS on the Go / MyPack

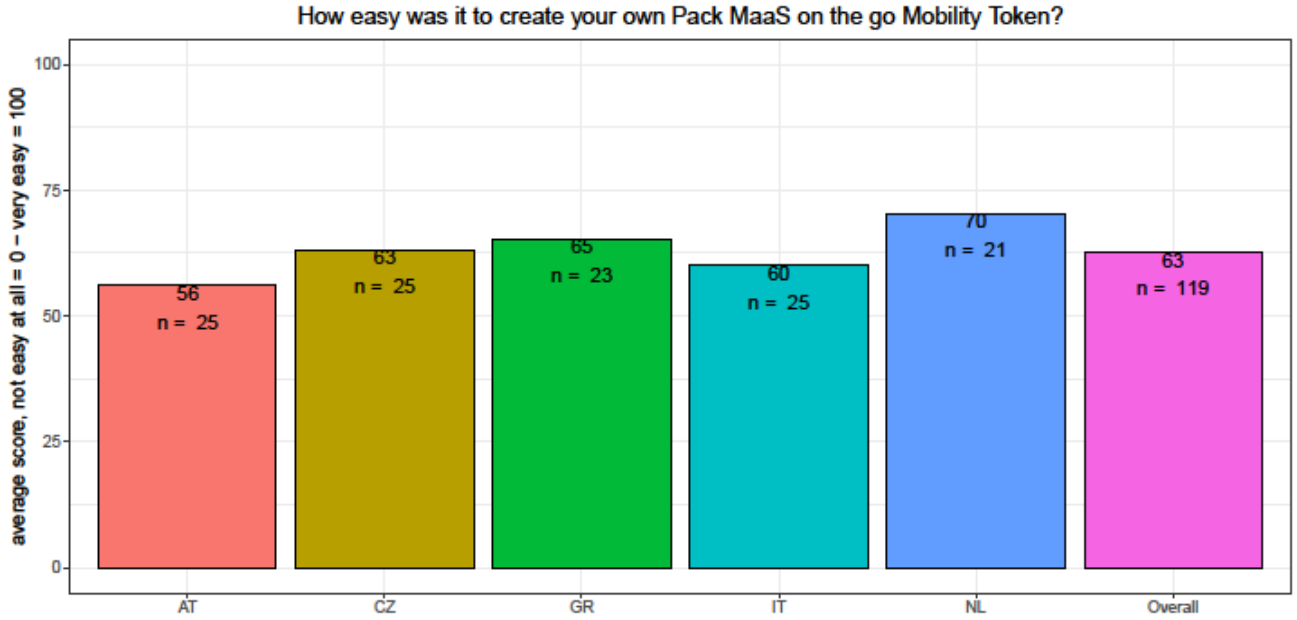


Figure 94: How easy was it to create your own Pack MaaS on the go Mobility Token?

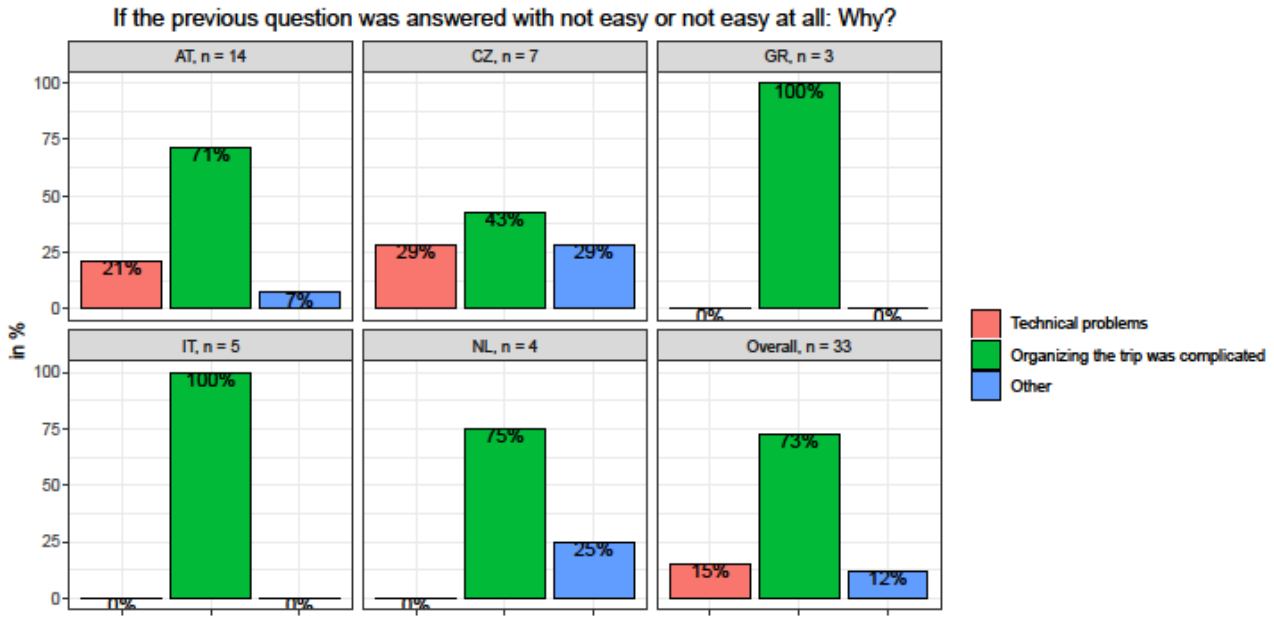


Figure 95: If the previous question was answered with not easy or not easy at all: Why?

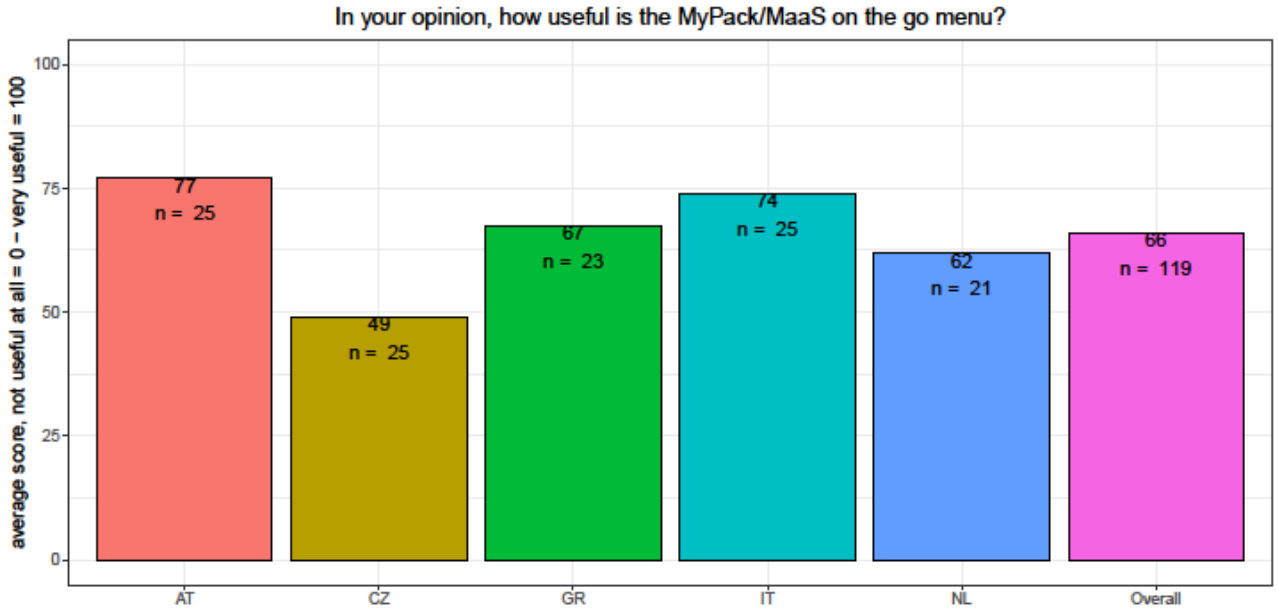


Figure 96: In your opinion, how useful is the MyPack/MaaS on the go menu?

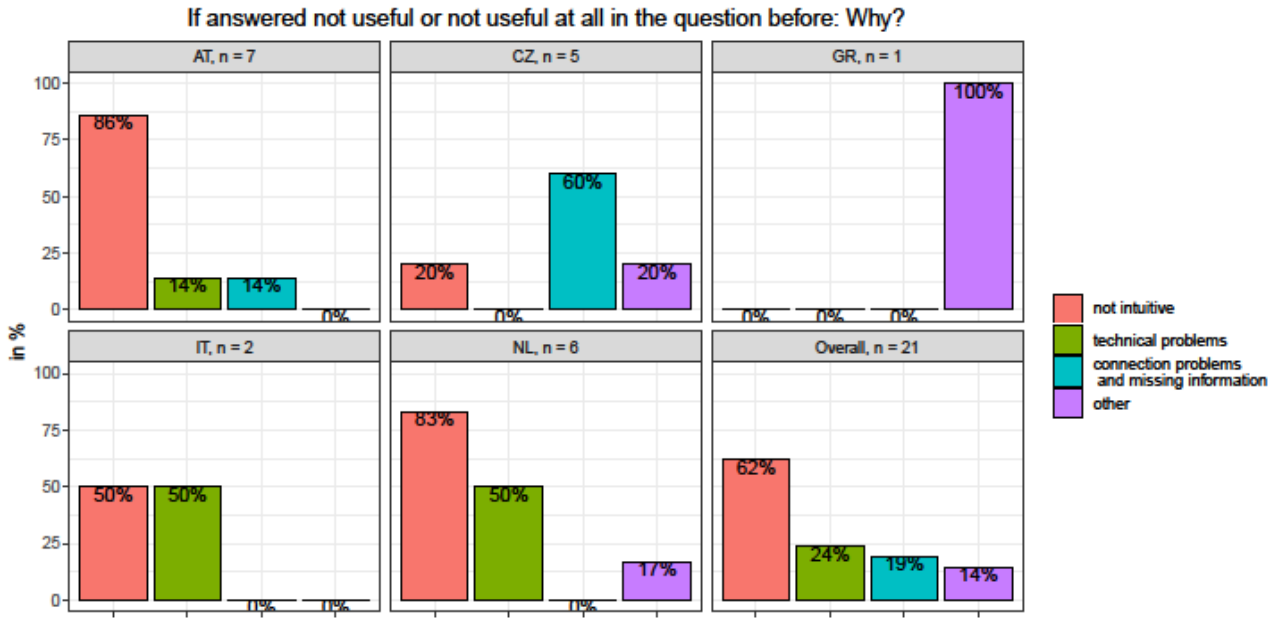


Figure 97: If answered not useful or not useful at all in the question before: Why?

1.1.5 Results from the facilitator diaries

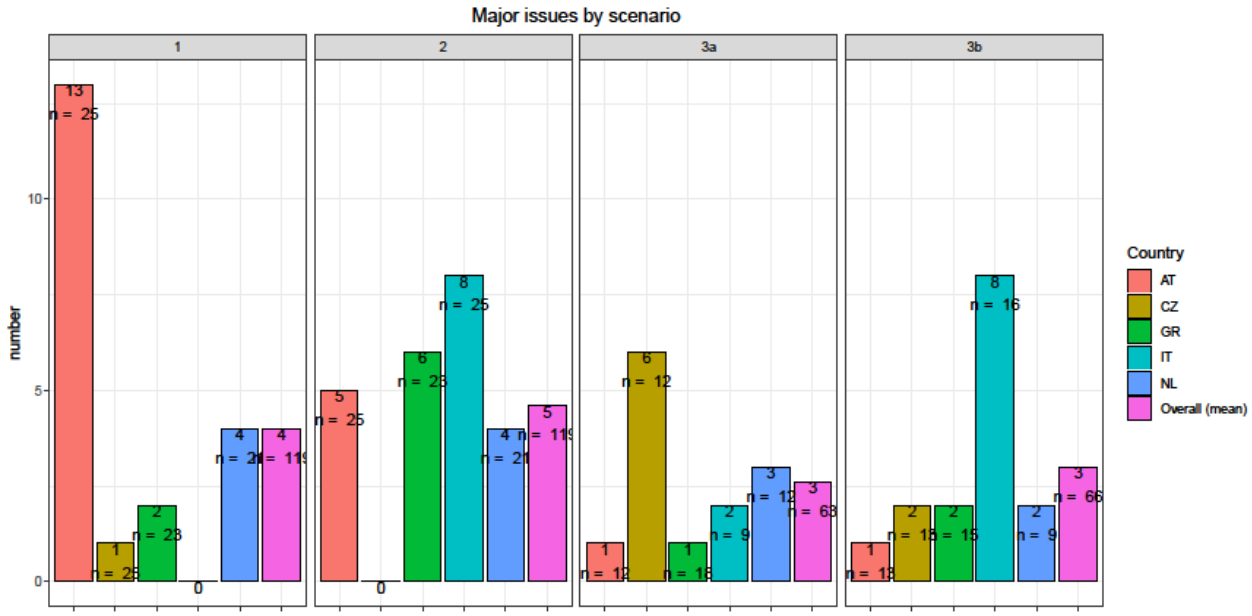


Figure 98: Number of major issues by scenario

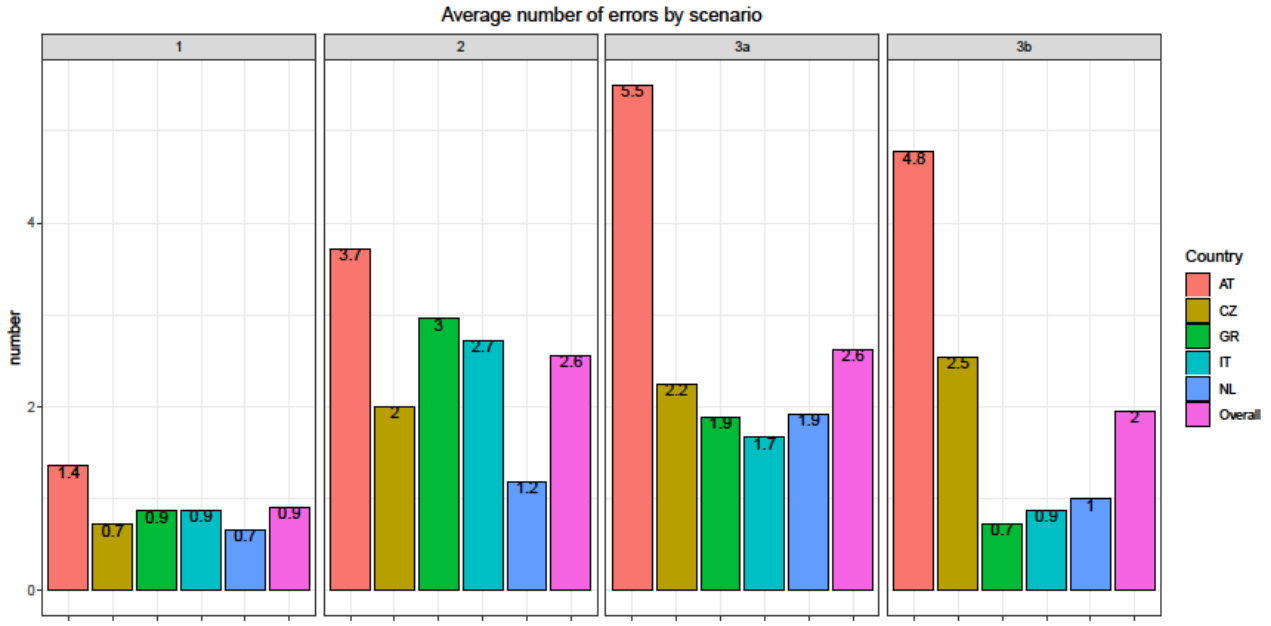


Figure 99: Average number of errors by scenario

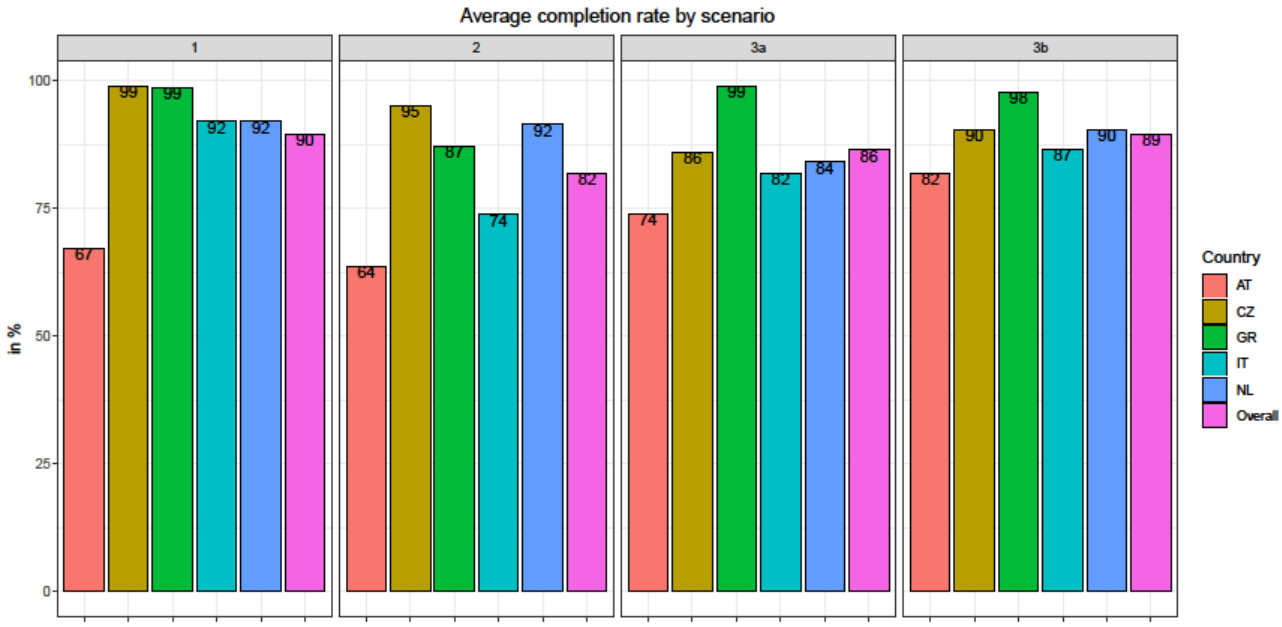


Figure 100: Average completion rate by scenario

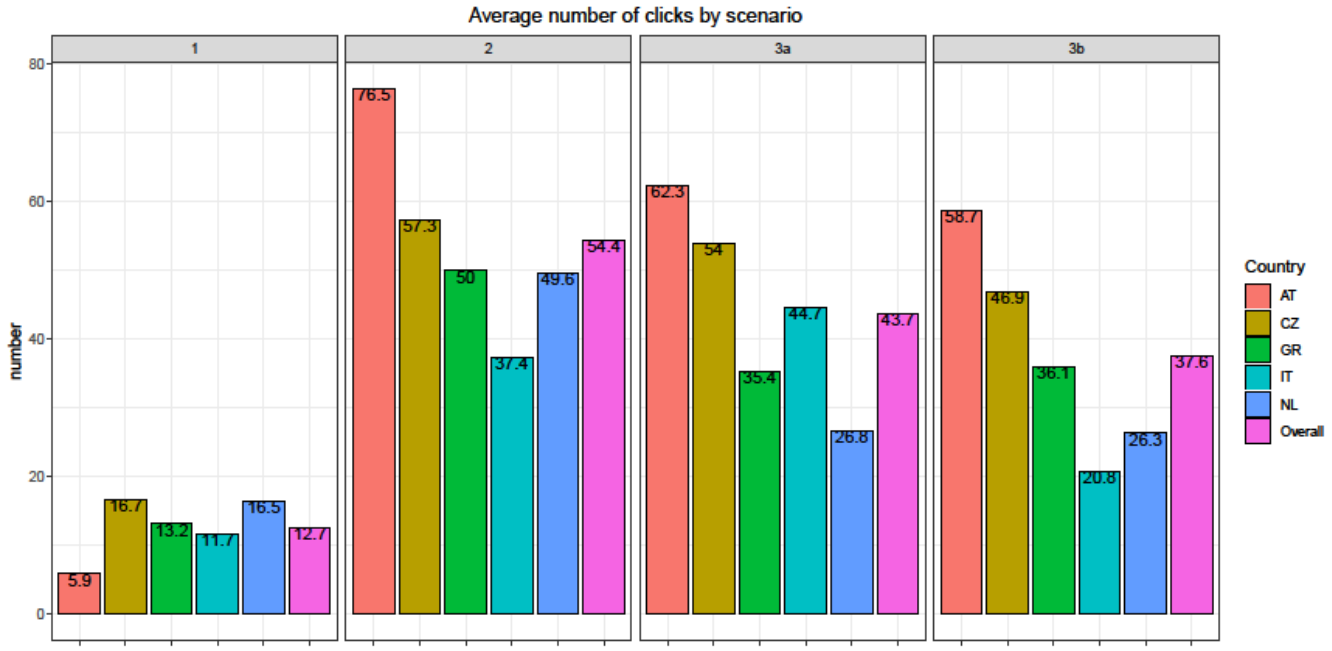


Figure 101: Average number of clicks by scenario

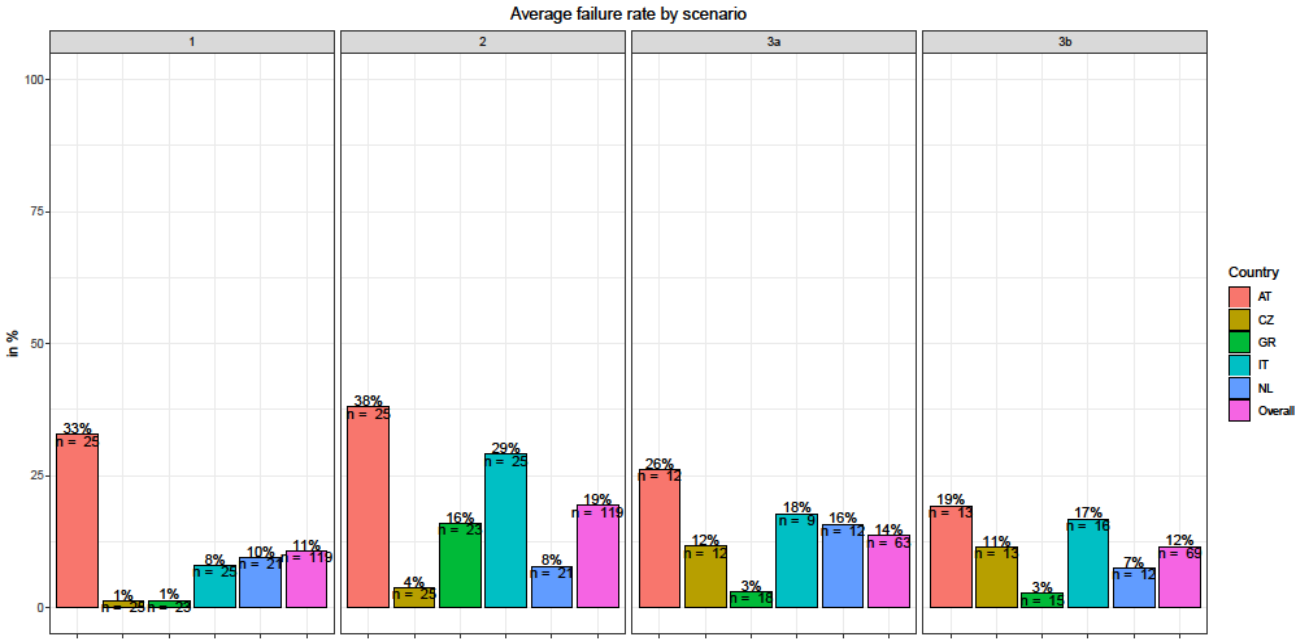


Figure 102: Average failure rate by scenario

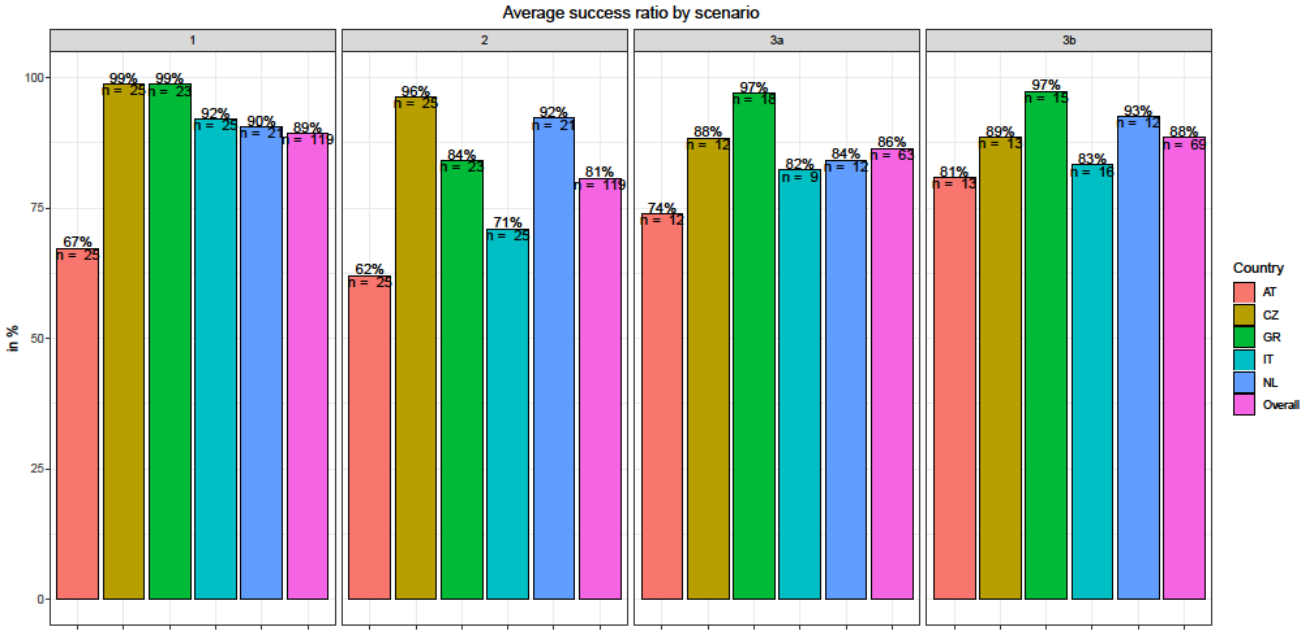


Figure 103: Average success ratio by scenario

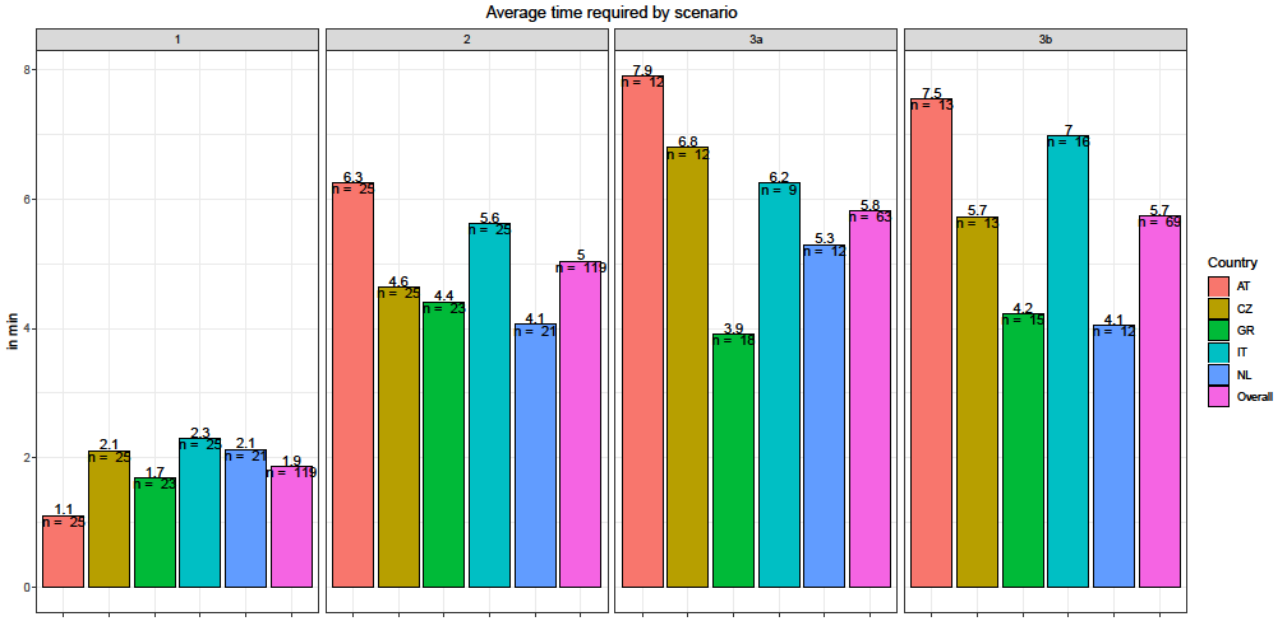


Figure 104: Average time required by scenario

1.1.6 Results from the Post-questionnaires

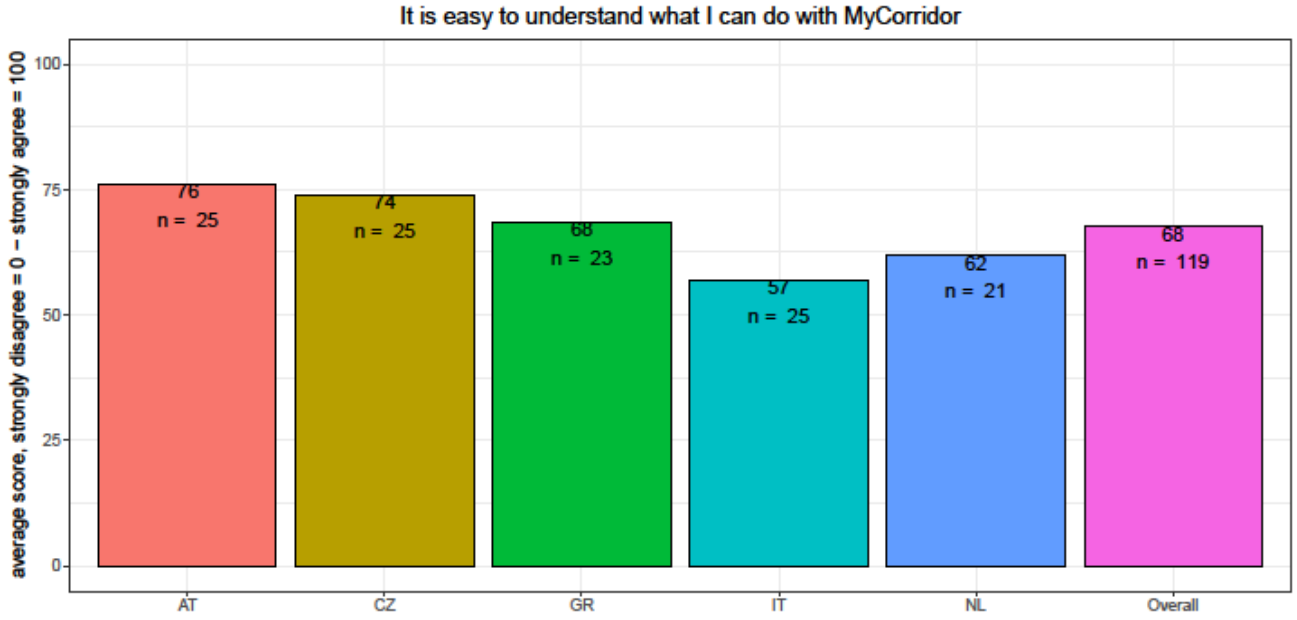


Figure 105: It is easy to understand what I can do with MyCorridor

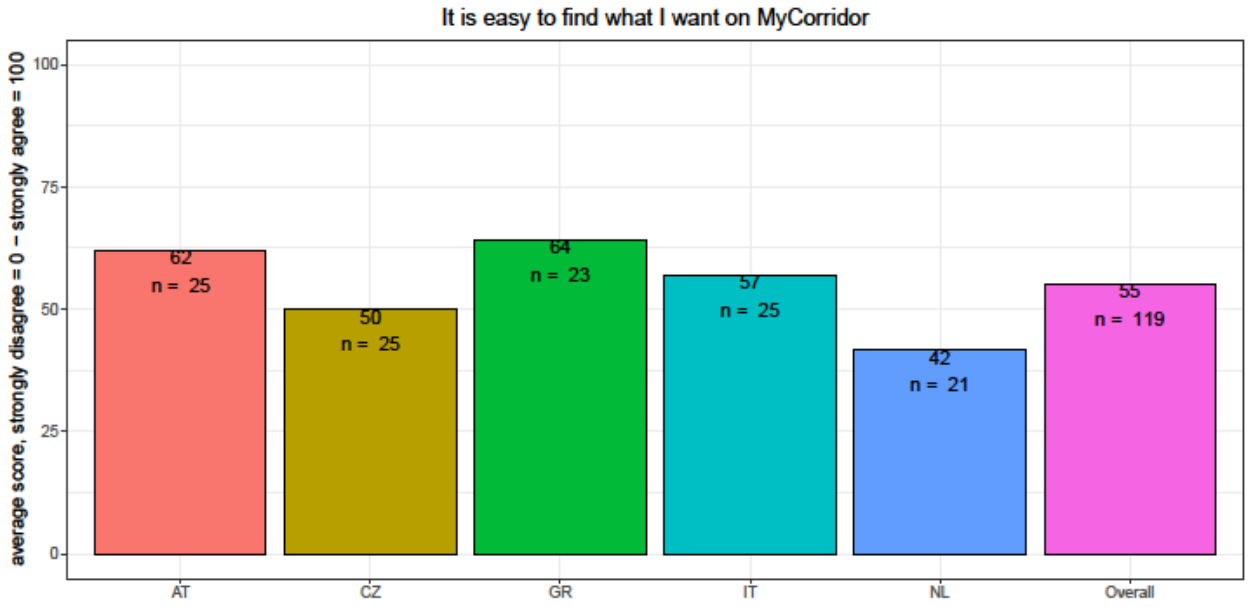


Figure 106: It is easy to find what I want on MyCorridor

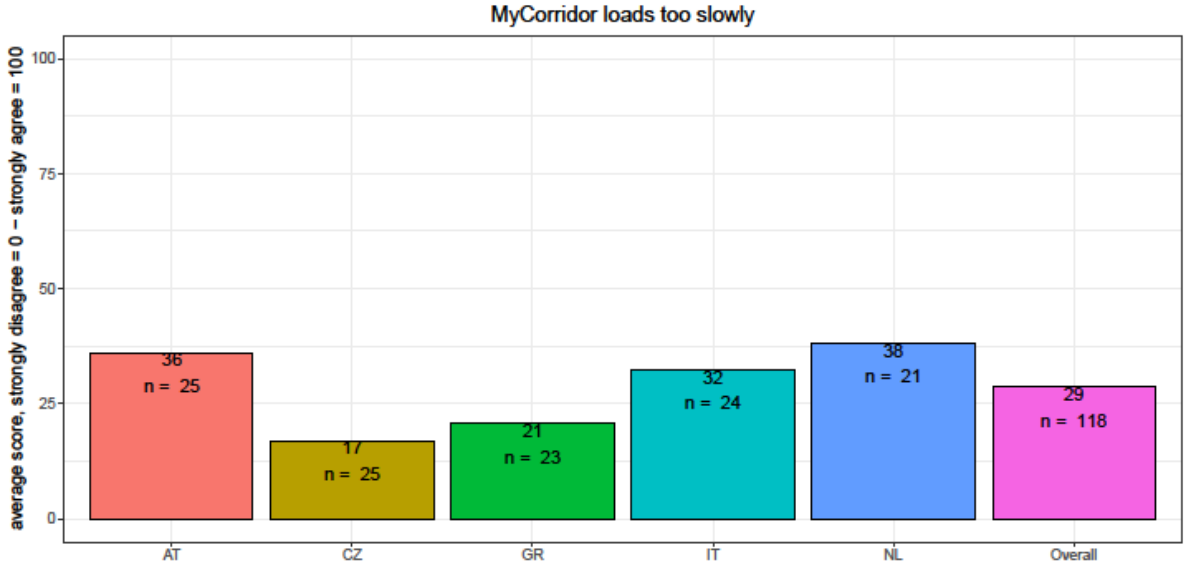


Figure 107: MyCorridor loads too slowly

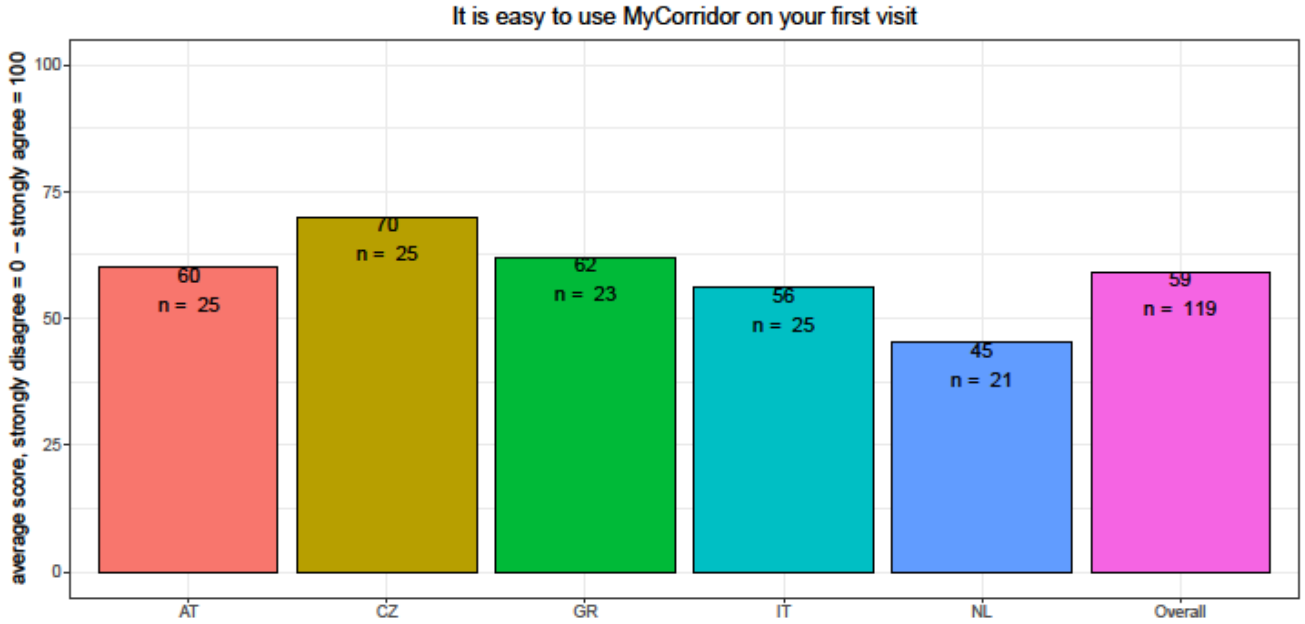


Figure 108: It is easy to use MyCorridor on your first visit

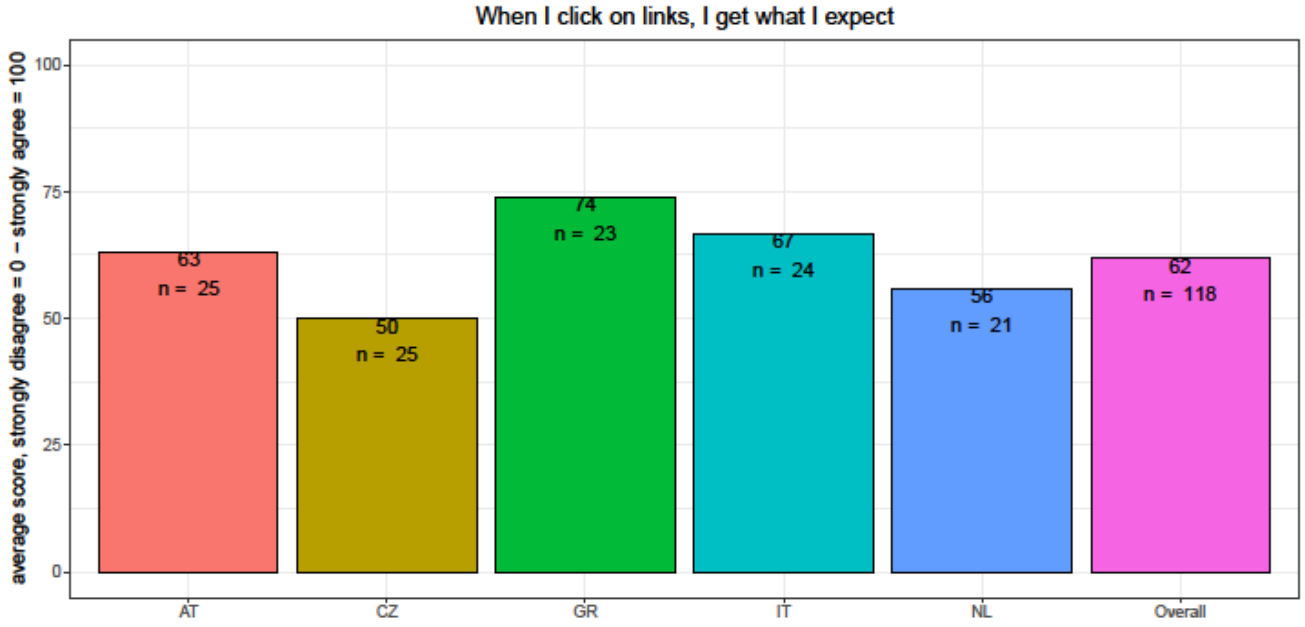


Figure 109: When I click on links, I get what I expect

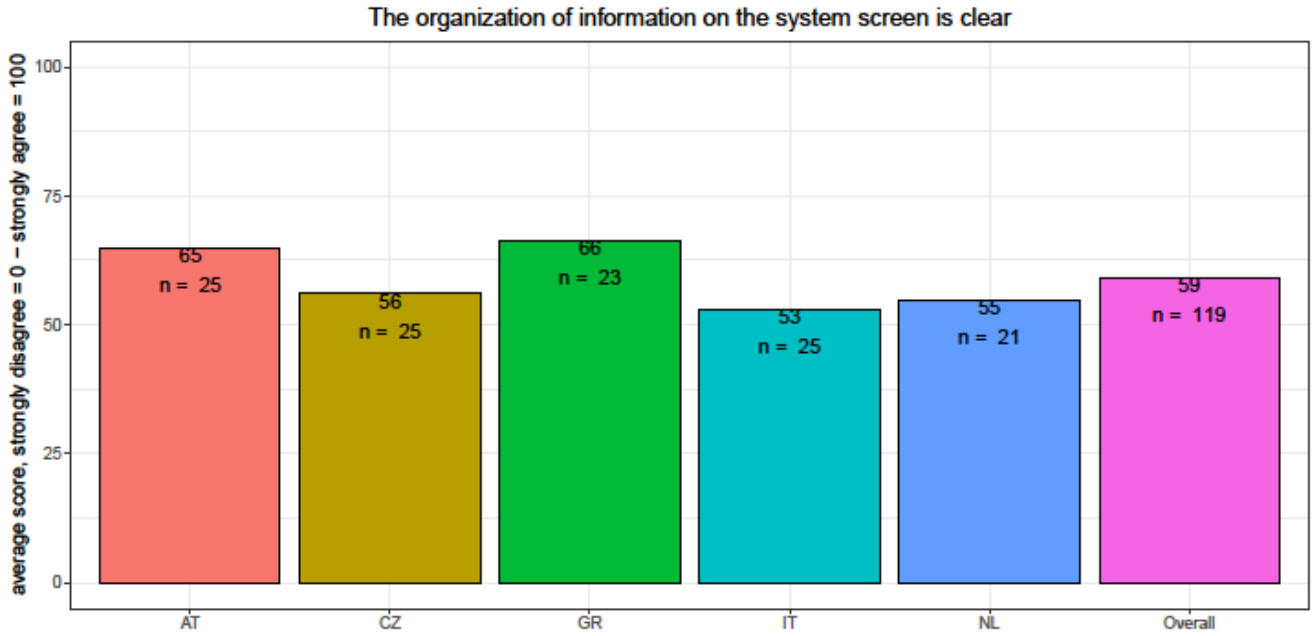


Figure 110: The organization of information on the system screen is clear

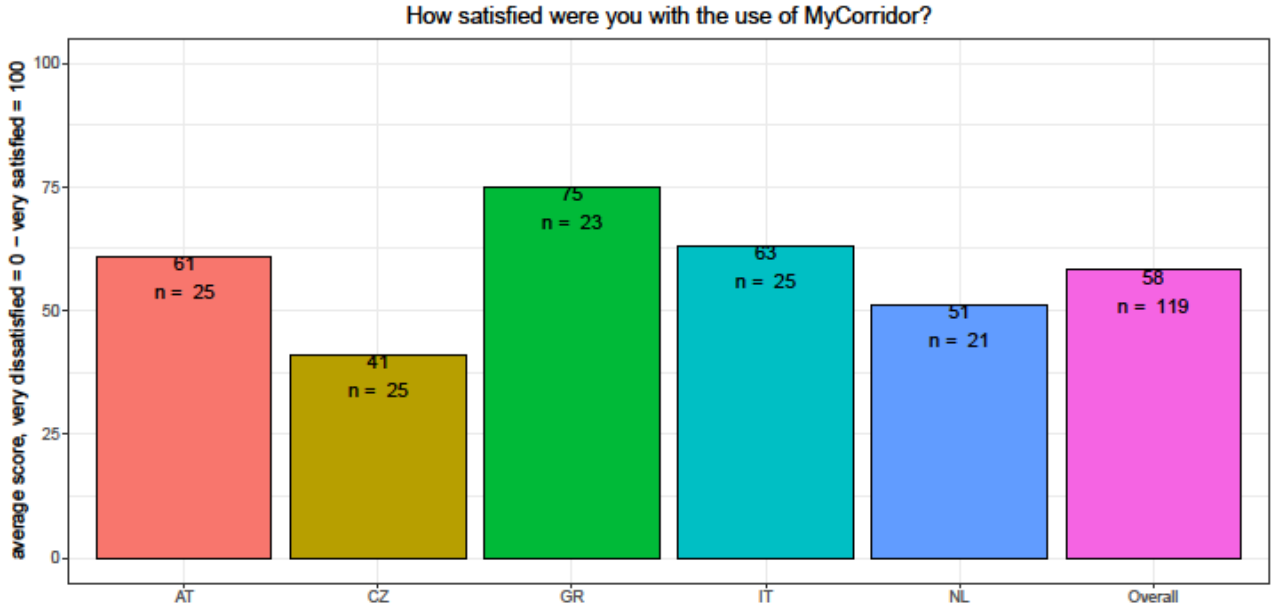


Figure 111: How satisfied where you with the use of MyCorridor?

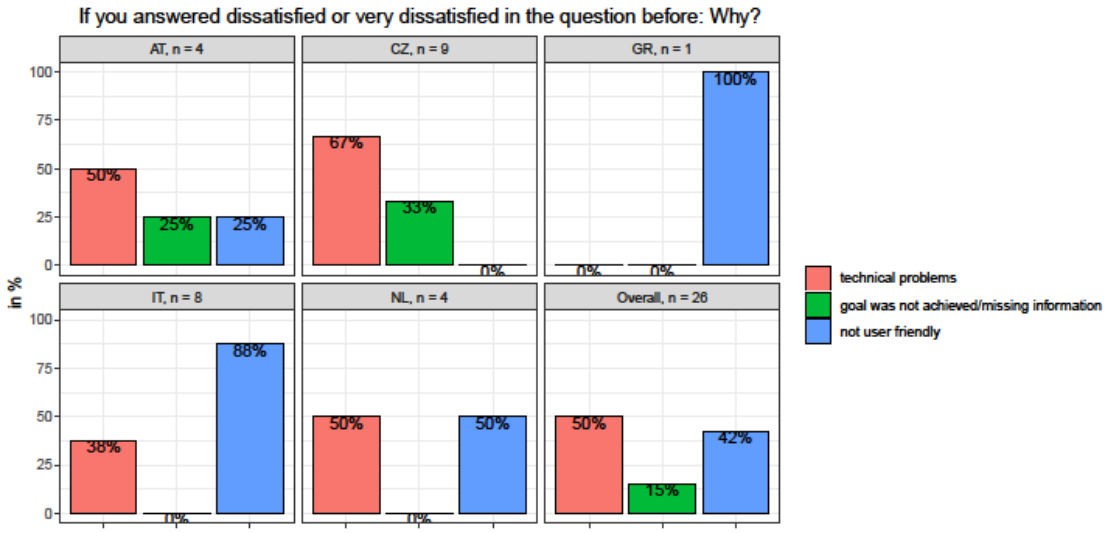


Figure 112: If answered dissatisfied or very dissatisfied in the question before: Why?

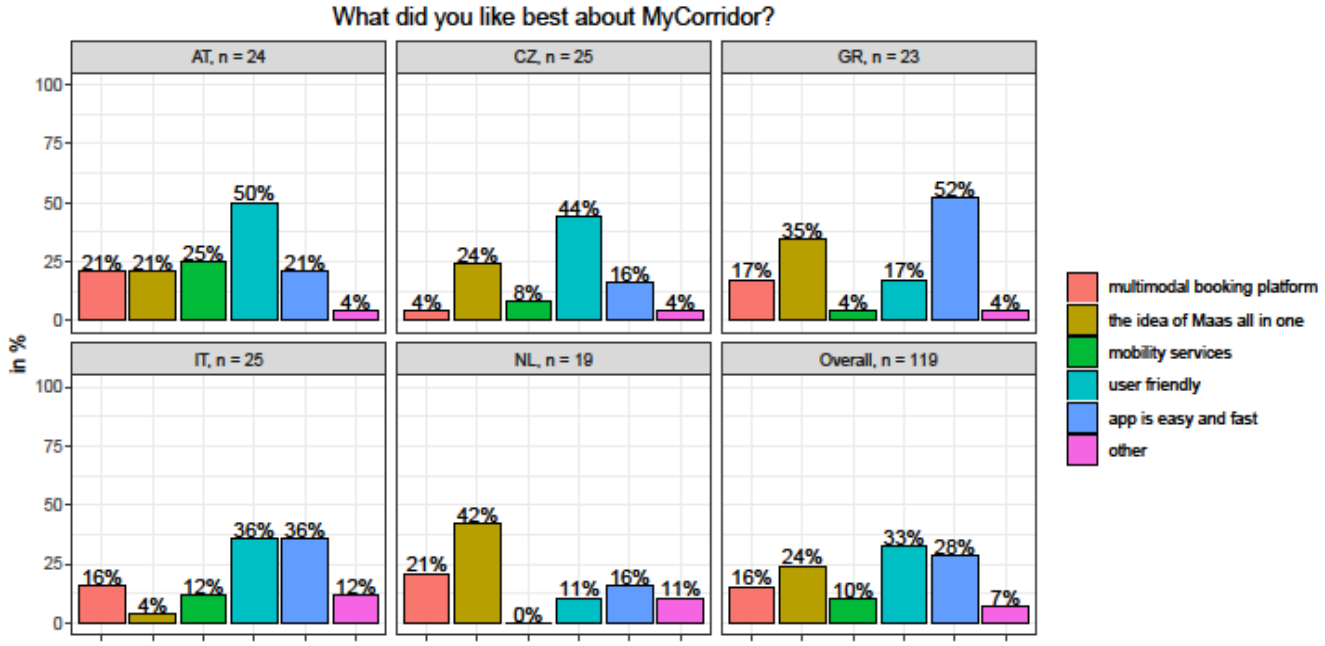


Figure 113: What did you like best about MyCorridor?

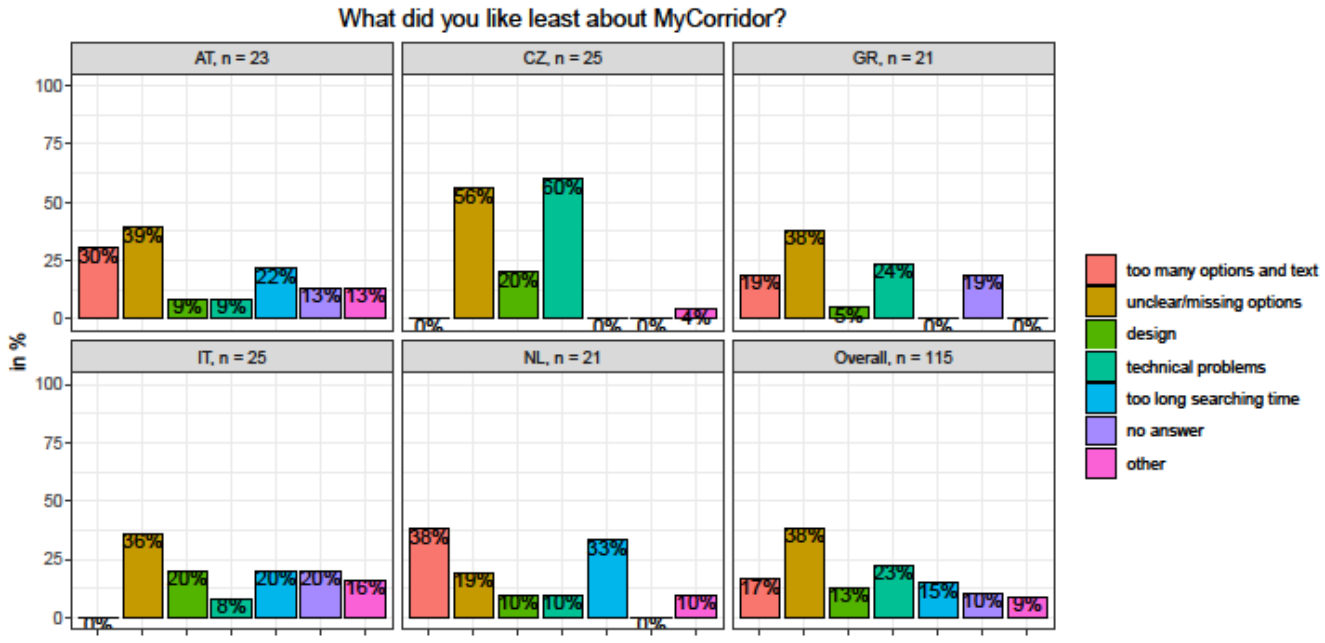


Figure 114: What did you like best about MyCorridor?

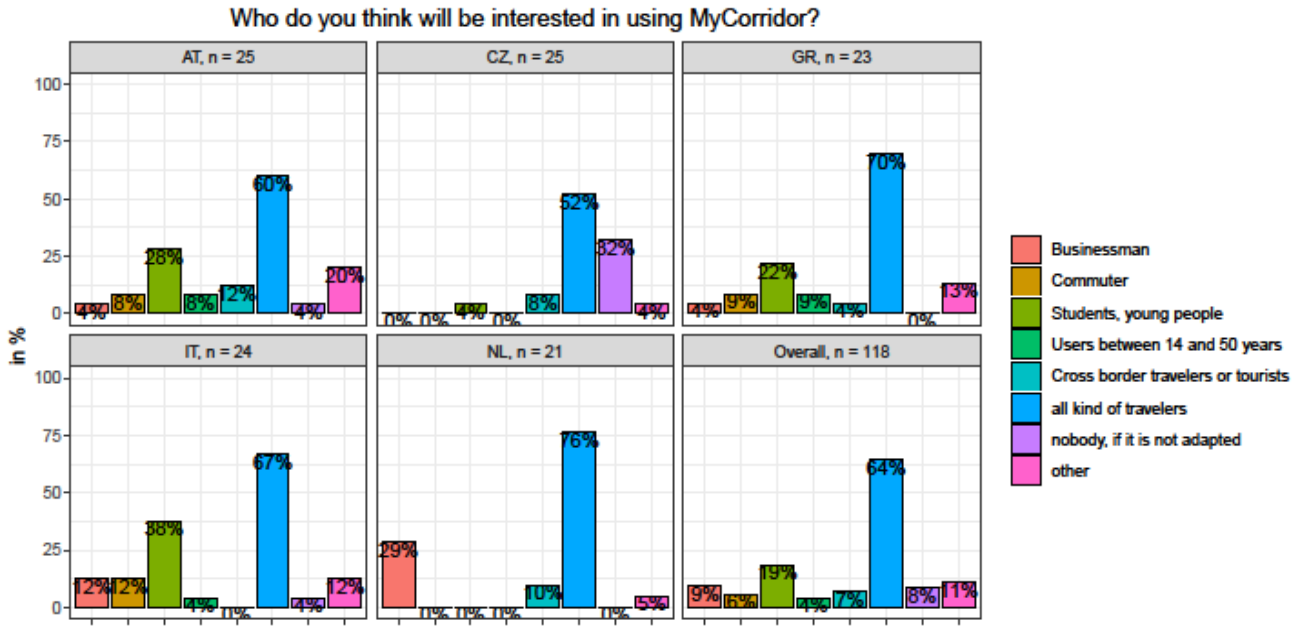


Figure 115: Who do you think will be interested in using MyCorridor?

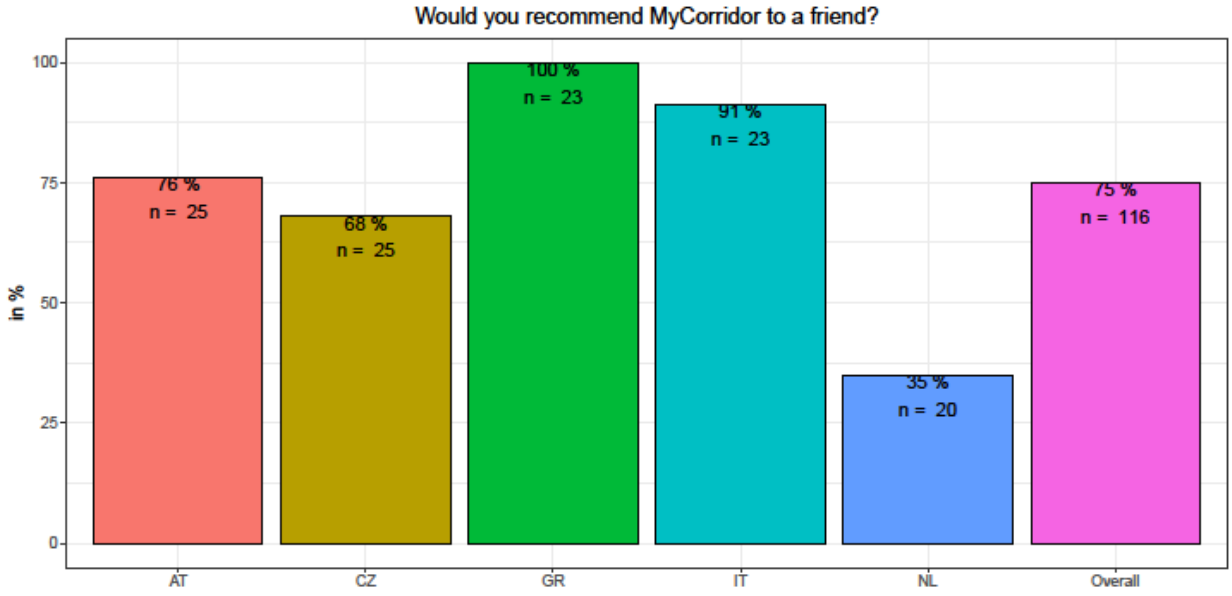


Figure 116: Would you recommend MyCorridor to a friend?

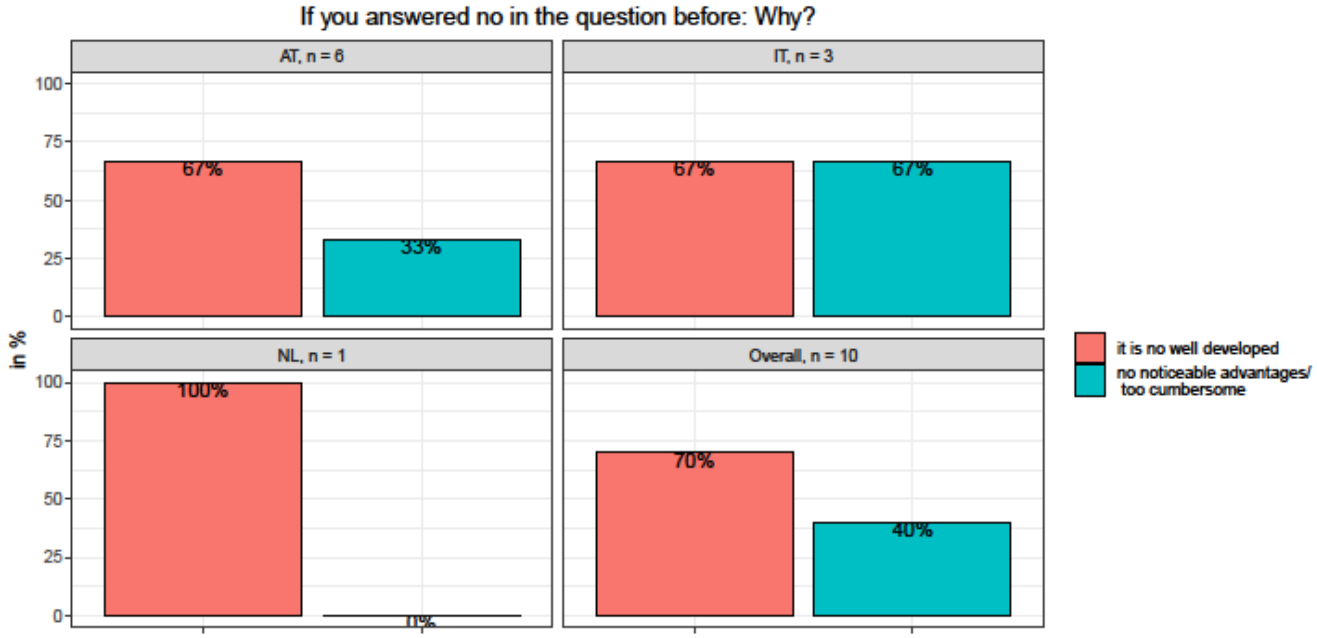


Figure 117: If you answered no in the question before: Why?

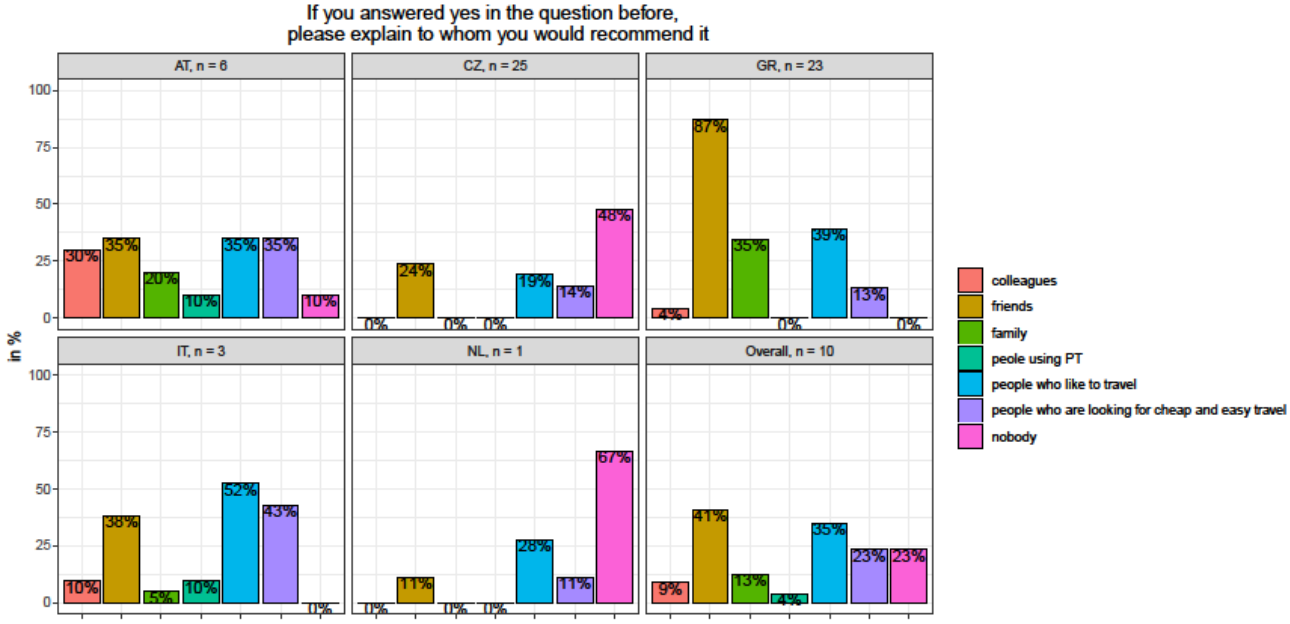


Figure 118: If you answered yes in the question before, please explain to whom you would recommend it

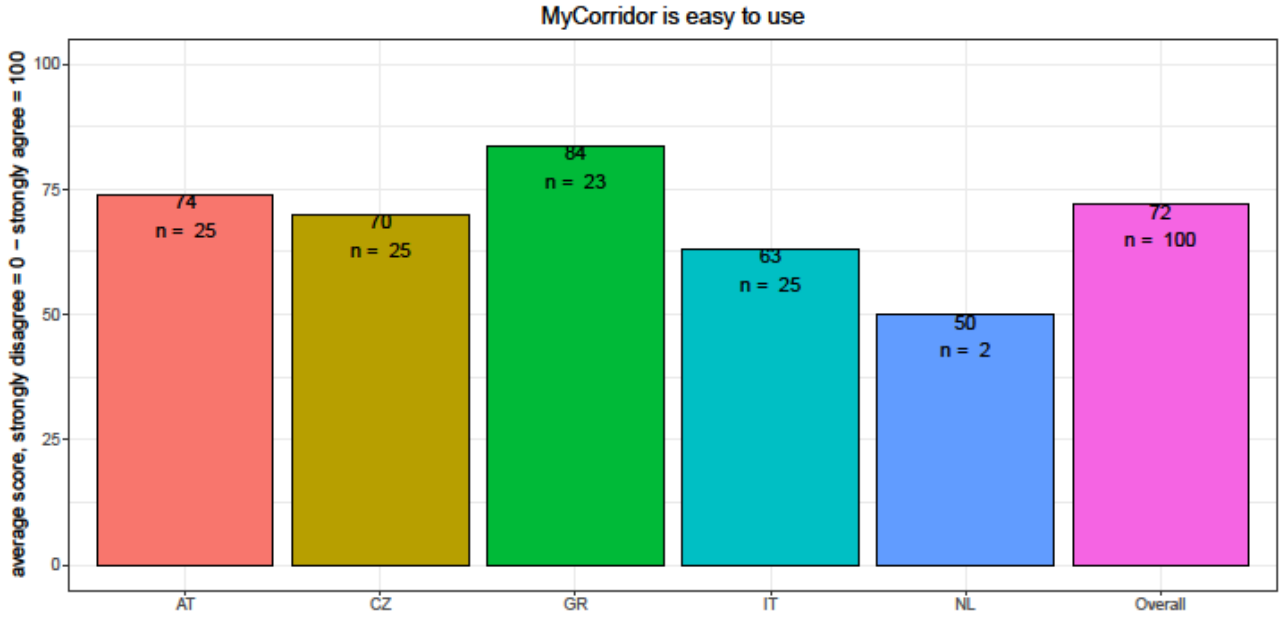


Figure 119: MyCorridor is easy to use

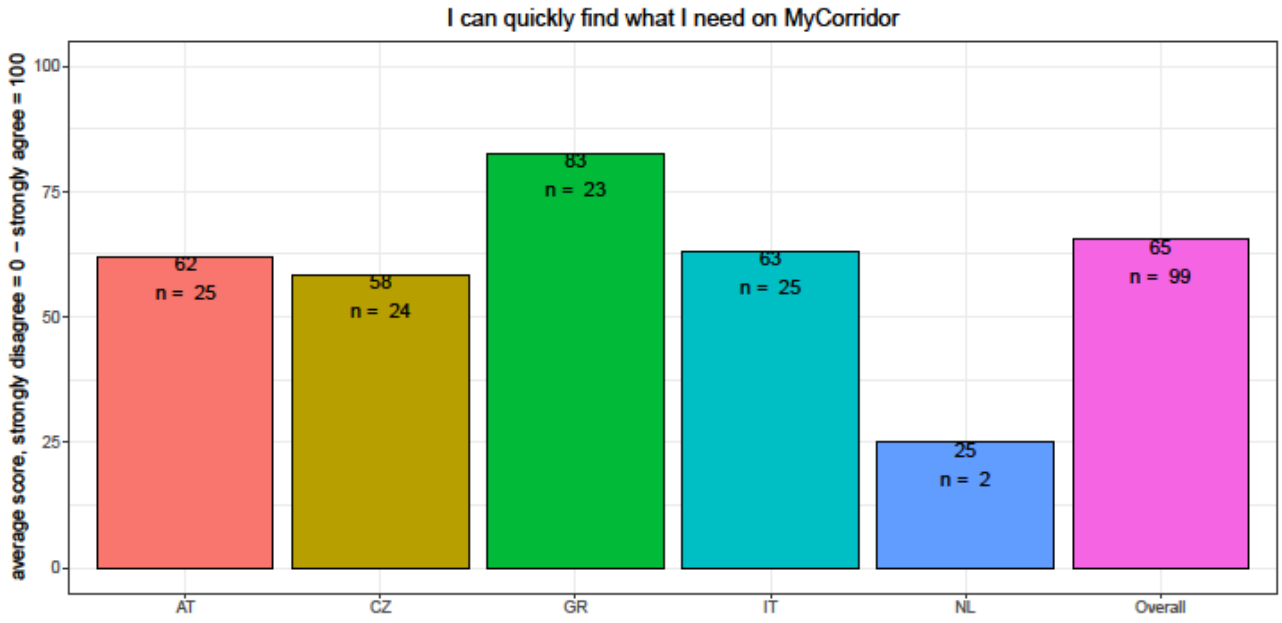


Figure 120: I can quickly find what I need on MyCorridor

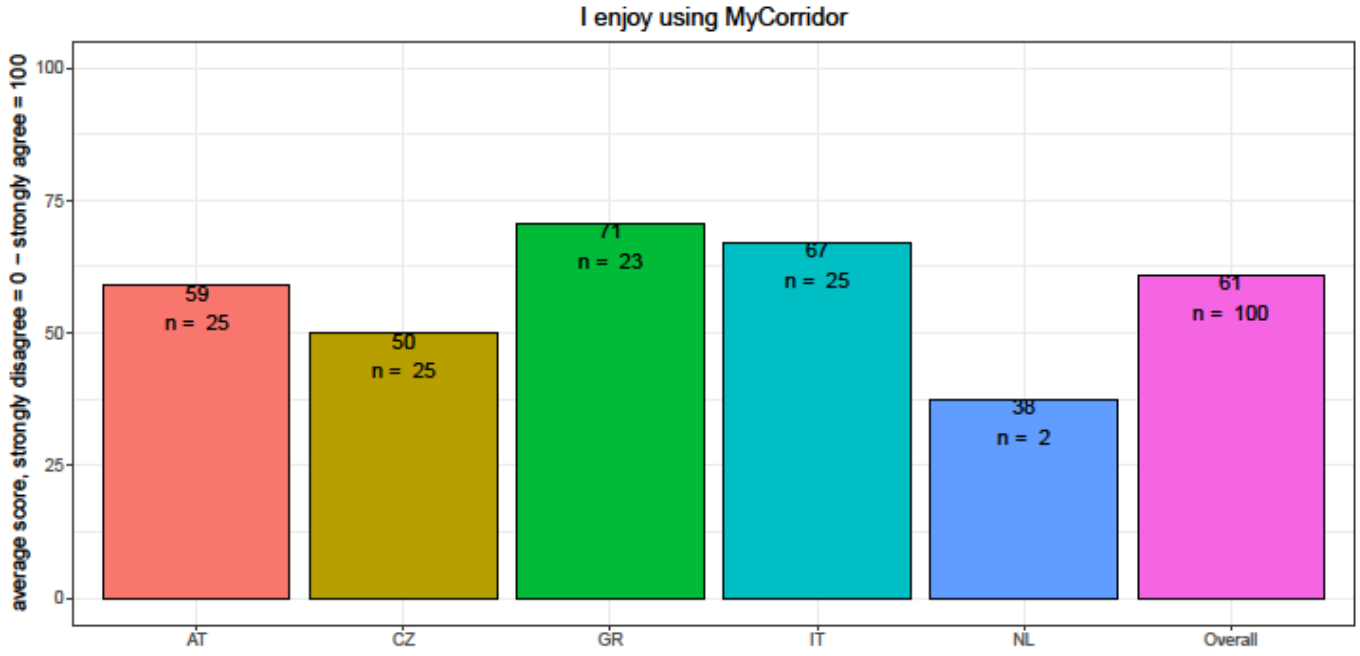


Figure 121: I enjoy using MyCorridor

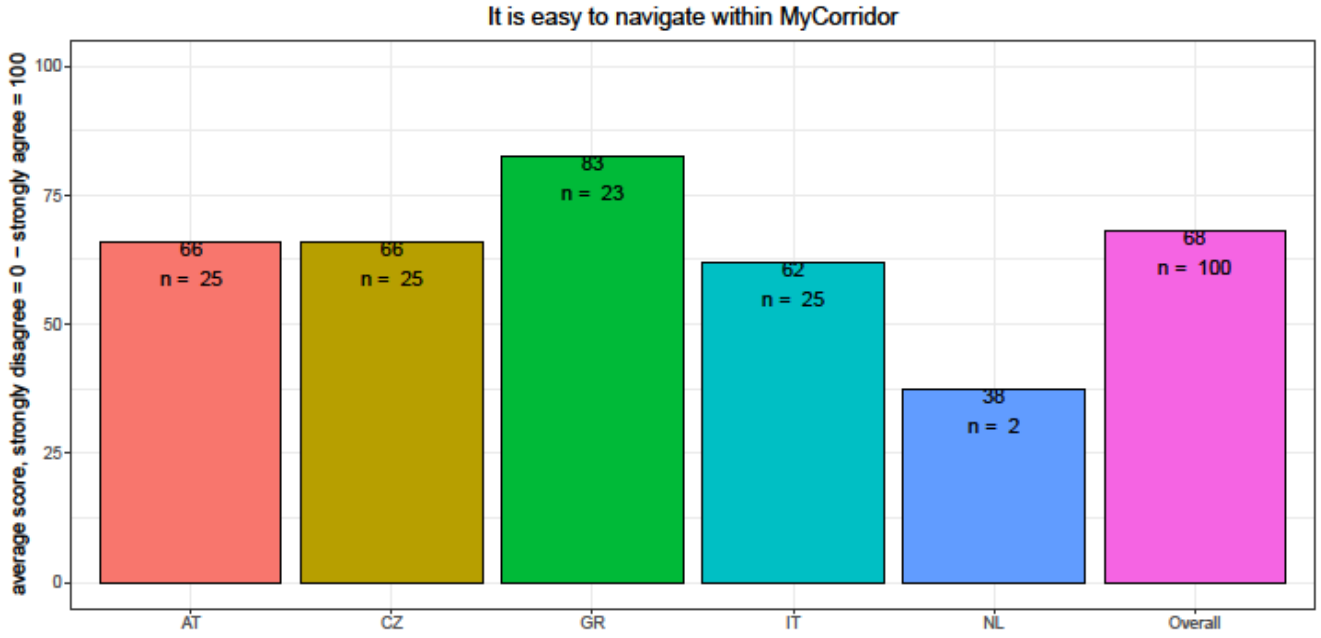


Figure 122: It is easy to navigate within MyCorridor

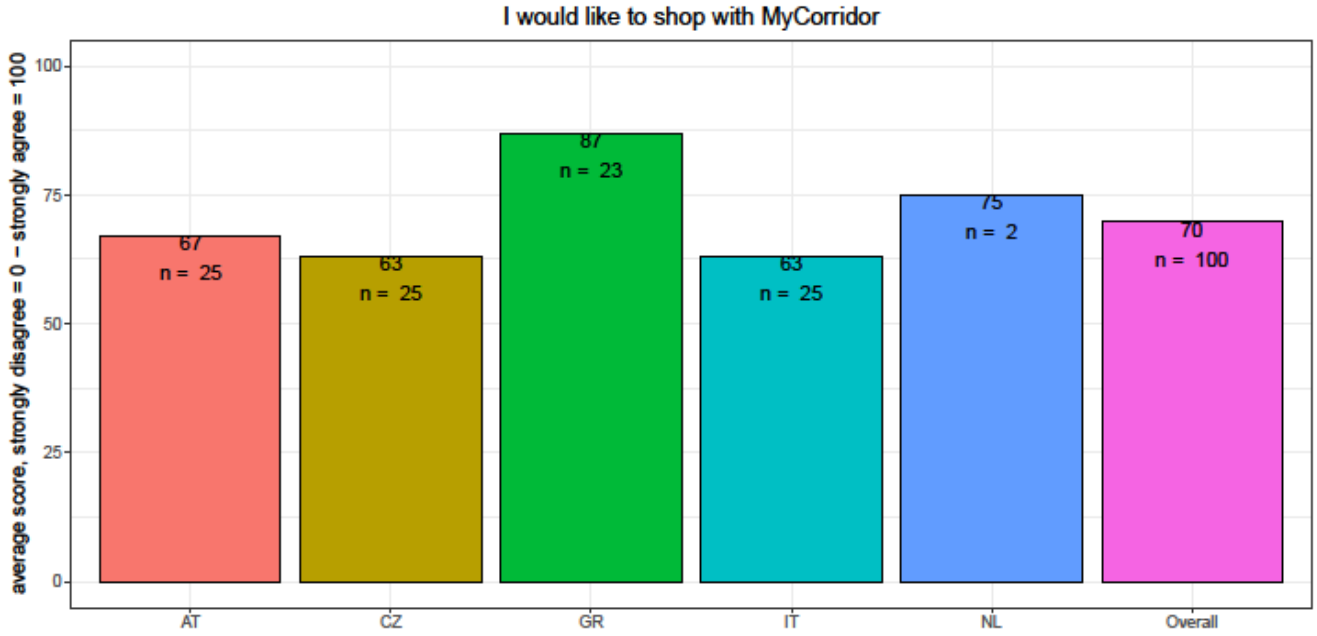


Figure 123: I would like to shop with MyCorridor

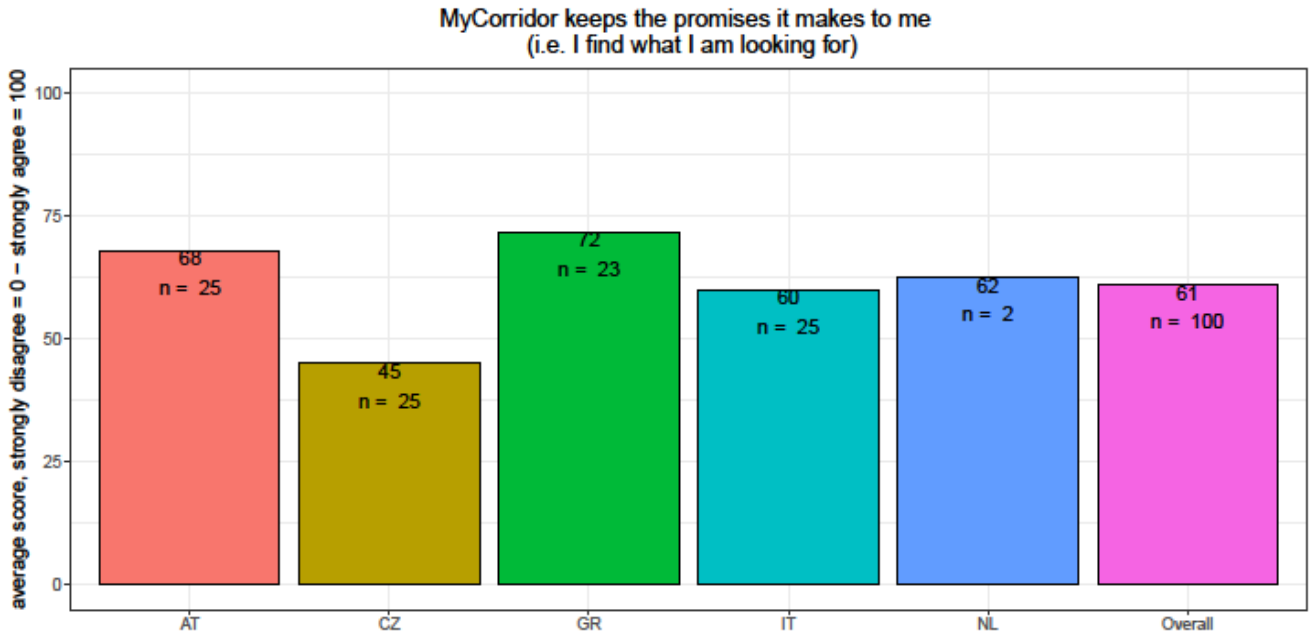


Figure 124: MyCorridor keeps the promises it makes to me

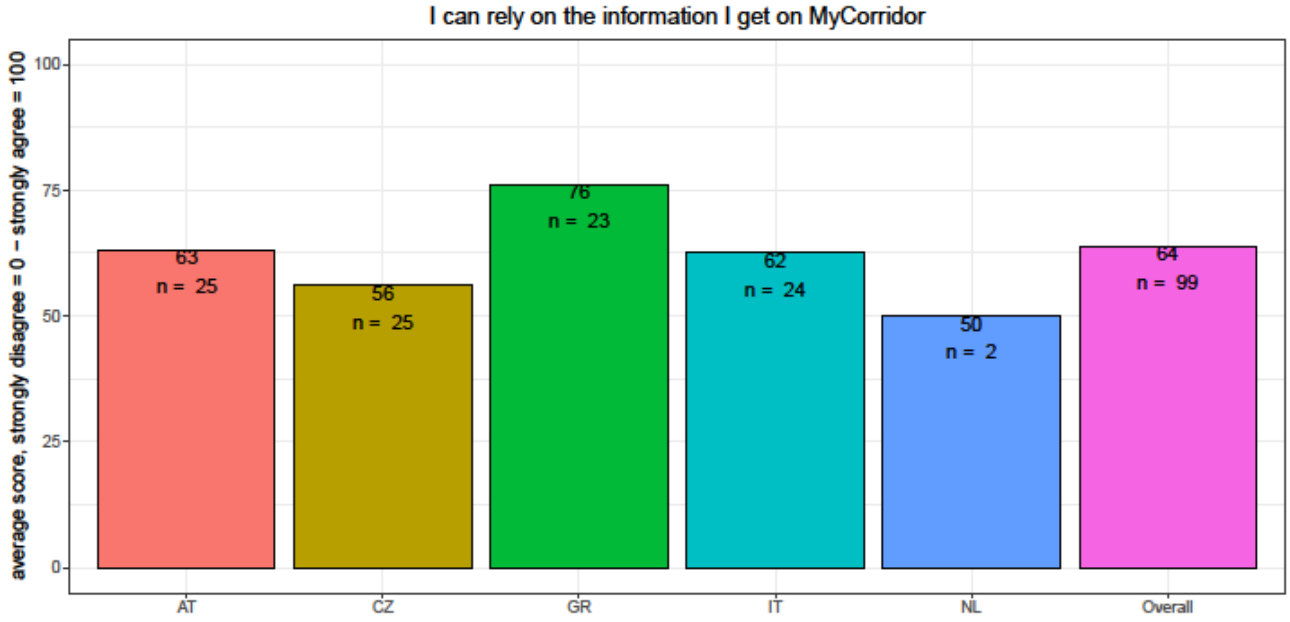


Figure 125: I can rely on the information I get on MyCorridor

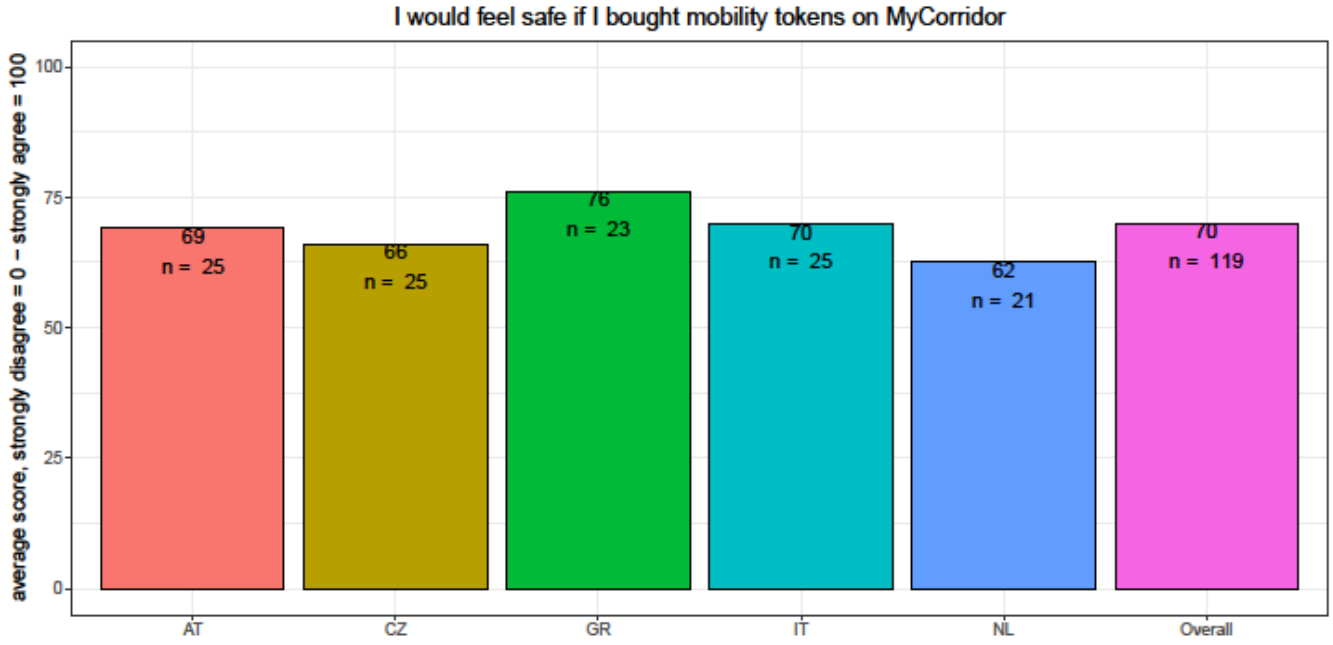


Figure 126: I would feel safe if I bought mobility tokens on MyCorridor

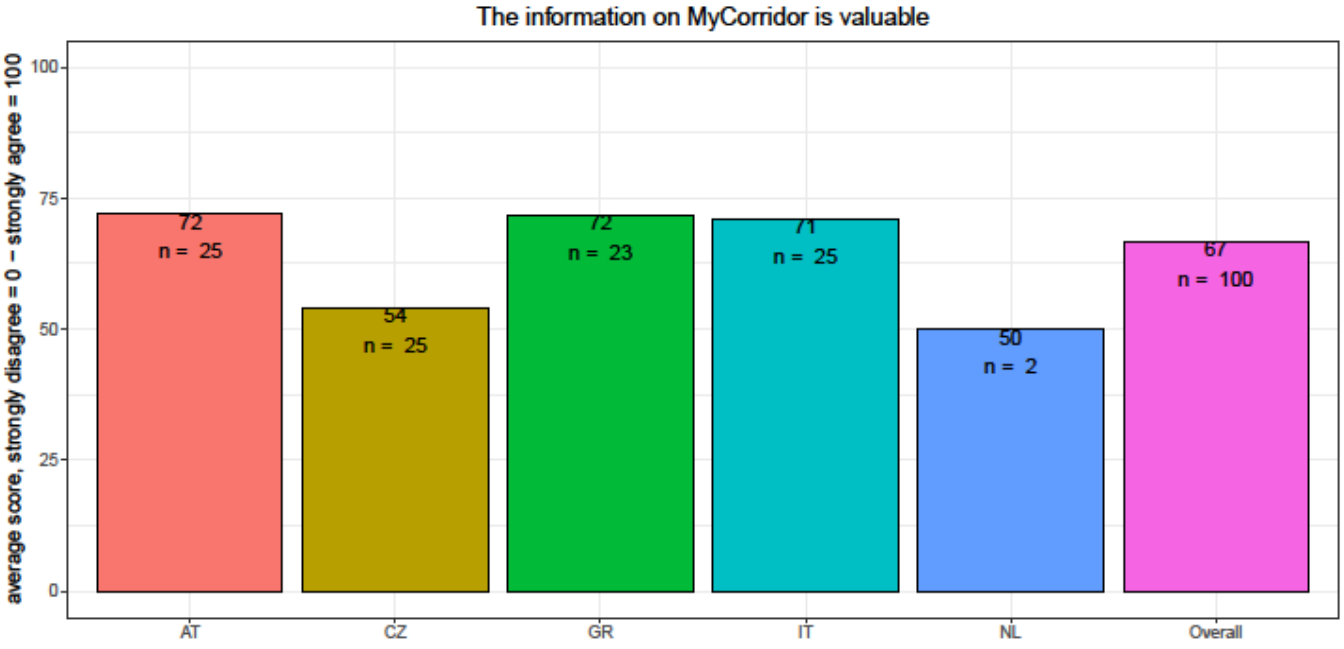


Figure 127: The information on MyCorridor is valuable

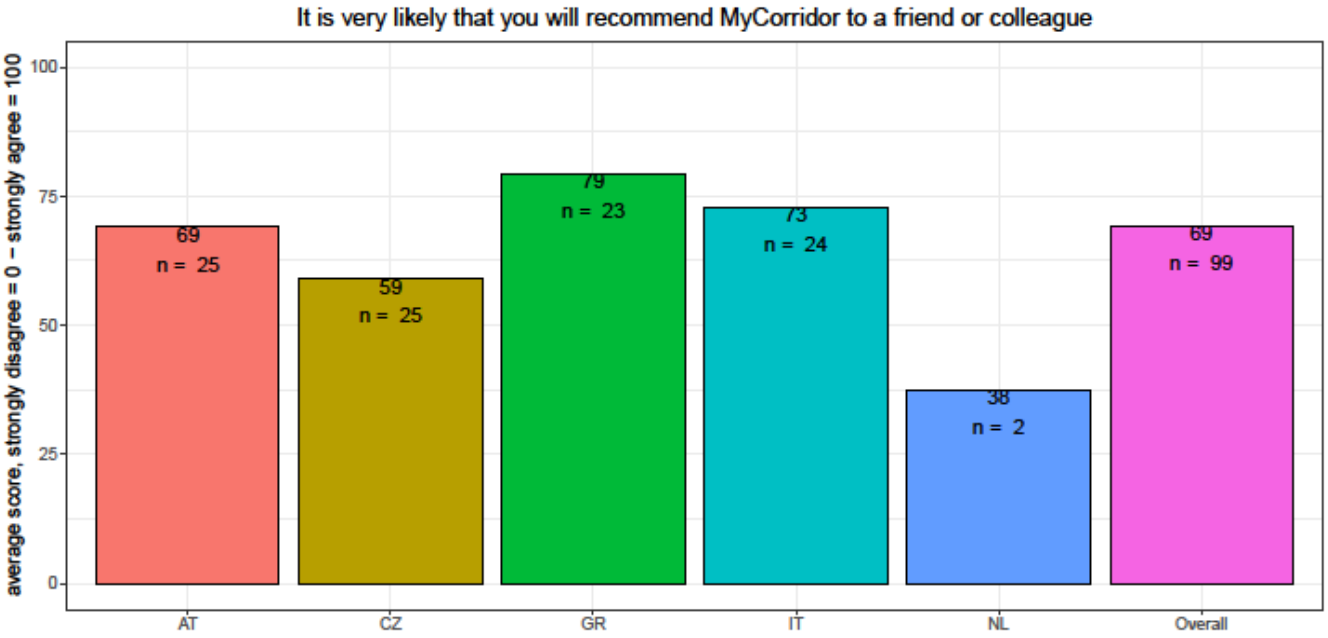


Figure 128: It is very likely that you will recommend MyCorridor to a friend or colleague

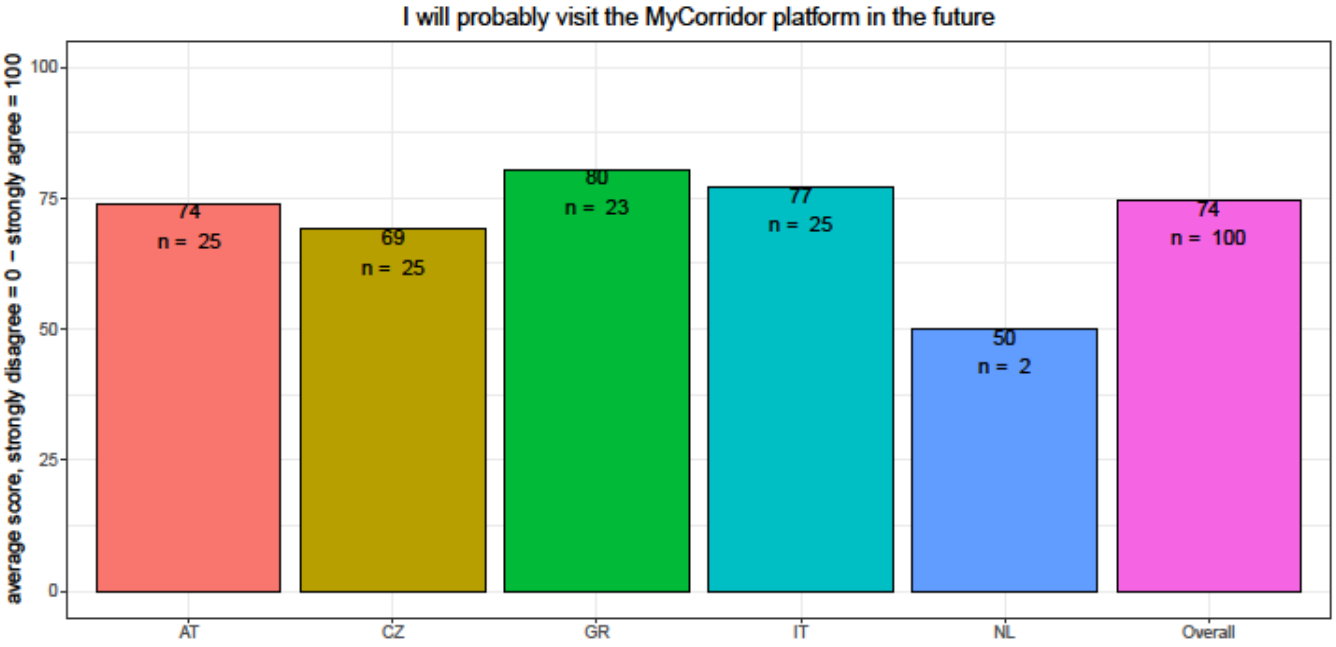


Figure 129: I will probably visit the MyCorridor platform in the future

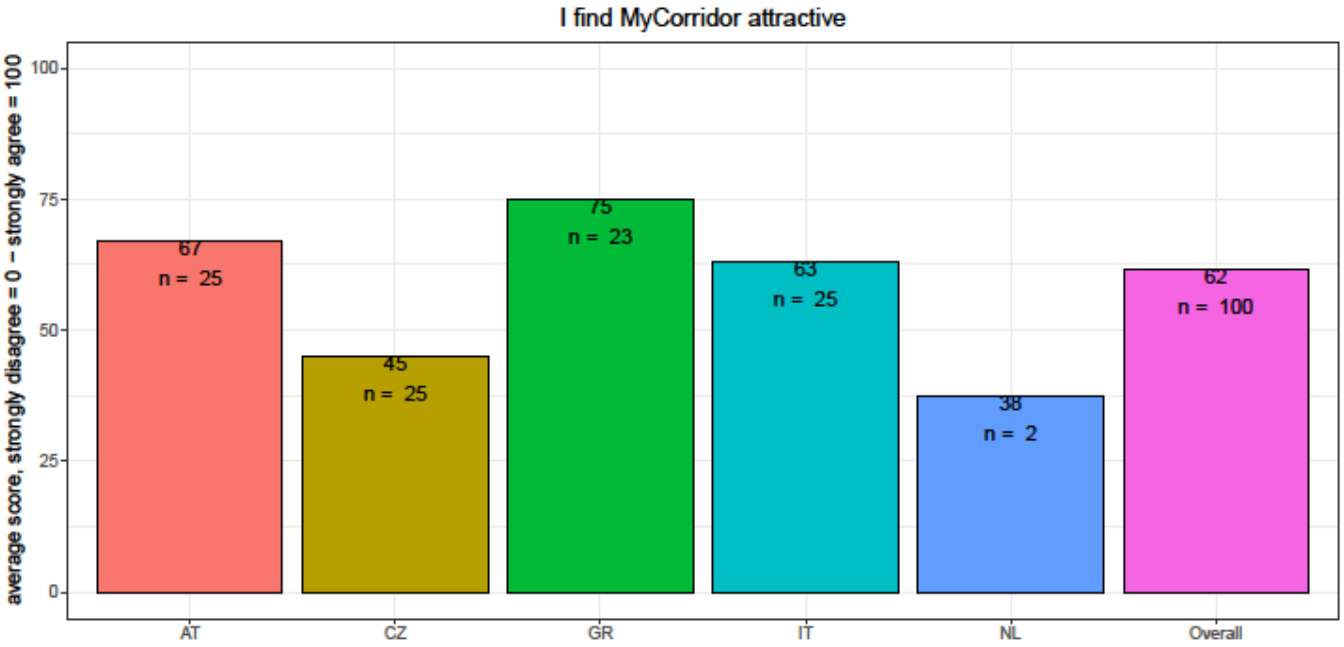


Figure 130: I find MyCorridor attractive

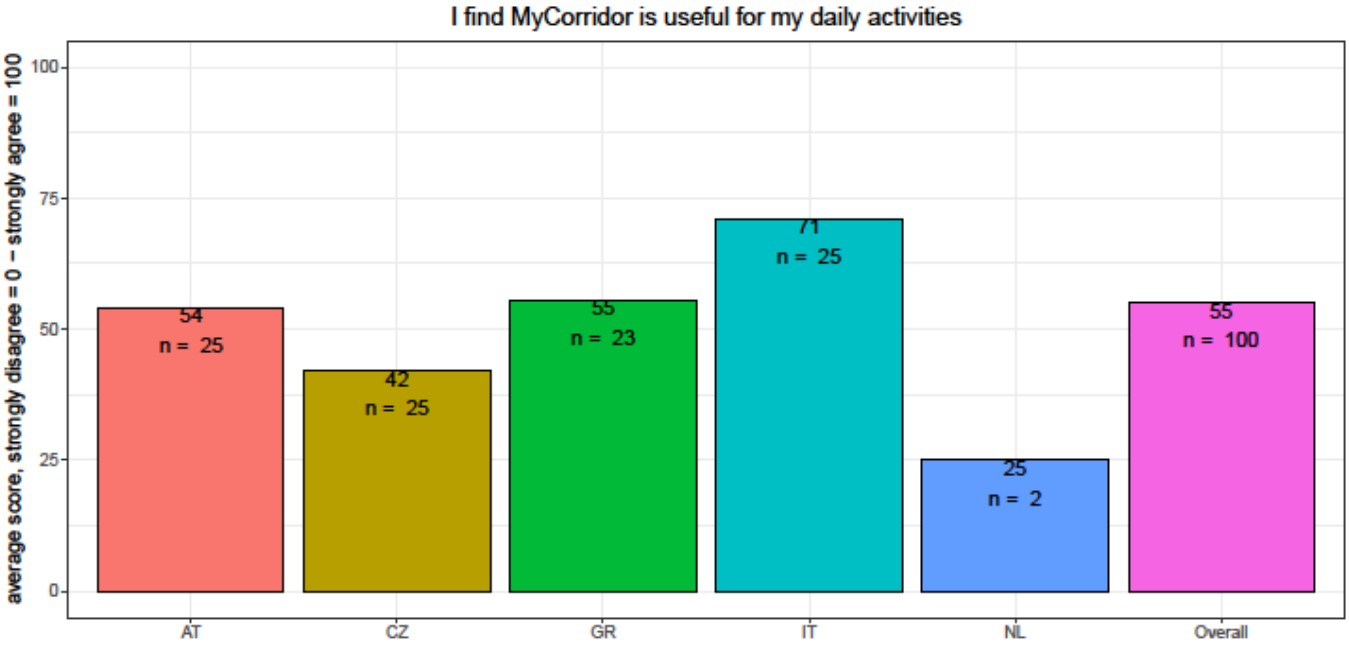


Figure 131: I find MyCorridor is useful for my daily activities

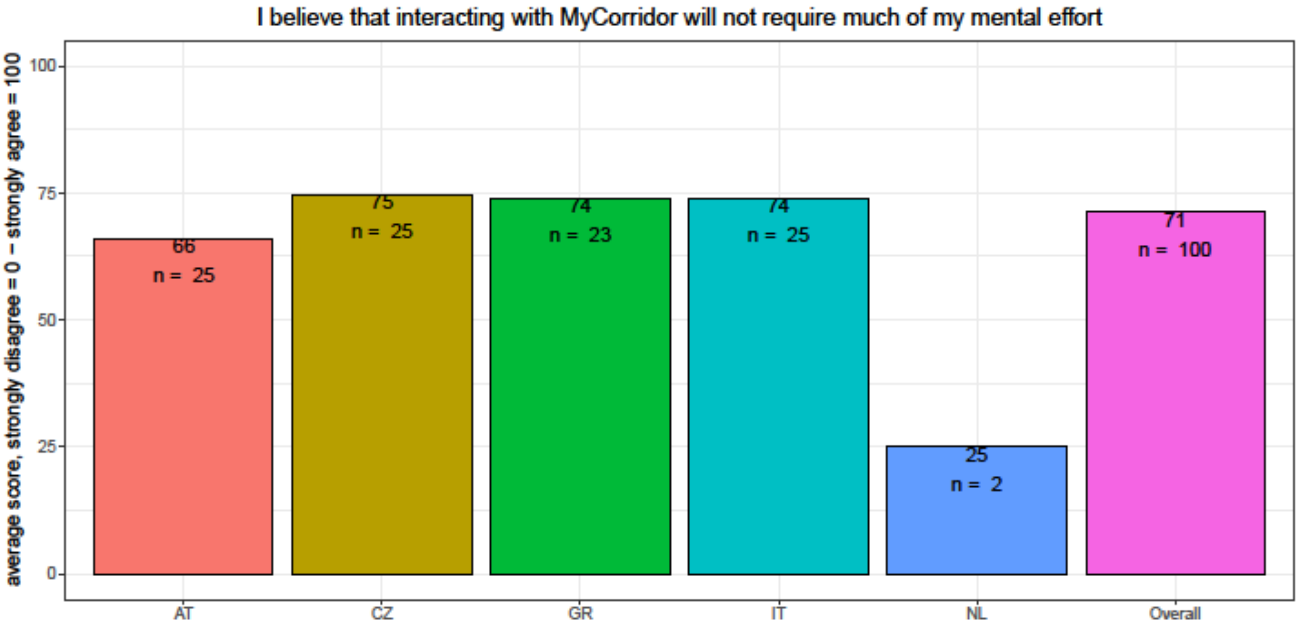


Figure 132: I believe that interacting with MyCorridor will not require much of my mental effort

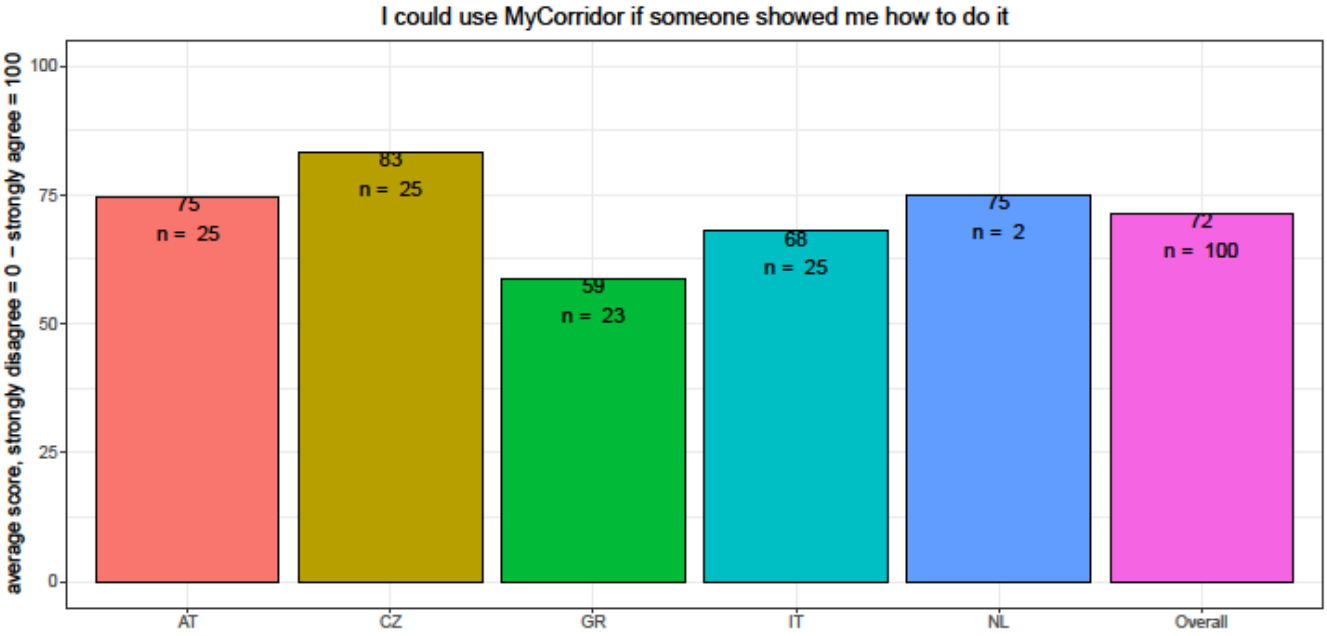


Figure 133: I could use MyCorridor if someone showed me how to do it

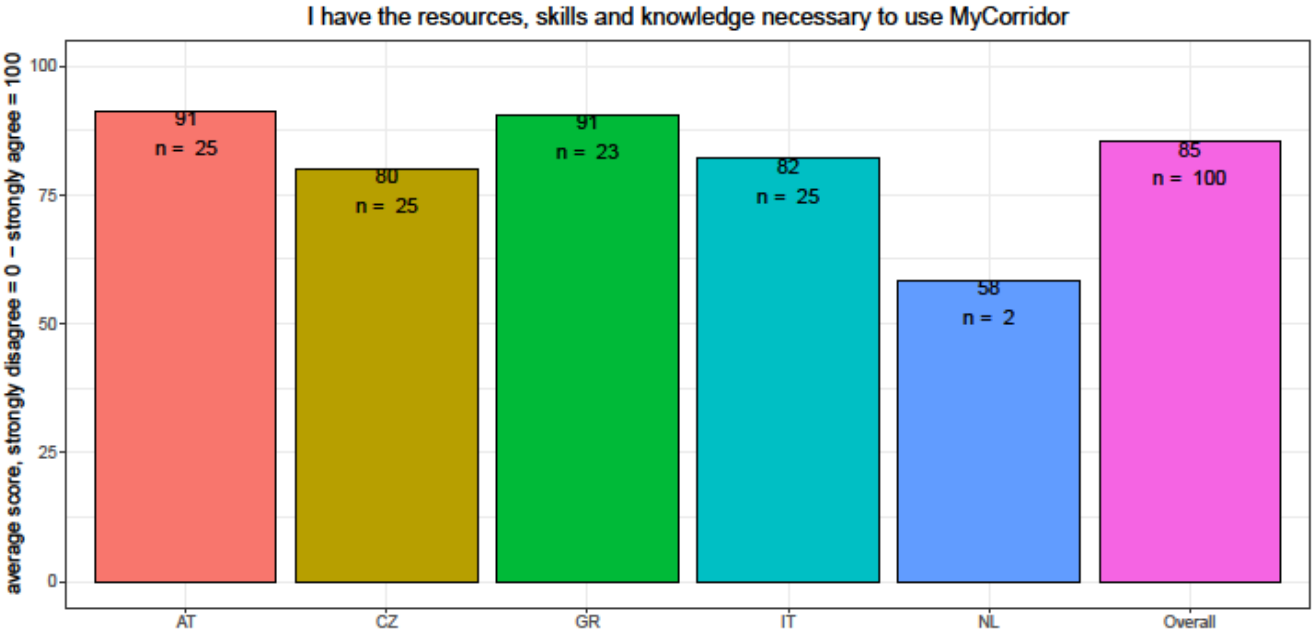


Figure 134: I have the resources, skills and knowledge necessary to use MyCorridor

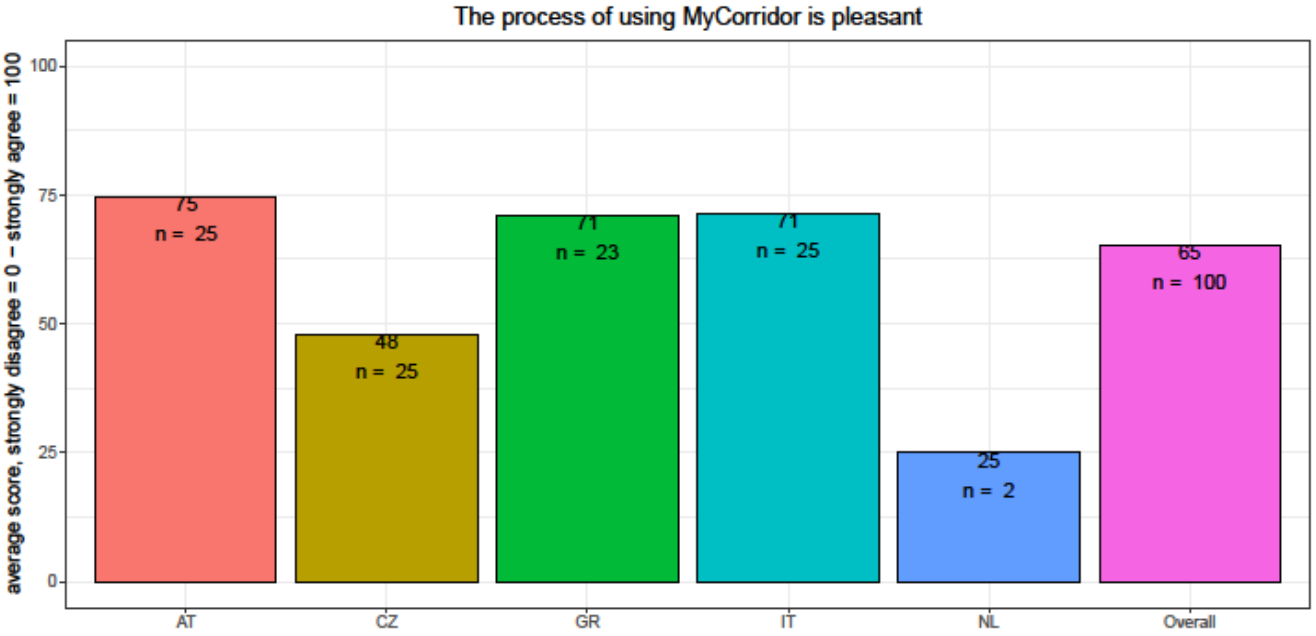


Figure 135: The process of using MyCorridor is pleasant

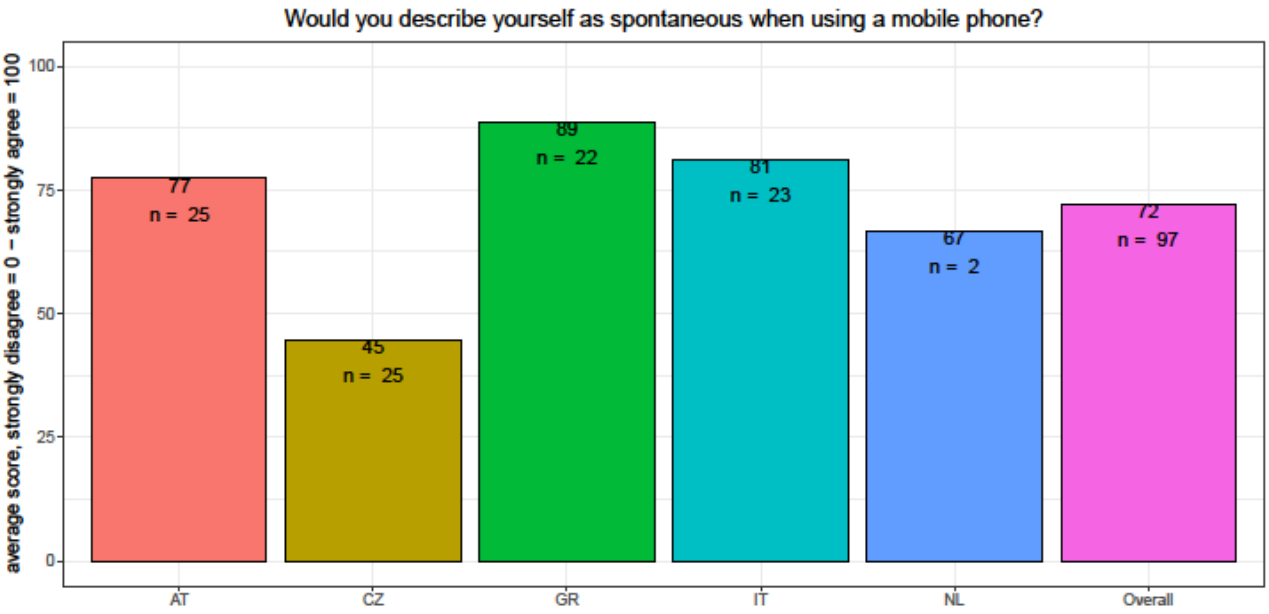


Figure 136: Would you describe yourself as spontaneous when using a mobile phone?

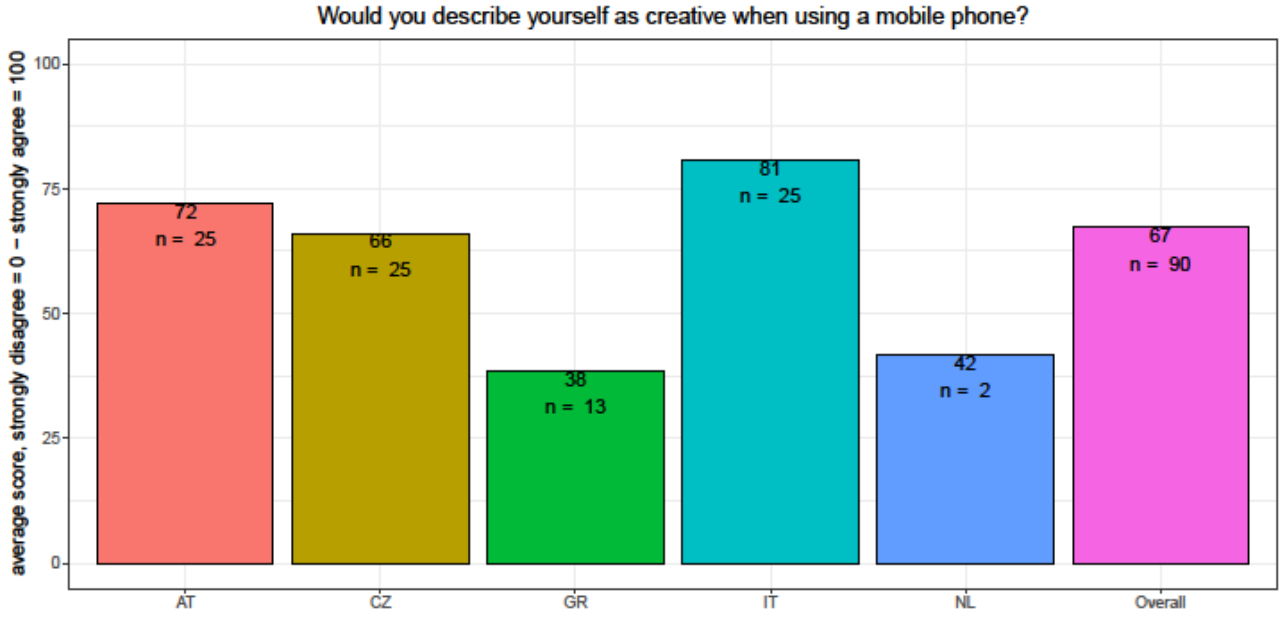


Figure 137: Would you describe yourself as creative when using a mobile phone?

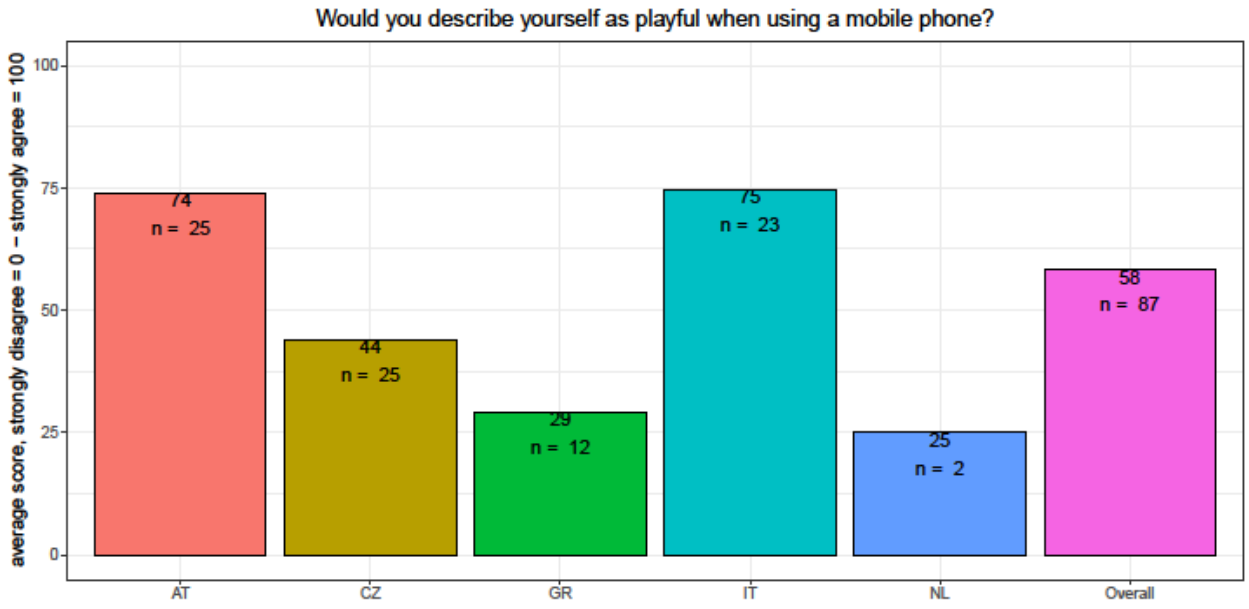


Figure 138: Would you describe yourself as playful when using a mobile phone?

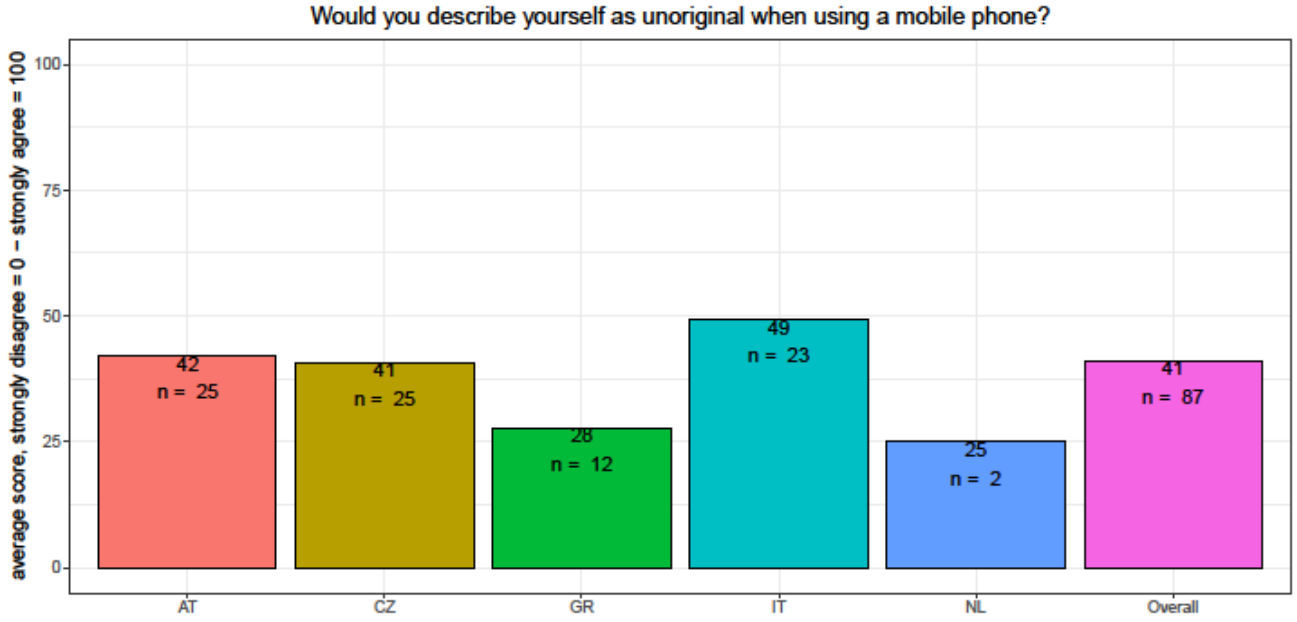


Figure 139: Would you describe yourself as unoriginal when using a mobile phone?

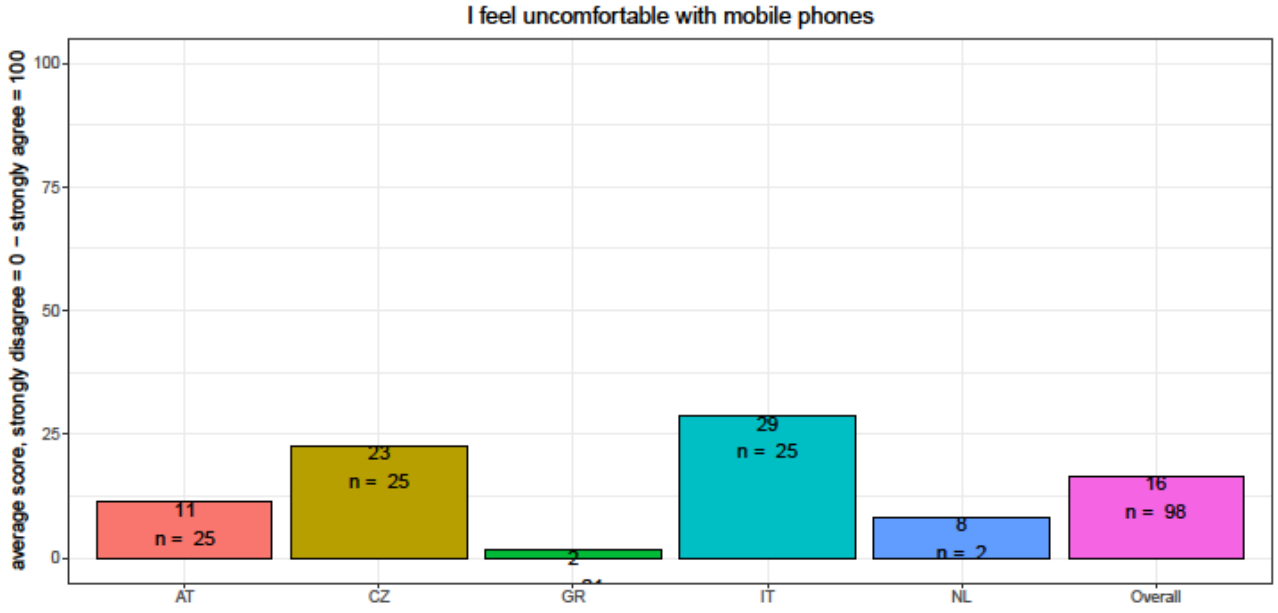


Figure 140: I feel uncomfortable with mobile phones

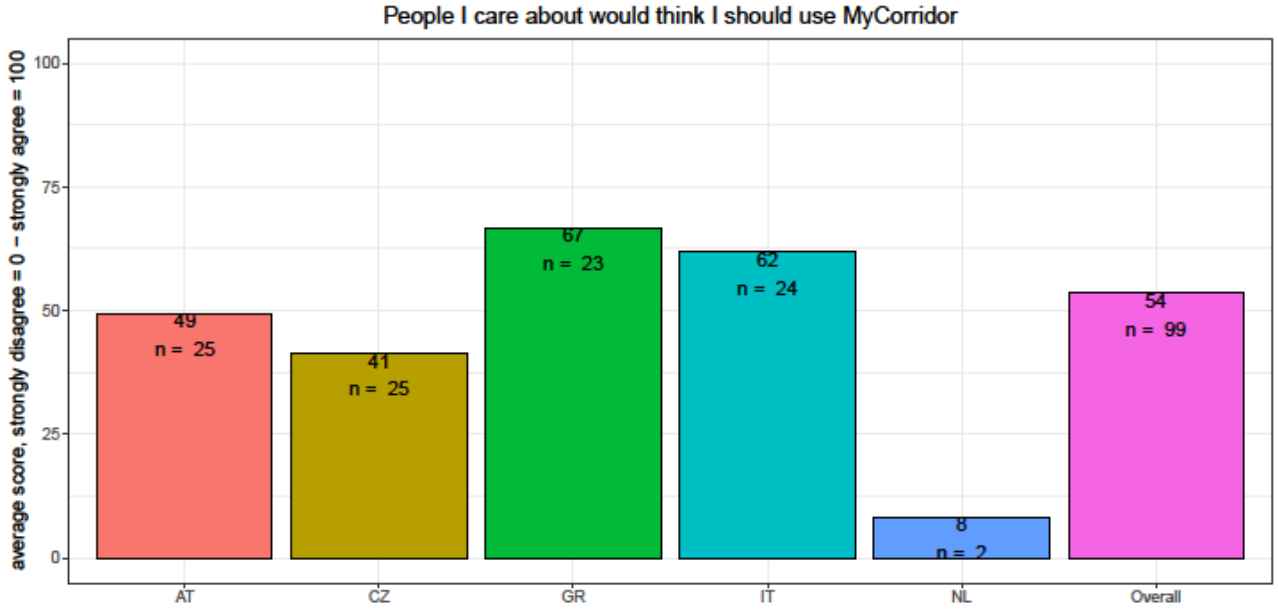


Figure 141: People I care about would think I should use MyCorridor

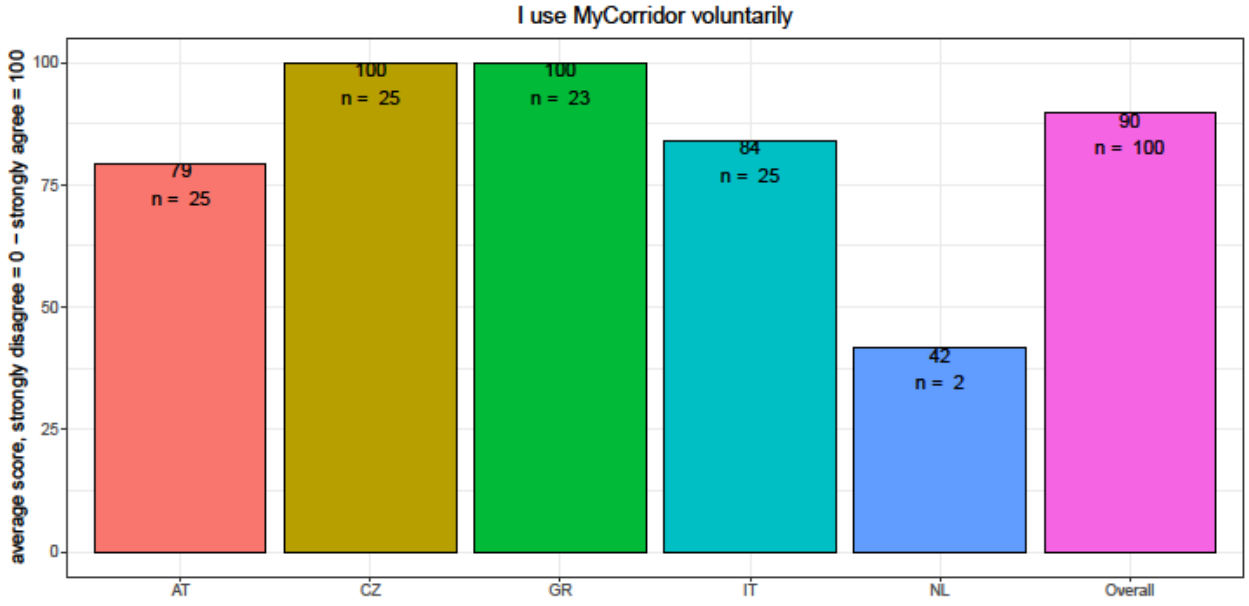


Figure 142: I use MyCorridor voluntarily

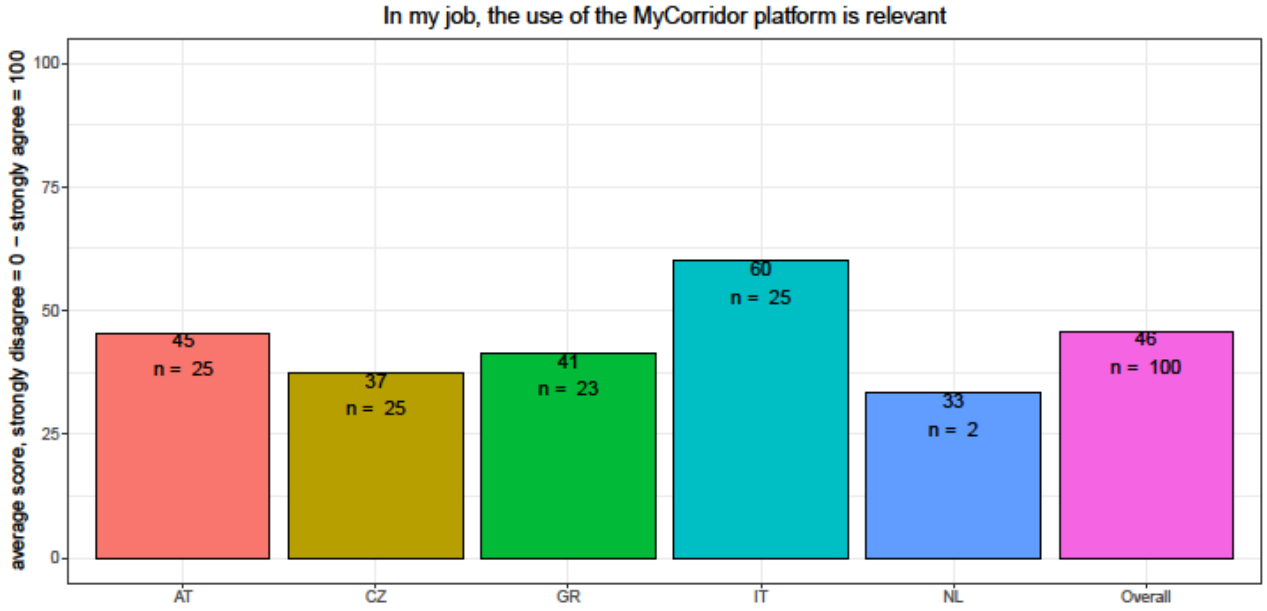


Figure 143: In my job, the use of the MyCorridor platform is relevant

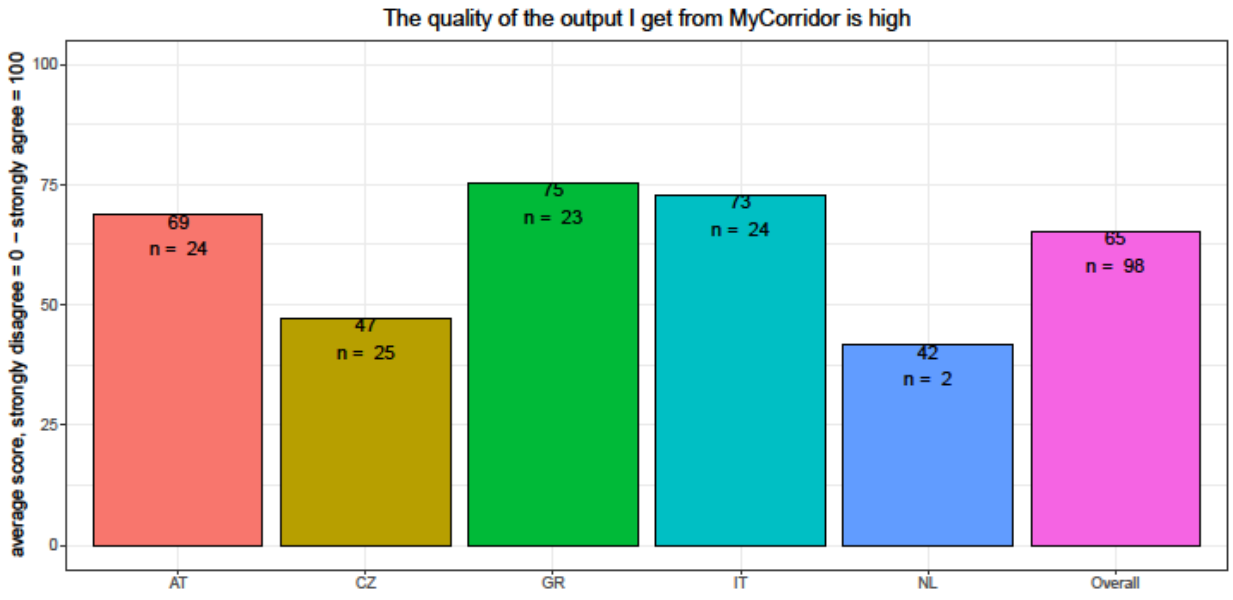


Figure 144: The quality of the output I get from MyCorridor is high

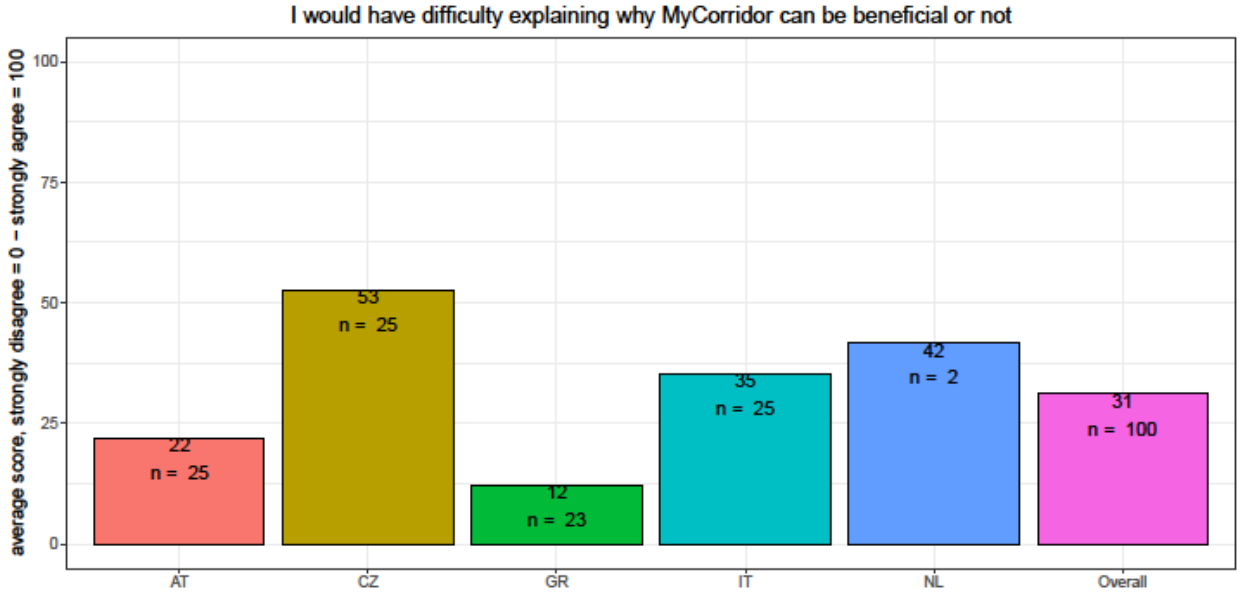


Figure 145: I would have difficulty explaining why MyCorridor can be beneficial or not

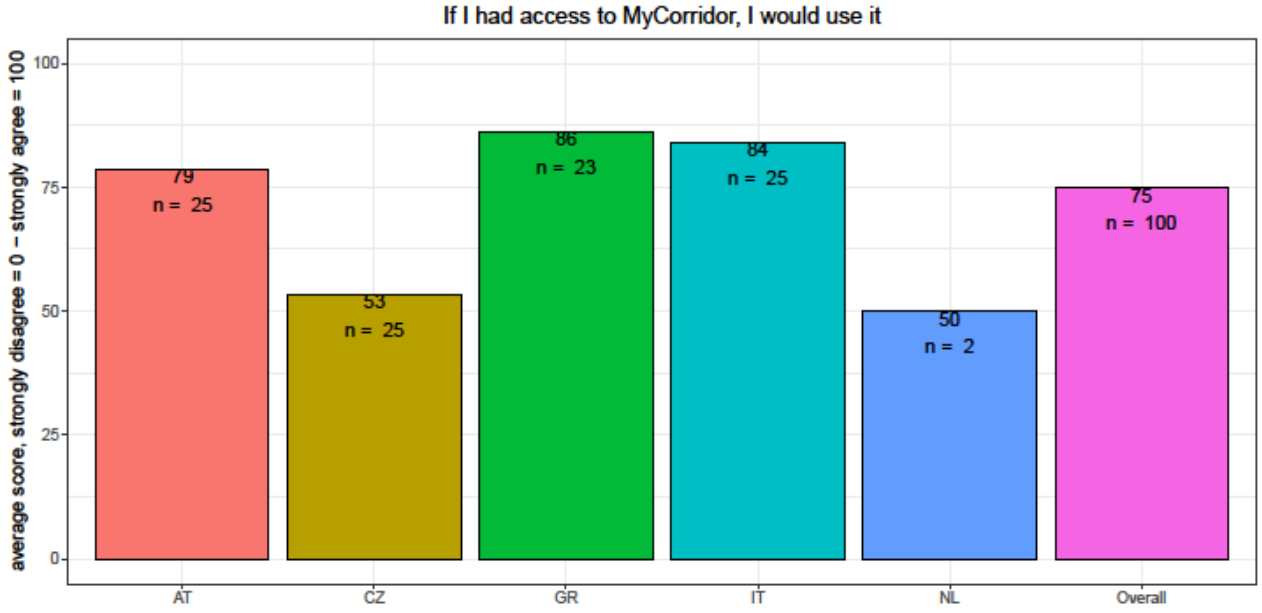


Figure 146: If I had access to MyCorridor, I would use it

1.1.7 Evaluation results from the travellers - Answering the hypotheses

Hypothesis 1

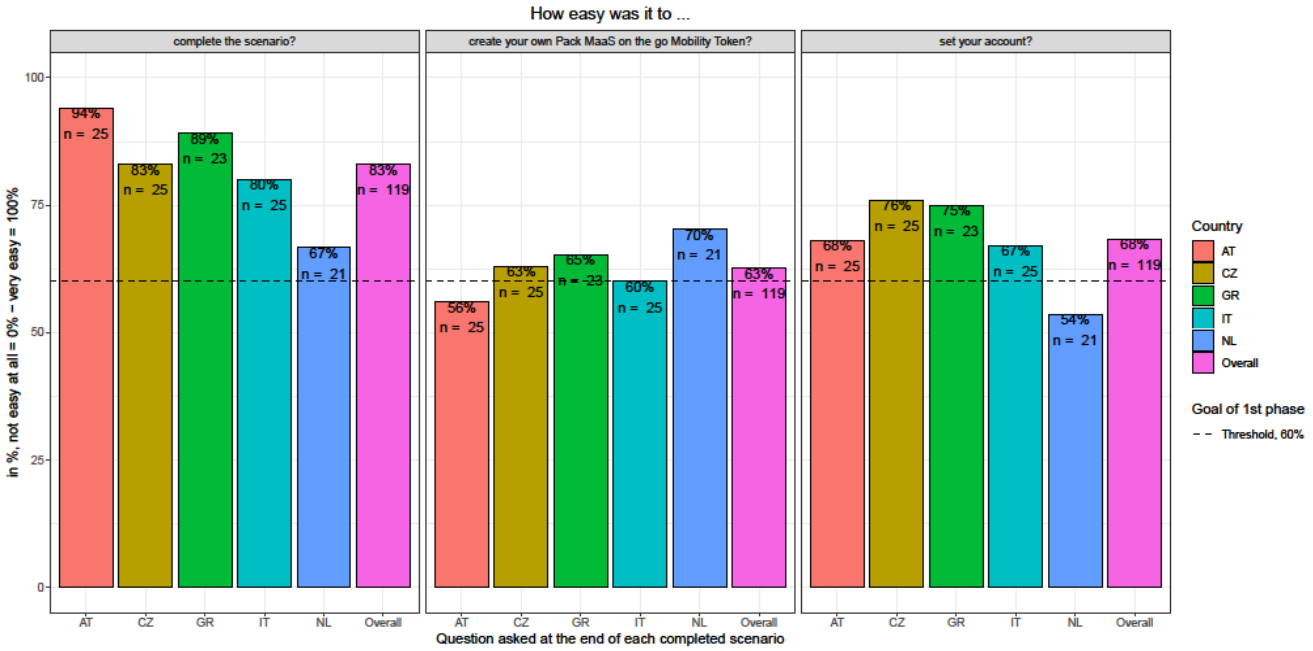


Figure 147: Hypothesis 1 - The MyCorridor platform is easy to use. Ease of use measured at the end of each completed scenario

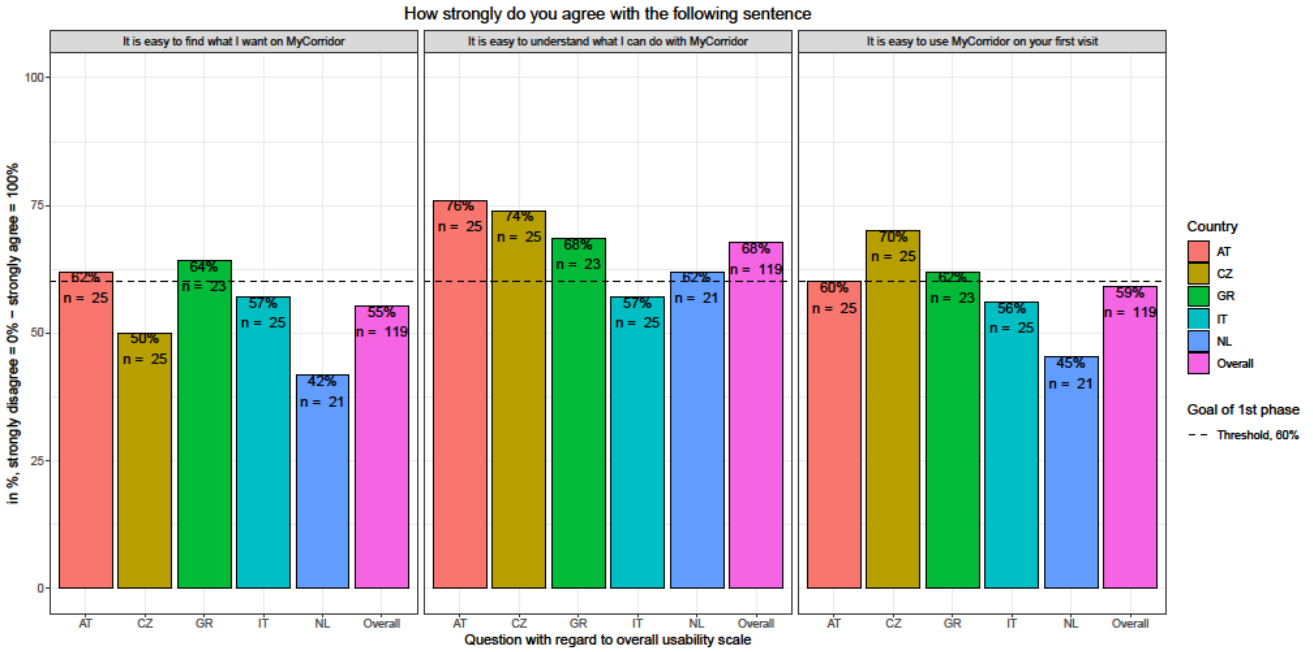


Figure 148: Hypothesis 1 - The MyCorridor platform is easy to use. Overall usability scale I

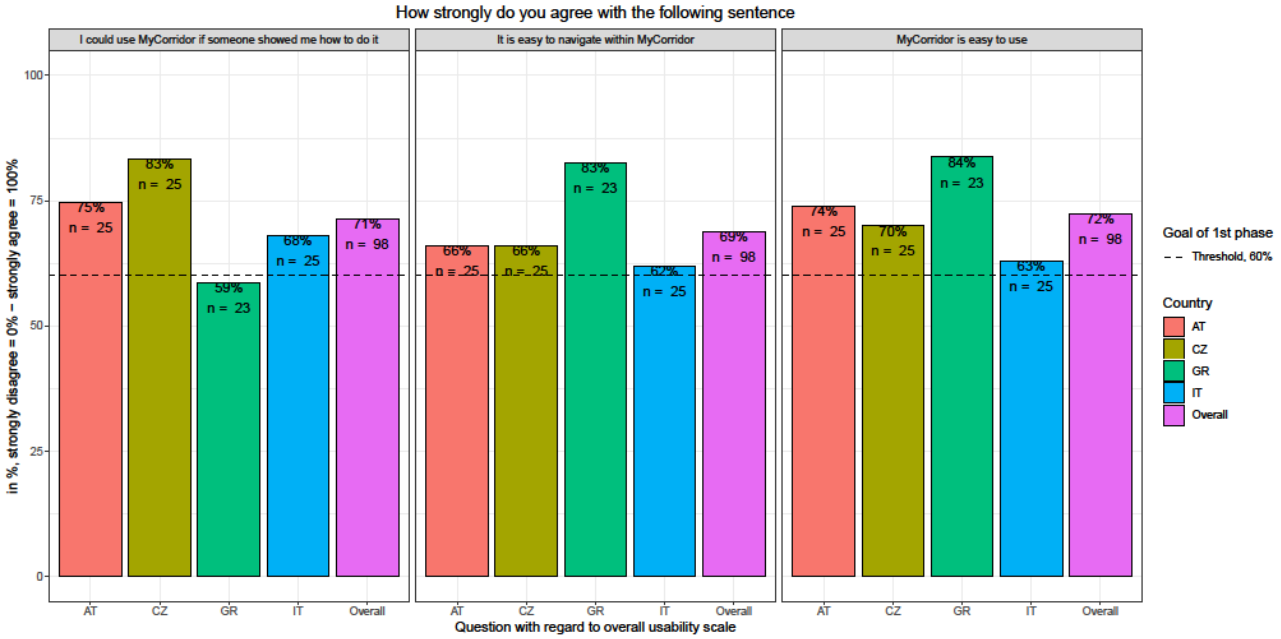


Figure 149: Hypothesis 1 - The MyCorridor platform is easy to use. Overall usability scale II

Hypothesis 2

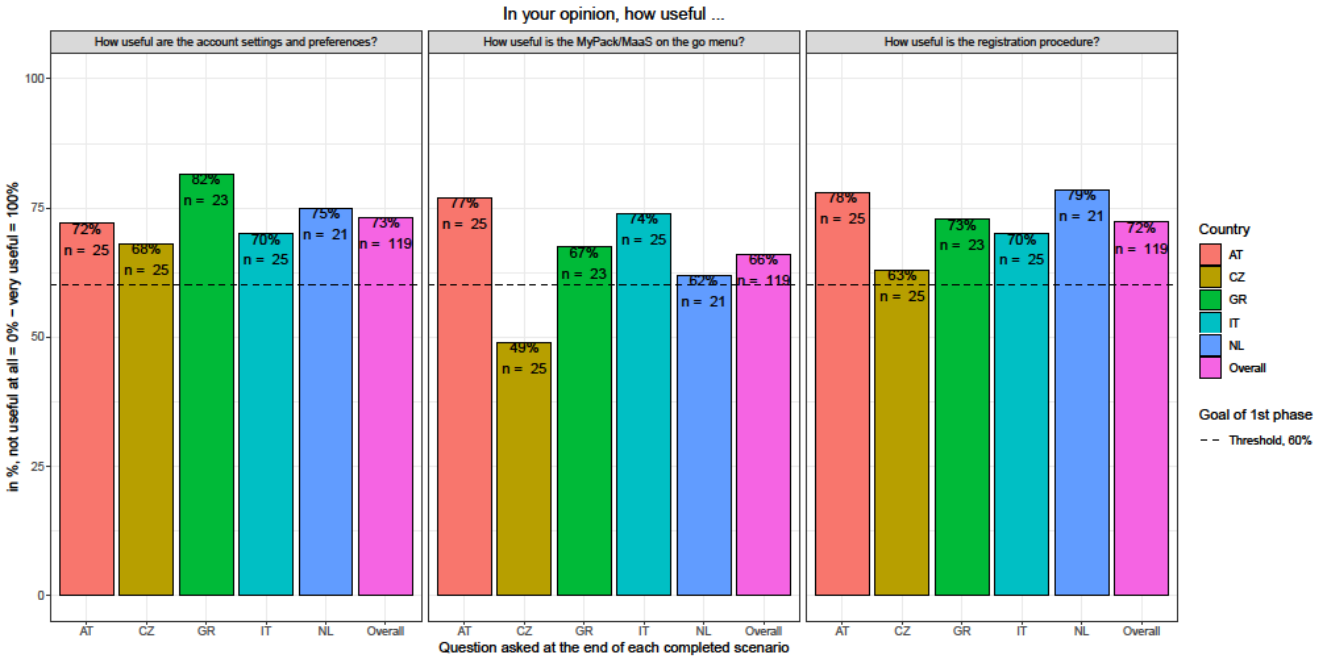


Figure 150: Hypothesis 2 - The MyCorridor platform is useful. Usefulness measured at the end of each completed scenario

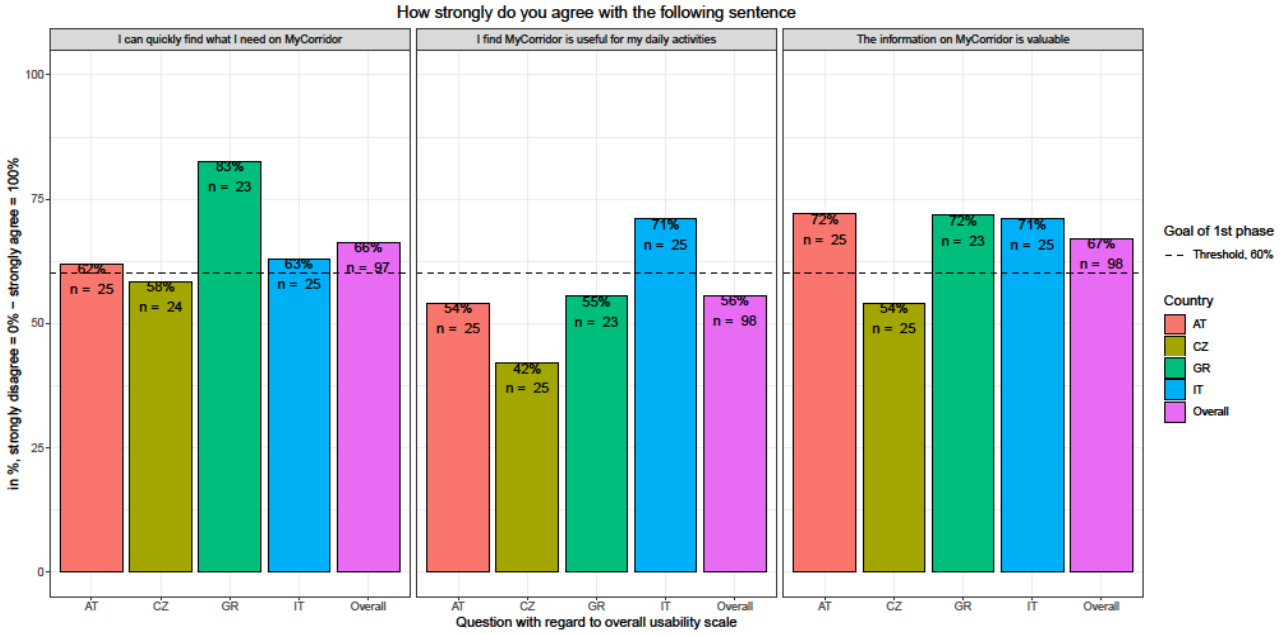


Figure 151: Hypothesis 2 - The MyCorridor platform is useful. Overall usability scale I

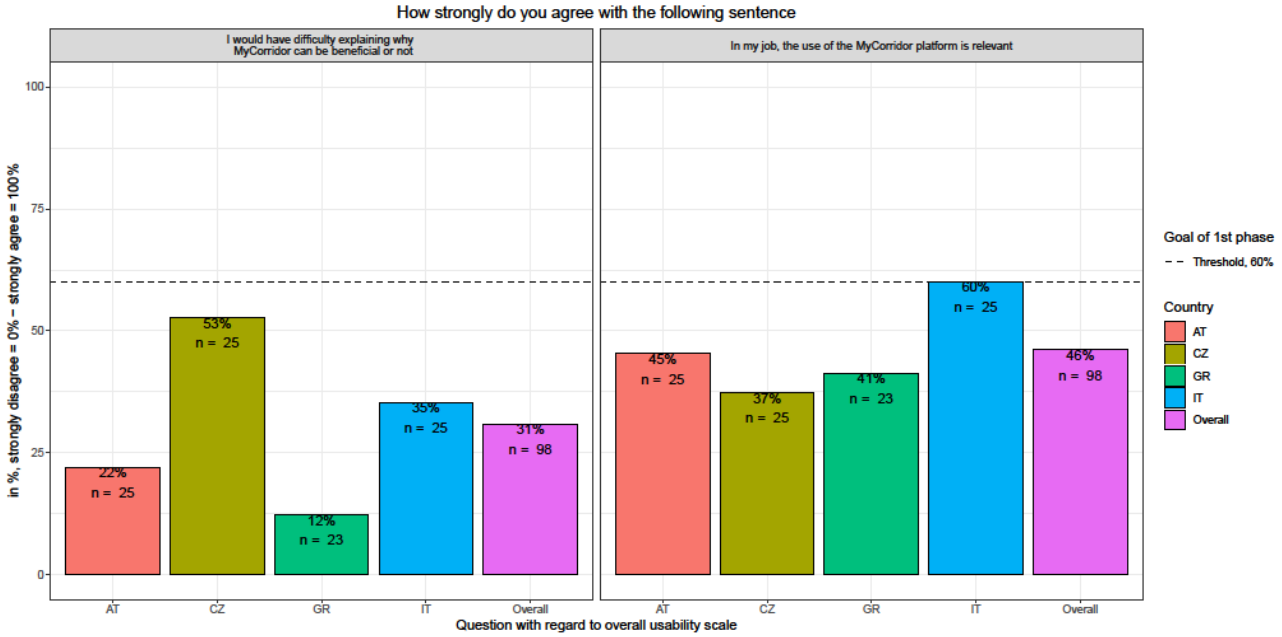


Figure 152: Hypothesis 2 - The MyCorridor platform is useful. Overall usability scale II

Hypothesis 3

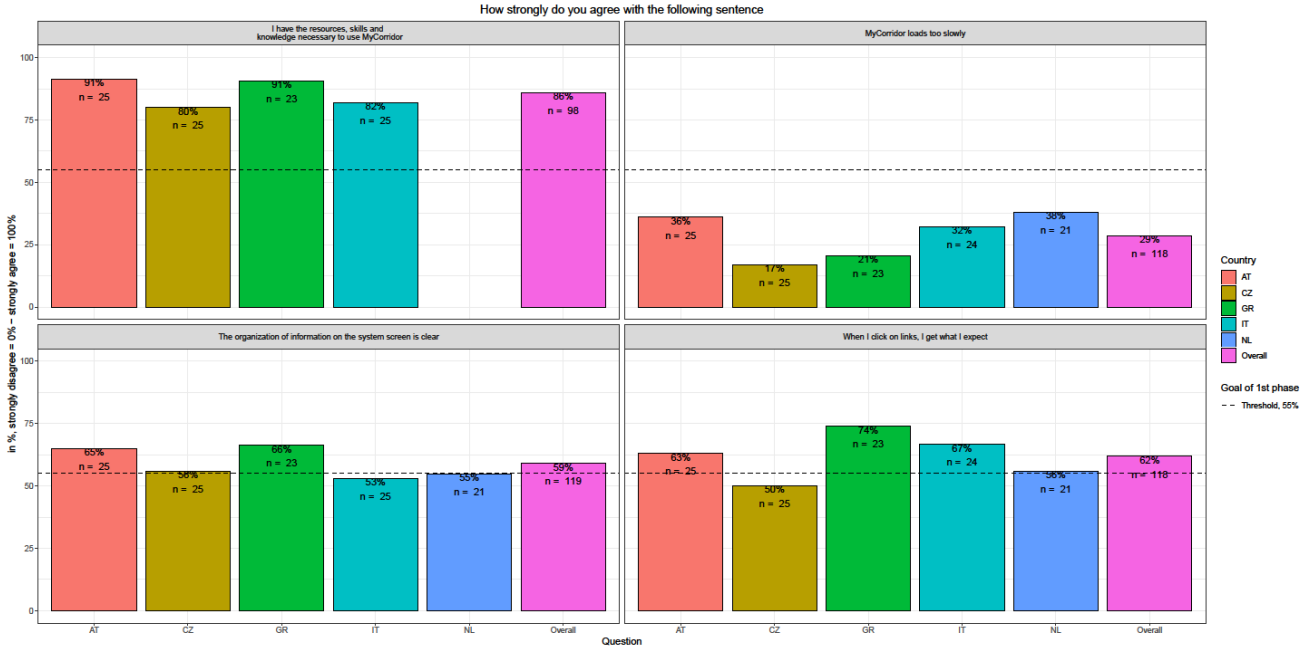


Figure 153: Hypothesis 3 - The MyCorridor platform is usable.

Hypothesis 4

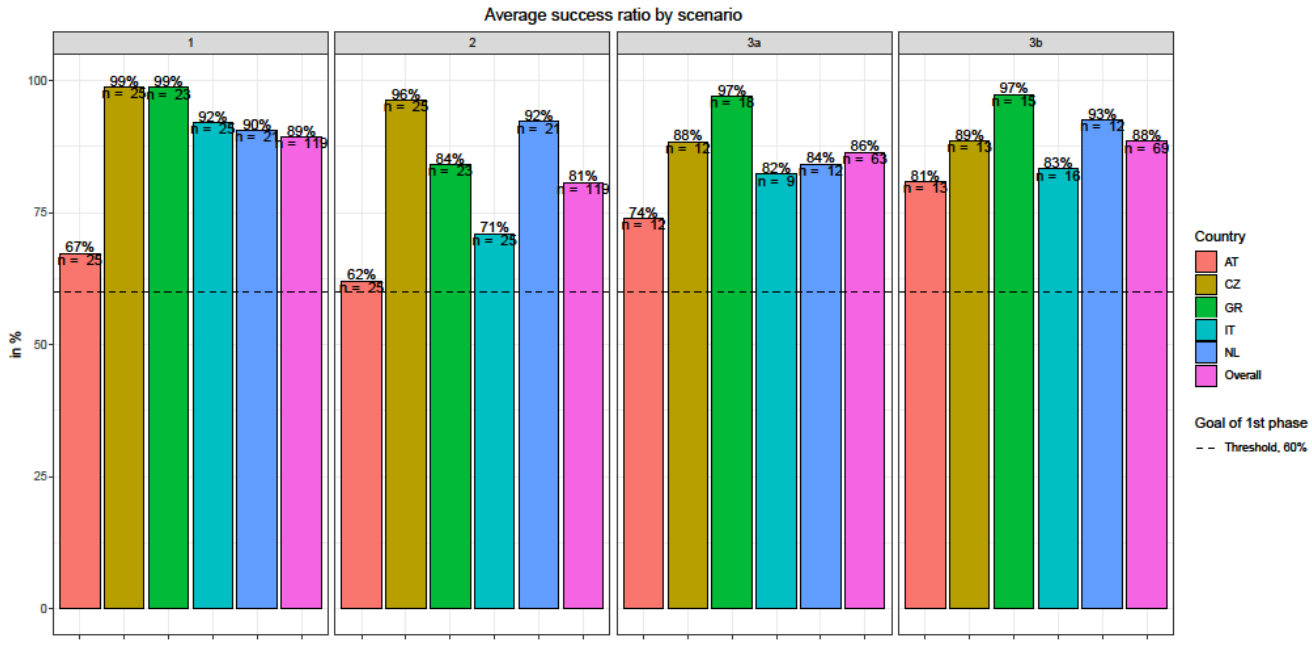


Figure 154: Hypothesis 4 - The travellers are successful in completing the scenarios. Success ratio in scenario completion

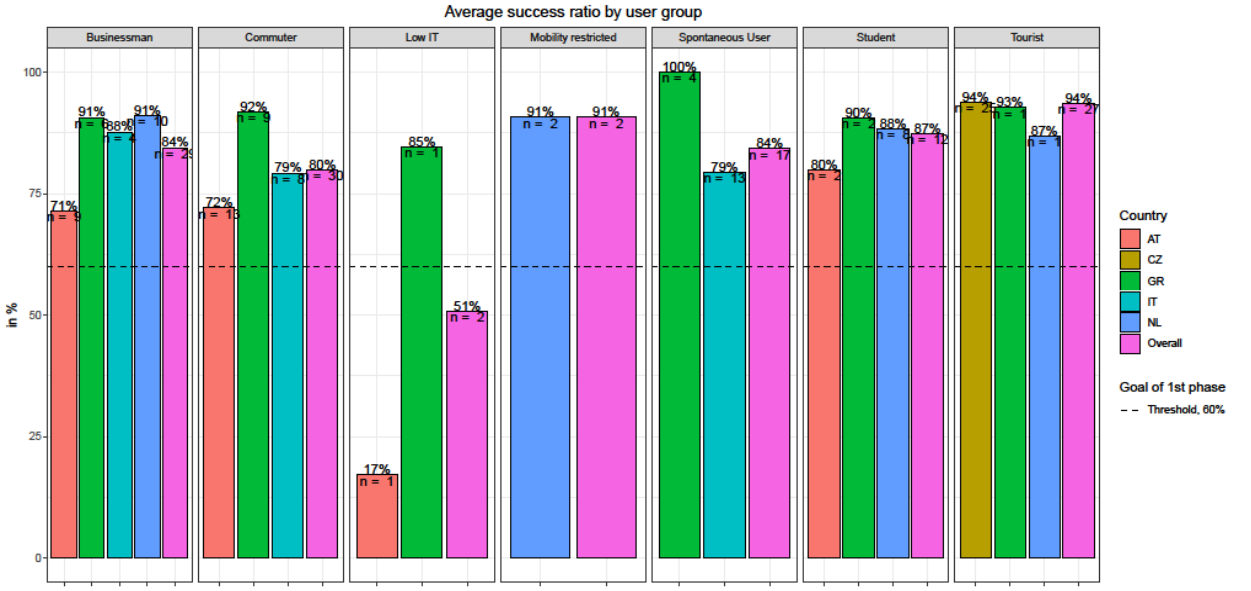


Figure 155: Hypothesis 4 - The travellers are successful in completing the scenarios. Success ratio in scenario completion. Per user Group

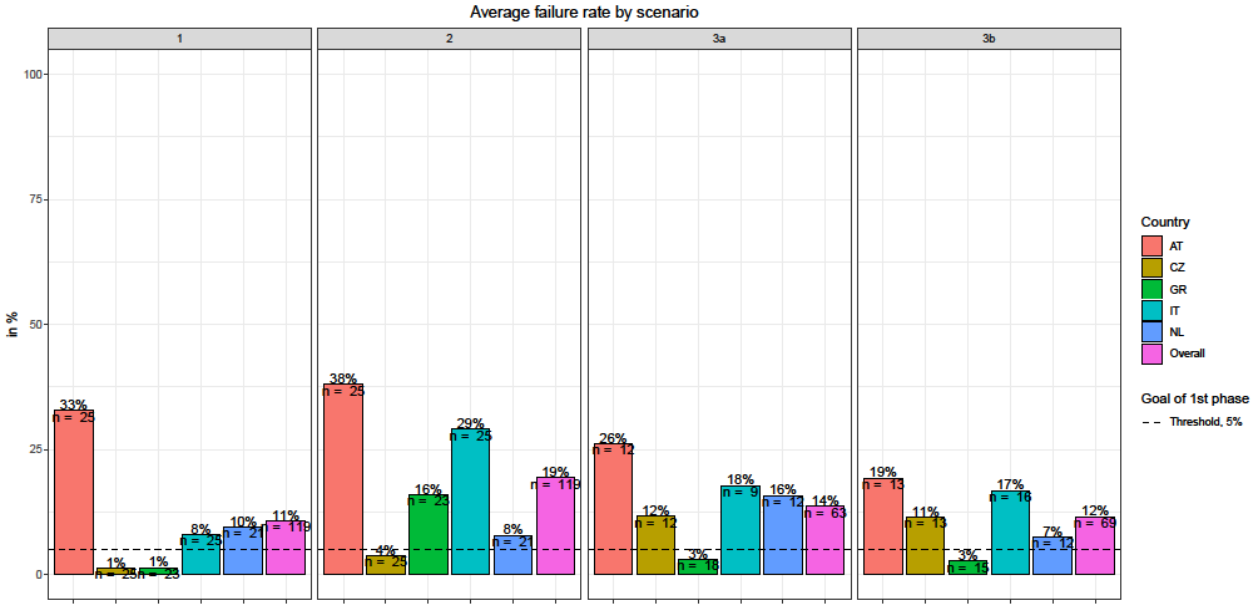


Figure 156: Hypothesis 4 - The travellers are successful in completing the scenarios. Failure ratio in scenario completion

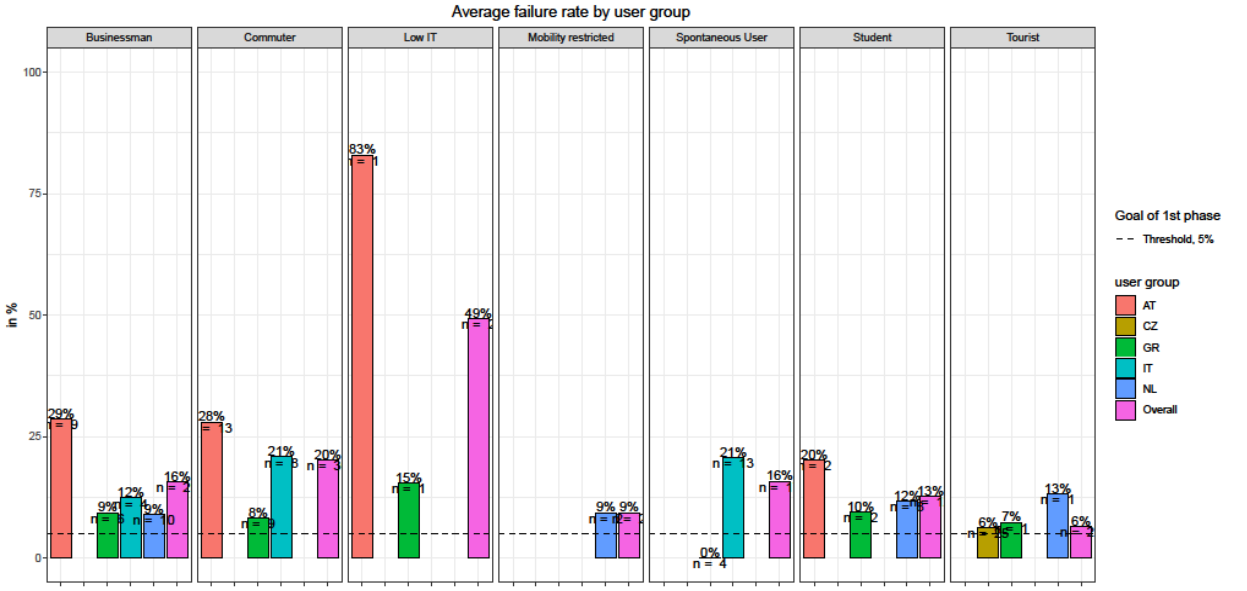


Figure 157: Hypothesis 4 - The travellers are successful in completing the scenarios. Failure ratio in scenario completion. Per user group

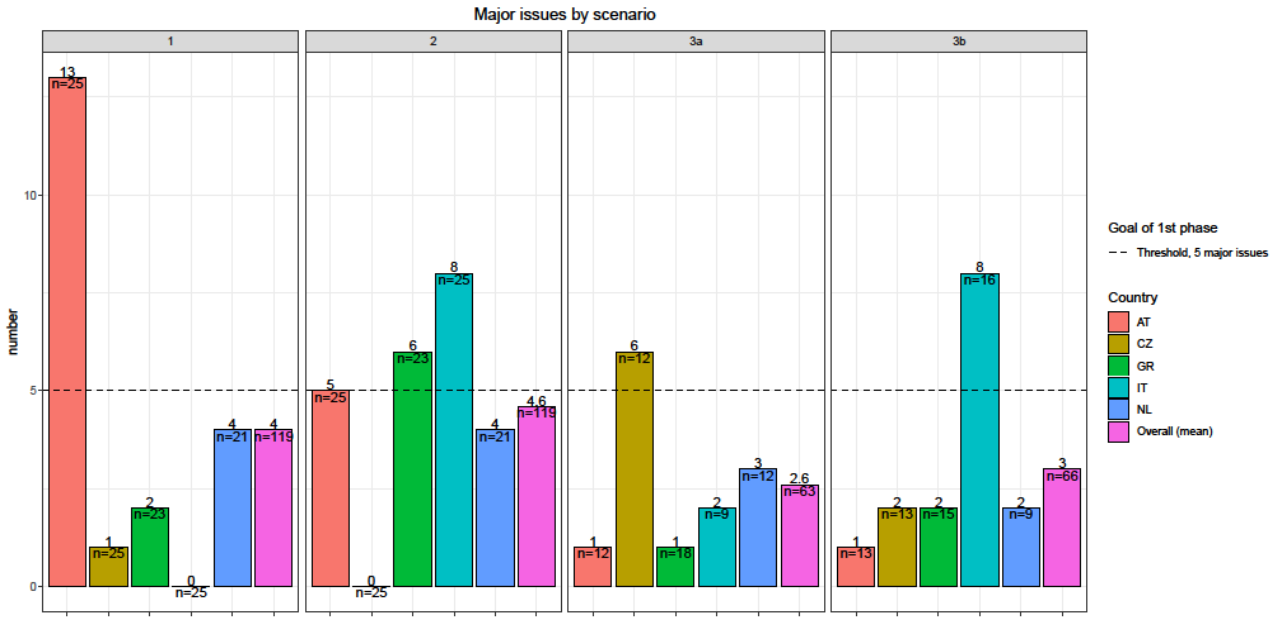


Figure 158: Hypothesis 4 - The travellers are successful in completing the scenarios. Major issues

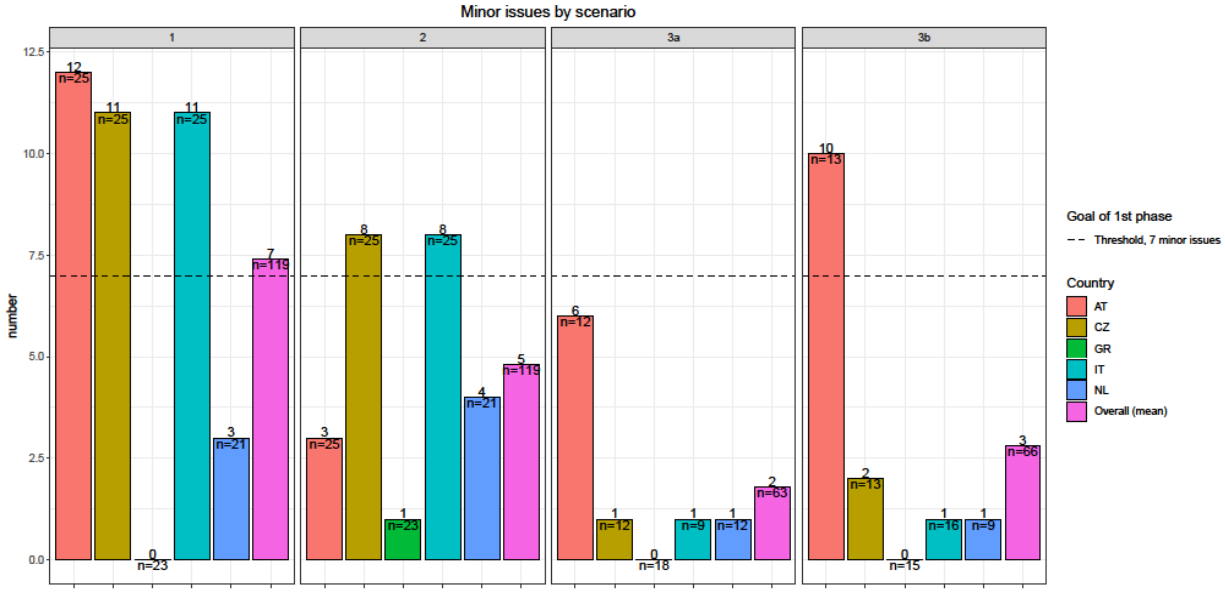


Figure 159: Hypothesis 4 - The travellers are successful in completing the scenarios. Minor issues

Hypothesis 5

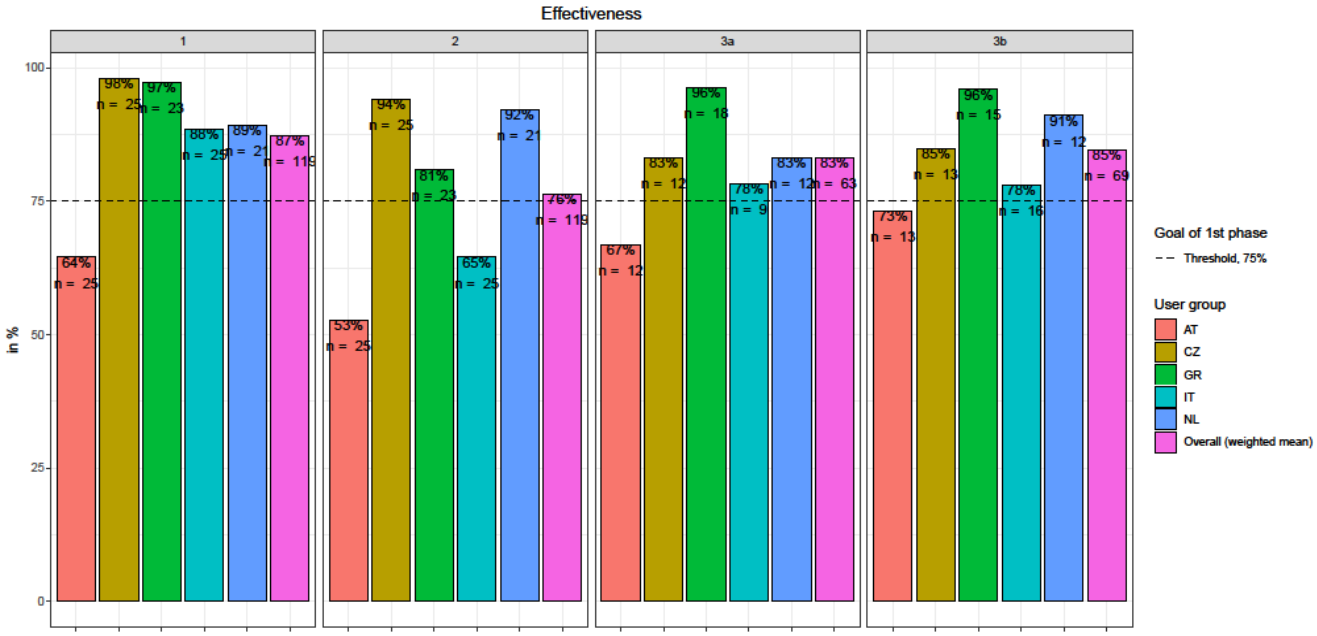


Figure 160: Hypothesis 5 - Personalisation of offered services is effective

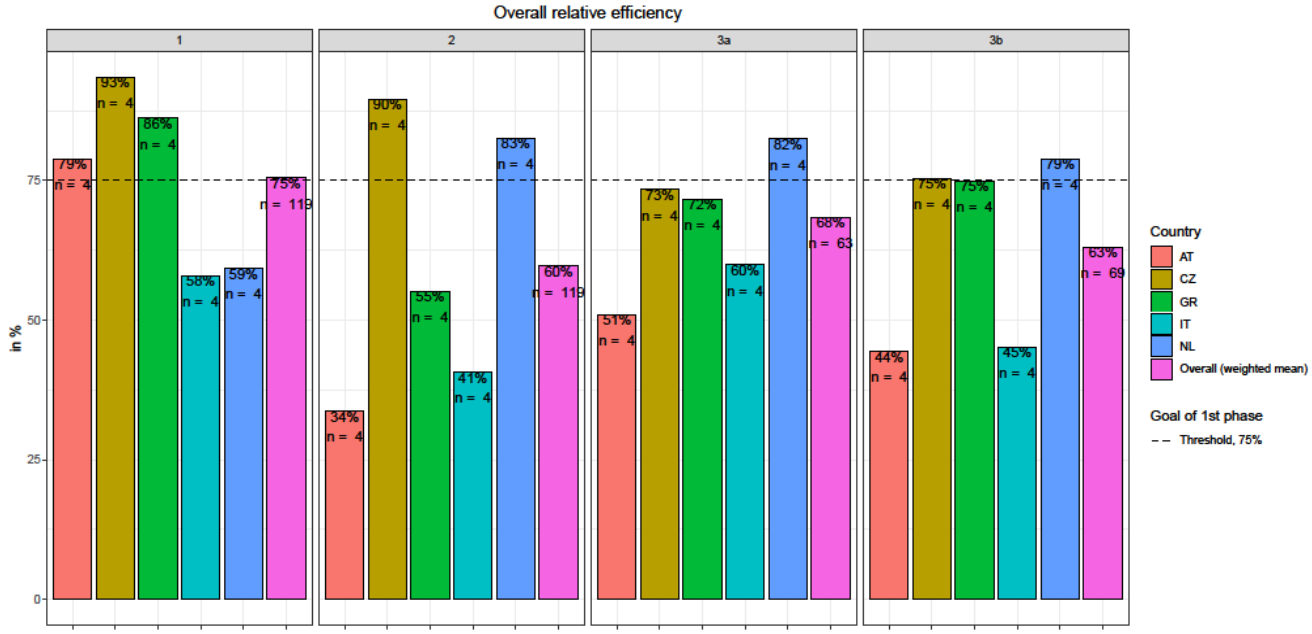


Figure 161: Hypothesis 5 - Personalisation of offered services is efficient

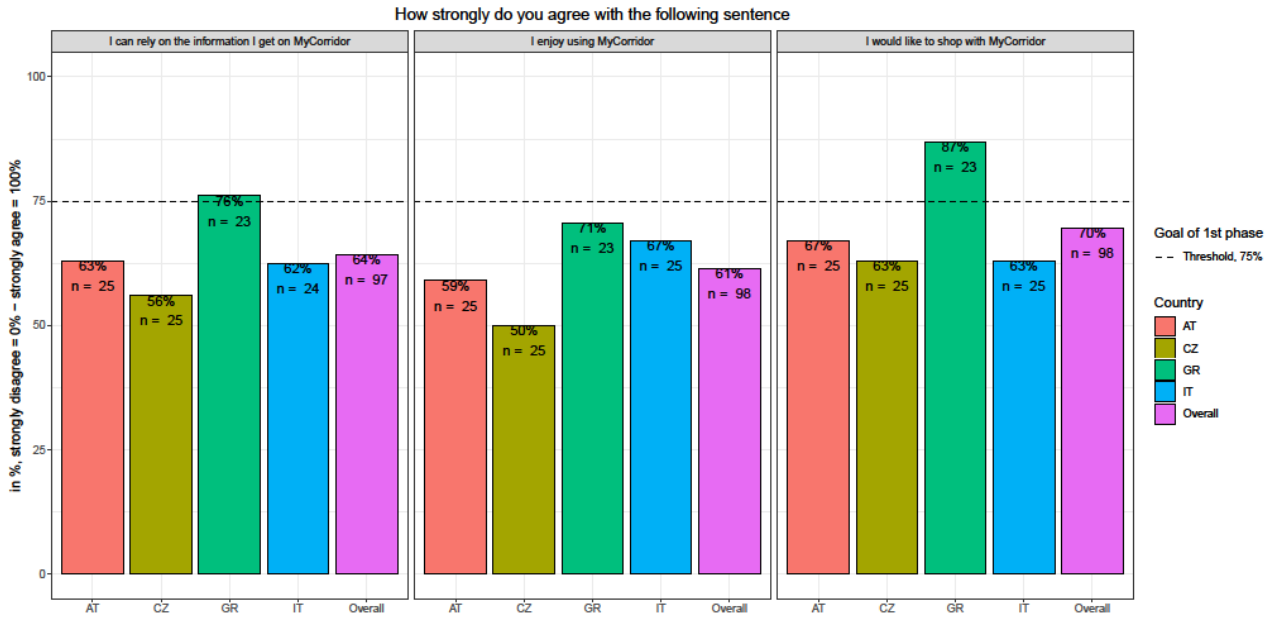


Figure 162: Hypothesis 5 - Personalisation of offered services is effective. Highly tailored to their needs I

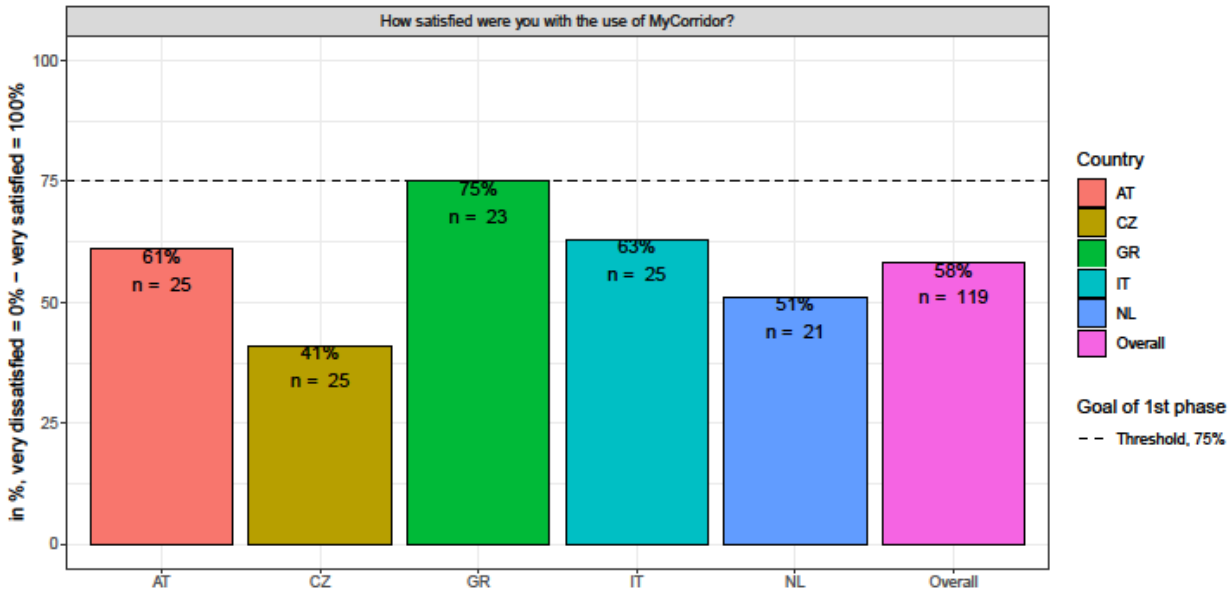


Figure 163: Hypothesis 5 - Personalisation of offered services is effective. Highly tailored to their needs II

Hypothesis 6

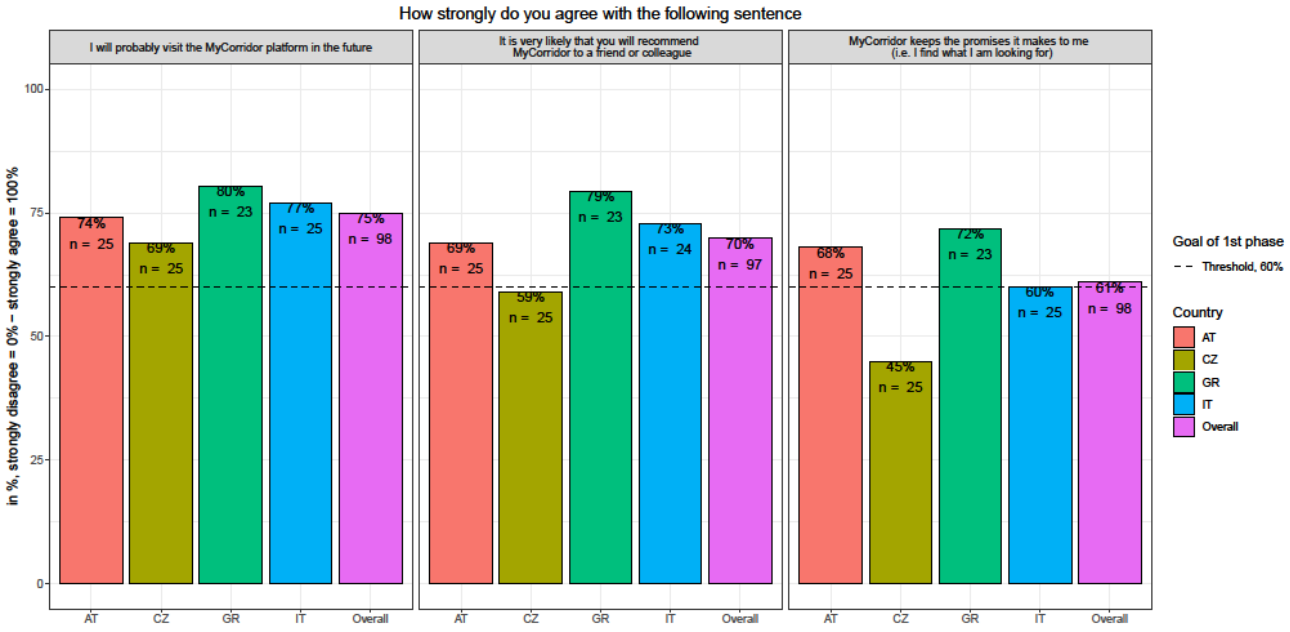


Figure 164: Hypothesis 6 - Travellers are positive towards MaaS technologies. Acceptance I

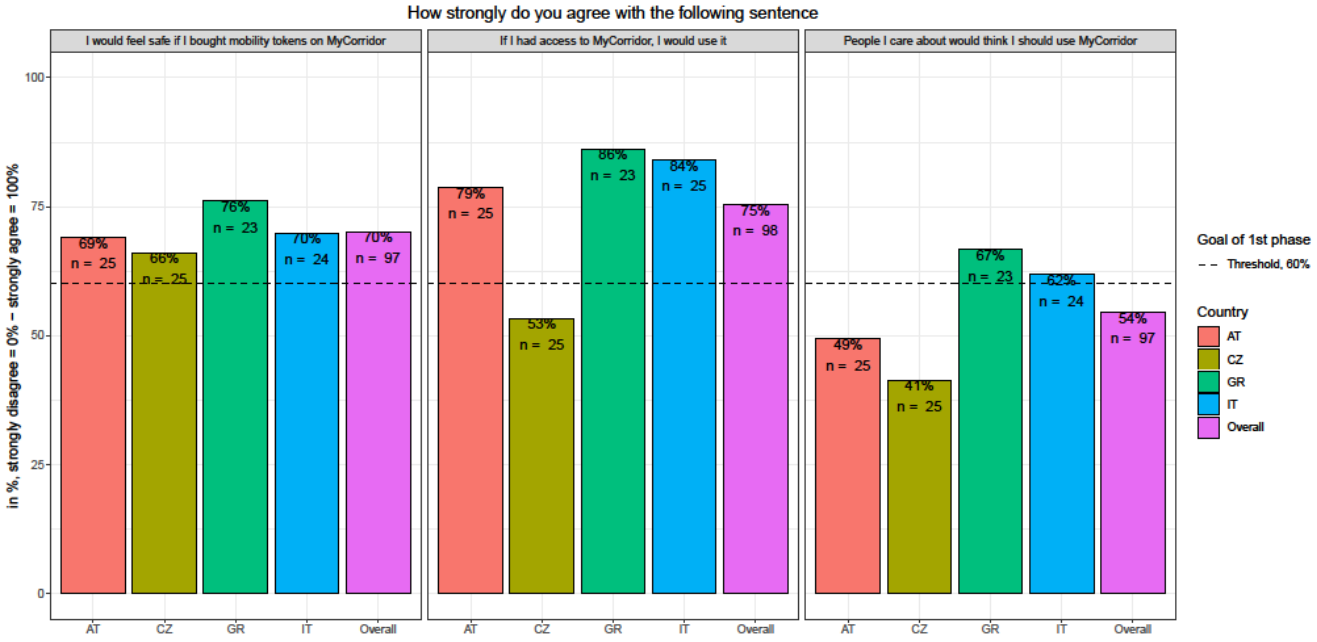


Figure 165: Hypothesis 6 - Travellers are positive towards MaaS technologies. Acceptance II

1.1.8 Evaluation results from the service providers - Answering the hypotheses

Hypothesis 1

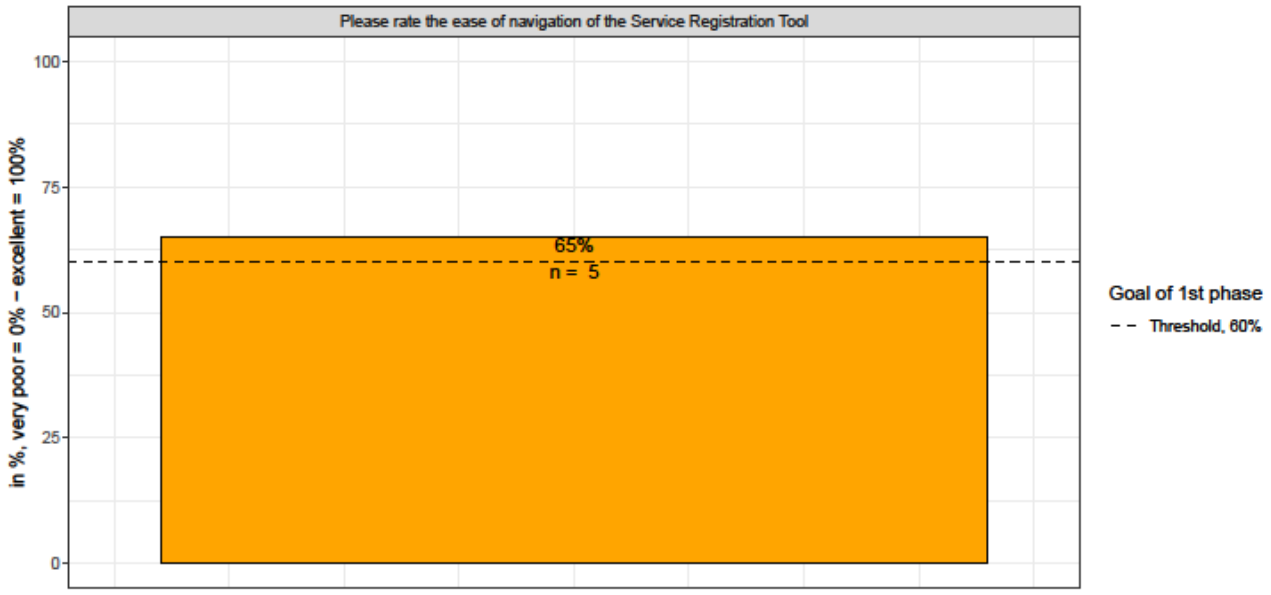


Figure 166: Service Providers 1. Pilot - Hypothesis 1: The Service Registration Tool is easy to use I

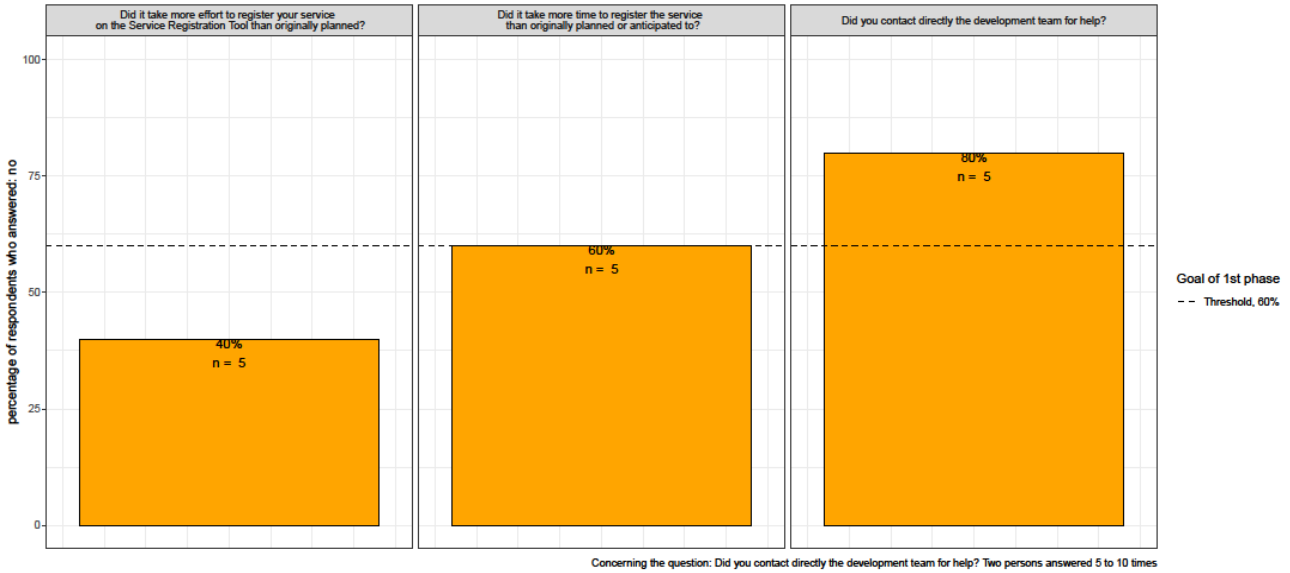


Figure 167: Service Providers 1. Pilot - Hypothesis 1: The Service Registration Tool is easy to use II

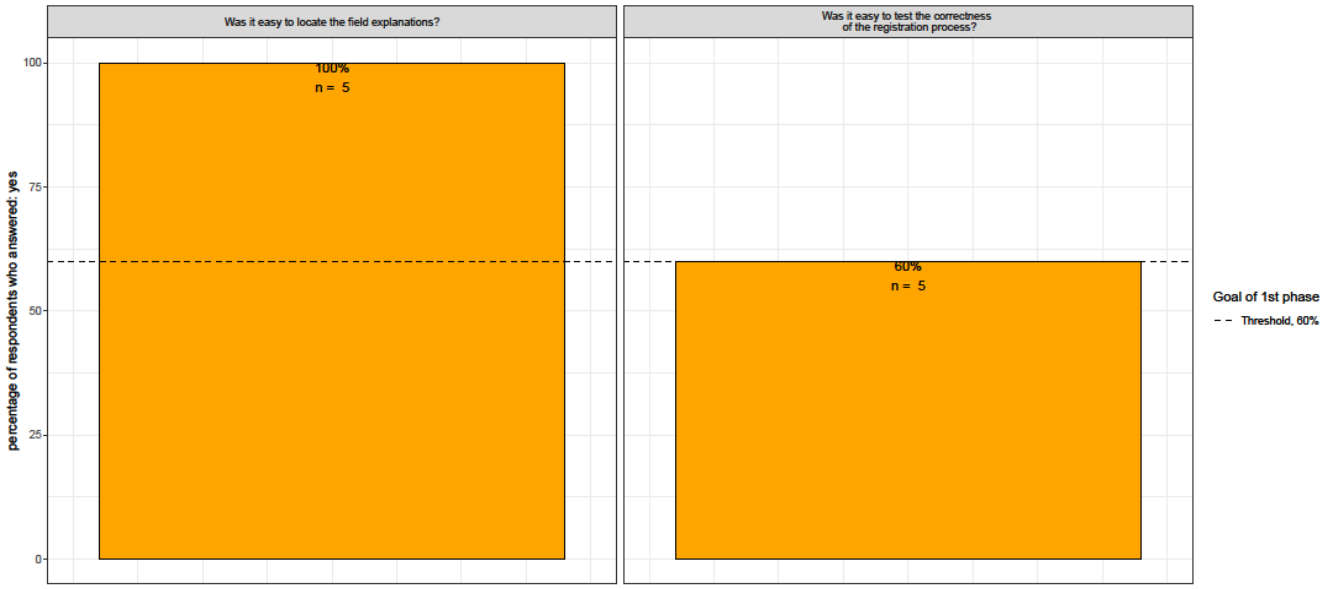


Figure 168: Service Providers 1. Pilot - Hypothesis 1: The Service Registration Tool is easy to use III

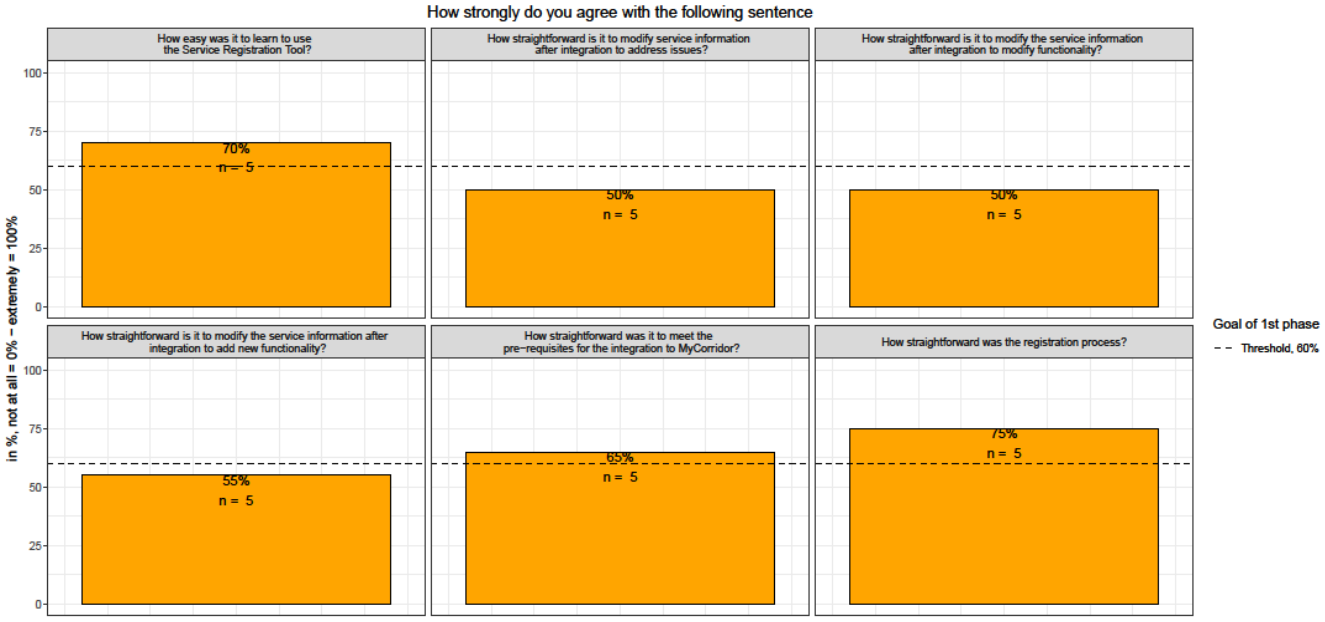


Figure 169: Service Providers 1. Pilot - Hypothesis 1: The Service Registration Tool is easy to use IV

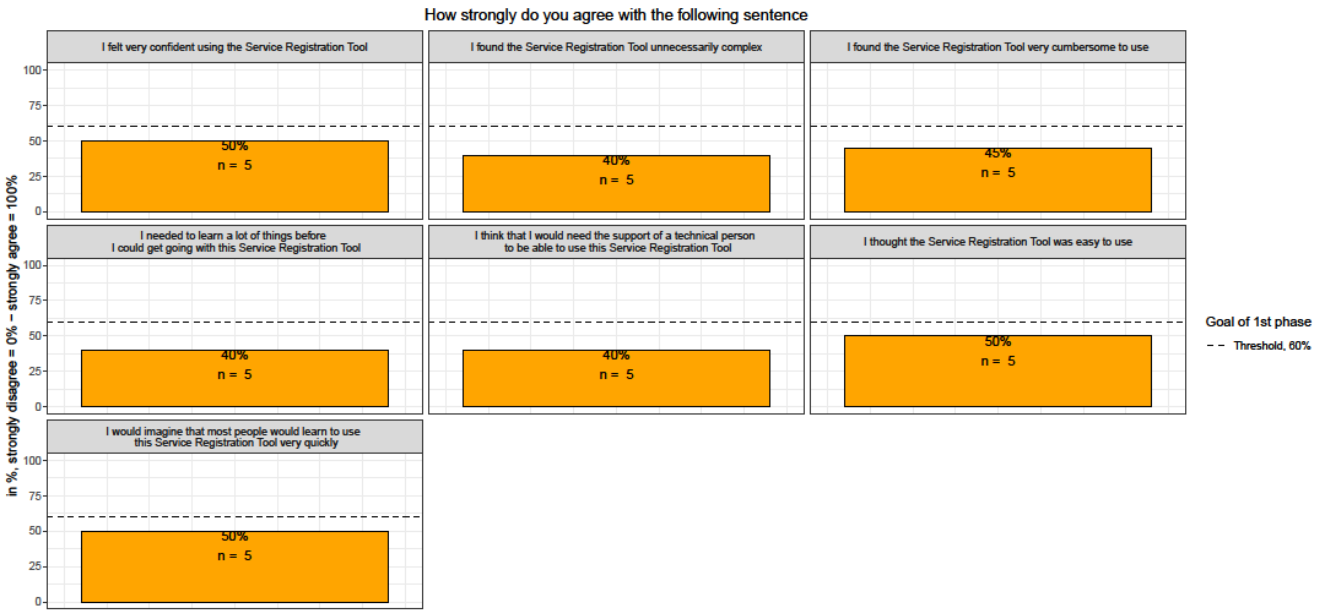


Figure 170: Service Providers 1. Pilot - Hypothesis 1: The Service Registration Tool is easy to use V

Hypothesis 2

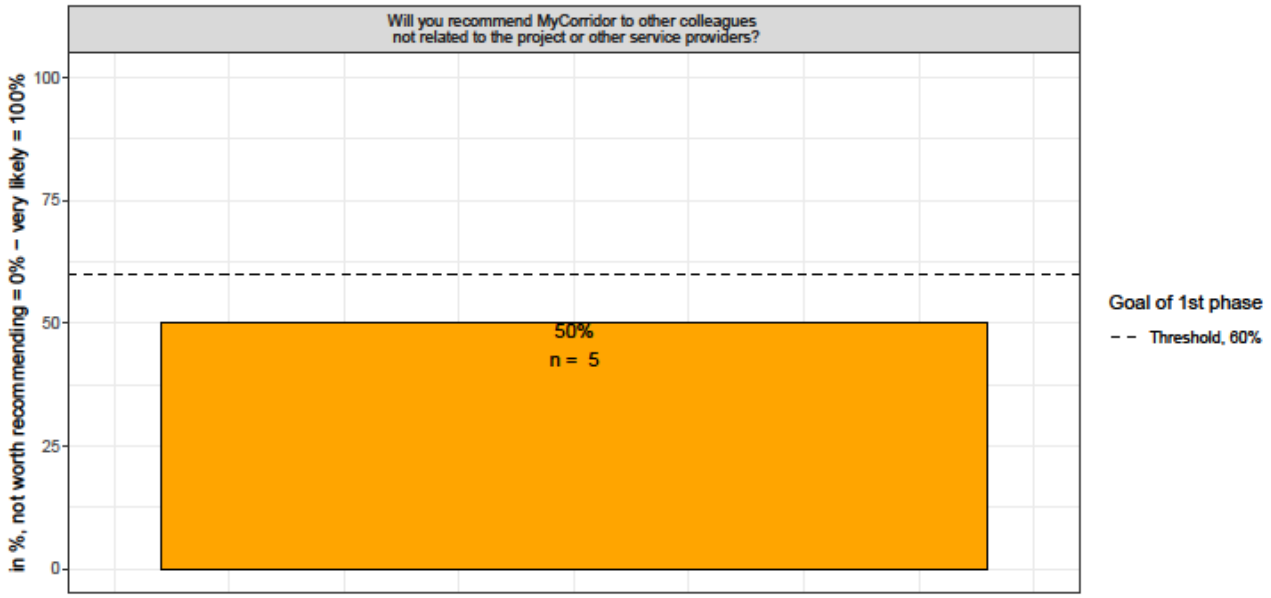


Figure 171: Service Providers 1. Pilot - Hypothesis 2: The Service Registration Tool is useful I

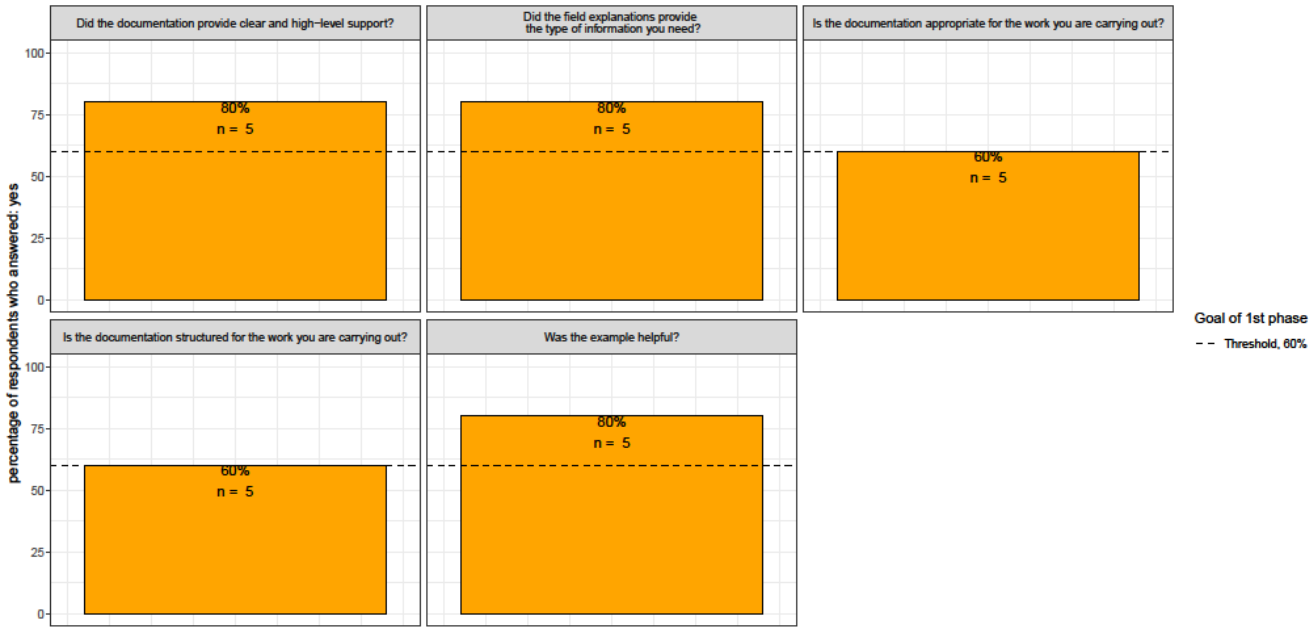


Figure 172: Service Providers 1. Pilot - Hypothesis 2: The Service Registration Tool is useful II

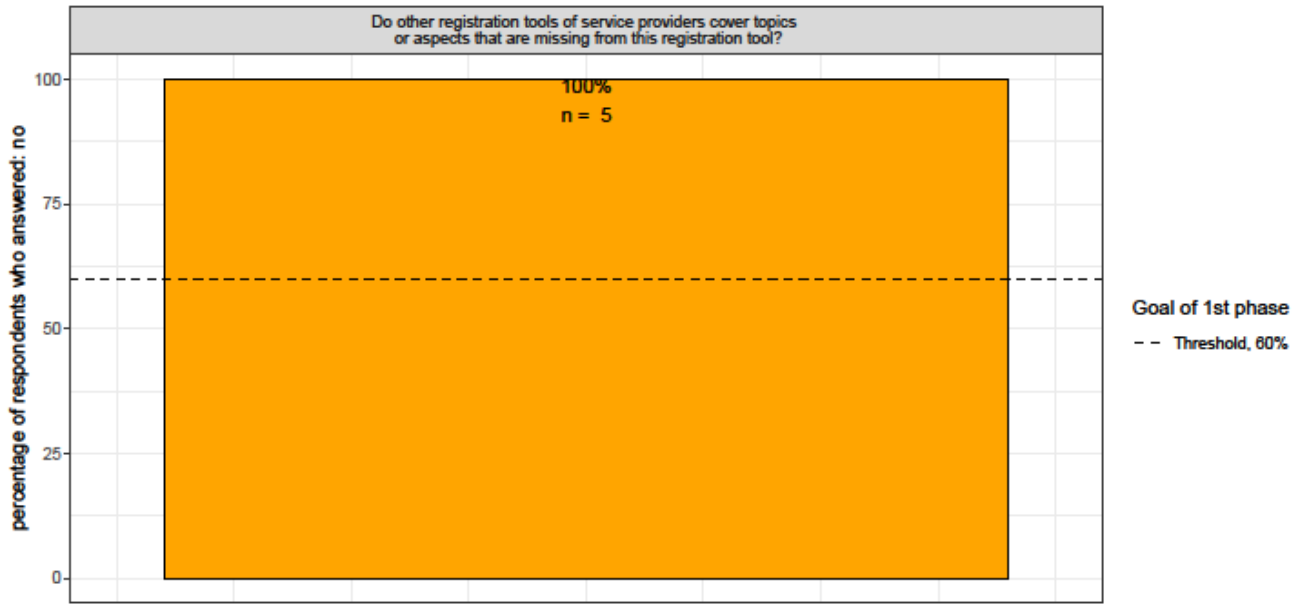


Figure 173: Service Providers 1. Pilot - Hypothesis 2: The Service Registration Tool is useful III

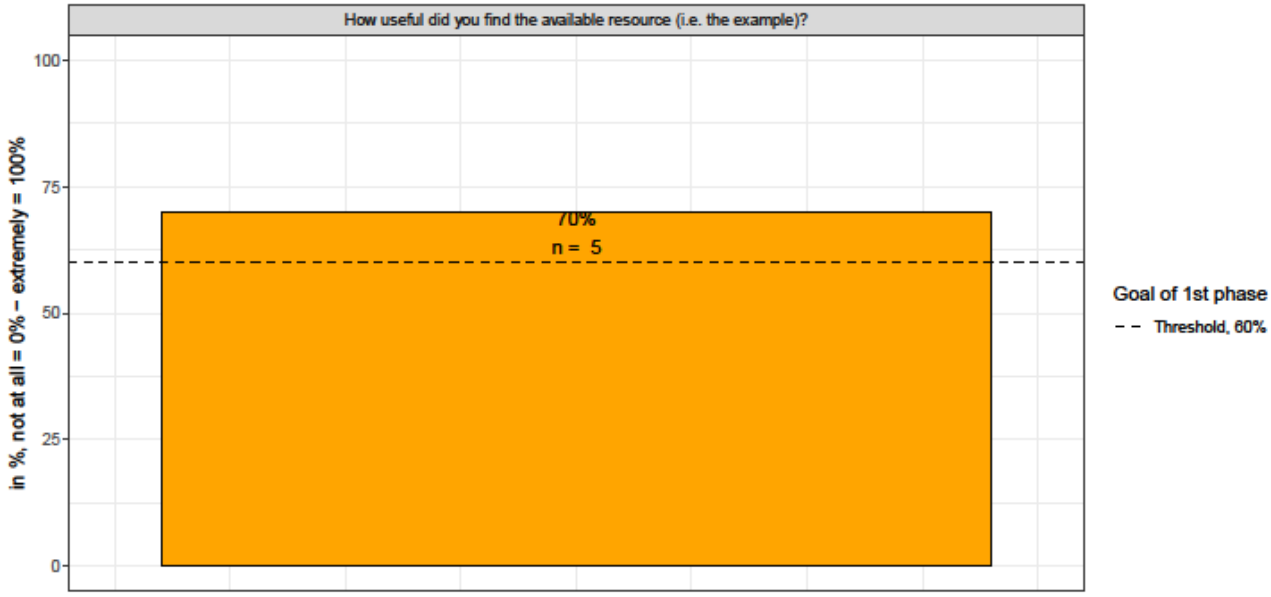


Figure 174: Service Providers 1. Pilot - Hypothesis 2: The Service Registration Tool is useful IV

Hypothesis 3

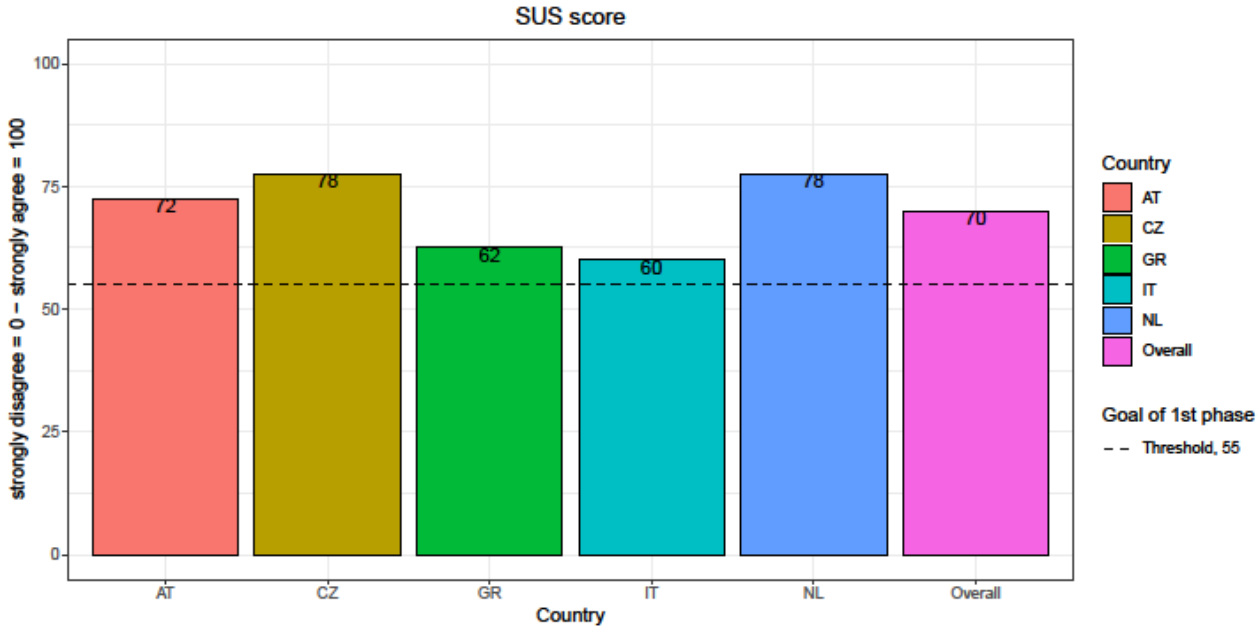


Figure 175: Service Providers 1. Pilot - Hypothesis 3: The Service Registration Tool is usable

Hypotheses 4

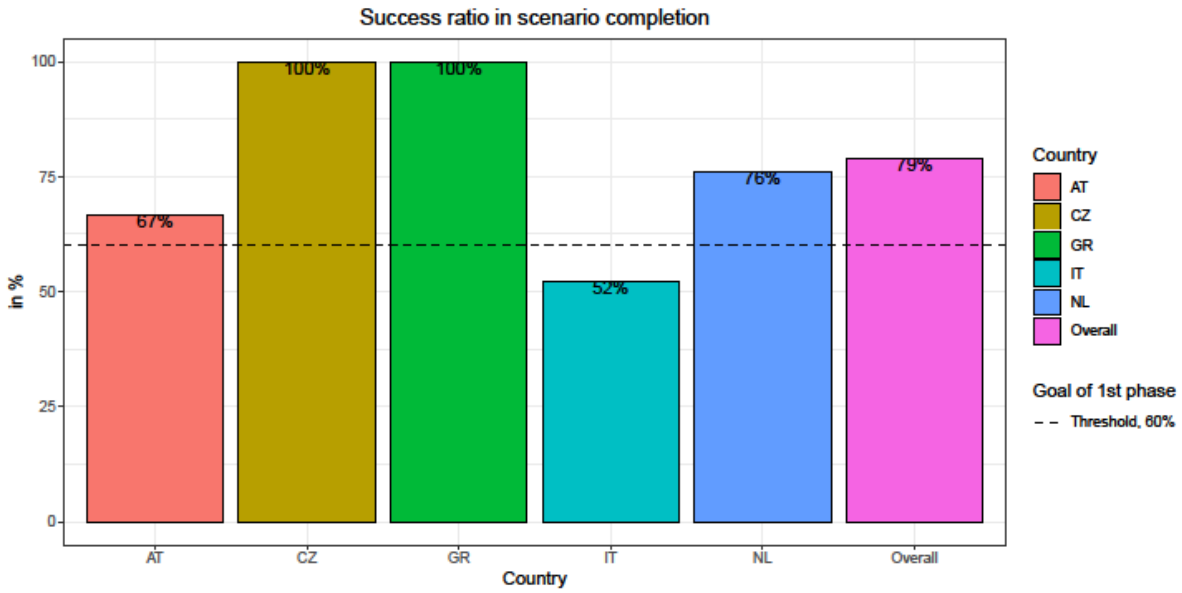


Figure 176: Service Providers 1. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Success ratio in scenario completion.

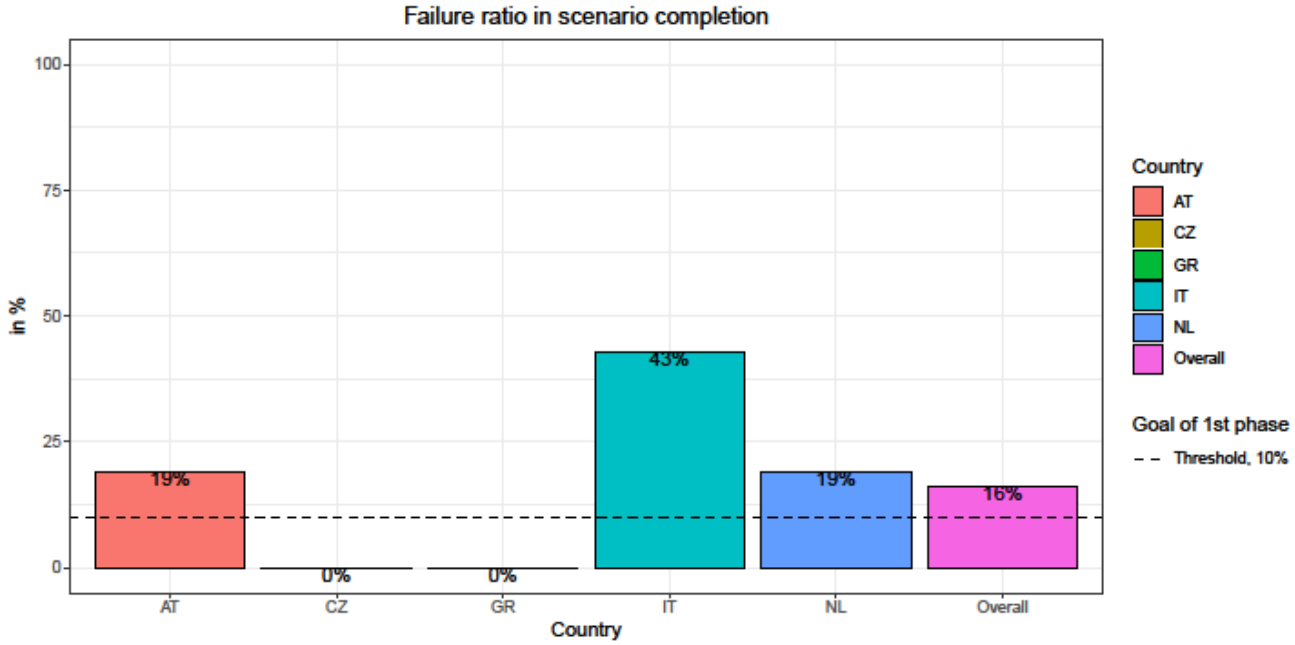


Figure 177: Service Providers 1. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Failure ratio in scenario completion.

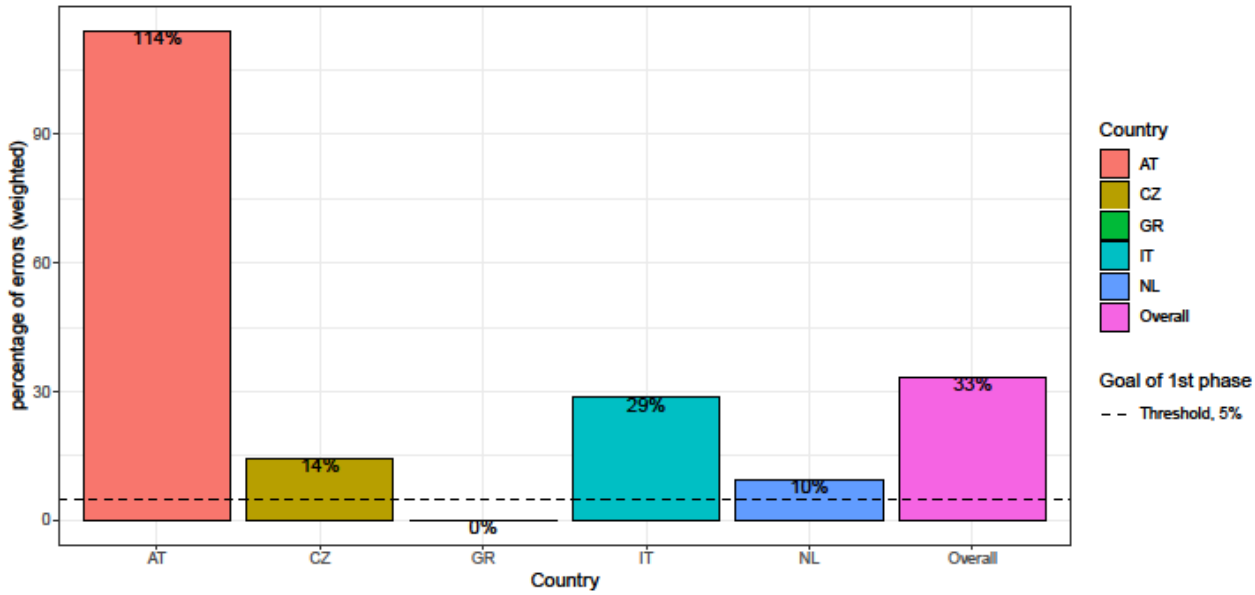


Figure 178: Service Providers 1. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Error percentage. Errors are weighted by severity (High = 3, Moderate = 2, Low = 1)

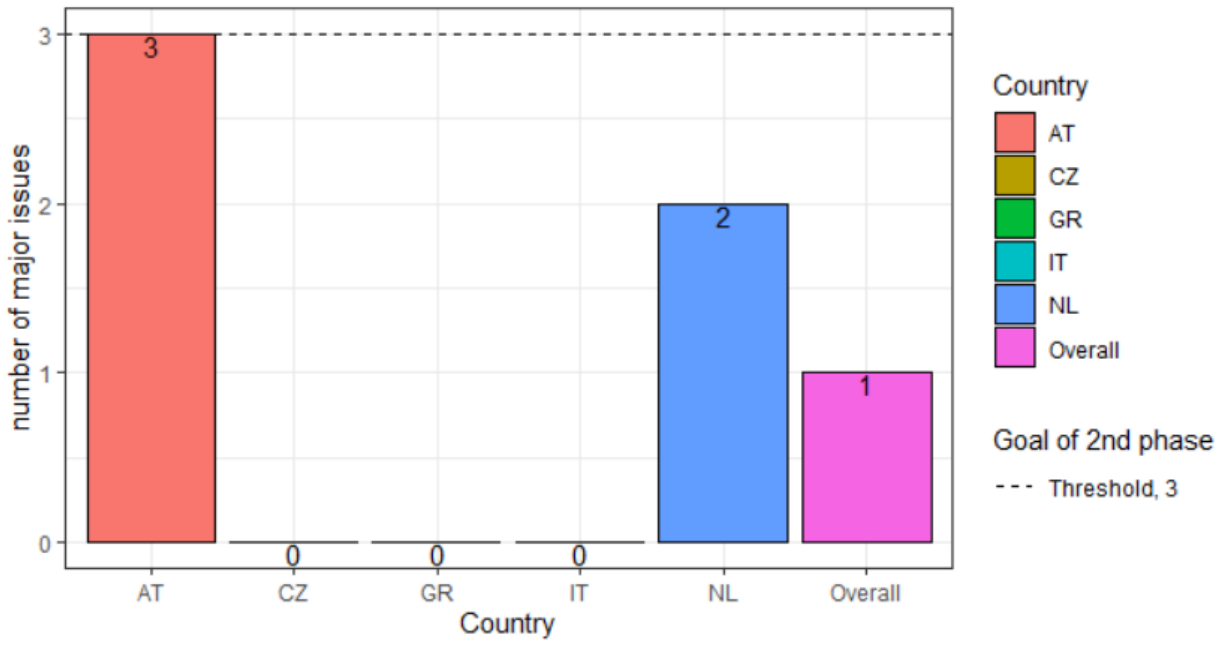


Figure 179: Service Providers 1. Pilot - Hypothesis 4: Issues encountered but not resolved with the development team, major issues

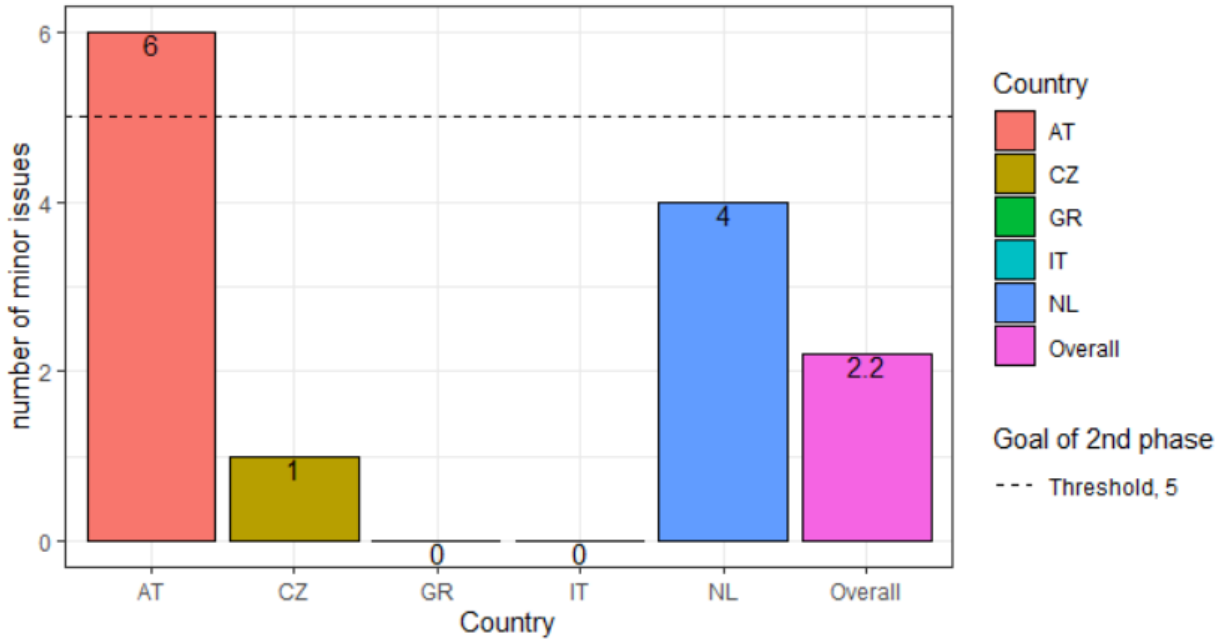


Figure 180: Service Providers 1. Pilot - Hypothesis 4: Issues encountered but not resolved with the development team, minor issues

1.2.1 Participants: Demographics and background information

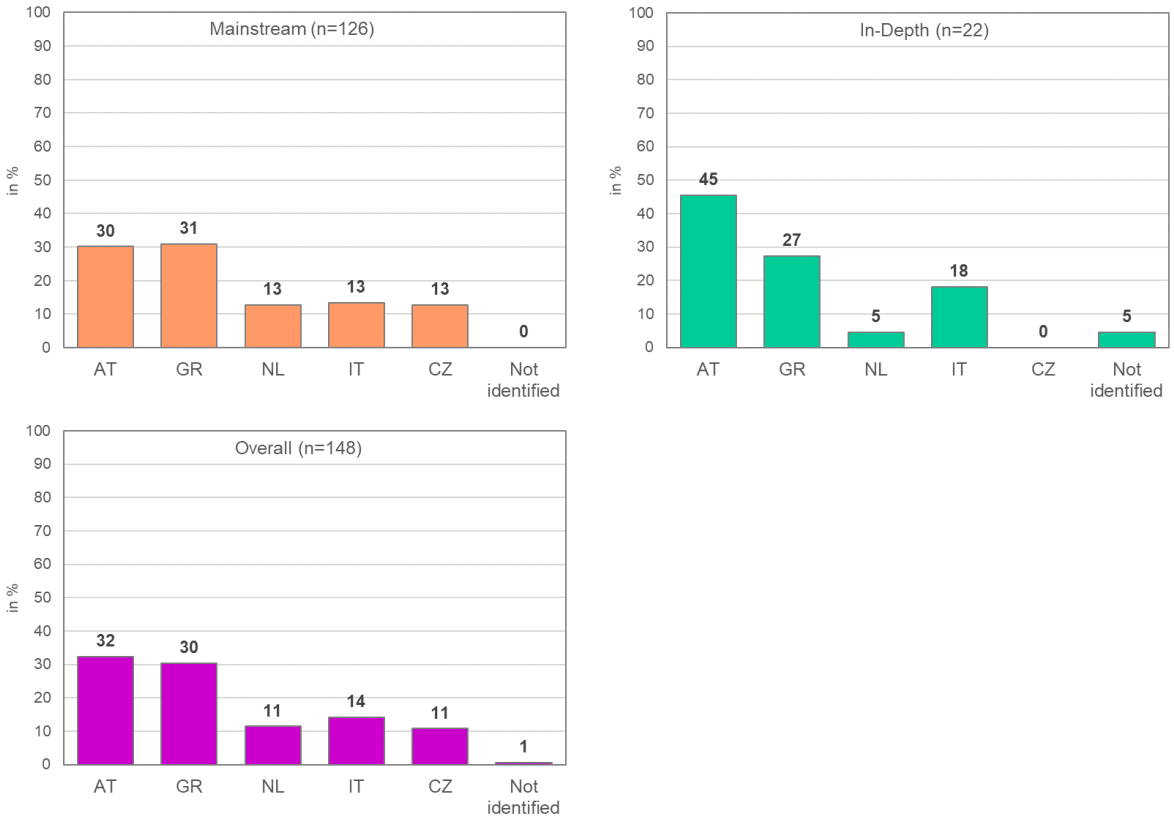


Figure 181: Nationality of respondents, mainstream users, in-depth users and overall. In percent.

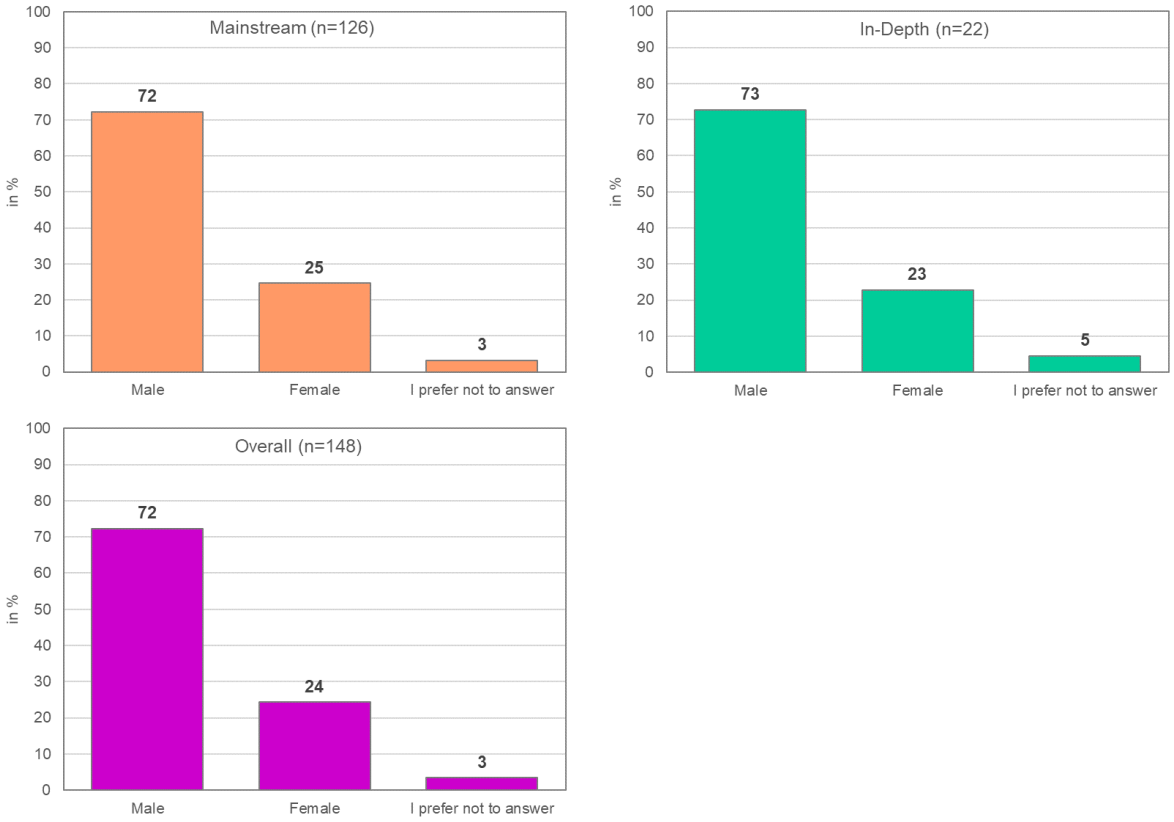


Figure 182: Gender of respondents, mainstream users, in-depth users and overall. In percent.

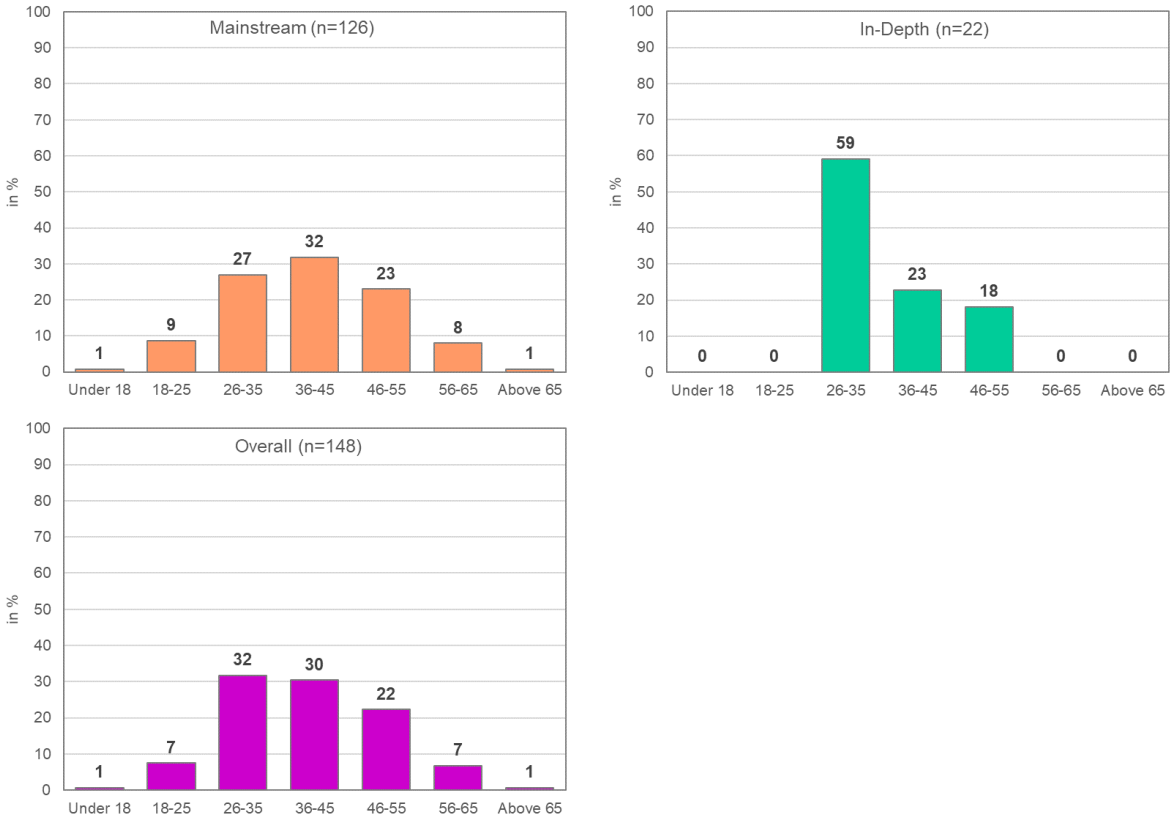


Figure 183: Distribution of age among respondents, mainstream users, in-depth users and overall. In percent.

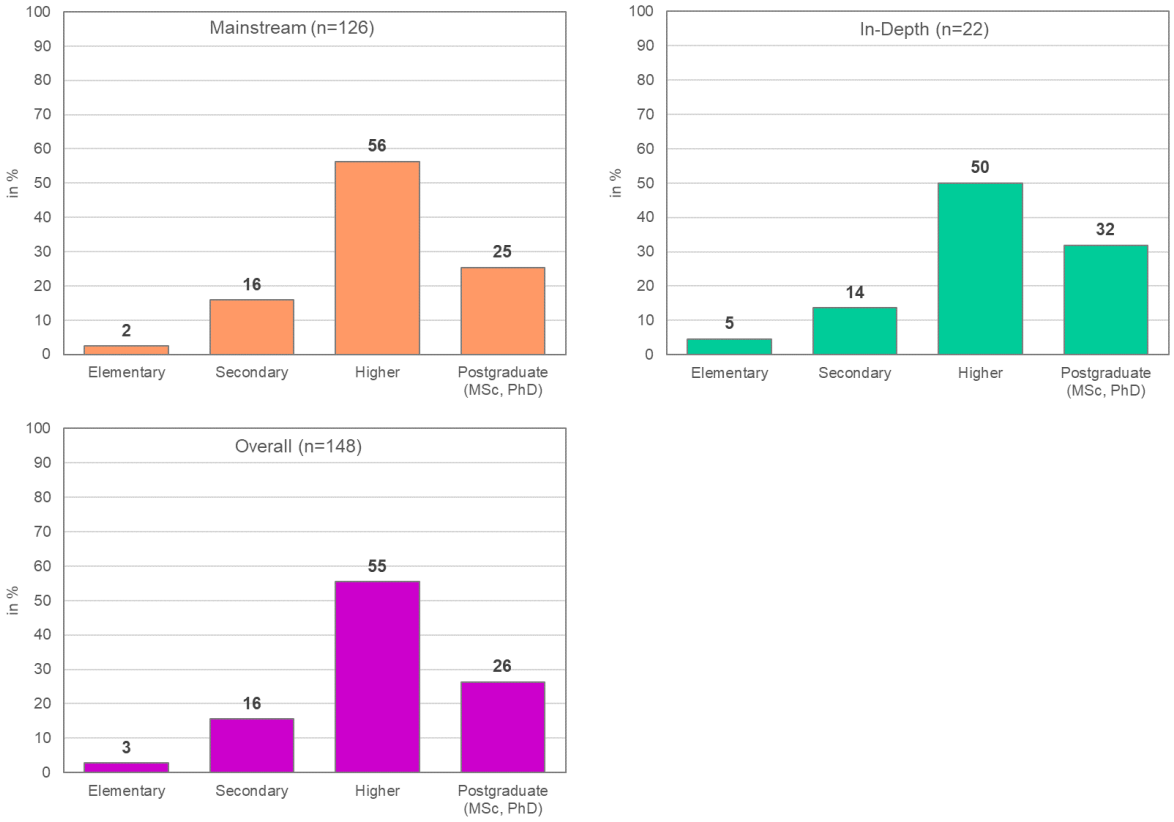


Figure 184: Educational attainment of respondents, mainstream users, in-depth users and overall. In percent.

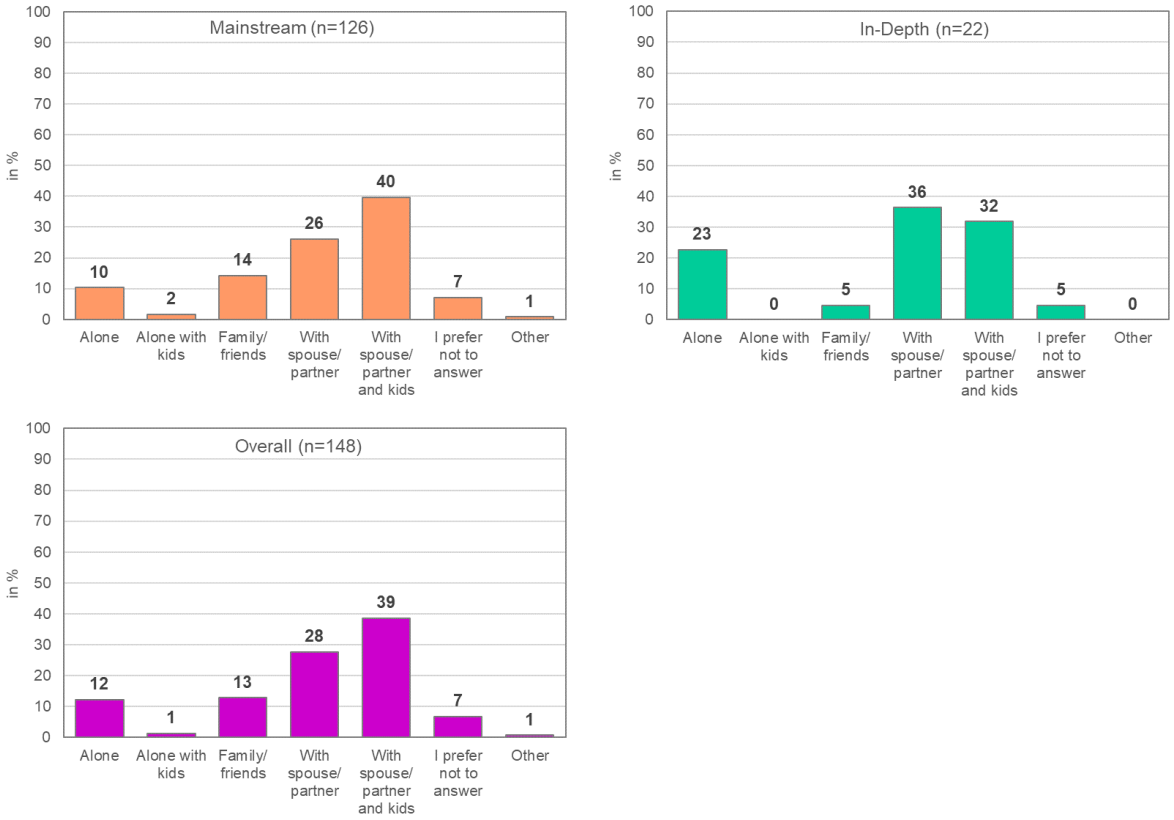


Figure 185: Living situation of respondents, mainstream users, in-depth users and overall. In percent.

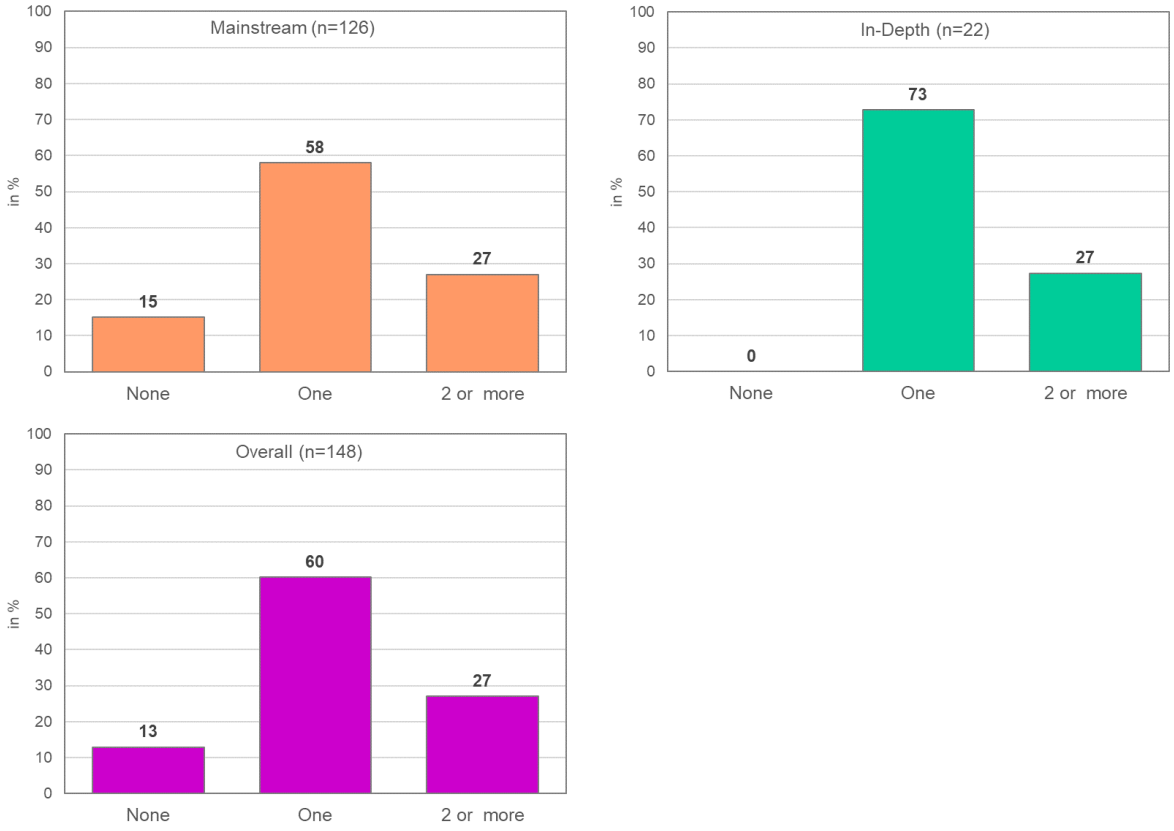


Figure 186: Number of cars per household, mainstream users, in-depth users and overall. In percent.

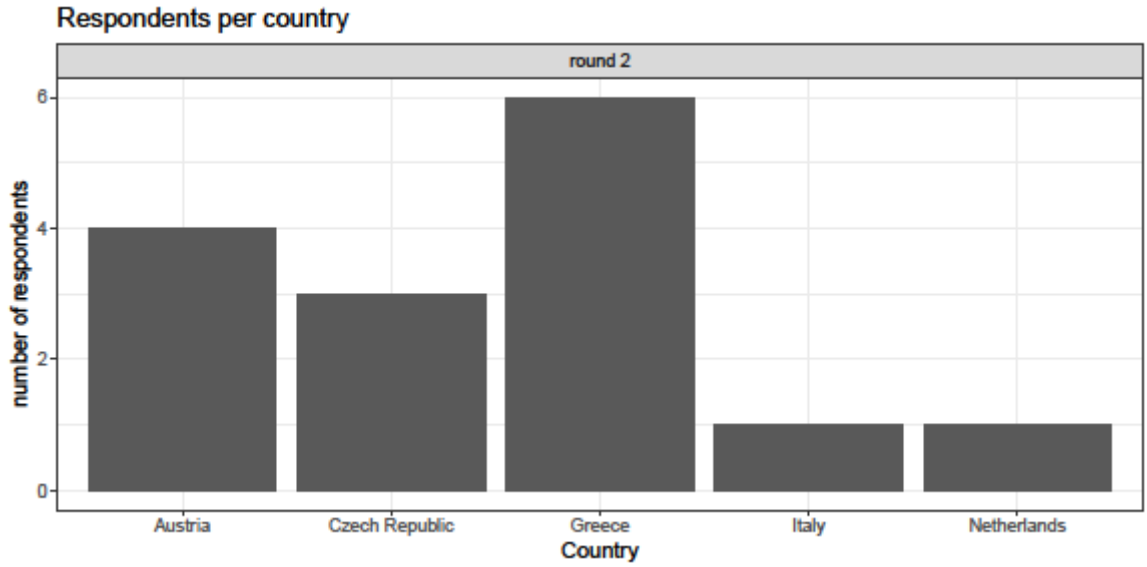


Figure 187: Service Provider round 2 - Respondents per country

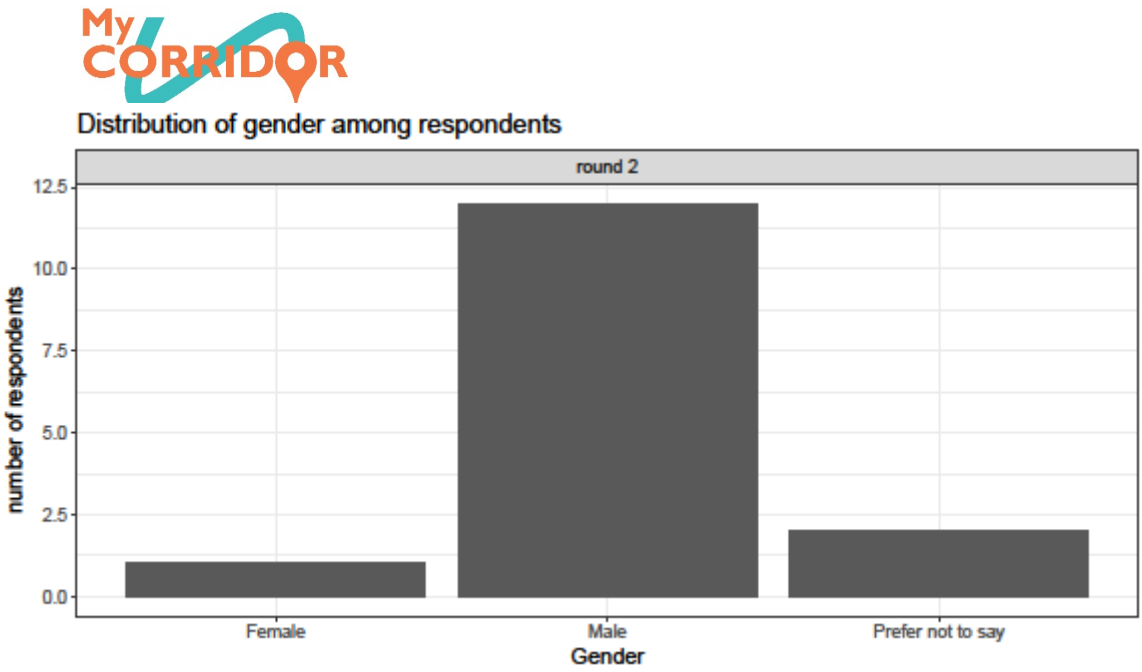


Figure 188: Service providers round 2 - Distribution of gender among respondents

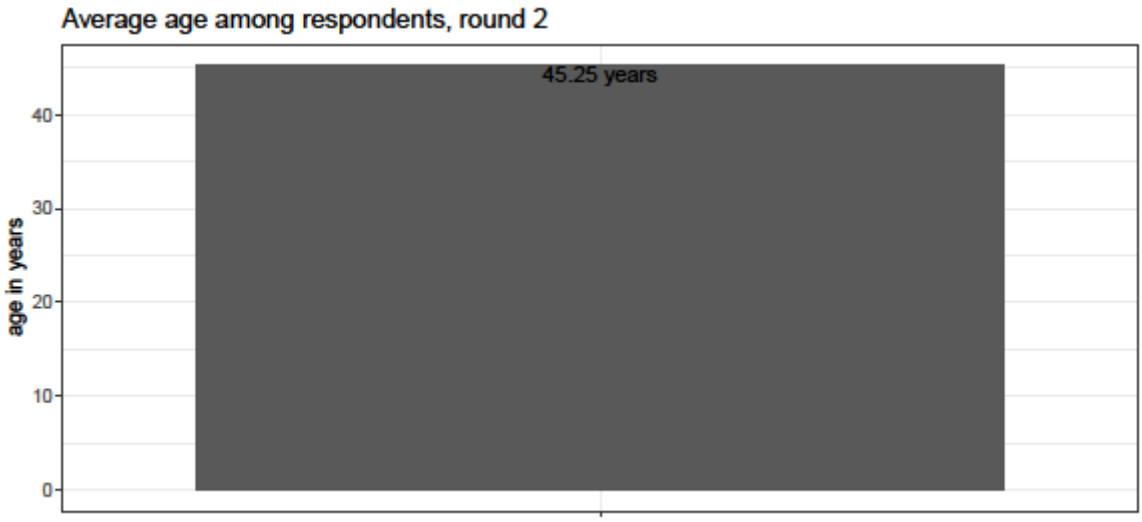


Figure 189: Service providers round 2 - Average age among respondents

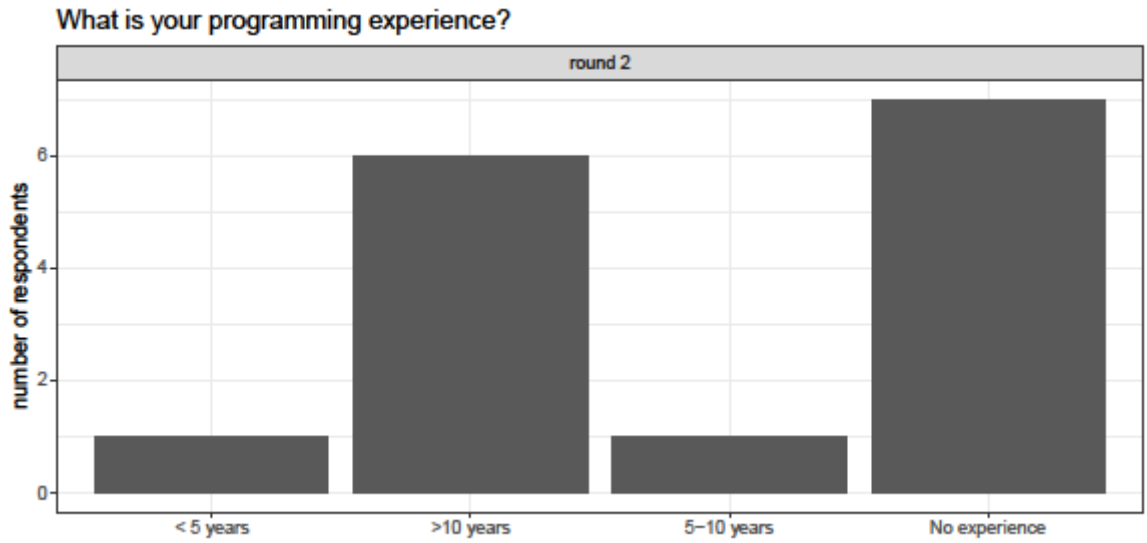


Figure 190: Service providers round 2 - What is your programming experience?

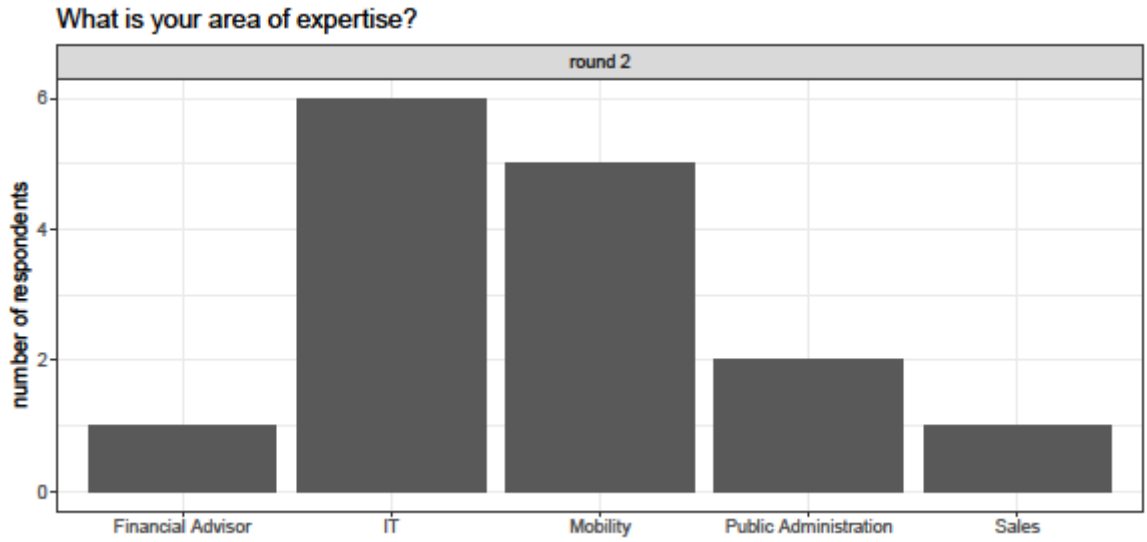


Figure 191: Service providers round 2 - What is your area of expertise?

1.2.2 Mobile analytic results - Evaluation of logged data

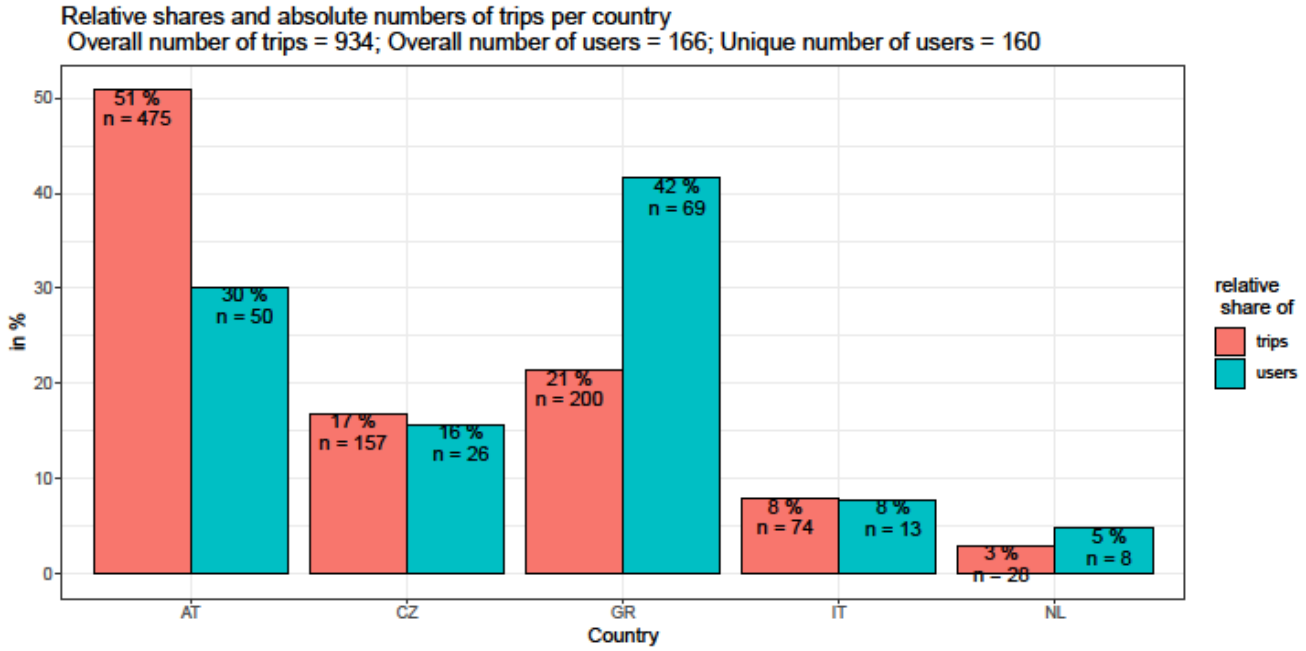


Figure 192: Relative shares and absolute numbers of trips and users per country

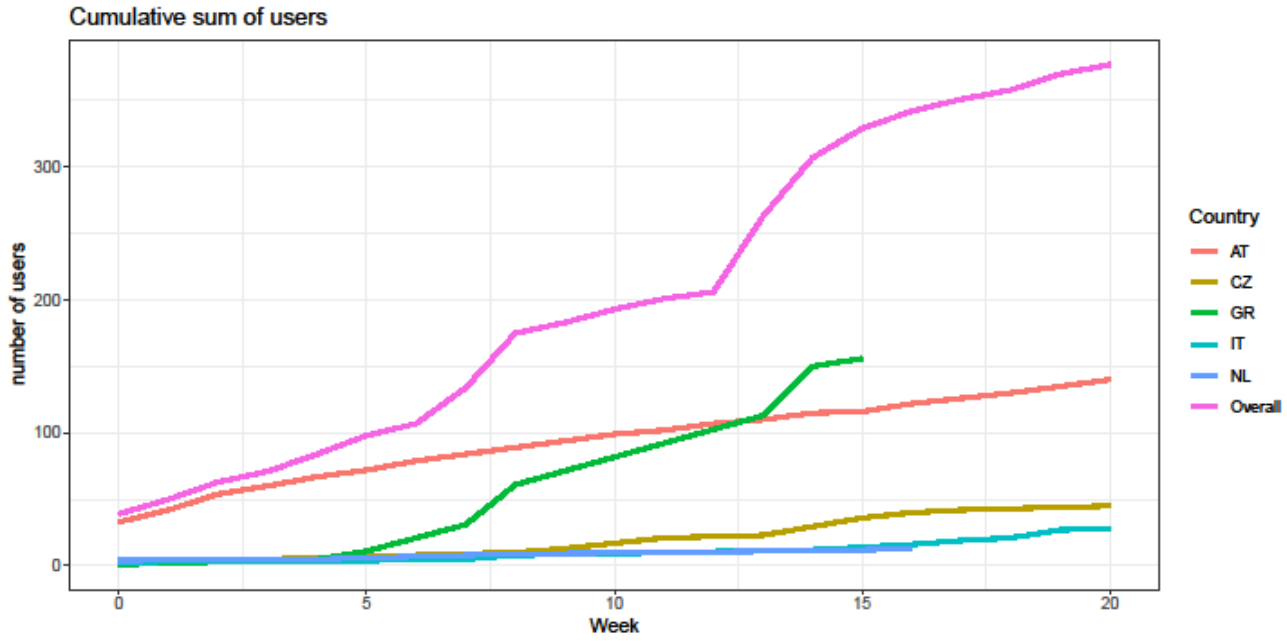


Figure 193: Cumulative sum of users

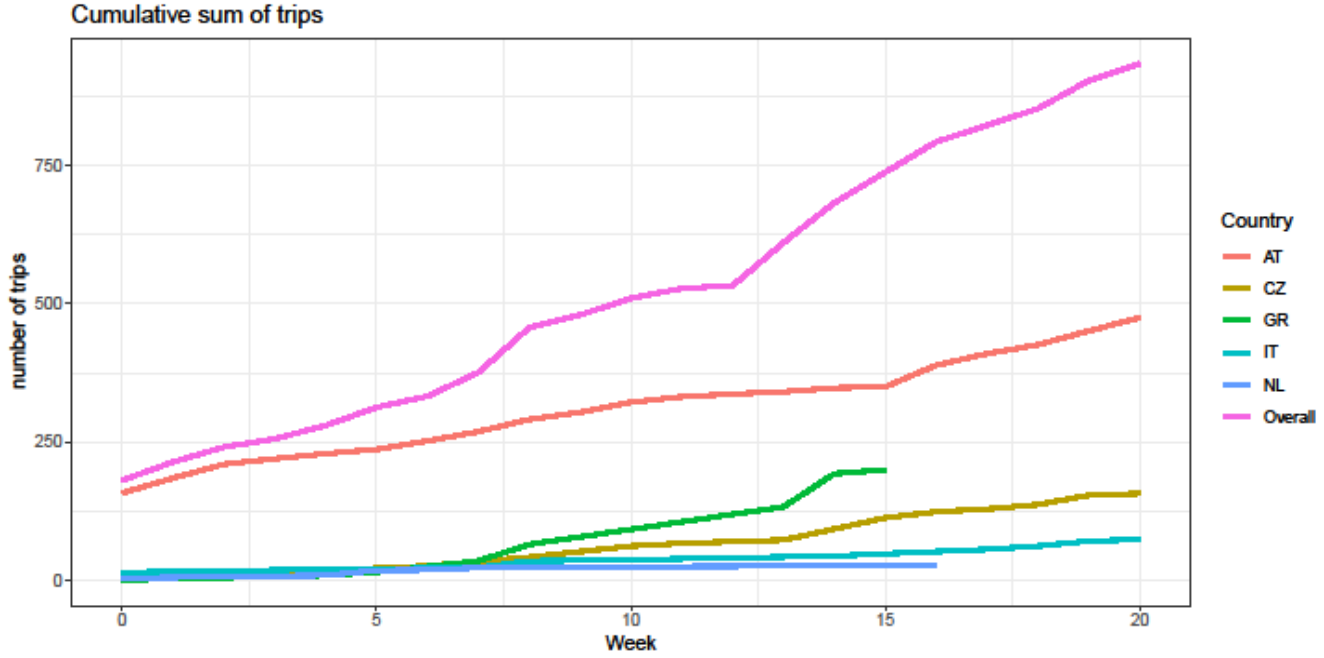


Figure 194: Cumulative sum of trips

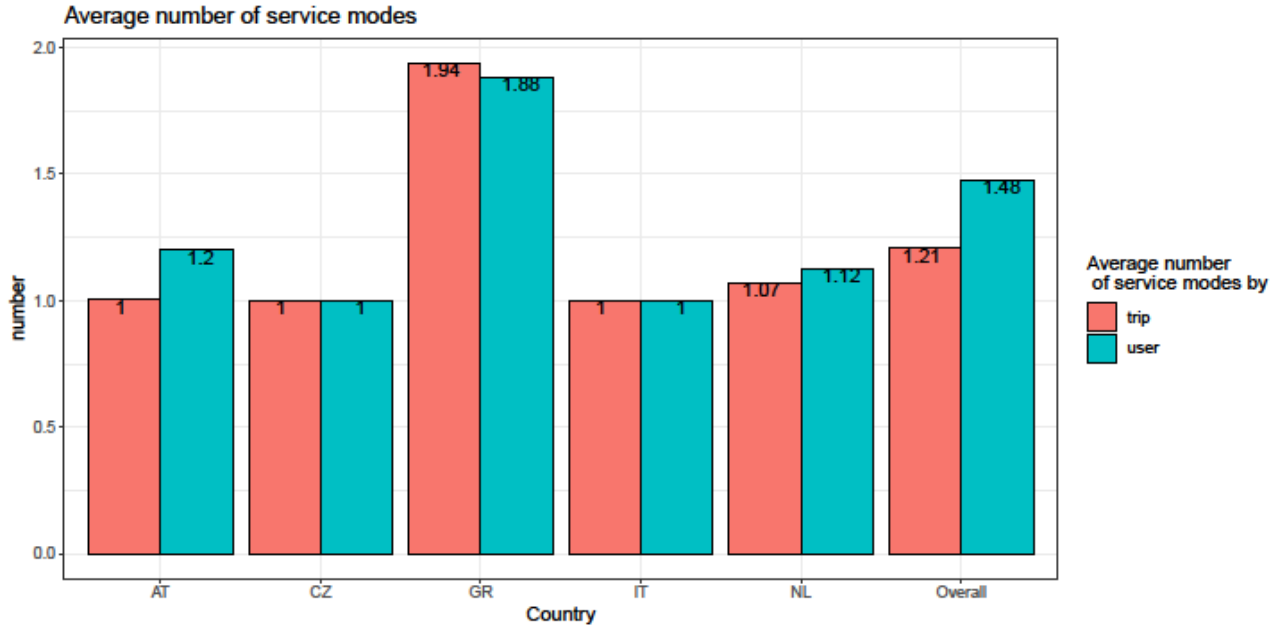


Figure 195: Average number of service modes

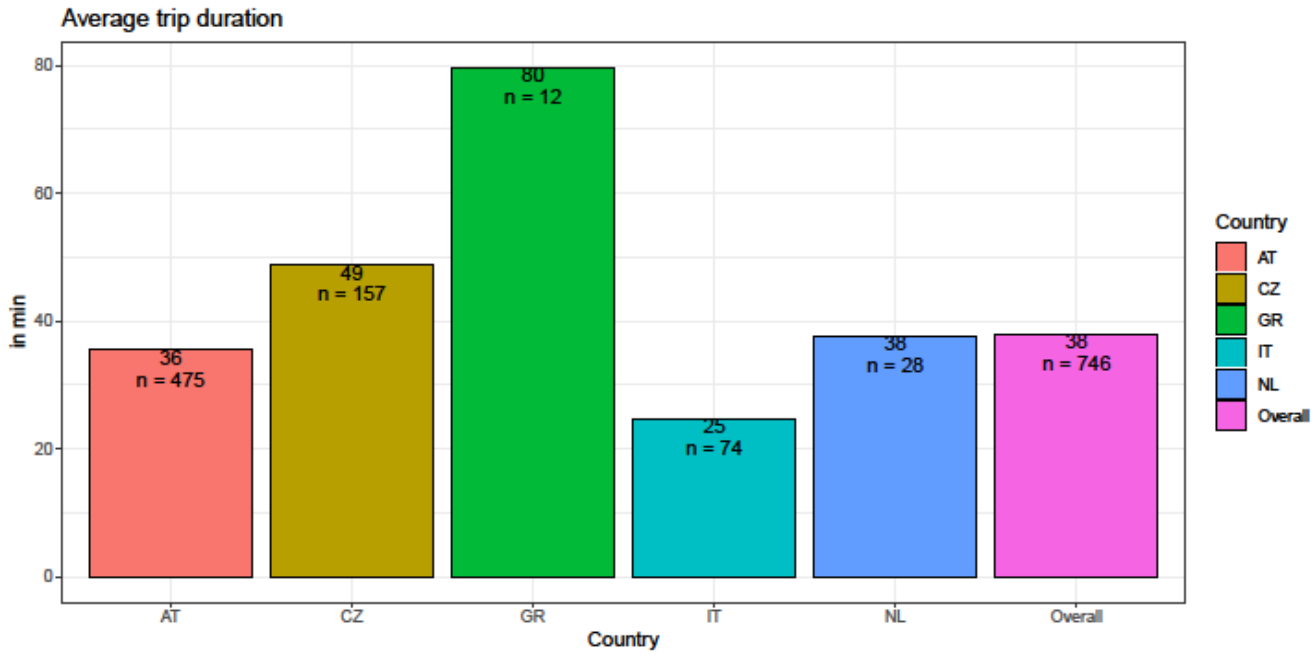


Figure 196: Average trip duration

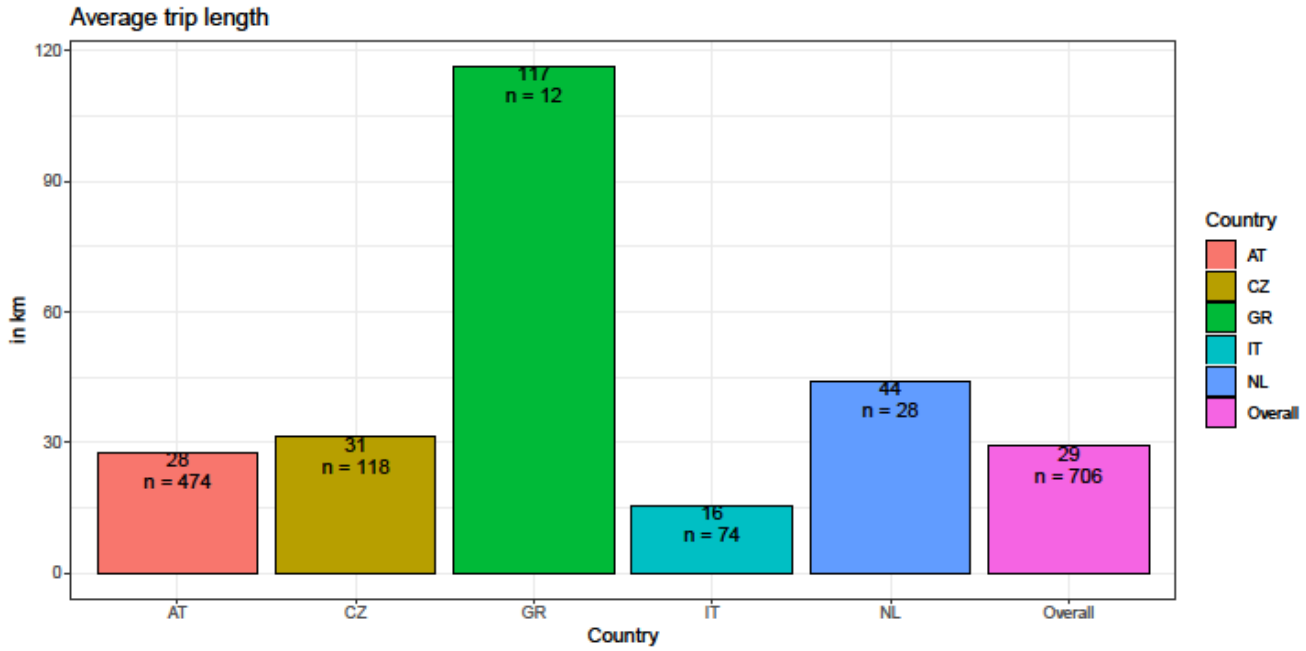


Figure 197: Average trip length

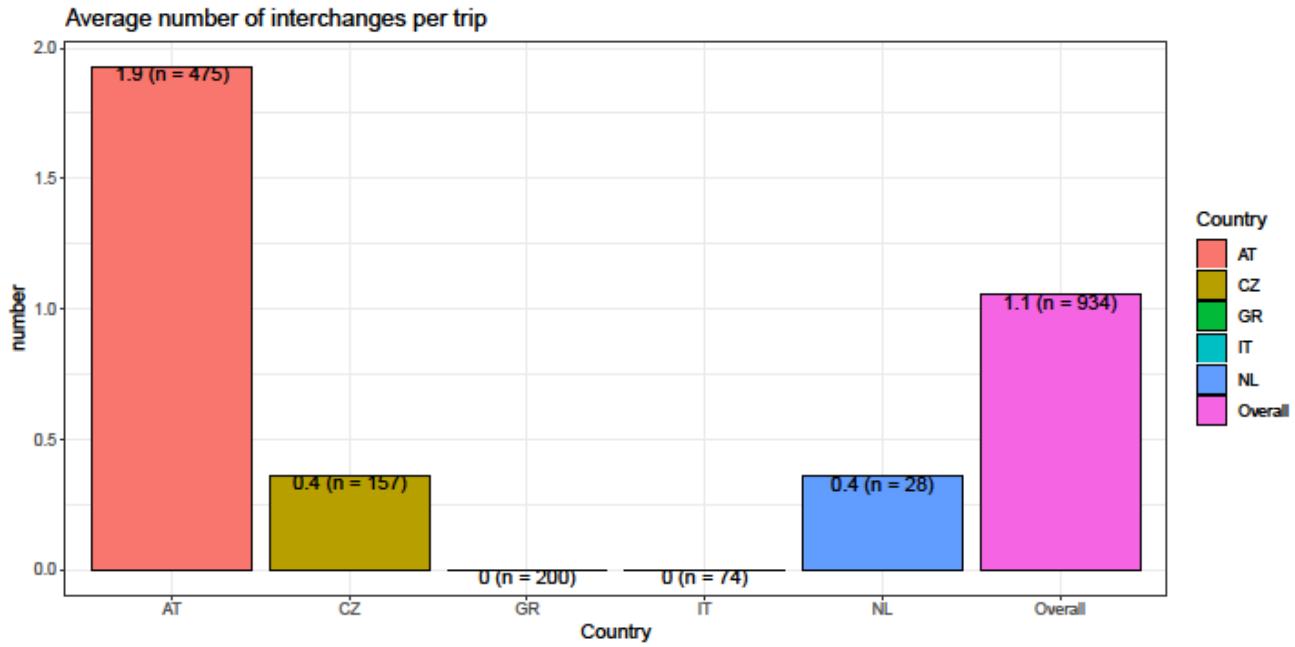


Figure 198: Average number of interchanges per trip

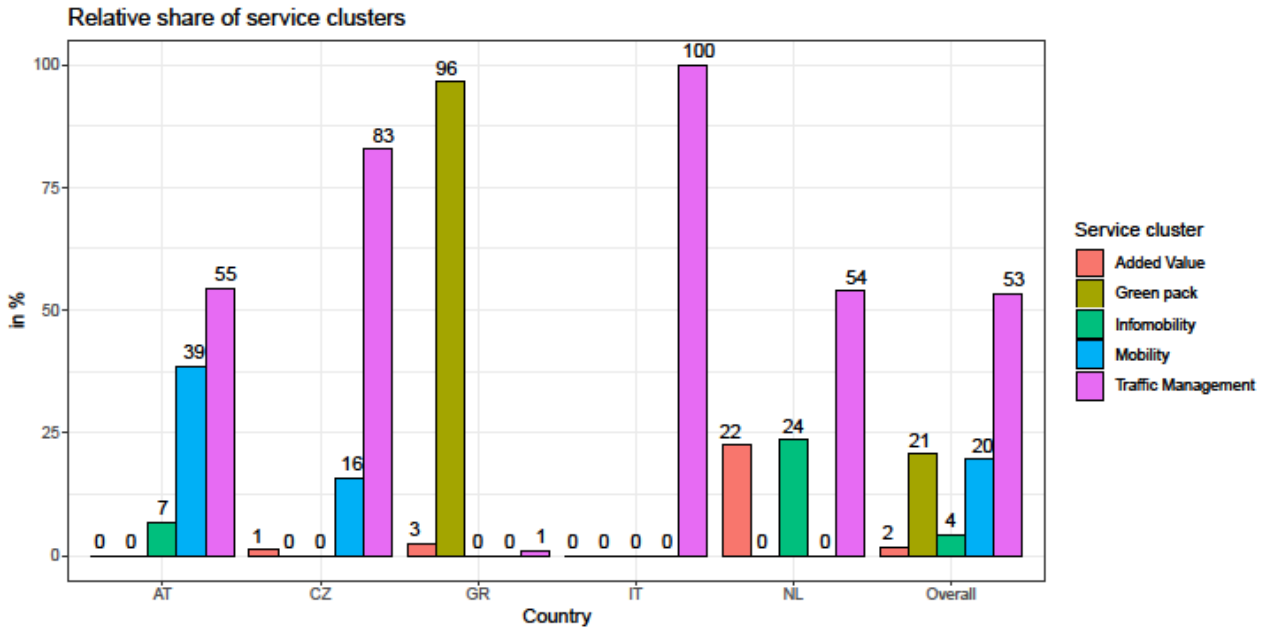


Figure 199: Relative share of service clusters

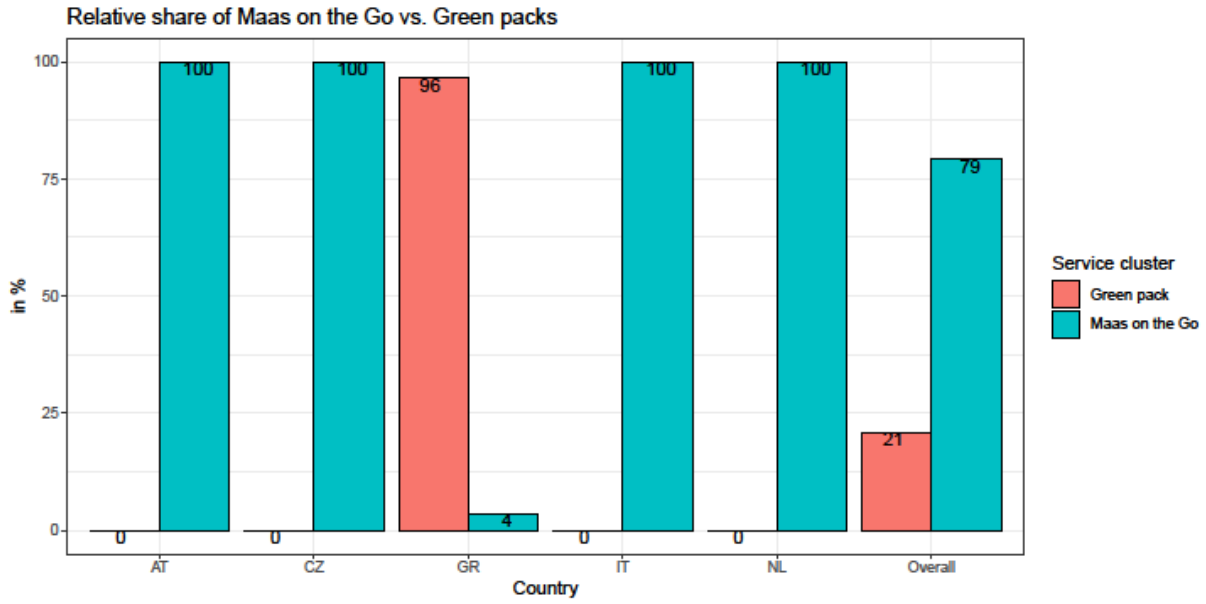


Figure 200: Relative share of Maas on the Go vs. Green packs

1.2.3 Results from Pre- questionnaires

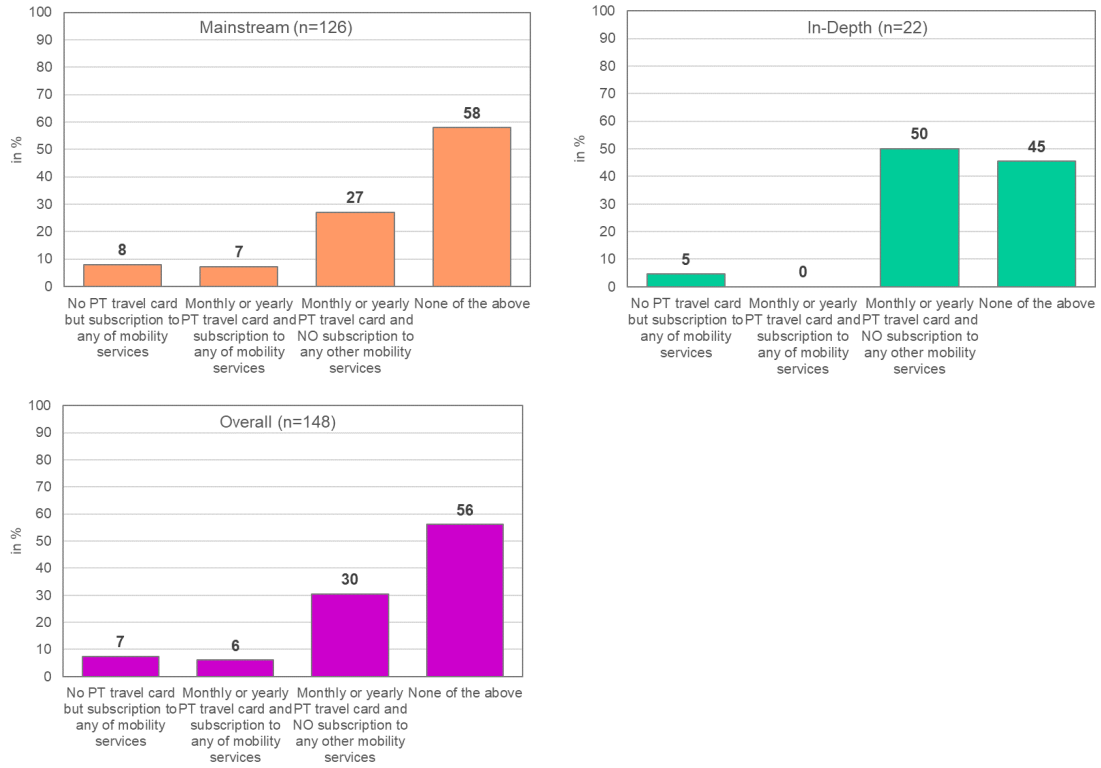


Figure 201: Are you a travel card holder? Mainstream users, in-depth users and overall. In percent.

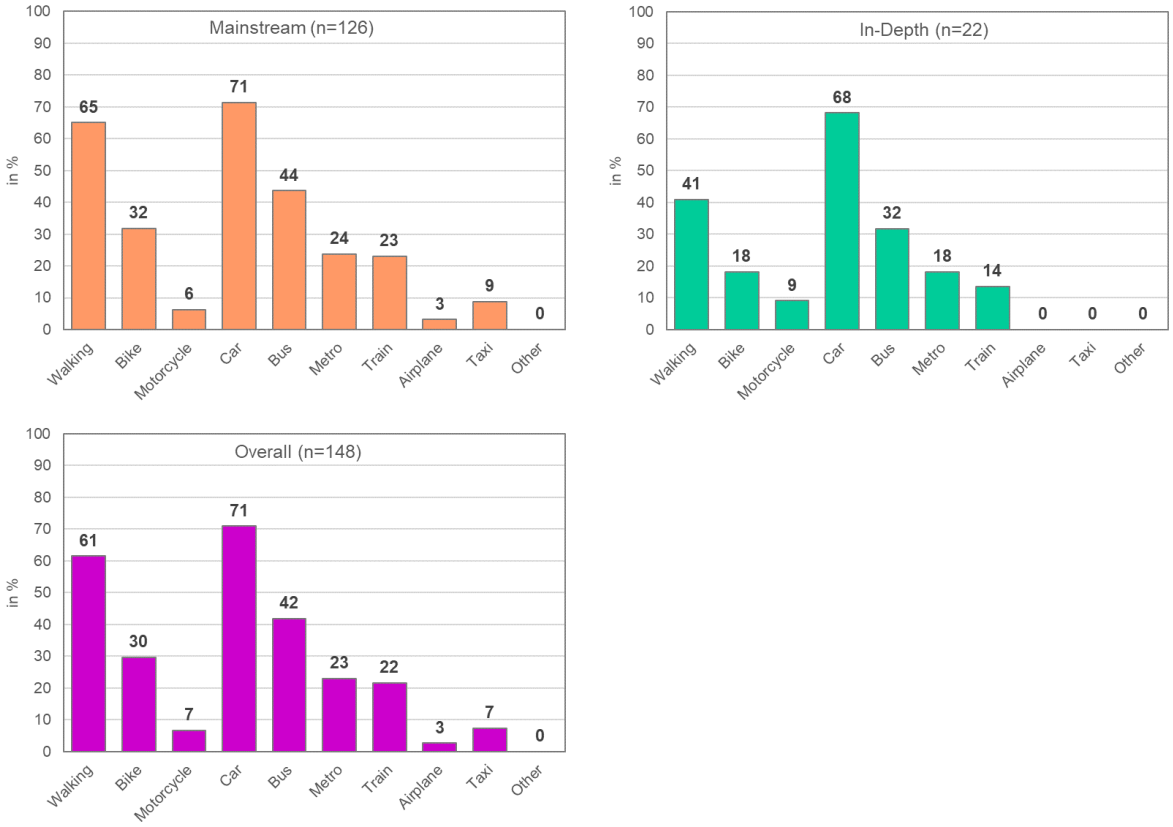


Figure 202: Transport modes used for most frequent journey, mainstream users, in-depth users and overall. In percent.

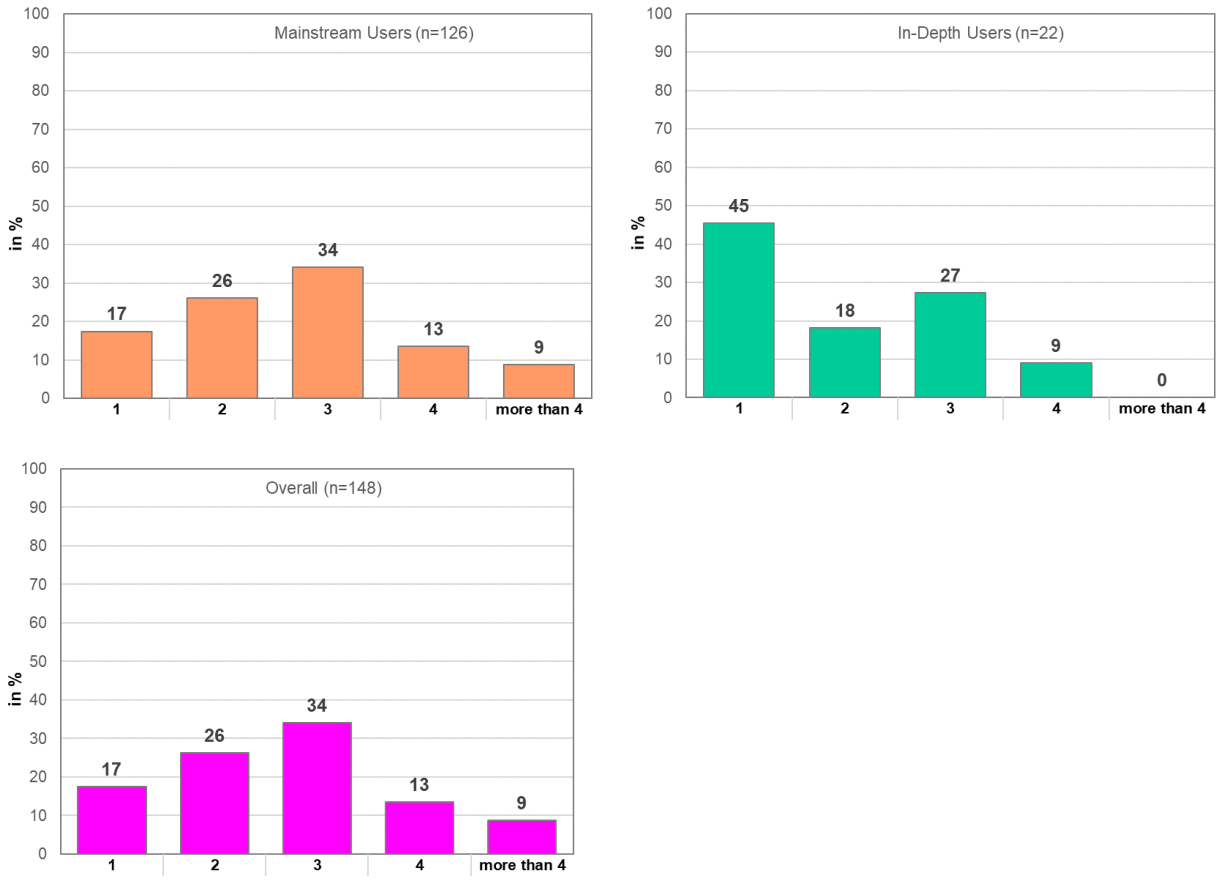


Figure 203: Number of transport modes used for most frequent journey, mainstream users, in-depth users and overall. In percent.

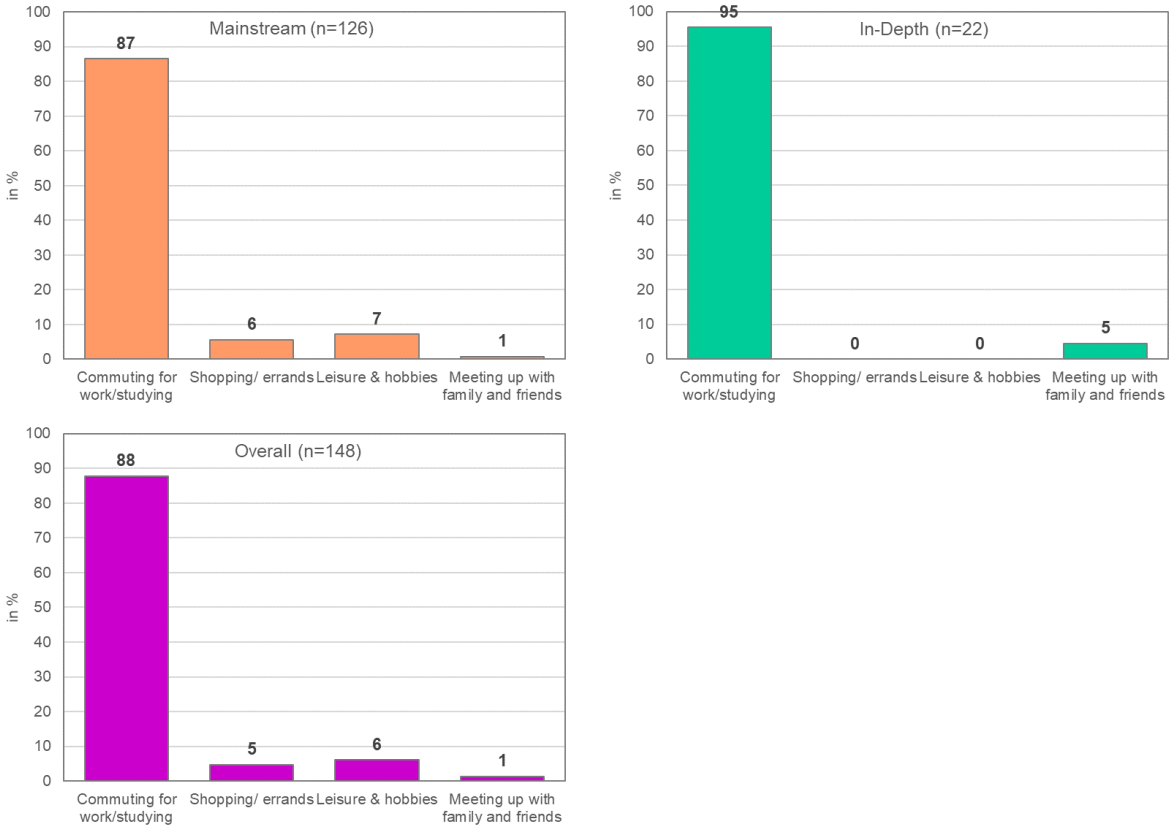


Figure 204: You use this combination transport modes mostly for? Mainstream users, in-depth users and overall. In percent.

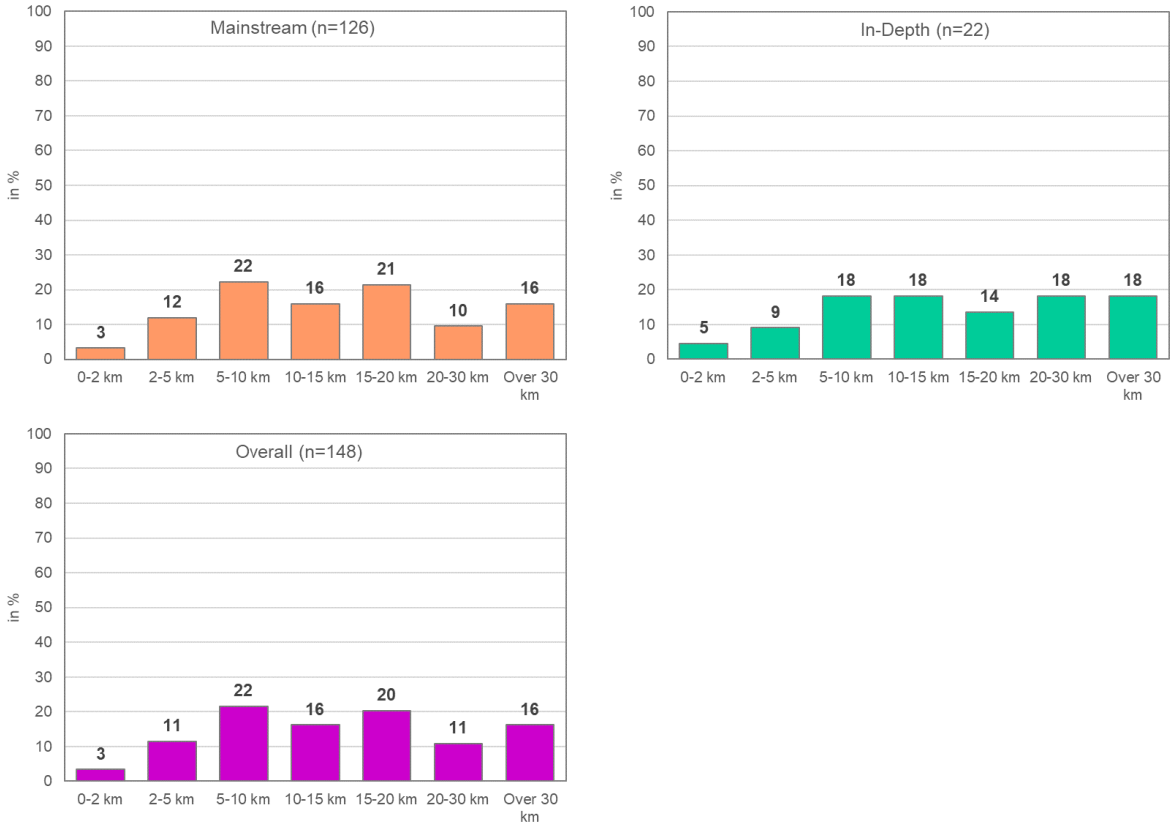


Figure 205: Distance for most frequent journey, mainstream users, in-depth users and overall. In percent.

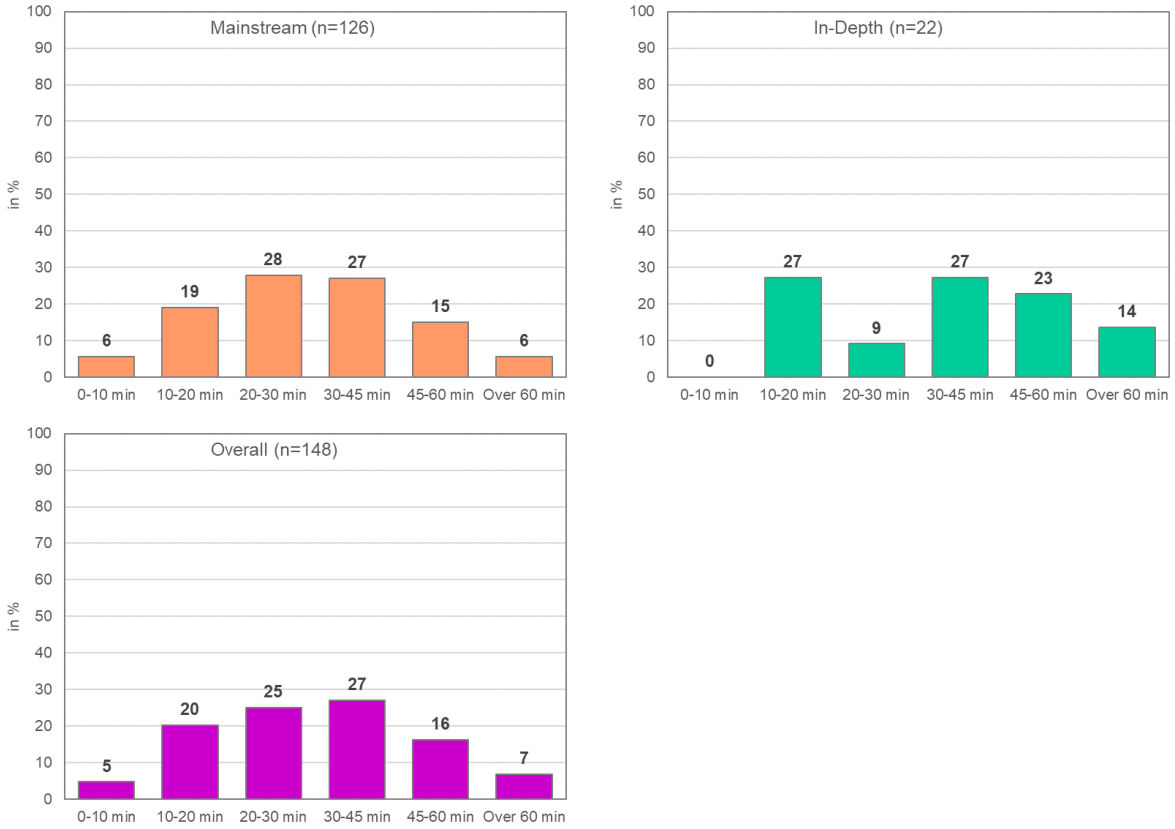


Figure 206: Usual Time for most frequent journey, mainstream users, in-depth users and overall. In percent.

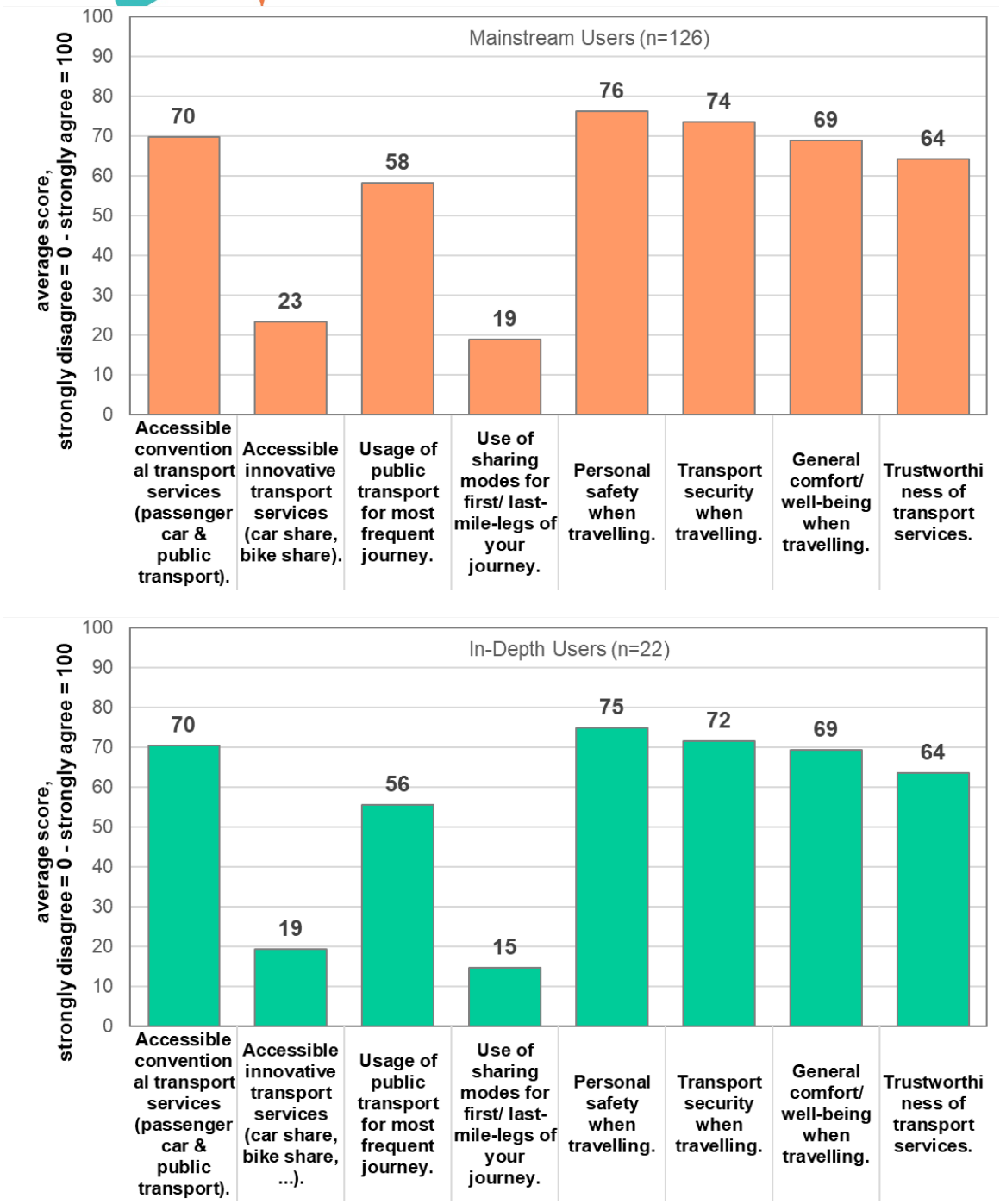


Figure 207: How would you assess your satisfaction with your existing means of transport? Mainstream users and in-depth users. Average values.

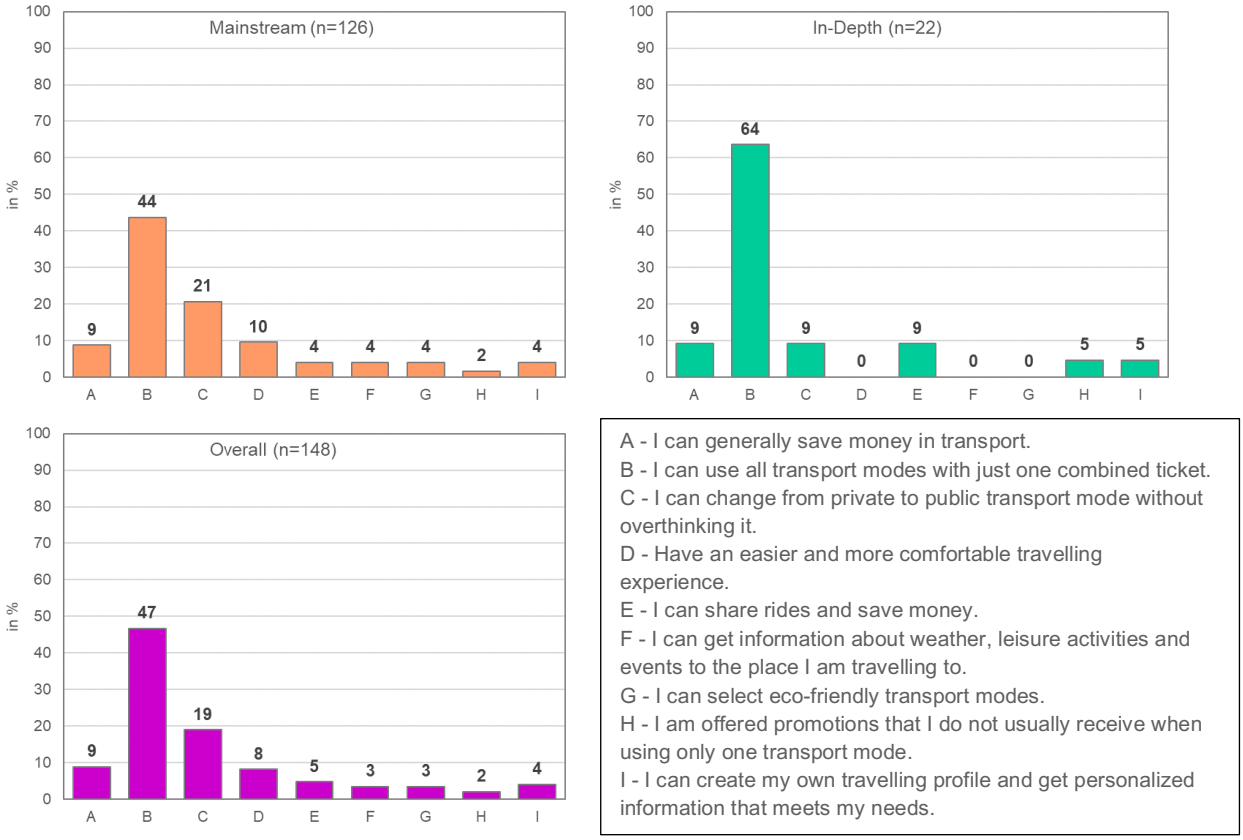


Figure 208: Based on the description of MaaS above, please select the statement that makes the use of MaaS products most ATTRACTIVE? Mainstream users, in-depth users and overall. In percent.

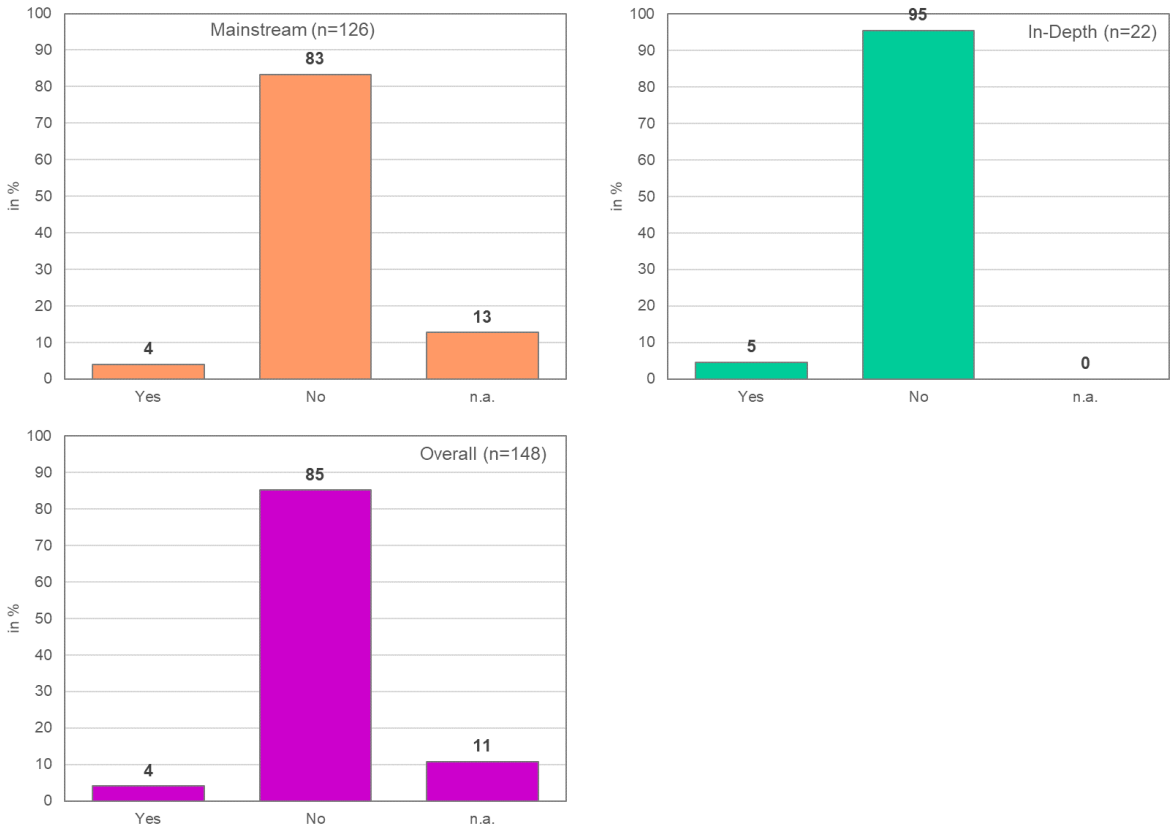


Figure 209: Have you used a MaaS applications before? Mainstream users, in-depth users and overall. In percent.

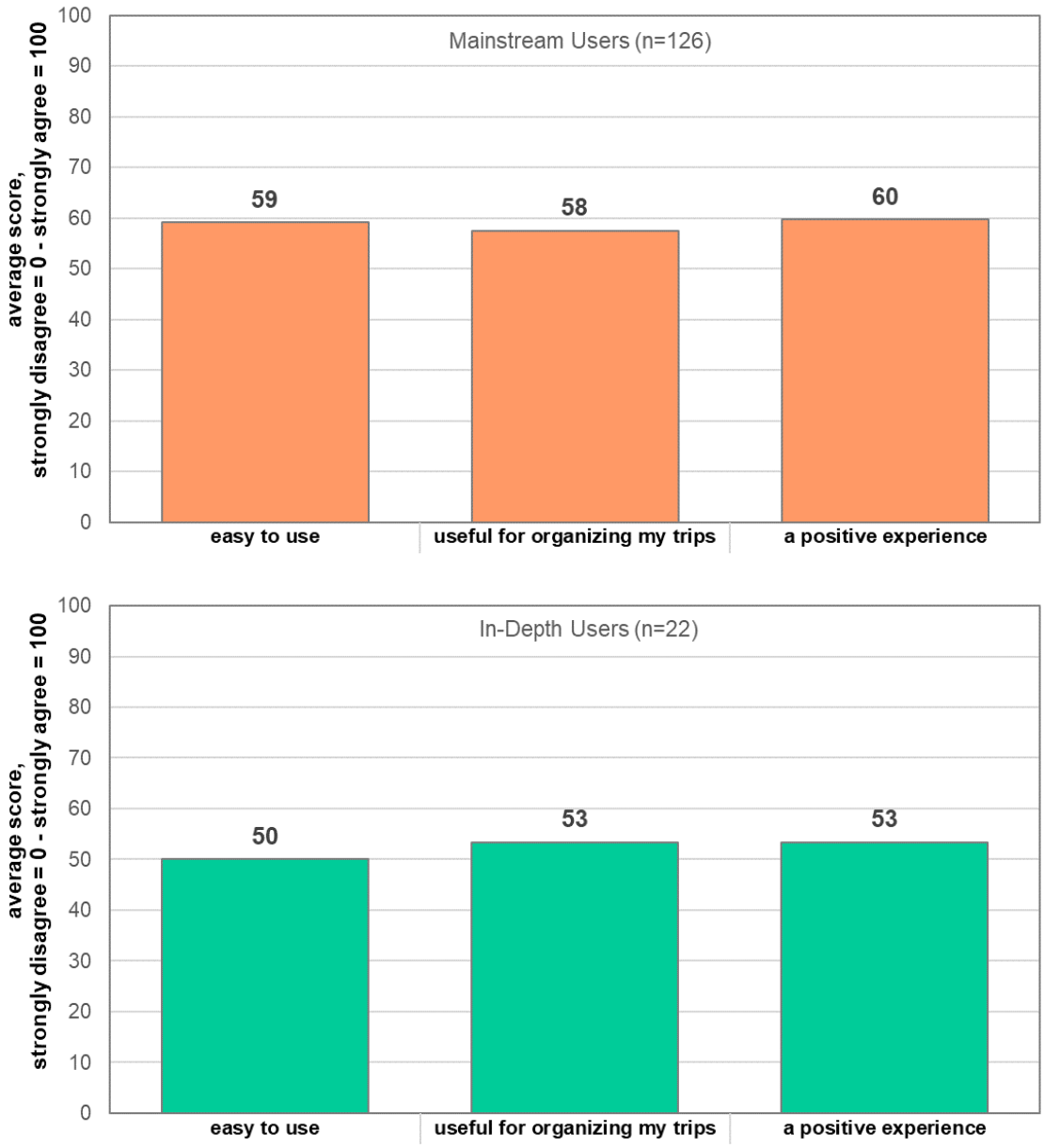
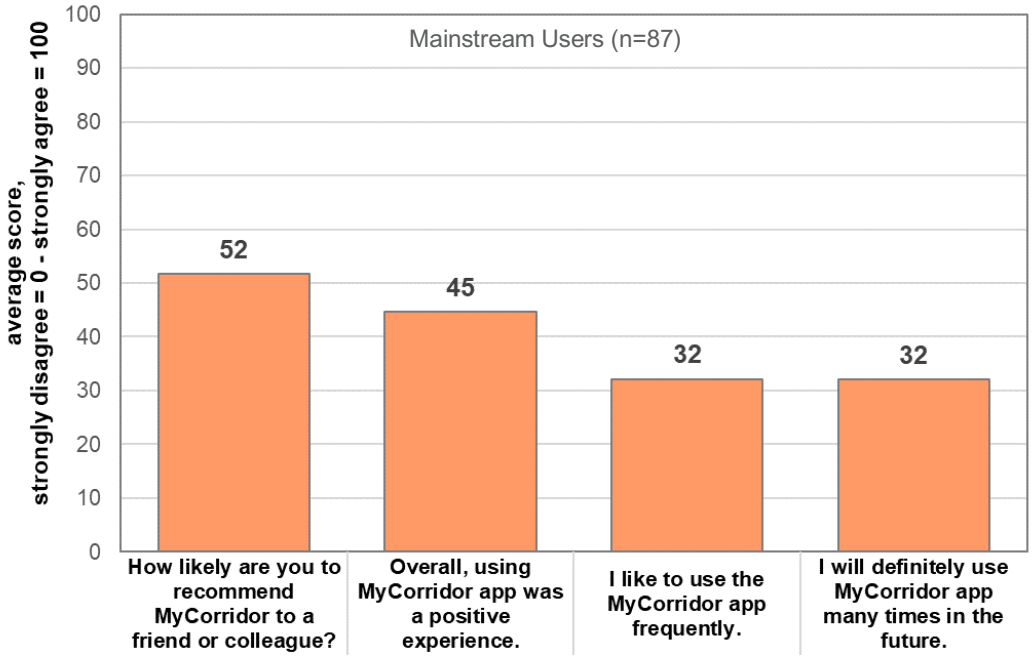


Figure 210: I think MyCorridor mobile app will be.... Mainstream users and in-depth users. Average values.

1.2.4 Results from Post- questionnaires



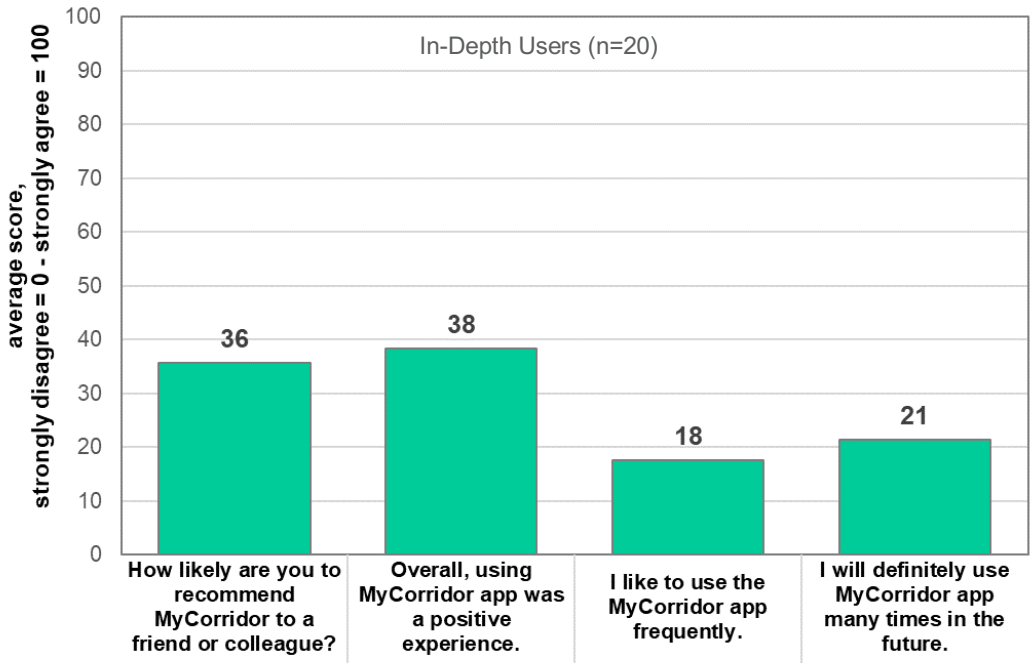


Figure 211: Mainstream users and in-depth users, MyCorridor app assessment (I).

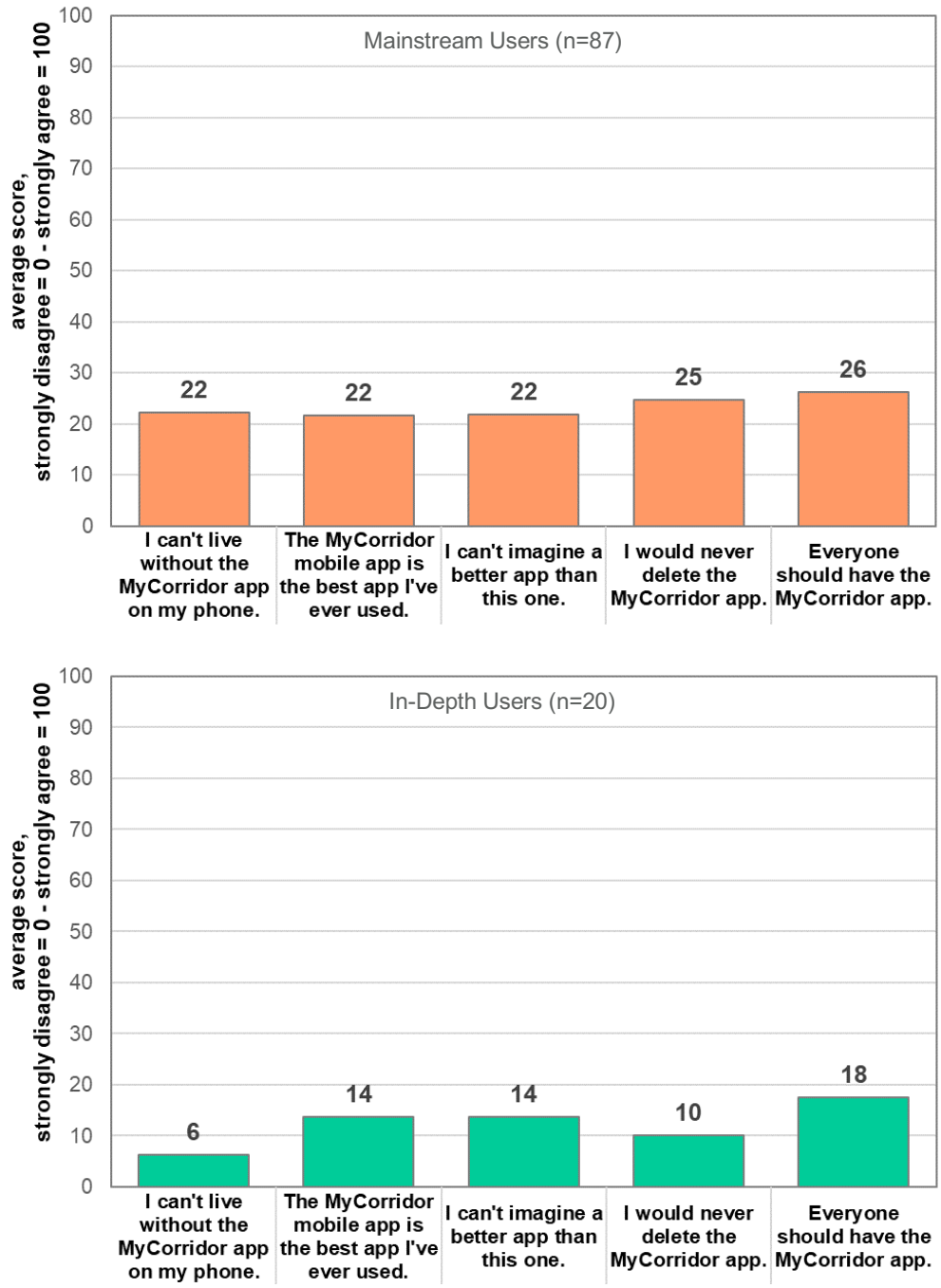


Figure 212: Mainstream users and in-depth users, MyCorridor app assessment (II).

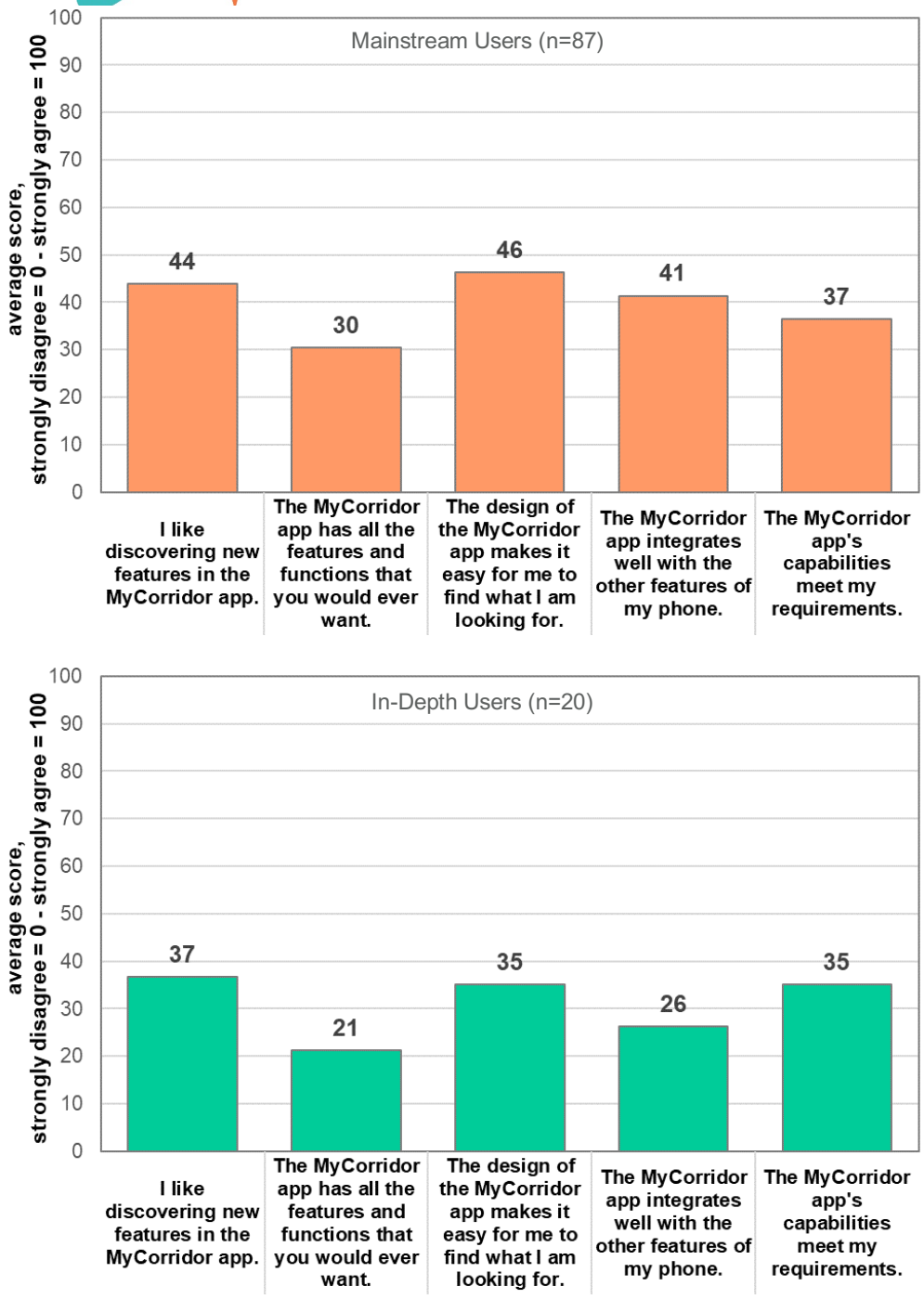


Figure 213: Mainstream users and in-depth users, MyCorridor app assessment (III).

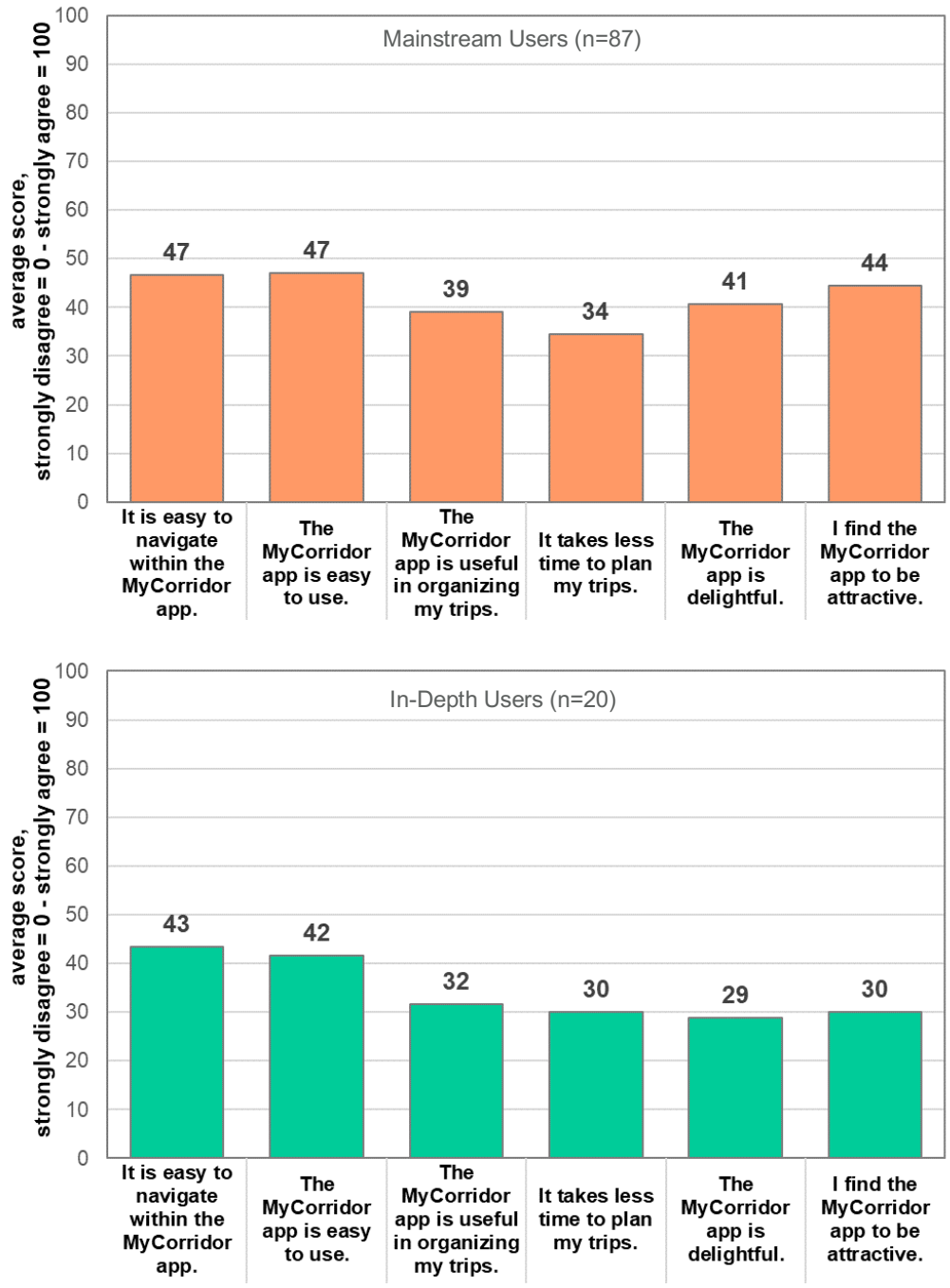


Figure 214: Mainstream users and in-depth users, MyCorridor app assessment (IV).

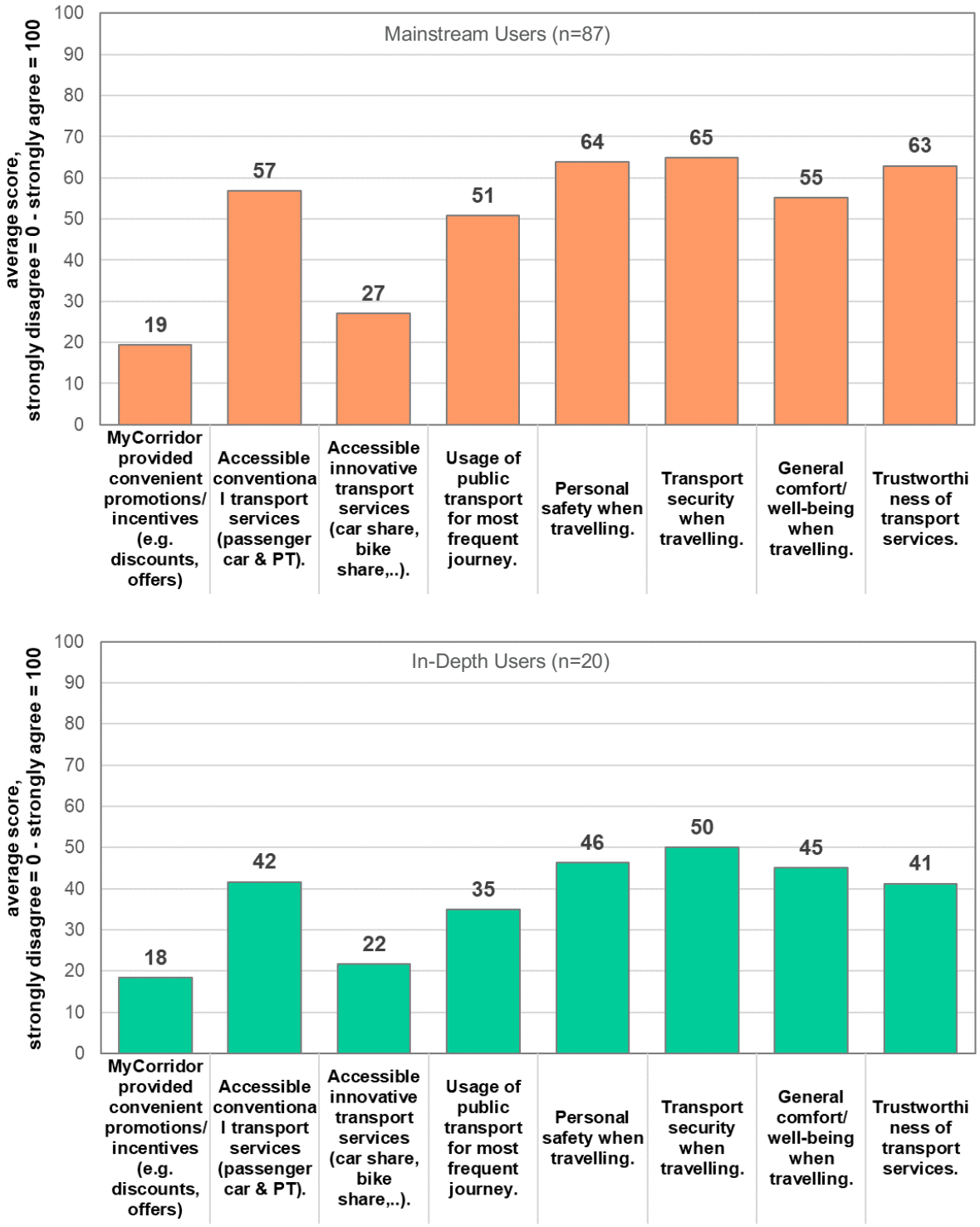


Figure 215: Mainstream users and in-depth users, MyCorridor app assessment (V).

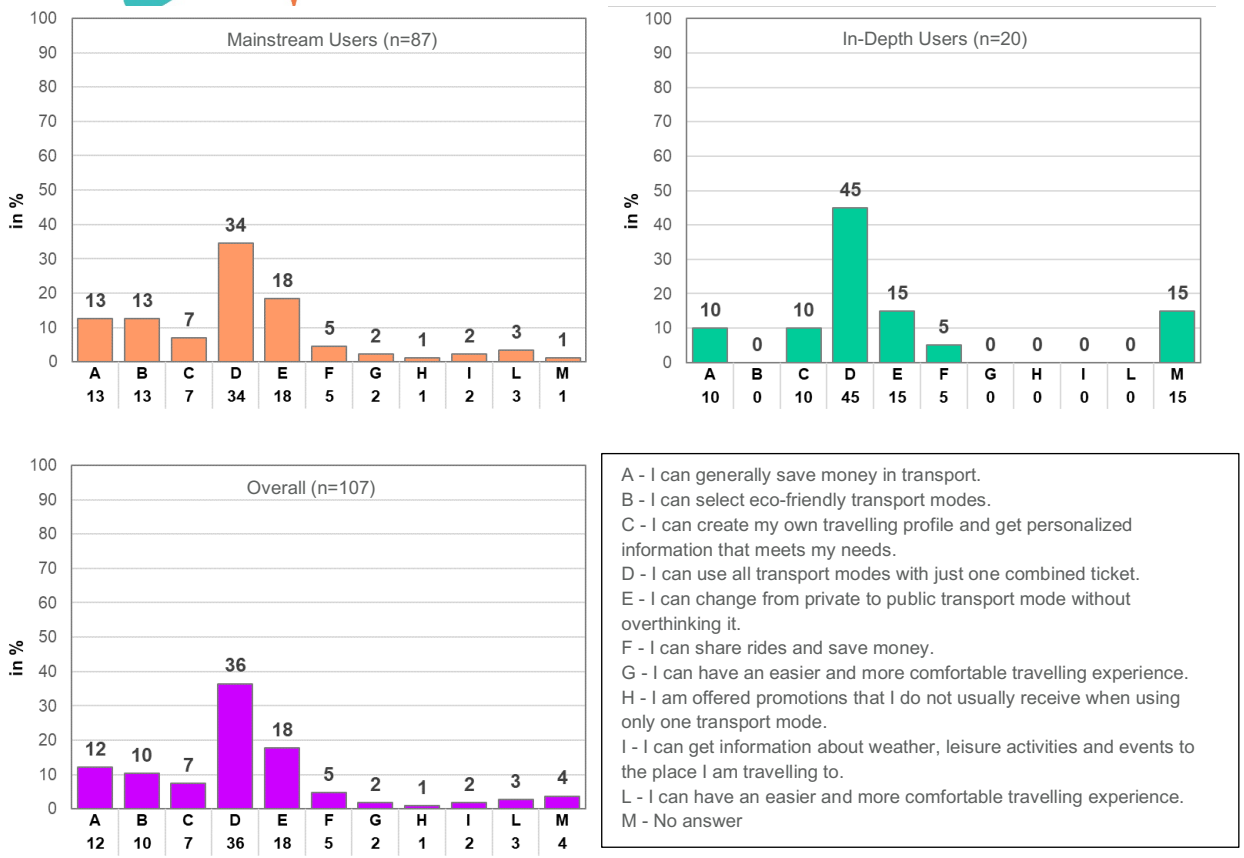


Figure 216: Choose the statement that makes MyCorridor app MOST ATTRACTIVE to you. Mainstream users, in-depth users and overall. In percent.

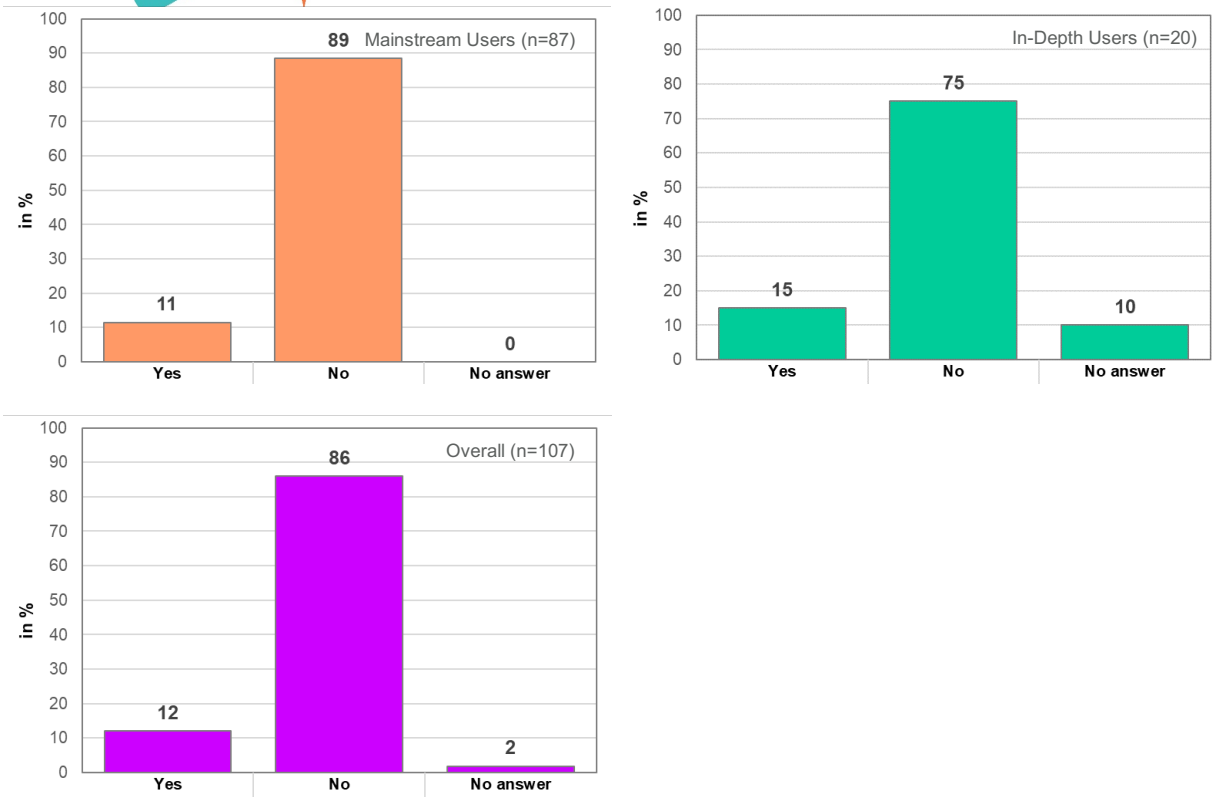


Figure 217: With MyCorridor app, I tried services that I have not used in the past. Mainstream users, in-depth users and overall. In percent.

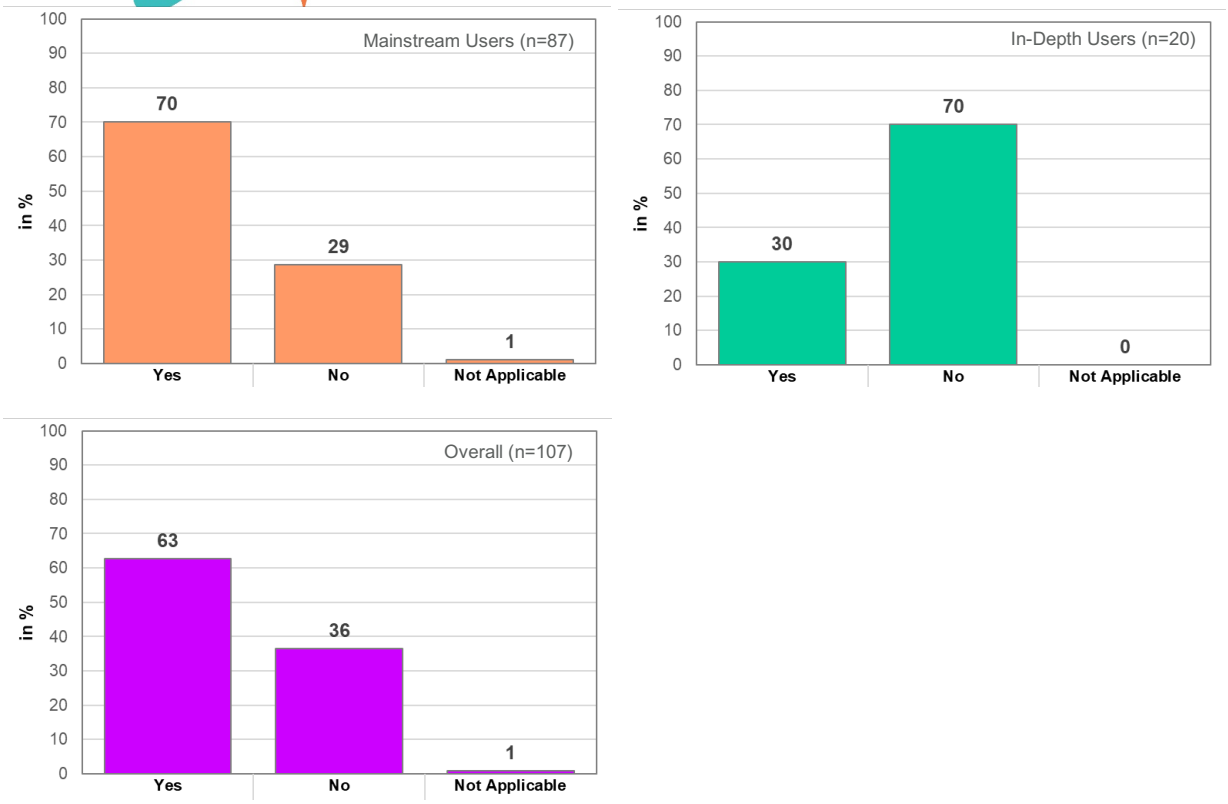


Figure 218: Would you use the MyCorridor app if it did not offer promotions or incentives (if applicable at your site)? Mainstream users, in-depth users and overall. In percent.

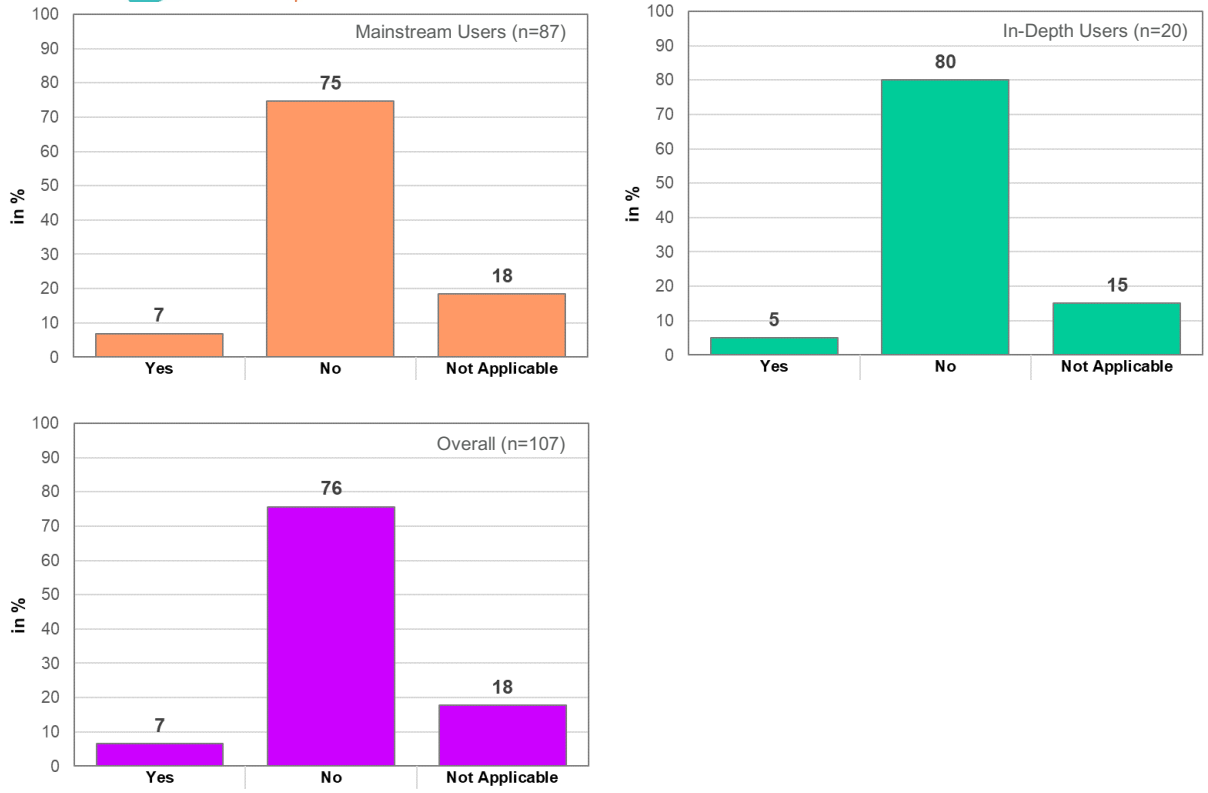


Figure 219: Were the trips you have taken available only through a promotion (if applicable at your site)? Mainstream users, in-depth users and overall. In percent.

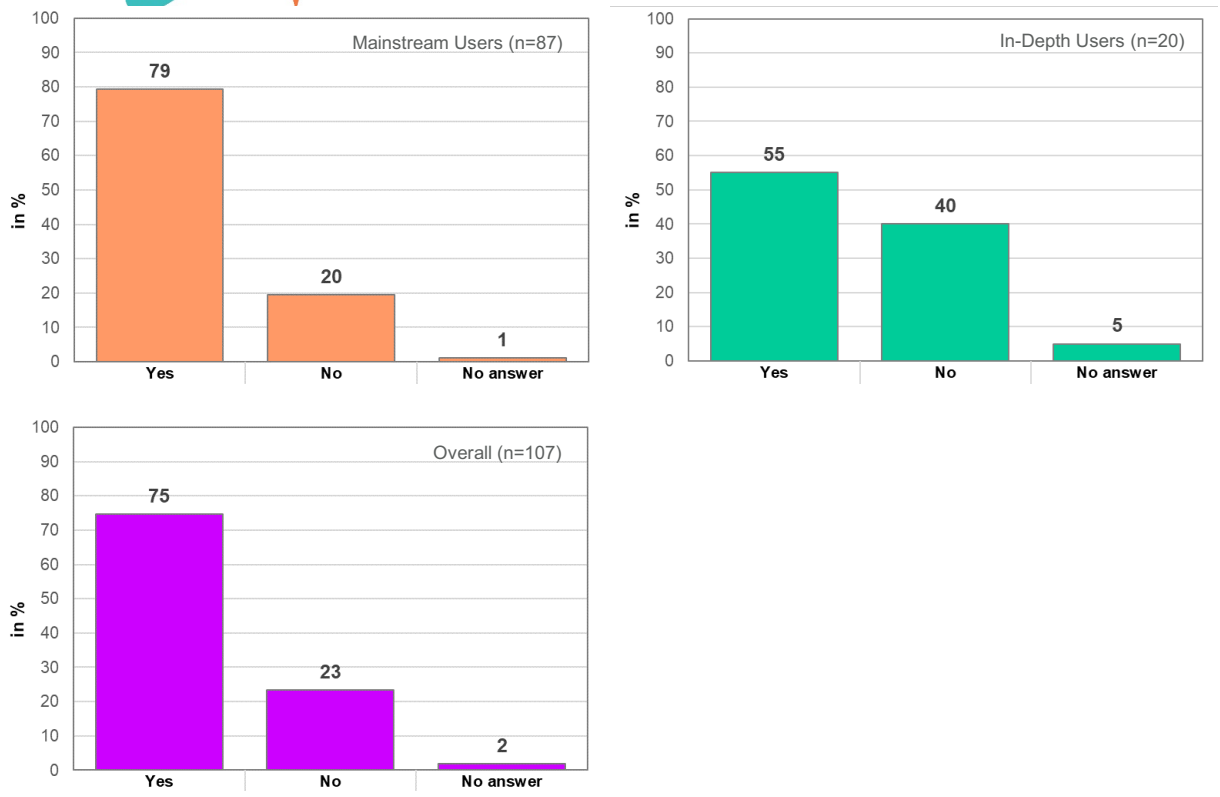


Figure 220: Are the environmental benefits of MaaS clear to you? Mainstream users, in-depth users and overall. In percent.

1.2.5 Evaluation results from travellers - Answering the hypotheses

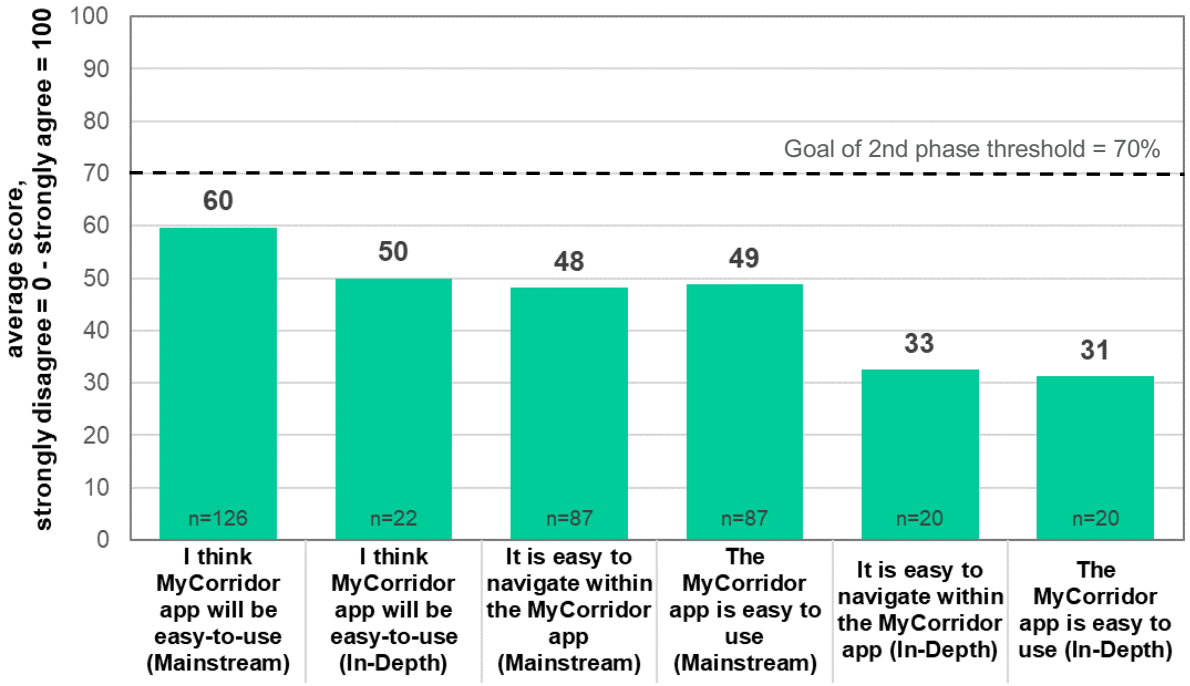


Figure 221: Hypothesis 1 - The MyCorridor platform is easy to use. Overall usability scale for each question

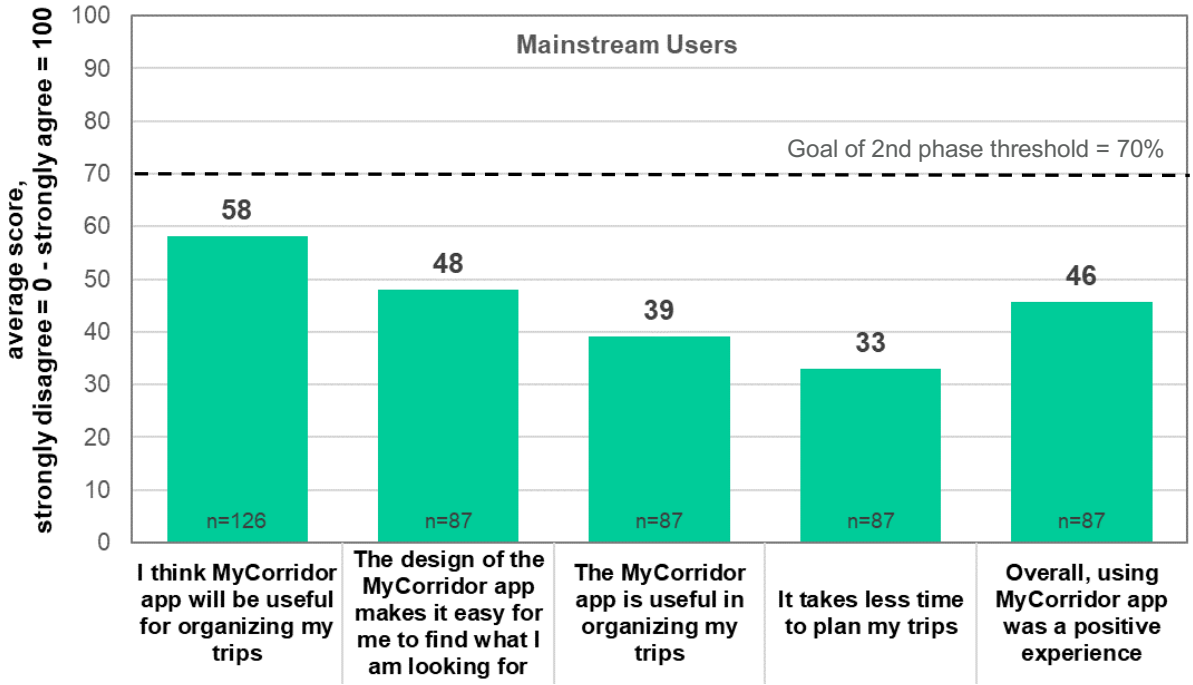


Figure 222: Hypothesis 3 - The MyCorridor platform is usable. Overall usability scale for each specific question for mainstream users.

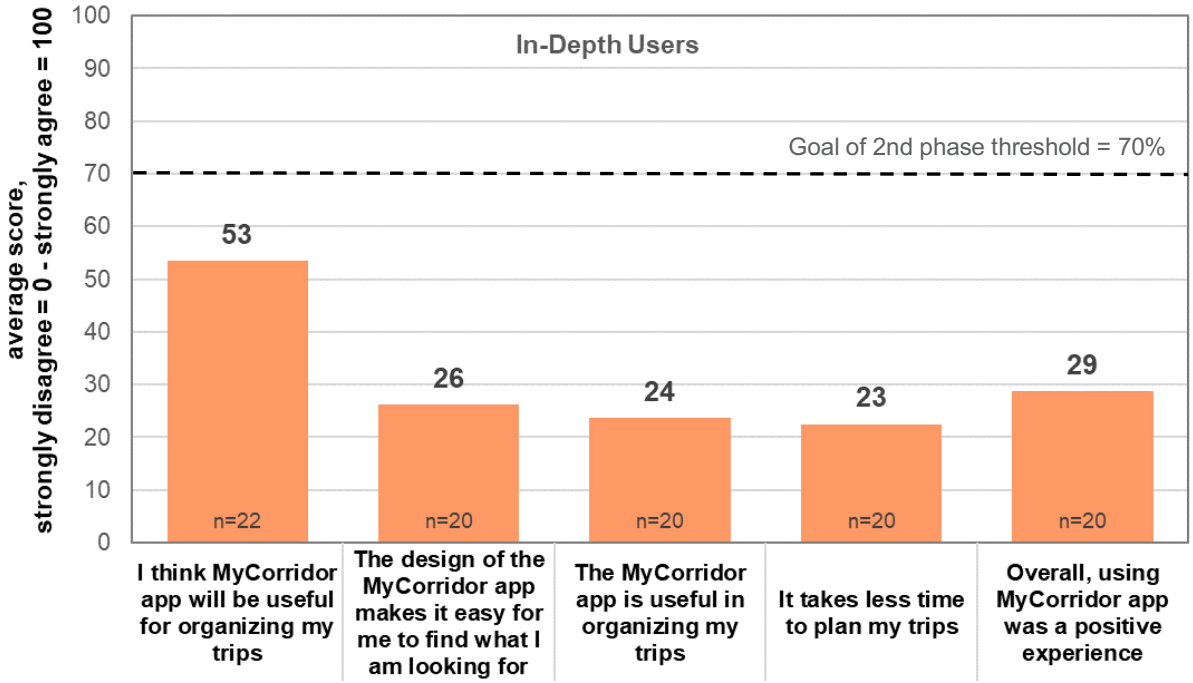


Figure 223: Hypothesis 3 - The MyCorridor platform is usable. Overall usability scale for each specific question for in-depth users

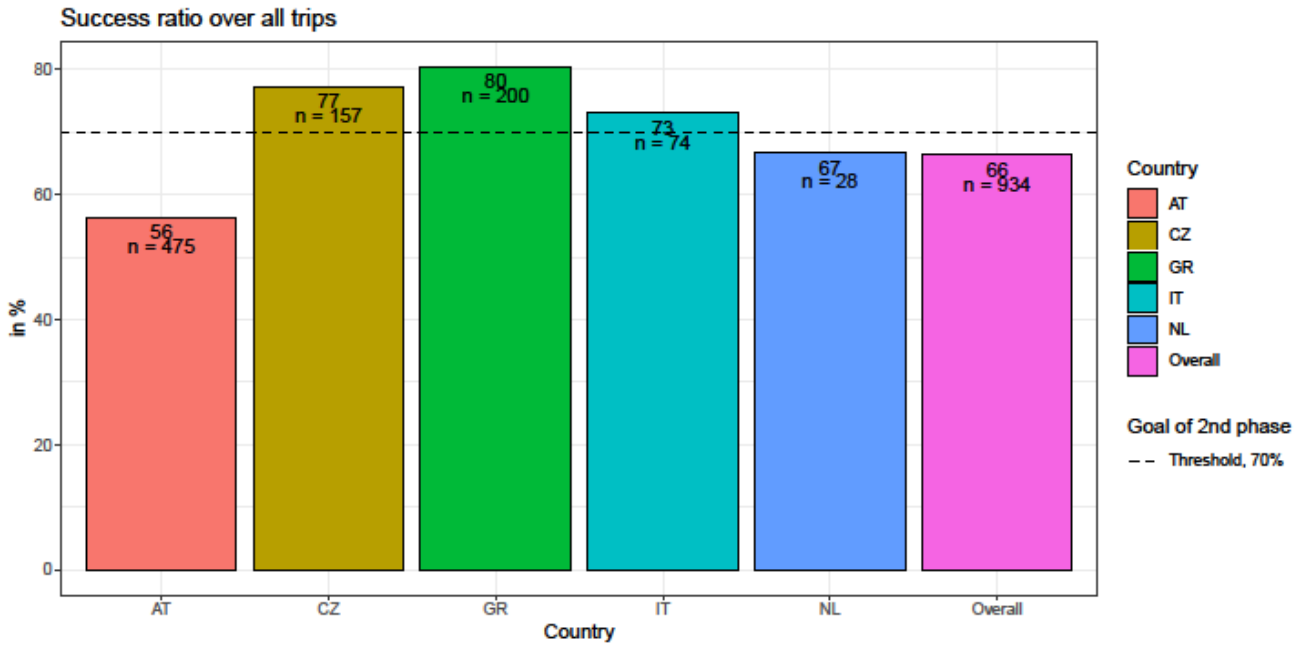


Figure 224: Hypothesis 4 - The travellers are successful in completing the scenarios

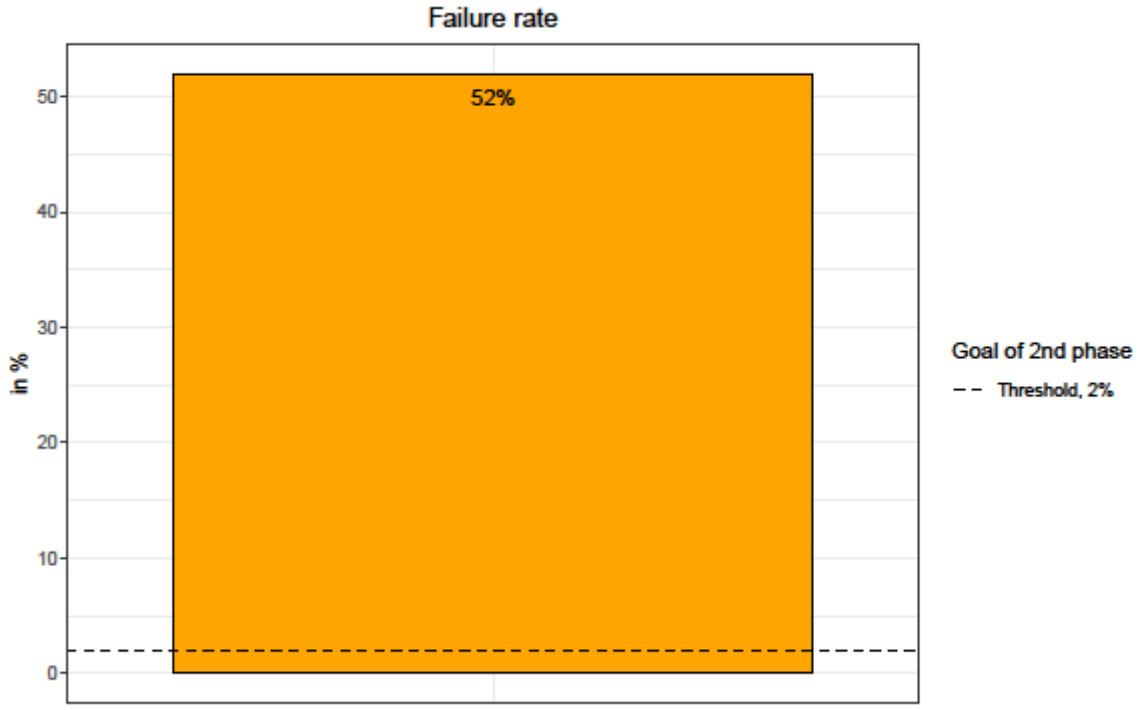


Figure 225: Hypothesis 4 - Personalisation of offered services is effective: Failure rate

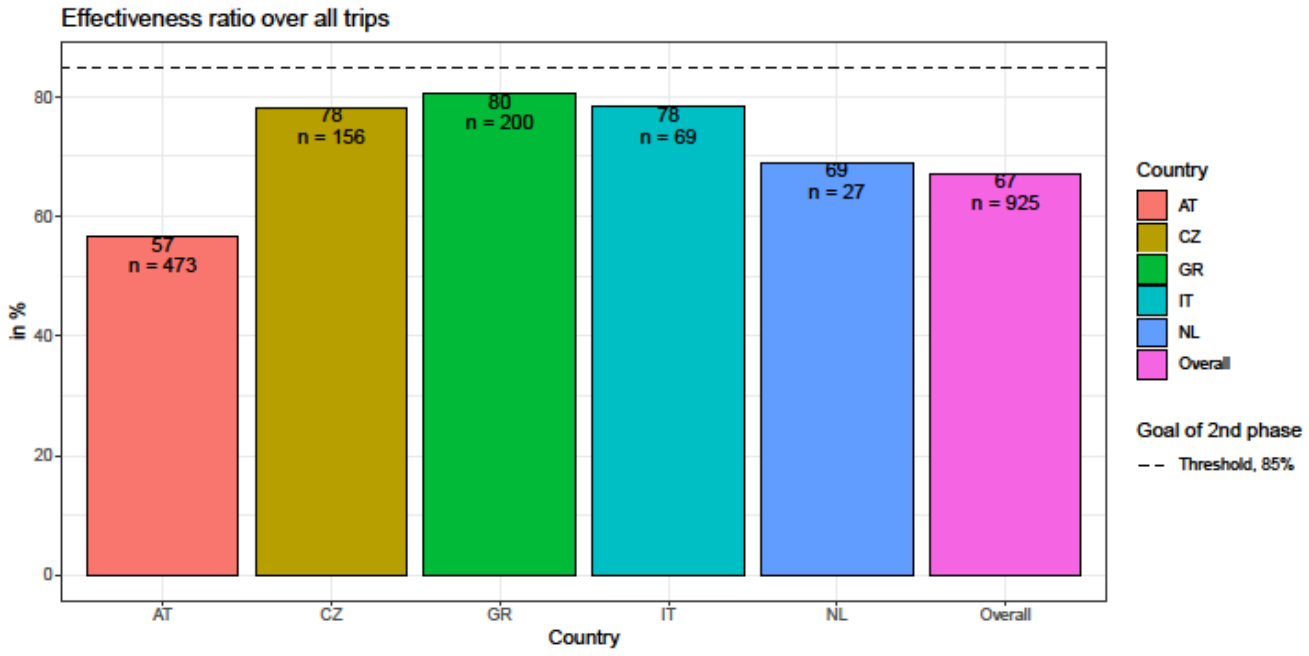


Figure 226: Hypothesis 5 - Personalisation of offered services is effective: Effectiveness

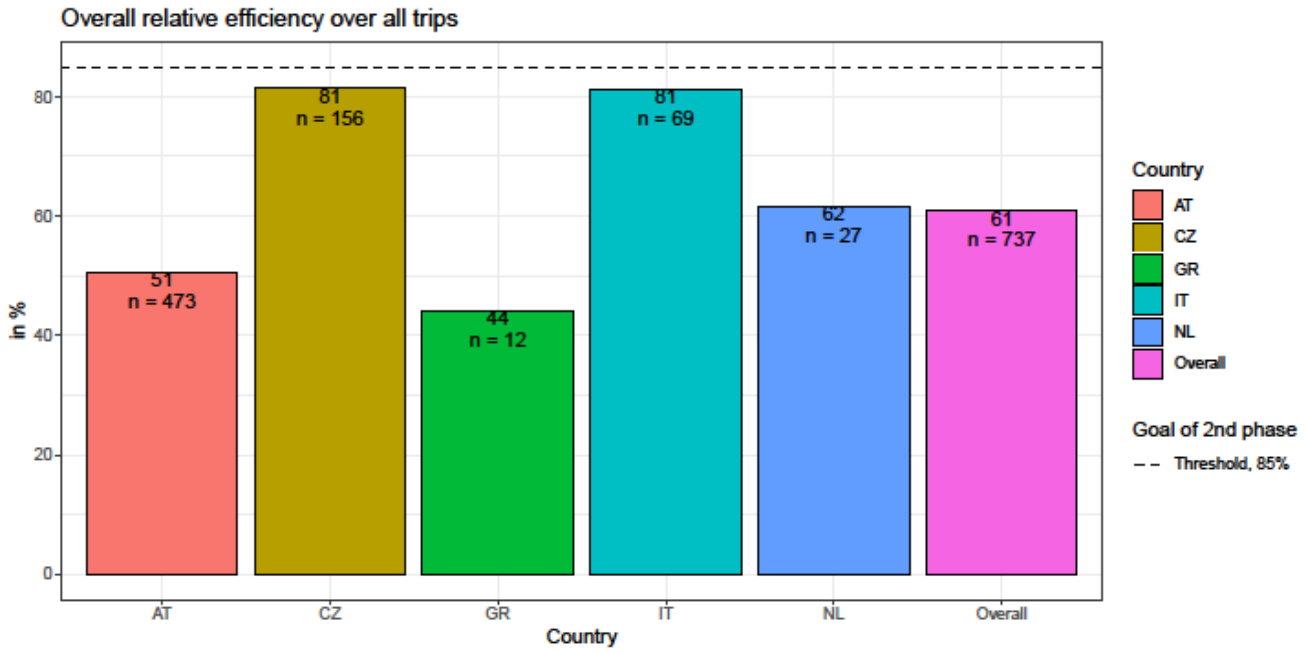


Figure 227: Hypothesis 5 - Personalisation of offered services is effective: Overall relative efficiency

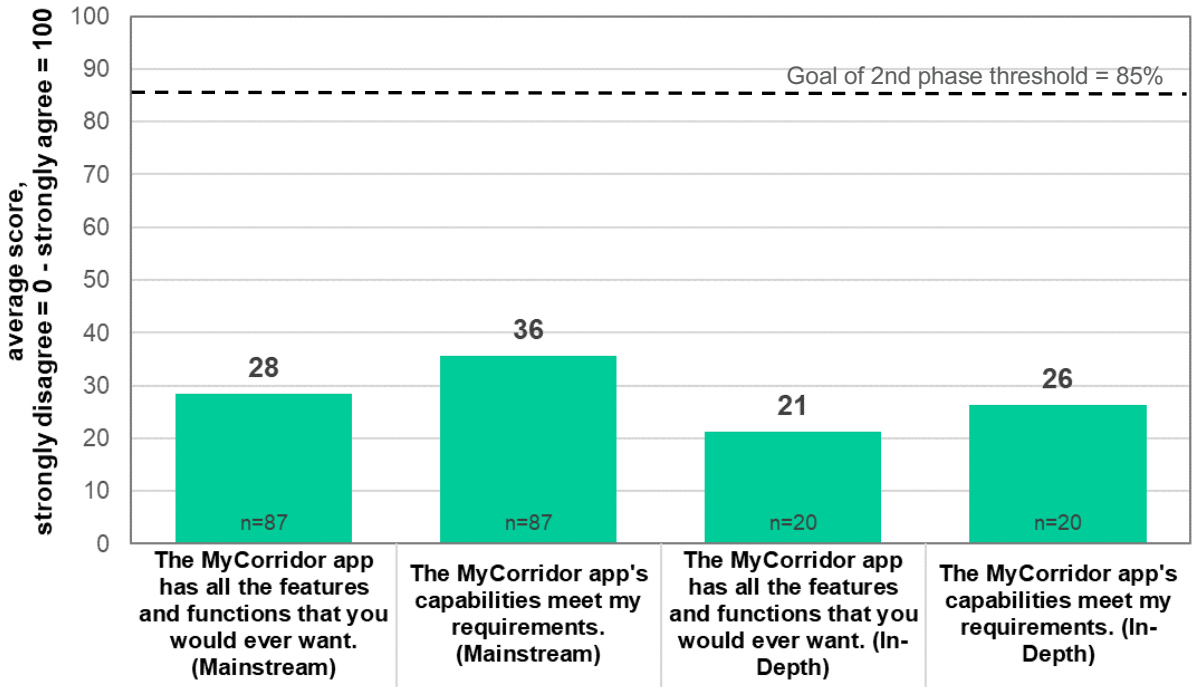


Figure 228: Hypothesis 5 - Personalisation of offered services is effective: highly tailored to the needs of respondents

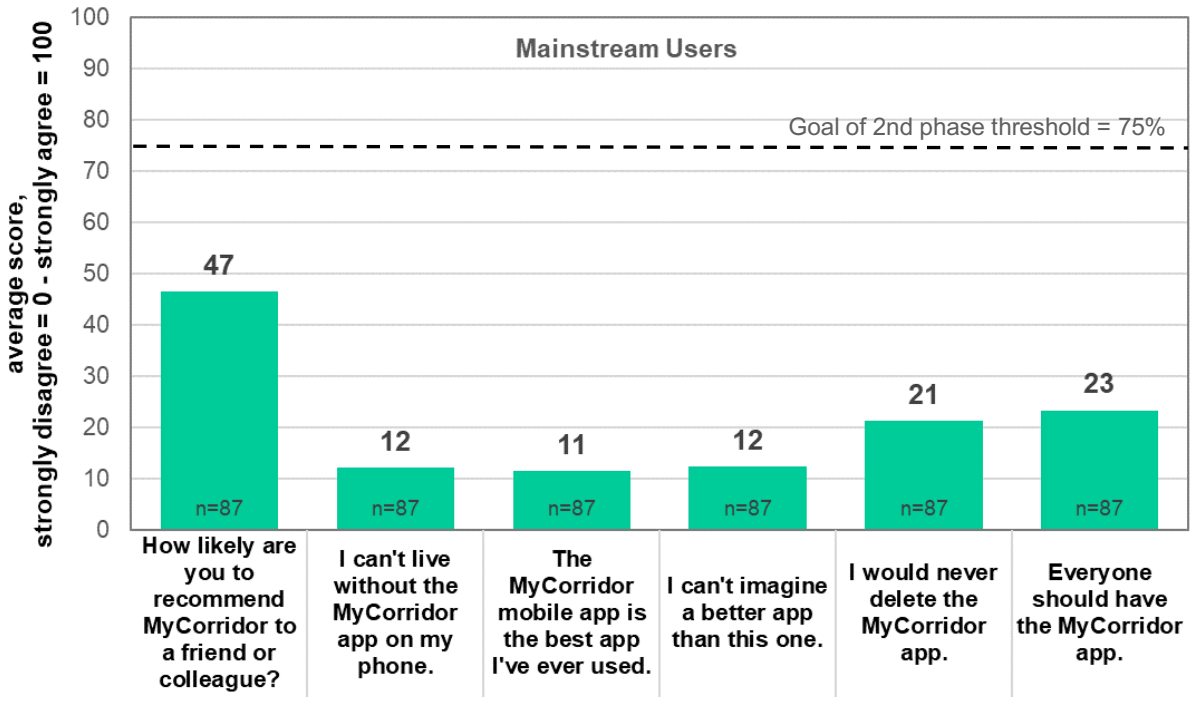


Figure 229: Hypothesis 6 - Travellers are positive towards MaaS technologies. Acceptance (mainstream users)

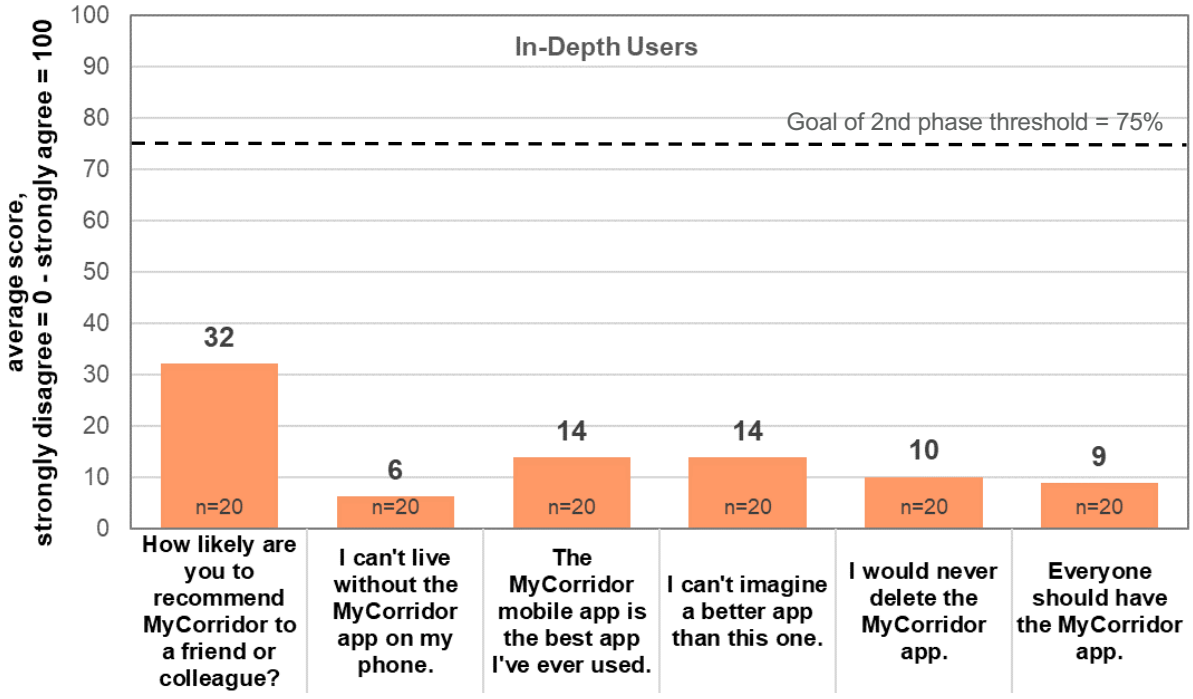


Figure 230: Hypothesis 6 - Travellers are positive towards MaaS technologies. Acceptance (in-depth users)

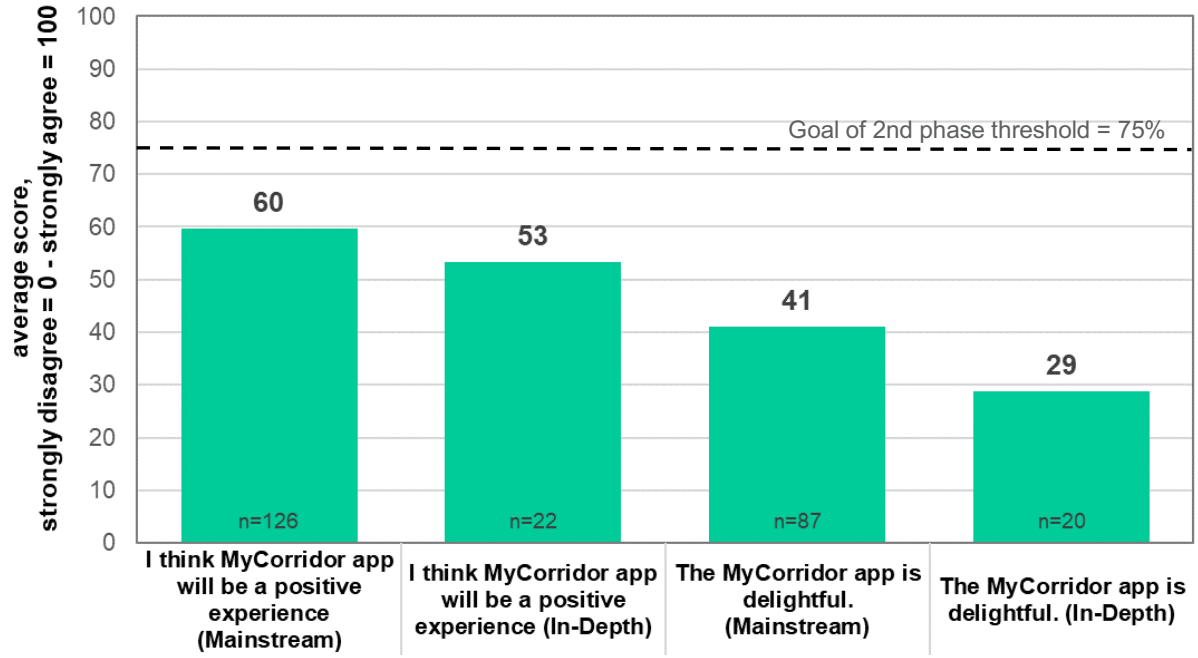


Figure 231: Hypothesis 6 - Travellers are positive towards MaaS technologies. Attitude

1.2.6 Results from the online diaries

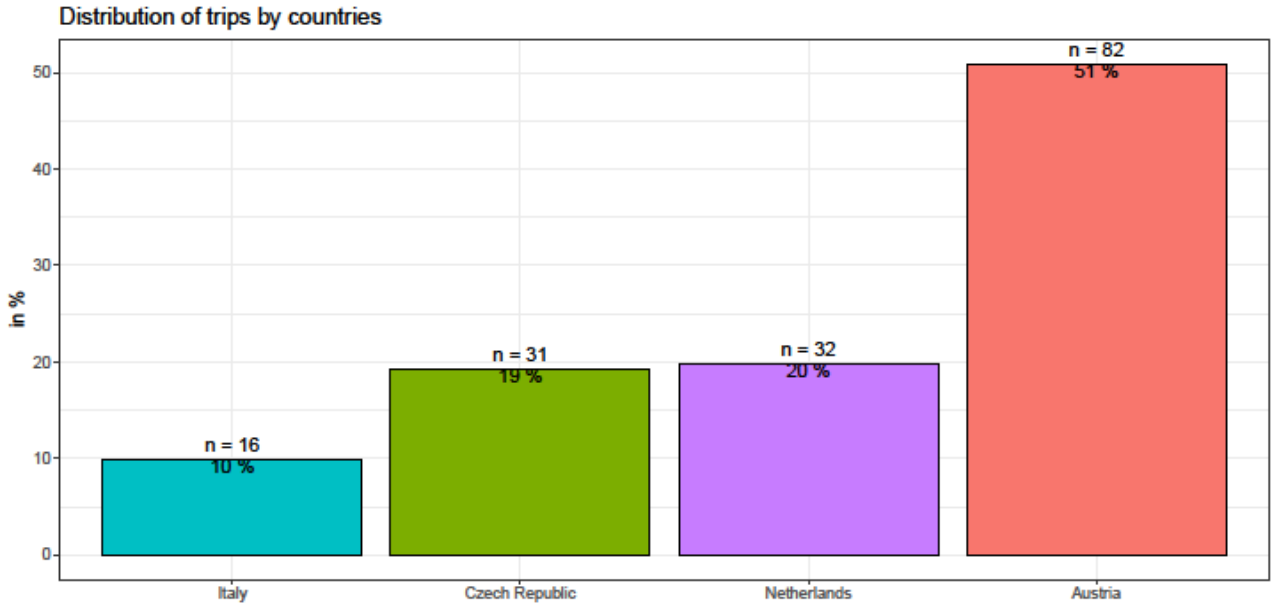


Figure 232: Results online diaries - Distribution of trips by countries

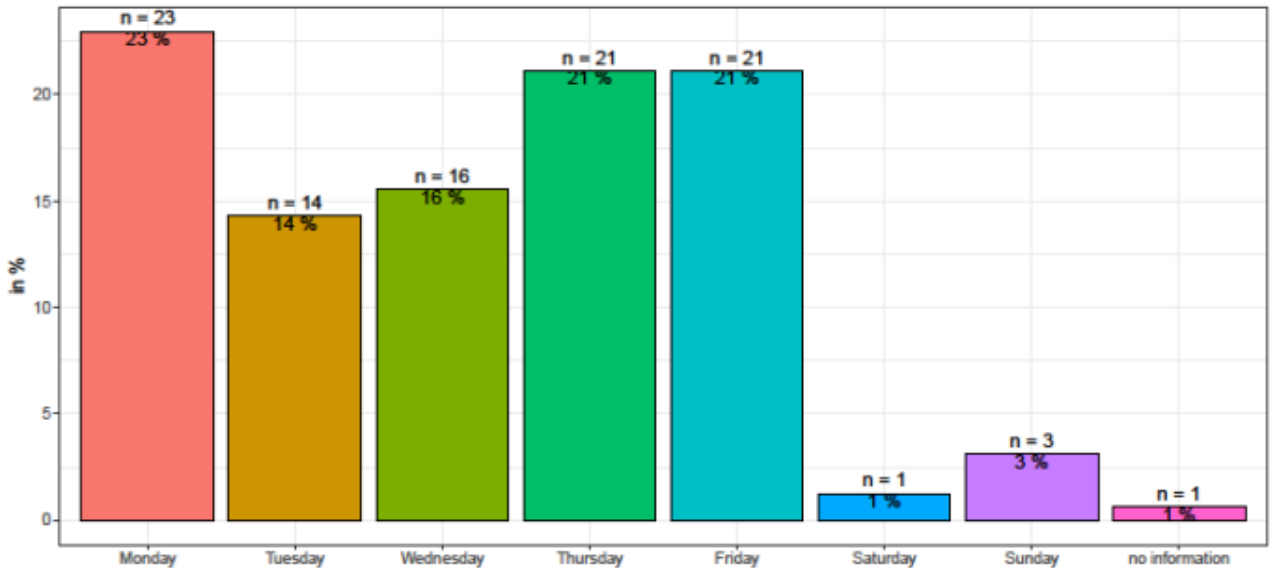


Figure 233: Results online diaries - Distribution of trips by weekdays

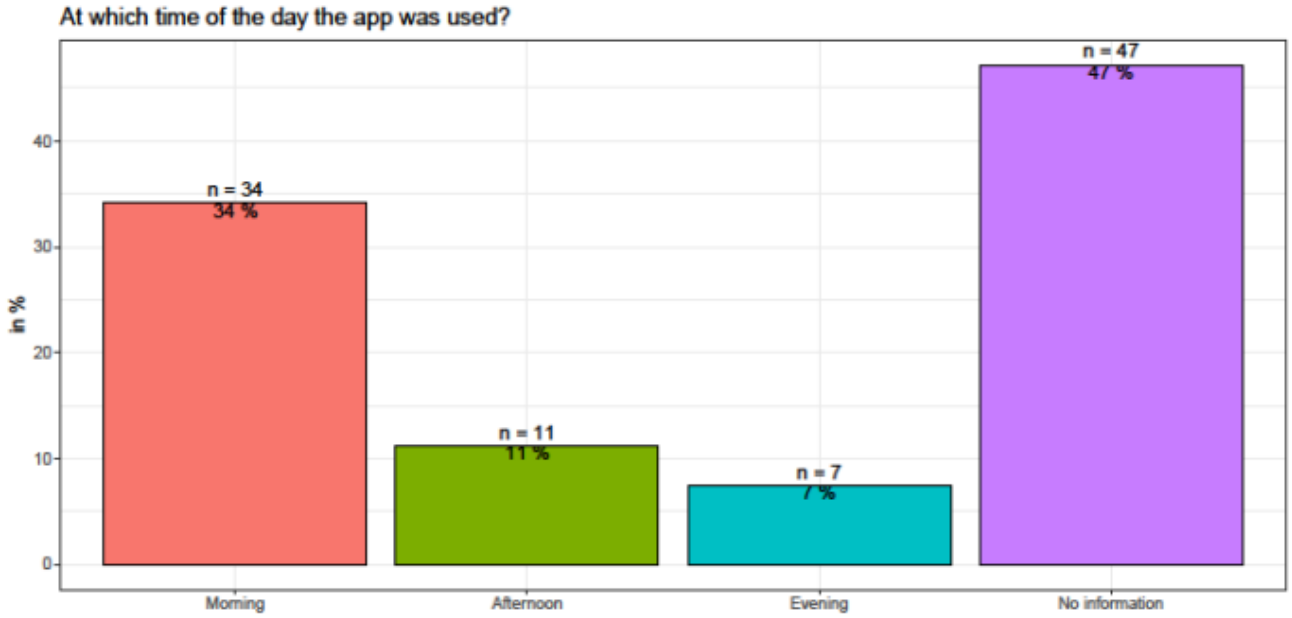


Figure 234: Results online diaries - Distribution of trips by time of the day

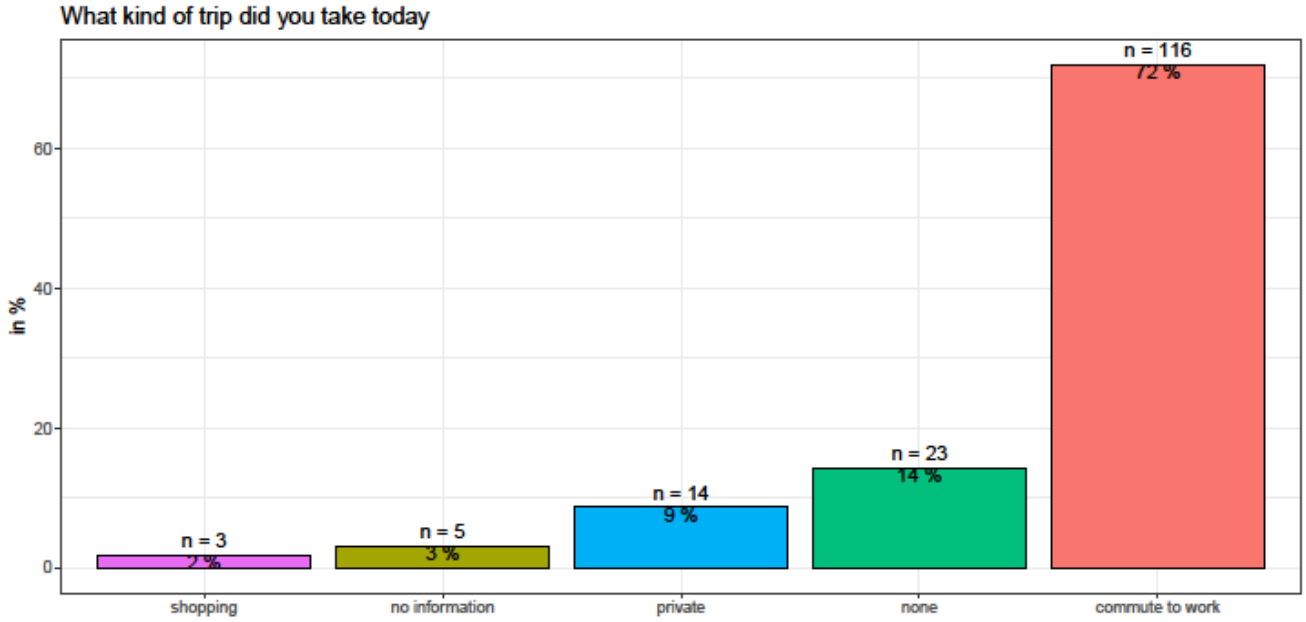


Figure 235: Results online diaries - What kind of trip did you take today

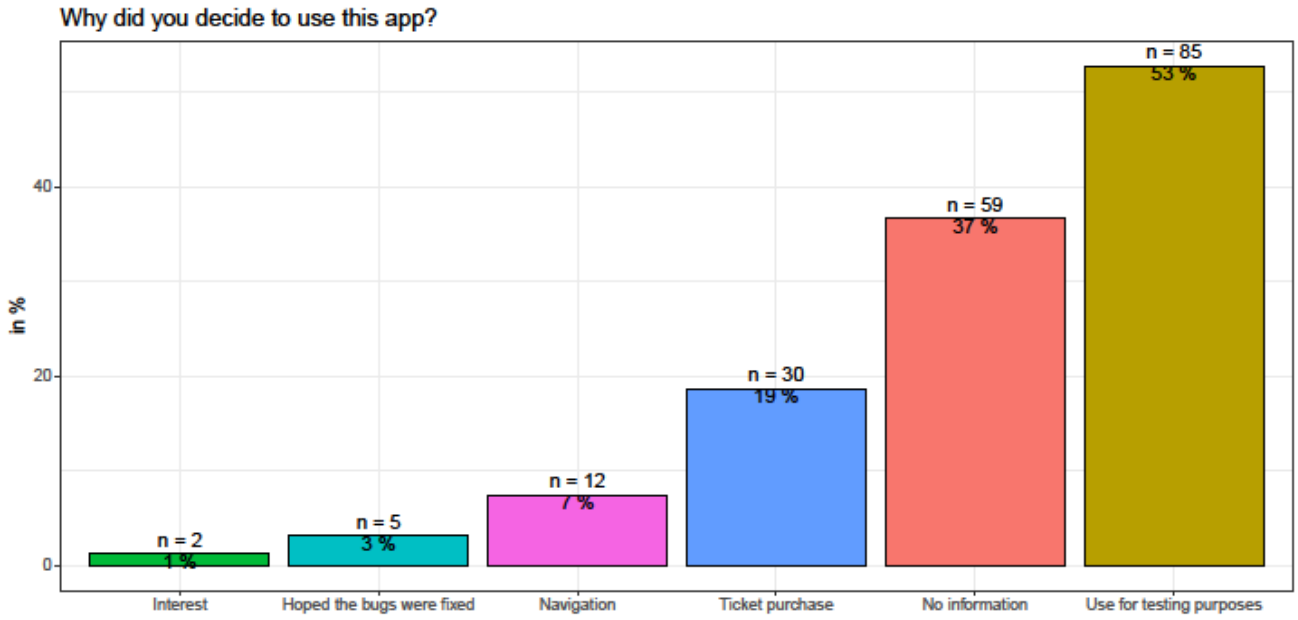


Figure 236: Results online diaries - Why did you decide to use this app?

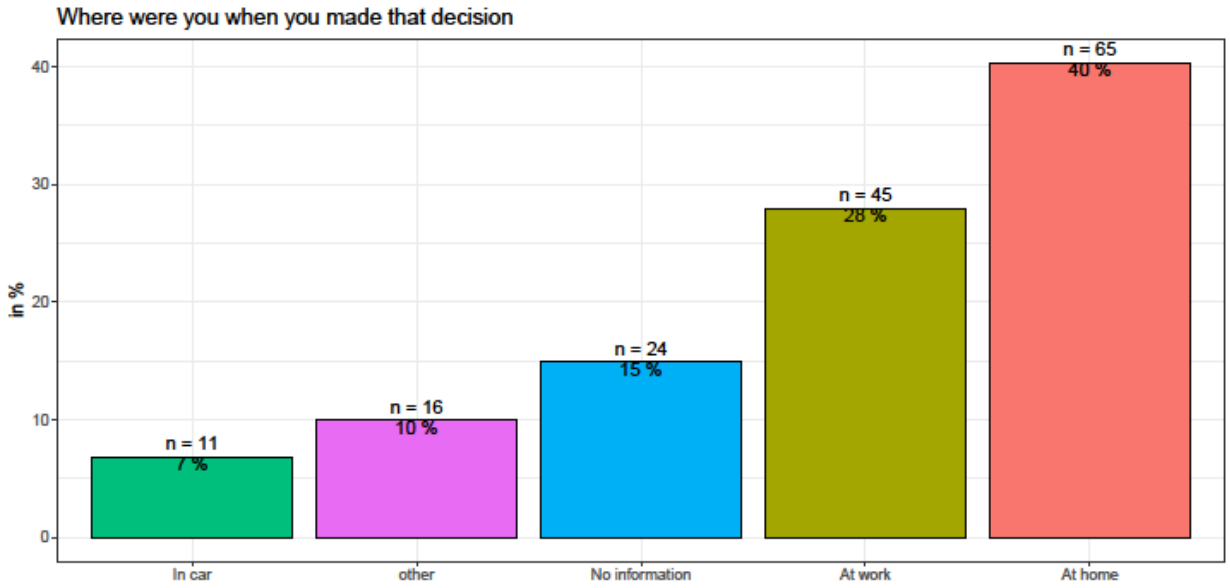


Figure 237: Results of diaries - Where were you when you made that decision?

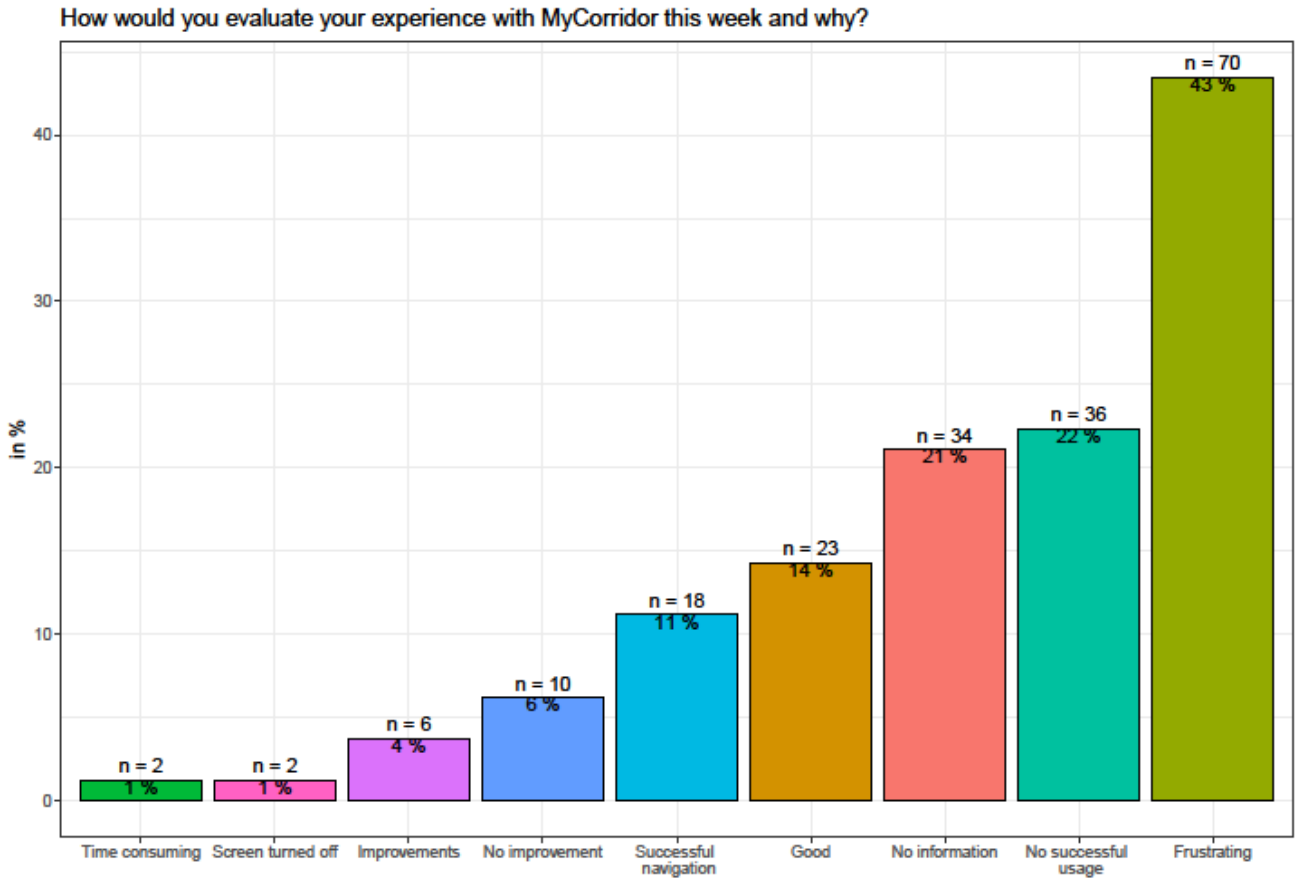


Figure 238: Results of diaries - How would you evaluate your experience with MyCorridor this week

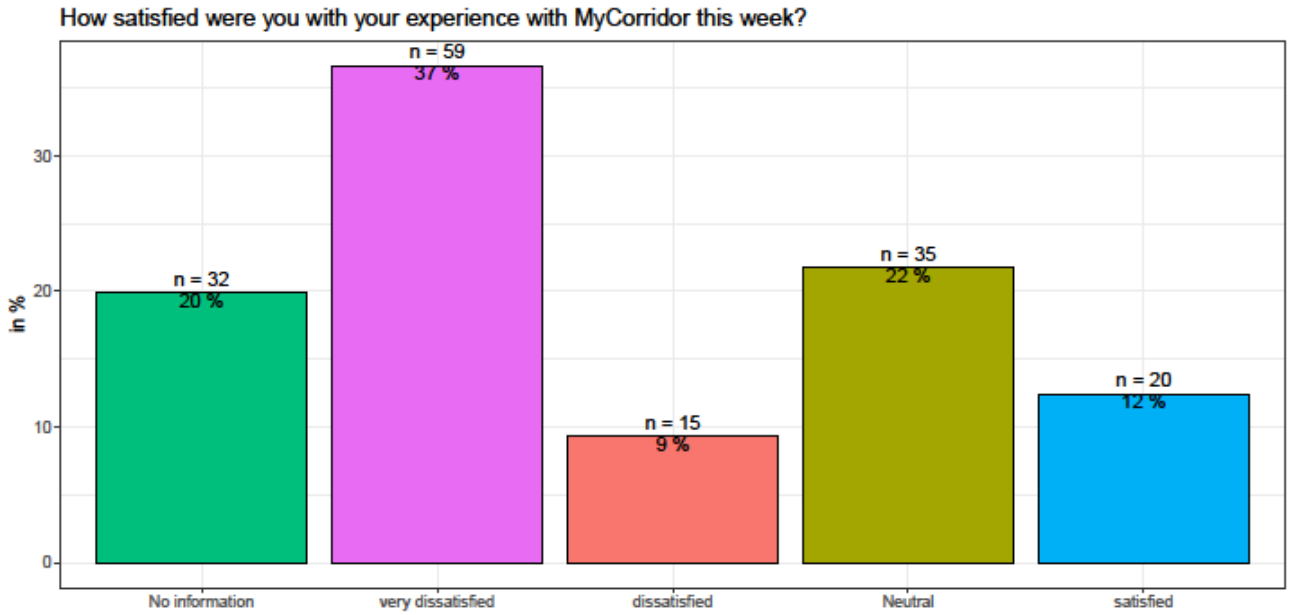


Figure 239: Results of diaries - How satisfied were you with your experience with MyCorridor this week?

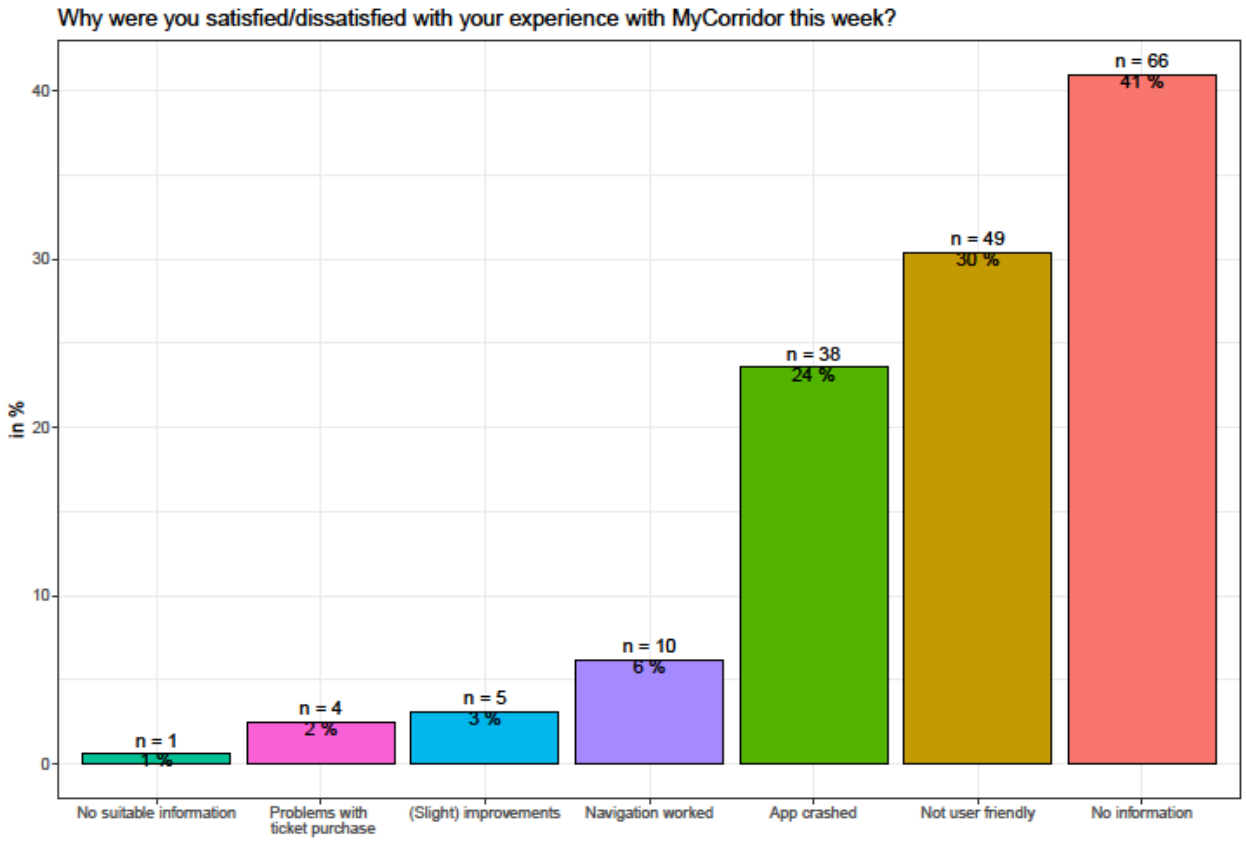


Figure 240: Results of diaries - Why were you satisfied/dissatisfied with your experience with MyCorridor this week?

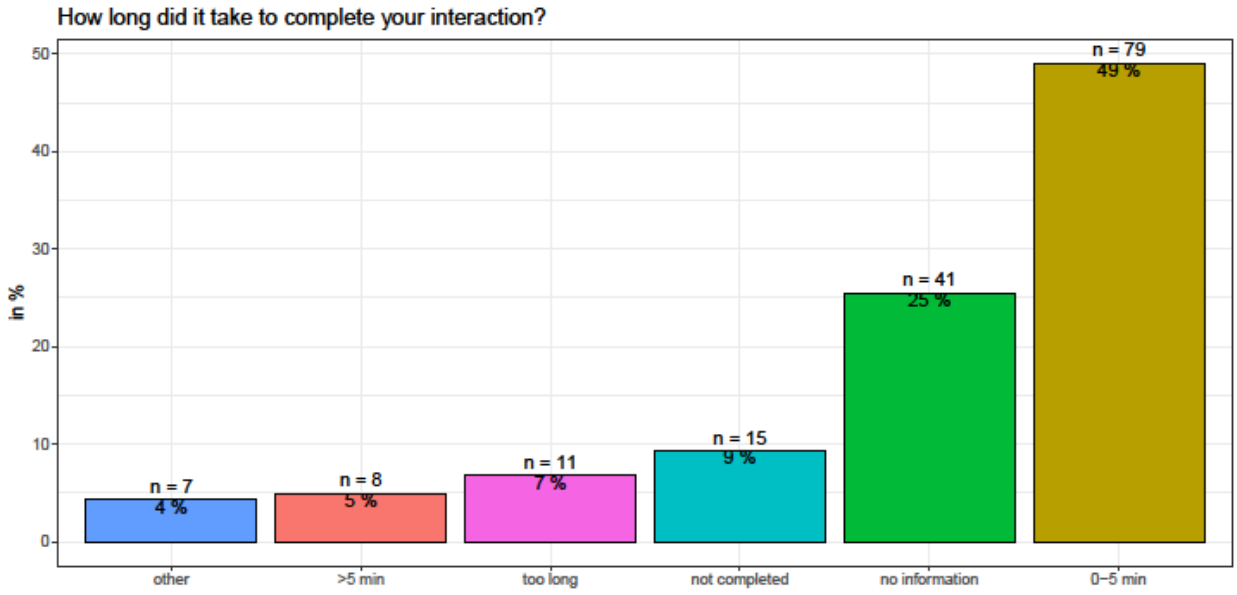


Figure 241: Results of diaries - How long did it take to complete your interaction?

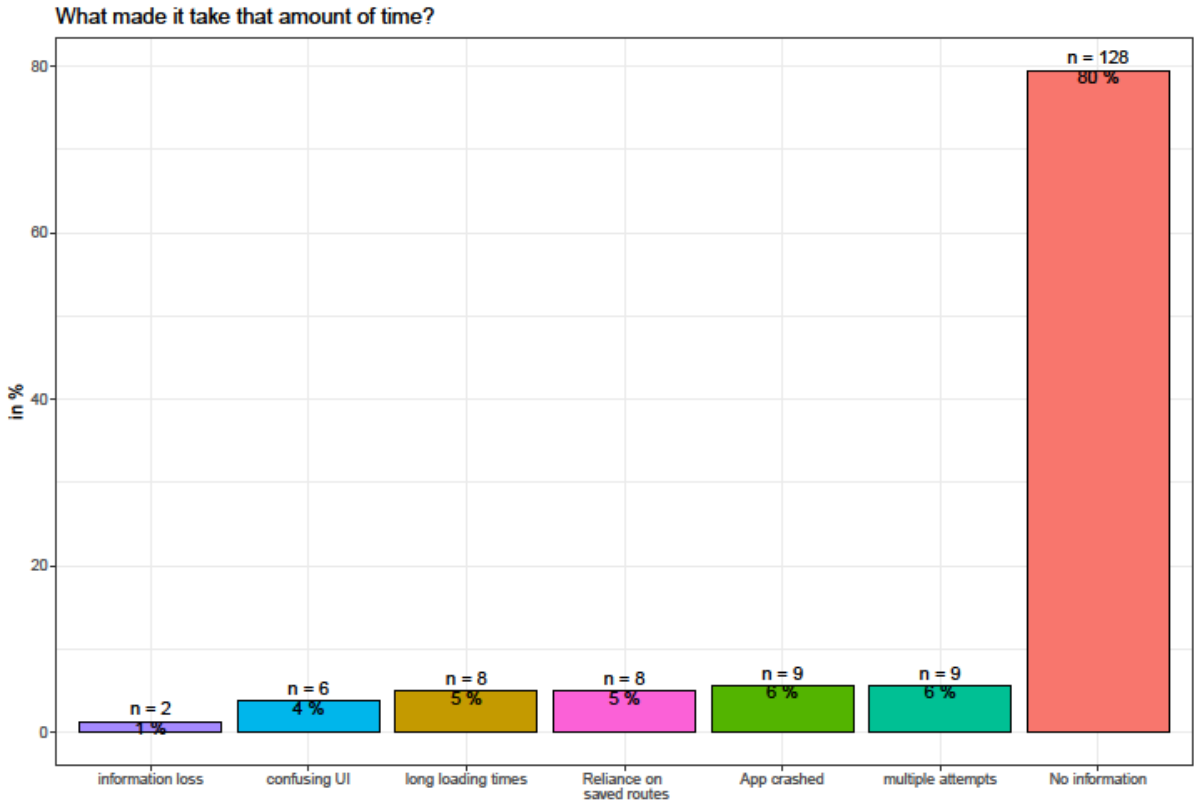


Figure 242: Results of diaries - What made it take that amount of time?

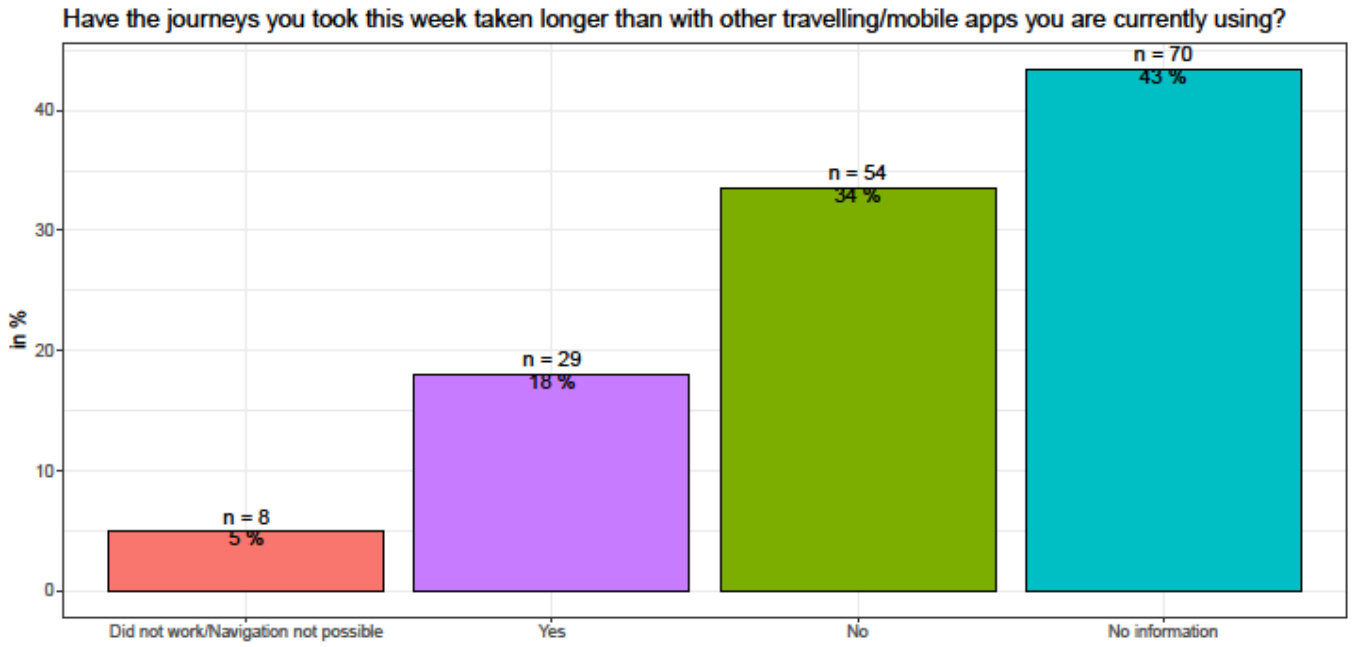


Figure 243: Results of diaries - Have the journeys you took this week taken longer than with other travelling /mobile apps you are currently using?

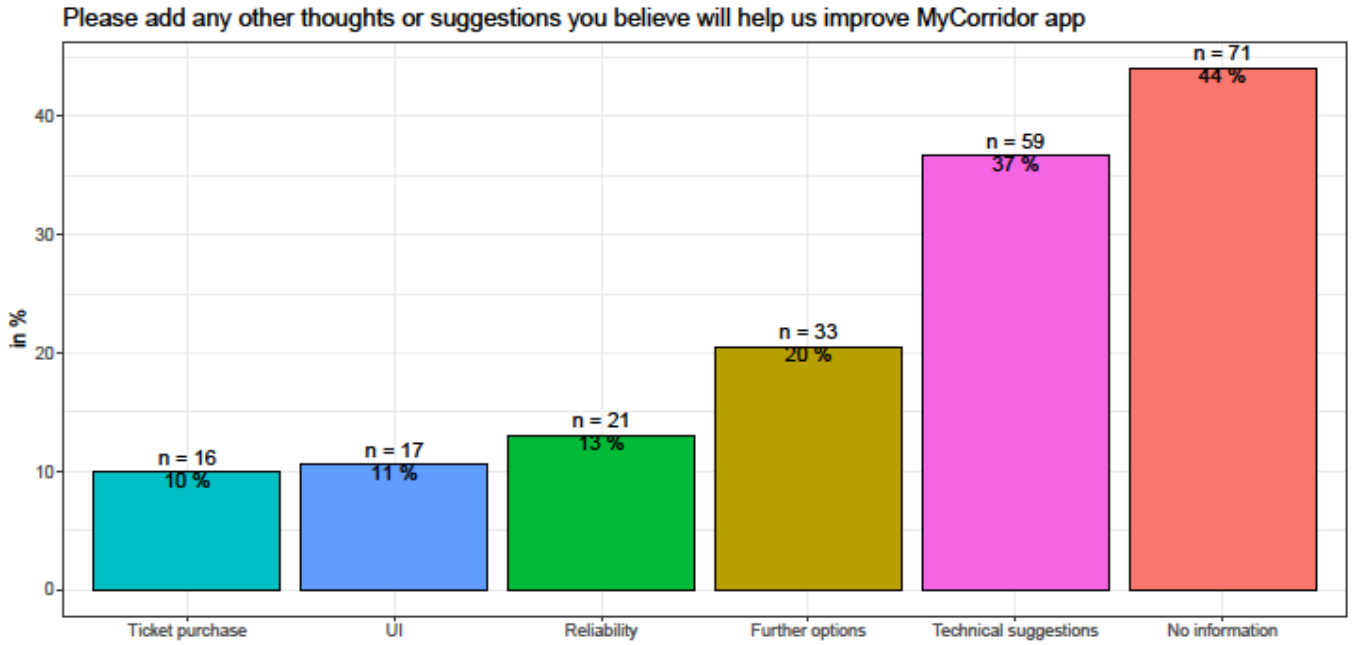


Figure 244: Results of diaries - Please add any other thoughts or suggestions you believe will help us improve MyCorridor

1.2.7 Evaluation results from the service providers - Answering the hypotheses

Hypothesis 1

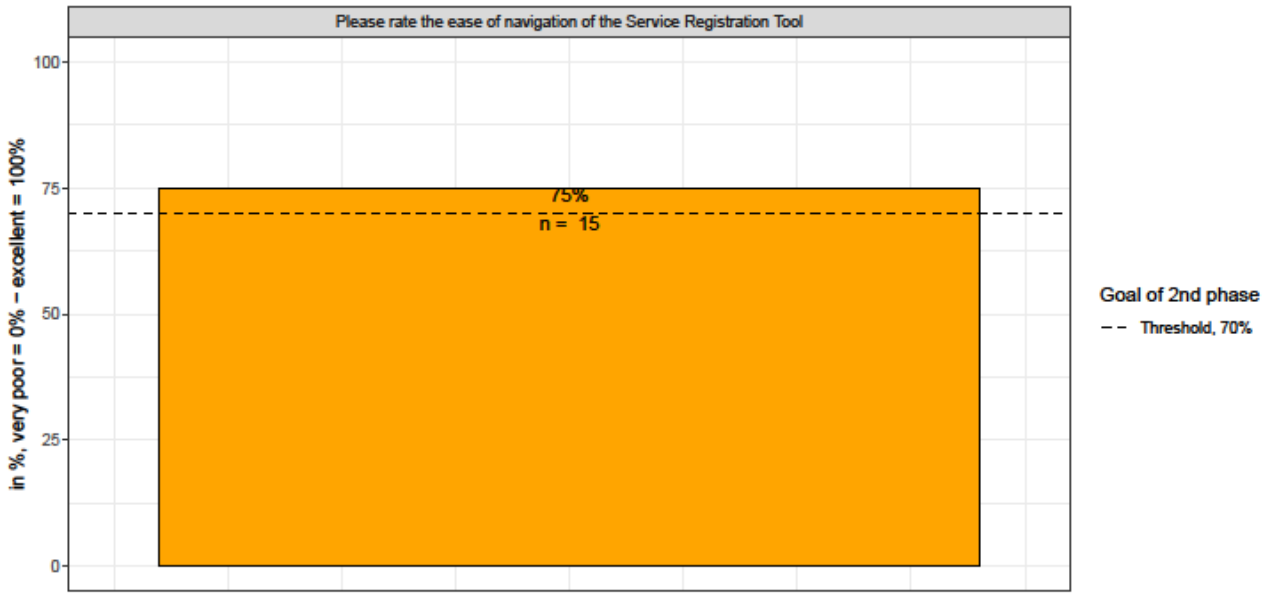


Figure 245: Service Providers 2. Pilot - Hypothesis 1: The Service Registration Tool is easy to use I

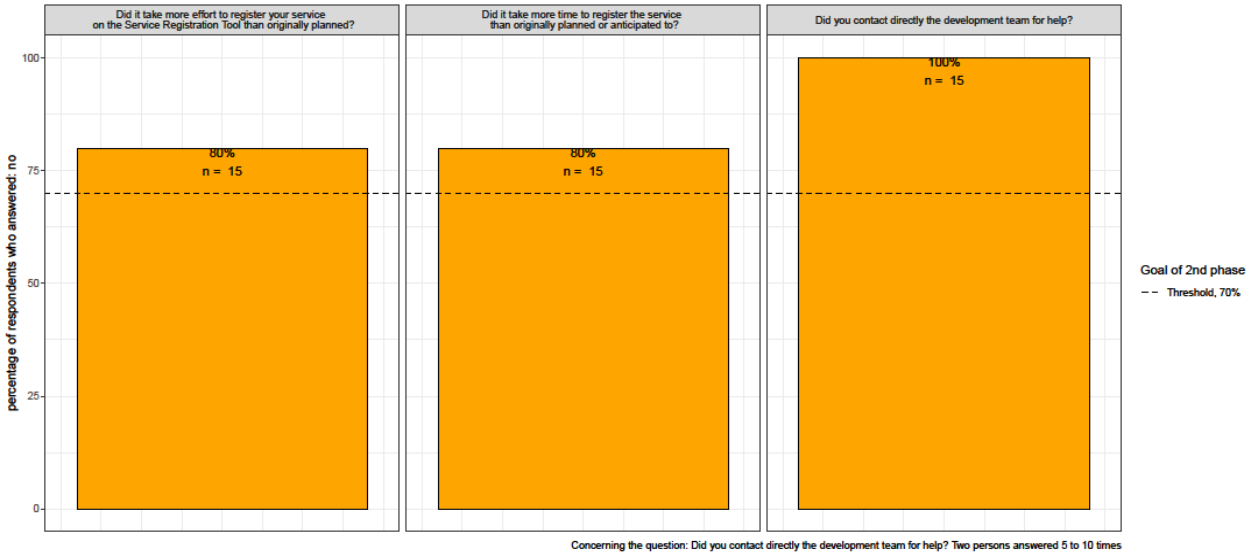


Figure 246: Service Providers 2. Pilot - Hypothesis 1: The Service Registration Tool is easy to use II

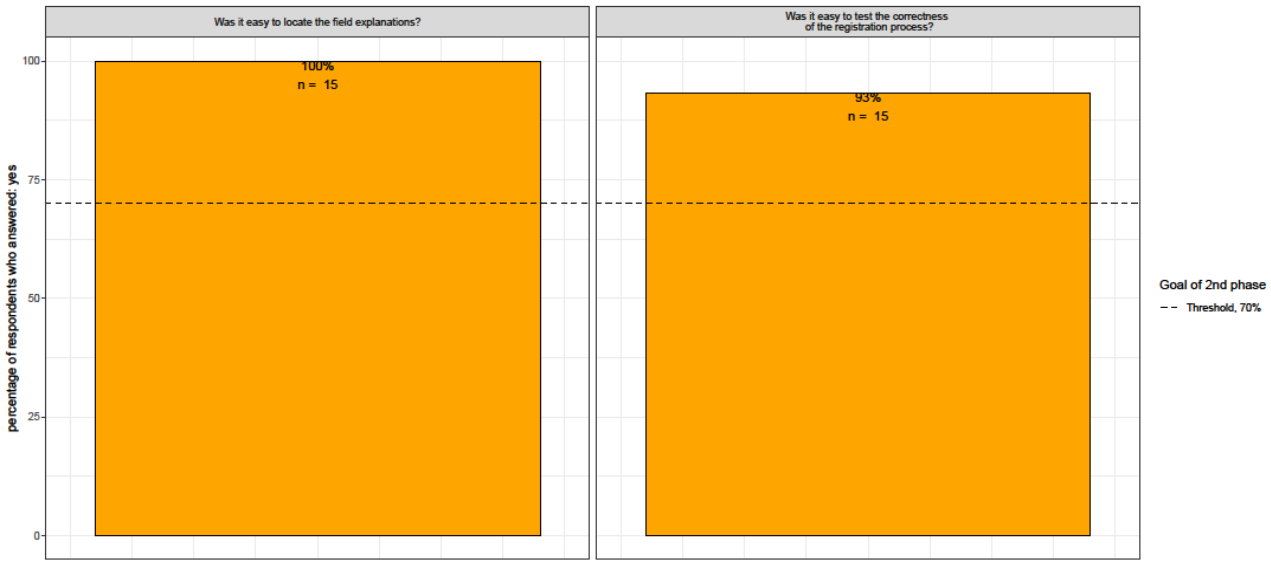


Figure 247: Service Providers 2. Pilot - Hypothesis 1: The Service Registration Tool is easy to use III

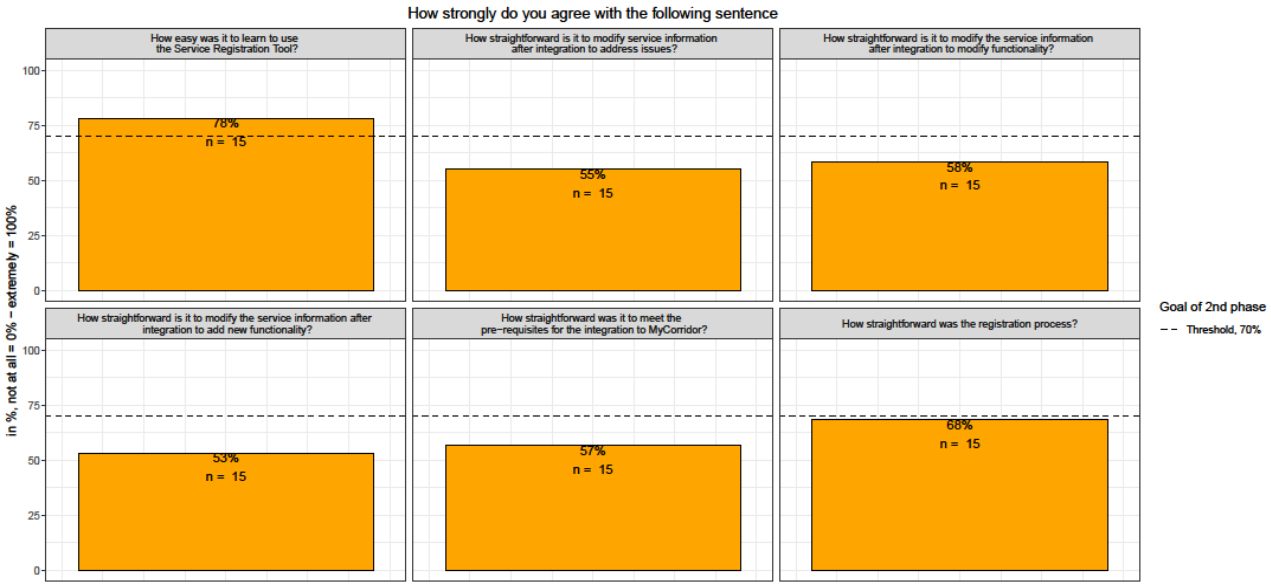


Figure 248: Service Providers 2. Pilot - Hypothesis 1: The Service Registration Tool is easy to use IV

Figure 249: Service Providers 2. Pilot - Hypothesis 1: The Service Registration Tool is easy to use V

Hypothesis 2

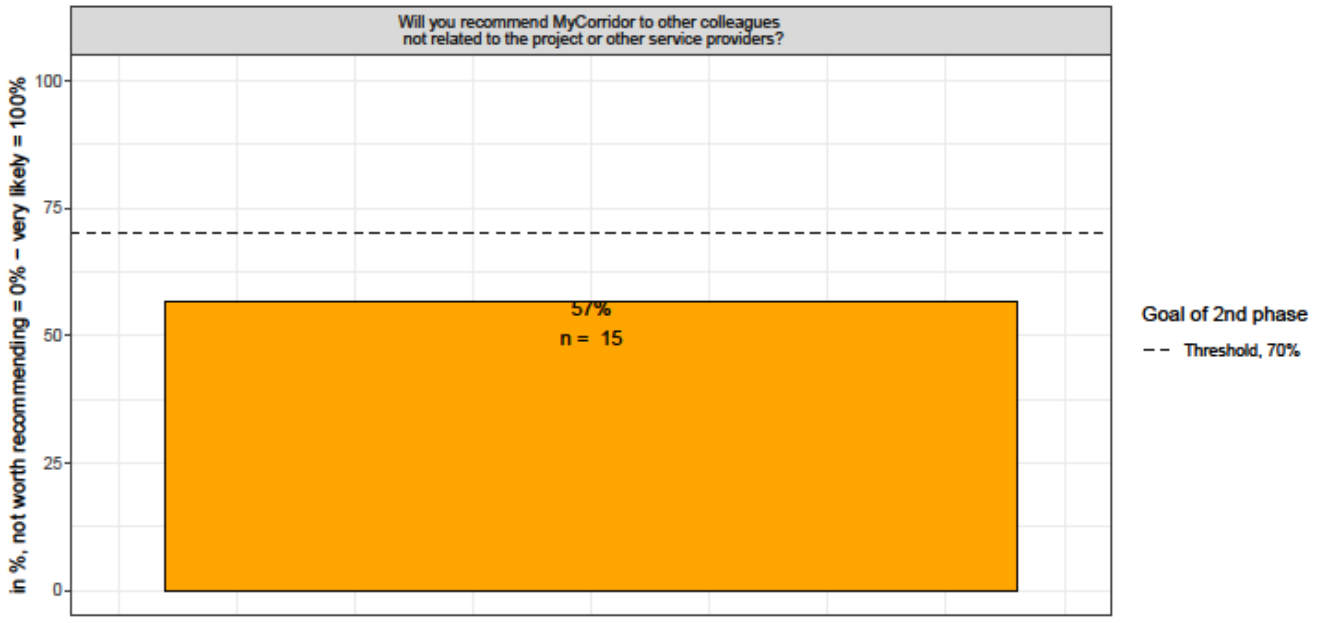


Figure 250: Service Providers 2. Pilot - Hypothesis 2: The Service Registration Tool is useful I

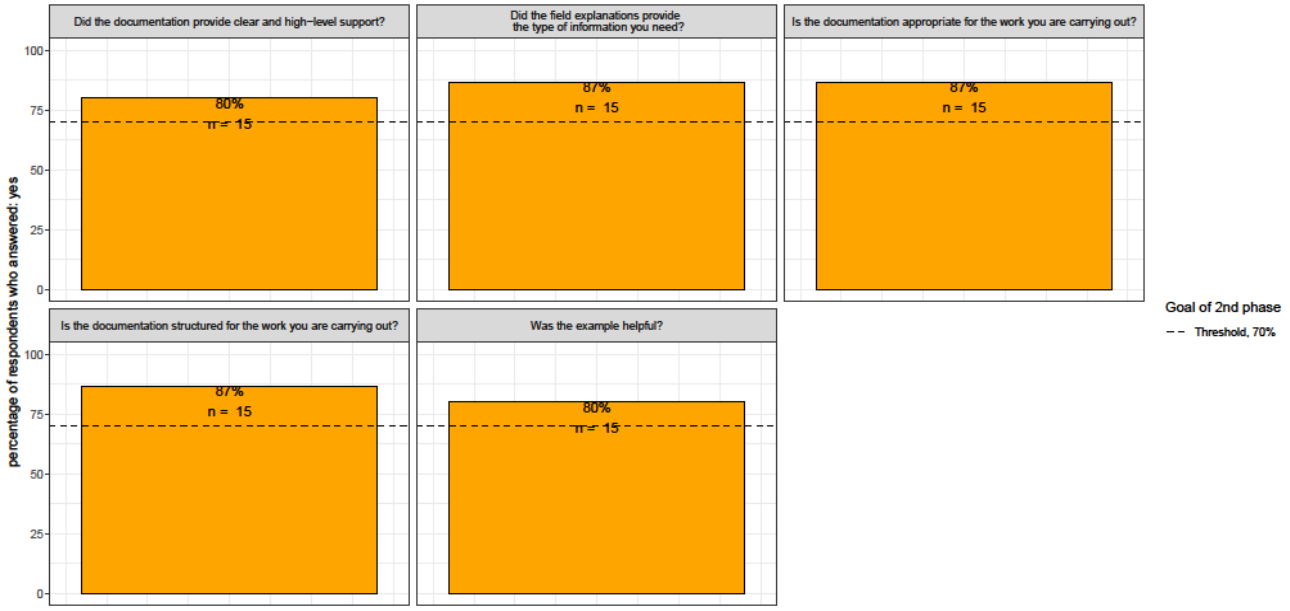


Figure 251: Service Providers 2. Pilot - Hypothesis 2: The Service Registration Tool is useful II

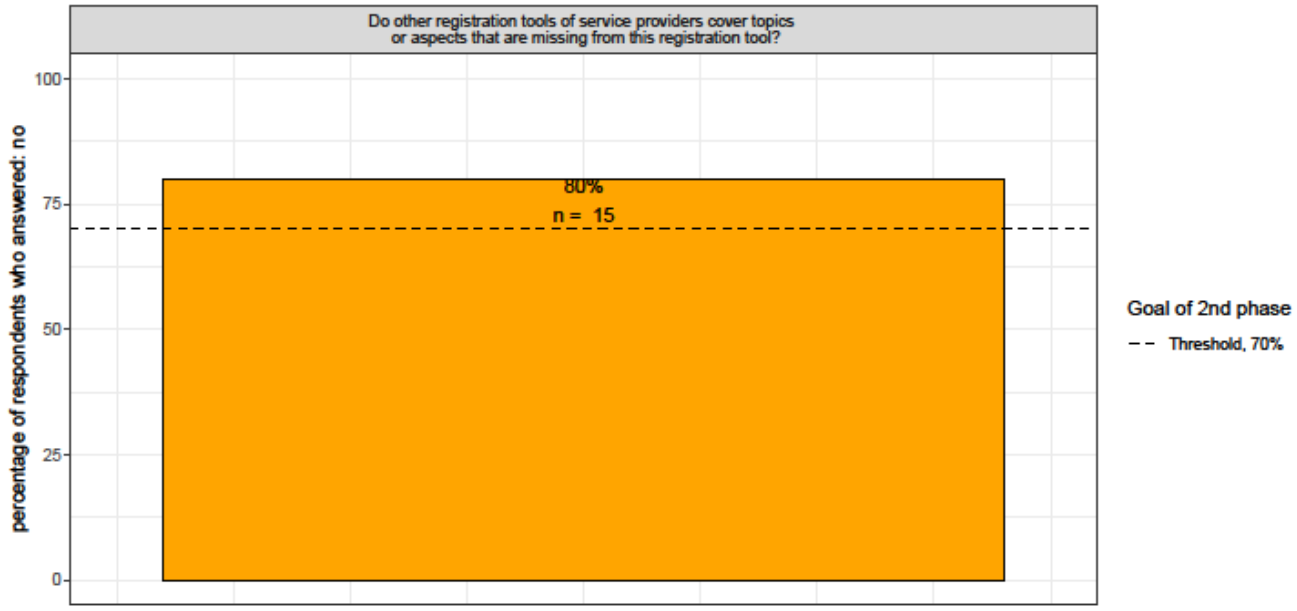


Figure 252: Service Providers 2. Pilot - Hypothesis 2: The Service Registration Tool is useful III

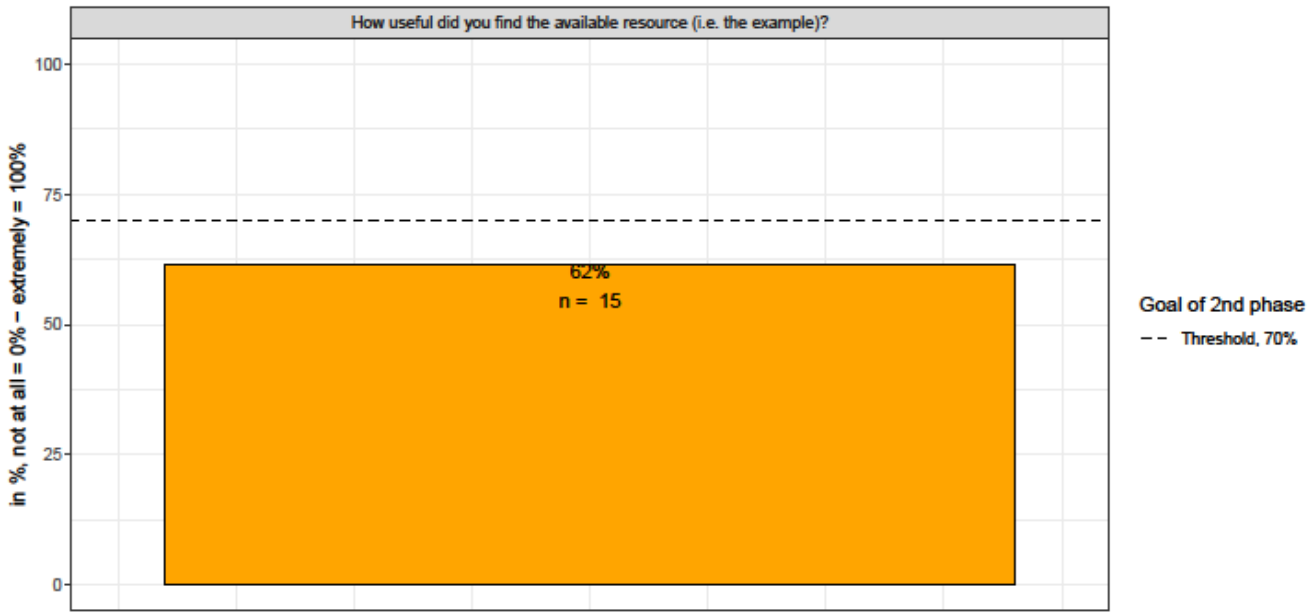


Figure 253: Service Providers 2. Pilot - Hypothesis 2: The Service Registration Tool is useful IV

Hypothesis 3

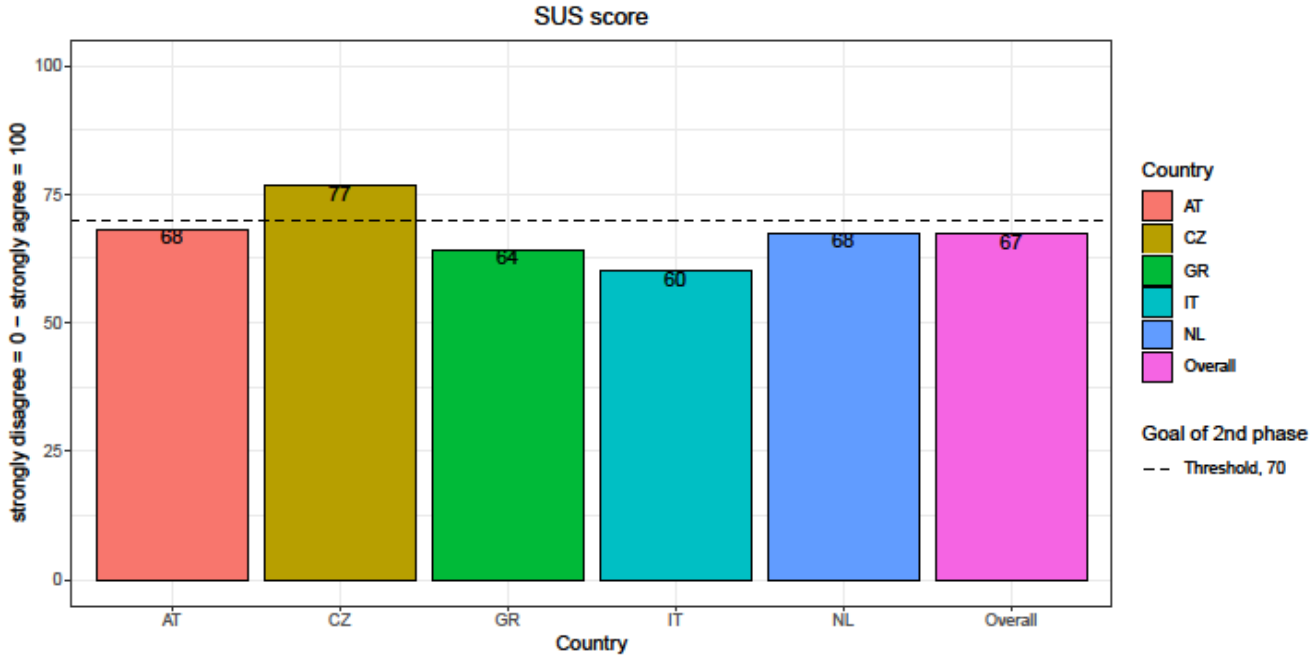


Figure 254: Service Providers 2. Pilot - Hypothesis 3: The Service Registration Tool is usable

Hypothesis 4

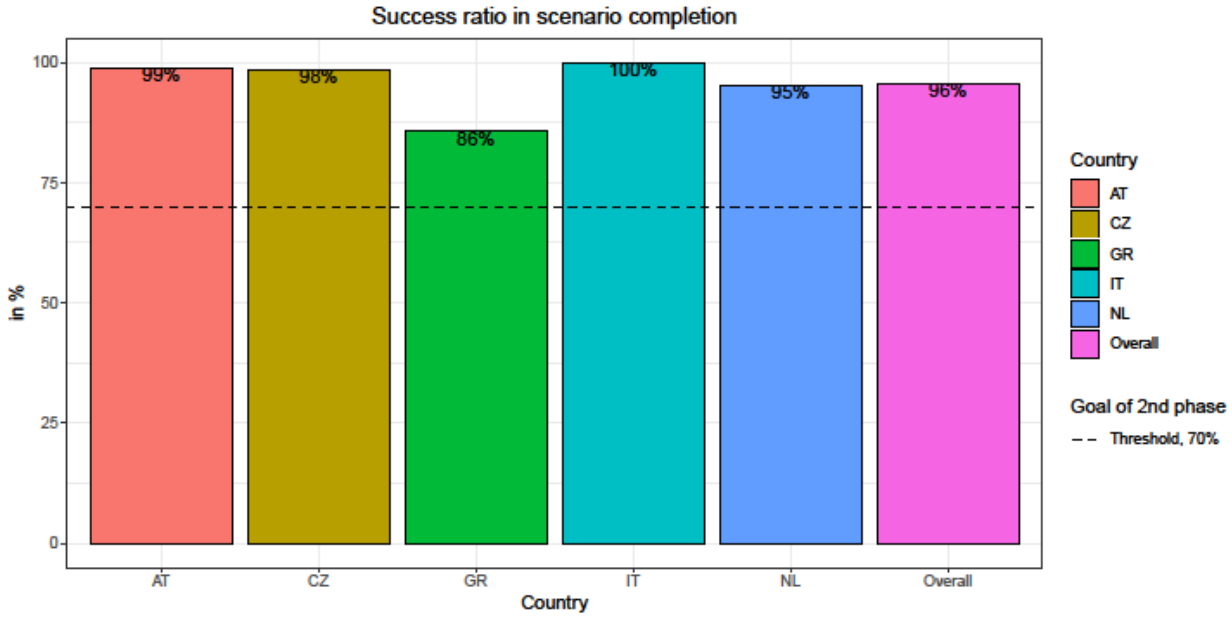


Figure 255: Service Providers 2. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Success ratio in scenario completion.

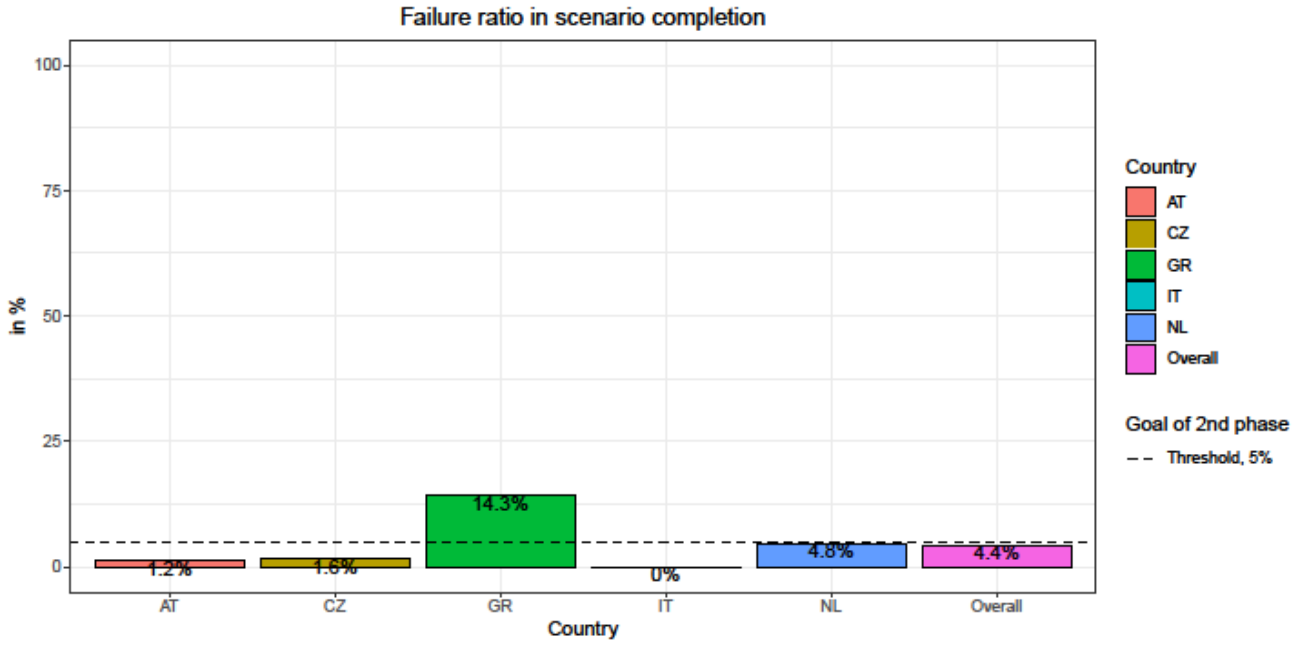


Figure 256: Service Providers 2. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Failure ratio in scenario completion.

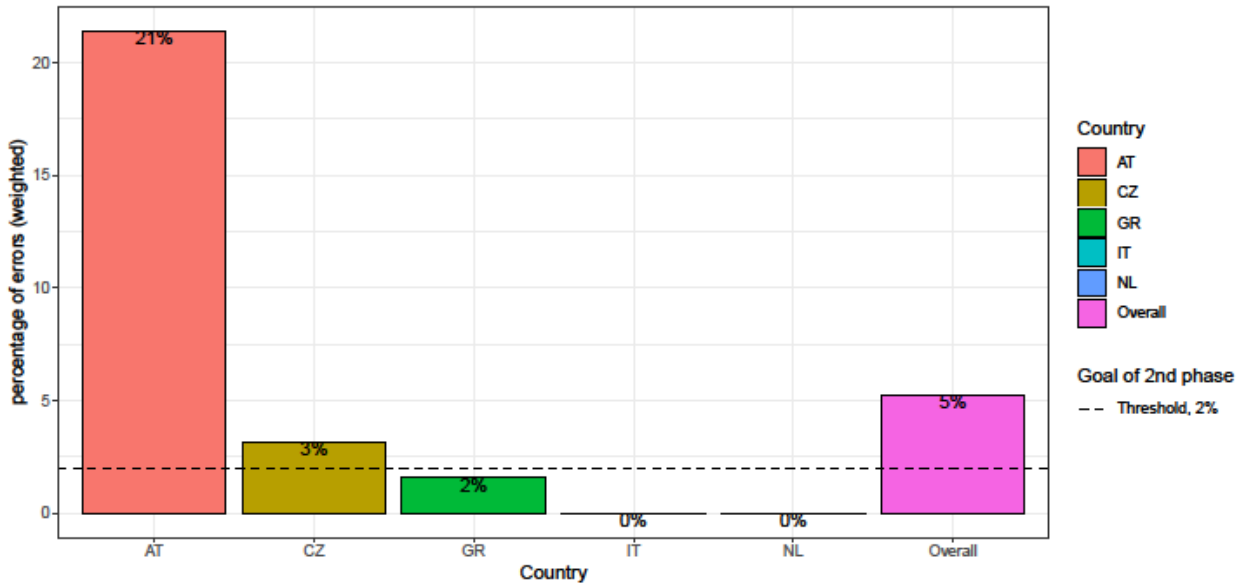


Figure 257: Service Providers 2. Pilot - Hypothesis 4: The service providers are successful in completing the registration process. Error percentage. Errors are weighted by severity (High = 3, Moderate = 2, Low = 1)

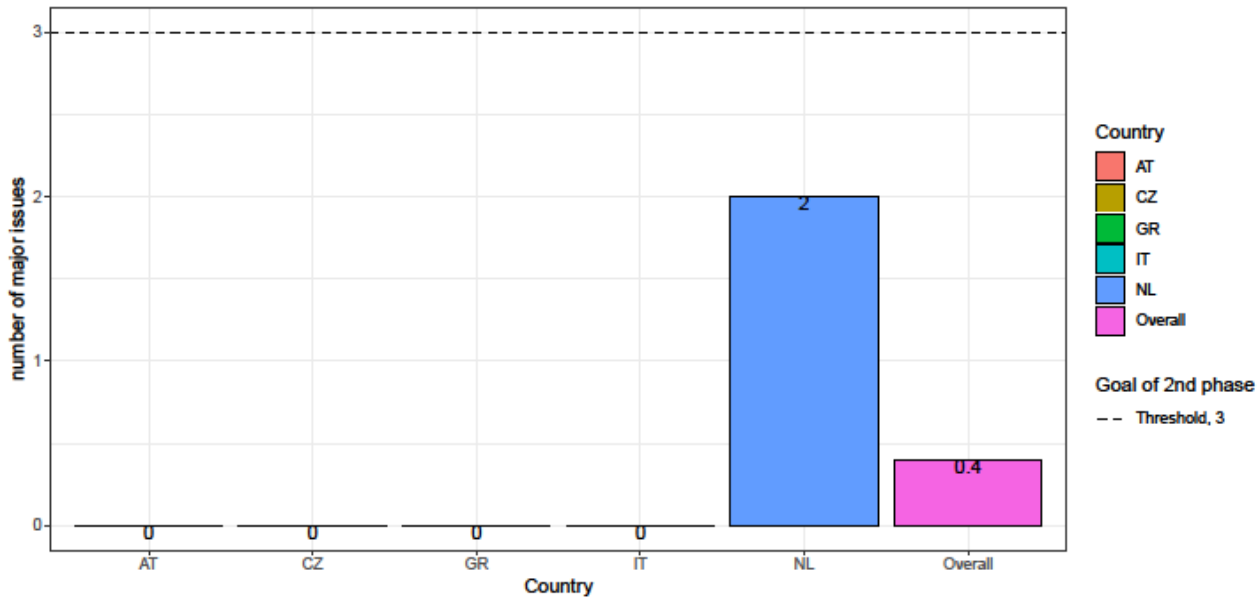


Figure 258: Service Providers 2. Pilot - Hypothesis 4: Issues encountered but not resolved with the development team, major issues

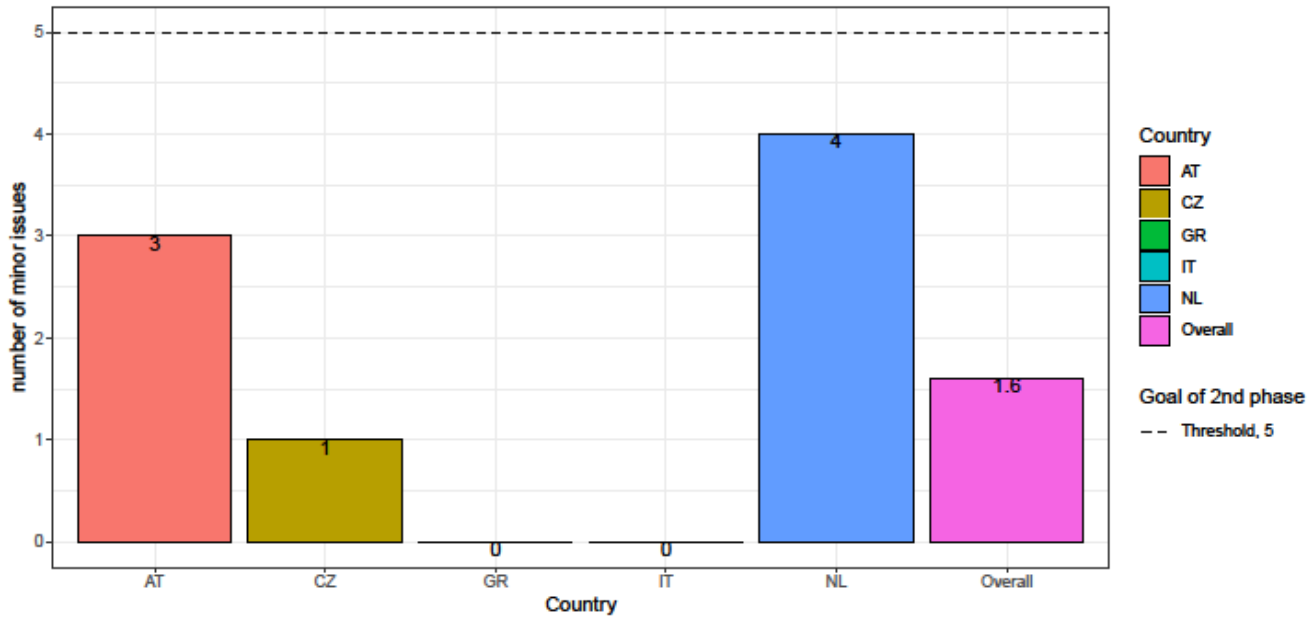


Figure 259: Service Providers 2. Pilot - Hypothesis 4: Issues encountered but not resolved with the development team, minor issues

1.3 Monthly analysis of user feedback (Travellers Feedback Module)

In this section, the mean ratings per month, from February to October 2020 are presented. The replies are categorized as in the other sections of 6.1.5, i.e., in a) sub-questions, b) service, c) trip and d) app.

1.3.1 February

Starting from February, the categories that contain replies are: a) "How easy was to use the app", b) "How happy using the app makes you", c) Service, d) App. They are analyzed next, through the average and standard deviation value. Charts are included only if it is relevant and necessary.

a) **How easy was to use the app?** Out of 11 replies, the mean value, along with standard deviation, was **4.91±0.30**, suggesting that the app was absolutely successful as per the easiness to use. During February, most users found the app easy to use.
b) **How happy using the app makes you?** Out of 2 replies, the mean value, along with standard deviation, was **4.50±0.71**, suggesting that the app was pleasant overall. Since there were only two replies, it is obvious that one was 4 and the other 5.
c) **Service** Out of 3 replies, the mean value, along with standard deviation, was **4.00±0.00**, suggesting that all of the users rated the service with a 4 during February.
d) **MyCorridor App** Out of 4 replies the mean value, along with standard deviation, was **5.00±0,00**, suggesting that all four users rated the app with a 5.

1.3.2 March

The categories addressed during March were: a) "How easy was to use the app?", b) "How happy using the app makes you?", c) "How satisfied are you with the app?", d) Trip, e) Service and f) App.

a) **How easy was to use the app?** Out of 31 replies, the mean value, along with standard deviation, was **3.58±1.71**, suggesting that users were divided between those who found the app easy ant he ones who did not.
b) **How happy using the app makes you?**
Out of 2 replies, the mean value, along with standard deviation, was **3.50±2.12**, suggesting that users were indifferent to the app. *The user with the lower rating commented "*Although I updated the app sequence of Question item appearance was not reiterated.*".*
c) **How satisfied are you with the app?** Out of 6 replies, the mean value, along with standard deviation, was **3.67±1.21**, suggesting that users were satisfied from the app. There is also a variation of ratings about satisfaction, but overall, the ratings tend to be high.
d) **Trips** Out of 9 replies, the mean value, along with standard deviation, was **3.67±1.41**, suggesting that users were satisfied from their trips. While the ratings are high, the only low rating is followed by the comment "*when searching for start or end location \salzburg hbf\ "search field usually closes after typing 'h'.*"
e) **Services** Out of 29 replies, the mean value, along with standard deviation, was **4.00±1.31**, suggesting that users were pleased from the provided services. The rating of the service is remarkably high, with single low ratings.
f) **MyCorridor App** Out of 13 replies, the mean value, along with standard deviation, was **4.46±1.20**, suggesting that the majority of users were significantly satisfied from the app. Most of the users were satisfied by the app, except from single cases.

1.3.3 April

The categories addressed during April are: a) "How easy was to use the app?", b) Trip, c) Service and d) App.

a) **How easy was to use the app?** Out of 3 replies, the mean value, along with standard deviation, was **5.00±0.00**, meaning that all three users rated the app with 5 stars.
b) **Trips** Out of 3 replies, the mean value, along with standard deviation, was **4.33±1.15**, suggesting that most of the users were satisfied from their trips. The trips during April were rated high, expressing satisfaction of users.
c) **Services** Out of 5 replies, the mean value, along with standard deviation, was **3.60±1.95**, suggesting that the provided services leave a moderate impression to all users. Ratings of the services during April appear a variation from low to high, yet the maximum value is the same as the third quartile, so we can suggest that more users were satisfied by the service than the ones who were not.
d) **MyCorridor App** Out of 3 replies, the mean value, along with standard deviation, was **4.00±1.00**, suggesting that there are three different replies from 3 to 5, expressing a roughly satisfying use of the app.

1.3.4 May

The categories addressed during May are: a) "How easy was to use the app?", b) App.

a) **How easy was to use the app?** Out of 2 replies, the mean value, along with standard deviation, was **5.00±0.00**, suggesting that two users of May found the app easy to use.
b) **MyCorridor App** Out of 3 replies, the mean value, along with standard deviation, was 5.00±0.00, suggesting that users' satisfaction from the use of the app was high and mutual.

1.3.5 June

The categories addressed during June are: a) "How easy was to use the app?", b) App.

a) **How easy was to use the app?** Out of 14 replies, the mean value, along with standard deviation, was **4.00±1.04**, suggesting that most of the users found the app easy to use, during June. Following, the boxplot chart:
b) **MyCorridor App** Out of 2 replies, the mean value, along with standard deviation, was **5.00±0.00**, meaning that both users were absolutely pleased by the app, during June. The boxplot will be emitted.

1.3.6 July

The categories addressed during July are: a) "How easy was to use the app?", b) "How satisfied are you with the app?", c) Trip and d) Service.

a) **How easy was to use the app?** Out of 9 replies, the mean value, along with standard deviation, was **3.56±1.59**, suggesting that many users had difficulties in using the app. There is a wide variation of ratings, setting the average rating at about 3.5. This fact could express that half of the users found difficulties in using the app, compared to the other half.
b) **How satisfied are you with the app?** Out of 2 replies, the mean value, along with standard deviation, was **3.00±1.41**, suggesting that both users were partly satisfied.
c) **Trip** Out of 2 replies, the mean value, along with standard deviation, was **3.50±2.12**, suggesting that the two users had different opinions. Among the two ratings, the lowest one comes along with the comment "*Navigation didn't work. The displayed position has not changed during the journey*".
d) **Services** Out of 2 replies, the mean value, along with standard deviation, was **2.00±0.00**. Both users gave the low rating of 2, one of them commenting "Navigation did not work". The boxplot is emitted.

1.3.7 September

The categories addressed during September are: a) "How easy was to use the app?" and b) "How satisfied are you with the app?".

a) **How easy was to use the app?** Out of 8 replies, the mean value, along with standard deviation, was **3.75±1.75**, suggesting that most users found the app easy to use. The use of the app is as always rated high, with only individual low ratings.
b) **How satisfied are you with the app?** Out of 2 replies, the mean value, along with standard deviation, was **3.50±2.12**, suggesting that the two users had different opinions about the use of the app.

1.3.8 October

The categories addressed during October are: a) "How easy was to use the app?", b) "How satisfied are you with the app?", c) Trip and d) Service.

a) **How easy was to use the app?** Out of 2 replies, the mean value, along with standard deviation, was **2.50±0.71**, suggesting that the users of October found difficulties in using the app.

b) **How satisfied are you with the app?** Out of 2 replies, the mean value, along with standard deviation, was **2.50±0.71**. The results are the same with the previous question. It is obvious that since the users had a hard time with the use of the app, they were not satisfied either.

c) **Trips** Out of 2 replies, the mean value, along with standard deviation, was **1.00±0.00,** suggesting that the users of October were deeply unsatisfied by their trips. The low ratings are followed by the comment "*Intermediate destination is completely ignored when planning a route*!".

d) **Services** Out of 8 replies, the mean value, along with standard deviation, was **1.00±0.00**. The same unfortunate ratings are presented also for the service, followed by the same comment as for the trip.

1.4 User Manuals (Android, iOS and for the Service Registration Tool - SRT)

The user manual for the Android MyCorridor application can be found in the app (slide drawer) and on the project's website.

The App for travellers

You can download the MyCorridor application for Android here and the MyCorridor Application User Manual for Android Devices (2020) here

You can download the MyCorridor application for iOS here and the MyCorridor Application User Manual for iOS Devices (2020) here

MyCorridor complies with the MaaS Alliance API design guidelines. For more information visit MaaS Alliance.

The Service Registration Tool

How to use it? Have a look here.

You can access the **MyCorridor Service Registration Tool for service providers** here.

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1.5 Service JSON schema


```
{
  "name" : "Test service",
  "url" : "https://www.test.com/",
  "api" : true,
  "api_url" : ""https://rest.test.com/v1",
   "cluster" : "Mobility",
  "subcluster" : "Public transport Para transit",
  "service_provider" : "Test provider",
  "mode" : "CAR",
  "mobility_product" : "Car-pooling_booking_and_ticketing",
  "location" : [
    {
        "bounding_box": {
          "min_lon": 3.3316,
          "min_lat": 50.7503837,
          "max_lon": 7.2271405,
          "max_lat": 53.6756
        },
        "name": "netherlands"
      }
  ],
  "booking_api" : true,
  "api_response" : "json",
  "booking_response" : "json",
  "booking_api_url": "https://rest.test.com/v1/bookings/",
  "is_free" : false,
  "currency": "EUR",
  "operation" : [
    {
      "day" : "Sat",
      "time" : "00:00-23:59"
    },
    {
      "day" : "Sun",
      "time" : "00:00-23:59"
    }
  ],
  "weight": 0.0,
  "registration_status": "Registered",
  "comments" : "",
  "business_rules" : "",
  "_id": "5e7a2056382fc81ad0160ee6",
}
```