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Toolkit for sustainable decision making in ITS deployment

WP 4.3

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Katerina Touliou (CERTH/HIT)

Matina Loukea (CERTH/HIT)

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List of the 2DECIDE Project Partners:

Beneficiary no.	Beneficiary name	Beneficiary short name	Country
1 (coordinator)	AustriaTech - Federal Agency for Technological Measures Ltd.	ATE	Austria
2	ECORYS Nederland BV	ECO	Netherlands
3	Egis Mobilité S.A.	EGI	France
4	VTT - Valtion teknillinen tutkimuskeskus (Technical Research Centre of Finland)	VTT	Finland
5	Transver	TRV	Germany
6	Genua Consult	GEN	Denmark
7	Politecnico di Milano – Dipartimento Indaco, Laboratory for mobility and transport	POL	Italy
8	Jacobs Consultancy spol. s.r.o.	JBA	Czech Republic
9	Vereinigung High Tech Marketing	HTM	Austria
10	EXODUS S.A.	EXO	Greece
11	Algoé Consultants	ALG	France
12	Center for Research and Technology Hellas/Hellenic Institute of Transport	CERTH/HIT	Greece
13	Rapp Trans (UK) Ltd.	RAP	United Kingdom
14	Mobycon BV	MOB	Netherlands

List of Abbreviations

FR/DE/IT	French/ German / Italian
HGV	Heavy Goods Vehicles
ITS	Intelligent Transportation Systems
SUS	System Usability Scale
UK	United Kingdom
WP	Work Package
WTH	Willingness to Have
WTP	Willingness to Pay

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Executive Summary

This Deliverable provides information about the results of the Validation Process (Deliverable 4.2 of 2DECIDE) and is prepared in the context of WP4: “Software Tool Development and Validation”.

After presenting the Validation plan and interrelation of the validation process with the rest of work conducted within the framework of 2DECIDE (Chapter 1) and the parts and materials of the whole validation procedure (Chapter 2), the outcomes of the Technical Verification process have been described in Chapter 3 as well as the results of the first and second validation phase (Chapters 4 and 5).

This validation procedure aims to check both the usability and the user acceptance of the 2DECIDE ITS Toolkit and provides feedback about for any further additions, comments and changes that could be also implemented for the ITS Toolkit’s further development.

Based on outcomes from both validation phases, users were positive towards the 2DECIDE ITS Toolkit while the usability rates showed that it gained the acceptance by the majority of the participants from all different test sites. The 2DECIDE ITS Toolkit was well-received by most users and it was perceived as an innovative Toolkit. The rationale depicted an existing need and respective knowledge and information “gaps” in the current ITS development arena.

Key aspects that could be taken into consideration for further improvements might be additions of explanations with regards to search criteria (i.e. their functionalities and terminology) by the addition of a glossary. Also, increasing flexibility in choosing search criteria (e.g. having the option to “bypass” some of the search criteria) would increase its usability. Most users believe that the high complexity of the suggested criteria might offer more refined results and provide a database of unique characteristics for future ITS searches.

Changes made will be the ones that are possible to be implemented taking into consideration both resources, available time, and realistic and added value of the feedback received. It is important to focus on the future by moving forward with the addition of reports and enriching the existing content for the next step towards a complete toolkit.

1. Introduction

2DECIDE addresses one of the most important ITS (Intelligent Transport Systems and Services) deployment related challenges on European level: Support and speed up consistent decision making related to ITS deployment for road and public transport (timely, cost-effective, interoperable, positive impact to urban and interurban mobility, positive cost/ benefit ration).

As lack on easy and efficient access to a wide spread ITS knowledge as well as decision making for the deployment are recognised as the key factors for slow down investment on ITS on administration level, a single entry approach for a new ITS toolkit for better decision making has been selected as the most appropriate solution.

Key ambition of 2DECIDE was to support both EU ITS policy goals as well as national ITS deployments strategies to gain the utmost benefit of ITS deployment and the related investments for a sustainable road and public transportation system.

Good existing co-operation with national decision makers on different levels is a potentially viable future target for the maintaining body of the ITS Toolkit. Most of the project partners are in close co-operation with national authorities (e.g. via participation within the EASYWAY project or other ITS related activities). The project partners can be seen as “National Information Points” for decision makers in the various countries. In order to have the strong support from the 2DECIDE target group the partners discussed the idea of 2DECIDE already during the elaboration phase of the proposal.

This work effort was part of WP4 (Task 4.3) focussing on the development of the 2DECIDE ITS Toolkit and its validation process. A verification and validation task in WP4 is indeed relevant and needed, in order to ensure that the developed ITS Toolkit is built according to the requirements, as identified in WP1 and is indeed useful for the potential users. The validation task provided the users the opportunity to test the draft ITS Toolkit, and provide comments, which have been used to improve the existing version, and make the final ITS Toolkit. The validation process took input from task 4. 1 which was the main task for the specification of the 2DECIDE decision support tool and the findings were fed to WP3 evaluation activities in order to improve criteria and content quality and also used for making the required changes in all iterative steps leading to its final version. The initial planned interrelation among different WPs and tasks was followed and is depicted in Figure 1.

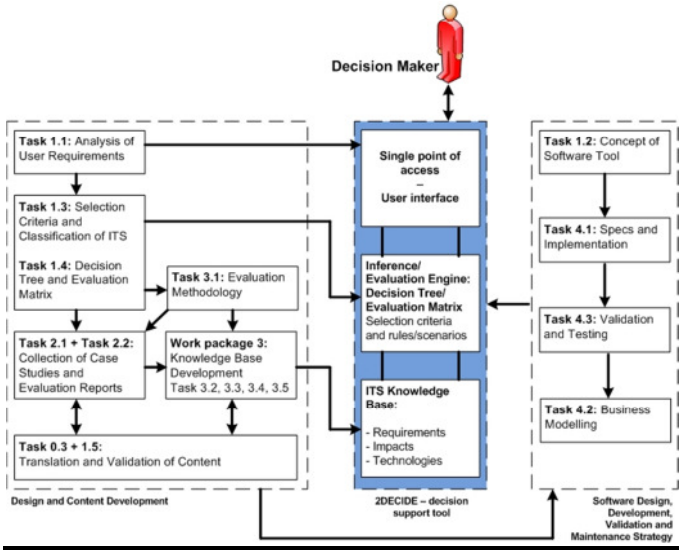


Figure 1: Interrelation of the work packages (2DECIDE Annex I: Description of Work, 2009)

This Deliverable aims to provide the validation process and the emerging results by the tests conducted in all participating countries (2DECIDE partners). The purpose of this validation process was to collect and examine data in an effort to investigate the acceptance and validate the 2DECIDE ITS Toolkit for future users. Such aspects are: the content soundness in terms of content usefulness and added value, the impact to current situation on decision making in ITS field, as well as user acceptance willingness to use in the future. Data were obtained from three main sources:

- Comments resulting by the internal verification process made by the partners of the 2DECIDE project that were also involved in the development of the 2DECIDE Toolkit (Annex 1).

- The post questionnaire, distributed to the users t the end of the testing period and it is a more detailed evaluation of the ITS Toolkit (Annex 3).

- Interviews with the users that participated in the validation process. Interviews were focussing on aspects that could be discussed in depth and not covered in the questionnaires (Annex 4).

Although there is no formal definition of a database quality, there are some elements that identify and determine its value and its usability. For example, the Southern California Online User Groups in 1990 defined 10 categories that determine database and database service quality (Basch, 1990). These include: consistency, coverage and scope, timeliness, accuracy and error rate, accessibility and ease of use, integration, output, documentation, customer support, training and value-to-cost ratio.

In addition, the Finnish Society for Information Services (Juntunen et al.,1995) identifies the following major criteria by which the quality of on-line databases should be evaluated: system connection, search language, content quality, information retrieval aids and costs. Within these broad criteria there are more than two dozen more specific criteria encompassing coverage, index terms, abstracts consistency of data elements, etc.

These aspects of difference sets and types of criteria for evaluation purposes led to re-assess the required steps to be taken. In other words, before setting the evaluation and, subsequently, the evaluation criteria, the evaluation rationale had to be defined (section 1.1). Therefore, first, it is important to have a theoretical notion backing up this endeavour. For instance, we need to think upon the main issue of the development process of this tool. This tool is being developed in a manner that maximises the probability of satisfying its users' expectations. The process of Verification and Validation (V & V) actually attempts to insure that the product will meet users' expectations.

Secondly, it is essential to define the terminology applied:

Verification refers to the process of determining if the tool fulfils the requirements set by the expert teams involved. It mainly answers the question:" Are we building the tool *right*?"

The application of an internal (mainly technical) review of the tool at this stage was to investigate if we were able to answer this question. Main characteristic of this verification process was to identify and isolate any product faults and/or errors in order to rectify them and avoid future failures, thus aiming at proofing the tool's correctness.

Validation refers to the final evaluation of the tool and answers the question:" Are we building the *right* tool?". It insures that the tool is developed according to the requirements set early in the project and that it is free of failures.

Last, the cycle of development is a subject of validation in itself and requires feedback from representatives of all parts of this cycle in order to meet its purpose. Hence, if each partner gives feedback on the plan, then the plan will reflect its purpose.

1.1 Validation plan

A validation plan was established earlier in the project and discussed with involved partners. This validation plan incorporated a timeline for implementation of the agreed process in order to avoid any arising problems because of the inherent difficulties of cross-country studies. The final version of the ITS Toolkit is based on this validation process. The following diagram presents how the final version of the 2DECIDE toolkit will be used after the validation process (Figure 2). Feedback is essential and central in all relevant steps from validation to deployment.

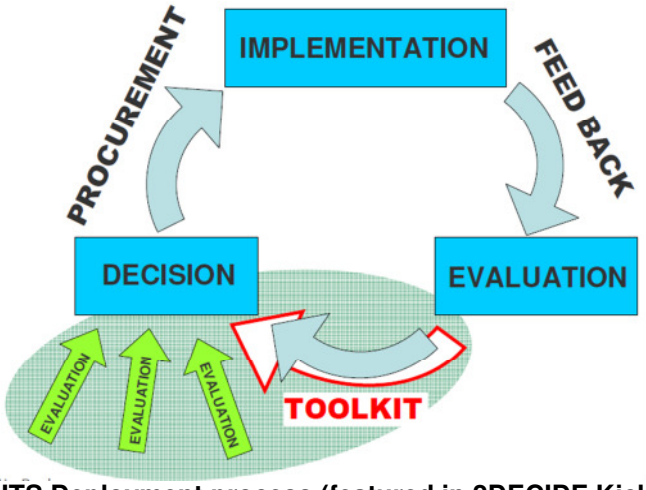


Figure 2: ITS Deployment process (featured in 2DECIDE Kick off meeting presentation, Martin Böhm, 2009)

The validation plan of the 2DECIDE ITS Toolkit (http://www.itstoolkit.eu/2decide/index.php) aimed at addressing the following aspects:

- ✓ Usability
- ✓ Content soundness
- ✓ User acceptance
- ✓ Consistency
- ✓ Necessity
- ✓ Sufficiency
- ✓ Performance

The following diagram shows the steps taken in the validation process. It was important to not perform a "one-for-all" validation phase, as the 2DECIDE decision support tool was a multi-perspective effort that its final version could not be based on just one large pilot testing procedure. The verification process was a natural outcome of partners' collaboration in order to amend and rectify arising problems. The addition of two validation phases led to a more reliable and valid 2DECIDE support tool to be deployed.

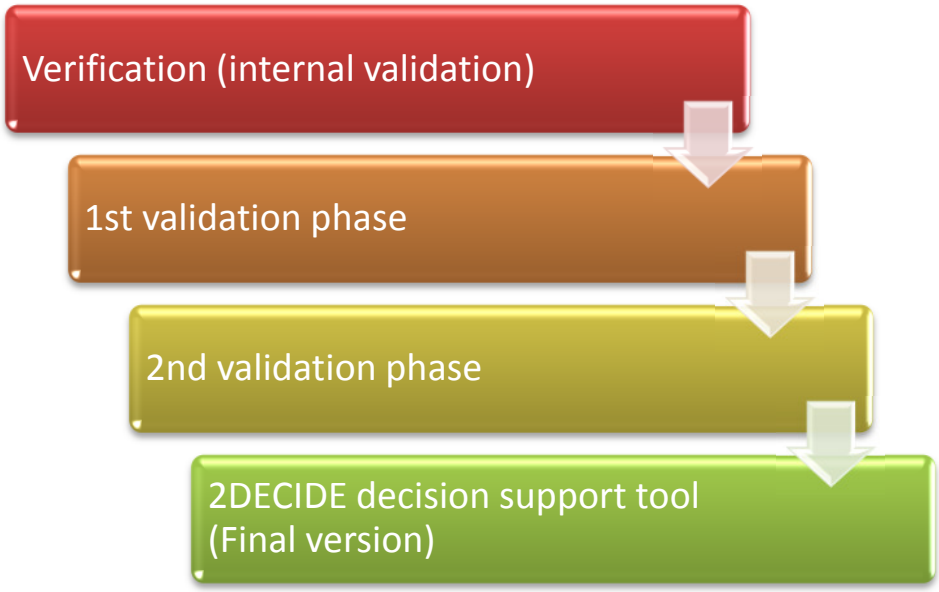


Figure 3: Validation steps

1.2 The verification process

This is the internal validation of the Toolkit that was implemented by the partners of the 2DECIDE project, involved also in the Toolkit's development. The Verification process enhanced validity and, therefore, augmented future implementation. This process enabled the delivering of a tool with less bugs and increased usability and, moreover, it identified potentials for alterations.

The 2DECIDE ITS Toolkit verification tests lasted approximately 15 days and each expert involved created their own checklist relevant to their field of involvement and expertise. However, a list of proposed items was distributed to partners in order to sketch potential areas of problems. Problems, errors, misses, and bugs were checked by all verification participants. In order to provide sound ground for consolidation and overall assessment, the following critical functionality issues were addressed:

- System crashes
- System errors
- Time spent for each search
- Success/completion of search
- Satisfaction from results
- Shortages

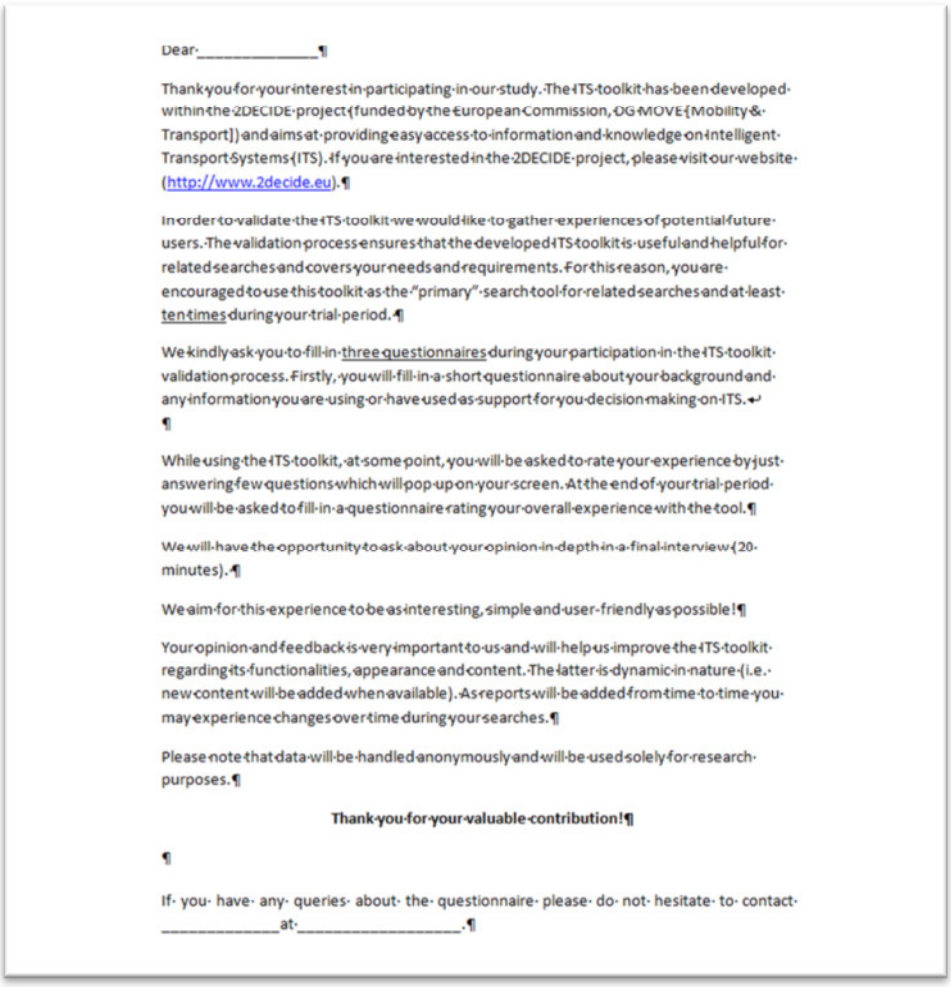
At least one expert per partner was involved in the internal validation process (as discussed in Chapter 2).

1.3 The validation process (Phase 1)

The first phase of the external validation tests followed the internal verification process aiming at providing a working toolkit to the participants and has been the intermediate evaluation stage of the whole Toolkit validation activity in which users outside the consortium were involved and provided their feedback after a testing period. The first testing phase lasted approximately two months (from 15th of July till mid-September 2011) of continuous interaction with the ITS Toolkit.

The materials used for the implementation of the validation process were created by CERTH and it consisted of the following items:

I. **User information sheet** Although the tool is self-explanatory, a letter was created, providing a description of the project and some instructions which were brief, focussing more to what is expected by the users.



Dear·_____¶

Thank·you·for·your·interest·in·participating·in·our·study.·The·ITS·toolkit·has·been·developed·within·the·2DECIDE·project·(funded·by·the·European·Commission,·DG·MOVE·(Mobility·&·Transport))·and·aims·at·providing·easy·access·to·information·and·knowledge·on·Intelligent·Transport·Systems·(ITS).·If·you·are·interested·in·the·2DECIDE·project,·please·visit·our·website·(http://www.2decide.eu).¶

In·order·to·validate·the·ITS·toolkit·we·would·like·to·gather·experiences·of·potential·future·users.·The·validation·process·ensures·that·the·developed·ITS·toolkit·is·useful·and·helpful·for·related·searches·and·covers·your·needs·and·requirements.·For·this·reason,·you·are·encouraged·to·use·this·toolkit·as·the·"primary"·search·tool·for·related·searches·and·at·least·ten·times·during·your·trial·period.¶

We·kindly·ask·you·to·fill·in·three·questionnaires·during·your·participation·in·the·ITS·toolkit·validation·process.·Firstly,·you·will·fill·in·a·short·questionnaire·about·your·background·and·any·information·you·are·using·or·have·used·as·support·for·you·decision·making·on·ITS.↵
¶

While·using·the·ITS·toolkit,·at·some·point,·you·will·be·asked·to·rate·your·experience·by·just·answering·few·questions·which·will·pop·up·on·your·screen.·At·the·end·of·your·trial·period·you·will·be·asked·to·fill·in·a·questionnaire·rating·your·overall·experience·with·the·tool.¶

We·will·have·the·opportunity·to·ask·about·your·opinion·in·depth·in·a·final·interview·(20·minutes).¶

We·aim·for·this·experience·to·be·as·interesting,·simple·and·user-friendly·as·possible!¶

Your·opinion·and·feedback·is·very·important·to·us·and·will·help·us·improve·the·ITS·toolkit·regarding·its·functionalities,·appearance·and·content.·The·latter·is·dynamic·in·nature·(i.e.·new·content·will·be·added·when·available).·As·reports·will·be·added·from·time·to·time·you·may·experience·changes·over·time·during·your·searches.¶

Please·note·that·data·will·be·handled·anonymously·and·will·be·used·solely·for·research·purposes.¶

Thank·you·for·your·valuable·contribution!¶

¶

If· you· have· any· queries· about· the· questionnaire· please· do· not· hesitate· to· contact· _____at·_____.¶

Figure 4: Information sheet

II. Pre-test questionnaire

It contained questions about the views and experiences of the users on a range of transport and ITS issues that they might deal with as part of their job. This was based on the user needs and requirements questionnaires developed early in the project (WP1: analysis of users' requirements) (Annex 2).

III. Post –test questionnaire

The post-questionnaire consisted of close-ended questions focusing on acceptance, usability and usefulness (Annex 3).

IV. Interview Topics

In addition to the post – questionnaire, a small list of questions has been developed in order to get some in depth information about users' experience during the testing period (Annex 4).

V. Translation of the Materials

Translation of questionnaires into native languages has been performed and then back-translated. In addition, all other related items (i.e. interviews) have also, been translated into native languages.

1.4 Participants

1.4.1 Recruitment

Participants were derived by all target user groups (e.g. public infrastructure owners, local authorities, cities and municipalities, national governments, European legislators) to ensure variability as the aim of this validation has been not to generalise the outcome but to fulfil all relevant requirements to the extend this is feasible.

It is quite common for response rates to fall from onset of an evaluation study to its finalisation phase. Therefore, in order to be on the safe side, more participants were recruited to foresee and prevent any data misses due to fall outs. Each local partner was responsible for participants' recruitment, briefing, and debriefing after the end of evaluation process.

1.4.2 Demographics – user profile

A basic profile of the participants was created based on the completion of the pre-questionnaire in order to get background information, mainly for descriptive purposes. Demographic details that were taken under consideration were gender and type of the company/organisation that users worked for.

1.4.3 Conditions of testing

The participants were asked to use the 2DECIDE decision support tool as the primary tool for their searches. This allows for concentrating on increasing the possibilities the participant to use the ITS Toolkit and for the evaluators to gather important feedback.

1.5 The validation process (Phase 2)

After the completion of the analysis of the first validation phase results, which has been described above, involved experts proceeded with the necessary changes based on received feedback and then the second phase of the validation procedure was kicked off. The evaluation, and subsequently the analysis, focus was on post testing materials. Both technical verification and first validation process provided rich feedback for the improvement of the toolkit. A final validation phase was implemented in order to evaluate the final version of the 2DECIDE decision support tool.

During the second validation phase, which started at the end of October, the same materials were distributed as in the first phase while most of the participants were

new users who haven't taken part in the previous phase. There were also some participants who participants in both phases and provided feedback for the final validation phase. These participants were regarded as second validation phase users.

2 Technical verification results

During the internal evaluation process experts from each company/organisation that participates in the project used the Toolkit by making various and repeated tests in order to evaluate the database in the most objective and comprehensive possible way.

The purpose of this technical verification was to identify any existing problems, find the source of each problem and get them corrected before the database becomes available to external users who would participate in the next phase of the overall validation process.

In this pre- phase of the validation all available aspects were checked and tested. The verification tests aimed to correct any defective operation of the entire system, the ability of completing every given search, the system interface, the toolkit's user-friendliness, and any other problems encountered that might hinder its usage. The conclusions reached after this evaluation suggested what kind of improvements and modifications are necessary before the Toolkit is ready to be used by external users.

The authors collected comments from all experts involved in the development of the ITS Toolkit. Clustering the comments and feedback received during the technical verification testing led to the identification of two major categories that should be further improved. Hence, improvements were directed towards **usability** and **user friendliness** of the ITS Toolkit. For example, it was mentioned that "back button" should be defined in order to be appropriately used and the need for further clarifications for the successive phases towards the ITS Toolkit user was emphasised.

Technical issues (e.g. problems in algorithms that sometimes affect the ability to integrate research and display the desired results) were reported to a lesser extent.

Finally, all comments raised and received feedback were sent to EXODUS (partner responsible for development of the 2DECIDE ITS Toolkit) in order to implement the necessary corrections and modifications and rectify specific problems. At this stage the ITS toolkit was ready to be evaluated by external users and therefore the validation phase was initiated.

3 First validation phase

The materials used during the validation phase were basically qualitative. Initial planning to use stored logfiles was dropped as the logfiles did not provide information

that would add value to the already distributed questionnaires (post-analysis). As most participants used the ITS Toolkit for the number of searches they were at least advised to do so (5-10 searches) by the validation partners, the logfiles did not provide the research team any richer information apart from frequency of visits. Therefore, the subjective scales were the primary source of information and the evaluation basis. The data collection procedure comprised three parts:

The ***first part*** was the completion of the **initial questionnaire** (Pre-Questionnaire), which provided information about demographic data of the user, as well as information related to the occupation of each user, such as the their activity field or their opinion on issues regarding the ITS or Transport area.

The finalisation of testing was followed by the completion of the **post-questionnaire**, which has been completed by all external users after almost one month testing (***second part***). The post-questionnaire includes questions related to the assessment of the 2 DECIDE Toolkit by the users as described in detail in section 2.2. Questions have been clustered in such way in order to examine all the aspects of the system. More precisely, the characteristics that are being evaluated is the usability of the system, the graphical interface, the content and the overall performance, while at the end, there was also a section concerning an overall evaluation of the Toolkit.

The ***third*** and ***final part*** was the **interview**. The interview lasted approximately 45 minutes and was conducted in order to give participants the opportunity to discuss in depth several features of the ITS Toolkit, such as the graphical impression of the system, the content and structure. Moreover, at the end of the interview users were asked to make suggestions for the improvement of the Toolkit and provide feedback about their overall impression.

3.1 Pre-Questionnaires

3.1.1 *Demographic Data*

Basic demographic data were collected without further identification of participants.

17 users took part from five different test sites:

- French test site
- Czech test site
- Dutch test site
- Danish test site and
- Finnish test site

The vast majority of users are men. The ratio between men and women users is being presented in the following chart.

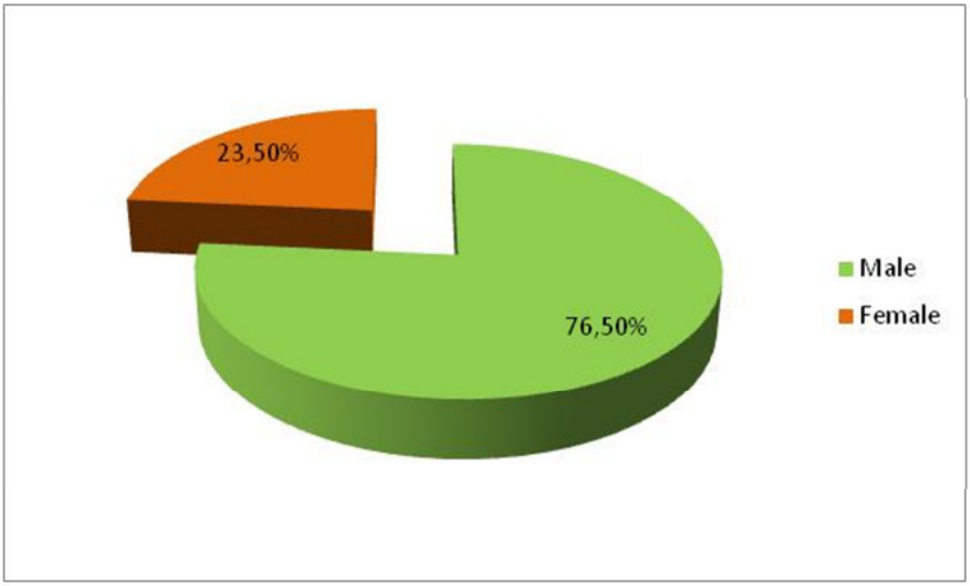


Figure 5: Gender overall representation

Participants have been occupied in the Transport area in general for an average of 13.4 years, while for the field of Intelligent Transport Systems the average drops to 9.2 years. More specifically, regarding the sectors or transport modes, the largest percentage of participants are being involved in the field of "Motorways & Expressways" while the next three categories with the highest rates are "Secondary and Rural Roads", "City Streets" and "Major National Roads". On the other hand, the category with the lowest rate of the users' involvement is the "Freight Terminals". The overall impression of the rates per category is shown in the graph below (Figure 6). In order to understand the presented percentages (%) it is important to clarify that it was possible to choose multiple categories in the pre-questionnaire leading to a total of all categories higher than 100%.

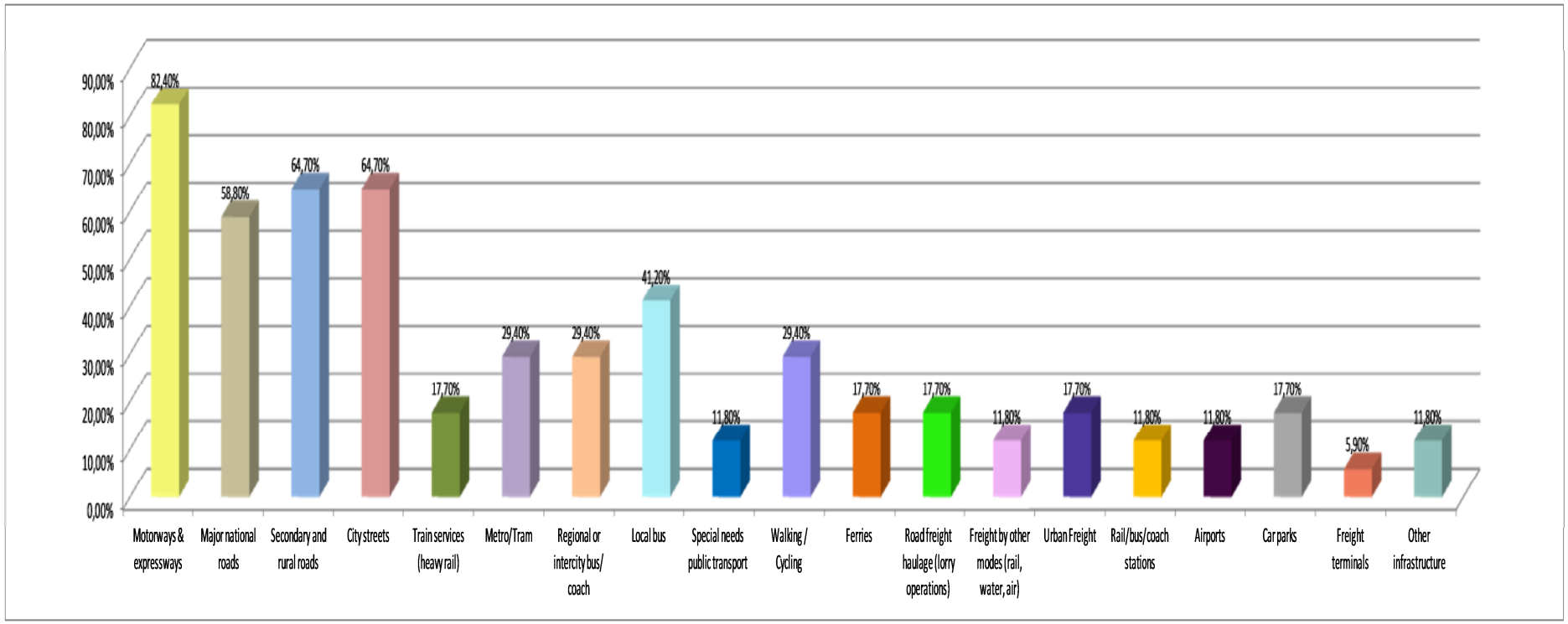


Figure 6: Percentages (%) of users occupational direction per Transport area

The country-specific test site did not necessarily include participants from the specific country. Within these five test sites there were participants of other nationalities, too. For example, the nationality British user was included in the French site and in the Danish test site there was equal representation of Danish and Swedish users. As far as the Czech test site is concerned, users of Slovakian nationality have also participated for the validation of the Toolkit.

Taking under consideration all the information documented above, it is an interesting issue to examine which are the native languages of the users and other languages that they are fluent or use on adequate level. So, based on the information given by users, the reported native languages were the following:

- French
- English
- Czech
- Slovak
- Dutch
- Danish
- Swedish and
- Finnish.

In addition, the participants stated that they can also read, on a satisfactory level, the following languages:

- English
- German
- Russian and
- Swedish.

3.1.2 Decision-making for Intelligent Transport Systems and Services

Moving on to the second part of the questionnaire, the participants stated to what extent they have used ITS applications to address various issues in the transport sector in their work.

Overall, the highest percentages of participants reported using such applications mainly for issues such as reducing traffic, enhancing safety, improving user-friendliness and promotion of multimodality are concerned, while for issues such as strengthening the enforcement of traffic, enhancing security and addressing global environmental issues, intelligent systems are not used at all or only by a very small percentage of users.

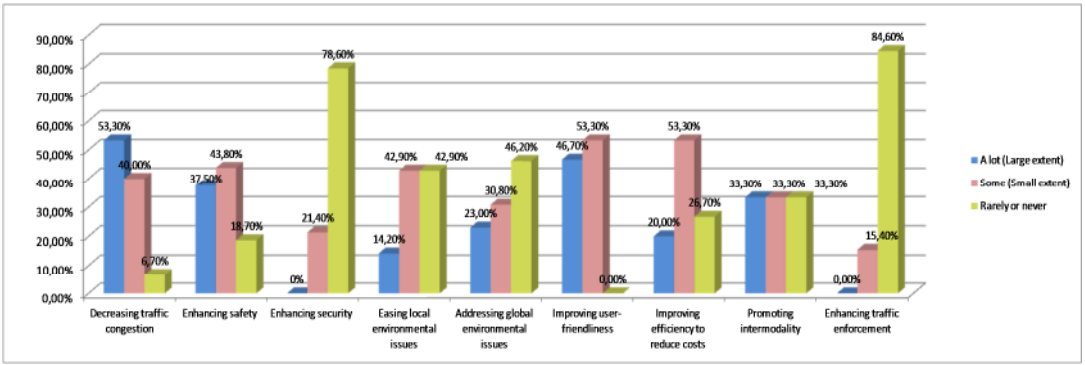


Figure 7: Rates of ITS systems application for addressing policy issues in all participating countries

The analysis of the results about potential issues related to the application of Intelligent Systems in transport per country leads to the following conclusions:

- **French site**

According to the French site's participants, the main area of ITS deployment was traffic congestion. Additionally, issues about safety, efficiency, increasing user-friendliness of design and cost reduction were shown to be of significant interest for implementation. On the contrary, traffic enforcement and security enhancement were not areas that ITS application was so common (Figure 8).

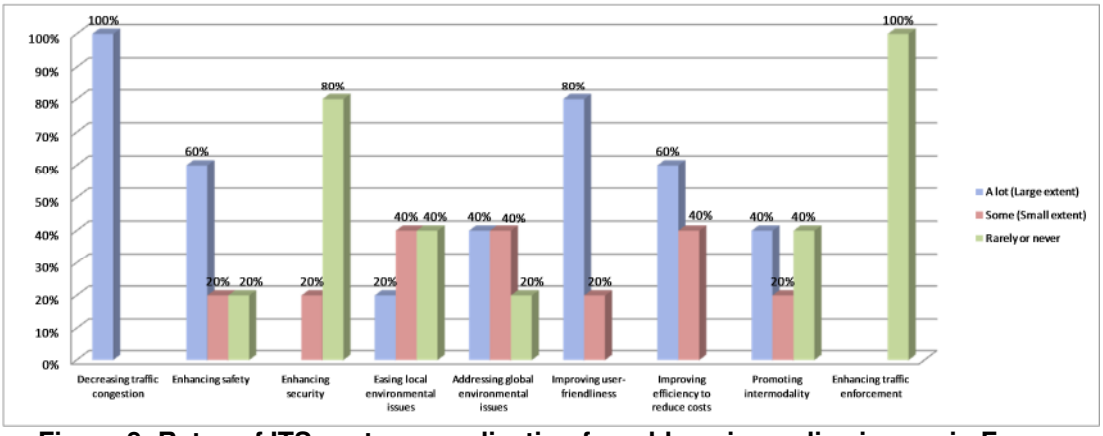


Figure 8: Rates of ITS systems application for addressing policy issues in France

- **Czech site**

External users (n=2) from Czech Republic reported limited application of Intelligent Transport Systems for enhancing safety and security, increasing efficiency, reducing costs and promoting intermodality. Concerning all other issues, no application of ITS systems was reported. Because only two users participated in this part of the study, no graph has been added.

- **Dutch test site**

Participants in the Dutch study reported that problems of traffic congestion, user friendliness and intermodality are being treated by a larger extent by ITS systems and services relatively more often than others (e.g. global and local environmental issues). In contrast, issues like enhancing safety, security, traffic enforcement are not being addressed by using such systems. In general, safety and security are not heavily addressed by ITS systems in more than one pilot site.

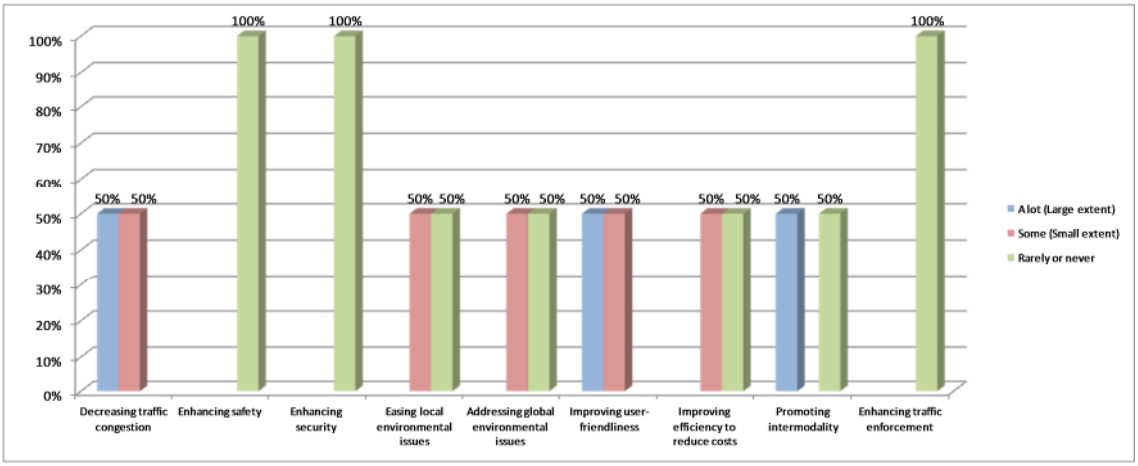


Figure 9: Rates of ITS systems application for addressing policy issues in the Netherlands

- **Danish site**

Intelligent Transport Systems and services are mainly applied in order to manage traffic congestion, improve user-friendliness, and to a smaller extent, for enhancing security, promoting intermodality, addressing local environmental problems, improving efficiency, and for costs' reduction. Similar to other European sites, there is no application of ITS systems in problems such as enhancing security, addressing global environmental issues and enhancing traffic enforcement.

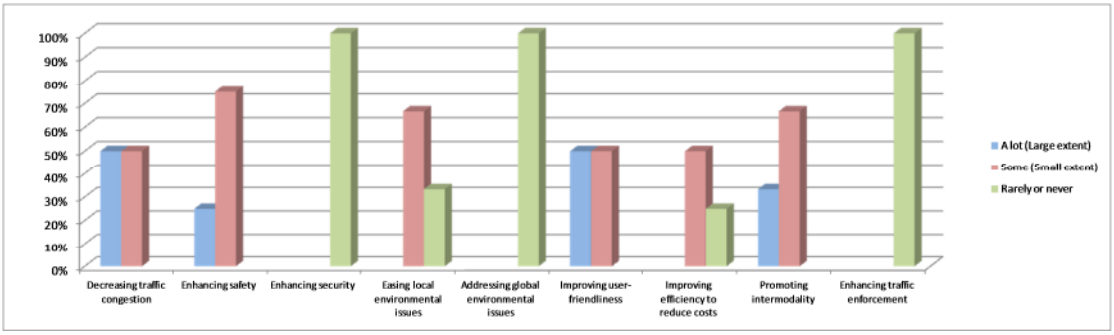


Figure 10: Rates of ITS systems application for addressing policy issues in Denmark

- **Finnish site**

Participants in the Finnish site reported that ITS systems are mainly being used for addressing safety issues and in a lower percentage for traffic congestion issues, environmental problems and intermodality. The difference -for the Finnish participants- is evident in the following graph. The users reported that ITS systems and services are being used for almost all options for policy issues included in the pre-questionnaire depicting a breadth of possibilities for resolving problems and issues with the application of ITS toolkits.

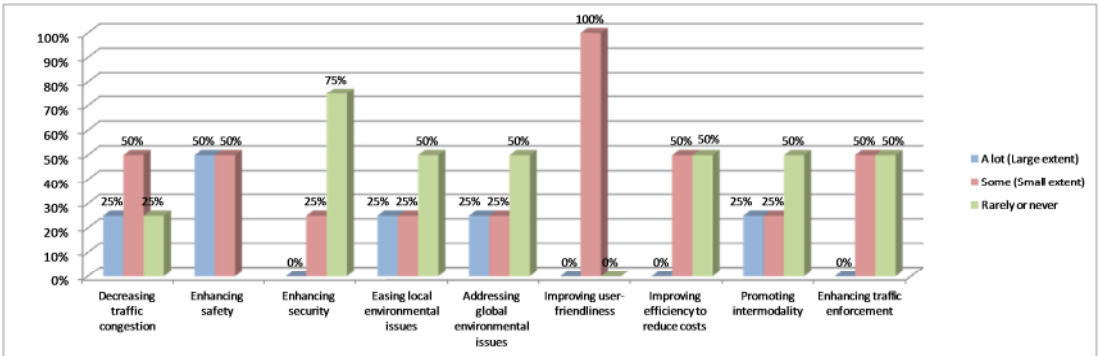


Figure 11: Rates of ITS systems application for addressing policy issues in Finland

3.1.3 Tools for ITS Investment Decisions

This section of the pre-questionnaire investigated the factors taken into consideration -as well as tools used- for making decisions regarding investments in ITS systems and services. Overall prioritisation for tools included in the pre-questionnaire led to the following:

1. Finding out about national or international Best Practice (press internet, site visits, from personal contacts etc.)
2. Evaluation reports from other deployments by the users own organization
3. Evaluation reports from other deployments by other organisations
4. Cost-Benefit Analysis
5. Guidelines

The types of guidelines are discussed in more detail in the country-specific sections.

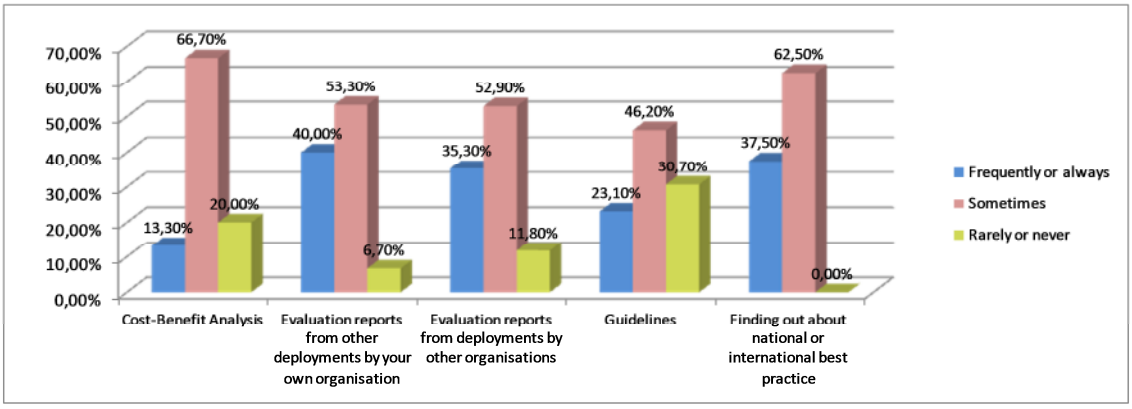


Figure 12: Overall rates regarding toll preferences for decision-making about ITS investments

Prioritisation per country study is described in detail below:

- **French site**

According to the responses of the French users, the sources they trust the most in their attempt to decide about investments in ITS systems and services is the information they receive from the press, the Internet or through personal contacts and acquaintances about national and international practices. As a second and third option, participants chose first deployment by their own country and then by other countries. Guidelines were the last potential choice. Overall prioritisation is identical to the one for the French pilot site. The users did not mention particular guidelines or set of guidelines but categorisation was based on general terms. In addition, one more extra tool has been reported by the French users and that is the interest of the market sector.

- **Czech site**

The answers given by the users from the Czech pilot site, show that the only tools that they find reliable enough to help them make decisions or give advice regarding to Intelligent Transport Systems is the information they receive about national or international Best Practices (internet, press, site visits and personal contacts). Moreover, they also trust evaluations that arise by other deployments either from their own company or by another organisation. These tools appear to be of similar importance for users in this site, whilst other options were not mentioned as potential preferences.

- **Dutch site**

Higher preference was reported for evaluation reports that come from other deployments made by the user's company. Of equal importance were the evaluations reports from other companies/organisations, the cost analysis and information about national and international practices. Guidelines were not chosen. The establishment of a European evaluation expert group was an additional tool mentioned by the participants.

- **Danish site**

The majority of participants chose their own company's evaluation report followed by national/international practices and then reports by other companies. Cost Benefit Analysis was the last choice.

- **Finnish site**

Three tools were shown to be of equal importance (i.e. evaluation reports from other deployments made by the user's organization or by other companies/organizations, as well as finding out about national or international best practices) followed by cost benefit analysis and guidelines without having any references to specific examples.

3.1.4 Problems Related to the Decision-Making Process about ITS-based Solutions

When dealing with ITS systems and services and especially when seeking to use such systems as solutions for problems concerning transport issues, there is always a great likelihood of emerging problems that are related to the decision-making process. More specifically, the frequency and the incidence of some specific issues that often arise and cause difficulties in the selection and implementation process of ITS-based solutions were taken into consideration. These problems were the following:

- Not enough information about the costs or benefits of different solutions
- Lack of information on different experiences and evaluations elsewhere

- Lack of impartial information
- Legal obstacles or lack of political acceptance or awareness of ITS
- Lack of public acceptance or awareness

Firstly, the classification of these issues-based on their frequency and the importance according to the overview of the participating countries-was formed as follows:

Great hindering to the decision-making process was shown to be brought by lack of sufficient information about inherent cost and benefits of different solutions, followed by legal obstacles, and lack of political acceptance or awareness about ITS solutions. Of lower impact was believed to be the lack of information on different experiences and evaluations elsewhere and the lack of impartial information. Finally, lack of public awareness was characterized by the majority of the participants as an issue which rarely or even never occurs in such processes, concerning ITS-based solutions. The classification of these problems is depicted in the following graph.

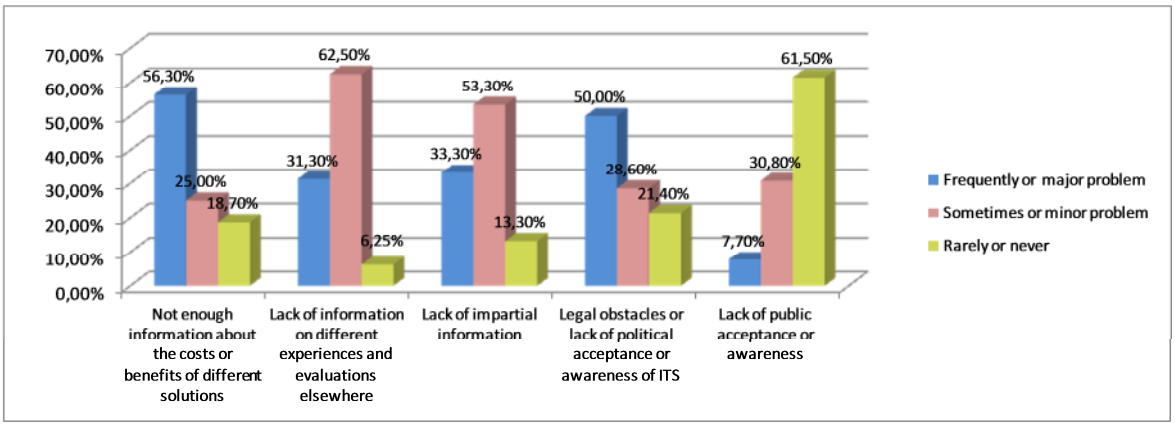


Figure 13: Overall rates regarding the occurrence frequency and importance of the problems related to the ITS-based solutions

In more detail, the results per country were the following:

- **French site**

Three of the problems that seem to interfere in the decision-making process regarding solutions based on ITS systems and services that are of equal importance were the lack of information either on different experiences and evaluations elsewhere or impartial information, legal obstacles, and lack of political acceptance or awareness regarding ITS followed by insufficient information about the costs or benefits of different solutions and, last, lack of public acceptance or awareness. Two more problems (financial issues and inadequate technology) were added by the users that could probably cause difficulties during a ITS- based solution decision making process.

- **Czech site**

None of the proposed problems was perceived by users as potential difficulties in the implementation of an ITS-based solution. The users have given to four out of five problems exactly the same ranking, characterising them as issues that sometimes may occur in a process like that but they can only cause a minor impact. These problems were the insufficient information about the costs or benefits of different solutions, the lack of information on different experiences and evaluations elsewhere and impartial information, and the legal obstacles or lack of political acceptance or awareness about ITS. On the other hand, they mentioned that the last issue ("Lack of public acceptance or awareness") is a rare problem that doesn't have a negative impact to the whole process.

- **Dutch site**

Two problems were reported as being the biggest threat during a decision-making process regarding the ITS-based solutions. These problems were the lack of sufficient information about the costs or benefits of different solutions and the legal obstacles, lack of political acceptance or awareness of ITS with the highest potential interference possibilities for the users. The next more important issue that may cause obstacles in such a process is the lack of information concerning different experiences and evaluations elsewhere. Finally, the least important problems seem to be the lack of impartial information, as such the lack of public acceptance or awareness.

- **Danish site**

The perceived ranking of the proposed problems based on their importance and frequency was the following:

1. Lack of impartial information
2. Lack of information on different experiences and evaluations elsewhere
3. Not enough information about the costs or benefits of different solutions
4. Legal obstacles or lack of political acceptance or awareness of ITS
5. Lack of public acceptance or awareness

- **Finnish site**

The major and most frequent problem concerned costs or benefits of different solutions followed by the lack of information on different experiences and evaluations elsewhere and of impartial information, as well as legal obstacles, lack of political

acceptance or awareness of ITS. Moreover, the least serious problem that may be confronted in such a process is lack of public acceptance or awareness. Lack of information in traffic safety effects was reported by the users as another probable hindrance.

3.1.5 Useful Information within an ITS Toolbox

The next question focused on the type of information that users would find useful to be included into an ITS Toolbox.

Overall, the most useful information reported was related to benefit data and the least useful was information on political acceptance.

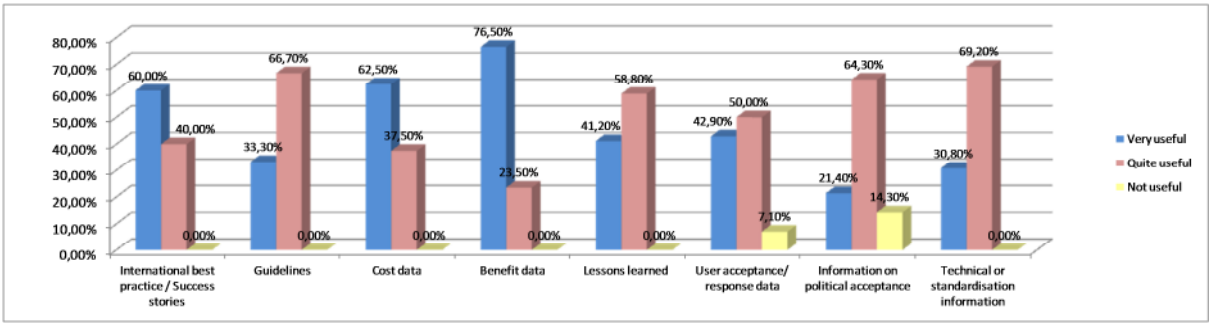


Figure 14: Overall rates regarding the usefulness of the information that could be included into an ITS Toolbox.

Analysis per country site is described below:

- **French site**

The most useful types of information to be included into an ITS Toolbox would be information about international Best Practice and success stories and about benefit data. As least useful was reported to be information about prospective guidelines and user acceptance and response data. Users mentioned that the academic thinking and the works on ITS impact on public poly-objectives of mobility (socio-economic approach and financial approach) should be taken into consideration as potential sources of importance information.

- **Czech site**

In this site users believed that proposed sources of important information are of equal importance emphasising the importance of presence of multi-aspects into an ITS Toolkit for enhancing its creditability.

- **Dutch site**

The type of information that seems to be considered as absolutely essential for an ITS toolbox is information about cost and benefit data. The remaining sources of information were of similar importance except political acceptance that was perceived as not of significant contribution to the success of on ITS Toolkit. A similar line of

thinking with other sites is revealed. Data from national knowledge institute (e.g. academia) might provide a fruitful source of information.

- **Danish site**

The first three types of information that were chosen as the most appropriate and important to be included in the ITS Toolkit were benefit data, lessons learnt, and information about technical issues or standardisation. The least important kind of information to be included in the ITS toolbox was related to political acceptance. Additionally, participants suggested that information about failure stories, which are related to the ITS service or system, should be considered each time.

- **Finnish site**

The information concerning the benefit and cost data of an ITS system or service is the most crucial information to exist in a relevant ITS toolbox, according to the questionnaires obtained from the Finnish participants. The next most important information was about international best practices/success stories and user acceptance/response data. Information about political acceptance was regarded of least importance and interest.

3.2 Post-Questionnaires

Post questionnaires were distributed to participants as soon as testing period ended. Five clusters of question items comprised the post-questionnaires:

- **Usability** of the Toolkit
- **Graphical Interface**
- **Content**
- **Overall Performance**
- **Overall Evaluation**

3.2.1 Participants' Language Information

Post-questionnaire was available (translated) to the languages that the ITS Toolkit was available (English, French, German, and Italian).

The majority of participants were native speakers in other languages than the four available languages (65%).

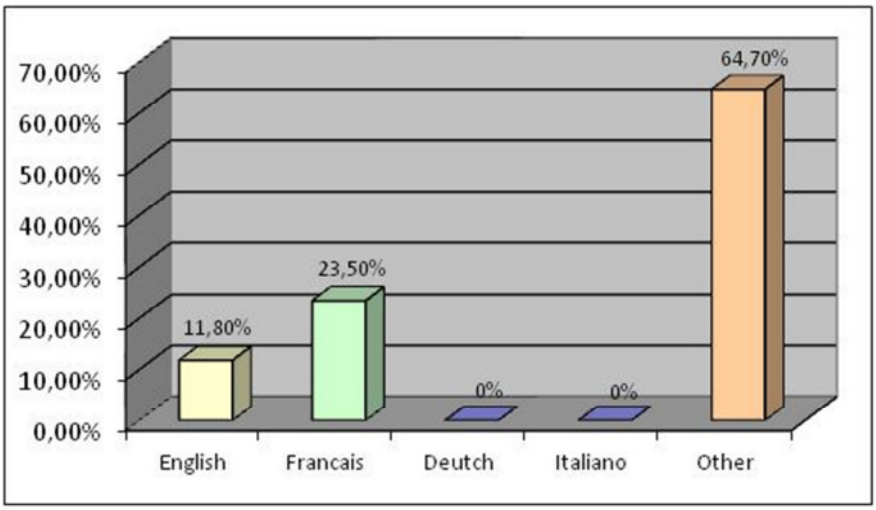


Figure 15: Percentage (%) of native speakers

Expectantly, most participants (76.5%) preferred to perform their searches in English.

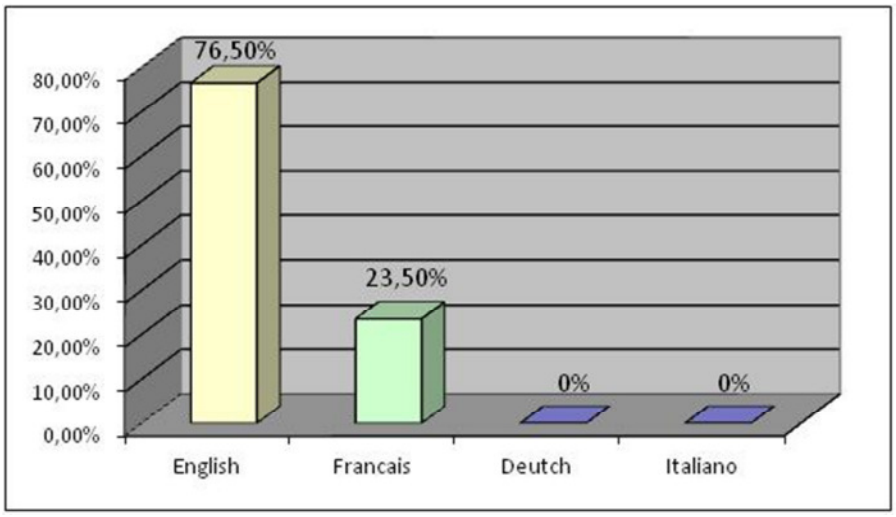


Figure 16: Preferred search language (% of participants)

3.2.2 Usability

The concept of usability does not have an absolute and predefined meaning. It is always interpreted and evaluated within the context it is applied and examined. An adaptation of the System Usability Scale (SUS; Brooke, 1996) was used in order to estimate the usability percentage of the ITS Toolkit as a global overview assessment of its usability. The **overall usability was estimated to be average (53%)** for the consolidated subjective data received by all country sites.

Two more questionnaires were administer in order to gather information about potential applications of the ITS Toolkit and their willingness to use it in the future in

order to use it as a source of relevant searches. More than half of the participants (53%) reported that they usually perform these types of searches on a monthly/bimonthly basis.

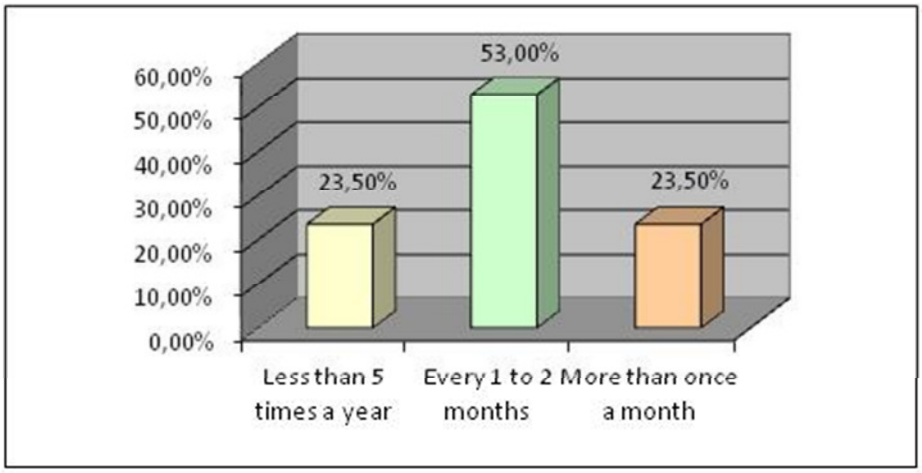


Figure 17: Percentages of users (%) as a function of frequency of application of the ITS Toolkit

The **vast majority of participants** (almost 65%) are **willing to use** the 2DECIDE ITS Toolkit along with other data sources. Another third of the participants would use it if they could not find the desired information from another source (possibly for the data sources they already use in their usual searches). Participants did not believe that 2DECIDE Toolkit would be their first choice for searches. However, it is important to note that if content is not rich and available for most users-even if these users are very experienced in the field- it is difficult to envision the possibilities and the applicability of such a system.

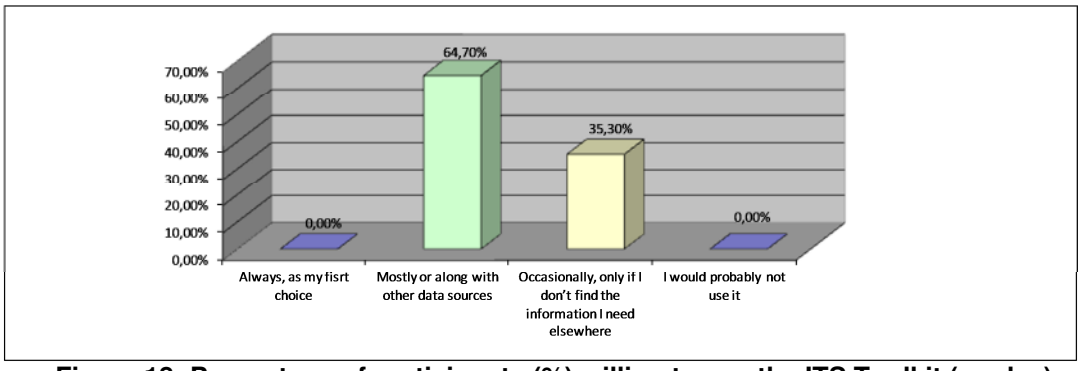


Figure 18: Percentage of participants (%) willing to use the ITS Toolkit (modes)

3.2.3 Graphical Interface

In the second part, the graphical interface of the ITS Toolkit is examined in order to investigate how many and how much participants liked and accepted it. The majority of the participants were overall satisfied by the graphical aspects of the ITS Toolkit.

However, further improvements could yield a more positive attitude towards their interaction with the graphical interface.

The main clusters of questions investigated the following aspects:

- Font size
- Colour contrast
- Navigation across menus
- User account
- Use of the buttons and guides

Almost 65% of users reported it was easy to read the font size. Similarly, most participants (70%) were positive about the clarity of the colour contrast. Overall, the first impression of the ITS Toolkit was characterised by increased easiness to read and clarity. These characteristics are important in order to sustain a positive and not tiring interaction with the HMI features of the ITS Toolkit.

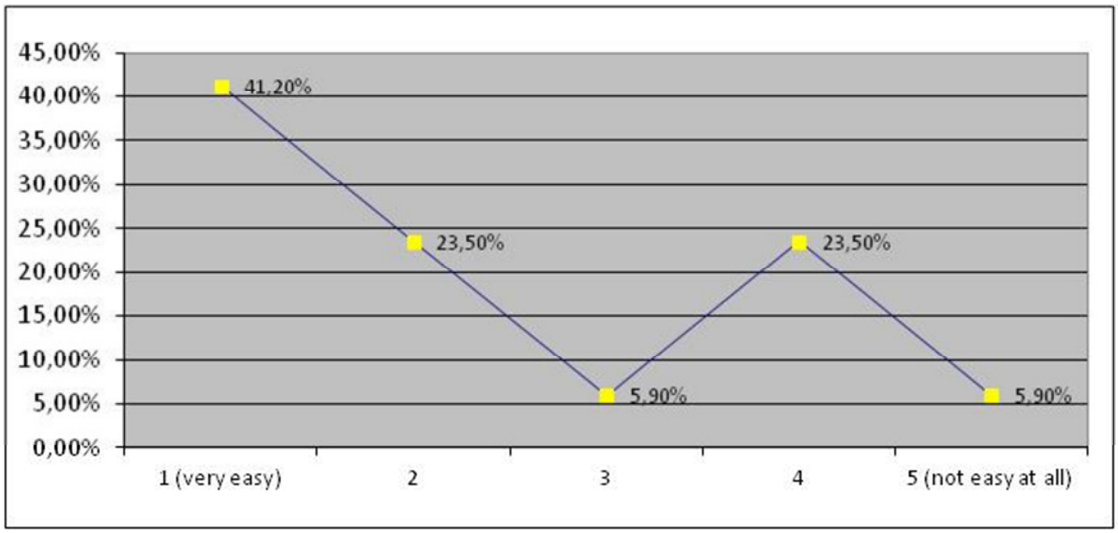


Figure 19: How easy was to see the font size

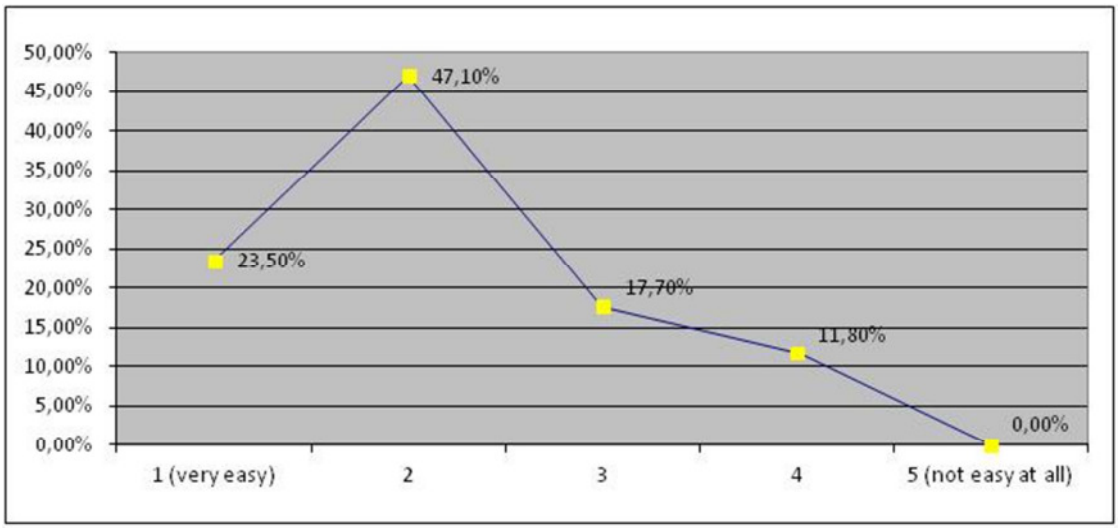


Figure 20: Colour contrast clarity

On the contrary, navigation through the menus was not perceived as very easy. Most participants (53%) believed the way menus were organised was satisfactory and adequate. However, almost the other half of the participants (47%) stated that it was not so easy to navigate across the menus. Therefore, the intuitiveness of the ITS Toolkit is an aspect for improvement in order to be a stand-alone and self-explainable tool.

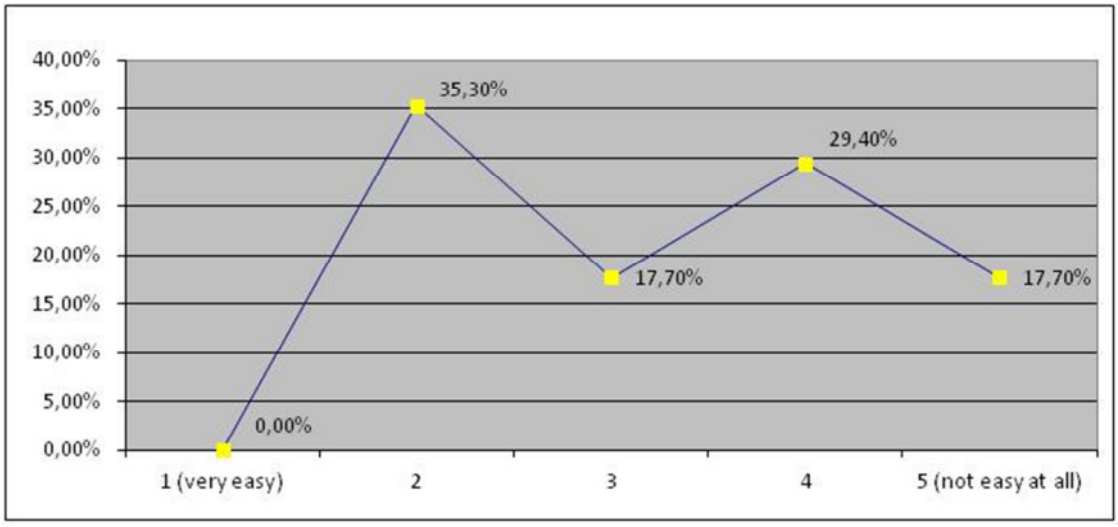


Figure 21: "Did you find it easy to navigate across menus?"

Furthermore, 75% of participants were positive or neutral about the user account option of the user account option is concerned, while only the rest 25% have a negative attitude towards this specific option available in the ITS Toolkit. The latter might be a measure of the how much users are being increasingly aware of personal data issues. Most participants did not show positive or negative attitude towards the user account as it is a very frequent, common, and straightforward aspect of most databases, engines, toolkits, etc.

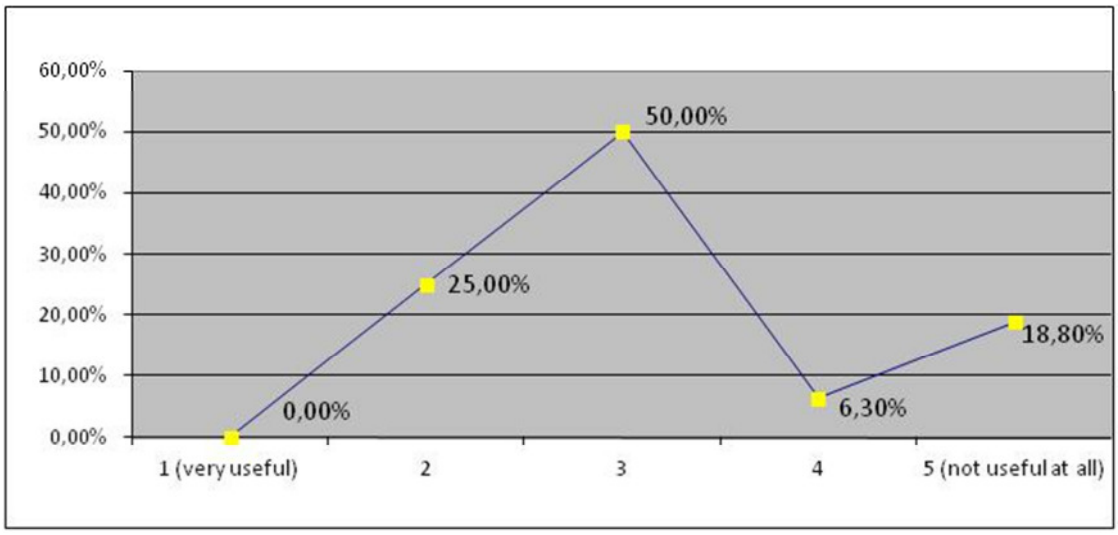


Figure 22: "Did you find the user account option useful?"

The vast majority of users (59%) reported "problem-free" experience with the ITS Toolkit with regards to the various guides (meaning the functions which allow the user to move to the next page, go back to the previous one, exit, etc.).

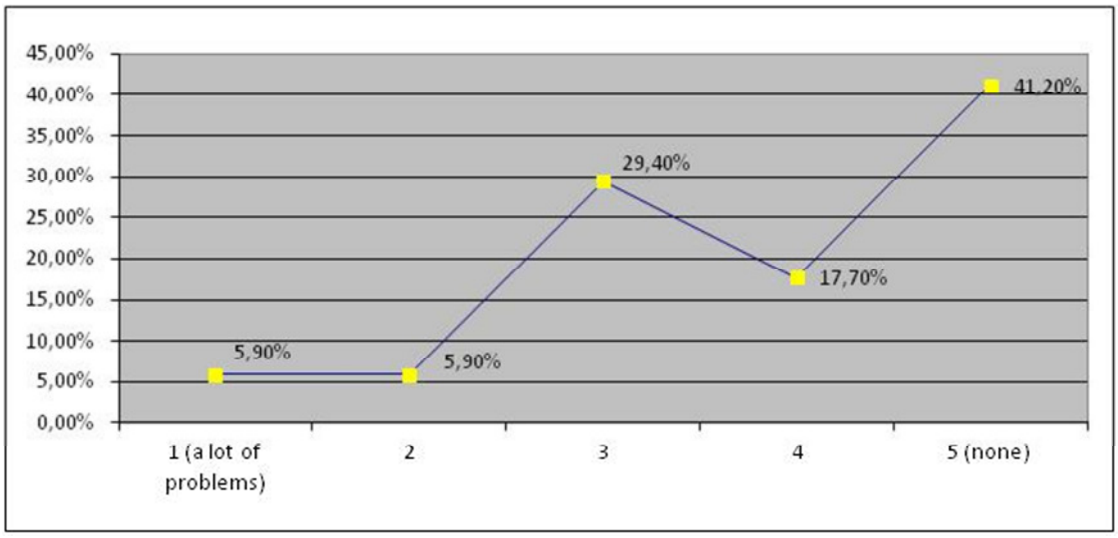


Figure 23: "Did you experience any problems with the ITS Toolkit guides during the trial?"

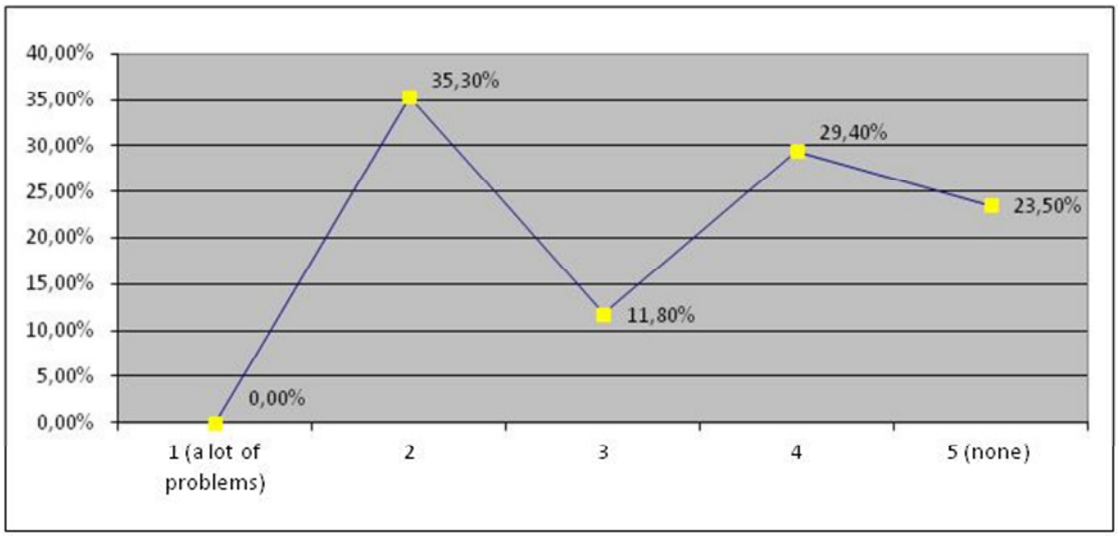


Figure 24: "Did you experience any problems with the ITS Toolkit buttons/scroll bars/check boxes during the trial?"

Some of the problems identified (53%) by the users were about the buttons, the scroll-downs and the check boxes.

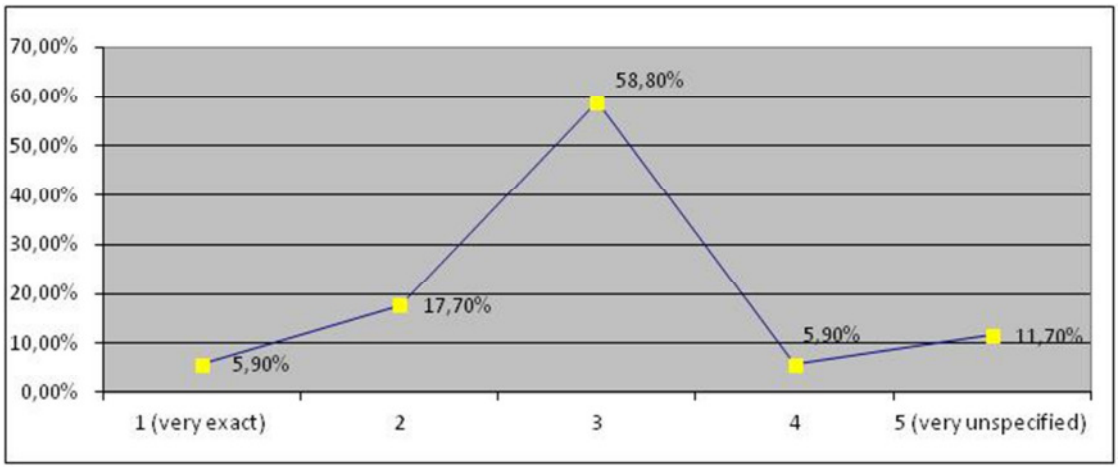


Figure 25: "What do you think about the graphical interface of the ITS Toolkit?"

In general, in an attempt to have an overview of the participants' experience with the graphical interface it would safe to report that most responses leaned towards the a**dequate** and **sufficient** side of the scale **(59%)**. The latter could be interpreted into an overall satisfying graphical display which could be improved in order to accommodate more the needs and requirements of these users and, subsequently, of future users.

3.2.4 Content

The next aspect of the ITS Toolkit that was evaluated was the content of the database. It is essential to note that it was decided early in the validation plan that

content would be mainly evaluated for its topics and areas included and not for the actual search results. This aspect was made clear to the participants in order to take into serious account the dynamic nature characterising the content of the ITS Toolkit. During the evaluation process, participants were informed about new reports continuously entered to the database, therefore informed about the possibility of performing the same search within two weeks and yielding different results. Under this prism, the below mentioned findings were expectable.

Most users reported that they only partially have managed to find the information which they were looking for during their searches with the 2DECIDE Toolkit. Specifically, 5.9% of the users stated that they were fully satisfied by their search results. Another 41.2% of them haven't been able to find the information that they were looking for and the remaining 52.9% represents those who have only managed to obtain a part of what they needed.

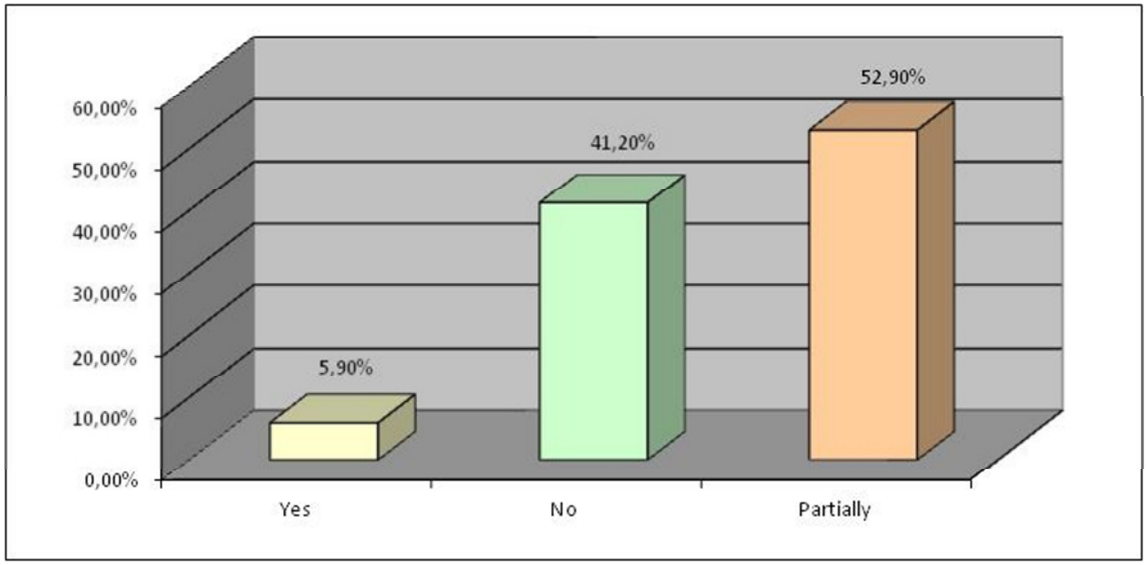


Figure 26: "Could you find the information you were looking for on the ITS Toolkit?"

However, most of the participants said that they were quite satisfied by how much understandable the information obtained was. Similarly, the exact same percentage of users (43.3%) did not express either a positive or negative opinion regarding this issue.

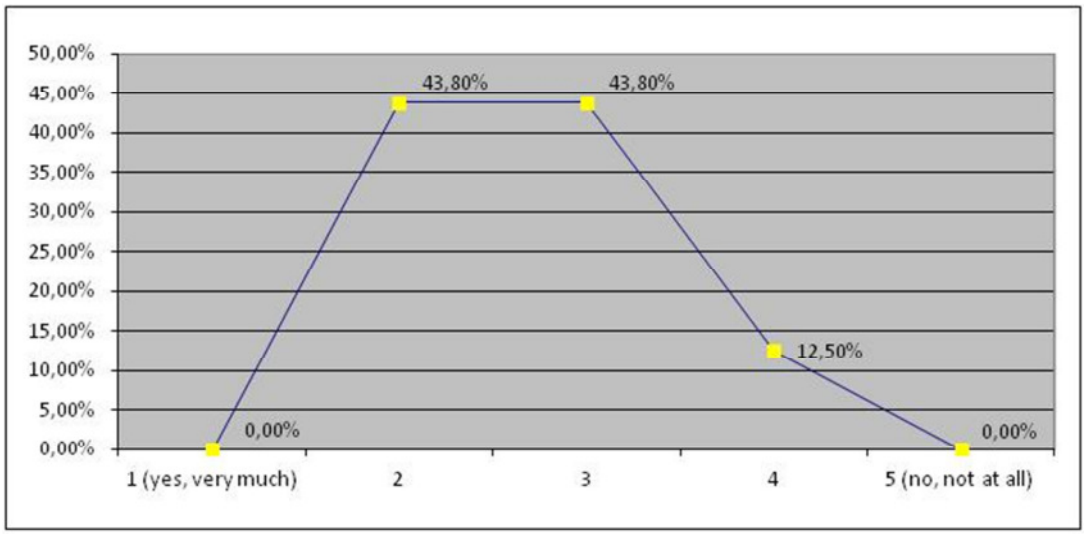


Figure 27: Was the information given by the ITS Toolkit easy to understand?

On the other hand, there seems to be a negative trend for the search criteria used. Almost half of users (47%) reported that the search criteria were not very clear or that they were not clear at all, while a rate of 35.3% were neutral about the search criteria's clarity.

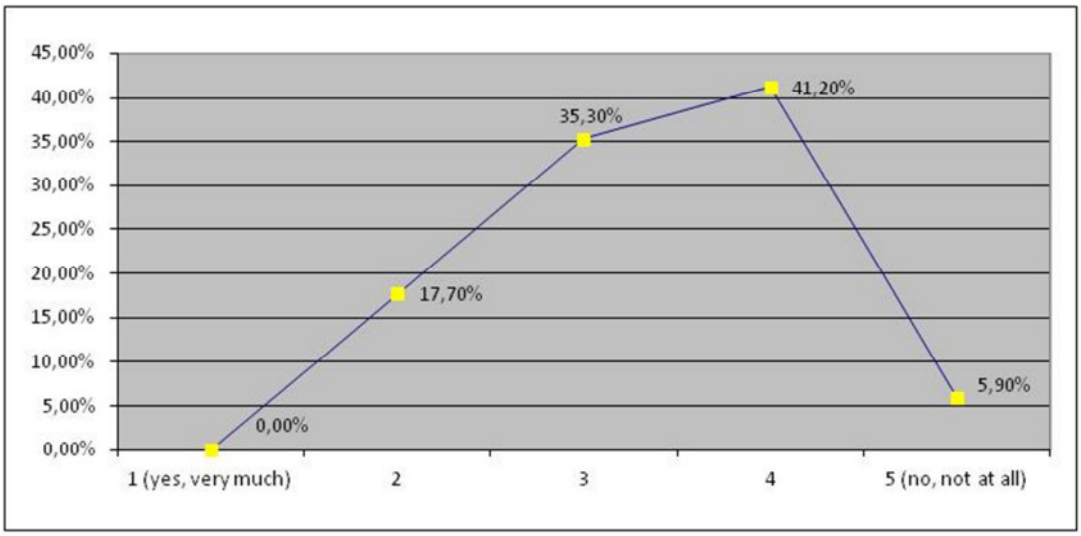


Figure 28: "Were the search criteria clear enough?"

Finally, search criteria were meant to target people who already are familiarised with ITS terminology. Therefore, as the assimilation level is not a uniformal experience, further explanations might be required. The last finding is important for either clarifying more in depth the search criteria and/or setting a glossary for the future users.

3.2.5 Overall Performance

Moving on to the overall performance of the 2DECIDE ITS Toolkit, the general feeling appears to be positive.

Specifically for each post-questionnaire cluster, the following conclusions were reached:

- **53%** of the participants reported that it was **easy to correct a wrong selection** (Figure 29). The rest of the participants were equally divided to those who could not or did not comment on this (i.e. or probably did not encounter such an issue/problem)

- **35%** were **satisfied** from the **logical connections between menus** and **submenus** while 18% were not (Figure 30).

- **41%** reported that the **response speed** of the ITS Toolkit was **fast** enough. On the other hand, 35.4% seem to find the Toolkit slow or very slow and a percentage of 23.5% were neutral (they did not believe it was either slow or fast) (Figure 31).

The aforementioned findings are depicted to the following graphs:

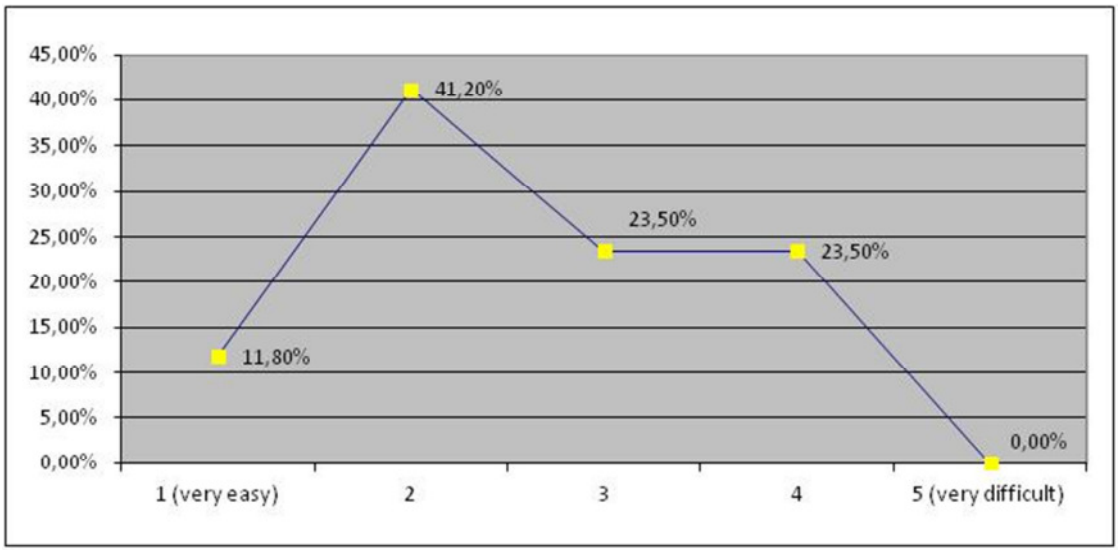


Figure 29: "Was it easy to correct a wrong selection during the trial?"

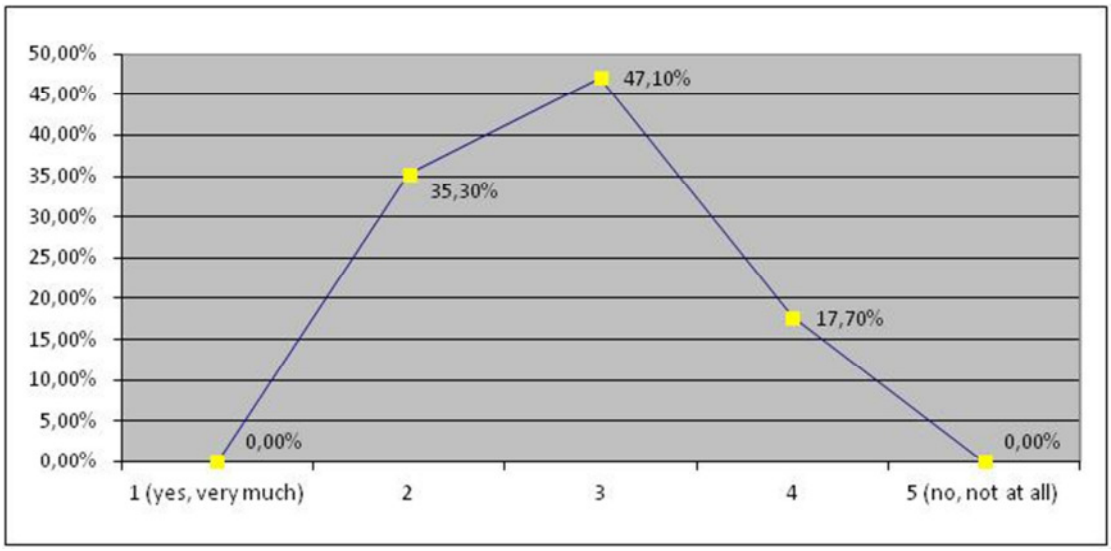


Figure 30: "Are all menus and submenus logically structured?"

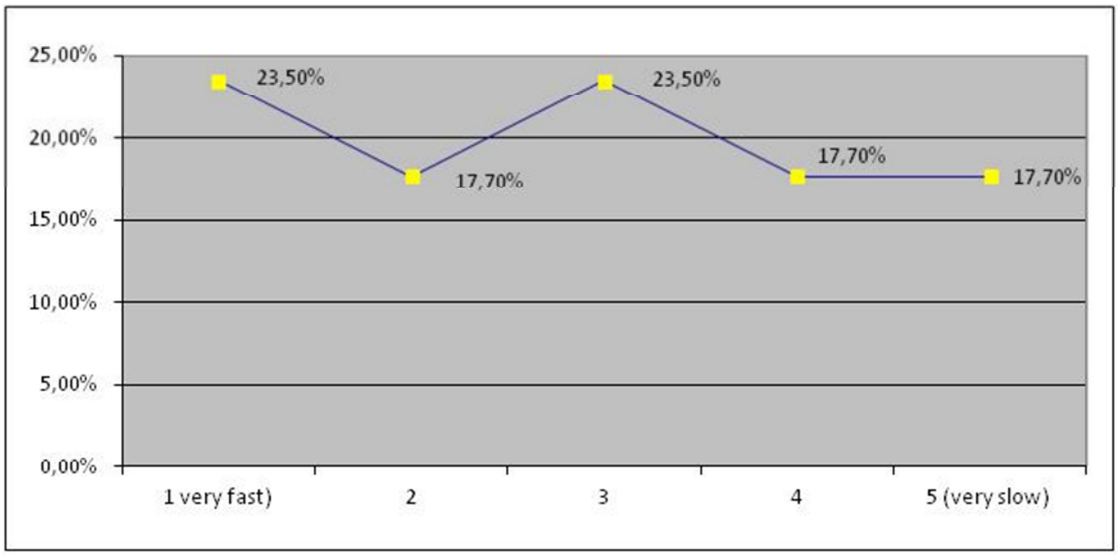


Figure 31: "Was the response of the system fast enough?"

3.2.6 Overall Evaluation

The last part of the questionnaire aimed to capture the overall impression of the ITS Toolkit. The main results are summarised below:

- **Most users (47%)** reported that **they would recommend** the 2DECIDE ITS Toolkit to other potential users. Participants who were either hesitant or unsure were probably users who believe that content would be the decisive element for recommending this toolkit.

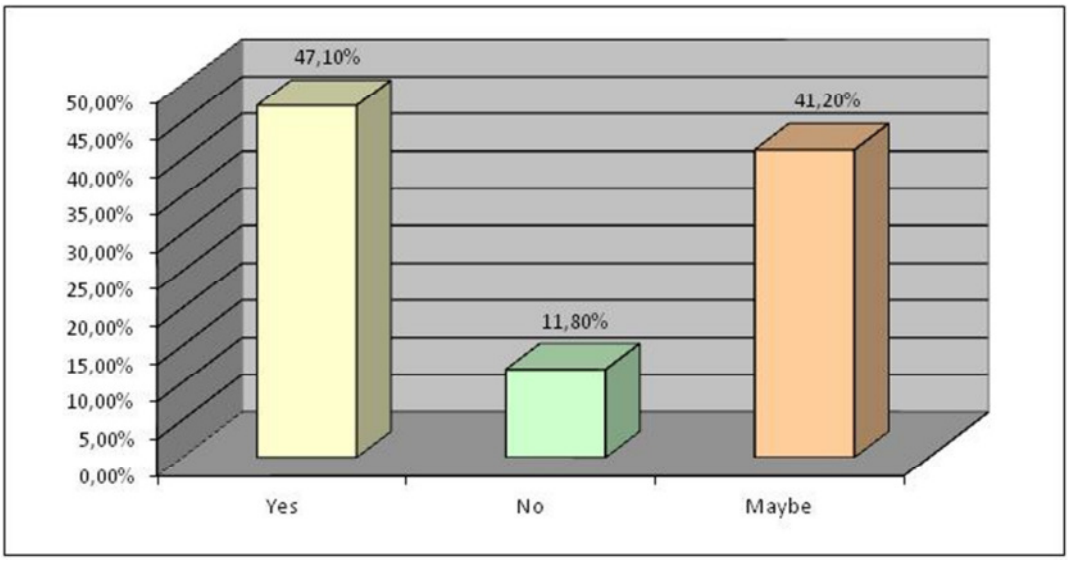


Figure 32: Willingness to recommend the ITS Toolkit to other potential users

- **Most users (65%)** agreed that the development of a toolkit for ITS decision-making - as one of the priorities of the EU's ITS Action Plan- **is a very worthwhile endeavour**. This concept seems to find grounds to the ITS Toolkit development carried out within the framework of 2DECIDE.

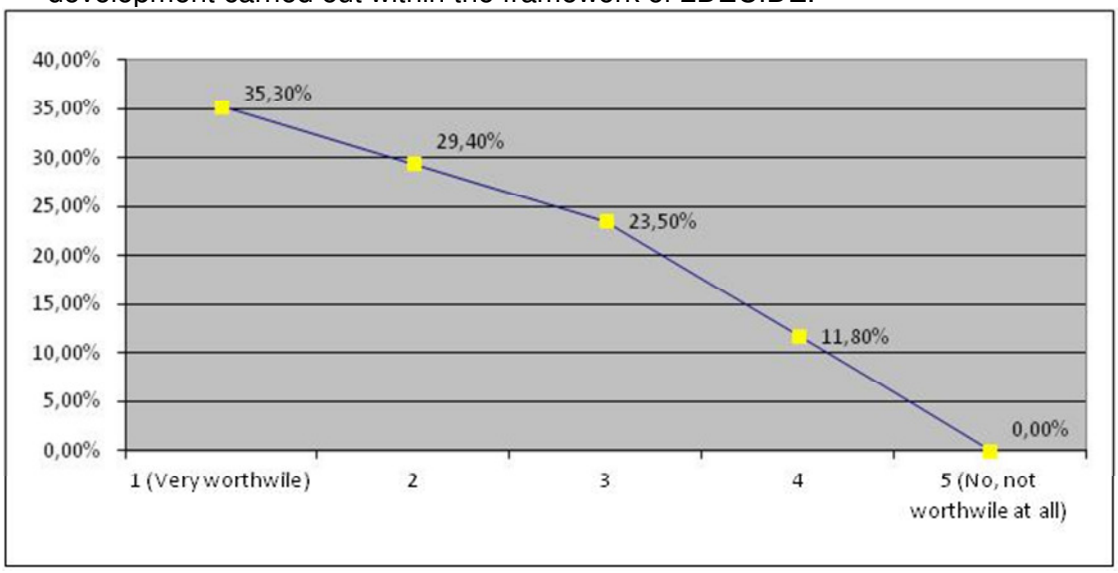


Figure 33: ITS Action Plan goal for the development of ITS decision-making toolkits

Most users (53%) stated that the ITS Toolkit **met their expectations**. However, 41% of users reported that it partially met their expectations.

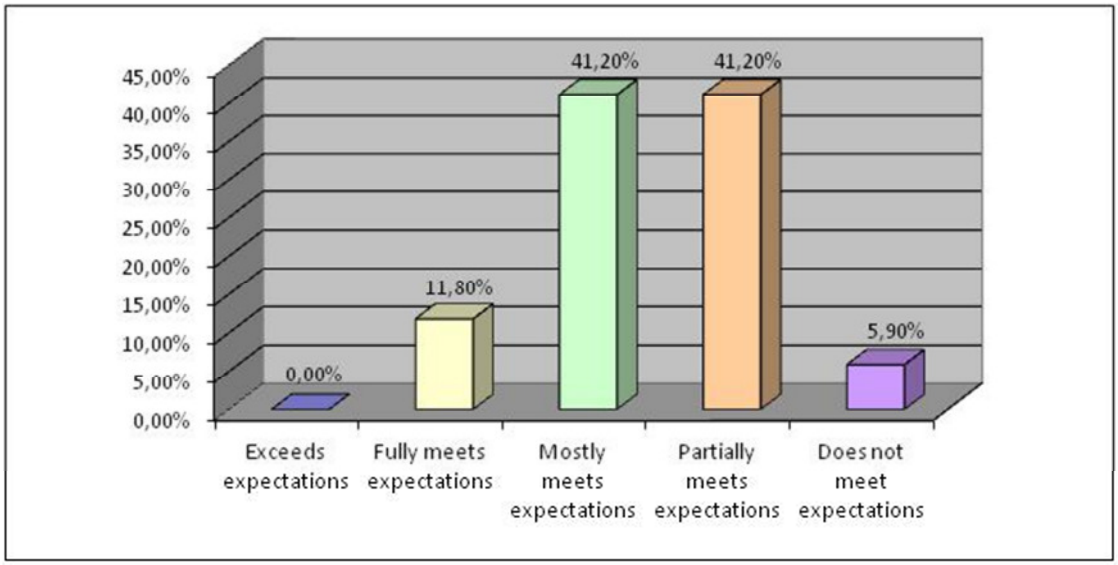


Figure 34: Overall evaluation of the 2DECIDE ITS Toolkit compared to the users' initial expectations

The reasons for not fully meeting their expectations was the basis for the improvements, rectifications and changes made to the ITS Toolkit after the end of the first validation phase and before moving to the second one.

3.3 Interviews

Interviews (n=17) were held in order to shed light to aspects that could not be covered by the standard close-ended format of the questionnaire and, also, to have an opportunity to have an open discussion with users about their experience with the ITS Toolkit as they could only describe it.

Most interviewees (43%) showed a positive attitude towards the ITS Toolkit.

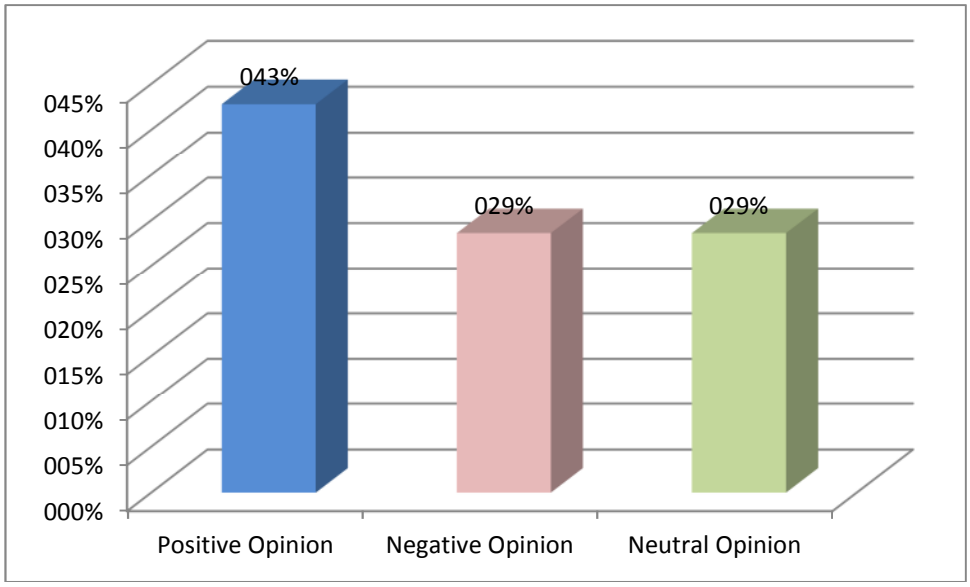


Figure 35: General evaluation of the interview responders about the ITS Toolkit

The critical aspect of the interview was not only to state how much (or not) they liked the ITS Toolkit and how positive they were about the innovative elements embedded in both its ontology and architecture but to highlight also the things that needed to be changed prior its deployment. The most frequent suggestions are presented below per each validation aspect:

- **Graphical Impression**

The general impression of the participants who were interviewed was positive; they thought that the **graphical interface** of the Toolkit was **quite good** and **practical** with a **very satisfying typology**. Moreover, the majority of interviewees expressed the opinion that the **thumbnails** used are quite **clever** and **well thought-out**. Some users mentioned that the interface is **not very attractive** and **lacks in visibility** and **readability**. More specifically, some users thought that the graphical aspect of the database was too dark and its colours were a bit dull and did not match together.

- **Content**

Most users thought the **content** was **detailed enough** and the option to **access single evaluation studies** was regarded as **very useful**. Moreover, participants emphasised the **innovative aspect** of the ITS Toolkit mainly because it is very useful to have a database gathering so much information and especially on a **pan-**

European level. Another innovative feature of the database was reported to be **its benchmarking aspect**. The **detailed accounts** of the reports were **positively viewed.** Many users mentioned that the details were really **sufficient** and that the results of the Toolkit **were in context** and that they didn't find them confusing at all.

However, there were some negative comments about the content aspect of the Toolkit. Most of these comments were summarised below:

- The links "why", "what" and "how" should be highlighted, for instance, the text should appear directly on the page. No need to click on links.
- Lack of information in several points of interest (e.g. smart ticketing and management of HGV emissions).
- Very similar to the DfT toolkit run by the University of Leeds
- List of adequate ITS services are too long. List contains ITS services that are not relevant to the expert.
- Ranking of ITS services was not understood at all.
- Need of more reports that aren't too old.

- **Structure**

The majority of users reported that the **search criteria**, in general, were **adequate**, that the **menu** was **quite simple** and easy to use and that they wouldn't change the way that information is being presented in the Toolkit. Despite overall positive feedback about the main structural elements of the Toolkit there were some comments and suggestions about changes that should be made in order to increase its easiness, understandability, usability and effectiveness. Negative comments were the following:

- Different options of criteria are not well explained.
- Within each criterion, it would be better that the selection of different options would be allowed. This is too restrictive for now.
- Not enough complete presentation of the information given.

- The selection per “area of transport” is obsolete and useless. This criterion should provide “multimodal” as a choice.
- The content of each criterion is limited.
- The difference between “ITS Toolkit“and “Search“is not clear. Both have the same search criteria.
- The texts of the studies are too long.
- The usability of the “my account” thumbnail is not clear.
- Categorization is not clear at all. It is not easy to understand what is involved behind each criterion. For instance, in the case of the “other transport (people)” selection, what does it mean and refer to?
- “Geographical coverage” should not be mandatory. The indication of the location isn’t necessary.
- The difference between mandatory criteria and optional criteria is not well explained.
- The connection between the three levels of an area needs to be easier and more effective.
- The structure is not self explaining and clear at all.
- Reduction of information is necessary.
- A shorter list of relevant ITS Services would be preferable.
- There are too many options in the search field from the beginning on. A 2step approach would be more appropriate.
- More detailed instructions are needed. It is not clear that some criteria are mandatory and some others are not.

- **Desirable improvements and additions**

The list documented below considers suggestions about improvement and about further additions that need to be made to the 2DECIDE ITS Toolkit:

- Contact details about the people/organization involved in the development of 2DECIDE projects should be added. Users would be interested to contact them.
- Integration of an “evaluation" thumbnail.
- After the launching of the ITS Toolkit, one of the main issue will concern how it will be continuously updated. It will be very important to make the ITS

Toolkit a reference and to keep the database always more complete. This will leverage the ITS Toolkit and encourage potential users to user it rather than Google search engine.

- Allowing of downloading studies would be very important. Nowadays, it is the usual way to do.
- Addition of American studies, as they have plenty of experience.
- More clarity and explanations about the way to use the Toolkit it would be preferable.
- Information about “cost and benefits” is needed. For now, there is no relevant indication.
- Increase in number of reports included in the toolkit.
- Full text search is desired. Structure should be similar to the structure in other online libraries.
- Integration of a programme/process that detects errors in the system to improve the search engine and content presentation.
- Correction of spelling mistakes through the database.
- Correction of language inconsistencies: On the main page and general description of ITS service languages are widely mixed.
- Less information should be presented.
- Combination of Full text search is desired.
- Search field should contain fewer options in the beginning and should grow subsequently / 2step approach.
- Combination of more different problems/objectives/ITS services should be possible.
- Integration of new search tags
- If a study cannot be published on the toolkit, an abstract should at least be included.

- **Aspects desirable to be removed**

The aspects of the database that were suggested to be removed were the following:

- Both mandatory criteria “area of transport” and “geographical coverage”.

- Cost and benefits are always the same: If this isn't going to be changed, it would be better not to give this information.

- **Problems encountered during testing**

The problems that have been reported by the users of the Toolkit were the ones below:

- Problems in retrieving lost passwords.
- Problems with the "go back" button.
- Difficulties regarding the "Upload case study" field.
- Problems with bugs in the Toolkit.
- Occasional speed problems and re-setting of selected criteria.
- Very similar queries did not lead to the same result. Some original studies could not be found, although there should have been.
- Search options were not adequate to search for a problem. Therefore a full text search is desired.

- **Overall Impression**

Most of those users were positive about their experience with the 2DECIDE ITS Toolkit. Despite their positive experiences, they stressed the fact that some changes and improvements need to be implemented in order for this Toolkit to reach its purpose. Specifically, it was frequently suggested that the toolkit needs to get more elaborated and further developed. But almost all interviewees mentioned that with some improvements and additions this database would be a very useful and important tool.

4 Second validation phase

The second validation phase followed the same steps as the first phase. However, the second phase was based on the improved toolkit after the comments and feedback from the first validation process. The outcomes of the second phase will serve the basis for the delivery of the final version of the ITS Toolkit.

4.1 Pre-Questionnaires

4.1.1 Demographic Data

22 users took part from six different test sites:

- Austrian test site
- Danish test site
- Dutch test site
- German test site
- French test site
- Greek test site

The second validation phase was the final round; therefore participants from all country sites were included. In some occasions, the number of participants might be less than five participants but the conduction of two validation phases was not considered in the Technical Annex. Overall, if both cycles are considered, more participants per involved country than expected had participated.

The number of male users increased in the second sample (78%). Gender representation is depicted in the following pie chart.

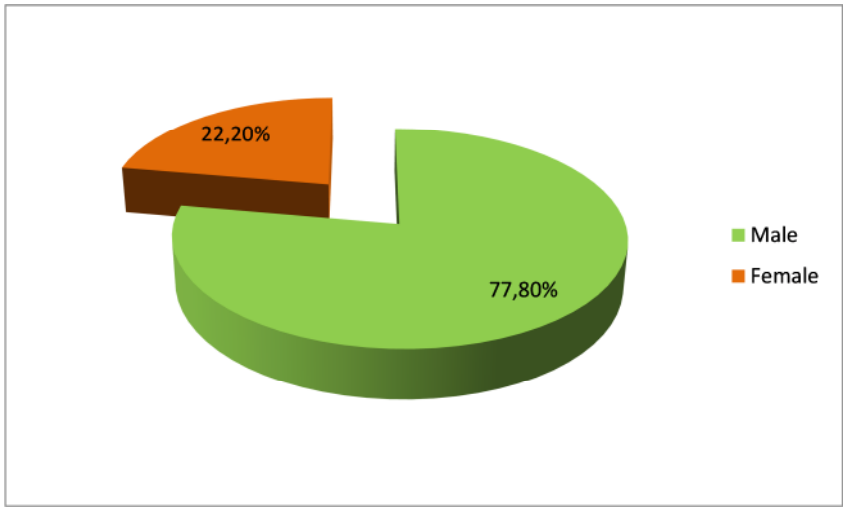


Figure 36: Gender representation during the second validation phase

Participants who tested the 2DECIDE ITS Toolkit during this phase have an experience in the general Transport area of about 13.4 years which is similar to the experience of participants in the first validation phase. Their experience in the sector of the Intelligent Transport Systems has been averaged at about 8.9 year.

The transport fields and the transport modes in which most of the users seem to be involved are presented in the following graph.

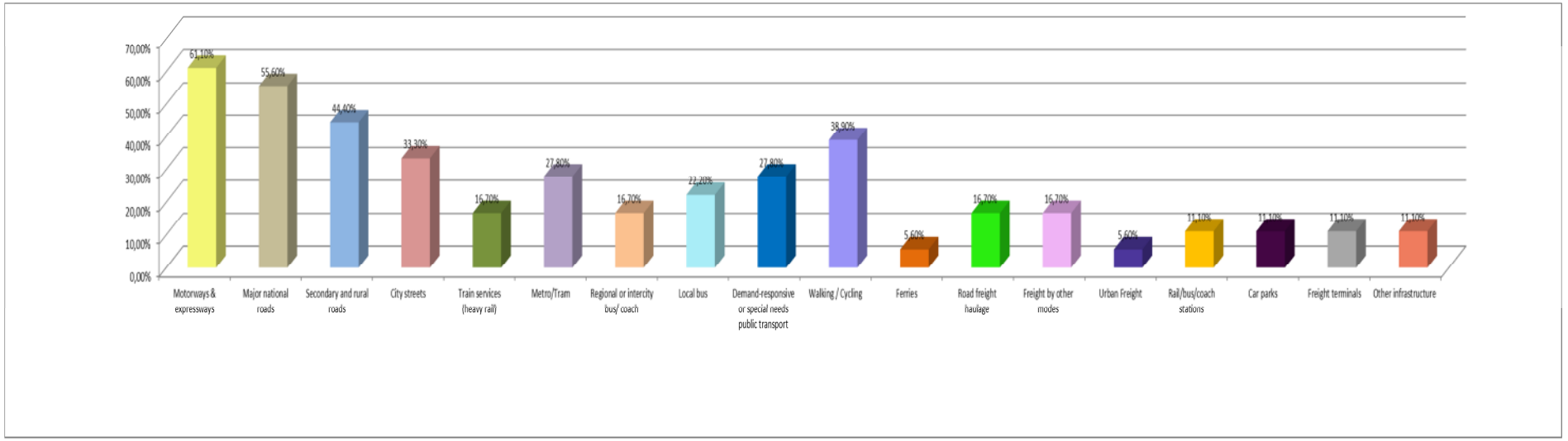


Figure 37: Participants (%) involvement in each sector/tranport mode

Native languages reflected the country site with the exception of one British user who was a participant for the French site. However, the languages that the users reported that they can also use, on a satisfactory level, are shown in the following graph.

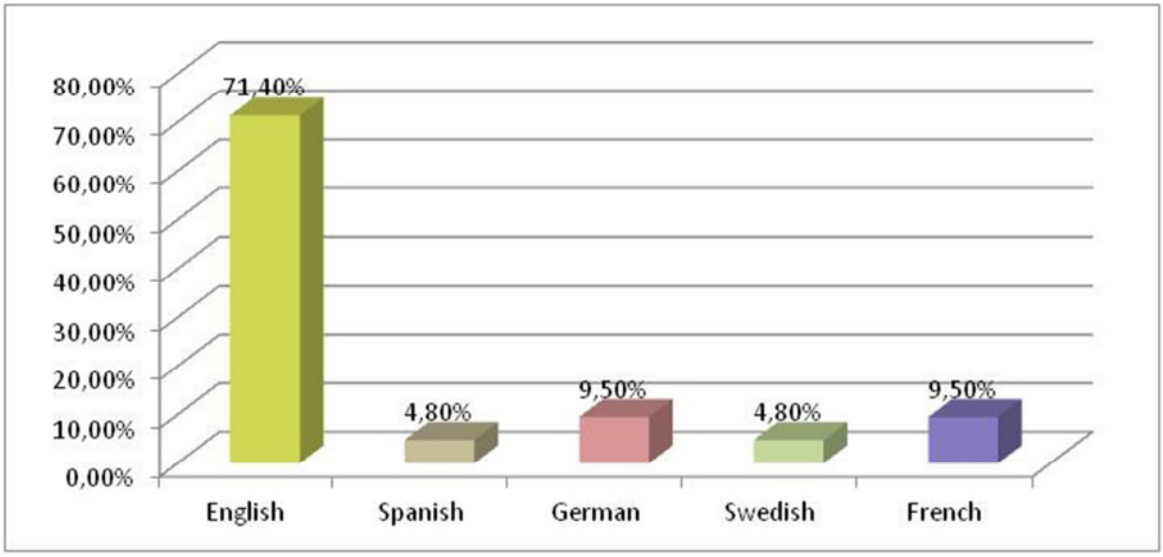


Figure 38: Other languages used by the participants of the 2nd Validation Phase

Similar to the first validation phase, most participants are in favour of using English if not using their native language.

4.1.2 Decision-making for Intelligent Transport Systems and Services

The second part of the questionnaire focused on the usage of ITS applications in order to handle several different issues in the transport sector based on their professional experience. Most users adopt ITS in order to address issues that are related to the decrease of traffic congestion, the enhancement of safety and the improvement of user friendliness. On the other hand, the participants believe that the Intelligent Transport Systems are not effective in dealing with issues like enhancing security, enhancing traffic enforcement and addressing global environmental issues.

Participants filing in the pre-questionnaire in the second validation phase were in agreement with responses from the second round of validation. There is a trend of diminishing interest and trust of using these systems for enforcement, environmental issues and aspects of transport. The latter is an important research area the last few years and there is a possibility to lead to an increase in sound research findings for “green transport” which would lead to enhancements in ITS development and involvement.

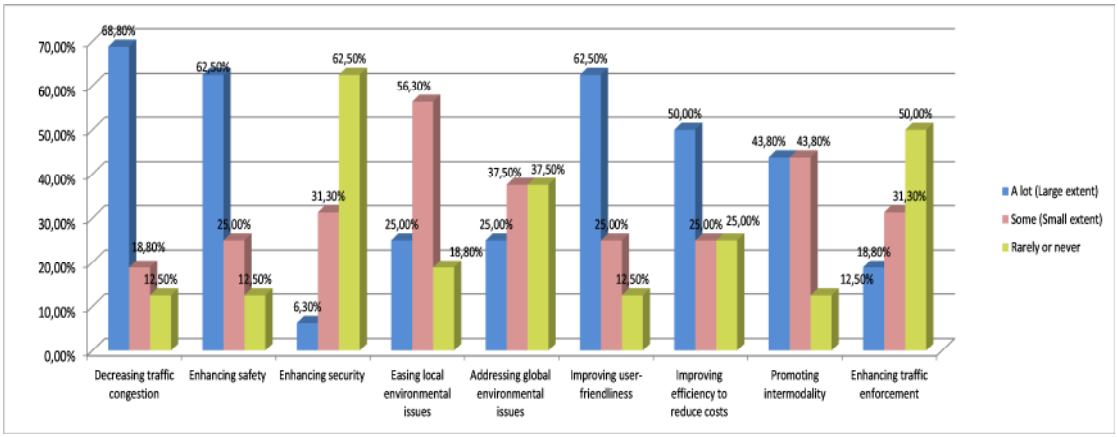


Figure 39: Rates of ITS application for addressing policy issues in all participating countries

The second validation results are presented in the same order as the first validation results, therefore pre-questionnaires' findings are presented per country site:

- **Austrian site**

There are several issues that seem to be handled by these professionals through the use of ITS. A similar pattern is apparent across sites for various professionals. Most frequent application appears to be traffic congestion management. Environmental issues do not appear at the bottom of the list as it seems to be the situation for other country sites. However, enhancement of traffic enforcement and security are the least addressed by ITS solutions as it is the case for other sites as well.

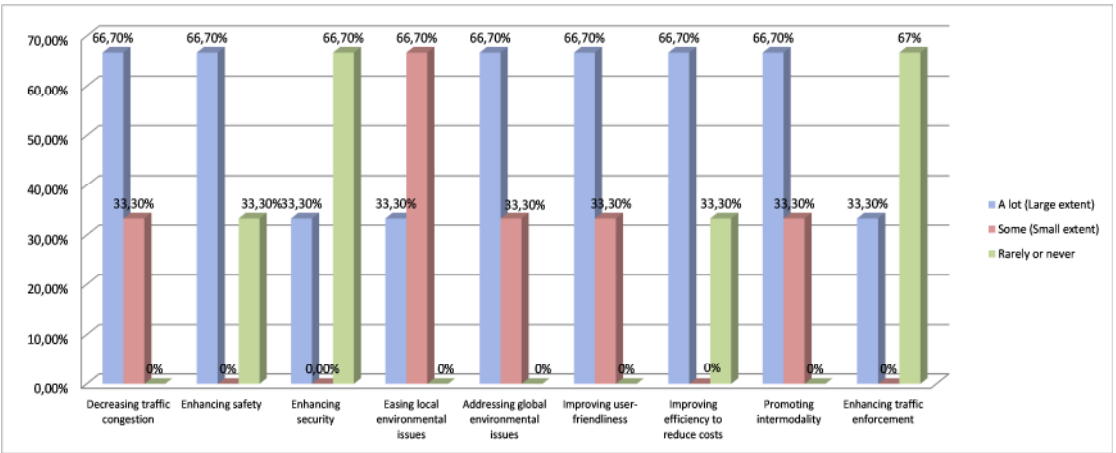


Figure 40: Rates of ITS application for addressing policy issues (Austrian site)

- **French site**

Participants stated that they infrequently use ITS solutions on issues such as enhancing traffic enforcement, enhancing security, increasing and addressing global and local environmental issues. However, French participants have reported using ITS solutions mainly for issues concerning traffic congestion, user-friendliness and intermodality.

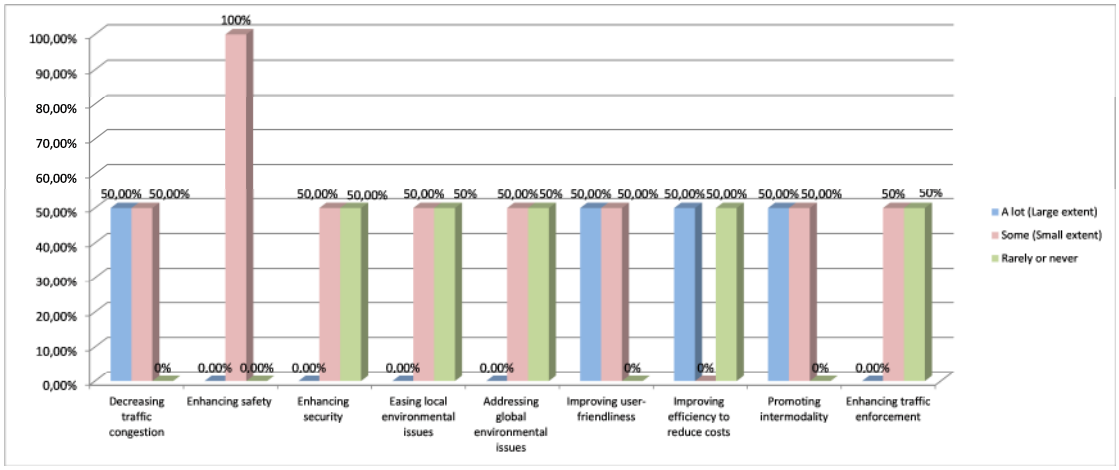


Figure 41: Rates of ITS application for addressing policy issues (French site)

- **Dutch site**

Traffic congestion is high on the list, also, for the Dutch site users. Safety enhancement and safety are among the important areas and issues as it is depicted in the following graph. Possible reasons could be the complexities resulting from the variety of road users (i.e. cyclists) in the Netherlands.

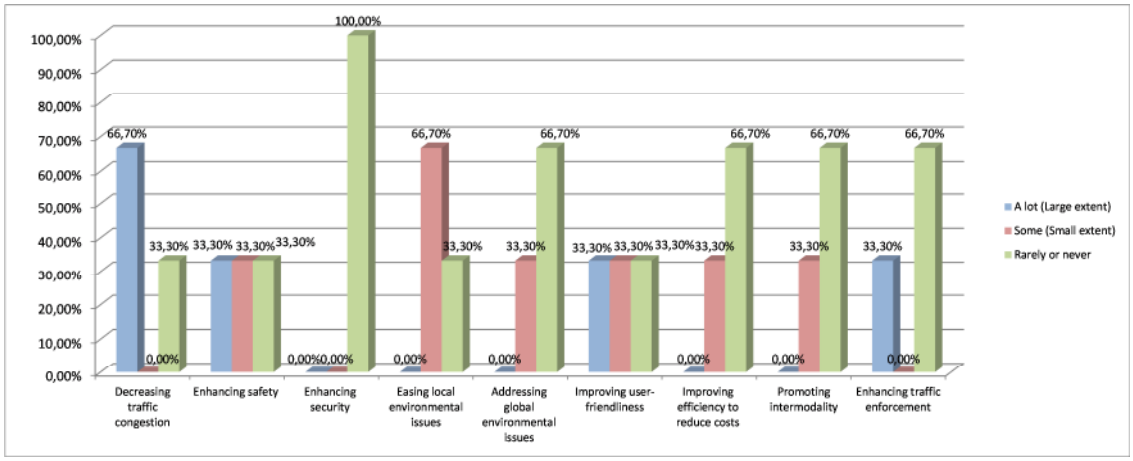


Figure 42: Rates of ITS application for addressing policy issues (Dutch study)

- **German site**

Intelligent transport systems and services were reported to be applied mainly for managing issues such as traffic congestion, intermodality, safety, local environment issues and costs reduction. Less frequently, the ITS applications are being applied in issues like global environmental issues, improvement of user-friendliness, traffic enforcement and security.

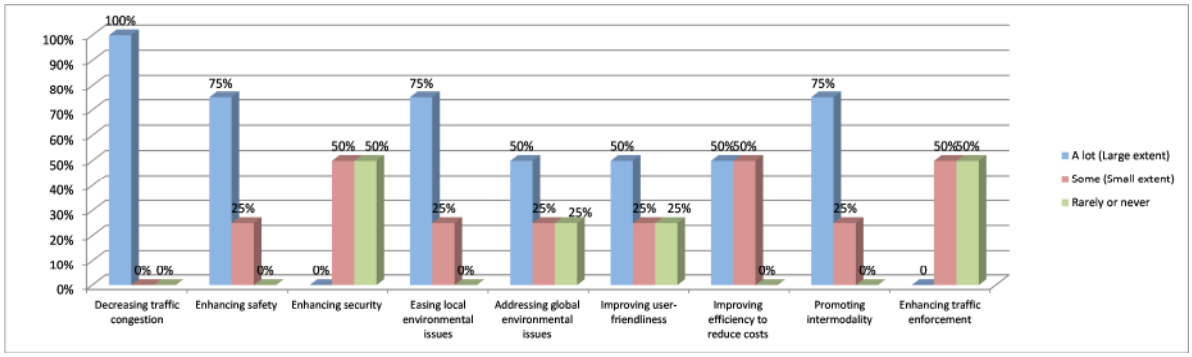


Figure 43: Rates of ITS application for addressing policy issues (German site)

- **Greek site**

ITS systems were reported to being used mainly for addressing safety and user-friendliness issues and, as shown below, in a lower percentage for environmental and security issues.

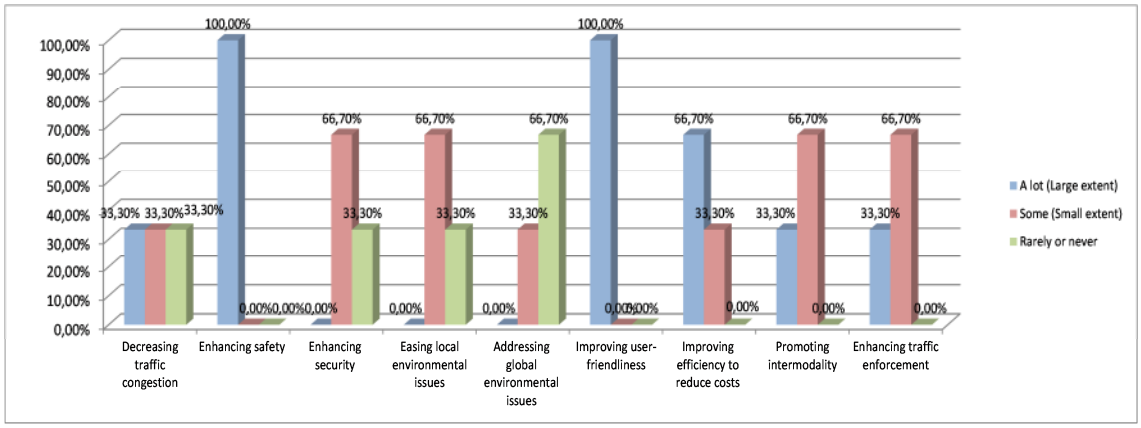


Figure 44: Rates of ITS application for addressing policy issues in (Greek site)

- **Danish site**

ITS applications are used to a large extent for addressing issues like congestion, safety, user-friendliness and reduction of costs and to a smaller extent for issues concerning environment and intermodality. The number of participants was small; hence no graph depiction is needed.

4.1.3 Tools for ITS Investment Decisions

Decision making is an important element in ITS applications. Professionals working in areas that ITS solutions are applied, follow several routes for decision making. The following graph presents the consolidated results for the whole 2DECIDE validation sample. Separate analysis per country study follows. It is evident that Cost Benefit analysis is the common decision path followed by “in house” evaluation reports. Guidelines seem to be the least preferred decision making “assistant”. This finding is in line with results from the first validation phase. Guidelines are either viewed as

robust alternatives or are not easily implemented for ITS solutions. Guidelines are highly regarded as a universal channel to harmonise efforts and potentially increase the validity of the outcome (i.e. decision).

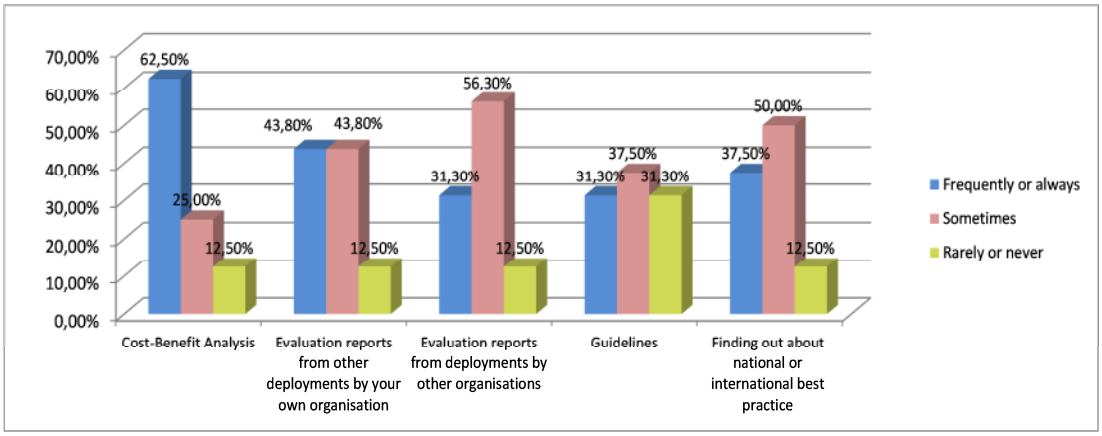


Figure 45: Percentage of users (%) as a function of the frequency of tools applied for ITS investment decisions

Specific ITS choices for decision making per site were the following:

- **Austrian site**

Participants' main sources of ITS decision making are Cost Benefit Analysis and guidelines. They rely less on information they receive about national or international best practices (internet, press, site visits and personal contacts) and evaluation reports from deployments by other organisations. In other words, they rely mostly on robust and concise sources of information that sometimes are less time-consuming in implementation.

- **French site**

Contrary to the previous test site, participants from the French site prefer to rely more on evaluation reports from their own organisation and least on Cost Benefit analysis findings.

- **Dutch site**

In this site, findings are more in agreement with the rest of the sites and the popular choice of Cost Benefit analysis. In addition, national or international Best Practices are considered. Evaluation reports are less popular.

- **German site**

Evaluation reports in general and Cost Benefit analysis are the preferred sources and Best Practices are the least used.

- **Greek site**

Best Practices are at the top of their decision making and guidelines are the least preferred.

- **Danish site**

Participants do use more than one decision making route and mostly CBAs, evaluation reports, and Best Practices and least guidelines.

4.1.4 Problems Related to the Decision-Making Process about ITS-based Solutions

There is always the possibility of problems occurring in the process of decision-making with ITS based solutions. The problems examined were the following:

- Not enough information about the costs or benefits of different solutions
- Lack of information on different experiences and evaluations elsewhere
- Lack of impartial information
- Legal obstacles or lack of political acceptance or awareness of ITS
- Lack of public acceptance or awareness

Overall, lack of impartial information is apparently the most frequently encountered problem followed by lack of information about the costs and benefits of different solutions. The latter appears to be an important problem as most users seem to be interested in cost benefit analysis as a main decision making investment. The rest of problems do share similar frequency of occurrence.

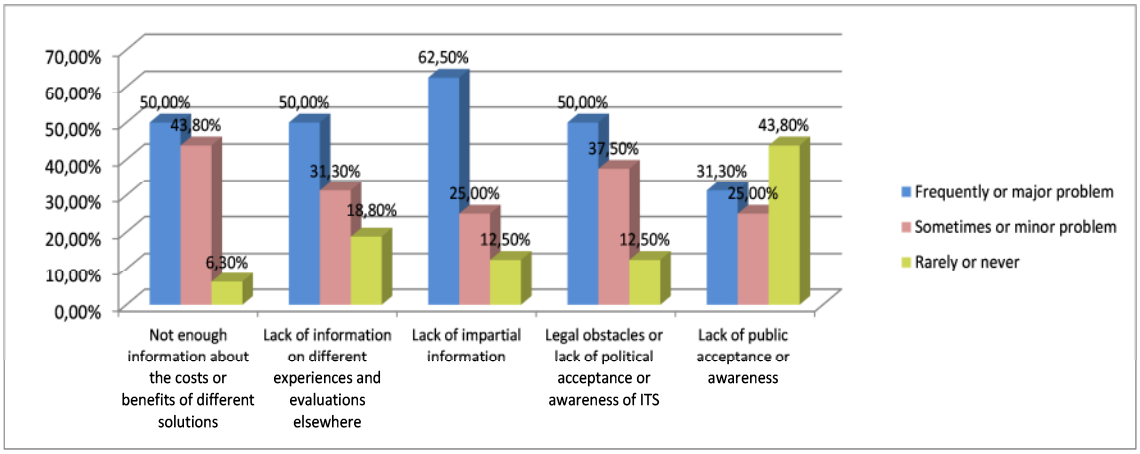


Figure 46: Frequency of encountered problems during decision making with the application of ITS solutions

Per country results are as follows:

- **Austrian site**

Lack of impartial information is the most important encountered problem. Legal obstacles and political awareness seem not to significantly hinder ITS application.

- **French site**

Lack of efficient information about the costs or benefits of different solutions, the legal obstacles and lack of political acceptance or awareness of ITS (e.g. difficulty in

promoting the concept to your political or managerial superiors) and the lack of public acceptance or awareness (e.g. public opposition or media campaigns against implementation) are regarded the most problems in ITS application. Least important is regarded the lack of information on different experiences and evaluations elsewhere.

- **Dutch site**

Lack of information about the costs and benefits of different solutions is regarded as the most important and frequent problem. Lack of public acceptance and/or awareness is not perceived as a hindrance for ITS implementation.

- **German site**

The most important problems reported were lack of information on different experiences and evaluations elsewhere and the lack of impartial information while the least important problem is lack of public acceptance or awareness.

- **Greek site**

Legal problems and political acceptance are regarded as the most important problems and lack of information on different experiences and evaluations are perceived as less important and frequent.

- **Danish site**

Four out of five problems mentioned were considered to be really important (legal obstacles or lack of political acceptance or awareness of ITS, not enough information about the costs or benefits of different solutions, lack of impartial information and lack of information on different experiences and evaluations elsewhere). While the last problem mentioned (lack of public acceptance or awareness) did not seem to have the same impact.

4.1.5 Useful Information within an ITS Toolbox

This questionnaire item was about the desired content of an ITS Toolkit. As the questionnaire was initially distributed to investigate needs and requirements of potential users, this feedback was used for the development of the 2DECIDE ITS Toolkit. In addition, similar questions were administered to the validation participants in order to investigate the needs of specifically this sample.

Overall, participants seem to be interested in evidence based information from lessons learnt from previous endeavours. However, information on political acceptance seems to be of less importance to them and it is not considered to be useful to be included in an ITS Toolkit. The follow graph depicts usefulness of all proposed content categories.

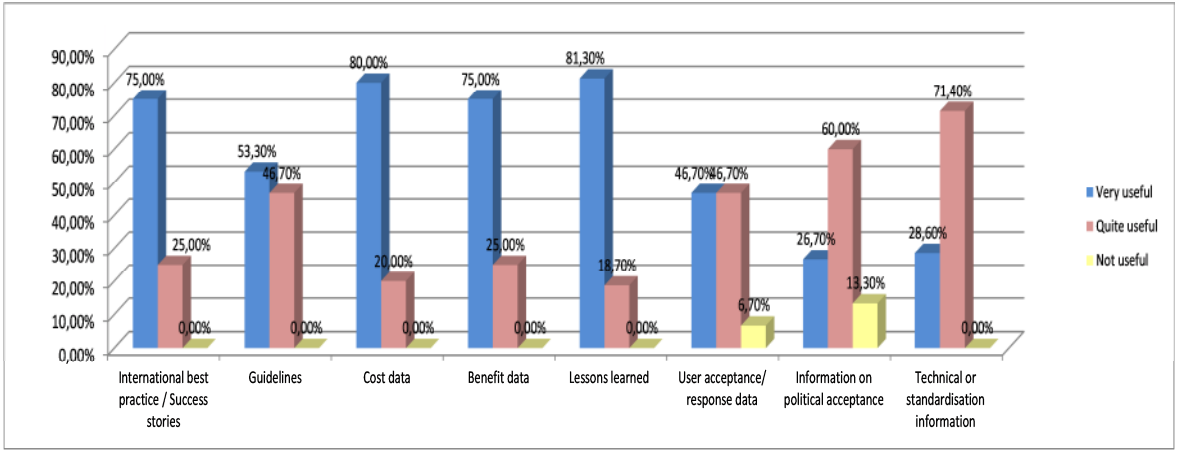


Figure 47: Overall usefulness of proposed content categories

A synopsis of the main findings per site is given below as in detail presentation of findings is beyond the scope of this deliverable.

- **Austrian site**

Lessons learnt, political acceptance and technical information were top of the list for content for an ITS Toolkit. Guidelines and cost data seem to be of less interest.

- **French site**

Participants from this site believe that lessons learnt are the most essential information that needs to be added in an ITS Toolkit while guidelines and cost data information are not desired to be included.

- **Dutch site**

Success stories, cost and benefit data, and lessons learnt appear to be all important and desired content for an ITS Toolkit. Technical and standardisation information is not regarded as needed to be included in such a toolkit.

- **German site**

Cost data were very important to be included in the ITS Toolkit and information concerning political acceptance was not regarded as useful content. .

- **Greek site**

Best Practice, cost and benefit data seem to be of greater importance and interest to be included. On the contrary, information about guidelines and political acceptance were not described as useful content.

- **Danish site**

Most proposed content seem to be important to be included in such a toolkit. Cost data and information on political acceptance seems to be less important.

4.2 Post-Questionnaires

The questionnaires administered after the end of the testing period were the same distributed during the first validation phase. Therefore, the same five clusters of question items were analysed:

- **Usability** of the Toolkit
- **Graphical Interface**
- **Content**
- **Overall Performance**
- **Overall Evaluation**

4.2.1 Participants' Language Information

As in the first validation phase, predominant native languages were other than the four most popular European languages. In addition, a high percentage of participants were native German speakers (39%).

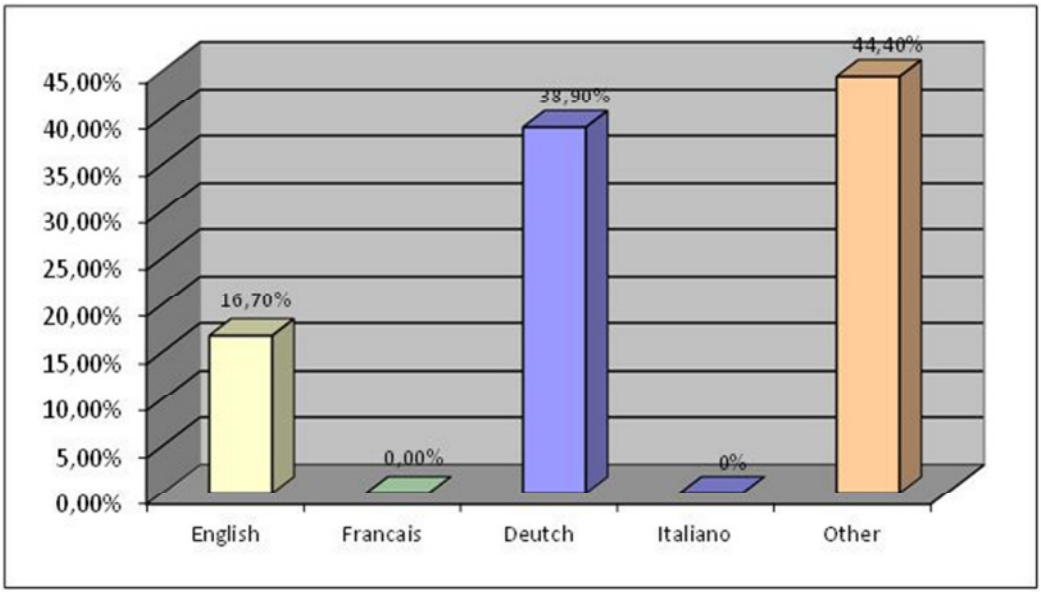


Figure 48: Percentages of users per native language

Similar to the first phase, most speakers prefer to use English (61%) as a search language followed by German (33%). Increase in German speaking participants led to increase in number of participants who use their native language as a first search option.

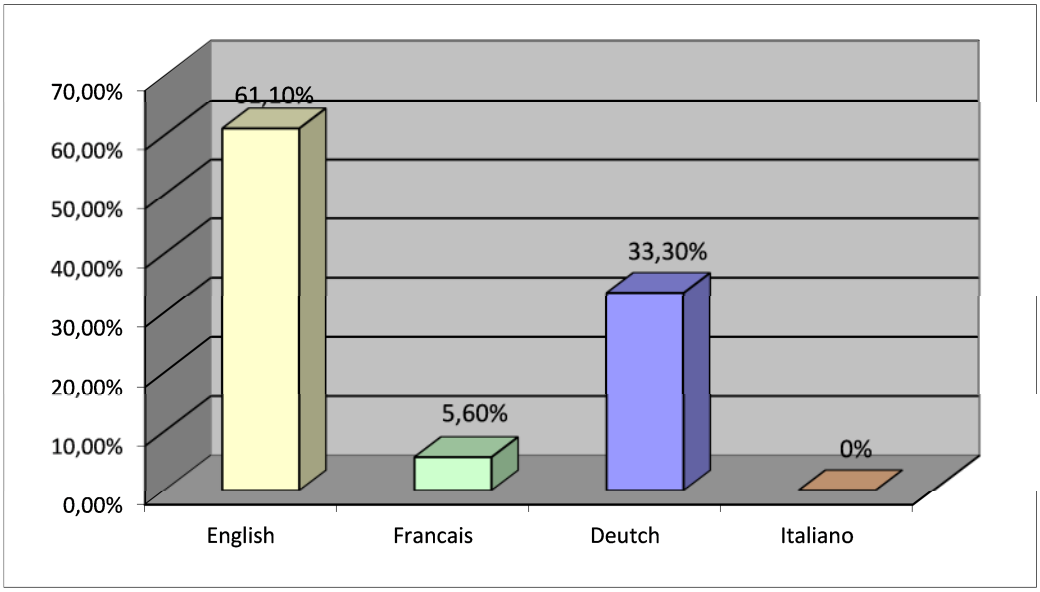


Figure 49: Percentages of users per preferred search language

4.2.2 Usability

During the second validation Phase, users were also asked to evaluate the usability of the 2DECIDE ITS Toolkit using questions weighted according to the specific questionnaires' needs (SUS scale). The SUS scale is a standardised and universally applied scale.

The overall usability score was 59% and translated to above average usability evaluation for the second phase of the validation process. Apparently modifications and improvements made to the tool after the end of the first validation phase led to a considerable increase in its usability score.

Frequency of related searches and future use of the ITS Toolkit enables the investigation of added value of this toolkit in the already existing market in relation to the exploration of the needs of the specific sample of users (pre-questionnaire).

Almost 62% of all participants estimate that the ITS Toolkit will be used at least every two month. At first, such estimation appears to be not so often or even rare. However, if the considerable specificity of the content types and search criteria provided are taken into serious consideration, then the searches are expectable not to be so rare except for users who are specifically focussing on ITS tools and applications.

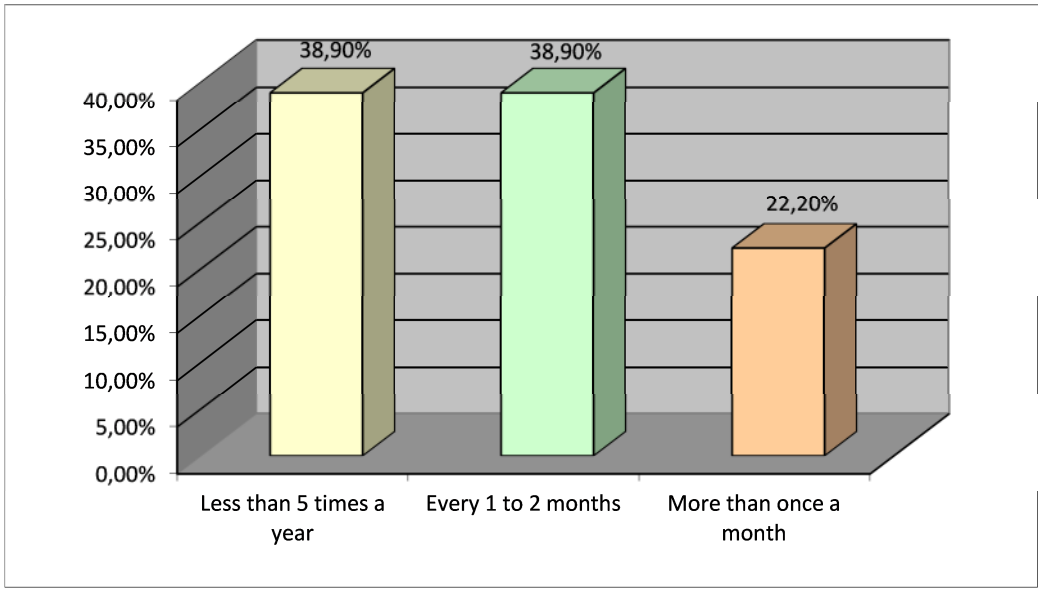


Figure 50: Frequency of related searches

The majority of users (61%) are willing to use the ITS Toolkit along with other data sources. This finding reflects mostly the fact that most of the content is dynamic and it will be continuously enriched. Therefore, its actual potent will be strengthened with time. In addition, it is important to emphasise that most users tend to follow certain search patterns and have their own way of finding information. Thus, it takes time to change habits and attitudes towards adapting new search methods and criteria, especially when multi-criteria and complex searches are involved.

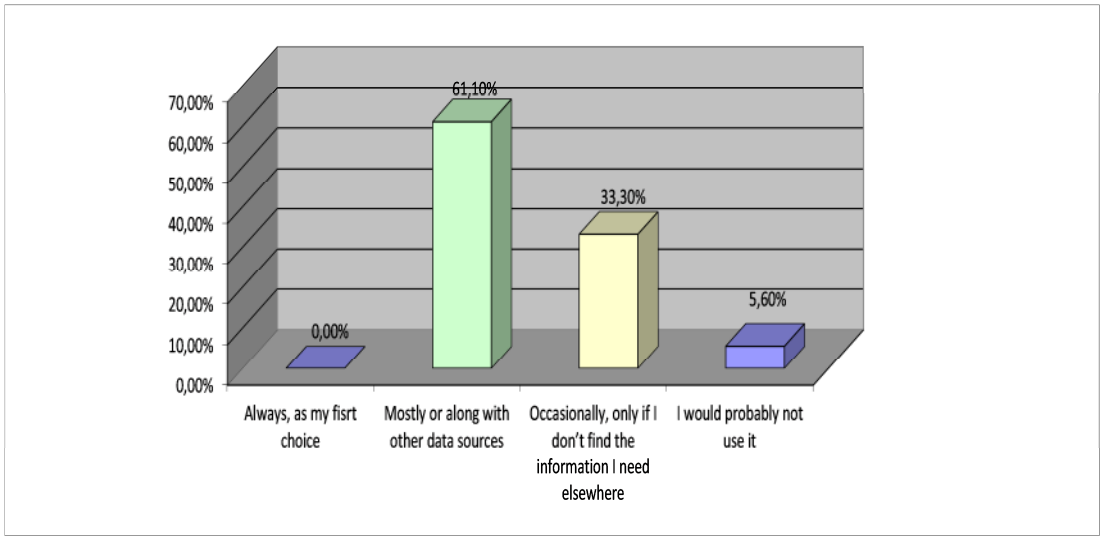


Figure 51: Percentage of users (%) as a function of ITS search types

4.2.3 Graphical Interface

Participants were asked to report their opinion regarding the graphical interface and provide feedback about several of its aspects (e.g. font size, colour contrast, etc.).

Most participants believe the graphical interface is exact (39%) and adequate (38%). Less participants (22%) believe that the ITS Toolkit needs to become more specific and clear.

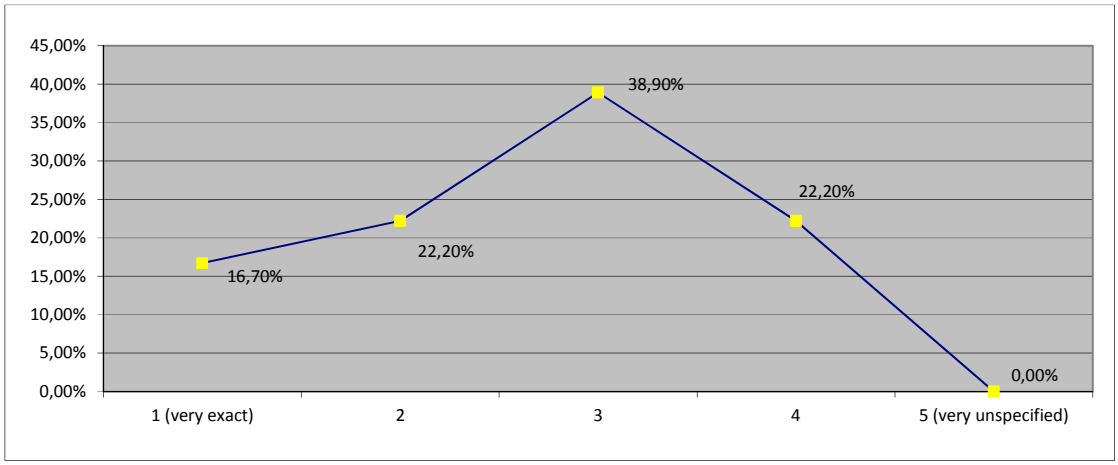


Figure 52: Overall users' impression of the graphical interface of the 2DECIDE ITS Toolkit

The vast majority (72%) reported that they are satisfied by the font size and stated that it is easy to read.

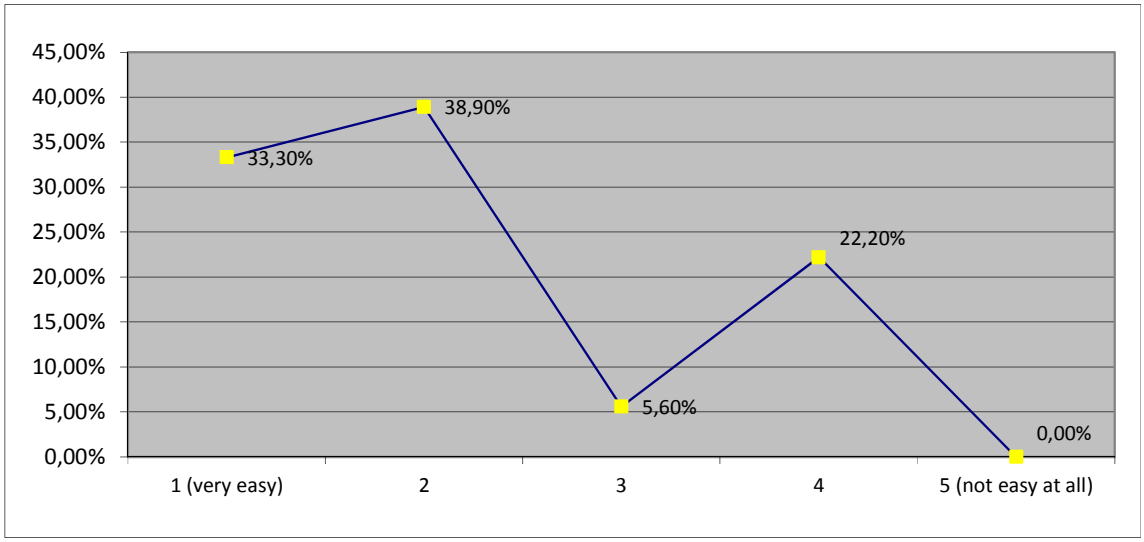


Figure 53: "Was the size of the font easy to read?"

Similarly, the overwhelming majority of users (78%) were satisfied with the chosen colour contrasts and reported high easiness to see the ITS Toolkit environment and distinguish the background information.

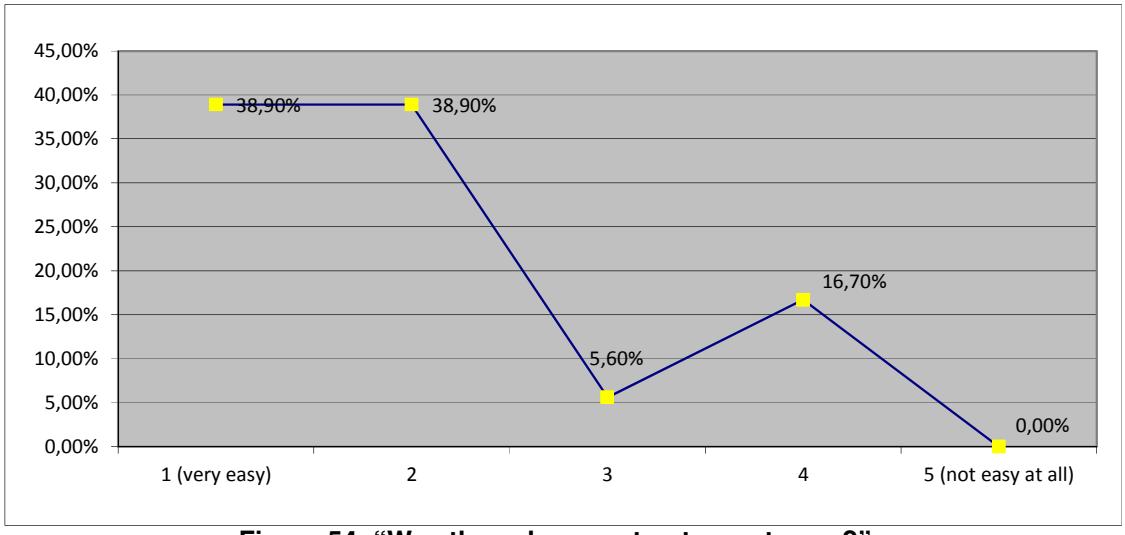


Figure 54: "Was the colour contrast easy to see?"

Many participants found it easy (33.3%) to navigation around menus and submenus and another 33.3% thought that the navigation menus were acceptable and adequate.

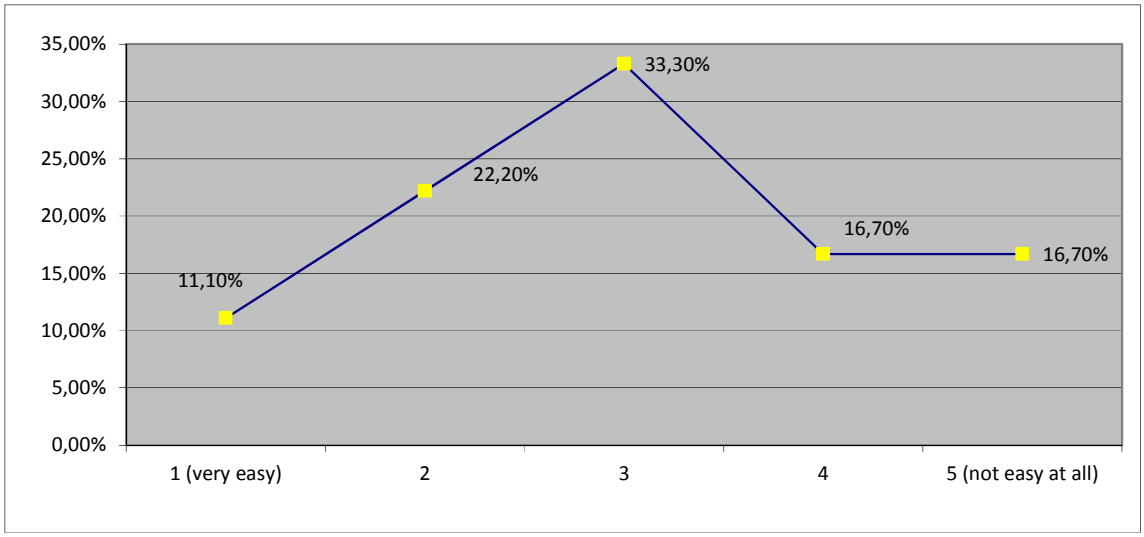


Figure 55: "Did you find it easy to navigate across menus?"

Finally, the majority of users reported not experiencing any problems with the ITS Toolkit during their trials. Specifically, almost 28% of users reported no problems at all with the use of the buttons/scroll bars/check boxes (Figure 55) and another 50% mentioned that they did not encounter any problems with the guides (Figure 56). It is worth mentioning that the percentages (%) of satisfied participants increased since the first phase of the validation process.

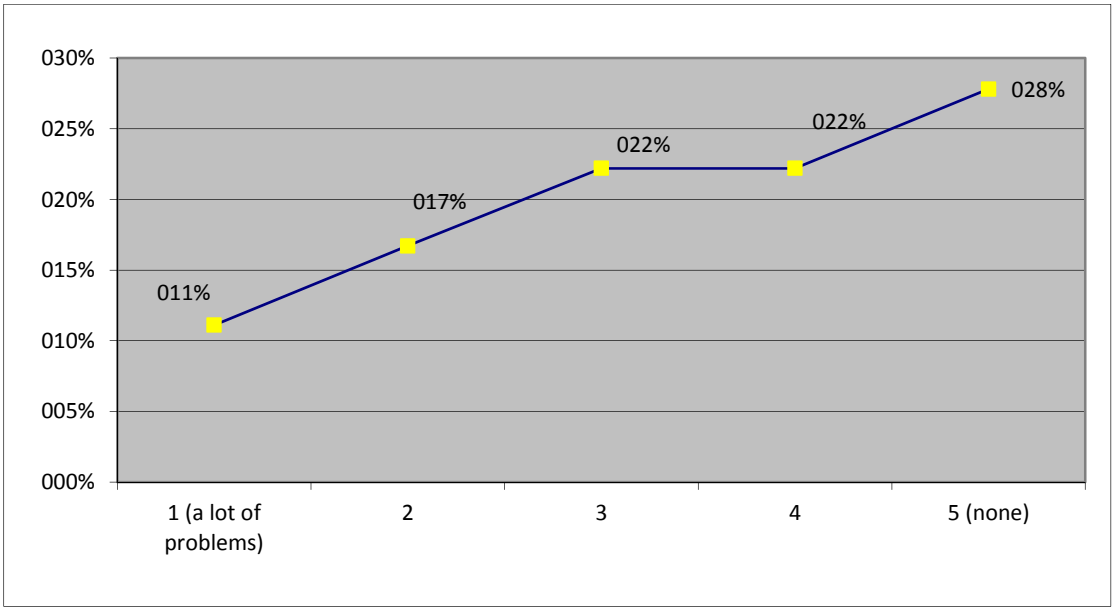


Figure 56: "Did you experience any problems with the ITS Toolkit buttons/scroll bars/check boxes during the trial?"

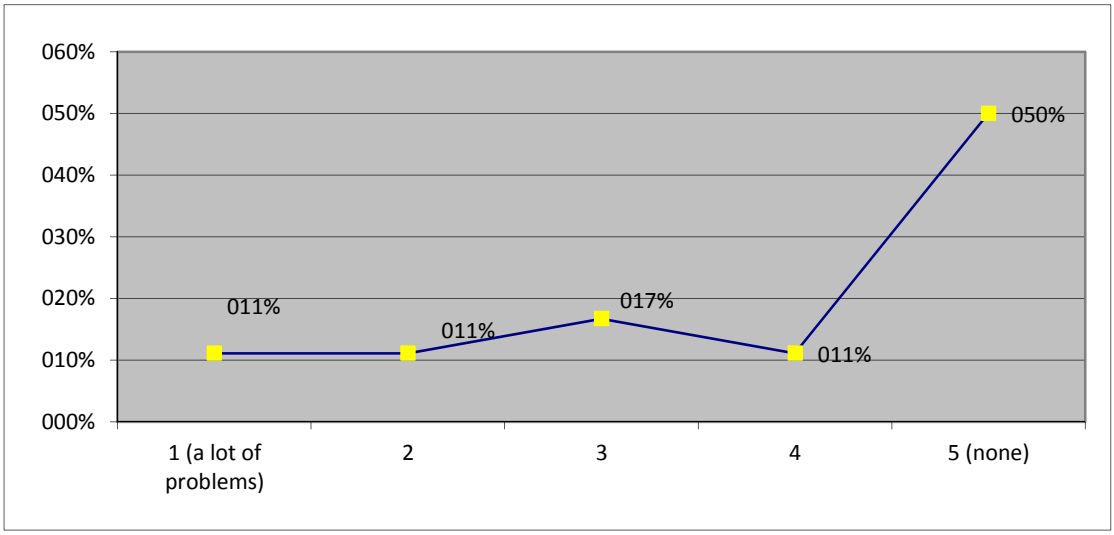


Figure 57: "Did you experience any problems with the ITS Toolkit guides during the trial?"

4.2.4 Content

Most users reported that they partially (61%) managed to find the information they were looking for during their searches in the Toolkit. However, an increase of more than 10% in fully satisfied users with the search results was attained from the previous validation phase (17% compared to 6%).

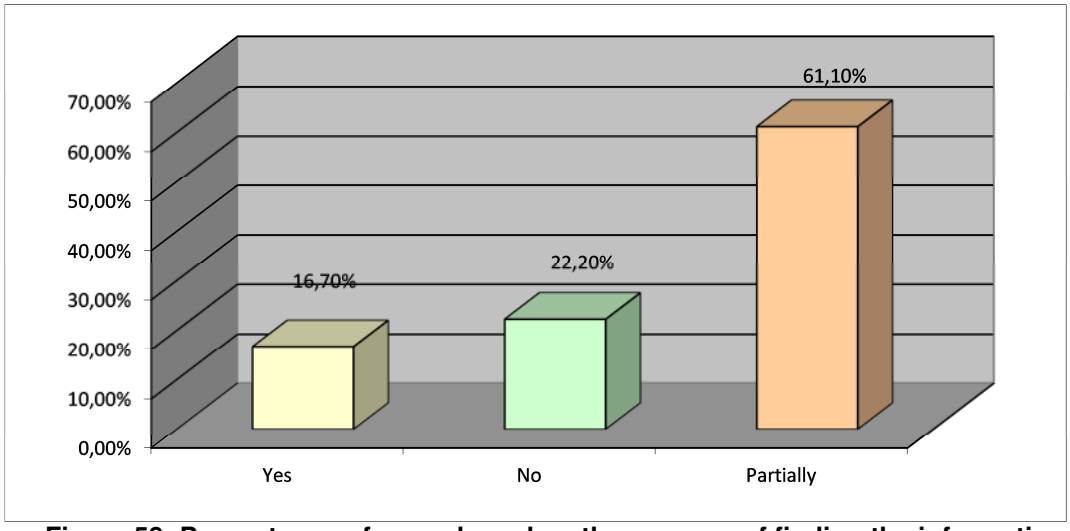


Figure 58: Percentages of users based on the success of finding the information searched for in the 2DECIDE ITS Toolkit

Moreover, the vast majority of the participants said that they were satisfied by the information they have obtained from the database, especially in terms of how much understandable it was.

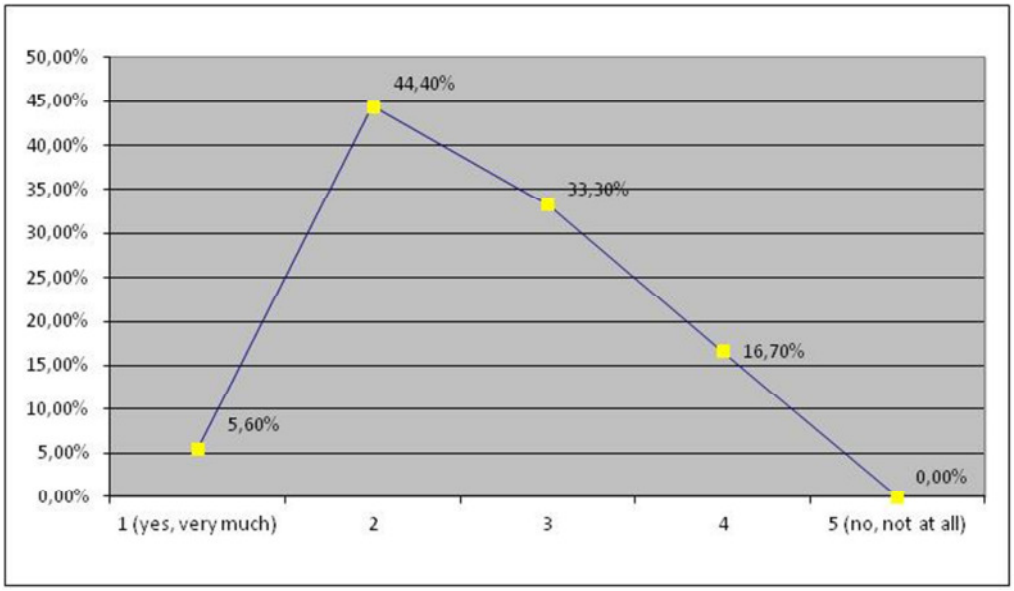


Figure 59: "Was the information given by the ITS Toolkit easy to understand?"

However, there still seems to be a negative trend regarding the search criteria of the Toolkit. According to the majority of the users (nearly 60%), these search criteria are not clear enough. The addition of a glossary for the search criteria could prove useful for future use.

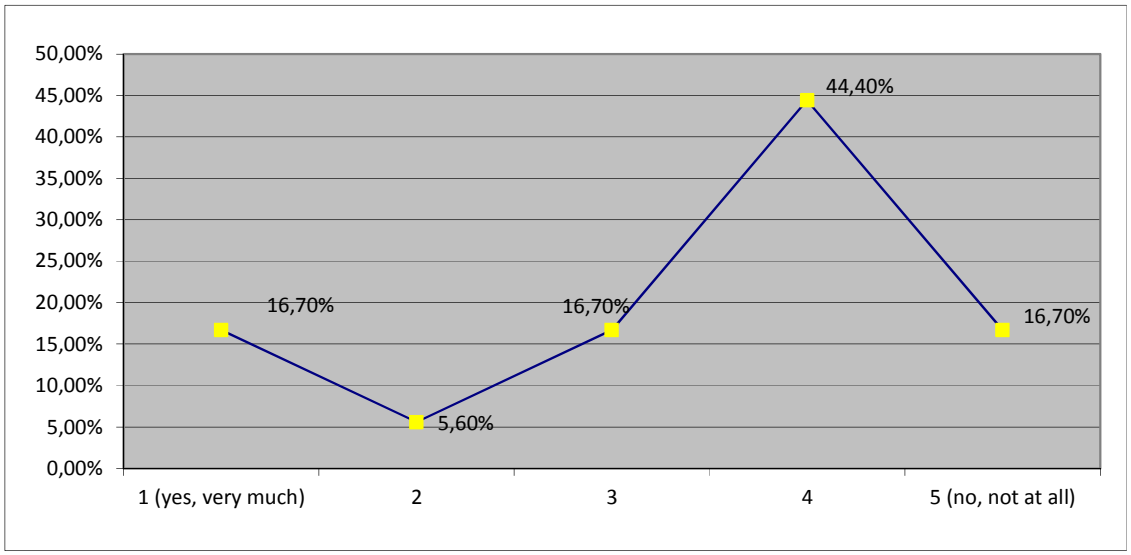


Figure 60: Were the search criteria clear enough?"

4.2.5 Overall Performance

Participants were asked to provide an overall evaluation of the performance of ITS Toolkit in order to sketch its strong points and weaknesses of online access. 61% (compared to 53% of the previous validation phase) of the participants claimed that it has been easy to correct a wrong selection during the trial.

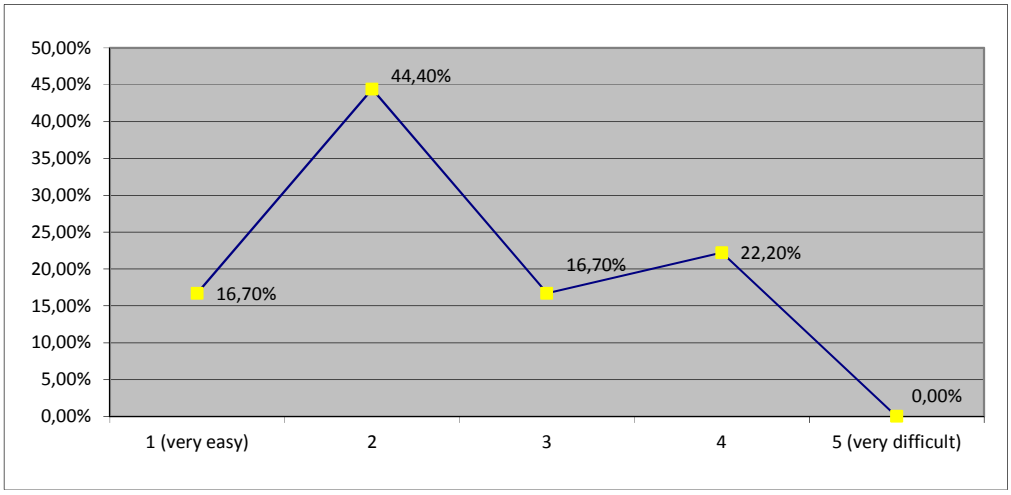


Figure 61: "Was it easy to correct a wrong selection during the trial?"

Half the participants reported to be satisfied with the structure of menus and submenus and agreed that the structure was logical and intuitive. Another half was not satisfied with the menus and they thought that it was complicated to follow and familiarisation with the structure would be enhanced with the addition of "Help" and "Instructions" options and/or menus.

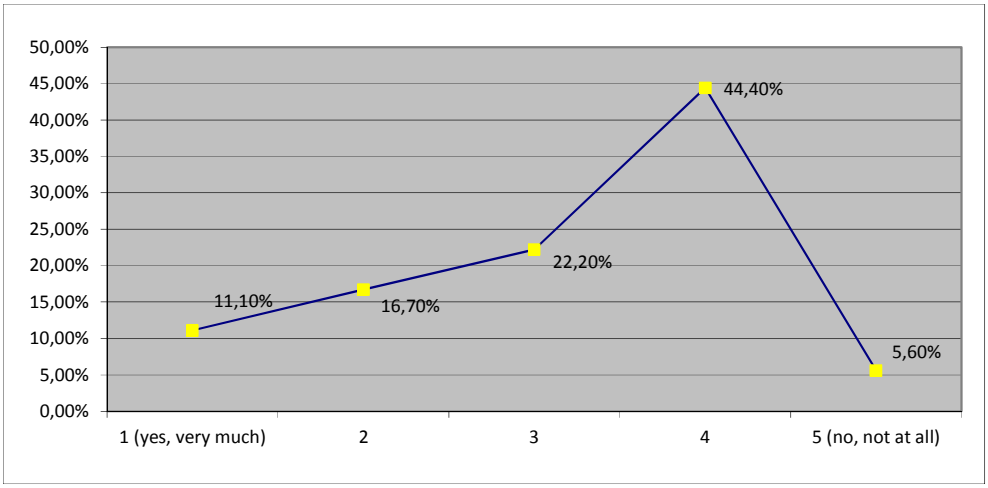


Figure 62: "Are all menus and submenus logically structured?"

The vast majority (almost 72%) described the database to be fast enough. An increase of 30% has been achieved since the first validation phase (72% compared to 42%).

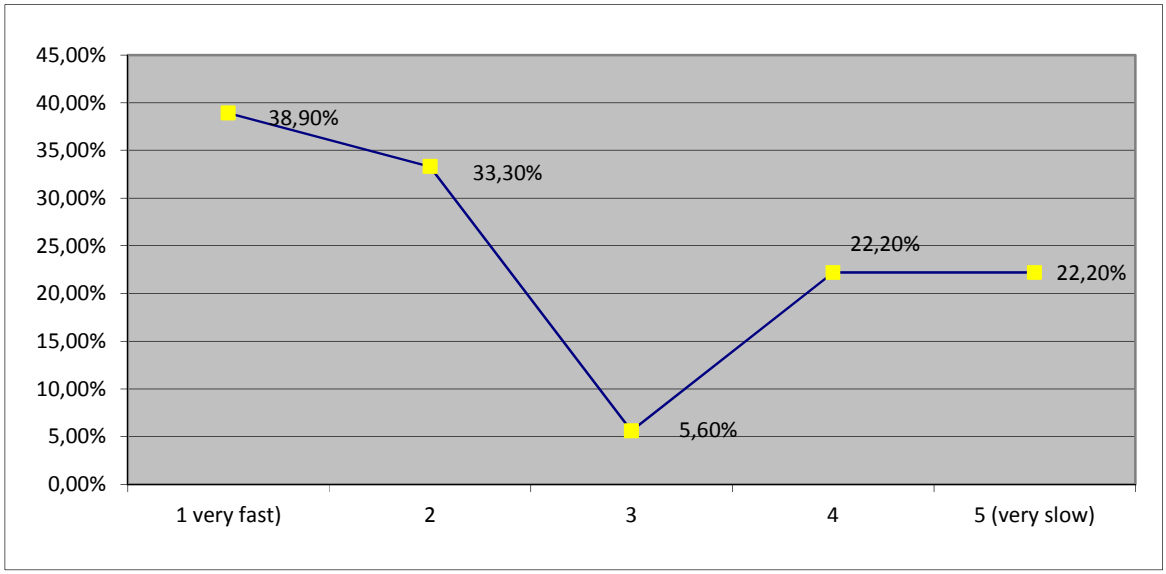


Figure 63: "Was the response of the system fast enough?"

4.2.6 Overall Evaluation

Finally, regarding the overall evaluation of the 2DECIDE ITS Toolkit the following conclusions were reached:

- The majority of users reported that they would probably recommend the 2DECIDE ITS Toolkit to other potential users

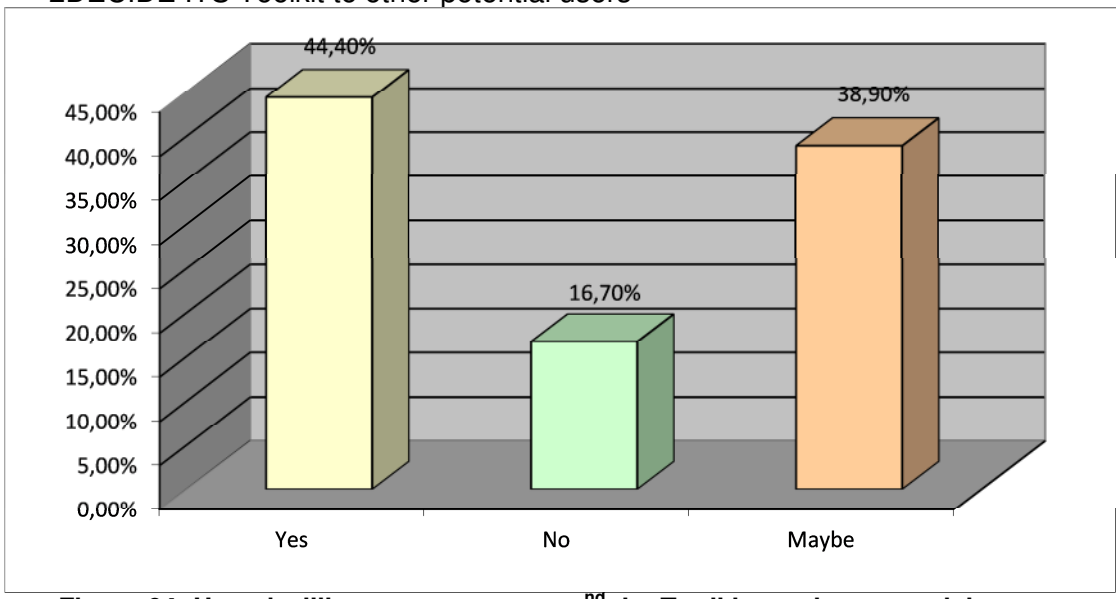


Figure 64: Users' willingness to recommend the Toolkit to other potential users

- The vast majority of the participants of all test sites supported the idea for the development of a toolkit for ITS decision-making as a very worthwhile goal/concept

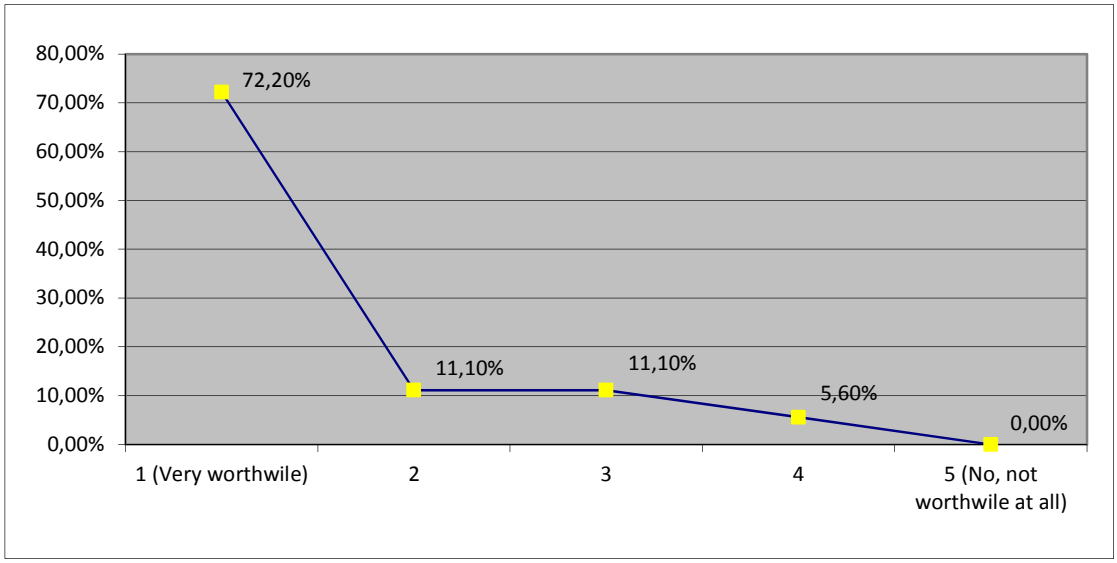


Figure 65: Perceived value of EU ITS Action Plan concept

- Most of the users reported that this database partially or mostly meets their expectations (nearly 72%)

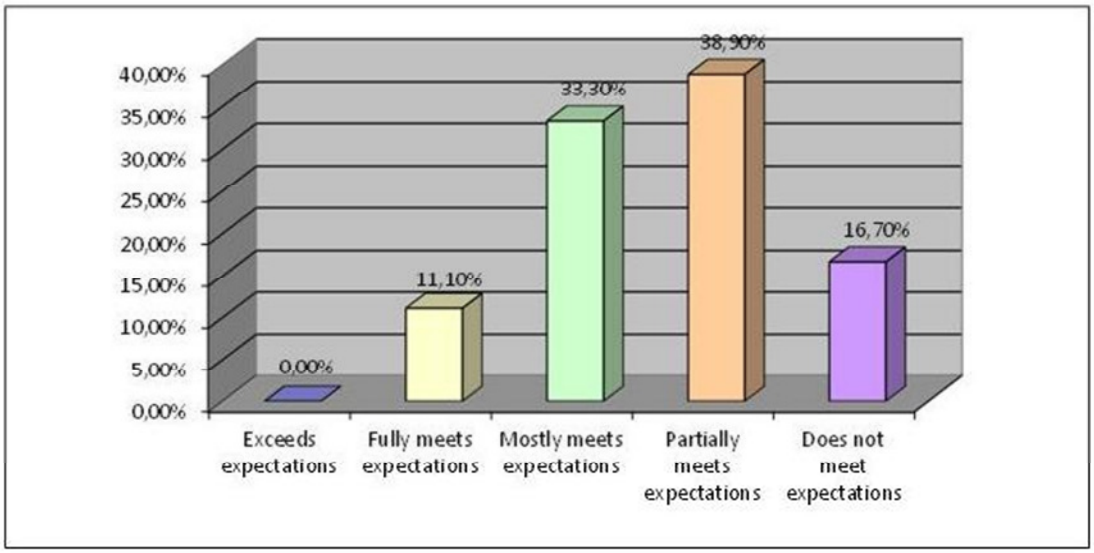


Figure 66: Overall evaluation of the 2DECIDE ITS Toolkit compared to the users' initial expectations

4.3 Interviews

Detailed feedback was collected by the interviews (n=10) conducted per country-specific site. The interview topics were the same with the first validation phase.

Most participants expressed a positive attitude towards the implementation of the ITS Toolkit developed. Interviewees mentioned that this is an innovative idea that could prove useful for various stakeholder groups.

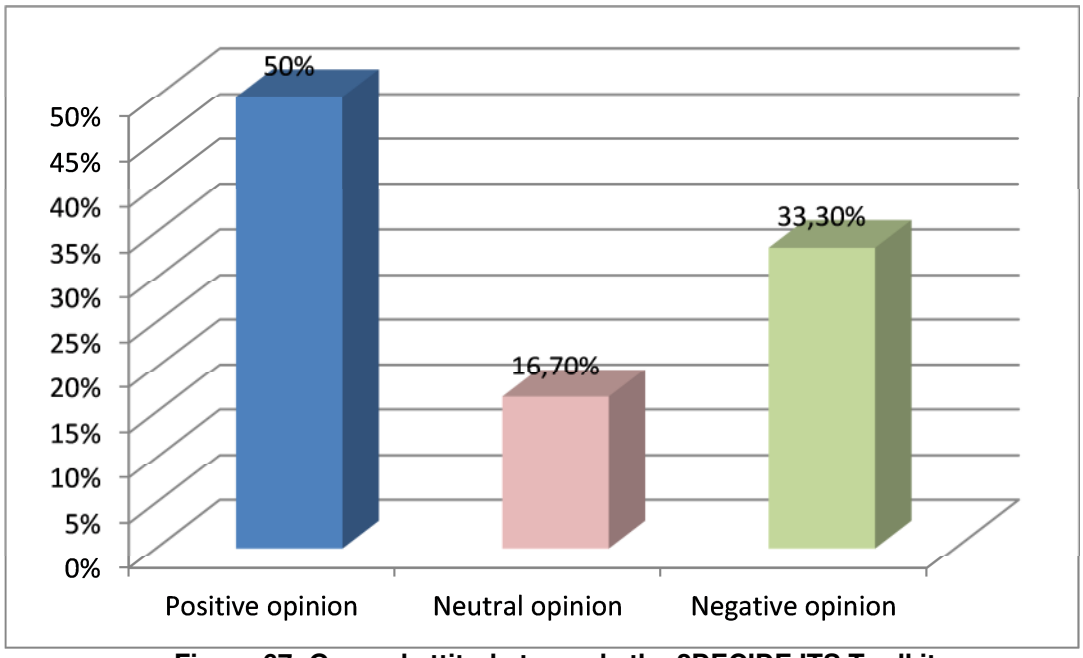


Figure 67: General attitude towards the 2DECIDE ITS Toolkit

Interviews were conducted with users who have participated in the validation phase but also with users who were introduced to the toolkit but were not part of the external users' sample aiming at gathering data from participants with also less experience with the system.

Participants comments were clustered around certain themes and topics covered during the interview.

- **Graphical Impression**

The majority of the participants have expressed a positive opinion regarding the graphical interface of the Toolkit. Colours were pleasant (subdued and not garish) and easy to the eye. Participants noted that the chosen colours were easy to distinguish between different background elements. Participants were satisfied with the lay out and the possibility to see who is online. However, they mentioned that there is room for improvement. Instructions should be more prominent and with different font in order to be able to easier locate the necessary information. Moreover, the presence of two "scroll-down" bars was confusing for some of the users.

- **Content**

Interviewees expressed an overall positive attitude towards both the innovation of the database and the fact that it is detailed enough and easy to understand. In particular, they often mentioned that reports were sound, informative and complete.

Another important aspect highlighted by most participants was that the tool contains a wider range of ITS types than other tools. Furthermore, a significant advantage is the fact that the toolkit provides findings from various countries and exposes the user to results they would not have otherwise known about. The addition of Cost Benefit ratio is well explained in the text and is a substantial addition to its value.

Participants made recommendations for changes in encountered errors. Comments were made about the appearance of mistakes in the text; sometimes important information is substituted by strange characters (e.g. 1ï¿½2). Some interviewees suggested to add a disclaimer/warning in the French/Italian/German versions that most of the content is in English only. It is important to clarify what is translated into FR/DE/IT (e.g. the menus & interface, lists of services) and what is not (e.g. the service descriptions and evaluation summaries). Although, for most participants, the fact that the fields were detailed and search criteria allowed for in depth search and increased specificity in the results found, some of the users stated that maybe the Toolkit is too detailed and some adjustment should be made based on using mostly contemporary reports wherever is possible.

- **Structure**

Comments made by the users regarding the structure of the database were in most occasions positive, especially when compared to the comments made after the first validation phase. Search criteria should be clarified and exemplified according to some of the user.
Main menu was described as very useful and the expert summary was regarded as especially helpful. It was suggested to make the executive summary available earlier in the Toolkit. In addition, it was requested to add “AND” searches (Problem & Policy Objectives / ITS Service & policy objectives, etc) and not just one or the other. Moreover, the difference between search case studies and using the toolkit needs to be clearer. Last, for geographic area/coverage ‘all EU’ or ‘Any Area’ should be set as defaults.

- **Desirable improvements and additions**

Participants were asked to suggest potential improvement and further additions in order to increase 2DECIDE ITS Toolkit’s value, usefulness, and efficiency. General remarks were made for potential to improve the overall site ergonomics with additions of descriptions and explanations about the structure and the layout. Maybe if categories were less, then it would be easier to navigate during searches. However, the partners should continue adding new projects and information into the Toolkit. The latter is a future goal of the project. It was also suggested that an overview between different ITS tools could be added (i.e. potentially in search criteria).

A valuable addition would be to dedicate a part of the website to users in order to discuss about ITS Toolkits, problems, ideas, etc. (i.e. a Forum). This is a potential for attracting more users and, hence, increase its impact and usage. Some difficulties were reported when attempting to export reports as pdfs. This should be checked and rectified.

A successful outcome of the interviews was that most participants believed that no aspects should be removed.

- **Problems encountered during testing**

Some isolated problems were reported. Specifically, problems with special characters were reported (e.g. in French). It was suggested to provide the option of "no problem" in Case Studies' searches (e.g. accidents). Some participants asked for explanations for "Improve travel efficiency" option. In addition, some interviewees suggested an additional option for searches for "fuel consumption" and/or "operational cost".

- **Overall Impression**

At the end of the interview, the users were asked to express their overall impression regarding the 2DECIDE ITS Toolkit. Many users underlined the improved usefulness of the tool and noticed (the users who participated in both phases) that the changes implemented after the first validation made the toolkit better.

Probably, the biggest advantage of this specific toolkit was the fact that this decision support tool offered users (i.e. decision makers) access to reports that they would not otherwise have heard of.

5 Conclusions

The 2DECIDE ITS Toolkit was well-received by most users as the majority of users (61%) reported that they would use it but mostly along another tool. The latter was probably affected by –in some occasions- limited availability of evaluation reports. Regardless of content availability, it is important to take into consideration that usually users-including decision makers- tend to follow certain search patterns and have their own way of finding information. Thus, it takes time to change habits and attitudes towards adapting new search methods and criteria, especially when multi-criteria and complex searches are involved. The 2DECIDE ITS Toolkit was perceived as an innovative Toolkit (based on feedback from the interviews in both validation phases) and worthwhile concept (72%). Most users perceived the ITS Toolkit as usable (59%). The rationale depicted an existing need and "gaps" in the current ITS development arena.

Overall, participants (average 70%) reported that the appearance of the tool (e.g. graphical interface, contrasts, font size) were at least adequate. The 2DECIDE ITS Toolkit's appearance was accepted by the participants but it was not perceived as it was something different or more aesthetical pleasing than other existing decision support tools. Less participants (ranging between 15%-25%) had encountered difficulties with the way the menus and submenus worked, scroll bars and buttons. According to both appearance comments and certain functionalities of the user interface, few improvements could increase the effectiveness of the user's interaction with the 2DECIDE ITS Toolkit.

Key aspects that could be taken into consideration for further improvements might be additions of explanations with regards to search criteria (i.e. their functionalities and terminology) by the addition of a glossary. Also, increasing flexibility in choosing search criteria (e.g. having the option to "bypass" some of the search criteria) would increase its usability. Most users believe that the high complexity of the suggested criteria might offer more refined results and a database of unique characteristics for future ITS searches.

At present, content is rather limited and in some occasions scarce, therefore this might have affected the evaluation results. Although, the dynamic nature of the database was emphasised, sometimes it is difficult to isolate the Toolkit from the outcome and its reason of existence. Understandability of provided information was adequate (more than 50%) but still the addition of exemplars (e.g. training video) and instructions apart from the glossary would potentially increase the understanding of the content.

Feedback was more positive during interviews and specifically the second phase interviews where less negative comments were found, probably because of participants increased understandability of the whole rationale of the 2DECIDE Toolkit by now. Interviews allow for more in-depth discussion and gathering of more qualitative responses. Taking into account that, in most occasions, interviewees were questionnaires' respondents as well, then the inferences made by the interview, which was the last responses received by the users, strengthened their opinions and

overall evaluation. It is important to note that the aim of this process was to validate the main functionalities of the 2DECIDE ITS Toolkit and not investigate the generalisability of the validation findings. This would possibly be a larger effort and an endeavour of more than one working groups in ITS area.

Overall, the Toolkit was perceived as useful and an important addition to current ITS databases. This is an endeavour towards new ways to present information and, most importantly, to search ITS related research outcomes. Validation by the potential users indeed revealed that the new ITS Toolkit has an added value for them and it mostly or partially meets their expectations (72%). For example it provided them access to reports they would not have found otherwise but the way it is presented should be modified in order to be easier to find it, more pleasing to look at and most importantly users to be supported all along the way during their searches. The toolkit provides both experienced and inexperienced users access to relevant (mainly European) ITS report in an easy and convenient way.

6 Next steps

This deliverable serves as the basis for delivering the final version of the 2DECIDE ITS Toolkit. Comments and feedback have been forwarded to the responsible partner for implementing the changes required for not only having a fully functional tool (1st validation phase goal) but also a usable and user accepted version. Changes made will be the ones that are possible to be implemented taking into consideration both resources, available time, and realistic and added value of the feedback received. The final validation phase highlighted the latest changes to be made in order to have the final version of the 2DECIDE decision support tool ready, functional, and adequately usable as a distinct addition to the ITS database research and deployment. Constant updates would also increase its usability, acceptance, and improve its appearance.

It is important to focus on the future by moving forward with the addition of reports and enriching the existing content for the continuation of the 2DECIDE support tool in order to deploy it to the European stakeholders.

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ANNEX 1: Verification checklist (internal validation)

Suggested checklist

- System crashes
- System errors
- Time spent for each search
- Number of clicks to reach result
- Success/completion of search
- Satisfaction from results
- Shortages (i.e. not found)
- Any suggestions?

- ✓ Proposed areas to be checked with regard experts' perspective of adequate functionality of ITS toolkit
- ✓ Prepare a very brief overview of your experience to include it in the D. section on technical verification

ANNEX 2: Pre-Questionnaire

Introduction

The objective of the 2DECIDE project is to provide support to decision-making and deployment of **Intelligent Transport System (ITS)** solutions, through the development of an online Toolkit that can help governments and public administrations or transport operators, to choose the ITS solution most suited to their problems.

To enable us to test the toolkit that has been developed in the context of the 2DECIDE Project, we would like to firstly ask about your views and experiences on a range of transport and ITS issues that you might deal with as part of your job.

Before beginning the questionnaire

- **Please answer the questions by reflecting your personal opinion!**
- **Please return the questionnaire by Monday 9 May 2011**
- **Your personal details will remain confidential** and analysis of this questionnaire will not reveal which persons or organisations provided what responses.

Part 1: Information about you and your organisation

***Question 1*: What is your level of professional experience (in years) of dealing with?**

- Transport in general (transport / infrastructure engineering, operations, economics, policy, etc)? years
- Intelligent Transport Systems? years

***Question 2*: In what sector or mode of transport are you involved?**

Please select all that apply.

- ☐ Motorways & expressways
- ☐ Major national roads
- ☐ Secondary and rural roads
- ☐ City streets
- ☐ Train services (heavy rail)
- ☐ Metro/Tram
- ☐ Regional or intercity bus/ coach
- ☐ Local bus
- ☐ Demand-responsive or special needs public transport
- ☐ Taxis
- ☐ Walking / Cycling
- ☐ Ferries
- ☐ Road freight haulage (lorry operations)
- ☐ Freight by other modes (rail, water, air)
- ☐ Urban Freight
- ☐ Rail/bus/coach stations
- ☐ Airports
- ☐ Ports

☐ Car parks

☐ Freight terminals

☐ Other infrastructure: Please describe:

Part 2: Decision-making for Intelligent Transport Systems and Services

***Question 3*: Thinking about ITS applications that you have been personally involved with, to what extent have you used them to address the following policy issues?**

Decreasing traffic congestion	Please select:
Enhancing safety (prevention of accidents / effective emergency response)	Please select:
Enhancing security (prevention / detection of crime, vandalism, terrorism or planning for / mitigation of natural disasters)	Please select:
Easing local environmental issues (pollution, local air quality, noise, visual effects)	Please select:
Addressing global environmental issues (greenhouse gases, carbon footprint, energy use)	Please select:
Improving user-friendliness, information or accessibility	Please select:
Improving efficiency to reduce costs	Please select:
Promoting intermodality, multimodality or modal shift	Please select:
Enhancing traffic enforcement	Please select:
Other objective (1): Please specify:	Please select:
Other objective (2): Please specify:	Please select:

***Question 4*: What tools do you use to make decisions (or advise others) regarding ITS investments?**

Cost-Benefit Analysis	Please select:
Evaluation reports from other deployments by your own organisation	Please select:
Evaluation reports from deployments by other organisations	Please select:
Guidelines: Which ones? :	Please select:
Finding out about national or international best practice (press, internet, site visits, from personal contacts, etc)	Please select:
Other: Please specify:	Please select:

***Question 5*: Which of the following have you had problems with when making decisions ITS-based solutions?**

Not enough information about the costs or benefits of different solutions	Please select:
Lack of information on different experiences and evaluations elsewhere	Please select:
Lack of impartial information (e.g. most information you get is from suppliers trying to sell their own product)	Please select:
Legal obstacles or lack of political acceptance or awareness of ITS (e.g. difficulty in "selling" the concept to your political or managerial superiors)	Please select:
Lack of public acceptance or awareness (e.g. public opposition or	Please select:

media campaigns against implementation)

Other problems: Please specify:	Please select:

***Question 6*: What kinds of information would you find most useful in an ITS Toolbox?**

International best practice / Success stories	Please select:
Guidelines	Please select:
Cost data	Please select:
Benefit data	Please select:
Lessons learned (unsuccessful deployments, what went wrong)	Please select:
User acceptance/ response data	Please select:
Information on political acceptance	Please select:
Technical or standardisation information	Please select:
Other data: Please specify:	Please select:

***Question 7*: The Toolkit is available in a number of languages. Please tell us which languages you are able to read:**

a) Native language:

b) Other languages you can read fluently or well:

Part 3: Further information

***Question 8*: Do you have any reports of ITS implementations which you or your organisation has been involved in (containing information about costs, benefits, impacts, or user acceptance of the systems deployed)?**

Please select: If yes: for what type of ITS deployment(s)?

Are they available on a website? If so, where? http://

If not, can they be made available to us to include in the 2DECIDE database?

Please select:

If you are able to provide any such reports now, please send them to the e-mail address below.

The following details will be confidential and will not be used for any other purpose than to keep you informed about 2DECIDE or to contact you specifically about this project.

Your details will not be passed to any other organisation and will not be linked with your responses to this questionnaire.

Your name:

Name of your organisation:

Address:

City and postcode: Country:

E-mail:

Telephone number: country code (+) number

Please return this questionnaire by Monday 9th May 2011

to Mr./Ms. ....., Email: .....

(in case we send it through email and not have it online)

Many thanks for your help!

ANNEX 3: Post-Questionnaire

Final Questionnaire (post testing)

1. **What is your native language?**

❑ English ❑ Français ❑ Deutsch ❑ Italiano ❑Other

2. **What was your preferred search language?**

❑ English ❑ Français ❑ Deutsch ❑ Italiano

A. USABILITY (adapted scale; Brooke, 1996)

You are kindly requested to record your immediate response to each item, rather than thinking about items for a long time. All items must be checked. If you feel you cannot respond to a particular item, you should mark the 6th point (No comment) of the scale for each question.

USABILITY ITEMS						
SUS questions	**1-"Strongly Disagree"**	**2**	**3**	**4**	**5- "Strongly agree"**	**6-No comment**
1. I think I would like to use the ITS toolkit frequently	❑	❑	❑	❑	❑	❑
2. I found the ITS toolkit unnecessarily complex	❑	❑	❑	❑	❑	❑
3. I found the various functions in the ITS toolkit were well integrated	❑	❑	❑	❑	❑	❑

USABILITY ITEMS						
SUS questions	**1-"Strongly Disagree"**	**2**	**3**	**4**	**5- "Strongly agree"**	**6-No comment**
4. I thought there was too much inconsistency in the ITS toolkit	❑	❑	❑	❑	❑	❑
5. I imagine that most people would learn to use the ITS toolkit very quickly	❑	❑	❑	❑	❑	❑
6.The toolkit allows me to increase my knowledge on & the range of solutions and ideas for solving transport problems	❑	❑	❑	❑	❑	❑
7.The toolkit could help me save time and make more informed decisions	❑	❑	❑	❑	❑	❑

1. **How often do you need to find the sort of information offered in the toolkit (on ITS deployments, costs/benefits, applications, case studies, etc)?**

   ❑ Less than 5 times a year
   ❑ Every 1 to 2 months
   ❑ More than once a month

2. **When looking for such information would you use the ITS Toolkit?**

   ❑ Always, as my first choice
   ❑ Mostly or along with other data sources
   ❑ Occasionally, only if I don't find the information I need elsewhere
   ❑ I would probably not use it

B. GRAPHICAL INTERFACE

1. **What do you think about the graphical interface of the ITS toolkit?**

   Very exact ❑❑❑❑❑ Very unspecified

2. **Was the size of the font easy to read?**

   Very easy ❑❑❑❑❑ Not easy at all

3. **Was the colour contrast easy to see?**

   Very easy ❑❑❑❑❑ Not easy at all

4. **Did you find it easy to navigate across menus?**

   Very easy ❑❑❑❑❑ Not easy at all

5. **Did you find the user profile option useful?**

   Very useful ❑❑❑❑❑ Not useful at all

6. **Did you experience any problems with the ITS toolkit during the trial?**

   a. **With the buttons/scroll bars/check boxes?**

      None ❑❑❑❑❑ A lot of problems

   b. **With the guides (e.g. back, next page, exit)?**

      None ❑❑❑❑❑ A lot of problems

C. CONTENT

Please take into account that the content of the ITS toolkit is dynamic and continuously changing when you answer the following questions. It is being further improved and expected to increase over time.

1. **Was the information given by the ITS toolkit easy to understand?**

   Yes, very much ❑❑❑❑❑ No, not at all

2. **Were the search criteria clear enough?**

   Yes, very much ❑❑❑❑❑ No, not at all

3. **Could you find the information you were looking for on the ITS Toolkit?**

   ❑ Yes ❑ No ❑ Partially

D. OVERALL PERFORMANCE

1. **Was it easy to correct a wrong selection during the trial?**

   Very easy ❑❑❑❑❑ Very difficult

2. **Are all menus and submenus logically structured?**

   Yes, very much ❑❑❑❑❑ No, not at all

3. **Was the response of the system fast enough?**

   Very fast ❑❑❑❑❑ Very slow

E. OVERALL EVALUATION

1. **Would you recommend ITS Toolkit to other potential users?**

   ❑ Yes ❑ No ❑ Maybe

2. **Developing a toolkit for ITS decision-making was one of the priorities of the EU's ITS Action Plan. How worthwhile is this overall goal/concept?**

   Very worthwhile ❑❑❑❑❑ No, not worthwhile at all

3. **How well does this ITS Toolkit meet your expectations of what an ITS decision-support toolkit should be like?**

- ❑ Exceeds expectations
- ❑ Fully meets expectations
- ❑ Mostly meets expectations
- ❑ Partially meets expectations
- ❑ Does not meet expectations

Many thanks for your help!

Your contribution will help us improve the ITS Toolkit.

In case you have further comments and suggestions you may contact us (email@address) to arrange for a meeting.

Thanks for your help!

ANNEX 4: Interview topics

2DECIDE Interview topics

This semi-structured interview aims to get in depth information about users' experience during testing period. The interview should last about 20-30 minutes and will give us the opportunity to explore topics and themes not covered by the questionnaires. The interviewee may wish to expand more on a topic rather than other, then he/she should be allowed to, but the interviewer should make an effort to try to expand across all elements of the interview's framework.

1. Graphical impression

- What did you like the **most** about the graphical impression? And why?

- What did you like the **least** about the graphical impression? And why?

- Was the content **useful** or not? And why?

- Was the content **easy to understand** or not? And why?

- Was the content **detailed enough** or not? And why?

- Was the **content innovative** (i.e. excels compared to other similar tools) and in what? And why?

2. Structure

- **Menu** pros/cons

- **Content categorisation** meets requirements or not and justification for both cases

- Would you change the **way that the information is presented** and why? How would you prefer it?

3. Required improvements

- Desirable **improvements**

- Desirable **additions**

- Aspects desirable to be **removed**

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4. Overall Impression

- Did you have a **positive** or **negative** overall impression? (Discuss the most positive and negative points from the previous questions, as well.)

- **Problems** encountered during testing. Describe main problems. How did you cope with them?

- Anything **else** to report about the evaluation process (for the validation participants only)

- Do you have some final questions about the ITS toolkit? (e.g. when the final version will be available)