DELIVERABLE REPORT
D6.1.1
"Mobile Assistant Service"

collaborativeproject
MASELTOV
Mobile Assistance for Social Inclusion and Empowerment of Immigrants with Persuasive Learning Technologies and Social Network Services
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06		COVENTRY UNIVERSITY	UK
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08		FH JOANNEUM GESELLSCHAFT M.B.H.	AT
09		TELECOM ITALIA S.p.A	IT
10		FLUIDTIME DATA SERVICES GMBH	AT
11		BUSUU ONLINE S.L	ES
12		FUNDACION DESARROLLO SOSTENIDO	ES
13		VEREIN DANAIDA	AT
14		THE MIGRANTS' RESOURCE CENTRE	UK

CONTENT

1. EXECUTIVE SUMMARY

This deliverable describes the work carried out in the scope of task 6.1 “Mobile Assistant” of work package 6 “MOBILE ASSISTANCE & INFORMATION SERVICES”.
The result of this task is a documentation of the overall planned MASELTOV assistant – the mobile MASELTOV service. Seamless integration of all MASELTOV tools into a single service application is a curial part of work within development process. Especially in the case of the MASELTOV, which is a very complex system with a huge amount of software components provided by different technical partners. The final goal of this conceptual work is to ensure a seamless integrated application with a consistent look & feel and usability to the users based on design patterns from work package 2, even if several software components of different MASELTOV project partners are involved in a certain use-case.

D6.1.1 depictures a first draft of the planned mobile assistant application at a very early stage of the project with regard to software development right after the finalization of the first version of system specification and architecture. There will be one update at September 2014 with deliverable D6.1.2 to integrate lessons learned during the implementation phase and including all adoptions made to solve upcoming issues, which haven’t been identified yet.

2. INFORMATION ACCESS WITHIN THE MASELTOV APPLICATION

There are different approaches ensure efficient information and tool access within the mobile MASELTOV application:

1. Dashboard Concept (2 types)
2. FAQ Quick Access
3. Context-driven recommendations

2.1 DASHBOARD CONCEPTS

Basically the MASELTOV application is a bundle of software components, which can be seen as thematic containers for related technical functionalities and should help to get structure into the technical image of the MASELTOV system.

With regard to the client side and particularly the frontend components the consortium agreed on implementing the dashboard approach for the mobile app showing the thematic clusters of assistance provided by the MASELTOV system. To achieve this it was decided to have one frontend component for each thematic cluster implementing the graphical user interface to make the technical functionalities available for users of the mobile app. The following mockup shows the basic idea behind the MASELTOV dash board.

Figure 1: Basic idea of a dash-board for the MASELTOV app

A second approach for the implementation of the dash-board could be to include not only thematic clusters, which link the user to sub-menu's containing a collection of thematic tools, but direct links to different tools and information services provided by the MASELTOV system (see figure 6). This would avoid the hierarchical 2-step access but could lead to visually overloaded dash-board. If it could be managed to keep the number of icons needed to provide access to all MASELTOV functionalities as little as bellow 14, this second approach would be preferred. If additional entries are needed it could also be thought of adding a menu for common functionalities like the user profile or configuration.

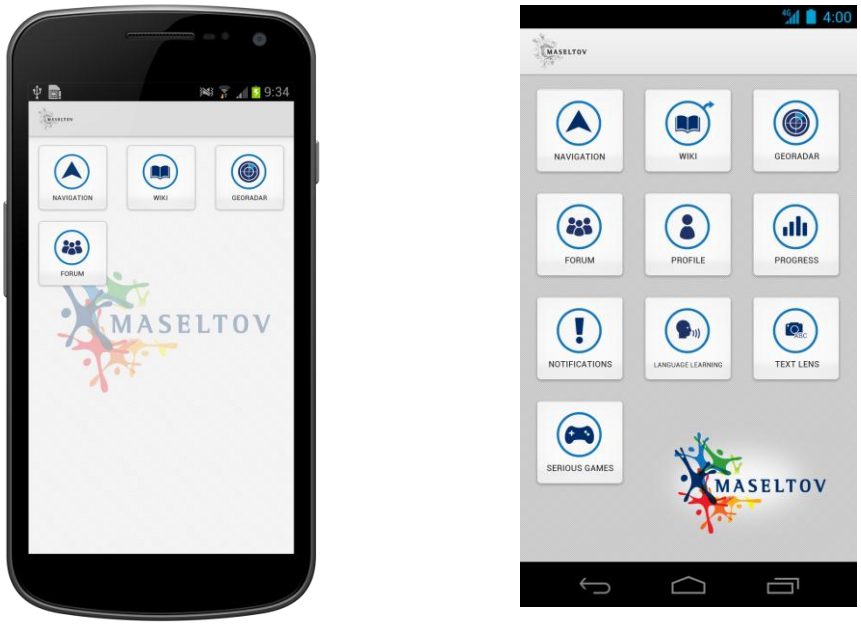


Figure 2: Dash-board concept without thematic clusters

From the current point of view, the following icons – links to MASELTOV functionalities and tools - have to be present on the dashboard at minimum:

1. **Geo-Social Radar (TI)**
2. **Text Lens (CTU**)
3. **Navigation (FLU & JR)**
4. **Language Learning (BUS)**
5. **Wiki (FLU)**
6. **Serious Games (COV)**
7. **Discussion Forum (TI)**
8. **Profile (AIT)**
9. **Progress (Learning, Games) (AIT)**
10. **Notification (JR)**

The following list shows a current snapshot of identified system components, which have been derived from the technical use-case analyses during the system specification phase of the project under strong involvement of all project partners:

Client Side:

- User Interface component (Android native)
  - Bureaucratic advisor service (FLU)
  - Language learning service (BUS)
  - Community building service (TI)
  - Serious games service (COV)
  - Health care service (FLU)
  - Navigation service (FLU)
  - Profile & configuration service (AIT)
  - FAQ access (JR)
- Background component

    - Recommendation service (AIT)
    - Context awareness (JR)
    - Notification service (JR)
- Software component
    - Text lens (CTU)
    - Situated navigation assistance service (JR)
    - Text-2-speech (JR)
    - POI service (FLU)
    - Navigation service (FLU)
    - Wiki (FLU)
    - Avatar assistance service (COV)
    - Serious games service (COV)
    - Language lesson learning (BUS)
    - Situated language service (BUS)
    - Geosocial radar service (TI)
    - Maseltov forum (TI)
    - Social network connector (TI)
    - User profiling (AIT)

Server Side:

- User Interface component (HTML)
    - Wiki website (FLU)
    - Social Network Analysis GUI (TI)
    - Opinion Mining GUI (TI)
    - Community building service admin (TI)
- Software component
    - Wiki server (FLU)
    - User Profiling & Recommendation (AIT)
    - Social network connector (TI)
    - Maseltov Forum (TI)
    - Geosocial Radar Platform (TI)
    - Opinion mining (TI)
    - Social network analysis (TI)
- External Systems (MASELTOV will connect to)
    - Routing services
    - POI repositories
    - Map providers
    - BUSUU platform
    - Social network platforms

All the identified system components can be seen as a container for implementing a bundle of technical functionalities with a clear responsibility of implementation. Interfaces between those components have to be defined during the integration process of MASELTOV. A figurative visualization of those components and their logical and physical scope of implementation can be found in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.
A detailed specification of each component listed above can be found in deliverable D3.2.1 System Specification.

2.2 FAQ QUICK ACCESS (JR)

Based on a Wiki page essential questions of members of all MASELTOV user groups will be collected over time and the corresponding MASELTOV assistance or functionalities to answer those questions or fulfill those demands will be linked directly to the question. For example important and frequently needed information could be "How to fill out a visa form?" and by clicking the attached link the smartphone component "WIKI" will be opened showing the requested topic. For each topic in the list of FAQ's, included in the Wiki page "FAQ Access", the software component responsible for handling the specific user demand, has to provide an interface in order to start the MASELTOV assistance.

2.3 CONTEXT-DRIVEN RECOMMENDATIONS (AIT)

This functionality will run as a background service on the smartphone and will generate personalised recommendations for users in the scope of MASELTOV functionalities and tools relevant in the current situation of the user. Recommendations will be shown to the user by the use of the smartphone notification system. Following a recommendation means that the recommended functionality or relevant information will be opened in case the user accepts the recommendation. To produce recommendations any available user-related information like usage history, context-recognitions, user progress and so on will be queried from the user profile component. Generated recommendations and whether they were accepted or not will be stored in the user profile in order to learn about users preferences.

3. MASELTOV TOOLBOX

In this chapter all MASELTOV tools provided by the mobile assistant application will be described briefly in order to give an overview of the whole assistance provided.

3.1 GEO-SOCIAL RADAR (TI)

The software component "GeoSocial Radar Service" runs as service-on-demand on the smartphone with the goal to localize and notify volunteer's proximity. The purpose of this service is to augment the mobile user context awareness, allowing user-to-user communications in many ways (video, call, chat, sms,…) when registered users need assistance. The GeoRadar will search and display potential volunteers nearby to the requesting participant. The user participation will be on a voluntary basis, and therefore each participant will be able to allow or deny his localization.

Each user has to subscribe his/her self to the service. By subscribing, the user explicitly authorizes the Maseltov platform to localize his position. Whenever he likes, he can unsubscribe the service, in order to stop his localization permanently. After subscription a certain Knowledge Profile of volunteers can be searched (list of available knowledge). As a search result, a list will be shown to the user with volunteers found. The user can view with detailed info (language, proximity, knowledge and rating) on a specific volunteer, and get in contact by calling (audio/video), email, sms, chat and so on.
A user can sign up as a volunteer and has to declare his knowledge/skills, the languages he is able to speak, and setting some other parameters for better profiling the service: the accuracy

of the position provided (city level, street level, exact) and the daytime availability. Availability can be changed "on-the-flight", whenever needed by the user. User can manually declare his position in case of lack of automatic discovering.
User can view his history of received assistance from volunteers. He can vote the satisfaction level about the assistance received. For each aid, involved volunteer and volunteer rating is shown.

Figure 3: Screenshot of the "Geo-Social Radar" tool

3.2 TEXT LENS (CTU)

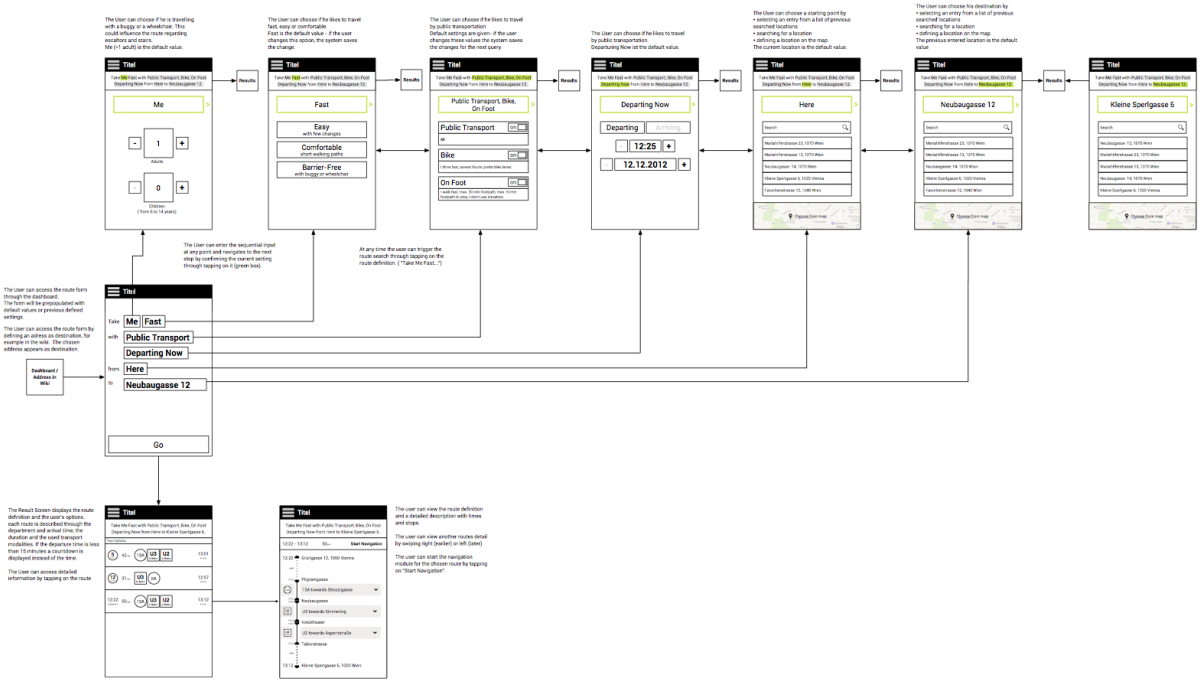
Text Lens is a component which uses mobile phone camera to detect and recognize text. When a user points his device to an arbitrary text, the text is processed by the component and the user has then the ability to automatically translate it into his native language or to ask Text Lens to read the text out loud in its original language using a speech engine.

Thanks to Text Lens, a user is able to quickly translate unknown text (such as signs, shop names, forms, menus in restaurants, etc.), which aids orientation in unknown environments. It also contributes to improve his language skills, because he can easily adopt new vocabulary and improve his day-to-day communication skills.

3.3 NAVIGATION (FLU & JR)

The navigation module includes a journey planner, augmented reality navigation and a text to speech engine. After the user choses a route, the mobile service will automatically detect the behaviour of the user and identify if he/she has done right or wrong in the current navigation context, with continuous visual and spoken feedback to keep the user on track, without the need of user interaction.
Additionally, the user has the possibility to show specific POI categories on a map and use it as start / destination point for the journey planner. Furthermore start / destination point can be taken from other modules (Wiki, Text lens).

The next figure shows the screen flow of the journey planner.



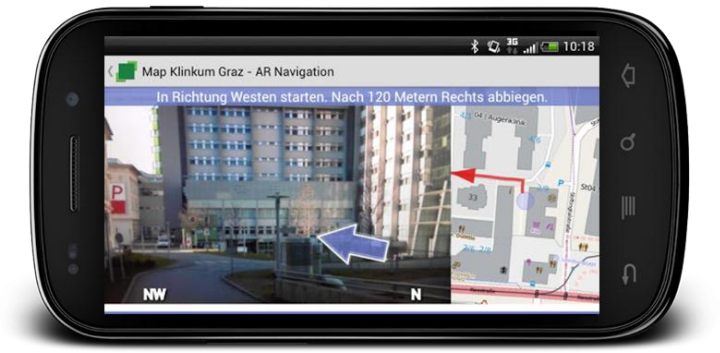


Figure 4: Screenshot of the "Augmented Reality Navigation" tool

3.4 LANGUAGE LEARNING (BUS)

busuu.com will be providing language learning services to the MASELTOV application. Language learning is a social process of enculturation and relationship forming, as much as it

is an individual process of language acquisition, practice and improvement. Social language learning occurs on the basis of exchanges between the learner and the teacher, or learners interacting with other learners and the wider target language community. Willingness to be immersed in a different culture by learning a different language occurs when there is sufficiently strong motivation to learn the other person's language or to be accepted in a new social setting, and it can be facilitated by a willingness to teach one's mother tongue in return.

Social language learning is increasingly fostered through use of the Internet, including language-learning sites and communities set up specifically for this purpose. busuu.com has been a leading proponent of a new type of online community where language learners mix with teachers in an informal setting that combines traditional elements of working through learning materials with new forms of feedback and mutual support. Members of this community willingly help others to learn their own language because of the mutual benefit they derive from these transactions.

The learning on MASELTOV will happen through modules divided in different categories, which include customised lessons aimed at tendering to the migrants language needs in specific situations. The language learning will include language short lessons that can be triggered by the learner when needed and access to a more structured course allowing for a deeper understanding of the language. Socio-cultural elements will be added to allow the learner to integrate in his surroundings. A social network will support the learning process by allowing the learner to receive corrections from native speakers but also to discuss cultural issues in a discussion board.
Please refer to the screenshots below that offer a clear view of how the lessons and social interaction will happen.

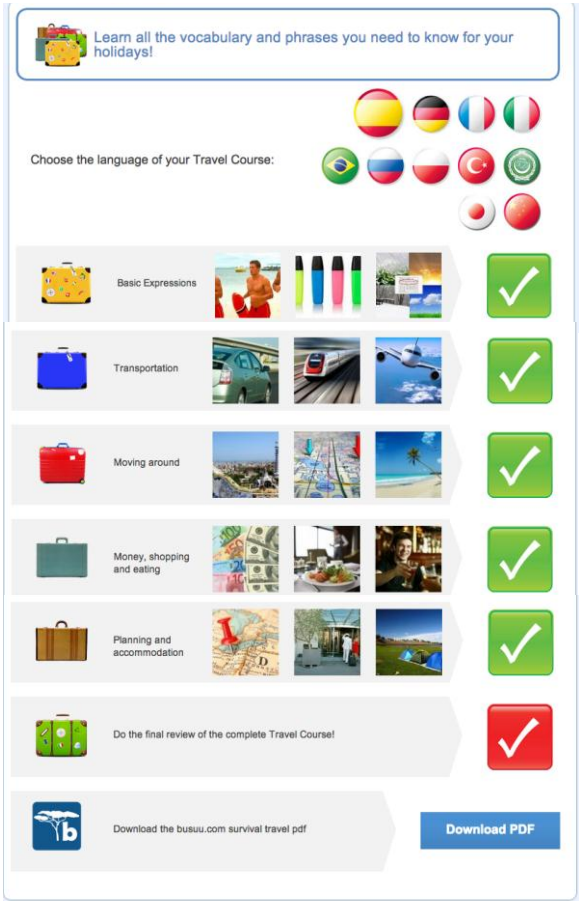


Figure 5: Overview of the set of different topics available to the learner

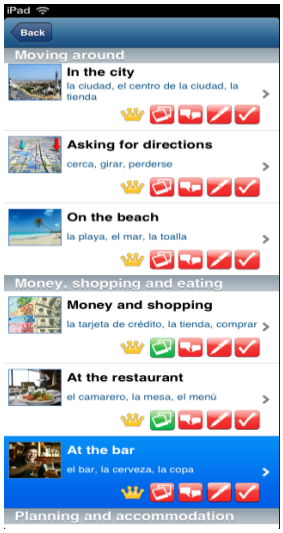


Figure 6: The lesson view adapted to the mobile app

Figure 7: A typical lesson tasks

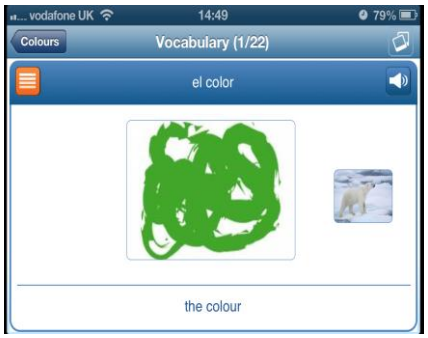


Figure 8: A vocabulary lesson overview

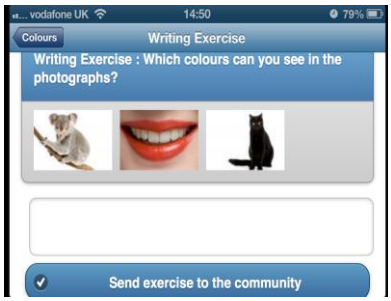


Figure 9: The possibility to be corrected by native speakers on MASELTOV

MASELTOV will benefit from this service as knowing the host's local language will allow a better integration in the host society. This is the ultimate objective of this project to ease the integration of migrant in their host societies.

3.5 WIKI (FLU)

Based on Wiki pages, the user can get information to several topics that could be interesting for them. The defined topics are

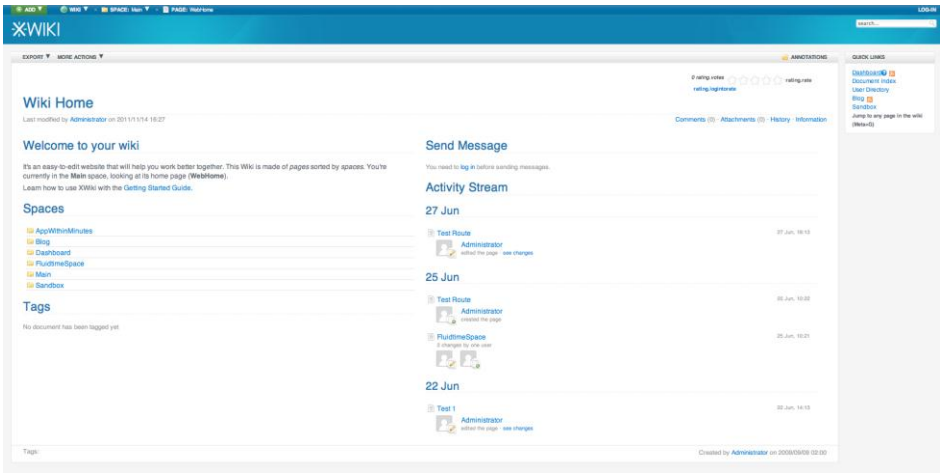
- Bureaucratic advisor
- Health care
- Housing
- Education & Career
- FAQ
- Language guide
- Forms
- Emergency calls and hotlines
- Privacy and data storage

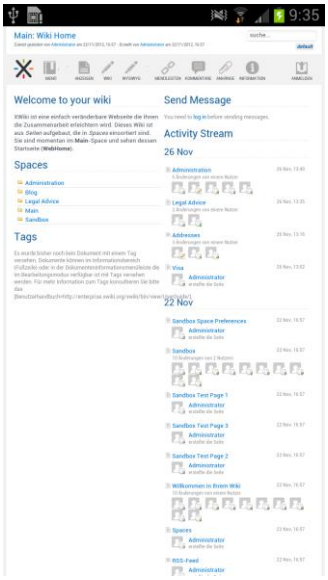
Every category will have a sub-chapter where the relevant information will be provided. For example:

- In Bureaucratic advisor there will be a sub-chapter Administration Offices where the links and addresses to the most important offices will be stored

Additionally, the user has the possibility to start other modules from the Wiki pages. One example could be, that an address can be used as input for the navigation module (as start of end point).

The Wiki will be started in the browser, but can be additionally accessed by mobile. Therefore, an especially adapted mobile skin will be developed. The screenshots of the current Wiki versions are presented below.





3.6 SERIOUS GAMES (COV)

The serious game currently under development for MASELTOV WP7 by COVUNI implements a 'platform game' type mechanic, intended for play on Android devices. The game's narrative creates two culturally distinct "dimensions", as a basis for puzzles and

character interactions, allowing the learner to gain insight into how cultures may differ and the challenges that can occur as a result. With a focus on usability and the creation of a "fun" learner experience, the game seeks to capitalize on the current state-of-the-art understanding of how best to design and deploy games in contexts where extrinsic motivation to learn cannot be relied upon. Furthermore, through the notion of an in-game store in which the user can spend credits earned though using other MASELTOV services, the game intends to explore how it may synergise with other MASELTOV services through the provision of the ability for partners to reward users for actions or participation.

Figure 10: Screenshots from the MASELTOV serious game

3.7 DISCUSSION FORUM (TI)

The software component runs as service-on-demand on the smartphone with the goal to mainly provide to users functionality to manage posts and discussions and to be notified about news.

Objectives of Community Building Services applications are to elevate the individual as part of a community and to improve the user experience making the participation in social networks and the access to information more satisfactory. Using the Forum, Maseltov users can share personal experiences, read Maseltov community news, interact in specific topics like Job requests, real estate information, bureaucratic difficulties and so on, exchange private messages, pictures and share useful information on Facebook and Twitter. A voting system is

also provided to promote the most successful thread and to encourage user to submit their experiences/information to the community. User is notified of new private messages, reply to his threads and new contribution on subscribed threads. Several studies demonstrate that a forum structure is the best way to aggregate people with strong common interests and problems. For this reason that social networks like twitter and Facebook provide API to easily connect the already existing worldwide forums. The MASELTOV app will offer a smartphone interface to the forum which can be accessed by a desktop computer as well.

Users can access all information presented in SN and can interact with all other users in different ways. The following functionalities will be provided:

- Search on SN content
- Send/receive private message from other SN user
- Share a content on external social network
- Receive notification about new post and new discussion
- Insert new post/discussion; replay to existing post/discussion
- Being notified about news
- Notify goodness of specific answer
- Report problem to administrator

Figure 11: Screenshot from the MASELTOV forum tool

3.8 PROFILE (AIT)

This software component is responsible for the handling and storing of any kind user-related data produced by MASELTOV components. Interfaces have to be provided to accept user-related information from any software module like progress information from language learning module or the current status within serious games or context recognitions. Further usage patterns have to be accepted from any module in order to store a history of behavioural data as a basis for the generation of personalised recommendations. Besides receiving user-related data could also be queried from this module

The GUI component will implement an graphical user interface to give the user possibilities to enter personal data like name, email, age or gender and to visualise any user related data stored in the user-profile which was generated by the MASELTOV system and sent to the User Profiling client software component. Information like the current learning progress, histories of recommendations or application usage patterns are shown in this user interface.

3.9 PROGRESS (LEARNING, GAMES) (OU)

This service is closely associated with the "Profile" service.

Progress reporting will be incorporated within a number of the individual tools and services. For more structured learning tools and games this will indicate progression and successful completion of tasks by the user. For social tools, this should allow sharing one's progress and viewing other users' progress if they are willing to share it. For all tools, this should include feedback activities undertaken by the users, such as reporting on how satisfactory a tool has been, or the reporting of a bug or unexpected behaviour.

It is anticipated that the majority of these will report back to the MASELTOV database server. This implies that the MASELTOV tools and services will need an agreed framework for storing and passing on their progress data. Data reflecting an individual's progress will be aggregated within the Profile tool (See Section 3.8, previously). Data reflecting the quality of the tool/service may be held separately for administrative analysis.

A number of tools may not report progress back to the MASELTOV database server, but keep local records: for example serious games which are only playable in single player mode could hold player scores locally only.

Work Package 7.2 (Feedback and Progress Indicators) will inform the type and presentation of progress indicators to be used within each tool or service. A unified approach is required across the tools and services to ensure a coherent and predictable user experience. Graphic visualisations of progress will be required: on an individual user basis within each user's Profile tool, and a synthesised summary presentation within mentor and administrator views.

Progress reporting will be presented to users (to support their learning), mentors (to understand participants' progress and where intervention is required), and system administrators (to enable bug fixing, and learner analytics to improve services).

3.10 NOTIFICATION (JR)

The “Notify System” is a software component on the client-side which runs in the background always ready to receive notification from any MASELTOV software component which should be presented to the user even when the MASELTOV app is not currently used. Therefore the Android notification system will be used to display notifications in the Android Notification Area (Notification Icon always shown, Pull-Down-Screen with lists of active notifications). Further, if multiple active notifications are present, they will be aggregated and linked to only one notify in the notification area in order not to overload the list, which would lead to a bad user experience. By following aggregated notifications, the user will end up in a list showing all currently active notifications. Notification could be on i.e. location based

recommendations of the MASELTOV system or received private messages from the discussion forum.

Notifications will be presented to the user, even if the user is not currently using the MASELTOV app by the use of the Android Notification system tray. On the one hand side the notification system will be able to receive messages via a provided interface or by Google Cloud to Device Massaging and will sent them to the Google notification system in order to show MASELTOV notifications on Android system level. If multiple active messages occur, the system will make an aggregation. The notification system could be used by any MASELTOV component to inform users about news. For example, if the background recommendation system of MASELTOV comes up with a location based language learning recommendation, it could gain users attention by using the notification system in order to point the user directly to the language learning module to do a lesson.

3.11 RECOMMENDATIONS (AIT)

This component will run as a background service on the smartphone and will generate personalised recommendations for users in the scope of MASELTOV functionalities and tools relevant in the current situation of the user. Therefore any available user-related information like usage history, context-recognitions, user progress and so on will be queried from the user profile component. Generated Recommendations should be stored in the user profile as well. Notifications to users could be sent directly through the clients Notify-System module.

The following list shows some examples of possible recommendations:

- Recommend to do a language lesson because the user is currently waiting for a bus which will arrive in 15 minutes.
- Recommend to play a serious game to prepare for a planned administrative task
- Recommend relevant information according to the current task or learning progress of users.
- Recommend most suitable MASELTOV functionalities with regard to predicted situational demands.

4. SUMMARY AND OUTLOOK

This deliverable depicts the initial state of the mobile MASELTOV application defined at the beginning of software developments within the project. Based on the finding and results shown above the development phase of all technical partners will be started. Clear definitions of components of the MASELTOV application, their requirements and responsibilities as well as their appearance in the graphical user interface are a prerequisite for a decentralized development process, which is necessary in the scope of an international project like MASELTOV. Despite the concept of decentralized development it is a major goal of MASELTOV to end up with one integrated service with only one user-interface to provide a seamless user experience. One major definition carried out in parallel is the establishment of proper integration process which is described in deliverable D3.2.1. Additionally, a detailed description of each software component and their provided functionalities can be found in deliverable D3.2.1.

Furthermore, we have to point out that there will be an update to this document at September 2014 with deliverable D6.1.2 to integrate lessons learned during the implementation phase and including all technical adoptions and additions made to solve future technical issues, which haven't been identified yet.