

DELIVERABLE REPORT

D6.1.2

“Mobile Assistant Service”

Collaborative project
MASELTOV
 Mobile Assistance for Social Inclusion and Empowerment of Immigrants with Persuasive Learning
 Technologies and Social Network Services
 Grant Agreement No. 288587 / ICT for Inclusion
 project co-funded by the
 European Commission
 Information Society and Media Directorate-General
 Information and Communication Technologies
 Seventh Framework Programme (2007-2013)

Due date of deliverable:	September 30, 2014
Actual submission date:	October 8, 2014
Start date of project:	Jan 1, 2012
Duration:	39 months








Work package	WP 06 – MOBILE ASSISTANCE & INFORMATION SERVICES
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Project co-funded by the European Commission within the Seventh Framework Programme (2007–2013)		
Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	X
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

VERSION HISTORY

version	date	author	reason for modification	status
001	01.08.2014	Patrick Luley	First draft version	Internal
002	14.08.2014	Anna Weber	Structure of the document	Internal
003	28.08.2014	Anna Weber	First integrated version	Internal
004	11.09.2014	Patrick Luley	Second iteration	Internal
005	17.09.2014	Anna Weber	Layout and Formatting	Internal
006	18.09.2014	Patrick Luley	Final version for review	Internal
007	30.09.2014	Patrick Luley	Final version	Internal
008	07.10.2014	Lucas Paletta	Formatting	To the EC

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MASELTOV partner			organisation name	country code
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16	PP		PEARSON PUBLISHING	UK
17	ATE		AUSTRIAN INSTITUTE OF TECHNOLOGY	AT

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1. EXECUTIVE SUMMARY

The deliverable D6.1.2 describes the work carried out in the scope of Task 6.1 “Mobile Assistant” of work package WP6 “MOBILE ASSISTANCE & INFORMATION SERVICES” and represents an update of deliverable D6.1.1, integrating lessons learned during the implementation phase, including all technical adoptions and additions made to solve technical issues. This deliverable depicts the final state of the mobile MASELTOV application.

The result of this task is the documentation of the overall MASELTOV assistant – the mobile MASELTOV service. Seamless integration of all MASELTOV tools into a single service application was a crucial part of work within the development process, especially in the case of MASELTOV, which is a very complex system with a huge amount of software components provided by different technical partners. The final goal of this work was to ensure a seamless integrated application with a consistent look & feel and with high usability to the users based on design patterns that were recommended by the analysis done in work package WP2.

The first section of the deliverable gives an overview of the different approaches to ensure efficient information and service access within the MASELTOV application. In the second chapter all MASELTOV tools and services of the mobile assistant application will be described. Finally the usage scenario of the MASELTOV application, demonstrating all services of the application by taking the example of a typical day in an immigrant’s life, will be presented.

2. INFORMATION ACCESS WITHIN THE MASELTOV APPLICATION

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

1. Dashboard Concepts
2. Context-driven recommendations
3. Notifications
4. Virtual currency

2.1 DASHBOARD CONCEPTS

The consortium decided that every MApp service should be presented on the dashboard in order to simplify the access to the desired service. During the development phase several iterations with respect to the dashboard were conducted. Figure 1 presents the final design and implementation of the dashboard.

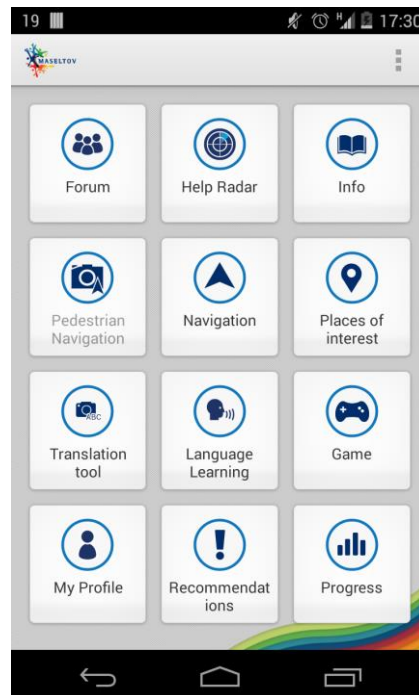


Figure 1: Final dashboard outline.

The following principal MApp services will be presented on the dashboard and are accessible by pressing corresponding icons:

1. Forum (TI)
2. Help Radar (TI)
3. Info (FLU)
4. Navigation / Pedestrian Navigation (FLU & JR)
5. Places of Interest (FLU)
6. Translation Tool (CTU)
7. Language Learning (PP)
8. Game (COV)

9. My Profile (AIT)
10. Recommendations (AIT)
11. Progress (Learning, Games) (AIT & OU)

2.2 CONTEXT-DRIVEN RECOMMENDATIONS (AIT)

This functionality runs as a background service on the back end server and generates targeted and personalized recommendations based on the detected user context, which includes the current position and activity, as well as the user preferences as stored in the user profile. Recommendations are produced by the recommender component, which makes use of a rule based engine that applies a number of rules to (a) events that are generated by other MApp applications and carry information about the current user context, and (b) user preferences. The generated recommendations are sent to the front end recommender component that pushes them to the Android notification service. Recommendations are active entities, as they may contain URIs that can be followed by the user. Recommendations can also be ignored or stored for later processing. Figure 2 shows the overall functioning of the recommender.

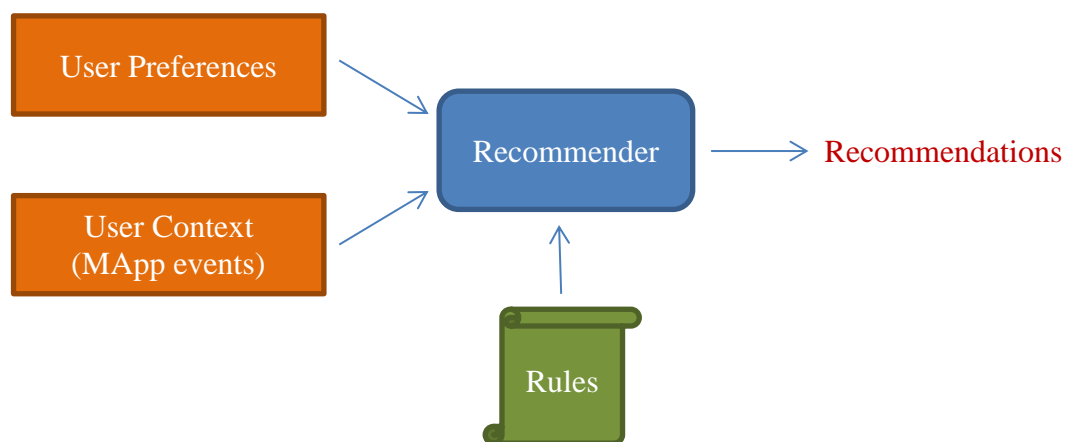


Figure 2: Overall functioning of the recommender.

A number of recommendations are produced by the recommender based on the user context and preferences. The following list contains 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.

The produced recommendations can be accessed from the dashboard. The recommendations drawer is shown in Figure 3. Recommendations can be categorized to read, unread, and starred. Chapter 3.12 contains screenshots of the different types of recommendations.

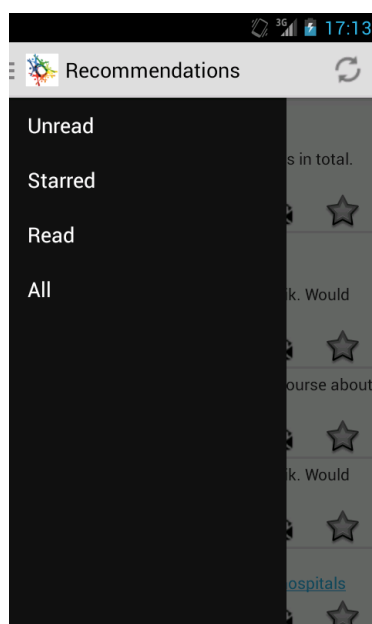


Figure 3: Recommendations drawer.

2.3 NOTIFICATIONS

This chapter shows the current collection of messages which will be sent to users from MApp components. Those messages are directly sent to the Android Notification Bar (see Figure 4) by the use of the corresponding Android API. All messages will be grouped under just one root entry in the notification bar called i.e. “MASELTOV: x pending messages”. Grouping of Messages is provided natively by the Android API available in Android version 4.1 and above. Below this Android version a compatibility library could be used to bundle notifications from the same app. The technical usage of the Android notification system is described in chapter 8 “Usage of the Android Notification Bar” of deliverable D3.3.3. The following table gives an overview of all notifications used within MApp and the linkage to certain MApp services.

Table 1: List of user notifications sent by MApp services

Software module	Description of the notification - Intention of the notification - wished reaction of users	Text of the notification shown to the user	When is the notification sent?
Help Radar (TI)	New message has arrived	Message from <nickname>	When the user starts a chat session with volunteer
Help Radar (TI)	Check if GPS is turned on. If not, a notification is sent to user to turn it on	GPS signal required	At device boot
MaseltoV forum (TI)	New personal message has arrived	New Personal Message	When a new forum message is sent to the user
Recommendation service (AIT)	Recommendations are sent to the notifications area	"You have # pending recommendations"	When one or more recommendation rules fire

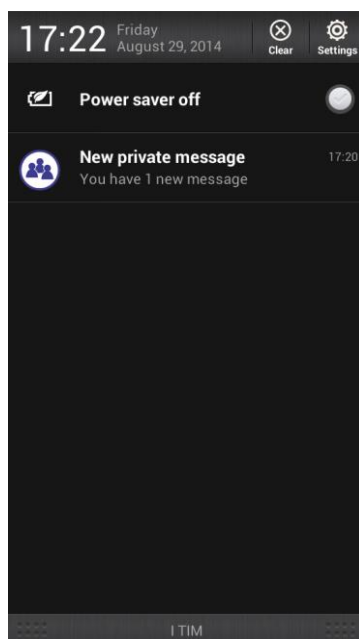


Figure 4: Notification for a new message.

2.4 VIRTUAL CURRENCY (COV)

A concept introduced to further the synergy between game and other MApp components, in response to reviewer feedback at the end of Y2 as well as the proposed approach in D6.1.1 (section 3.6), has been the introduction of a currency system which allows players to "earn" credits through the use of MApp services. These credits can then be spent by the player within the serious game. Credits can purchase a range of cosmetic items including hats and costumes for the player character, as shown in Figure 5.

Currency has been shown to promote a range of behaviours, though also brings with it a range of challenges (Wang & Mainwaring, 2008). These challenges can take the form of "realness", interpreted as the recognition of value sufficient for parallels to real-world currency to be established, trust, and fairness. Within MApp, the paradigm for currency integration is to incentivise transitions between services, and promote the use of the wider platform amongst users who may only have an initial interest in a single component. As an example, an immigrant using the navigation service may, on realising they have "earned" currency, be inclined to then seek to spend it through the game, experiencing the learning content and identifying some cultural challenges. Conversely, a player engaged with the game may, on reaching the in-game item store, be motivated to undertake a language learning lesson to gain an upgrade.

As no real-world currency transfer system exists (credits cannot be bought or exchanged for actual currency), rather than create a watertight system a lightweight approach is used under the paradigm that potential exploits (e.g. scanning and uploading text-lens words outside the intended usage context) would provide evidence through field trials of the efficacy of this method to influence behaviour, allowing a more robust approach to be implemented in future exploitation of the platform. Field trial outcomes must also be taken in-context, as personality types and traits can influence virtual currency use (Drennan & Keeffe, 2007). An anticipated

role of the game in the completed platform is to reach immigrants who are engaged with digital games, but not aware of NGO services or likely cultural challenges. As such, currency seeks to transition this demographic towards the wider suite of MApp services. Achieving a positive outcome here requires future understanding not only of the field trial audiences, who are by nature already engaged with NGOs, but also the wider response to the game through platforms such as Google Play.

On a technical level, implementation is straightforward: each user's profile contains a single integer coin total that can be queried or changed by services via the centralised MApp User Profile system. A typical value for currency was established across the platform with 1 coin roughly equivalent to 1 minute of active service use, translated to tasks such as Translation Tool uploads, trips using AR navigation, or completed language learning lessons.

A list of services within which the user can generate coins is given below:

- Language learning
 - 1 coin for completing an activity
 - 1 coin for posting an ok score on a test
 - 2 coins for posting a good score on a test
 - 3 coins for posting an excellent score on a test
 - 2 bonus coins for completing a lesson.
- Help Radar
 - 50 coins whenever user rates an assistance
- Forum
 - 5 coins whenever user sends a post / reply
- Pedestrian Navigation
 - 1 coin per minute of usage
- Translation Tool
 - 1 coin per minute of usage

The in-game store is accessed through the central game "hub". The store itself is shown in Figure 5. Spending the coins in-game is then achieved through the interfaces shown in Figure 6 and Figure 7.



Figure 5: The store in-game, allowing the player to spend currency earned through MApp services.

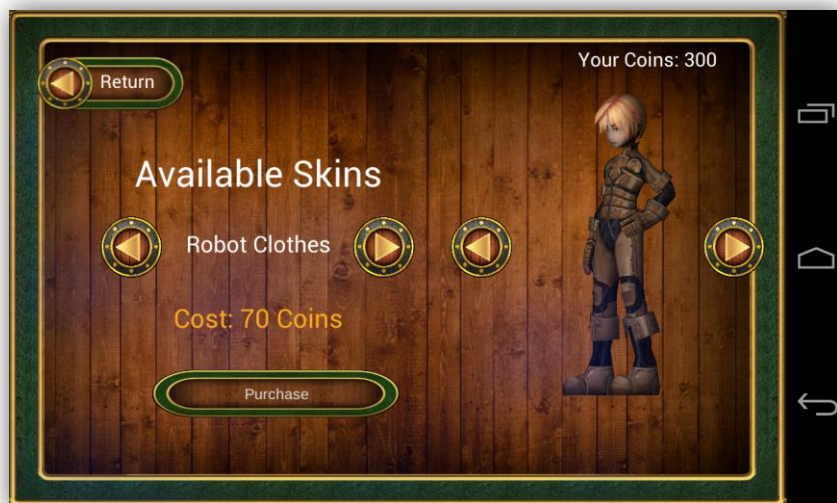


Figure 6: Different "skins" (clothing appearances) can be purchased, allowing the player to configure their character.



Figure 7: Similar to the overall appearance, hair and hats can be additionally purchased, allowing for further individualisation.

3. MASELTOV ASSISTANT APPLICATION (MAPP)

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

3.1 HELP RADAR (TI)

The software component “Help Radar Service” runs as service-on-demand on the smartphone with the goal to localize and notify volunteers in proximity of the user. The purpose of this service is to augment the mobile user context awareness, allowing user-to-user communications (chat) when registered users need assistance. The Help Radar 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 (even temporarily) his localization. In particular the authorization to localization is set in the MApp User profile and the Help Radar service works in accordance with this setting. When localization is denied by the user, he/she cannot benefit from the service.

The main ideas of the service are:

- Assistance seeking in certain thematic fields, searching for nearest / available volunteers
- Selection of a volunteer, according to his/her peculiarities; available Volunteers are shown in a list and in a map (details can be inspected: proximity, rating, competences, languages)
- Getting in contact (e.g. chat session) in order to receive immediate help (by chat) or to plan a successive contact
- Rating the quality of received assistance
- History of assistances (received/ provided)

When a user starts an assistance request, certain knowledge profiles of volunteers are searched. As a search result, a list will be shown to the user with available volunteers found. The user can view with detailed info (languages, proximity, competences and rating) on a specific volunteer and get in contact by calling or chat.

Any user can act as a volunteer provided that he/she has been certified by a NGO, by means of a specific authorization code. When an authorized user signs up as a volunteer, he/she has to declare his/her skills (competences), the languages he/she is able to speak and his/her usual availability (timetable) during the week. Availability can be changed “on-the-fly”, whenever needed by the user. Any user can view his/her own history of assistances received from volunteers or given to other users. A User can rate the satisfaction level about the assistance received.

The service UI is available (professional translations) in Italian, English, Spanish, Turkish and Arabic. Some screenshots of the Help Radar service are shown below.

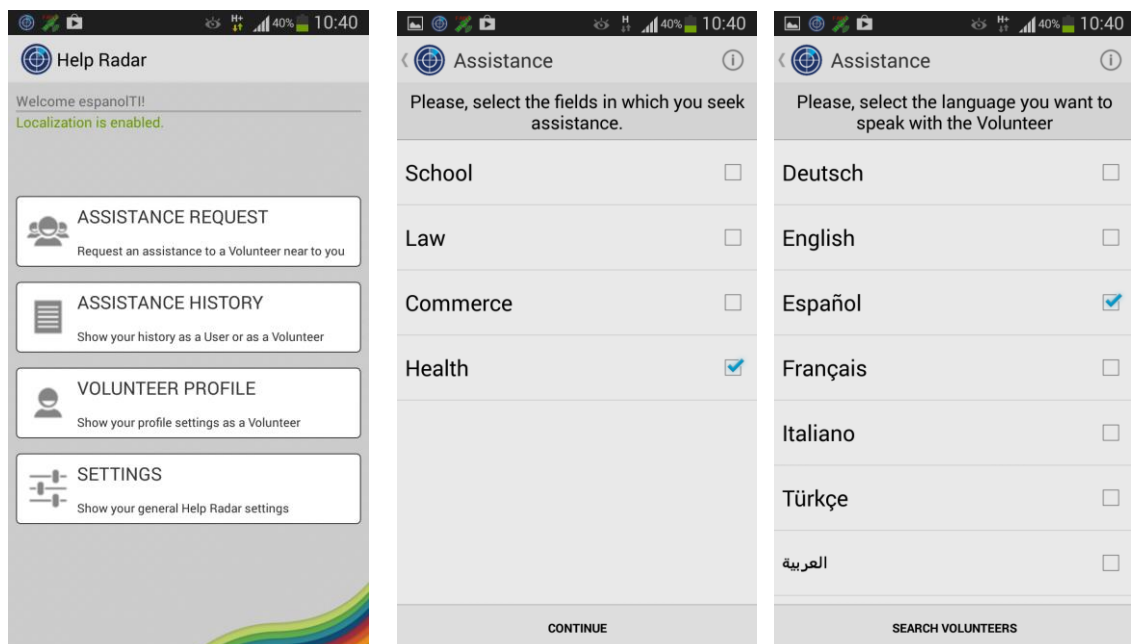


Figure 8: Connecting to Help Radar dashboard and creating an Assistance Request

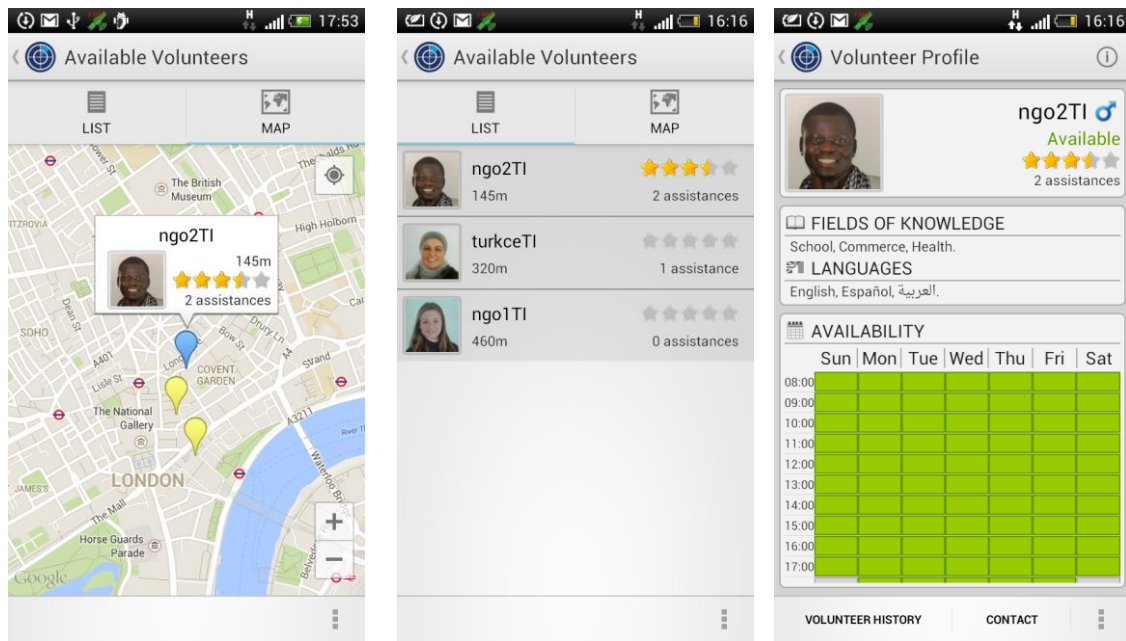


Figure 9: Browsing volunteers (map view and list view) and inspecting volunteers' details.

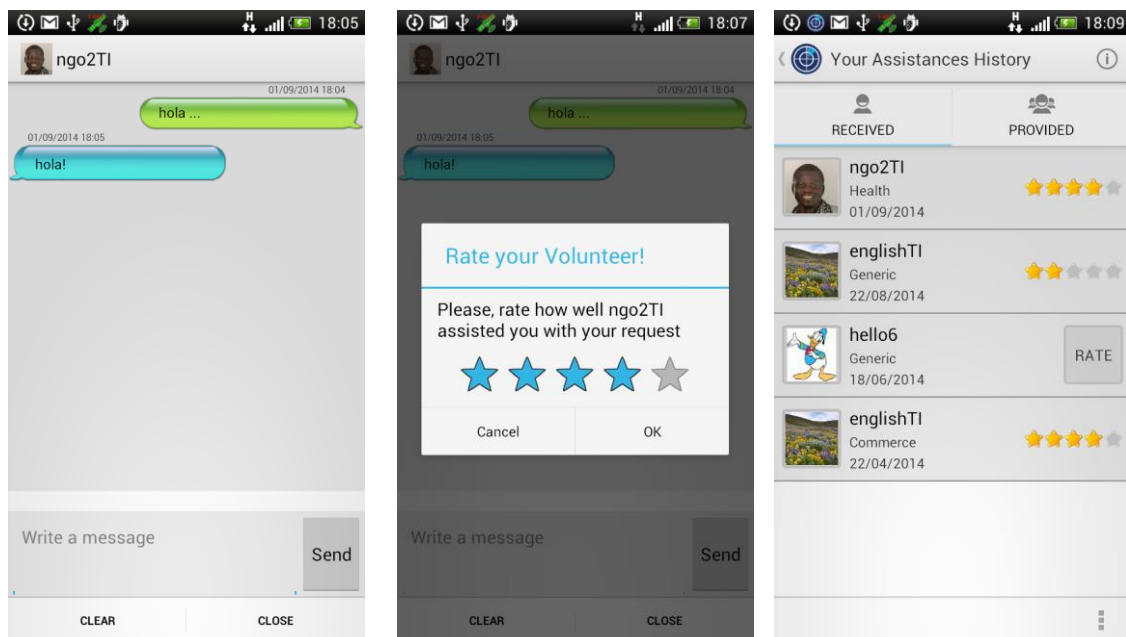


Figure 10: Getting in contact (chat), rating volunteer, inspecting Assistances history.

3.2 TRANSLATION TOOL (CTU)

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

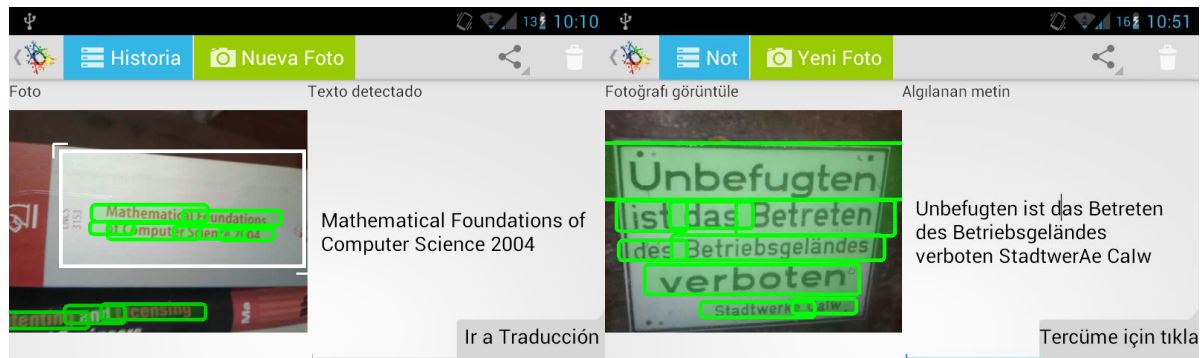


Figure 11: Translation Tool - Text detection and translation.

Thanks to Translation Tool, 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 language skills, because one can easily adopt new vocabulary and improve day-to-day communication skills.

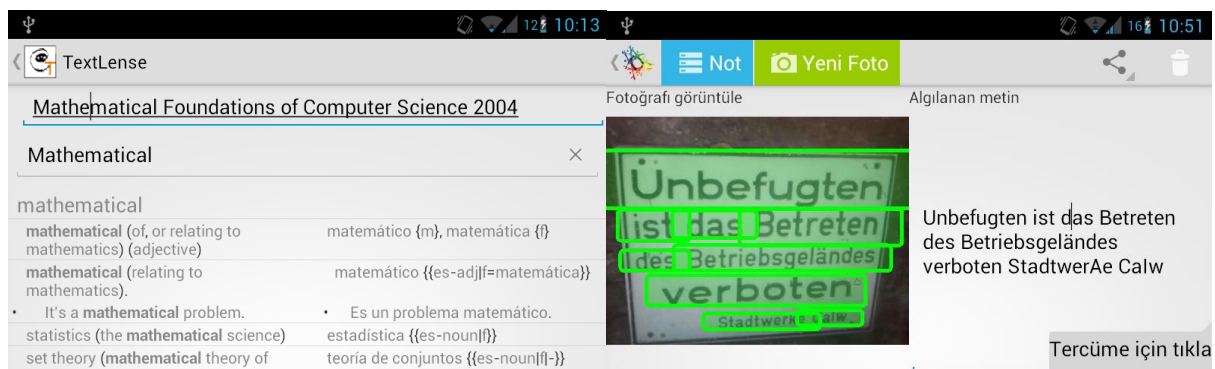


Figure 12: Translation Tool - offline dictionary and translation history.

Translation Tool runs fully on the mobile device without the need for an internet connection. The only time an internet connection is required, is when the offline dictionary is not sufficient and the user requires complex translation by an online service.

3.3 NAVIGATION (FLU & JR)

The navigation module includes a journey planner available in Vienna and London, including augmented reality navigation for walk segments of the route. The augmented reality navigation, described in the section below, is also available as a stand-alone module for Madrid.

Within the implementation phase several iterations of the concept and the resulting screen flow were conducted. The next figure represents the final screen flow of the navigation module.

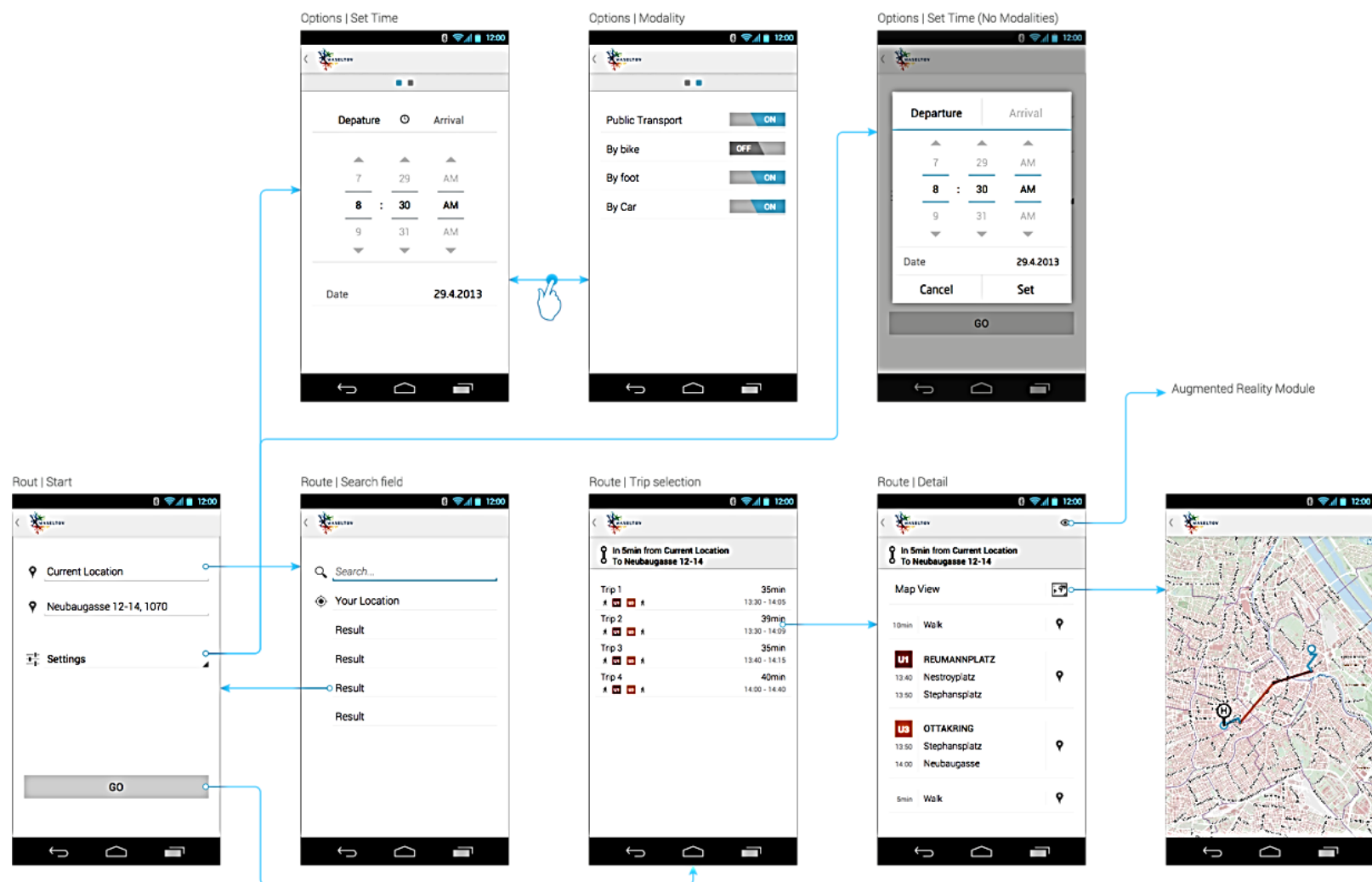


Figure 13: Journey planner screen flow - final concept.

In parallel to the mentioned user interface and visual design concept the technical specification was developed as well.

The journey planner application will be available for Vienna and London. In order to develop a journey planner application it was necessary to find a routing provider for both cities. In case of Vienna FLU made an agreement with ITS Vienna Region to use their routing engine for the MASELTOV project. For London there exists an open API for the routing engine offered by the public transport operator in London (TfL - Transport for London).

After the specification phase (including design and technical aspects) the journey planner application was developed for the mentioned cities. The next figures represent screenshots of the actual version.

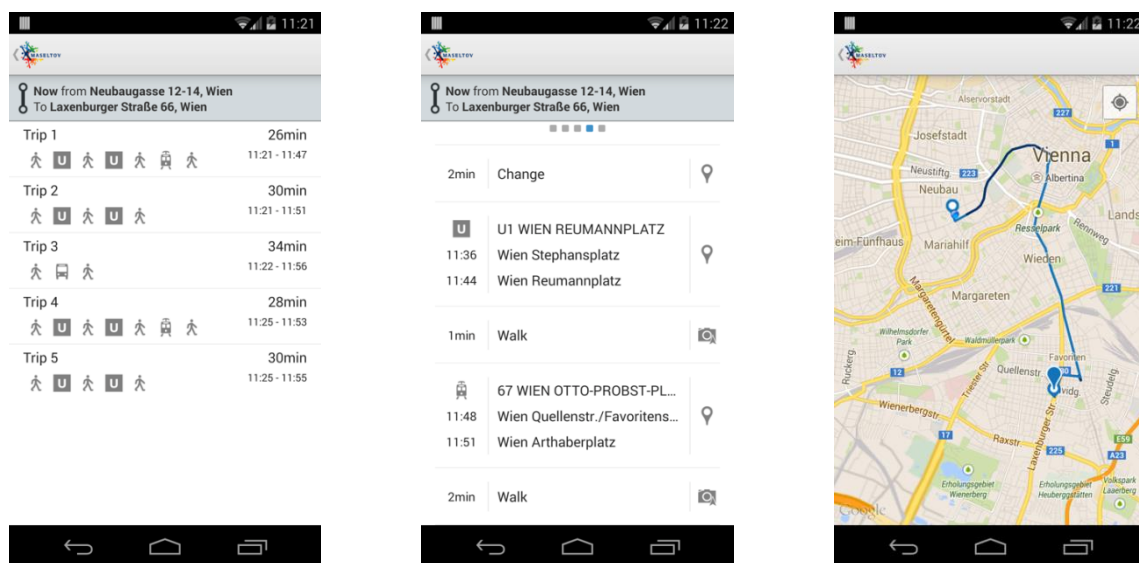


Figure 14: Journey planner screenshots (Vienna) – Routing result overview / detail / map.

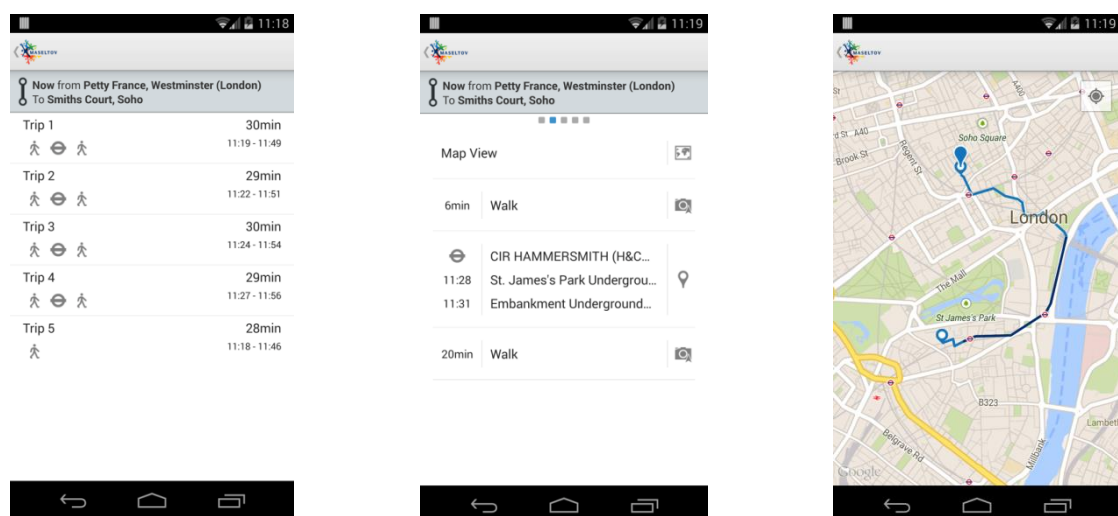


Figure 15: Journey planner screenshots (London) – Routing result overview & detail and map view.

Additionally, the inter-linkage with the augmented reality navigation component was successfully developed. The users have the possibility to use this functionality for walk segments of the route.

3.4 PEDESTRIAN NAVIGATION (JR)

The pedestrian navigation module represents an augmented reality navigation adapted for pedestrians with migration background using as little textual instructions as possible. Figure 16 shows the start screen, consisting of a map showing the current position of the user. To search for a destination, the search string has to be entered in the box on the top of the screen. As soon as the user starts to type, suggestions for possible destinations appear (Figure 17). Misspellings are automatically corrected by the component. After choosing a destination from the list of suggestions, the route is calculated and shown along with the destination point in the map (Figure 18).

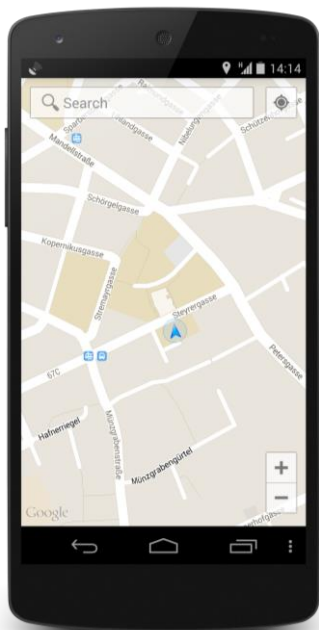


Figure 16: Start Screen.

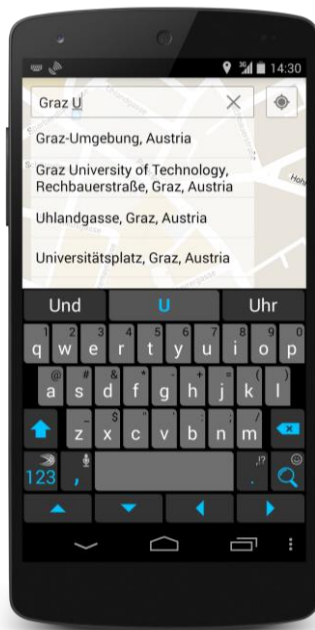


Figure 17: Searching for Destination.

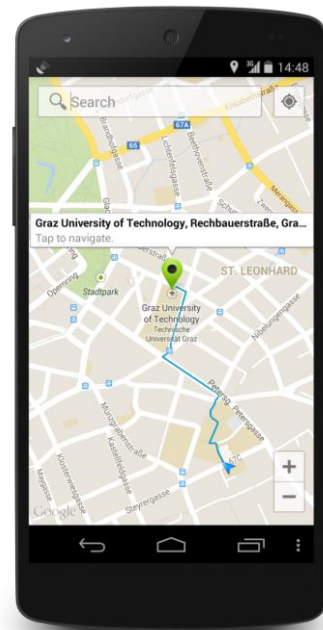


Figure 18: Preview of Route.

To start the navigation the window appearing above the destination point has to be tapped. If the route exceeds a certain distance, the window informs the user that this destination cannot be reached by foot. In this case the navigation will not be started. Reliable navigation can only be guaranteed if the position can be determined accurately. In case of poor position accuracy, a warning is presented to the user (Figure 19). Figure 20 finally shows the augmented reality navigation. The screen is divided into a camera view containing an arrow pointing towards the walking direction and an interactive map view displaying the route. The map view automatically aligns with the devices orientation and also supports zooming. Figure 21 informs the user about the correct phone orientation while navigation.

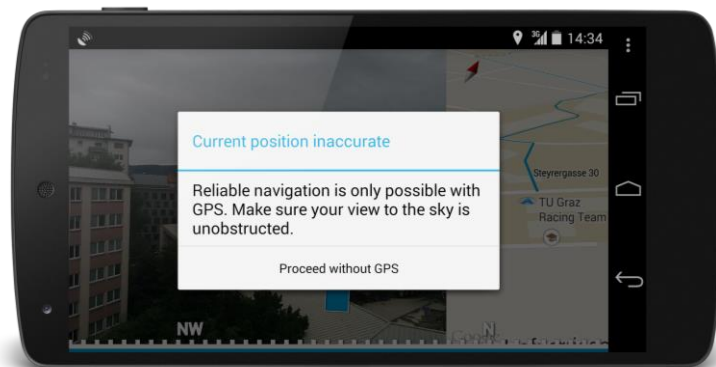


Figure 19: Warning inaccurate Position.

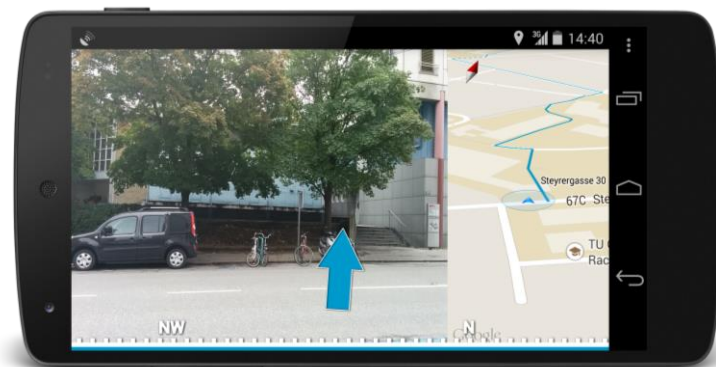


Figure 20: Augmented Reality Navigation.

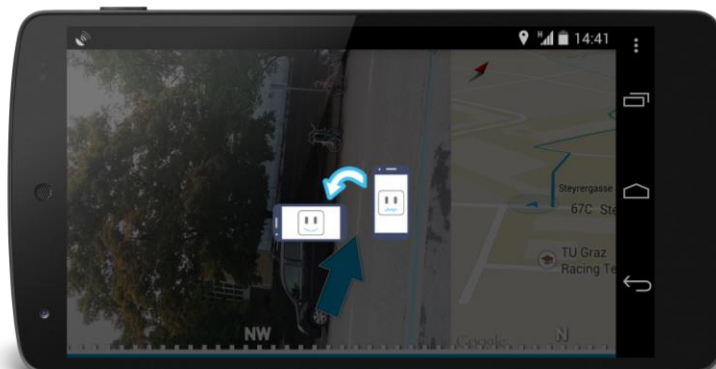


Figure 21: Hint correct Phone Orientation.

3.5 POINTS OF INTEREST (FLU)

The points of interest module covers the following functionalities: map showing all POIs and filter/search possibility. Additionally, the user can choose a POI as start/destination point for the navigation module. The POI categories cover all bureaucratic, health care and transportation topics. Figure 22 represents the final screen flow of the mentioned module. Figure 23 shows the actual status of the points of interest module.

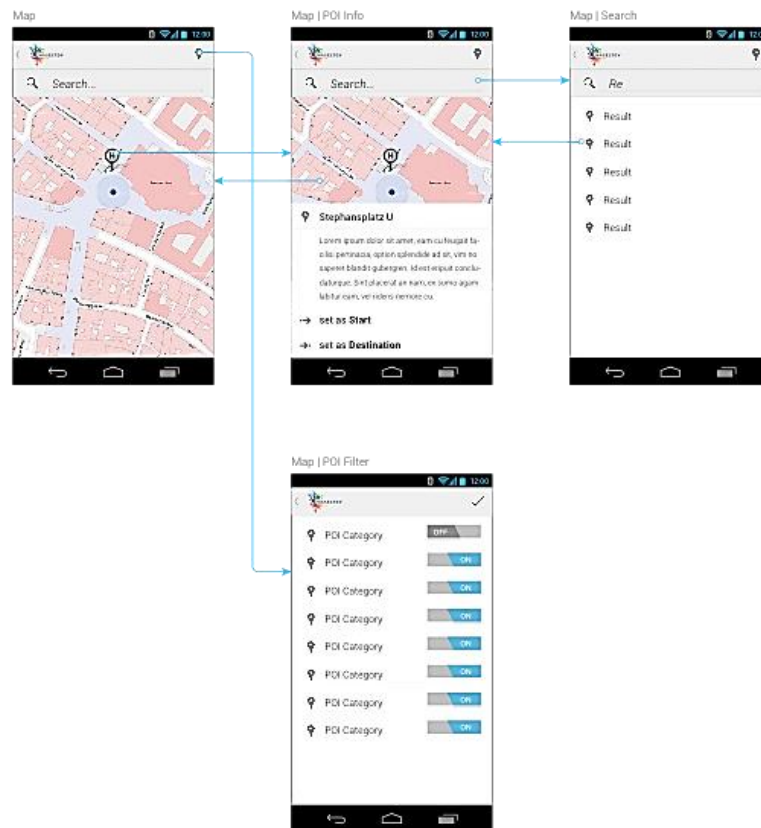


Figure 22: POI search service screen flow.

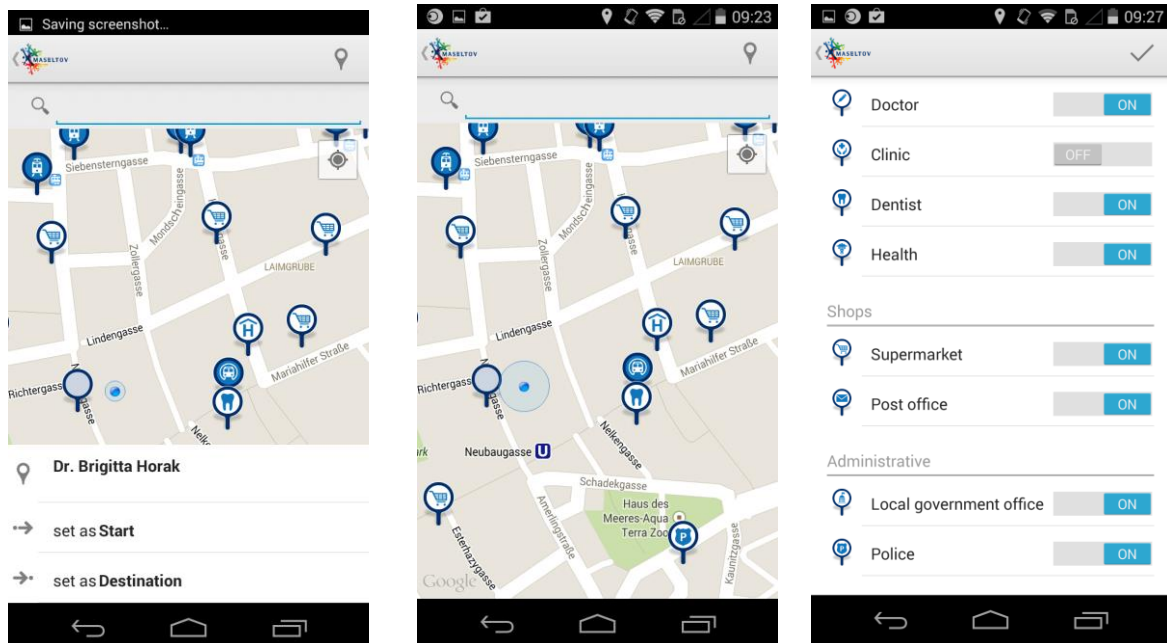


Figure 23: Screenshots points of interest (Vienna).

3.6 LANGUAGE LEARNING (PP)

Pearson Publishing (PP) will be providing language learning services to the MASELTOV application via its mobile publishing platform 'nimbl'. Pearson Publishing replaced bussu.com at the beginning of project year 3, and brings certain advantages and limitations. While PP is not able to provide the sophisticated social learning platform that was planned by busuu.com, PP provides an agile and attractive software platform, time, intelligence and experience in language learning with migrants. Developing its resources for MASELTOV largely from scratch has given it the advantage of producing resources that fit into the 'Incidental Learning Framework' that is the basis of Work Package 7.

3.4.1 Structure

Language learning on MASELTOV will happen through 6 different modules based around a theme relevant to the lives of immigrants. These modules are:

1. Basics (greetings, numbers, shopping and basic transactions)
2. Travel and transport
3. Healthcare
4. Education
5. Employment
6. Administration

Modules are can be selected on opening the language learning app.

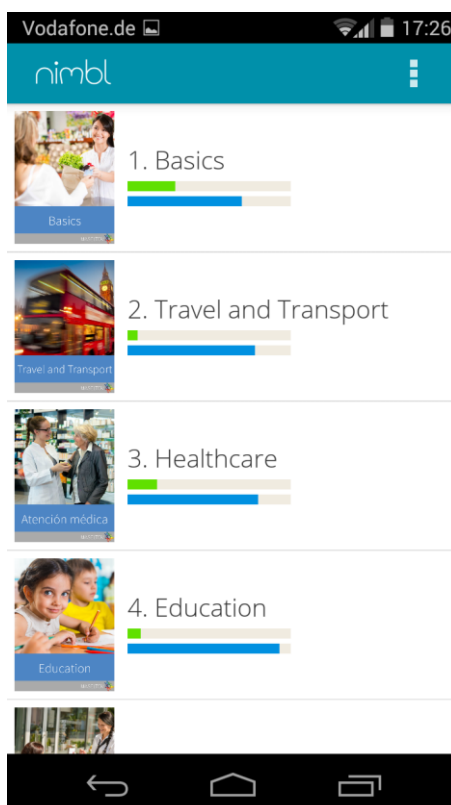


Figure 24: Module chooser.

Each module is divided into 3-4 lessons, a situations page and emergency vocabulary. The situations page provides audio and written snippets from language that might regularly be encountered. For example this might include common announcement at train stations in the module ‘Travel and transport’. This page is designed to be experiential rather than provide specific tuition. Emergency vocabulary is designed to be quick reference for words and phrases that might need to be accessed when a situation arises, e.g. missing a train or falling ill. Neither the situations page nor the emergency vocabulary page is tailored to a particular language level.

The lessons make up the bulk of the language learning content. They are aimed at specific language levels (CEFR A1-B1) and cover particular topics within a theme. They are designed to assist with preparation for a particular situation or to be a more reflective tool for learning and practicing relevant language once a situation has passed. Their content is constructed as follows:

1. Vocabulary and phrases
2. Reading or listening activities around a situation
3. Activities (writing activities and encouragement to practice in the real world)
4. A test

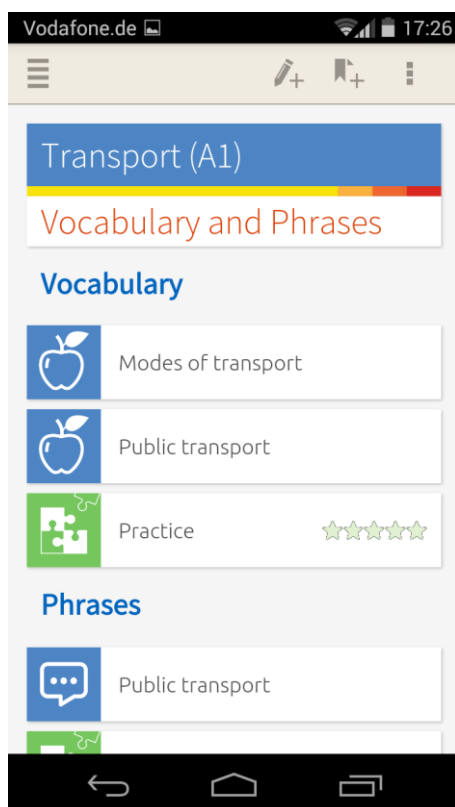


Figure 25: Vocabulary and phrase exercises.

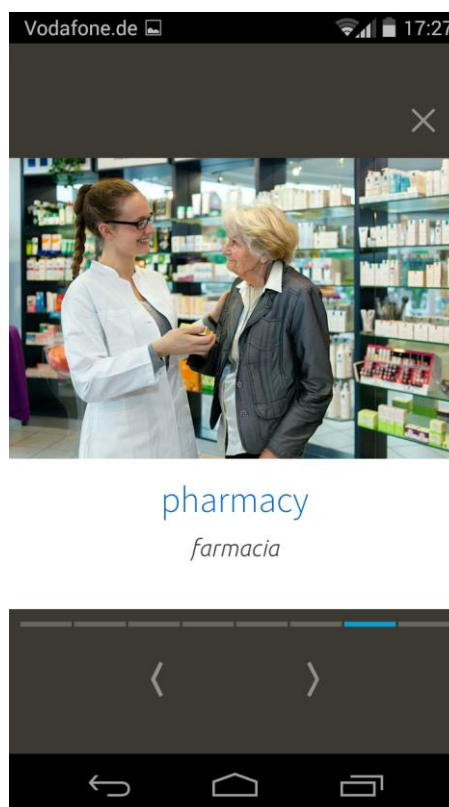
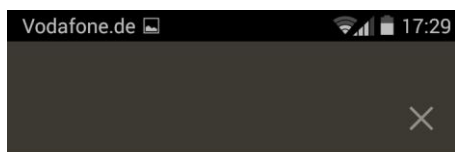


Figure 26: Learning a vocabulary item.



Listen to the word and
choose the correct
image.

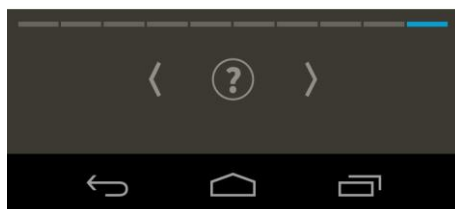
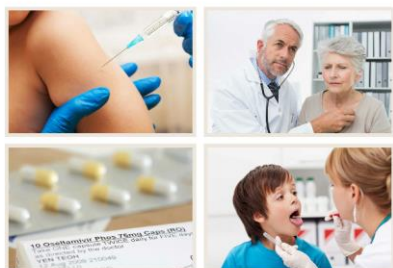
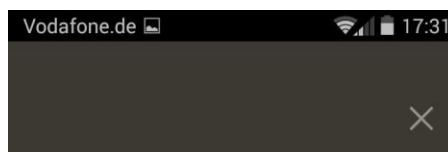


Figure 27: Testing vocabulary.



Fast, faster, fastest

The forms of long adjectives are different.
These sentences are wrong. What should they
be?

The train is more expensive.

X The plane is expensivest. X

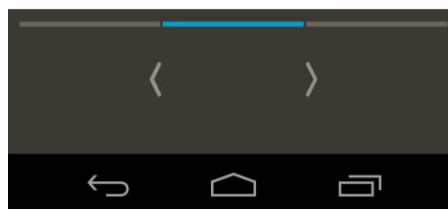


Figure 28: Part of a grammar lesson.

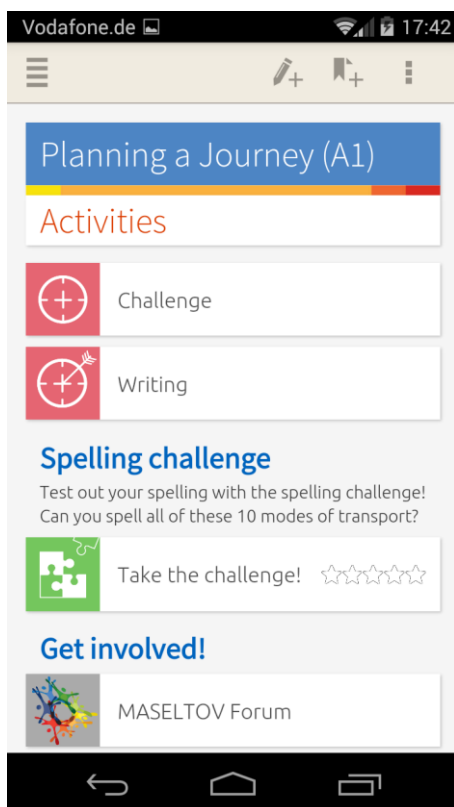


Figure 29: The activities page with a link to the MASELTOV forum.

3.4.2 Feedback and progress

As a motivational tool, the app displays in the menu bar results scored in tests and the percentage of the lesson completed. The app also allows the learner to provide feedback on the lesson by rating three evaluation statements on their learning and their enjoyment of the service. This information, as well progress information and test scores, is sent to the User Profile.

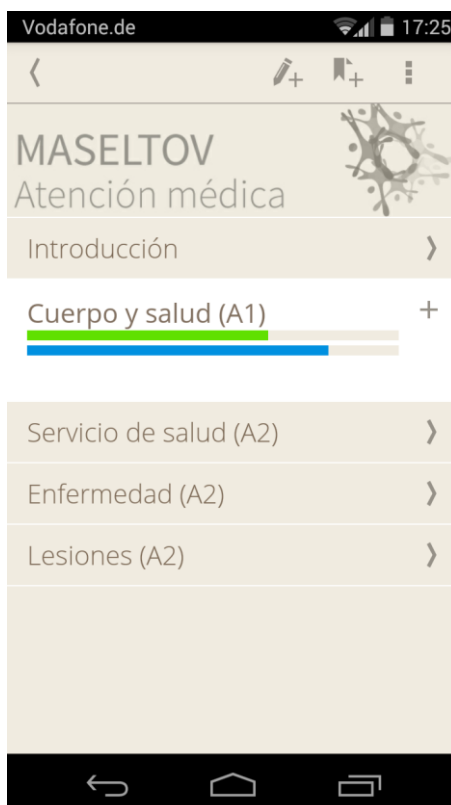


Figure 30: Lesson menu displaying coloured progress bars.

The app also awards coins for high test scores and for completing activities. These can be redeemed in the MASELTOV Serious Game service.

3.4.3 Integration with social media

The app frequently encourages users to seek help, participate and submit written work to the MASELTOV Discussion Forum to aid language learning through social means, and also community building. The app also links to an active Facebook page that offers discussion, activities and language information.

3.4.4 Recommendations

The language learning service is linked to the MASELTOV Recommendations Service with the aim of personalising and motivating learning. Events from the user's activity or environment can trigger recommendations to relevant lessons and new lessons and learning materials can be recommended once a lesson has been completed.

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.

3.7 INFO (FLU)

The goal of the Info module is to provide an information platform that covers the most important information related to the bureaucratic, administrative and health care topics. Within the first phase of the project several technical solutions were evaluated. Afterwards, it was decided to implement an intuitive admin platform covering the MApp use cases rather than using a standard solution (e.g.: Wiki system). The next figures represent the actual development status of the info module. In the first step, the admin GUI will be presented.

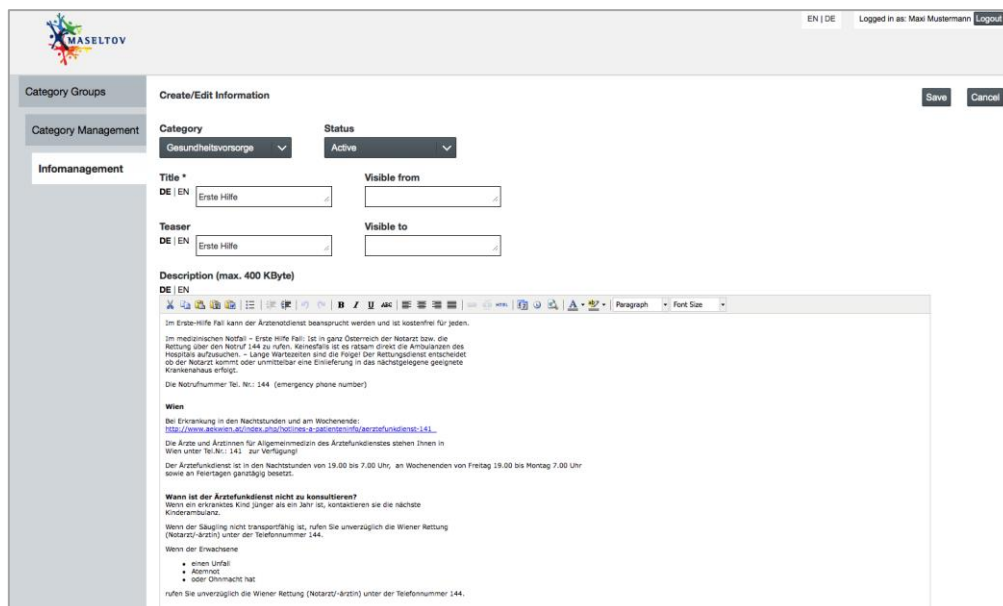


Figure 31: Admin GUI of info module.

Additionally, the admin has the possibility to combine text with POI (see Figure 32).

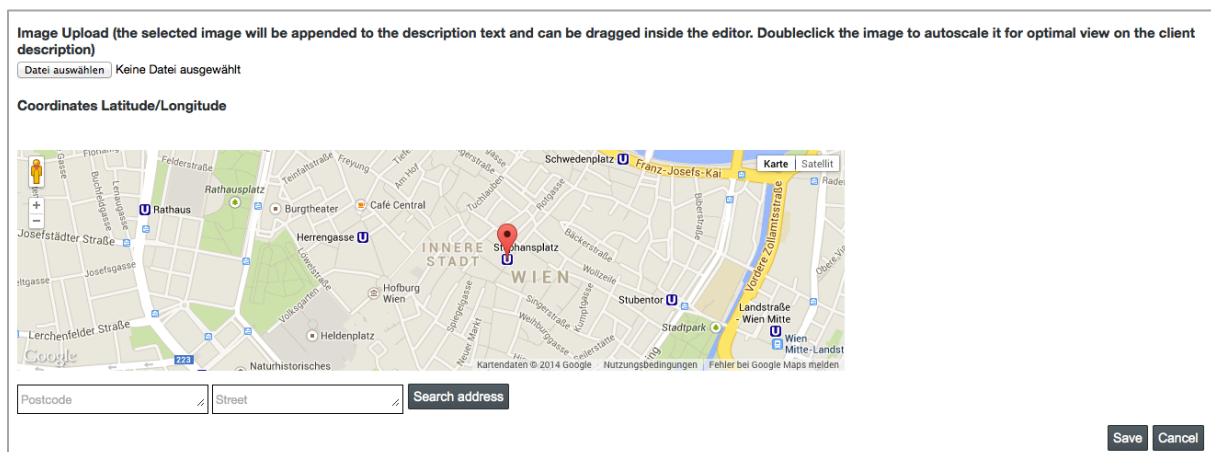


Figure 32: Admin GUI of info module.

The content, which is entered by the admin, will be shown to the user in a native application. Figure 33 shows the native representation of the content.

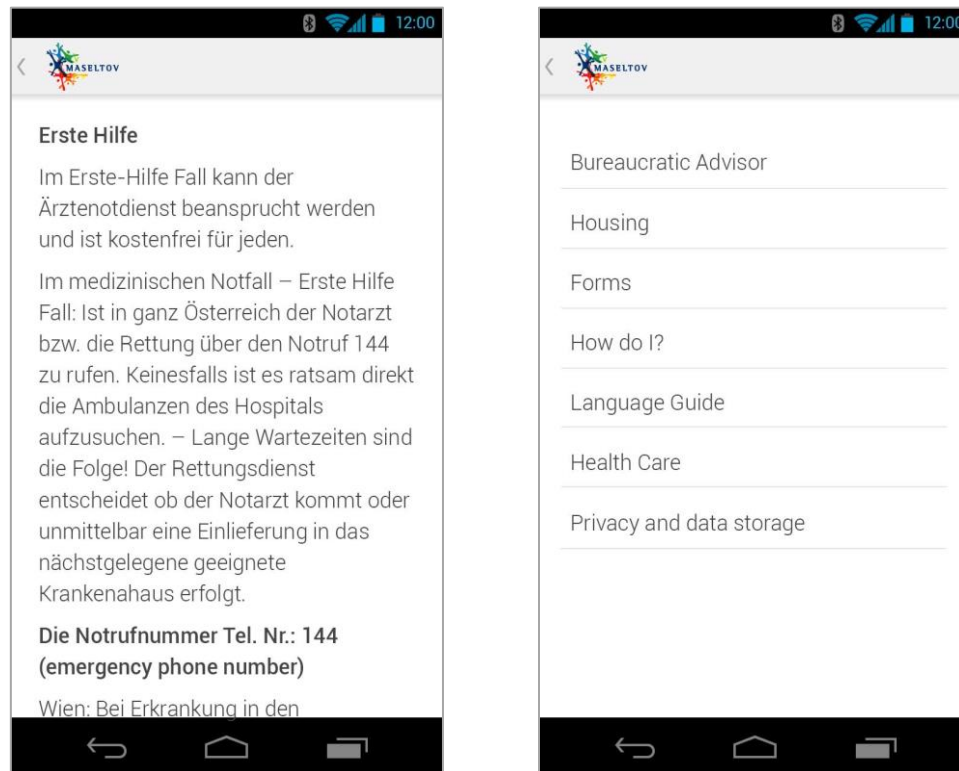


Figure 33: Native representation of the Info module.

3.8 GAME (COV)

As documented by D7.4.1, 7.5, and the forthcoming D7.4.2, the serious game provides an environment for game-based cultural learning. It integrates with the MApp dashboard and user profile system, with the first access prompting an install of the game itself (150Mb). The currency system described earlier in this deliverable is the main integrative component, with coins earned and MApp username reflected in game as shown in Figure 34. Overall, as the objective of the game is to reach users who engage with games, but may not necessarily be aware of the challenges and benefits of integration into host societies. As such, this design allows for the game to serve either as a route-in to the platform, or an additional component allowing for cultural learning. Cultural learning itself is embedded in the game through a narrative which sees the player transitioning between two worlds, communicating with characters in similar roles such as job interviewer or healthcare provider, but with different fictitious cultures underpinning their dialogues. Through puzzle-solving, the intent is to transfer cultural awareness on a meta-level, which can then be translated to practical solutions either through other MApp services, or wider interactions with services such as those provided by NGOs.



Figure 34: The game's main title screen, with links back to the user profile.

With a view towards stimulating engagement amongst a target demographic who may not be aware of cultural challenges or other MApp services, the game is a visually distinct component using a bespoke user interface, refined through field trials. This also allows for a gamified look and feel, which can differ from interfaces commonly found within other tools. Consequently, whilst many interaction components differ from other services, such as the method to navigate the character through the game world, the goal is for these to be internally-consistent within the game and sufficiently well-scaffolded to allow the interface to be learnt by new players. For field trials this is a particular challenge as participants are largely non-gamers, and therefore a balance must be achieved in providing sufficient scaffolding and purpose that they can access the game, without obstructing play by experienced gamers through excessive use of pop-ups and direction prompts.

Whilst previous research has explored the integration of games with learning management, or learning content management systems (Blanco, Torrente, Moreno-Ger, & Fernandez-Manj, 2010; Dunwell et al., 2012), the notion of integrating a game within a suite of tools for immigrants is largely unique to MASELTOV. A key differentiator is the context of use; tools may be used as-is without an explicit learning requirement or outcome. However, effort should be made to support transition away from reliance on tools and towards the development of competencies to achieve goals. For example, initial reliance on the Translation Tool component to provide translations of signs may be supported by Language Learning components, as well as immediate learning of translation results, though this requires knowledge of and exposure to both services. Through the coin system, which incentivises the use of other services purely to advance within the game, the MApp user may gain exposure to, and awareness of, these services, increasing the likelihood of them transitioning frequently between them. This overcomes the potential pitfall of immigrants becoming reliant on a single tool within the MApp, and overlooking opportunities to learn competencies through other services.

A final integrative point is the ability of the user profile to track individual service use. This is again applied to the game as a means to assess uptake in comparison to other components, and can also be considered with respect to the above objective of promoting homogeneity amongst services and a unified user experience. With the underlying character customisation within the

game linked to currency, an additional extrinsic motivator for service use is applied to supplement the user's intrinsic motivation and awareness. Hence integration towards usage tracking across services has the potential to serve as a progress indicator towards uptake of the wide toolset provided by MASELTOV.

3.9 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 informed about news. Objectives of the service 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 (reading posts, creating thread/post, replying to a post of a thread) MASELTOV users can share personal experiences, look for help, read MASELTOV community news, interact on specific subjects (like job requests, real estate information, bureaucratic difficulties, language learning and so on), exchange private messages and share useful information on Facebook and Twitter. A “like” system is also provided to promote the most successful thread and to encourage user to submit their experiences/information to the community.

The following functionalities are provided:

- Browse the Forum contents (topics/threads/posts)
- Read posts, create posts (replying to an existing post)
- Create threads
- Search on Forum content
- Express quality of specific post (“like”)
- Share a content on external social network (Facebook and Twitter)
- Send/receive private message to/from other Forum users
- Being notified about new private message
- Forum topics on language learning can be reached easily from the language learning service
- Forum can be enriched by threads created automatically when a user shares the translation of a text detected by the translation tool

The service UI is available (professional translations) in Italian, English, Spanish and Turkish. (professional translations). Some screenshots of the Forum service are shown below.

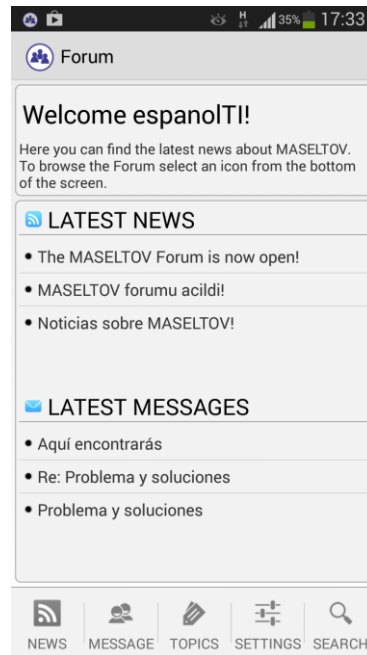


Figure 35: Forum dashboard.

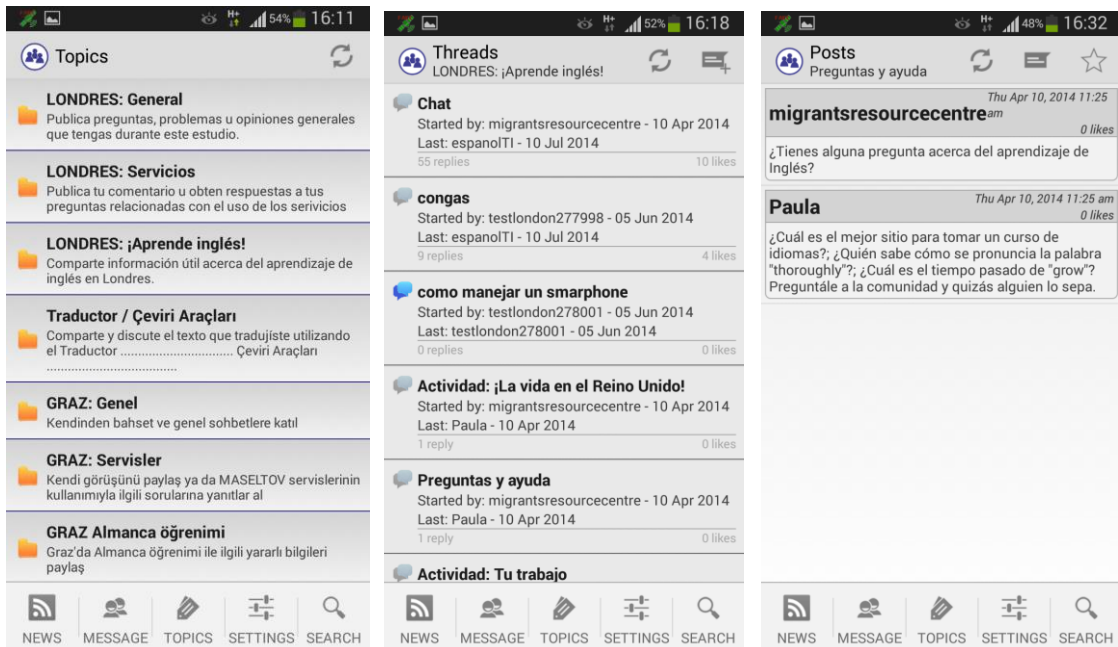


Figure 36: Browsing topics, threads and posts.

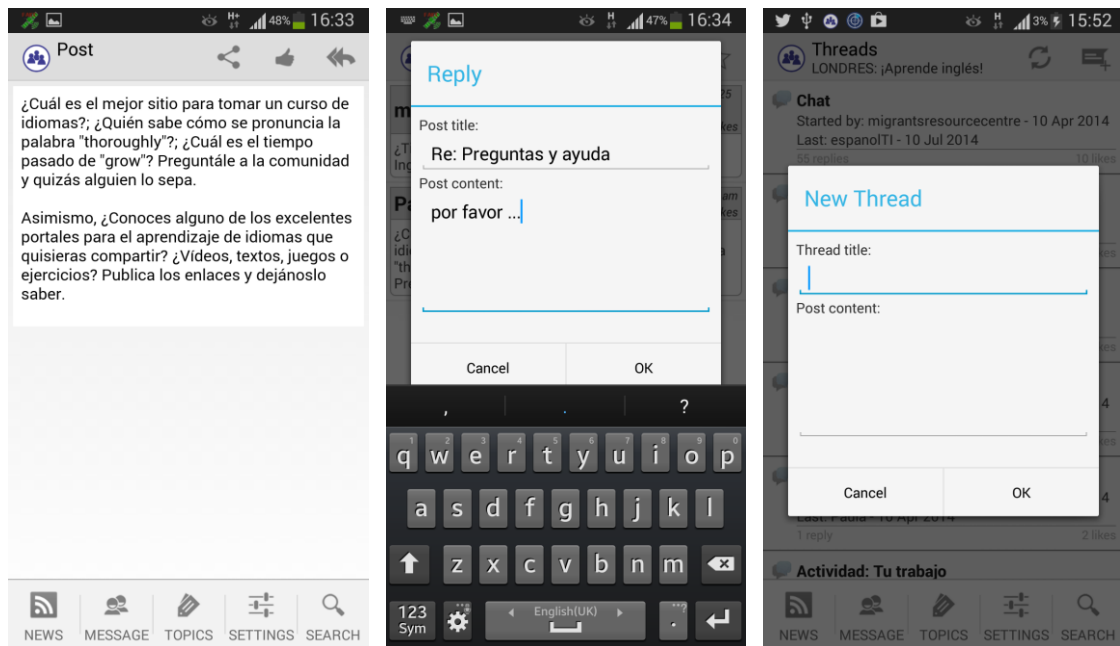


Figure 37: Reading a post, replying to a post, creating a thread.

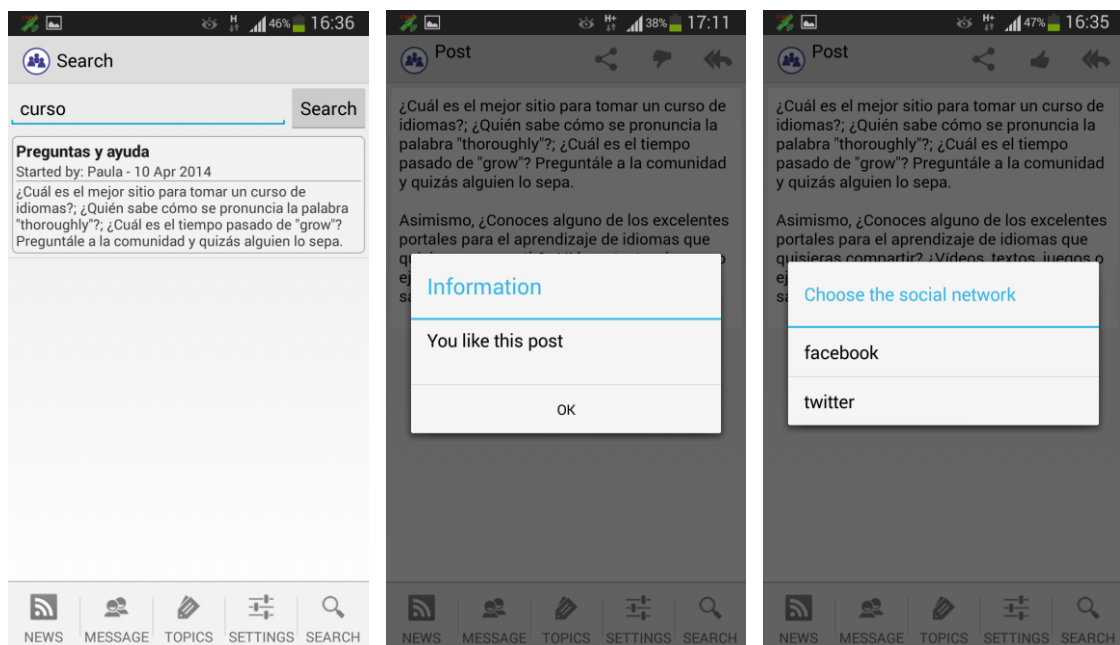


Figure 38: Searching for posts, liking a post, sharing a post on an external social network.

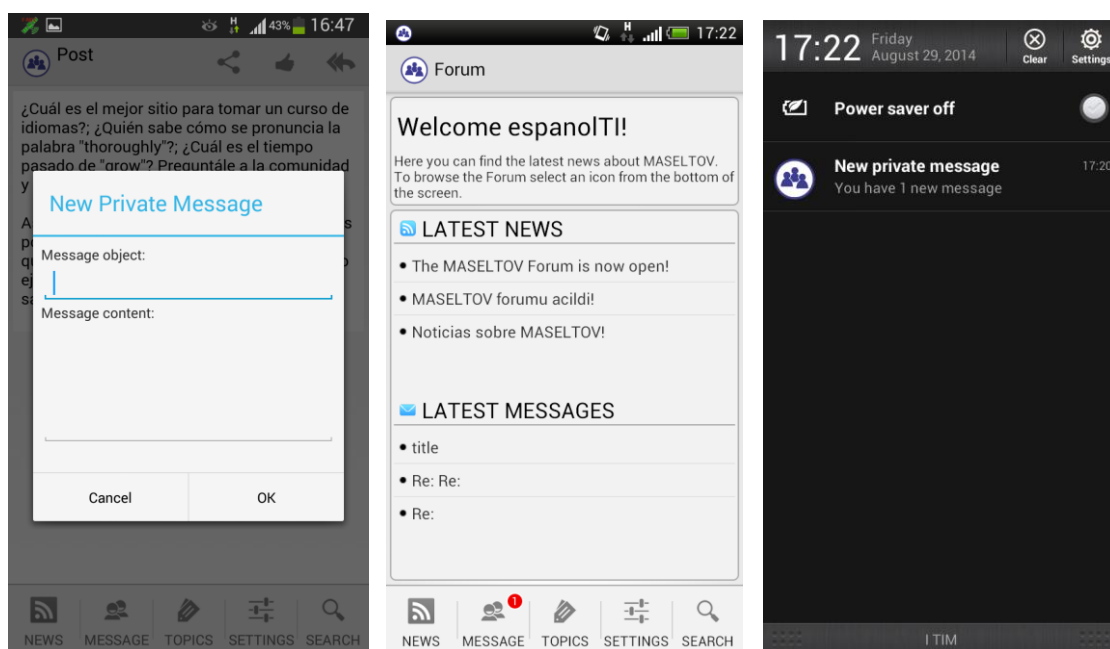


Figure 39: Sending a private message, being notified of the message in the Forum and via Android bar

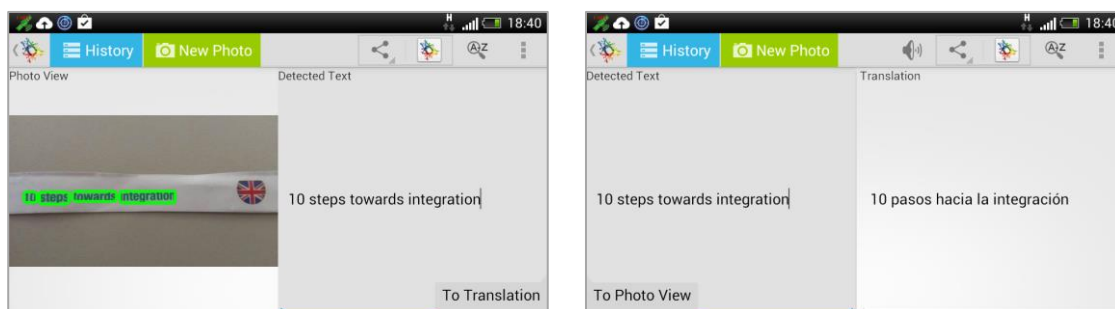


Figure 40: Detecting and translating a text by means of the Translation Tool module

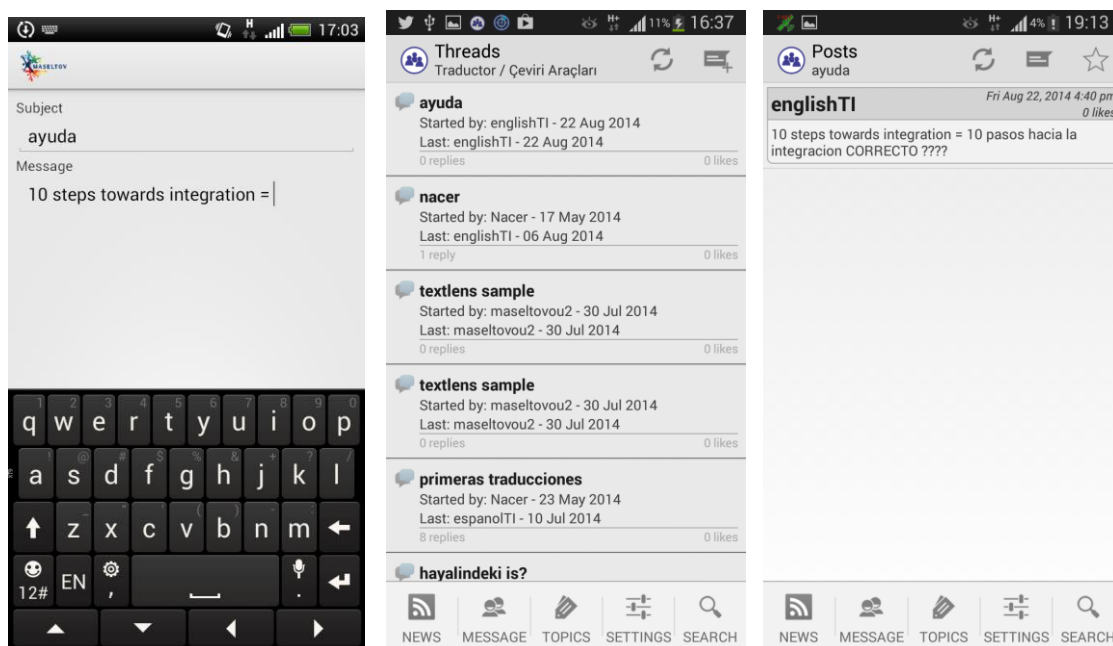


Figure 41: Sharing a translation from the Translation Tool module to the Forum: a new thread and its starting post are created

3.10 PROFILE (AIT)

This software component is responsible for handling user related data that are either static or dynamic. Static profile data are the user preferences that can be set and updated by the user. Dynamic profile data are the events that are generated by other MApp applications and are collected and maintained by the User Profile. They carry information about the user context, like current user location, and user activity. The User Profile comprises two subcomponents, a front end one that runs on the smartphone and a back end that runs on a back end server. The front end User Profile provides two kinds of interface: (a) a GUI that can be used by the user for setting their user preferences, and (b) an API for other MApp applications to send their events and also query the user preferences data. The back end User Profile component provides an API for communicating with the front end component. The User Profile provides also GUI visualizations of MApp applications usage data. Finally, the User Profile provides user authentication and registration functionalities, supporting also anonymous users.

Both identified and anonymous users can be registered with the User Profile. Figure 42 and Figure 43 are the screenshots for normal and anonymous user registration, whereas Figure 44 contains a screenshot for user login.

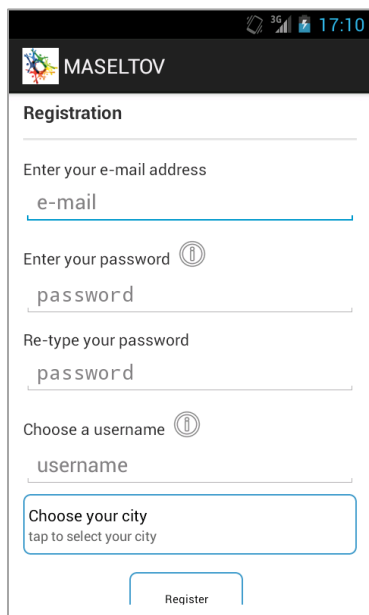


Figure 42: User registration.

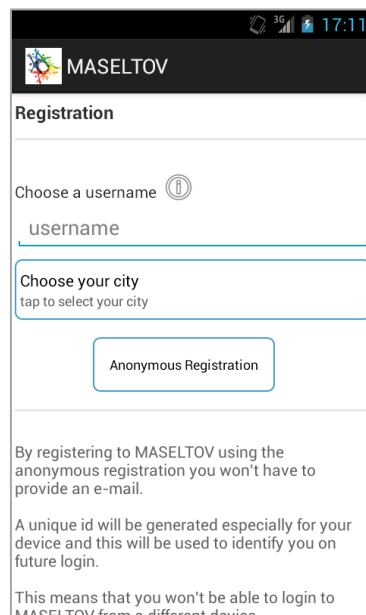


Figure 43: Anonymous User registration.

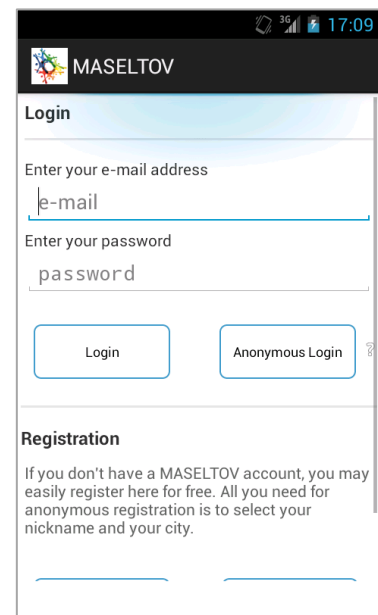


Figure 44: User login.

The user can set a number of user related data in their profile as shown in Figure 45. Moreover, Figure 46 shows the settings of a number of preferences and hobbies, whereas Figure 47 is a screenshot for selecting the language of preference. A number of languages are supported including right-to-left Arabic as shown in the figure. User data and preferences are used by the recommender to produce targeted recommendations.

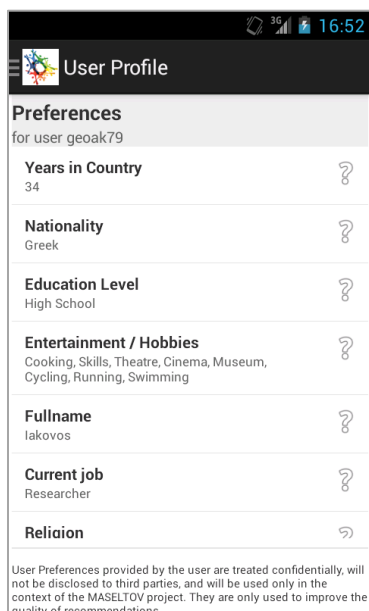


Figure 45: User Profile Preferences.

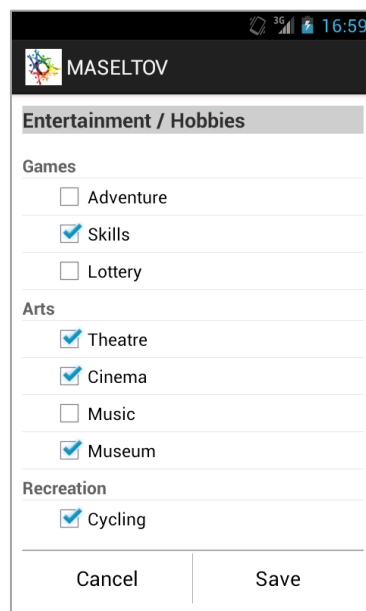


Figure 46: User Profile hobbies.

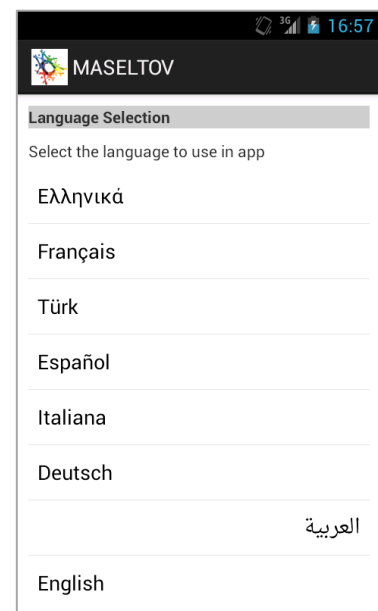


Figure 47: User Profile preferred language.

The User Profile has been designed to easily integrate with the Recommender component, which generates targeted and personalized recommendations. The recommendations that are produced are based on the user data as specified in the User Profile and the user context as

captured by a number of events that are emitted by various MApp applications. In an attempt towards privacy the User Profile gives the user the option to select the parts of the context data he/she allows to be collected. For example, the user may not want its current location to be monitored. Figure 48 shows the options the User Profile gives to the user for controlling what parts of their context can be collected for further processing.

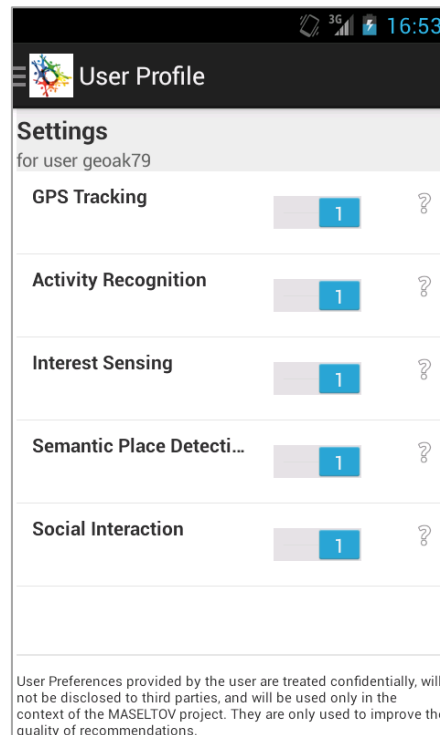


Figure 48: User Profile settings.

Finally the User Profile keeps track of the usage of various MApp applications and produces a visualization of the collected statistics. Figure 49 shows the statistics tab and Figure 50 the visualization of the relative usage of the various MApp applications.

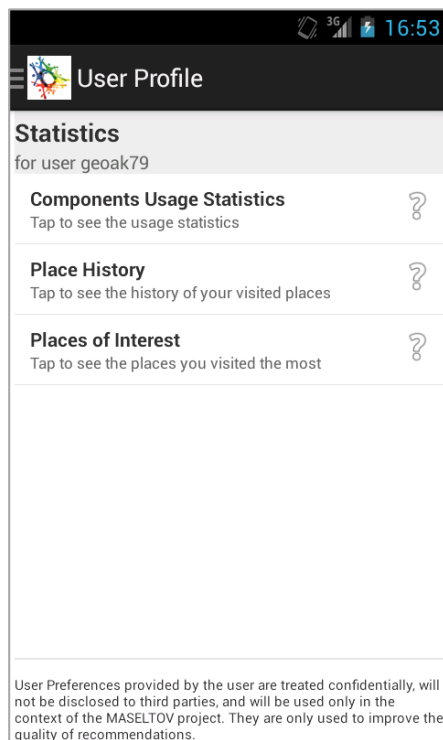


Figure 49: User Profile statistics tab.

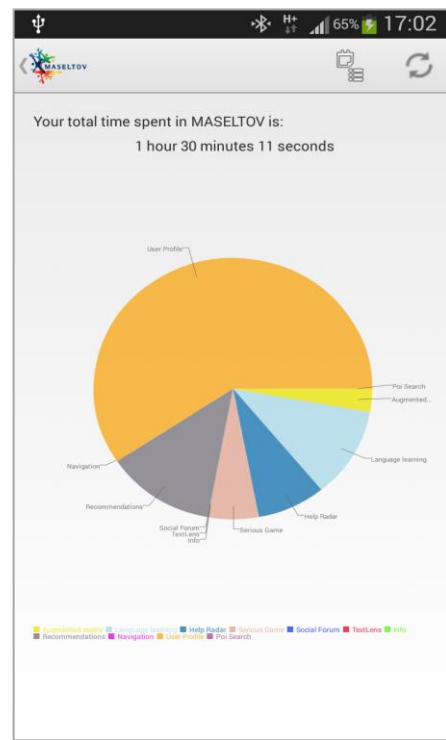


Figure 50: MApp statistics visualization.

3.11 PROGRESS (AIT & OU)

INTRODUCTION

The Description of Work describes the requirement for the MASELTOV application to provide feedback and progress indicators to users. The research background to this requirement has been previously described in Deliverable D7.2 („Feedback and Progress Indicators“). This document will describe the practical implementation within the MApp.

Progress reporting will be incorporated within a number of the individual tools and services, though a central Progress service has also been developed.

Research carried out during Task 7.2 and onwards has identified that „progress“ is a more complicated proposition than might first be imagined. While the language learning service incorporates the concept of ‚progress‘ in a traditional sense, of moving through a number of predefined activities and periodic assessment to enable both indicators of progression through content and recording of competencies, the majority of MApp services are ‚stateless‘: no state information or history is maintained for a user, repeated usage does not refer to previous usage, activities are not necessarily cumulative, and individual usage is straightforward and simple. The classic definition of ‚progress‘ as applied to learning services does not apply. For this reason, the „Progress“ service in the MASELTOV app encompasses both this classic model of ‚progress‘ but also ‚activity‘, recognising continued engagement as a soft indicator of progress in its own right. Furthermore, some services offer a proxy for progression, and these are also captured: virtual currency collected across services to recognised continued engagement and as a proxy for progress within the serious game, and a record of

recommendations triggered matched against those read as a proxy indicator for level of engagement with reflective processes enabled by the MApp. The Description of Work asks that, cognitive, affective, social, and motivational, progress indicators are considered (Task 7.2) and these are implemented within the Progress service. We now turn to describe the Progress service.

OVERVIEW

Five services will be presented in the “Progress” service.

- Service 1 (S1): Summary of user activities.
- Service 2 (S2): Language learning summary of progress, performance and self-reflection
- Service 3 (S3): Virtual currency earned
- Service 4 (S4): Summary of recommendations offered and read
- Service 5 (S5): Goal setting service (to be implemented on completion of goal setting service currently under development) – summary of goals undertaken and challenges underway.

These will be accessed by clicking on the “Progress” icon displayed on the main MApp dashboard screen.

SUMMARY VIEW

Summaries of user activity and progress are accessed by clicking on the “Progress” icon. This will take the user to a Progress summary screen, which will display a summary listing of all activity and progress indicators as one line titles (see Figure 51).

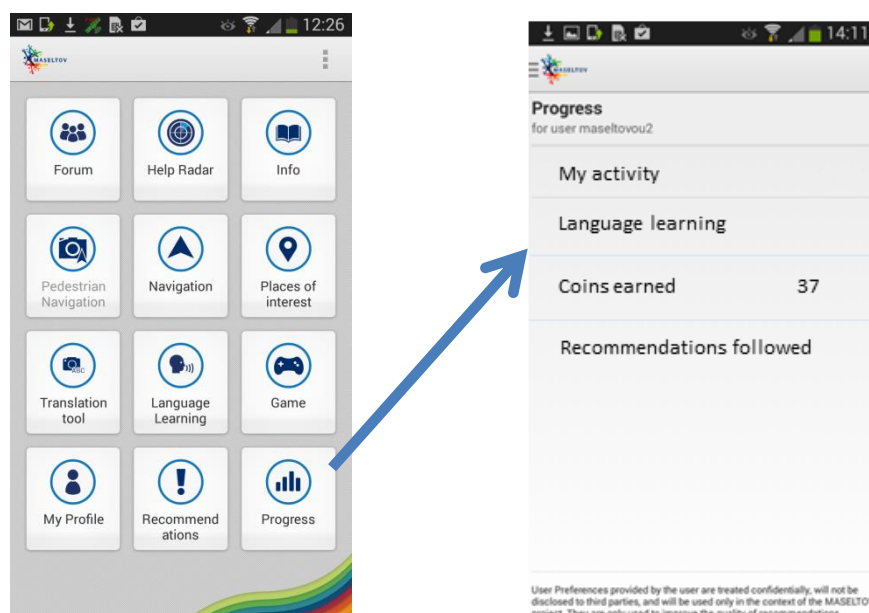


Figure 51: MApp Dashboard to the Summary Screen.

Services S1, S2, S3, and S4 titles will lead to additional detail screens, Service S5 will not be displayed for the Autumn 2014 field trials but code will be written to allow an additional title to appear on this page, and a summary view to be later inserted on completion of the goal setting service (expected Autumn 2014 for trialling Jan 2015).

SERVICE 1 (S1): SUMMARY OF USER ACTIVITIES

A summary of the time spent using different MApp services will be presented as a pie chart. Each segment of the chart will indicate the time spent using each service, defined as the overall time spent in each MApp component expressed in seconds. Clicking on each slice of the pie will pop up an information window providing the time spent on that specific service.

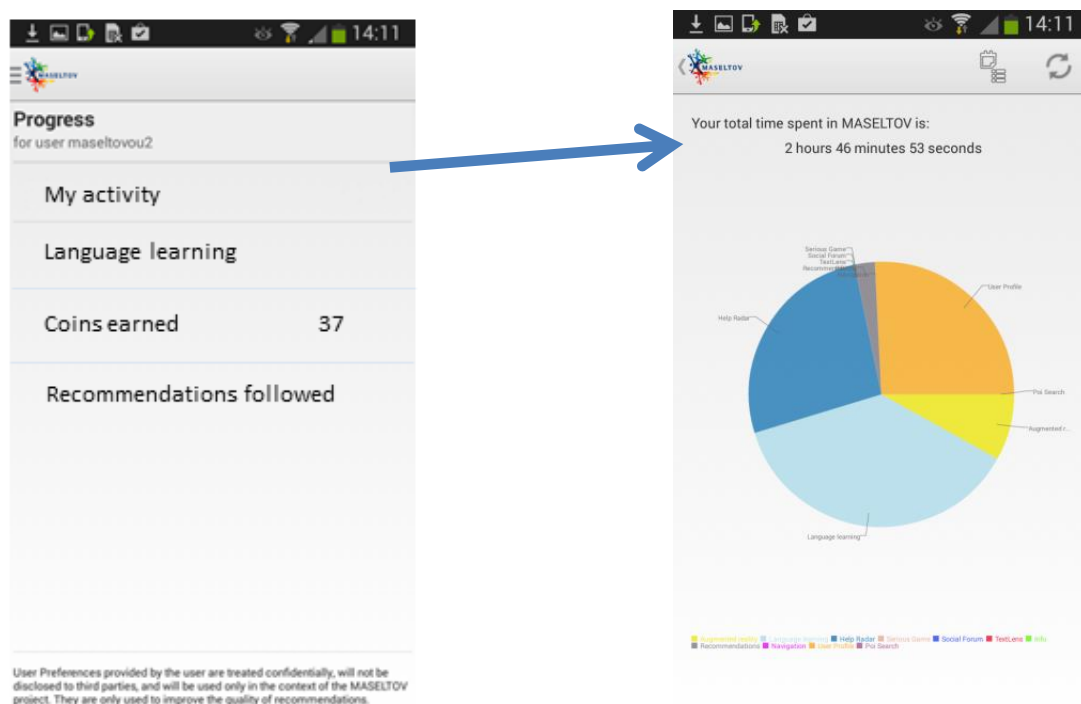


Figure 52: MApp Summary to “My activity”.

Additionally, users can select custom time periods and analyse time spent on different services during this custom time period.

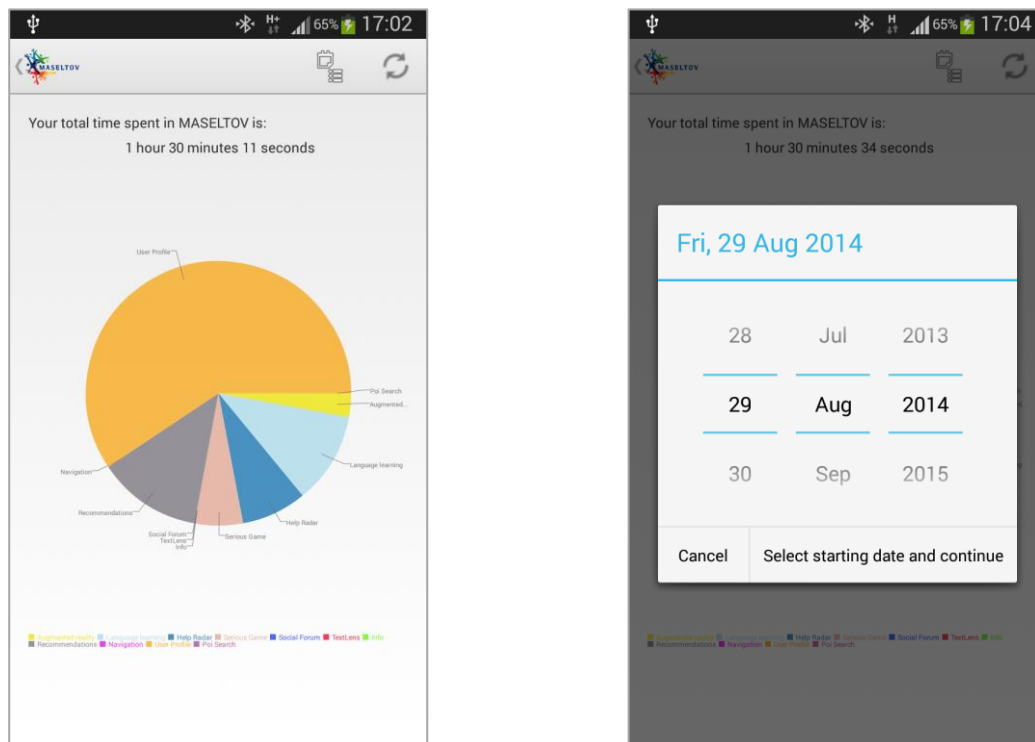


Figure 53: Customising the time period for analysis of service usage.

SERVICE 2 (S2): LANGUAGE LEARNING SUMMARY OF PERFORMANCE, PROGRESS AND SELF-REFLECTION

A summary of language learning activity will be presented in the Progress service, displaying summary statistics from the MApp language learning service activities that have been reported to the central user profile database.

Access to the summary is via the Progress summary screen, which displays a title “Language learning”. When clicking on this, the user will be taken to a language learning summary page that will display 15 values as bars (percentage completed shown as filled). For each of the six modules of language learning, two measures will be presented: Progress (% of activities completed across the whole module) and Performance (average score in tests across the whole module). These will be averaged from the scores in each lesson in the respective modules. In addition, three values of user self-rated performance will be presented: Enjoyment, Confidence, and Likely to Use. These last three will be derived from the final three questions presented to users at the end of each lesson (“I feel more confident”, “I enjoyed this lesson”, and “I will use the language more”), with values averaged across the whole of the Language learning service (comprising of all six modules), for lessons where a value has been entered by the user. If no value has been entered in a particular lesson, then no score will be added to the calculation (i.e. no entry does not mean adding a zero).

Table 2: Language learning measures to be presented in Progress

Module	Measure	How calculated
Basics	Progress	% of activities completed
Basics	Performance	% score
Travel and Transport	Progress	% of activities completed
Travel and Transport	Performance	% score
Healthcare	Progress	% of activities completed
Healthcare	Performance	% score
Education	Progress	% of activities completed
Education	Performance	% score
Employment	Progress	% of activities completed
Employment	Performance	% score
Administration	Progress	% of activities completed
Administration	Performance	% score
(Overall summary)	Enjoyment	% score
(Overall summary)	Confidence	% score
(Overall summary)	Likely to use in real life	% score

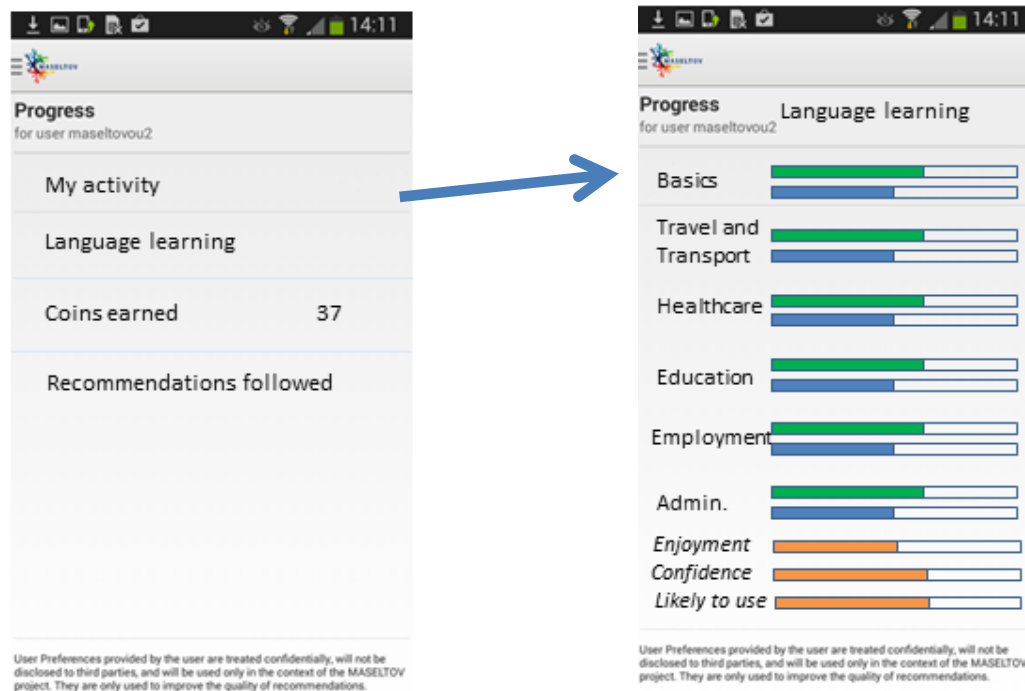


Figure 54: View of the Language Learning summary of progress, performance, and self-reflection.

Visualisations will emulate the colour coding used by the Pearson language learning modules, for consistency.

Table 3: Type, purpose, and representations of different language learning indicators

Indicator type	Represents	Representation
Progress	Activities completed	Green bar
Performance	Achievement	Blue bar
Affective	Emotional self-reflection	Orange bar

This display should follow the same approach as Service 1 (summary of activities) and provide explanatory text when the bars are tapped (black pop up window).

SERVICE 3 (S3): VIRTUAL CURRENCY EARNED

Usage of the majority of MApp services results in the earning of ‘coins’, a virtual currency that can then be exchanged within the Game. Coins provide evidence of continued engagement with the MApp services and can be considered a form of motivational feedback to users. Table 4 indicates how each service awards coins.

Any of the MApp components can earn coins by sending a request to the User Profile Content Provider (presented in detail in D5.2). The same interface provides a URI to request the current coin balance and also to redeem coins.

Table 4: Awarding of coins in MASELTOV services

MASELTOV service (responsible partner)	How currency is awarded
Situated navigation assistance service - AR Navigation (JR)	send 1 coin per minute usage
Translation Tool (CTU)	send 1 coin per minute usage
Language Learning (PP)	1 coin for completing an activity 1 coin for posting an ok score on a test 2 coins for posting a good score on a test 3 coins for posting an excellent score on a test 2 bonus coins for completing a lesson
Maseltov forum (TI)	Sending 5 coins whenever user sends a post / reply
Help Radar (TI)	Sending 50 coins whenever user rates an assistance
Route Search (FLU)	1 coin when the user searches for a new route
POI Search (FLU)	1 coin if a POI is used as a route start or end point

The Progress summary screen displays the title “Coins earned” which displays the current balance of account for the user. Coins can be acquired, and also spent in the serious game.

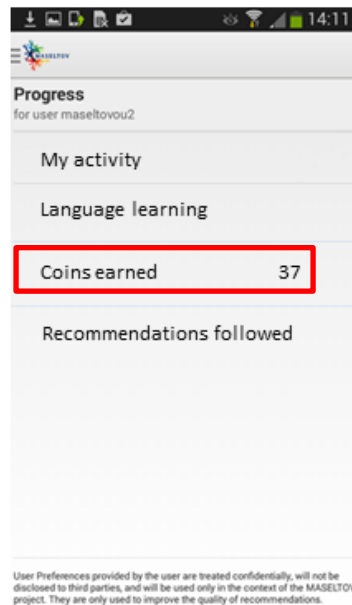


Figure 55: Coin summary and total displayed

Clicking on this title leads to a new screen that displays (a) the total number of coins earned, (b) the number of coins redeemed, (c) the current total, and (d) a list of the Mapp applications and the number of coins earned by each one of them.

SERVICE 4 (S4): SUMMARY OF RECOMMENDATIONS OFFERED AND READ

The MApp Recommendation service creates recommendations for users based on their activities and preferences. We consider the number of recommendations read as an indicator of engagement with the MApp service and therefore of continued engagement with learning.

The Progress summary screen displays the title “Recommendations followed” which leads to a visualisation of how many recommendations have been manually indicated as read by the user, compared to the total number of recommendations raised.

A graphic visualisation of a bar will be offered (% read as filled in colour). Further developments may include the ability to allow the user to view the summary over customised time periods.

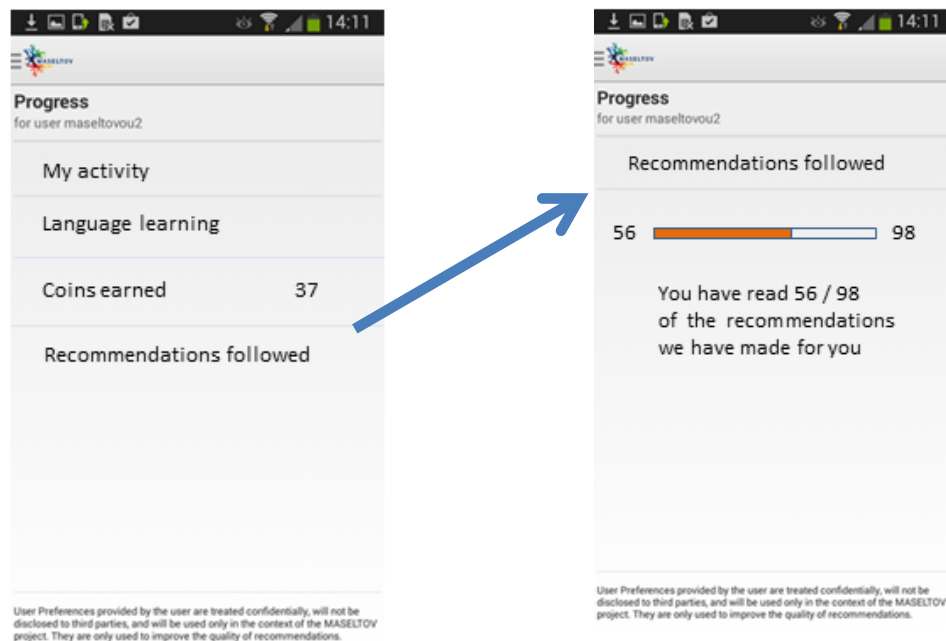


Figure 56: Recommendations summary

SERVICE 5 (S5): GOAL SETTING SERVICE SUMMARY

A goal setting service is planned yet is still under development, intended for completion for local field trials at the Open University in January 2015. Goal setting is seen as a key aspect of planning for learning, and progress in achieving or engaging with planned goals should be represented to encourage continued activities.

The progress service will therefore support its future implementation and visualisation. Background code will be written to allow fifth category to be displayed in the Progress summary screen, titled “My Learning Goals”, which will lead to the goal setting service summary screen. This will display which goals have been undertaken (self-described by users), their deadline for completion, and their state of progress. A second category, “My Challenges” will indicate progress towards completion of MASELTOV-set goals that require users to engage with a number of different MASELTOV services over time.

3.12 RECOMMENDATIONS (AIT)

Recommendations are produced by the back end recommender component and are sent to the Android notification service to be presented to the user. The recommender used is a deterministic one and makes use of the rule based engine DROOLS¹. It makes use of a number of rules that are expressed in terms of the user context (that is carried out by events that are generated by MApp applications) and the user preferences that are stored in the User Profile. The flowing list contains a sample of the recommendations that have been implemented for the current prototype.

¹ <http://www.drools.org/>

- Recommend visiting a POI based on the current location and the user preferences.
- "Well done for your improvement in English reading (you are now in level 2)! You can now read <http://www.newsnw.co.uk/h/Current+Affairs/Immigration>"
- "Looking for dentist? Have a look at <http://www.nhs.uk/Service-Search/Dentist/LocationSearch/3>"
- "You recently read a sign about measles. How about taking a course in Health"
- "You recently read a sign about measles. You may read further details at www.who.int/topics/measles/en"
- "You visited XYZ Hospital. Would you like to take lesson about Health Care?"

As shown in the examples above, recommendations are active entities, in the sense that they may contain links to resources of interest. Recommendations are classified to read, unread and starred, as shown in Figure 57 to Figure 60.

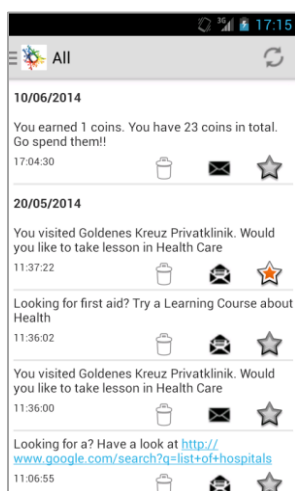


Figure 57: All recommendations.

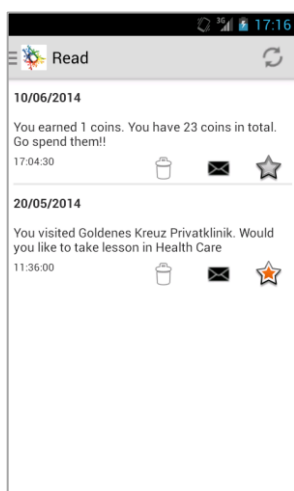


Figure 58: Read recommendations.

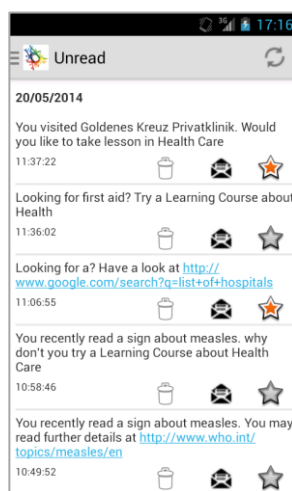


Figure 59: Unread recommendations.

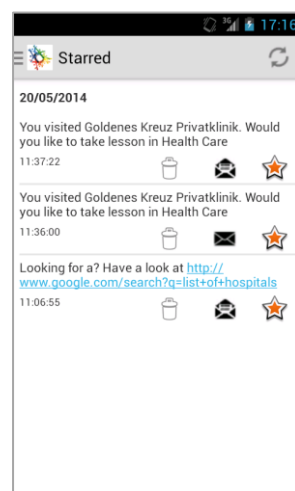


Figure 60: Starred recommendations.

4. A DAY IN THE LIFE OF MARIA

The following section demonstrates the usage of the MASELTOV application by taking the example of Maria, a fictional immigrant from Colombia who has recently moved to London. The scenario shows a typical day in the life of an immigrant and illustrates the benefits Maria gains from using the application. It will be used to demonstrate the functionality and seamless integration of all tools and services within MApp at the final review meeting.

4.1 SCENARIO

Maria has recently moved to London from Colombia, she has been living here for 3 months. She is 24, and was educated to secondary school level and has experience working as shop assistant in Cali, Colombia. She comes from one of the villages surrounding Cali.

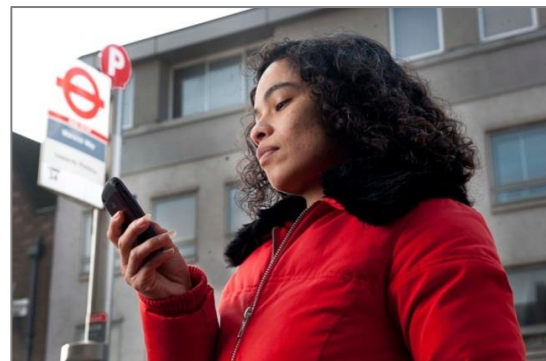


She moved to London with her two children to join her husband. She wants to work in London in order to support her family. However after her arrival in the UK, she can only apply for jobs which do not require elaborated English skills. With only a few contacts in London – her husband and some others from her own community – she only finds out about jobs through word of mouth, mostly in catering or cleaning. She is now working as an office cleaner and the family all lives together in one room in a shared house with two other families from Latin America occupying the other two rooms. She got the job through a friend already working as a cleaner so did not gain any experience of applying for jobs in the UK, yet. A friend at church tells her one day about the MASELTOV app and she starts discovering a number of useful tools and services that may help her in her daily life.

Maria wakes up at 6am by the alarm on her smartphone: like many young people she owns a smartphone and uses it for many purposes (e.g. gaming, social networking), not just for calling or texting friends. She gets the bus to start her job as a cleaner; there is no other transport at this time. On the way to work, she plays the MASELTOV serious game, which is teaching her some vocabulary and cultural aspects.



(a)



(b)

Figure 61: (a) Maria starts the day with a bus ride. (b) In the unknown environment, Maria uses the MApp for navigation.

Currently Maria needs support at the doctor's in the UK: she needs to take her son to have a vaccination in the afternoon and so it seems like a suitable challenge to take on in the game.

After her cleaning job, she takes her children to school, and has a little bit of spare time. She logs into the MASELTOV Social Network forum as she posted a message there yesterday to ask about how to improve your job prospects. Somebody had recommended taking an IT course, so Maria sends a private message to ask if the poster can recommend any colleges

near the area she lives. The poster sends a private message back indicating one they think is good.

Maria uses the MASELTOV navigation tool to direct her to the college, and finds it is not too far, so she decides to go there, as she has been given directions for which bus to catch and how to walk there.

On arrival, she finds the college library is closed. Using the Translation Tool, she takes a photograph of the notice on the door to understand what is said: the notice tells her that another building nearby is open for course registration. Maria records the words in the Translation Tool, to enable the Recommender tool to suggest language learning exercises around these words later. She then goes to the office where she can register, and joins the class.

Maria has just enough time to stop in at the shops on the way to picking up her children, and checks to see if there are any shops that sell Latin American groceries on the way. The Recommender system suggests a local market, and suggests she gets in direct communication with a volunteer in the market. At the market, the volunteer helps her finding the ingredients she needs for her recipe.



Figure 62: (a) Maria uses MApp to navigate to the college (b) MApp Translation Tool (c) Maria together with a helping volunteer in the market recommended by MApp

Maria then picks up her children from school, and goes to the doctor's in order to getting her son Santana vaccinated.



Figure 63: (a) Maria picks up her children from school (b) Maria goes to the doctor with her son to get him vaccinated

While she is waiting, she uses the MASELTOV Language Learning tool to learn how to request a future appointment, as she is worried about her son's weight and small size. This information helps her arrange another appointment with the receptionist. When she arrives at the metro station, she finds out there is a problem with the service and she decides to walk home. However, she takes a new route and gets lost, so she uses the MASELTOV Help Radar to find a volunteer who can help her find her way back. The service proposes two people nearby who can help, and Maria chooses to ask a female volunteer, Kate, who has a high trust rating in her profile as a volunteer. Kate helps her finding the correct route home.

Back home, Maria makes dinner and puts her children to bed. Having a few minutes to relax, she decides to practice some of her language skills by checking the MASELTOV Recommendation tool for outstanding recommendations. She decides to practice a vocabulary lesson around health care, and also tries a quiz on "markets and shopping". She then logs in to the forum and posts a message to the person who recommended the IT course at the college, and writes her thanks to the poster.

Besides illustrating the benefits of the MASELTOV assistance application, the usage scenario "A Day in the Life of Maria" was designed to demonstrate the functionality and seamless integration of all tools and services within the application. The scenario will be used to prepare a live presentation of MApp at the final review meeting.

5. SUMMARY AND OUTLOOK

This deliverable D6.1.2 "Mobile Assistant Service" depicts the final state of the mobile MASELTOV application for the usage in the final field trials incorporating the findings and results which occurred in the development phase of all technical partners. This deliverable represents an update of D6.1.1, integrating lessons learned during the implementation phase and including all technical adoptions and additions made to solve technical issues, which had not been yet identified in D6.1.1.

Clear definitions of components of the MASELTOV application, their requirements and responsibilities as well as their appearance in the graphical user interface were a prerequisite for a decentralized development process, which was necessary in the scope of an international project like MASELTOV. Despite the concept of decentralized development it was 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 was the establishment of a 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.

This deliverable also outlined a usage scenario of MApp to demonstrate the functionality and proper integration of each software component. This scenario was designed to point out the possible benefits for the target audience and will also be used for demonstrating the application at the final review meeting.

6. REFERENCES

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