

MobLang—Learning Foreign Languages via Mobile: Technical Requirements

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Abstract

Language barriers between individuals of different ethnic groups living in the same country, or Europeans visiting other countries, hinder natural interaction. Communication in a foreign language can hold back the establishment of friendships and closer relationships, thus preventing fruitful intercultural exchange and dialogue. Basic language knowledge of one's conversational partner is usually appreciated and creates a comforting atmosphere. However, today's Europeans are too busy to attend a language class.

Exploiting technology and especially the recently emerging developments in mobile learning offer a viable alternative. Mobile phones are optimal learning tools that enable people to learn anytime, anywhere, and at their own pace, even during leisure time.

MobLang (www.moblang.eu) is an innovative foreign language teaching and learning tool aiming at designing, developing, and publishing language learning courses delivered via the mobile phone. MobLang applies Mobile Assisted Language Learning (MALL) to support the following less frequently used and taught languages: Basque in the Basque country, Turkish and Greek in the separate parts of Cyprus, Albanian and Turkish in Greece, and Irish in Northern Ireland. Potential target groups are part of MobLang's development phase so as to ensure that the final mobile language course will be of interest, value, and usefulness to the end users.

Different target groups have been identified in the participating countries. In order to investigate their mobile features and capabilities a questionnaire was used to collect data.

Results show that 79% of potential MobLang users own a capable Java phone of Nokia, Samsung or Sony Ericsson. Over 50% have a mobile with a screen dimension of 240x320 with a high range of screen sizes among the end users. With respect to cost for a mobile language course, results demonstrate a range of costs in the participating countries from €0.14 to €2.260, bearing in mind that the majority of 35% of end user is willing to pay a monthly fee up to €2.00.

These results affect the technical development of MobLang with an investigation into solutions as the next step bearing in mind to keep user costs low.

1. Introduction

The aim of the MobLang project is to use mobile phones to help people learn Basque in the Basque country, Gaelic in Northern Ireland, Albanian and Turkish in Greece, and Greek and Turkish in the separate parts of Cyprus. For a solution to be successful there are five key areas of requirements that should be analyzed to make sure that the solution meets these requirements: (a) end user requirements, (b) pedagogical requirements, (c) content, (d) technical requirements, (e) promotion. Discussion on end user and pedagogical requirements has been covered elsewhere [1], [2]. This paper focuses on the technical requirements and in particular of end users' phones features and

capabilities to provide access to text, audio and images to as many users as possible and how these affect the technical development of the MobLang project.

2. Mobile language learning

Looking at pros of mobile learning in general, a mobile phone allows the user to virtually access material anywhere at any time, indicating a high degree of mobility as well as freedom of time and place [3]. Traxler emphasizes that mobile learning "allows ... students to exploit small amounts of time and space for learning..." [4], meaning "regular practice in short bursts" [5]. Besides learners' flexibility mobile technology moreover offers flexibility with respect to course type depending on learner-teacher interaction. Mellow distinguishes three different modes of operations: (1) push mode, (2) pull mode, and (3) interactive mode [6]. The push mode is a one-way where SMS messages go from teacher to learner. In the pull mode, learners can ask for information based on a list of contents; the information/answer will be delivered from the teacher. In the interactive mode, the teacher's messages are pushed and pulled. With respect to potentials of SMS messages in specific, they help learners build their command of vocabulary as words can be presented through definitions and examples [3].

Looking at cons of mobile learning, Researches criticize small screens and inconvenient keypads as restrictive factors to effective mobile learning [7], [8]. Moreover, Lee found out that due to high mobile costs users rather spend the costs on private use than learning purposes [8]. In their study with Japanese students Stockwell and Stockwell, however, found that 66% are willing to pay less than €10 monthly for mobile language learning [3].

In their study, Kennedy & Levy used the push mode of operation to send SMS messages to support vocabulary learning at beginner's level of Italian [5]. Students expressed a desire to not only reply to the SMS but also receive feedback on their replies. Although the authors claim that the students valued the SMS language course, results show that a push mode is rather restrictive, not allowing learners to actively participate in their own learning process.

A more sophisticated approach was taken by Stockwell who used a web based intelligent learning system accessible via PC and mobile in order to teach English vocabulary to intermediary level students [9]. The results show a preference for the web based course with not even half of the participants having used the mobile version. Although the results of Stockwell's study [9] cannot be generalized due to small sample size, they not only emphasize that learners' engagement is important and can be increased by understanding users' needs as well as showing compelling reasons for usage but also show the potential of mobile language learning.

3. Participants

386 potential end users of MobLang participated in the questionnaire [10] from four countries/regions: Basque country, Cyprus, Greece, and Northern Ireland. All owned a mobile phone; however only 163 participants provided detailed information regarding their phone type. The majority of the participants belonged to the 19-30 age group (40%), indicating that young adults are mostly the ones who showed interest in MobLang. However, the age groups 31-40 and 40+ also have a significant number of people which cannot be ignored (31% and 23% respectively).

4. Results

4.1 Type of mobile phones

Firstly, existing mobile phones were categorized according to their capabilities as outlined in Table 1.

Category	Description
Basic Phone [11]	Can only make and receive calls and SMS messages.
Non-Java feature phone	Simple phone that can run software, but not 3 rd party software and not Java based.
Basic Java phone	Most basic Java phone can have 3 rd party Java software installed, but is resource constrained (screen size, memory, database access) and doesn't support audio playback in Java.
Capable Java phone	3 rd party Java software can run with good resources (screen size, memory, and db) and can support audio playback in Java.
Touch screen Java phone	The same as capable Java phone, but with a touch screen, likely to have a larger screen and high chance of wifi internet access.
Non-Java smart phone / Superphone	Advanced phone that doesn't support standard J2ME Java software. Good examples would be iPhone and Android phones.

Table 1 Categories of mobile phone and their capabilities

An analysis of previous studies [5], [9] revealed that using SMS to deliver vocabulary had a very limited effectiveness and trying to teach vocabulary without audio support was against pedagogical best practices [12]-[14]. This meant that first three types of mobile phone could not be targeted if MobLang was to do more than send SMS and would require audio support on the phone.

To validate this decision we need to make sure that the majority of our potential end users would not be affected by this decision. Technical data from phones was analyzed with respect to distribution of the categories of phones of potential users and is summarized in Table 2. The great majority with 79% of potential users has either a capable or touch screen Java phone.

Device Category	Percentage of device
Basic Phone	N/A - (no way to assess)
Non-Java Feature Phone	2%
Basic Java Phone	3%
Capable Java Phone	63%
Touch Screen Java Phone	16%
Non-Java Smart Phone	7%
Unknown	9%

Table 2 Distribution of mobile phones by category of potential users

4.2 Mobile phone manufacturers

Theoretically J2ME Java on mobile phones should allow the same software to run in the same way on many different mobile phones that support Java. The reality is that each different phone can have different quirks and bugs in how Java is supported.

The results show that the top three manufacturers are the same across each of the target groups as indicated in Table 3. Nokia, Samsung and Sony Ericsson are the top three manufacturers in each of the regions that MobLang will focus on, therefore testing should be done using the phones from these manufacturers.

Target	Top Manufacturer	No. 2	No. 3	% others
Basque	Nokia (55.6%)	Sony Ericsson (16.7%)	Samsung (11.1%)	16.6%
Irish	Samsung (42.9%)	Nokia (26.2%)	Sony Ericsson (11.9%)	19%
Albanian	Nokia (38.2%)	Sony Ericsson (32.4%)	Samsung (20.6%)	8.8%
Turkish	Nokia (45.1%)	Sony Ericsson (20.4%)	Samsung (17.6%)	16.9%
Greek	Nokia (42.7%)	Samsung (31.9%)	Sony Ericsson (11.0%)	14.4%
Averages	Nokia (44%)	Samsung (23%)	Sony Ericsson (18%)	15%

Table 3 Breakdown of manufacturers by target language

4.3 Screen sizes of mobile phones

Bearing the constraint and con of small screen size in mind, an analysis of the Java phones was performed that also allows analyzing the screen sizes of the various phones, which is detailed in Table 4. Although the majority of phones have screen sizes of 240x320 the spread of screen distributions is quite wide ranging from 128x128 up to 360x640. This complicates the building of resources for these phones because the screens differ not only in size but also in their shape. The choice here is that graphical resources should either be scaled to optimal formats for each device, or vector graphics could be used so that the images scale automatically on a device. Currently the support for Scalable Vector Graphics is low on mobile phones (44% of our target users), so scaling images looks likely to be our solution. Scaling can happen automatically, but some of the automatically scaled images may need to be manually altered to work better on smaller screens.

Screen size (pixels)	Percentage of devices
128x128	5%
128x160	14%
176x208	1%
176x220	7%
240x320	51%
240x400	3%
320x240	9%
352x416	1%
360x640	8%
800x352	1%

Table 4 Breakdown by of Java mobile phones by screen sizes

4.4 Connectivity and local data card access

The categories of mobile phones that we have chosen to target all have the ability to make a data connection to the internet. Having this capability does not mean that it is configured, or indeed that the user will be happy to pay connection charges. Analysis of different tariffs in each region that MobLang will operate is shown in Table 5.

Tariff Type	Basque (Movistar)	Cyprus (CYTA)	Cyprus (TurkCell) ¹	Greece (? ²)	UK (Orange)
Per Mb	N/A	€1.18	YTL 2.7 (€1.35)	€0.10	N/A
Per Day	€1.18 (max 10Mb)	N/A	N/A	N/A	£0.60 (€0.71)
Per Month	€6	€9	N/A	€5	£4 (€4.80)

Table 5 Analysis of indicative data tariffs in each country

¹An exchange rate was taken from xe.com on 20/07/2010 €1 = YTL 1.9765

²No name was clear for this Greek carrier in notes

Taking these figures and making some content size estimates allows seeing what cost a download solution for each region would be; this is shown in Table 6. This showed a range of costs from €0.14 to €2.260 to install the application using an internet connection. A way to remove these potential

charges is to install the software and all resources on memory card for the end user to install this memory card in their phone and avoid any download charges. Results show that 44.4% could support a memory card based solution.

Content Type	Basque (Movistar)	Cyprus (CYTA)	Cyprus (TurkCell)	Greece	UK (Orange)
Install (100Kb)	€0.0118	€0.1180	YTL 0.27 (€0.135)	€0.0100	--
Text (50Kb)	€0.0059	€0.0590	YTL 1.35 (€0.678)	€0.0050	--
Images (200)	€0.0354	€0.3540	YTL 0.81 (€0.407)	€0.0300	--
Audio (10 min)	€0.0453	€0.4530	YTL 1.04 (€0.521)	€0.0384	--
Audio (20 min)	€0.0906	€0.9060	YTL 2.07 (€1.040)	€0.0768	--
Total (20 min)	€0.14 (€1.18 ¹)	€1.40	YTL 4.50 (€2.260)	€0.16	€0.71 ²

Table 6 Estimated costs of a mobile language course with 50Kb text, 200 images and 20 minutes of audio

¹This is the minimum rate that must be paid up to 10Mb

² This is the maximum that would it would cost if all downloaded on a single day – Orange no longer offer a per Mb tariff

4.5 Willingness to pay for mobile language learning

End users were asked if and how much they are willing to pay for a mobile language learning course as outlined in Figure 1. The results show that 64% of the respondents are not willing to pay any monthly fee for taking up a mobile language course. However, from the more than 35% potential users who are willing to pay the majority thinks that €2.00 monthly is acceptable.

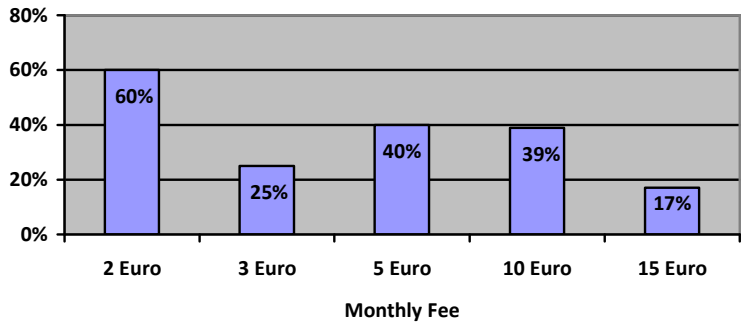


Figure 1: Willingness to pay monthly fee for mobile language course

5. Conclusion

The analysis of technical requirements of MobLang demonstrates that the solution, i.e. development of the MobLang software, is not only determined by research findings but also and even more by the end users' mobile phone features and capabilities. We have not yet chosen a solution but it is clear already that we cannot target the latest phones (iPhones etc) and operate with SMS only, while a chosen solution should work on at least Nokia, Samsung and Sony Ericson phones to reach the majority of potential users. Moreover, there is a conflict between the need to keep the development and running

costs low for end users with more than 60% not willing to pay an additional fee and to provide a solution with coverage of as many phones as possible. A mobile web based solution should work on a majority of phones, but users will have to pay data charges to access it. A Java based solution that is downloaded to the phone will also cost end users a data charge to install, but not to run—but requires more support. A solution installed from SD card on the phone has no installation charges and no running costs to the end user, but is much more expensive to support and install from the project point of view.

To facilitate the decision process, a more detailed country specific cost analysis as well as an investigation of already existing mobile language software could be useful.

Creating solutions for mobile phones requires compromises and in the case of MobLang we cannot compromise on the ability to have audio support, but we will have to compromise on the number of phones we can support, the cost to the end user and the ability to have images and text as we decide on a solution to our problems.

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