Mobile Services – Students as Need-Finders

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Abstract

This paper presents a way of identifying new and useful mobile services by letting students act as need-finders and developers of services based on their own needs and ideas. It describes the background and outcomes of a course in mobile services given at Blekinge Institute of Technology (BTH) in spring 2002.

1. Introduction

Mobile Services are a great challenge. There is a common understanding and agreement about their crucial importance for Information and Communication Technology (ICT) operators and industry, individuals and society. From the viewpoint of providers and operators, services are the main source of income. This money is needed for upgrading existing or investing in new technologies, mostly network infrastructure, as required by the services. On the other hand, new networks give raise to new possibilities for new services. However, new services have to be accepted by users, i.e. fulfill his or her needs in a way that he or she is ready to pay for it. If this does not happen, there is no money that makes the "wheel" (see Figure 1) spinning. Thus, the user has to be the focal point of all efforts regarding services and infrastructure.

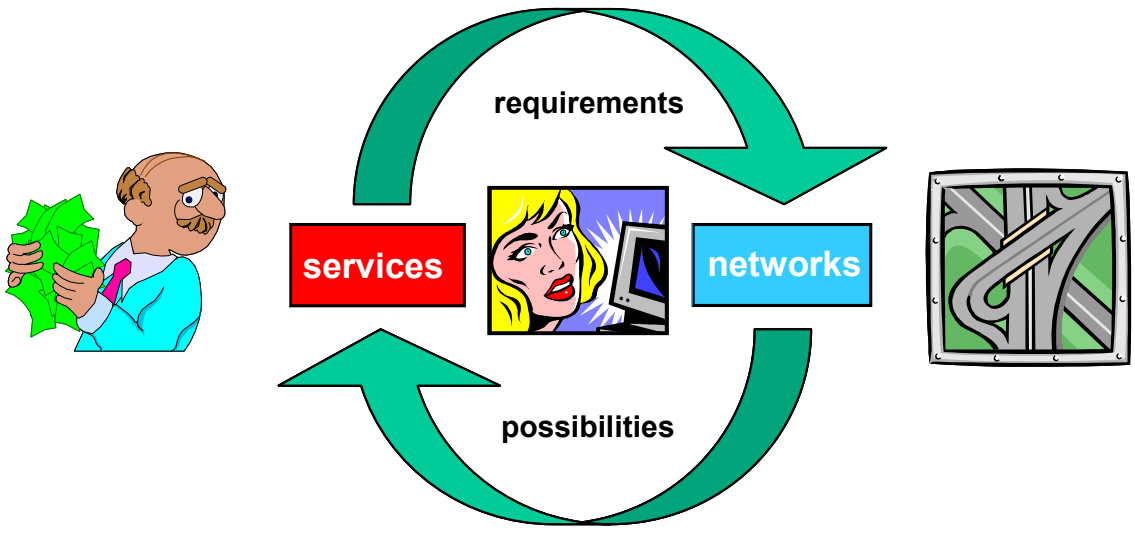

Figure 1: Relationship between services and networks.

Currently, there is a great deal of uncertainty about how to identify new services that people may find interesting, use and pay for and that make use out of the new possibilities offered by mobile networks beyond the 2nd generation (so-called 2.5G and 3G). While 2.5G technology with its General Packet Radio Service (GPRS) already offers a glance at Internet-like services (e-mail, WAP), 3G technology (Universal Mobile Telecommunications System, UMTS) is assumed to feature "real" Internet and other advanced applications by reducing the performance gap in terms of network performance and terminal capabilities between fixed and mobile networks. On the other hand, a debate over killer applications has been going on for quite some time. However, the important question seems to be rather on how to identify interesting and useful services that may "populate" 2.5G and 3G networks so that a satisfactory network load is achieved. Section 2 of this paper will elaborate on the key role of 2.5G services in this context.

This paper describes a possible way of overcoming this problem by choosing a bottom-up approach rather than high-level top-down market studies: Use creative and curious potential users, namely students, as need-finders and give them the possibility of realizing their ideas themselves. In spring 2002, a course on mobile services on master's level was given at Blekinge Institute of Technology with support of the local telecom industry. In this course, students were forced to come up with own ideas on services to be designed (and partly also implemented). Section 3 contains information on background, goals, course contents and external contributions. Moreover, results of the need-finding and the service development processes as well as spin-off effects of this course that is certainly one of the first of its kind in Sweden are discussed. Section 4 concludes the paper.

2. The key role of 2.5G services

As pointed out before, there is a common understanding that there is a lack of services for mobile networks beyond GSM (telephony and SMS). In case of 3G, this has definitely to do with the strange situation that there are currently no terminals available even though the network is already "on air", which efficiently blocks the "wheel". On the other hand, even 2.5G (GPRS) services face a comparably slow start. Early WAP services via GSM channels suffered from low speed, which drives up transmission costs to unacceptable levels. This annoying fact, combined with a stone-age user interface, made the service quite unpopular. WAP has not really had a large-scale comeback since it has been running on GPRS.

Interestingly enough, the simple user interface together with quite high prices has not stopped simple SMS from becoming a tremendous success story, even though the whole process took several years. One may conclude that given a service is well adapted to device capabilities and meets the attention and needs of people (in case of SMS, it's just about communication), it has the potential of becoming a hit. One of the best examples for this is imode in Japan, whose mostly entertainment-related services are used by the majority of the population. One important aspect is user-friendliness of the device configuration. Imode phones just need to be switched on, while GPRS phones often require advanced configuration through complicated menus or operator download until the first packet can be successfully transmitted. Despite these initial hinders, services for 2.5G networks deserve special attention, as both networks and terminals are readily available and technology is mature enough to be used in large scale.

Once 3G terminals are going to enter the market, 2.5G services can be developed further and equipped with features supported by those terminals. Initially, users will simply experience faster transmission, e.g. when downloading e-mails. More advanced services such as on-line games, high-quality video chat or animated information services demanding graphics and real-time capabilities may appear. Once that 3G technology is going to find its way into Personal Digital Assistants (PDAs) and laptops, traditional Internet services such as web browsing, file download and videoconferencing can be supported even outside of hotspots with wireless LAN connectivity.

Summarizing, to get into move and to be prepared for new challenges at the advent of 3G, service development should start *immediately* with 2.5G services including SMS. This policy that focuses rather on content than on technology was an important milestone for the course described in the sequel.

3. Course on Mobile Services

3.1 Background

The course ETD013 Mobile Services (5 credits) was given by the Dept. of Telecommunications and Signal Processing (ITS) [1] at BTH within the masters' program in Electrical Engineering with focus on Telecommunications and Internet systems. It is considered to be one of the first courses of its kind in Sweden. Its students have a solid background in tele-, data and mobile communications and are equipped with sufficient programming skills; many of them already have some experience with web programming. Most students attending this course merely have their final thesis (20 credits) left, i.e. they are ready for using their knowledge in industry right away.

3.2 Goals

The students shall learn how to design mobile services. The implementation of these services is of secondary importance; at least, the coding effort should be as little as possible, leaving enough time for working with concepts and ideas. The course covers the whole chain need-finding → design → coding → testing → marketing. The students are forced to come up with interesting project ideas by themselves, i.e. they shall start with the need-finding process.

3.3 Course Contents

The course consists of lectures on enabling technologies (web programming, positioning, security, digital identities, e-payments etc.) and the service platform, but also on service-related economy and jurisprudence. Knowledge on web programming techniques and on the service platform was deepened through laborations. The project work aiming at designing a mobile service was carried out by groups of two to four students; the final goal was either a business plan for or an implementation of the service.

3.4 External Contributions

There were numerous important contributions from outside BTH that helped to make the course successful and that are greatly acknowledged. Ericsson AB helped with course idea, lectures and project supervision. In order to make it possible to focus on the design instead of coding, Vodafone financed a platform for mobile services (Mobilis™) developed by a local company, Wireless Independent Provider (WIP) [2] that also provided training and support. Compaq (a computer manufacturer) provided servers and PDAs. Finally, the TelecomCity

project [3] and the municipality of Karlskrona helped with course marketing and project ideas.

3.5 Results of the Need-Finding Process

The need-finding process worked surprisingly well. A considerable share of the services was based on own interests and needs, or on experienced problems (information service for students; pizza service; electronic queue system; mobile instant messenger; mobile position parking and payment system; mail notification service; bus information). Other services are variants of mobile services that are already known (general information services; friend-finder; mobile advertisement). Some of the services address the business segment (taxi order; parking system; on-line calendars and address books). Also, some industry- and administration-related services were implemented (alarm system; requisition system handling orders, buying, delivery and payments).

The students proved to be highly interested and motivated, feeling of getting an extraordinary chance of doing something special during their studies and of making important contacts to outside the university. The results were presented through reports, posters, oral presentations and demonstrations. People from politics, companies, operators and related projects participated in this whole-day event. A competition took place during the whole course, making the students even more eager to do a good job. From the viewpoint of the jury, the information service for students was the most successful one. This service was driven by the need for a better communication facility between teacher and students than e-mail in case of short-term changes in the schedule etc., as students do not have the possibility to check their e-mail continuously. Sending out messages by SMS reduces this problem, as most students are equipped with mobile phones that show the message immediately once it has been received.

The winning service has some important and successful characteristics in common with most of the other services: It is not flashy, but useful! Thanks to the motto “Interaction and content superior to technology”, the students focused very much on making their service easy-to-use in a well-defined scenario instead of overloading it with unnecessary features. Configuration and basic administration mostly happens through web interfaces (both stationary and mobile), while the mobile interface is as simple as possible, which is well-adapted to the capabilities of today’s terminals. This native approach gave the students the chance to concentrate on the most important issues, to understand and manage the whole development chain (see Section 3.1.), to finish successfully in time and to attract attention for their (from the technological viewpoint) rather simple, but useful services (see Section 3.7). They gained a lot of knowledge and experience for future work, but also self-confidence: They were able to “test their wings”. By the way, some of the products got a really professional finish that makes it hard to believe that they were developed by students during a standard course (5 credits).

3.6 Service Development Process

As there was a considerable support by and interaction with IT companies, the students got a taste of service development in industry. Most of them have been prepared to professional software development by a special course during their Bachelors’ education.

Anyway, there seem to be some differences compared to service developments carried out in industry:

- The contact with the "customer" was established quite early during the need-finding process. The students had to motivate their project plan towards their supervisors both at BTH and at Ericsson, and many of them had the possibility of continuously discussing ideas with interested people. In contrast to this, industry often has to have semi-complete solutions at hand before they even may begin a conversation with a possible customer.
- Despite of deadlines, a service development at university is usually not exposed to the same amount of pressure as "sharp" projects in industry that are governed by many, mostly money-related conditions. Students are still working on their education, i.e. for their own account. They are allowed to be free and creative (and sometimes even to fail) without the risk of destroying any important business. Moreover, they are not that much used up from daily and often boring business.

Thanks to the availability of the Mobilis™ platform, the implementation phase was rather short. However, writing business plans (as some groups did) turned out to be a difficult job. Here, mixed groups of students with different backgrounds (technicians, programmers, economists etc.) would be an interesting alternative.

3.7 Spin-off Effects

This course, which is a good example for successful cooperation between university, the public sector and local industry, got considerable attention in local and national newspapers, radio channels and technical magazines. Contact was made with the mCity project, which is a pilot project on mobile services in Stockholm [4]. There is an upcoming collaboration with the Dept. of Work Sciences and Media Technology (IAM) at BTH aiming at integrating this kind of knowledge on the non-technical side of the course. The telecom group at ITS got new and tremendous possibilities for applied research projects in collaboration with providers and operators.

Some of the students got employed on other projects concerned with the development of mobile services through the summer. One of these projects was about a virtual tourist guide on PDA that positioned the tourist in Brunnsparken in Ronneby and provided location-based information on buildings, plants and works of art. This project was presented in the local newspapers as well as in the local TV news "Sydnytt". Some students are still working on their ideas (e.g. final theses) and are trying to market them. Contacts obtained during and after the course due to publicity and public interest have proven to be very useful in this context.

Last but not least, the course has got a very good reputation among the new master students, so that there is already a considerable interest for spring 2003.

4. Conclusions

Our experience has shown that students who are creative and hungry for the new are a very successful group of need-finders with a sound interdisciplinary view. Especially when having to deal with a bunch of (mostly technical) limitations, they have shown great potential to design and implement simple, useful, interaction- and content-oriented services based on 2.5G technology that can be improved as new terminals appear and 3G technology finds its way to the end users.

Fortunately, there is still some potential for improvements left. There are plans on having interdisciplinary project groups with technicians, programmers, work scientists, economists etc. to give each participating student the possibility of focusing on her or his areas of excellence. This happens while working on a common project with common goals together with students with different backgrounds, which is a very good simulation of what they are going to meet during work in industry. Another important point is to test the services in real environments, i.e. to carry out field studies. Finally, a larger group of "customers" and users (administration, health care, industry etc.) could be involved already in the need-finding phase by providing some general directions and wishes for mobile solutions.

References:

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