LIBRARY IN YOUR POCKET

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Introduction

Recently, in November 2001 a very timely article "The Deserted Library" appeared in the Chronicle of Higher Education /1/ and it was followed by a lively discussion also on the IATUL mailing list. What are academic library services to become in the 21st century as an increasing number of students bypass the library building but simultaneously take advantage of the online library services and resources? A desktop on campus is often still a privilege of the staff only whereas the students are more on the move – looking for empty seats in the crowded computer classrooms. It was to this target group that the new library services are being developed at the Helsinki University of Technology Library. However, instead of a coffee shop to attract in-person visits to the library the new services take advantage of the wireless communication technology.

Mobile phones are extremely popular especially among the younger generation in Finland. Typically for teenagers the mobile phone represents a highly personal piece of property where a calendar, a list of contacts, a watch, a calculator as well as "memorabilia" (saved important - often romantic - text messages) are integrated into one handy device.

Short Message Service (SMS) is the top-rated service on the GSM mobile phone networks. Every GSM phone supports sending and receiving text messages - originally developed for the maintenance communication purposes for the operators. Their huge success among the ordinary users was not foreseen. In the year 2000 close to one billion SMS's were delivered in Finland alone. Furthermore, their number is estimated to grow (see Figure 1) even though new technologies are emerging and market estimates forecast that SMS will merge into a larger messaging package. Sending an SMS is also rather inexpensive compared to the cost of a mobile phone call. In Finland one message costs approximately 15 US cents. It may also be worth mentioning that it is always the one sending the message who pays for it /2/.

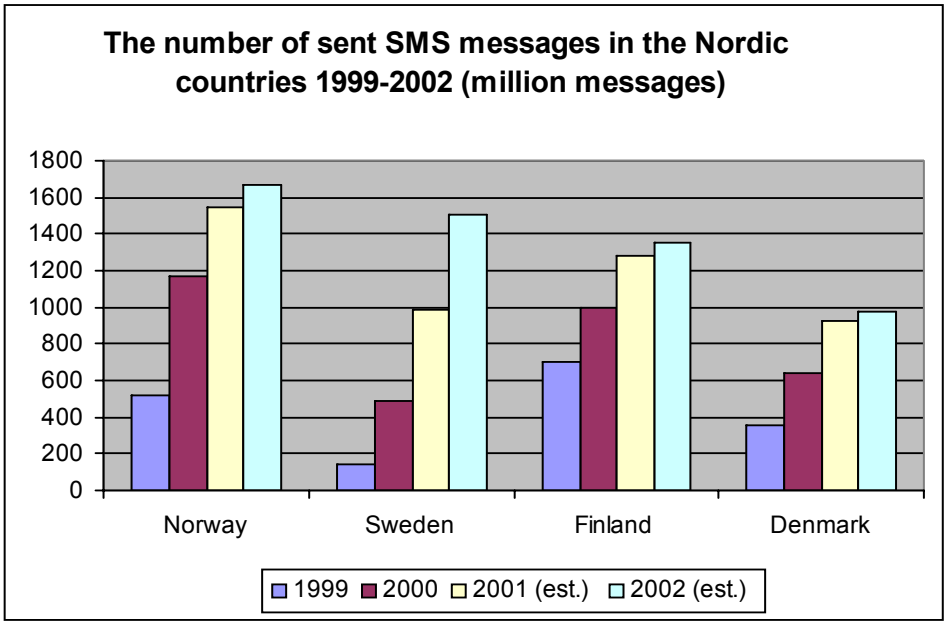

Figure 1. The number of sent SMS messages in Norway, Sweden, Finland and Denmark in 1999-2002. /2/

SMS special features include their limited length: a SMS message may be up to 160 characters. Also, a SMS message is always transmitted through a SMS Center (SMSC) and a notification of delivery (or if not delivered) to the sender is automatic. Messages can be sent simultaneously with other traffic in the signalling paths which means peak hours do not pose an obstacle for smooth communication.

A few years ago the expectations were high towards the mobile Internet and in Europe this focused to the development of WAP, the Wireless Application Protocol. The European markets have not, however, lived up to the hype and it has been only in Japan where the wireless Internet has exceeded expectations with the i-Mode system. From the technological point of view the WAP applications have several drawbacks compared with its Japanese counterpart. These include a slower contact to Internet, the use of WML (wireless markup language) which generates a learning curve for content providers as well as the fact that the devices, WAP mobile phones come with black and white displays. However, the market of mobile phones continues to grow. In this respect it is important to adjust the mobile service development to the wireless environment instead of trying to replicate wired Internet services and initial applications should support high reach and less rich applications /3/.

Helsinki University of Technology (HUT) is the leading institute of technology in Finland and it offers 14 degree programmes in engineering, technology and architecture. These programme all lead to a Master´s degree. Currently the enrolment is comprised of some 12 000 undergraduate and some 2500 postgraduate students. From the library´s point of view these students represent a very highly IT skilled clientele with a keen interest in technology. As a kick-off for the new millennium in spring 2000 the HUT library surveyed the attitudes and expectations of the current clientele towards the library services. The questionnaire revealed among other things that more than 95% of the student clientele carries a mobile phone (see Figure 2) and that this clientele would like to receive library information via their mobile phones /4/. This notion then laid the foundation for a project to convert basic library services into a pocket version.

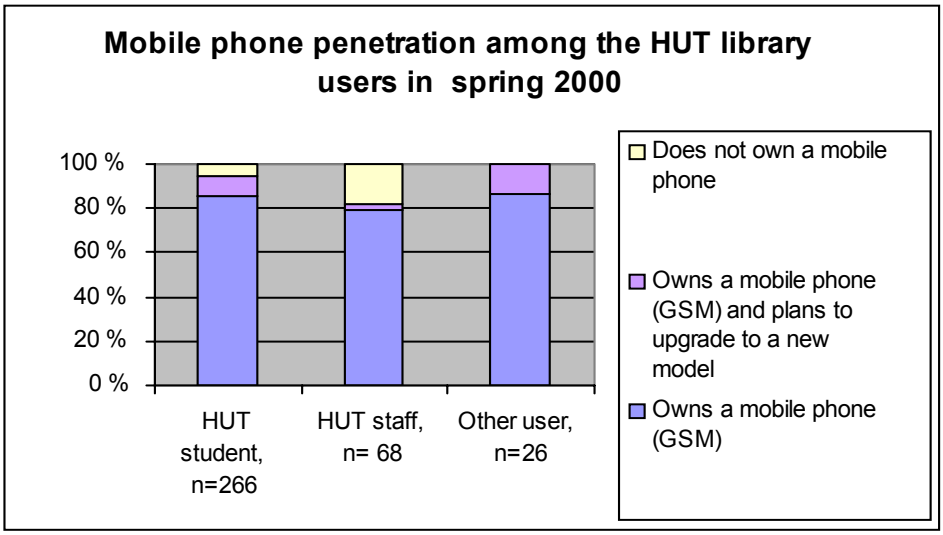

Figure 2. The mobile phone penetration among the HUT Library users in spring 2000. /4/

Before the project could be materialized another technological leap in the library required completion. The Linnea2 project that involved all Finnish university libraries had jointly purchased the third generation library system, Voyager in the year 2000. This project itself was a tremendous achievement from the consortium and quite unique in the world as all the conversions and installations of more than 20 libraries took place almost simultaneously. The web-based user interface of the 3rd generation library system was indeed the technical prerequisite for the mobile phone pilot project, as is explained in the following chapter.

Library in Your Pocket

The project started in September 2001. The first mobile services were launched in mid-November, in less than three months from the beginning of the development work! The rapid progress highlights the key concept: provision of new services with existing technology for widely accepted appliances, “high reach and less rich applications” (the forte of SMS!). This concept also supports the library’s strategy to offer up-to-date library services in timely manner.

The technical solution for the service is provided by Portalify (www.portalify.com), a Finnish software company specialized in mobile software solutions and products. Their solution for libraries, Liblet, is in essence software that translates SMS messages into Web-based queries and vice versa. This is illustrated in Figure 3. Furthermore, Liblet is “library-system-independent” and therefore no changes in the actual library system itself are needed. At this point HUT Library made also the decision to outsource the necessary application service (i.e. communication links and server maintenance) to Portalify.

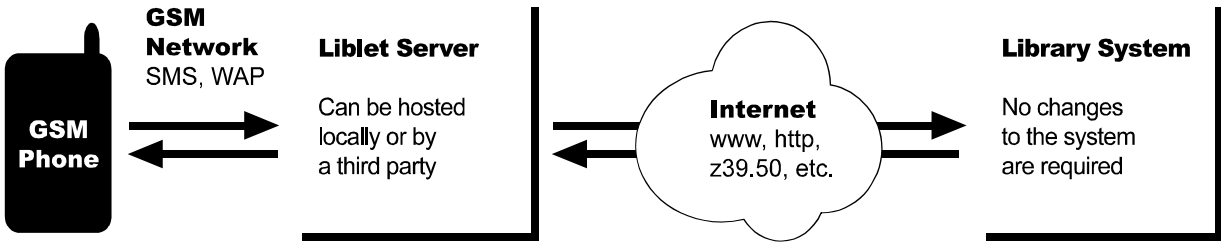

Figure 3. An outline of the Liblet architecture.

The supply chain of mobile services includes several actors; there are the content owners, the content providers, the service providers, the service operators, the network operators and finally the end-users. In the HUT Library project the library is both the content owner (the OPAC records) as well as the content provider (Web OPAC), Portalify acts as service provider and operator whereas the end-user may choose the network operator.

At the moment the HUT Library application of mobile services includes the following services:
1. Reminder notices for materials that will be due within a few days.
2. Renewal of borrowed materials. Can also be sent as an answer to the reminder notice.
3. Notice slips for reservations.
4. List of one´s own loans.
5. Availability of individual items.
6. General query to the librarian.
7. Paying of fees. A text message generates a transaction where the agreed value is added to the phone bill of the subscriber.
8. Alert service (TOC from Science Online to which the campus has a site licence).

The service requires registration. A message containing the library ticket number and surname is sent to the ASP service short code assigned for the Liblet service. The system verifies the information from the library system, confirms the registration and stores the user information together with the mobile phone number. Afterwards the identification is based on the mobile phone number and no separate id-information needs to be sent when using the service. A new registration from another number erases the previous registration (this is because people often change subscriptions from one mobile phone operator to another). Currently the system supports subscriptions from the three major operators in the country (total market share >98%) and negotiations with smaller operators are pending.

Liblet lets the user to query and renew his/her own loans in the Voyager library system. Reminder notices and reservation notice slips are generated by Liblet from Voyager during the night and sent to users the morning thereafter. A typical reminder message is illustrated in Figure 4 and simply replying to this message does the renewal. The alert service - a weekly table of contents from Science Online - represents Liblet´s possibilities to convert almost any named Web-page content into a SMS message. When an agent tracks down changes on the Web-pages it signals Liblet which in turn alerts the readers via a SMS wherever they are.

During the project phase each party pays for his/her own messages. This means that the library pays for the messages that are sent to the users. They in return pay for their own messages. There is no registration fee, only the use of the service costs.

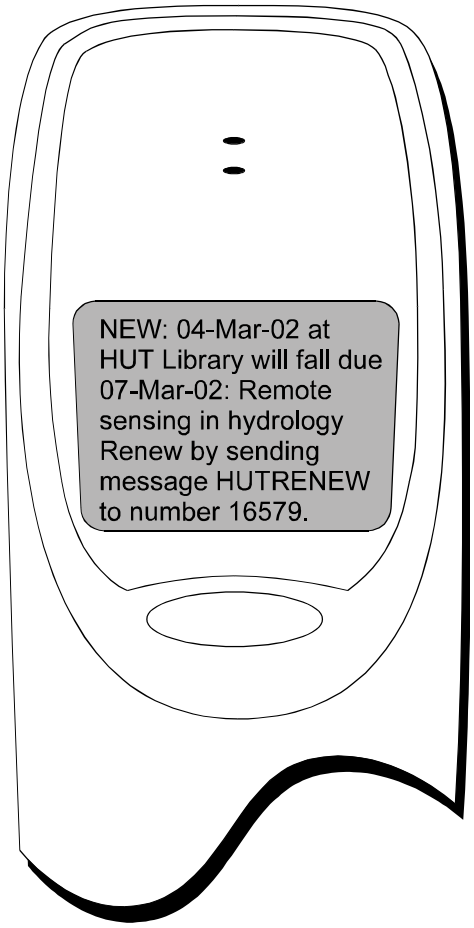

Figure 4. A text message reminding the user of an approaching due date. A reply message to sender with the text "HUTRENEW" will renew the item. After renewal the system sends a confirmation back to the user with the new due date information.

User feedback

The number of user registrations has increased in a very steadily manner during the 5 months of operation, approximately 20-40 new registrations are received every week. At the time of writing (the end of April) the library had close to 600 registered mobile users. The most used single service is the reminder notice of an approaching due date. This service is activated automatically when registered whereas all the other services require a separate activating (service ordering) message. Most of the users have not changed their default settings and hence the use of other services has remained limited. The numbers of sent messages and other activities are presented in Table 1.

The overall comments of the new service have been positive*: "The mobile services are the first useful service of the library that I have seen. I hope it can be used also in the future."* There

have, however, been some technical problems and unforeseen disruptions of the service. The fact that the supply chain of mobile services includes many new partners from the library´s point of view has made troubleshooting somewhat difficult. As in all other library services, it is the library the users hold responsible for any malfunctions, be they network errors or other technical matters.

Type of Liblet Short Message Service	**Activity Nov.15 2001-Apr.21 2002**
1. Due date reminder message	2219 messages sent by library
2. Renewal of borrowed materials	503 renew messages sent by users
3. Notice slips for reservations (available since Jan. 2002)	185 messages sent by library
4. List of one´s own loans	72 query messages sent by users
5. Availability of individual items	14 query messages sent by users
6. General query to the librarian	10 query messages sent by users
7. Paying of fees	18 messages involving money transactions sent by users
8. Order alert service TOC from Science Online	10 alert subscriptions by users

Table 1.
The SMS activity of HUT mobile library service recorded by the Liblet server.

The library itself benefits from the service in terms of required manpower. Due to the high automation level of the service only the paying of fees involves manual work. Once the fee is transmitted via a text message the Liblet system alerts the library where the fines are then manually removed from the Voyager system. However, this manual involvement can be regarded a worthwhile control mechanism to monitor money transactions.

The Voyager library system itself would also allow automated e-mail alerts to remind users of an approaching due date. The text message based reminder notice has, however, its benefits because the users may renew their loans immediately after receiving the notice regardless of their location. Roughly one fourth of the reminder messages sent by the library result to a renew message by the user.

Outsourcing a service such as this is advantageous. In a very rapidly changing environment of wireless communication the software development and server maintenance is risky business. The library hardly has the required technical knowledge or interest in investing in it. Furthermore, should the service become obsolete it would be a rather straightforward decision to cancel the service. This does not, however, diminish the library´s responsibilities concerning the service quality.

Future of the service

The current pilot project has funding until the end of this year. The total costs of the service include the monthly Liblet software licence and the costs generated by sent text messages. A sustainable funding model for the future may be one of the following or their combination:

- an annual fee for registered users,
- messages sent by the user are priced to cover the costs of the library
- present situation where both the users as well as the library pay each their own costs.

The annual fee - even if made payable through the service itself – has its disadvantage in terms of the target user group. Students do not necessarily want to commit themselves to something they regard as expensive. In addition to this, the total costs of the service will be difficult to predict as they are mainly based on the number of sent messages. On the other hand, user generated messages (such as the renew message) could be priced higher to cover also the costs of the library. It is in fact quite common in the SMS business to have different prices for different type of messages. There those actually using a specific service will also pay for it. The library may also want to continue to sponsor the service and e.g. not to roll the monthly software licence costs to the users.

The continuation of the service after the pilot phase will be under scrutiny next fall. At the moment the experiences are quite favorable. Since the HUT Library pilot start-up also other Finnish libraries have licenced Liblet and offer mobile services. These libraries include the Helsinki School of Economics, the Library of Parliament as well as Oulu Public Library.

Technically speaking Liblet is not very advanced and certainly there are other similar services available. However, Portalify´s other product for libraries, Coinlet, gives additional value to their ability to help libraries today to serve the remote users. Coinlet allows pay-per-view type of access to Web-based networked resources. There a fixed payment is made via sending a text message prior entering the desired Web-site. The site is then made available for a certain period of time or downloads.

Conclusion

The new technologies incorporate the wireless and cable-based information resources. The HUT Library experience with the mobile library services has been an encouraging start to offer library services through yet another medium.

Library services have always evolved to meet the then current needs of the patrons. Undoubtedly the blend of library services is going to grow in the future when the needs of different user groups seem to diverge. The research staff has different needs and requirements for a good library than the students, and the external users may have even additional needs. Also, depending on the circumstances at a certain moment certain users may want services delivered in a different manner, via different carrier etc. Timely library services may also have a different content in different geographical locations. A true win-win situation between the users and the library requires today not only close co-operation and understanding between the parties involved but also abilities to experiment open-mindedly with new service models.

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List of abbreviations:
ASP. Application Service Provider offers individuals or enterprises access over the Internet to applications and related services that would otherwise have to be located in their own personal or enterprise computers.
GPRS. General Packet Radio Service. Enables high-speed wireless Internet and data communications.
GSM. Global System for Mobile Communication. A standard for digital mobile communications.
i-Mode. A brand name of the data micro-browser service (of NTT DoCoMo, Japan), that is an operator, Internet service provider as well as a portal. I-Mode incorporates c-HTML, a subset of HTML, Hypertext Markup Language.
SMS. Short Message Service
SMSC. Short Message Service Center.
WAP. Wireless Application Protocol is a specification for wireless data communications using hand-held devices such as mobile phones and palmtop computers. Based on WML, Wireless Markup Language. Use of the WAP specification allows mobile devices to communicate with the Internet or an Intranet, providing the users of these devices with mobile data communications capabilities such as web browsing and e-mail.