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**A New Mobile Approach:
Peer-to-peer Loaning using Smartphones**

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Meeting: **182 — *What does the e-library mean for the public library users?*
— Public Libraries**

Abstract:

New open platforms for mobile application development enable libraries themselves to be the driving force when creating new smartphone based services. Helsinki City Library has developed an application that allows library patrons to easily manage their loans and also borrow library books directly from friends and acquaintances. We have combined simple features that facilitate basic library use with features that encourage patrons to try completely new kinds of social loaning practices. The development process was a flexible combination of outsourced user interface development, in-house infrastructure enhancements, and user testing.

1 Introduction

Since 2011, the Helsinki City Library has been developing a new kind of a service for smartphone owners. The result is a native smartphone application for the iPhone and Android platforms. For other platforms, including desktop computers, there will be a purely web-based access to a subset of the application functionality.

The application could be described as a library user's personal loan assistant, helping them to remember their current loans, renew them, and find new material to read. In this context, the most exciting new feature previously unthought of is the ability to borrow library material outside the library building: this allows a loan to be transferred from one library patron to another.

In this article, we will try to recreate the thought processes we went through developing the application, to provide motivation for the choices made. We describe how the original ideas materialised into a concrete working product in a library-driven development process that combined external technical consultancy and user involvement with in-house development work.

The development project was made possible with the 2 year funding of the Finnish Ministry of Education and Culture.

2 Project description, motivation and background

Our desire to cater for smartphone users will require some explanation. The fact is that smartphones have already gained widespread adoption and will continue to do so. A full-fledged mobile operating system is becoming a commodity instead of a luxury feature.

John Gruber explains[1] what the disruption caused by the iPhone five years ago was all about: it was not only a disruption of the mobile phone market, but of the personal computer market. In fact, the contemporary smartphone essentially *is* a computer, replacing many use cases of the traditional bulky PC's, especially for quick information retrieval, note keeping, and personal communication.

2.1 Characteristics of a post-PC device

Some of the first library endeavors in the new mobile space have left us needing for something more. We felt the need to examine new possibilities to create an *essentially* mobile service from the start.

The smartphone is a computer with some special properties:

1   It's radically more *personal* than a personal computer ever was. It's almost always tied to a single user and carries with it all the user's information in one compact access point. Access to this information is convenient and typically doesn't require constant verification of credentials.

2   It moves along with the user and gives access to a wide range of information and services almost *anywhere*.

3   It has sensors to interact with the real physical world, and to layer information experiences on top of it. For example, there is a quick access to the user's location and the camera can be used for real world interactions.

4   It has a small screen, and interaction with the device is intuitive but restricted. This entails quick interactions, with an emphasis on information *consuming* use cases and quick messaging, instead of complicated information searches and content producing.

2.1.1 Post-PC devices and digital content

A side-effect of hand-held computers is the rise of digital content. However, we have explicitly ruled digital content out of the equation for this project. The solution to a library e-book ecosystem is a difficult issue that is outside our project scope. Further, perhaps surprisingly it turns out that physical material circulation can allow a new kind of flexibility that can encourage social reading in a effortless way. The sovereignty libraries have over their physical collections will continue to be a genuine advantage, and it is very likely that digital and physical materials continue to exist side-by-side far into the future.

2.2 The focus of our new service: the smartphone as a library card

How should the features of a smartphone be reflected in a library mobile application? From the start, our project focused on the *personal* nature of the new pocket computers. Our guiding metaphor was *the library card*. As mundane as it may sound, we think we were able to generalize and expand on the idea of a library card, and take the relationship of the patron and the library to a new level.

Starting with a passive piece of identification and transforming it into a computer program that *does things*, we also begin to see a more active role for the patrons themselves. With a library card you can go to the library and identify yourself to borrow books. With a mobile phone, you could use the

phone itself to borrow books potentially anywhere. Seeing the library card in your wallet might remind you that your loans are about to become due. But your phone might remind you of this automatically, and you could renew the loans right away.
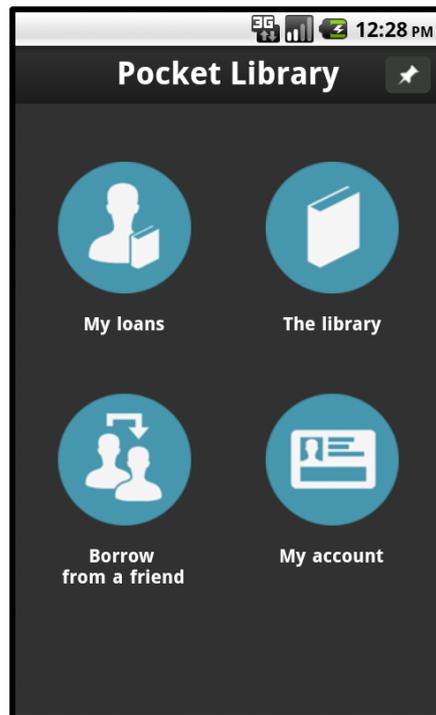
Image : The application main menu

2.3 Peer-to-peer loaning in public libraries

Public libraries are an important part of citizens' free time activities, by providing them with access to the cultural works that are currently being discussed in the public sphere, or are highly relevant for a certain individual or sub-culture at a certain time, or enhance people's individual growth and education, or are simply entertaining. This boils down to these observations:

1   The public libraries are *enablers*. Their role is focused on culture and cultural works, but the role is open-ended and ultimately defined by the goals of the individuals using it. It is not as strictly defined as types of libraries serving another organisation, for example academic libraries.

2   The items loaned by public libraries are often something that the borrowers deeply care about, and others in some reference group could also be interested in the same work.

Thus, works in library collections can often naturally connect people with similar interests in similar life situations and conversely, people who are interested in each other might also be inclined to read, watch or hear a work the other recommends. In short, a public library could be an ideal platform for *social reading*.

A peer-to-peer loan or a *friend loan* is a real, physical world recommendation by a library patron to another patron. The new patron can borrow the book from its previous borrower on the spot, accepting the normal responsibilities of a loan.
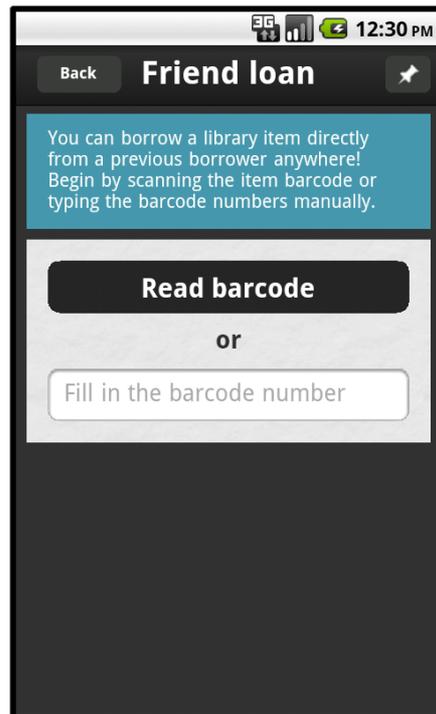
Image : Friend loan

The mobile application connects with the library system and allows this loan to be made with the receiver's credentials. The application essentially takes the library were the people are, to the contexts where the cultural discussions actually happen and the real-life influences occur. It makes the library collection itself mobile, and lets our users market the library for us.

3 Development methodologies and the end result

3.1 Library-driven development

Our project scope has been well-defined, with a concrete and achievable goal. Here are some methodological ideals we followed in the development process.

1   Libraries should know and do know how they want to serve the patrons also in highly technological contexts. There should be room for experimentation. There seldom are complete, one-size-fits-all, off-the-shelf solutions for organisations whose core processes are intertwined with software.

2   The patrons should participate in the development process.

3   Outsourcing to 3rd parties should be used, where in-house expertise is lacking. However, the outsourced parts should be limited in scope and budget, and the development done in continuous dialogue between the library developers and the partner.

   The end result of outsourcing should be freely modifiable and even distributable by the library, avoiding any vendor lock-in mechanisms. Selecting the outsourcing candidates should happen in a way that takes into account the actual skills and qualities of the candidates, not only formal qualifications.

4   The product should run on open platforms which enable easy modification and further development using high level programming languages.
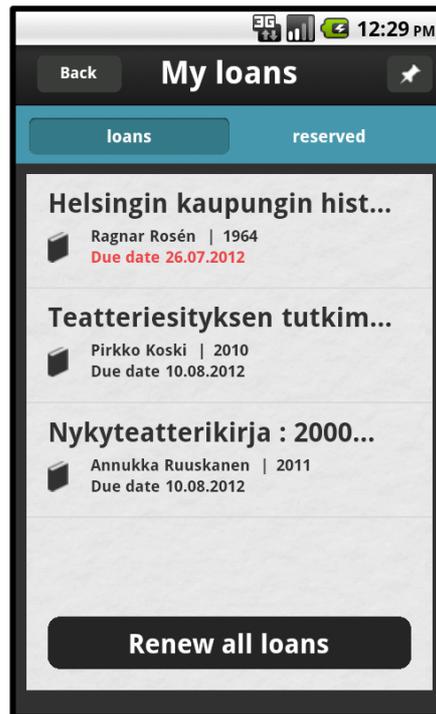
Image : My loans

These guidelines were also followed in the project. The components that required the most domain-specific library knowledge were created in-house, some already existing components were reused, and the actual user interface of the application was created in a specialized mobile software company (Taiste Ltd.), which also created appealing visual designs.

3.2 Asking the users

Early on, we contacted New Factory[2], a Tampere based organisation, which co-operates with students and other young experts in order to create an early-stage prototype and test the product effortlessly with user groups.

Library users were involved in the prototype development process, and the testing continued with a focus group trying out a finished prototype. During these tests we gained further assurance that our focus on patron-to-patron interaction is also inspiring to actual users. We made a semi-formal survey of desired features and made adjustments to our feature priorities.

3.3 Technical considerations and design principles

Technically, there are a few core decisions to be made when developing mobile applications. The first one is between developing a mobile web application that works on any smartphone platform but lacks some of the responsiveness of a native application and also lacks access to some of the phone's features such as the camera.

Acknowledging the limited library resources for maintaining several codebases for a single application, we chose the common Web platform to get a single application that works for all phones.
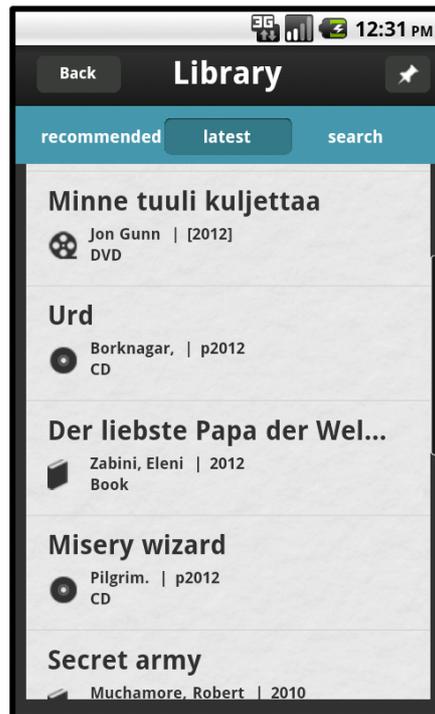
Image : The library

However, we still needed access to some native-only device features: the camera[3] for identifying items by reading barcodes, and notifications for due dates. The solution to this dilemma is a synthesis of the native and web approaches: PhoneGap/Cordova is a mobile application development framework, which runs a HTML5 application inside a native application wrapper.

Another important technical consideration is about making to the complete architecture of the product open and reusable. While developing a mobile application, we have also developed general, reusable library service infrastructure in the form of APIs that can be reused for other purposes.

An essential part of the infrastructure is an implementation of the SIP2 protocol[4] that is in use worldwide in library self-service automatons. Using SIP2 also makes the resulting service quite portable across library systems. However, we anticipate that SIP2 will eventually be replaced by more modern alternatives such as NCIP. Library system specific APIs can also be used for this purpose.

3.4 The Pocket Library: the resulting application

The resulting application allows patrons to access their personal loan information, retrieve automatic notifications of due dates, and borrow items from friends. They can also share insights about books to their friends in social networks.

The common concept of a personal loan is the underlying common denominator in all of these features. Even the traditional library catalog access is provided for completeness, but because of mobile interaction realities and user feedback we received, we emphasize browsing and recommendations, giving the user immediate views to interesting works even without entering any search queries.

We feel we have struck a balance between providing practical enhancements to the library user's common use cases while on the other hand pushing the boundaries of traditional library core services.

4 Ending thoughts

When developing software-enhanced services for patrons, modern development platforms allow libraries to stand on the shoulders of giants, leveraging existing open platforms to create unique and usable experiences for customers. We hope we have presented a good example of results from this kind of a lightweight development process.

We also believe in sharing results and co-operating to share development efforts: organisations and individuals interested in our fresh takes on loaning processes are encouraged to contact us. There were also many paths not taken during the project, which should be further explored in the future.

Footnotes:

1 http://daringfireball.net/2012/07/iphone_disruption_five_years_in
2 http://www.uusitehdas.fi/new-factory
3 And in the future, Near Field Communication (NFC) features
4 The 3M Standard Interchange Protocol Version 2.00