ABSTRACT
In recent years device manufacturers have been introducing so called Mobile Internet Devices (MIDs) at an increasing rate. The aim of these commonly touch screen based devices is not to be mobile devices’ “jacks-of-all-trades”, but to offer the best possible mobile internet user experience. In Mobile HCI 2008 Movial is presenting its new Movial IXS application suite for Mobile Internet Devices and aims to demonstrate how internet is not just something that you access, but a natural part of the user experience.

Unlike in any other Mobile Internet Device, Movial IXS’ user interface is built entirely with standard XHTML/CSS/JavaScript techniques and it uses Mozilla browser engine as its renderer and backbone. Using native web technologies for creating the user interface positions Movial IXS out of its seemingly natural mobile internet device genre and places it firmly to the close proximity of online internet and web applications. The aim of the Mobile HCI 2008 demonstration is to showcase how this close proximity of internet can be used to provide richer user experiences and flexible user interface development, and to provoke conversation about the role of the internet in the mobile devices that we use on daily basis.

Categories and Subject Descriptors
D.2.2 [Software engineering]: Design Tools and Techniques - Evolutionary prototyping, User interfaces, Software libraries.
D.2.11 [Software engineering]: Interoperability – Interface definition languages

General Terms
Design, Human Factors, Standardization

Keywords
Mobile internet device, MID, Web2.0, mashups, HTML, User experience, Mobile internet, Web applications

1. INTRODUCTION
The so called Web2.0 has revolutionized the way we perceive and use the internet. The web is no longer a collection of static informational corporate homepages, but a living social sphere for heterogenic communities and a platform for rich internet services and applications.

The essential enabler of the Web2.0 revolution has been the development of various underlying web technologies, such as AJAX, CSS/XHTML, RSS and even the “re-invented” JavaScript and DHTML. The developing technologies are however not alone the reason for the “Web2.0 revolution”, but the way they have been used to provide users with richer experiences.

One of the most notable characteristics of the Web2.0 revolution has been the rise of web based applications, also known as Rich Internet Applications (RIAs). A wide variety of mobile RIAs have been implemented by the hobbyist and corporations alike. Currently existing RIAs range from simple shopping list applications to complete operating systems (e.g. YouOS).

As the most popular RIAs (for example Google’s various services) have demonstrated, by combining the latest browser technologies and ideas of skilled designers it is possible to build services and user interfaces that provide both rich and engaging user experiences.

Movial is demonstrating how the entire user interface of a Mobile Internet Device can be implemented using standard and open source web technologies while maintaining high end user experience standards. Even more than that, Movial is demonstrating how browser technologies can be used to provide richer and more engaging user experience than using traditional UI technologies by merging the device UI and online web into one seamlessly integrated experience. In short, Movial is demonstrating the next step of evolution for Mobile Internet Devices and web mashups.

2. MOVIAL IXS
Movial has extensive experience and long-term history in building task oriented user interfaces for consumer targeted touch screen based Mobile Internet Devices, such as Linux based Nokia 770 Internet Tablet. This knowledge has now been refined to Movial IXS application suite. The aim has been to create an emotionally rich user interface, key design drivers being finger usable mobility and multitasking as well as effective and intuitive completion of tasks.

Movial IXS (Internet Experience Suite) is a Linux and Mozilla browser engine based white label application suite for Mobile Internet Devices. It comprises internet browser, internet communications and media consumption into one seamless user
experience enabling integrated information access, communication and entertainment.

So far various hardware and software manufacturers have introduced their own solutions for internet devices. For example Microsoft has its proprietary Origami-platform, Nokia has its partly proprietary Internet Tablet-range and Intel has announced partnership with Ubuntu-Linux and they are set to release their own MID platform. Also Sony is producing its proprietary Mylo-partnership with Ubuntu-Linux and they are set to release their partly proprietary Internet Tablet-range and Intel has announced their own solutions for internet devices. For example

and various APIs offered by 3rd party online content providers. Movial IXS offers developers easy methods for implementing device content as part of the default Movial IXS application suite, more than enabling the seamless integration of online and in-device content in the UI. Even though Movial IXS’ user interface is built using web UI techniques, there are no visual or interactional similarities which would associate the user experience with typical web user experience obtained via browser. Web UI techniques provide similar look and feel as “native” UI techniques and building tools.

3. WEB INTEGRATION

The so called mashups which combine data and content from various web services into new services have been seen as something that takes place only in the web. Movial IXS introduces the next step in the evolution of mashups by taking the idea of web mashups and integrating it tightly as part of the device’s user experience. For the end user this means that there are no borders in between online and in-device content in the UI and even the online content can be presented as a natural part of the UI.

More than enabling the seamless integration of online and in-device content as part of the default Movial IXS application suite, Movial IXS offers developers easy methods for implementing their own unique mashups by utilizing standard web techniques and various APIs offered by 3rd party online content providers.

A good example of the various ways of how the in-device content and online content are mixed in the Movial IXS application suite is the media player. When it comes to providing information about media content to the user, media player applications have traditionally been relying on metadata (as ID3-tags) stored in the in-device content. In the Movial IXS media library basic metadata is extracted from the ID3-tags and passed on as an online search query. Returned query results are presented as natural part of the content’s metadata information. In practice this means that compared to regular media players which extract the artist, song and album information from the ID3-tags alone, the media player of Movial IXS can complete the potentially missing metadata from online sources.

Movial IXS’ media player however does not just complete the potentially missing ID3-tag metadata but it also provides additional content and information (which could not be stored as metadata to files) as a natural part of the user interface. For example when listening a song from an artist, the user can instantly access things like the artist’s discography, lyrics of the song, information about related artists, or he/she can even play the music video made for the song or read artist related news.

The described media player functionality is just one example of how the online web content can be integrated as part of the device UI with Movial IXS applications suite. In the Mobile HCI 2008 Movial demonstrates also several other examples and spark a discussion about the ways how the border in between online and offline content and services could be even further dimmed. The goal that Movial has set itself is that the Mobile Internet Devices would no longer be just access points to internet, but the internet would be a natural part of any Mobile Internet Device.

4. APPLICATION DEVELOPMENT

As the technological backbone of Movial IXS is similar to ordinary web sites and Rich Internet Applications, also the same development tools which are used to develop RIAs and web services can be used to develop user interfaces for Movial IXS applications. Movial IXS platform offers developers clearly structured CSS-styles which enable fast development of user interfaces that comply with the overall user interface style of the platform. Movial IXS also offers well documented server services for creating applications that interact with the hardware or subsystems of the device.

The user profile of Movial IXS application developer greatly differs from the user profile of a typical application developer who is developing applications using for example open source technologies such as Gnome or GTK+. Whereas typical open source-developers have often a background in engineering, typical web-developer has a history in arts and design. Traditionally in the field of arts and design more emphasis has been put on the overall end user experience than in the field of engineering. From the end user’s perspective this means that the applications developed to the Movial IXS platform are human-computer interaction friendly and provide more emotional and engaging user experiences.
Figure 1: Movial IXS application suite reference platform prototype
(Prototype HW design & rendering by Provoke Design)