Telenor demonstrates future wireless and embedded services at Technoport technology festival

Telenor R&D demonstrated results from internal project **WiBrix** and European IST project **Daidalos** at technoport technology festival in Trondheim, Norway. The demonstrator, called CyberCity, shows how future mobile devices (e.g. mobile phones and PDAs) can be used to interact with public devices and services that are embedded into cityscape and city architecture. The demonstrator was developed in cooperation with the **Norwegian University of Science and Technology** (NTNU) in Trondheim.

Technoport (www.technoport.no) is a technology festival in Trondheim, taking place during October 19th to 22nd 2005. The objective of Technoport is to open up between various fields of technology and lines of business. Technoport is the **largest technology gathering in Norway**. More than 150 companies participate in exhibitions and various activities during the festival, which is hosted in a 6,000 square meter exhibition and conference center in the heart of Trondheim. Telenor R&D participated in the festival with a number of research prototypes including CyberCity. CyberCity combines technologies developed in the IST project Daidalos into a scenario demonstrator that shows how citizens can use mobile and wireless technologies to access and use embedded and public devices and services in a cityscape.

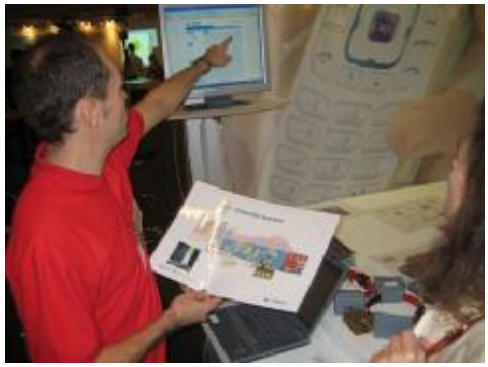

Figure 1: Stein Tore Rekdal from Telenor R&D describing the CyberCity prototype to a visitor.

CyberCity functionality

In CyberCity, the user carries with her a **mobile device** (e.g. a mobile phone or a tablet PC, see Figure 2) that is used to access and use embedded services in the city in a user-friendly manner. An **embedded service** is a service that is provided on site using **embedded devices**. For example, an embedded restaurant service shows a tailored view of the menu on an LCD display in the entrance to the restaurant. User's mobile device is used to discover services embedded into user's physical proximity (using RFID technology). This is much like searching for documents on the web, but is made simpler by taking user's context (location) as the starting point for the search. Moreover, discovered services are **personalized** to each user's preferences and use specialized devices embedded into the architecture of the city. Once a service is discovered the user can use the mobile device to log on to the service, use the service and pay for the service, all through the mobile terminal.

CyberCity allows anyone to provide services in a cityscape. Services can be public services (e.g. municipal services, public transport information services, hospital and medical services) or commercial services requiring payment, such as movie theatres and restaurants. CyberCity allows service providers to connect their services to a physical location in the city, and **increase the experience of visiting the city**. For instance, in the demonstrated prototype, a movie theatre service allows the user to use a mobile device to browse the list of current movies, and use an embedded high-definition display (at the movie theatre) to watch movie trailers. This combined usage of devices allows service providers to enable the best possible user experience tailored to their services.

Figure 2: Arlene Pearce from NTNU demonstrates CyberCity mobile terminal (a tablet PC) to a visitor.

CyberCity value network

CyberCity demonstrates a platform for combining digital services and physical architecture and cityscape. In CyberCity, **services are provided by inhabitants and businesses in a city**. The mechanics of accessing and using services, e.g. discovering, authenticating, personalizing, paying and auditing, are done by an **operator**. CyberCity uses open web services standards in order to allow easy migration and interoperability with existing services.

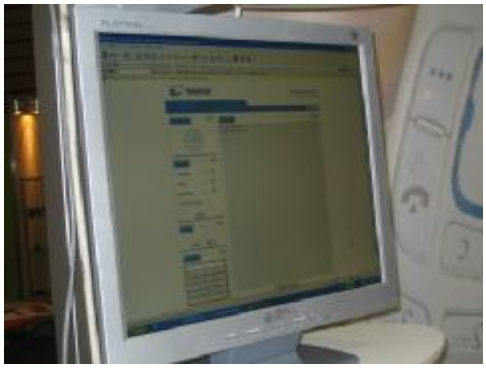

Figure 3: CyberCity embedded display used to interact with embedded services during the demonstration.

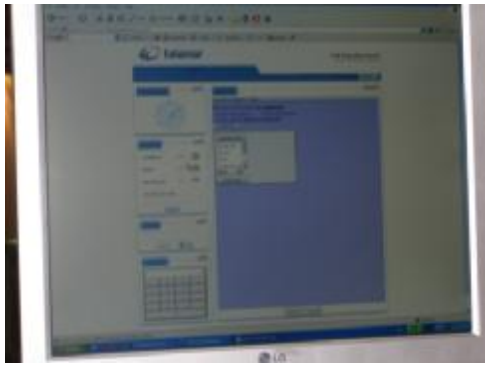

Figure 4: User interface for interacting with embedded services.

Figure 5: RFID reader for discovery of services in the city.

Figure 6: Telenor's exhibition at Technoport.

CyberCity applications

Two applications were implemented for the CyberCity demonstrator:

- **Concert hall**: Students' society in Trondheim owns a concert hall with a varied program. CyberCity allows a user to approach a billboard at the concert hall, log in to the billboard using a mobile device and RFID reader, and customize the billboard to her own preferences (e.g. see information about all Jazz concerts). Additionally, each user can add comments to the program and see other users' comments.
- **Movie Theatre**: Movie theatre in Trondheim employs a number of plasma screens for showing movie trailers and the program for the theatre, in addition to commercials. CyberCity allows a user to approach a screen, log in (using RFID reader and a tag attached to the screen) and personalize that screen according to own preferences (e.g. all European films on the program for tonight).

CyberCity is under development, and future applications will include shopping centres, libraries, and other city services. The platform will also demonstrate micro-payment associated to these services. For any questions regarding CyberCity please contact Babak Farshchian at Telenor (Babak.Farshchian@telenor.com)