

LBS 2.0

Enabling User-driven Provision and Context-aware Utilisation of Location-based Services

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1) Introduction

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3) Results and future work

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Current situation in mobile computing

- + Geographic positioning technology more and more common in mobile devices
- + Faster and cheaper permanent and reliable connectivity
- ! Rapidly increasing demand for mobile services
- Role for provisioning of LBSs reserved to professionals (proprietary development work)
- Utilisation of LBSs too complicated for end-users (download, installation, configuration of applications)

Web 2.0 in a nutshell

- No barriers for user-generated content
- Services can easily be made available
(e.g. wikis, blogs, web feeds, podcasts)
- Interoperable web applications simplify the usage of services
(e.g. widgets, web services, readers, mashups)
- No separation of providers and users

How can we make the provision significantly easier and feasible for end-users?

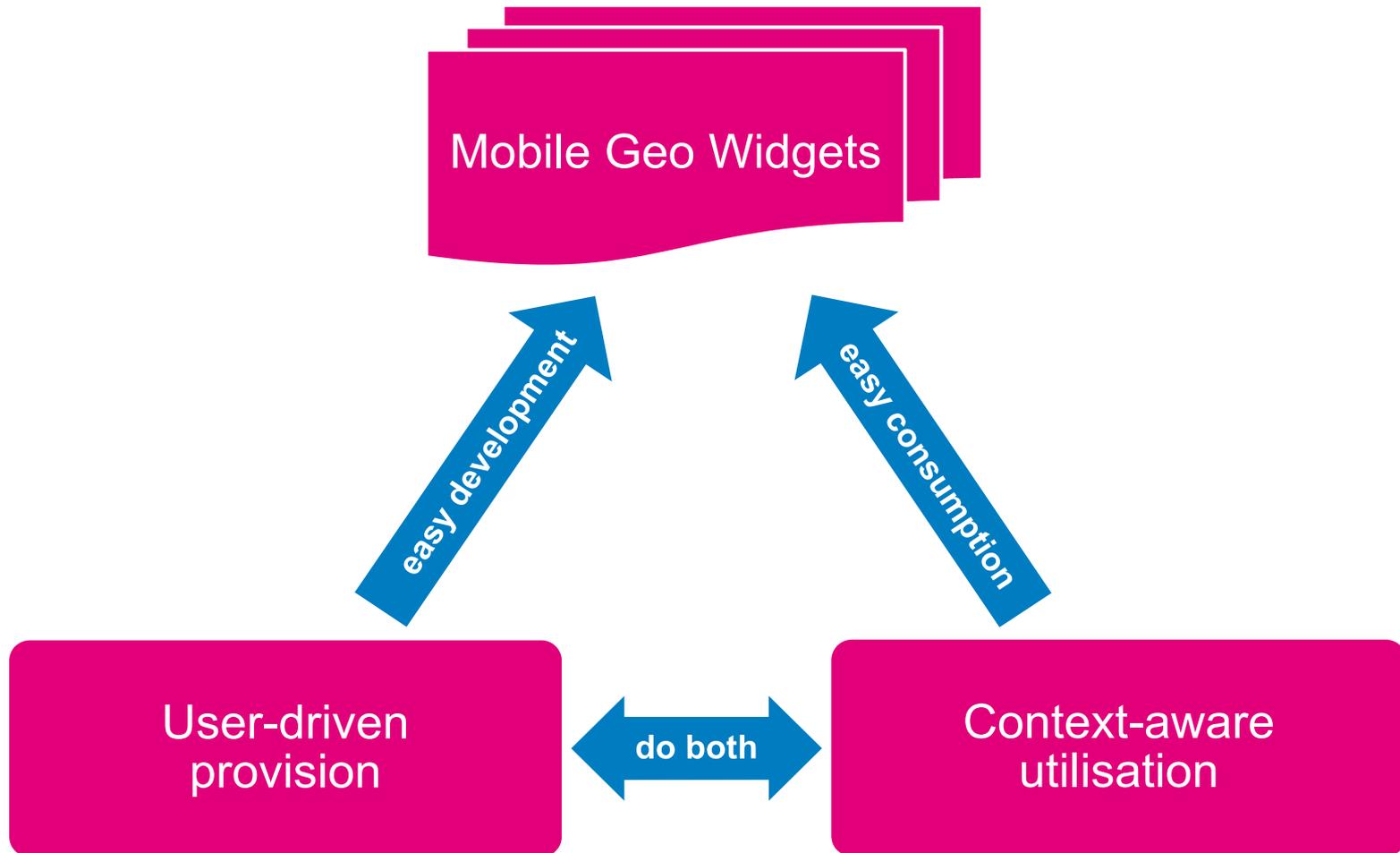
How can we radically simplify the mobile utilisation of LBSs?

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Idea for solution



Mobile geo widgets

- Borrowed from the web
- Lightweight applications for mobile devices
- UI and controller logic (MVC)
- Contextual binding (location and time)
- Semantic binding (tagging)



User-driven provision

- No need for specialized knowledge
- Easy, intuitive and web based development environment
- Building blocks for UI and functional logic
- Generating widgets for existing web services

Toolkit for end-users

home profile widgets buddies

newwidget search widget delete widget save as template

Widget Editor

Title: Pizzeria Bella Italia

Tags: marketplace, pizza, lunch

Pages

- menu
- opening
- reserve
- done

Widget

Table reservation

Persons:

Date:

Time:

Make a reservation!

Weitere Optionen

Menu

Opening hours

Controls

Headline

Text

Input

Button 1

Button 2

Button 3

Submitbutton

Image

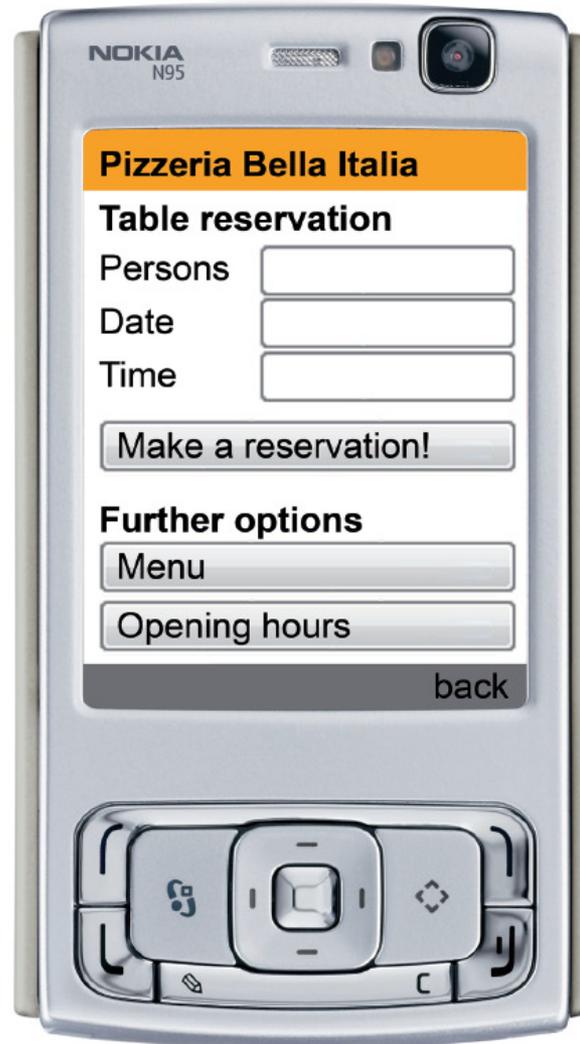
Pages

- empty page
- text page
- image page
- voting page
- contact page

Templates

- empty widget
- personal widget
- gallery widget
- media widget
- news widget

Widgets on mobile device

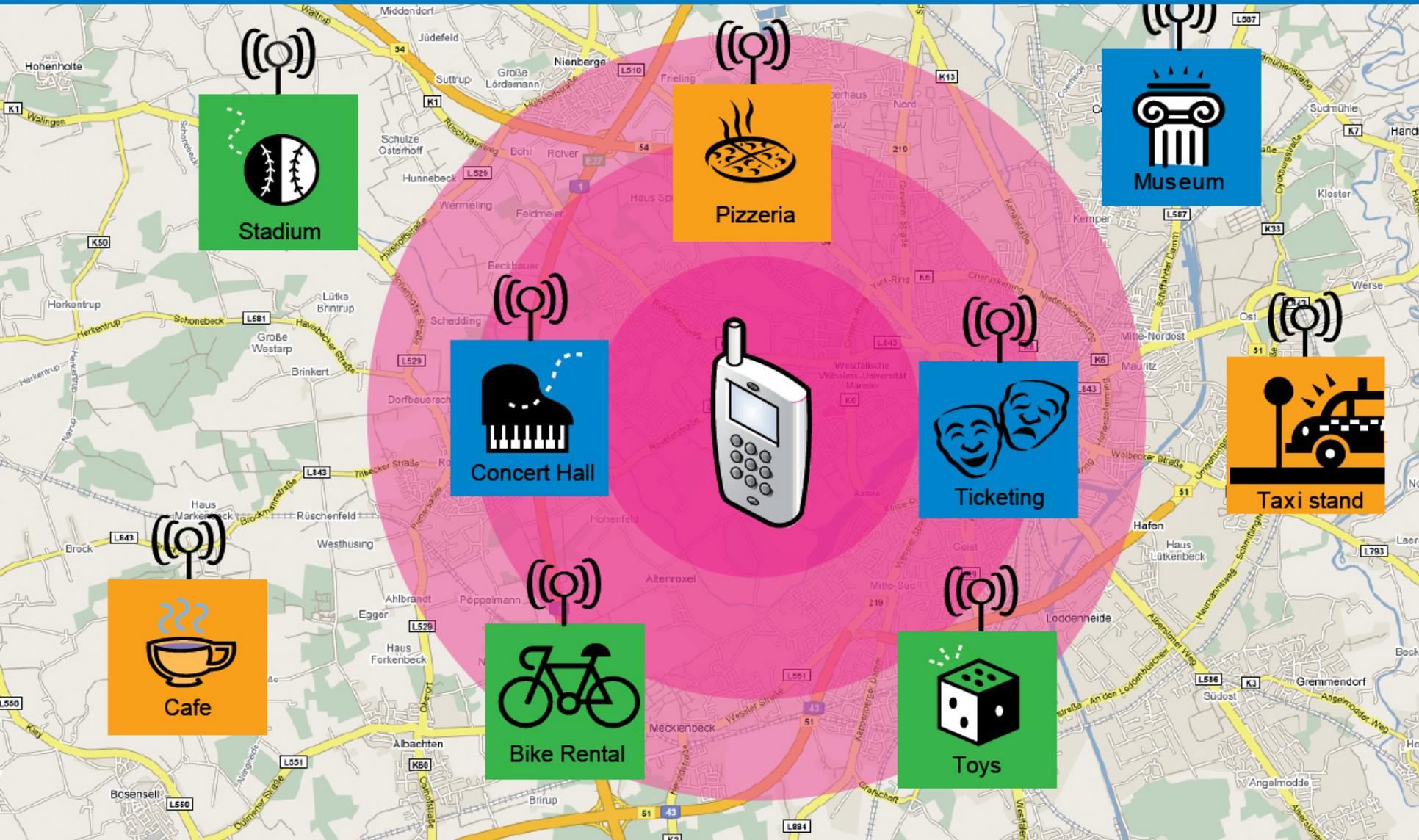


```
<widget title="Pizzeria Bella Italia">
  <ui startpage="menupage">
    <page id="menupage">
      <h>Menu</h>
      <text>Pizza Magherita: 5 EUR</text>
      <text>Pizza Funghi: 6 EUR</text>
      <text>Pizza Prosciutto: 6 EUR</text>
      <text>Pizza Hawaii: 7 EUR</text>
      <text>Pizza Tonno: 7 EUR</text>
      <h>Further options</h>
      <button text="Table reservation" action="gotoReser" />
      <button text="Opening hours" action="gotoOpen" />
    </page>
    <page id="openinghours">
      <h>Opening hours</h>
      <text>Mon-Fri: 11:00 am - 10:00 pm</text>
      <text>Sat-Sun: 11:00 am - 11:30 pm</text>
      <h>Further options</h>
      <button text="Menu" action="gotoMenu" />
      <button text="Table Reservation" action="gotoReser" />
    </page>
    <page id="reservation">
      <h>Table reservation</h>
      <input label="Persons" name="pers" />
      <input label="Date" name="date" />
      <input label="Time" name="time" />
      <button text="Make a reservation!" action="doReser" />
      <h>Further options</h>
      <button text="Menu" action="gotoMenu" />
      <button text="Opening hours" action="gotoOpen" />
    </page>
    <page id="done">
      <h>Table reservation</h>
      <text>We look forward to welcoming you!</text>
      <h>Further options</h>
      <button text="Menu" action="gotoMenu" />
      <button text="Opening hours" action="gotoOpen" />
    </page>
  </ui>
  <controller>
    <action id="gotoReser">
      <command type="gotopage">
        <param name="page" value="reservation" />
      </command>
    </action>
    <action id="doReser">
      <command type="senddata">
        <param name="url" value="http://procomo.org/senddata" />
        <param name="vars" value="pers,date,time" />
      </command>
      <command type="gotopage">
        <param name="page" value="done" />
      </command>
    </action>
    <!-- more actions -->
  </controller>
</widget>
```

Widget engine

- Instant appearing of widgets after push / entering context
- Automatic installation of small applications
- Widget engine interprets model (XML)
- Intuitive UI for usage of LBSs
- Interaction with services of previous unknown environments

Context of mobile users

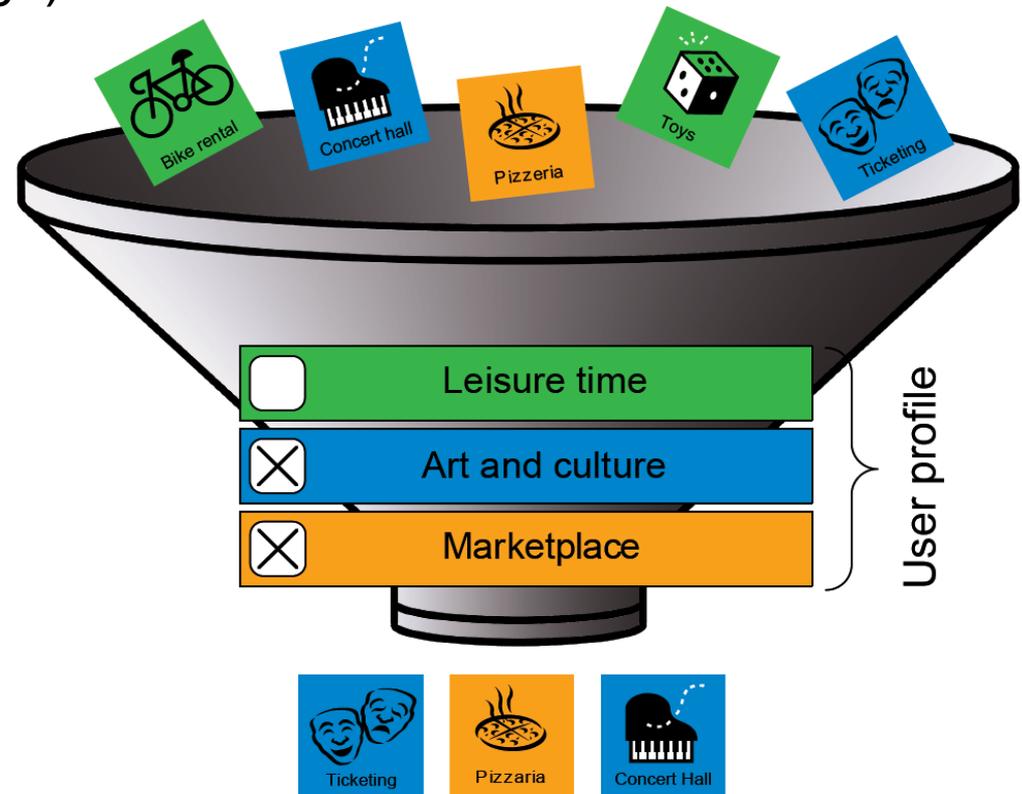


Context-aware filtering

- Definition of temporal and spatial relevance of LBSs
- Filtering by location
- Filtering by time
- Filtering by movement

Recommender system

- Problem of choice overload
- Adaptable user profiles (tags)
- Profile-based filtering
- Collaborative filtering
- Adaptive filters



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Current results

- Prototype implementation (J2EE, J2ME)
- Users are able to provide and use services
- Feeling of LBS 2.0
- Simple filtering algorithms
- Testbed for further research

Future work

- Enhance UI of widgets and web toolkit
- Extend functional possibilities of widgets
- Integrate social networking
- Delve deeper into semantic and context-aware filtering
- Port to iPhone and Google Android

Thank you for your attention!

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