

MyMobileWeb

An open source platform for developing
Mobile Web applications and portals

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Morfeo
PROJECT



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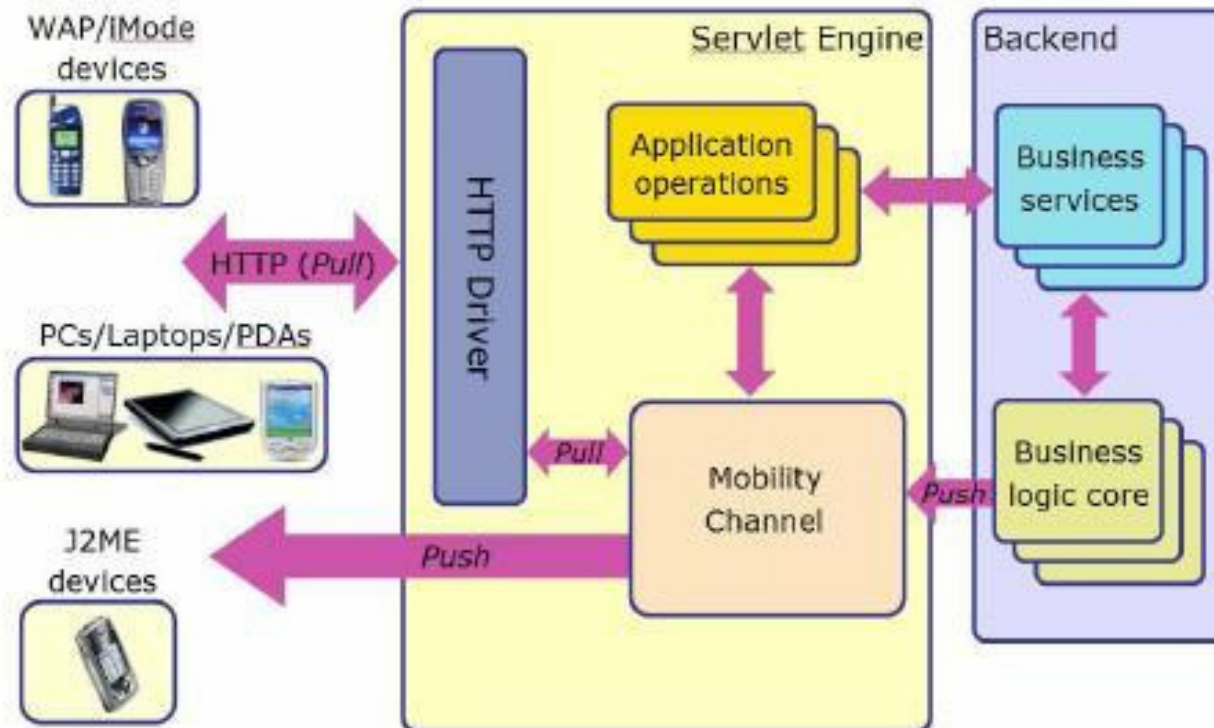
Introduction

- MyMobileWeb is an open source platform that simplifies the development of mobile web applications and portals
 - A low-cost platform (there are no license fees). GPL License
 - A modular product, open-standards-based
 - Other open-source technologies are used (WURFL, Batik, Xerces, Xalan, ...)
 - All-Java product that only requires a minimal Servlet / JSP container (Tomcat, for example)
- Provides different modules which cover all the basic requirements that must meet a complete and integrated mobile solution, hiding all the complexity related to dealing with multiple delivery contexts
- Includes experimental modules related to the exploitation of semantics in a mobile environment
- Applicability
 - dotMobi applications and portals
 - Mobile solutions intended to work in an uncontrolled environment (multiple devices)
 - Creation of mobile content channels based on JSR-170-based CMS or RSS

Vision

- Mobile Web development should be driven by a 'Channel Model' based on Service Oriented Architectures (SOA)
 - Applications publish business services that are invocable from different channels: traditional Web Channel and Mobility Channel
 - Services are independent of the channel and need not to be duplicated
 - Mobile Channel is different than Web Channel (in general)
 - Markup transcodification is an anti-pattern
 - It has different views (presentations) and navigation schema
 - Both channels can be integrated in the same server and CMS but they are essentially different
 - Aligned with the dotMobi vision
 - Typically a mobility channel only addresses a small percentage of functionality
 - Mobile Channel is composed by
 - Information that users want to access while they are on the move
 - Information that people want all the time
- Rapid Application Development (RAD) of MultiChannel and MultiDevice Services
 - Reduction of time and budget
 - Common development skills (Web, Java, XML ...)

Target Architecture



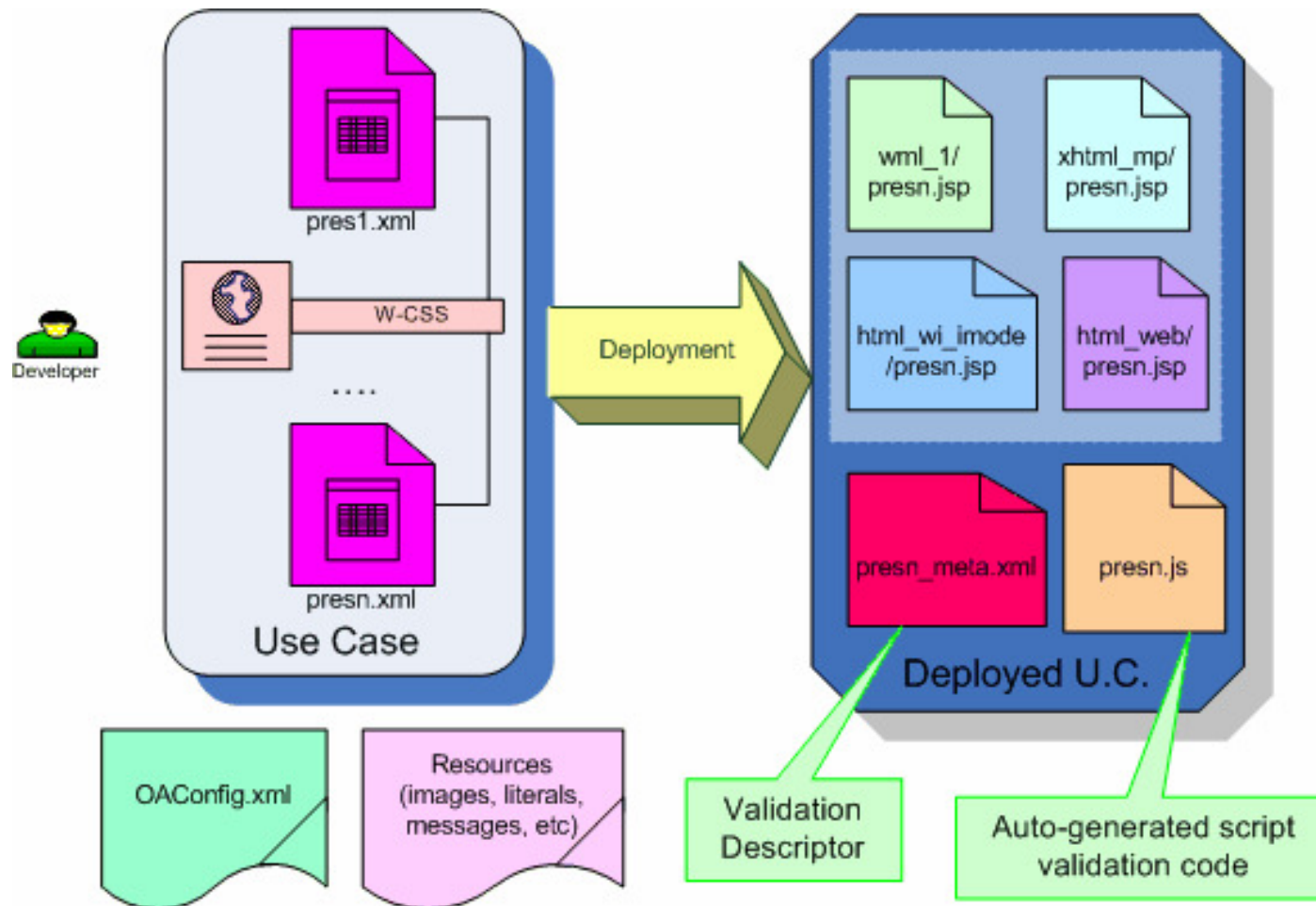
Main Features

- MyMobileWeb enables device independent development
 - It is followed a ‘flexible authoring’ approach
 - Flexible authoring is an authoring style that consists of designing once for all kind of delivery contexts, in addition to, when needed, a combination of adaptation policies and / or customized variants of few resources for specific delivery contexts.
- Differential aspects against competitors
 - High performance architecture. During each client request there is no markup transcodification
 - Integrated with WURFL (“de facto standard) for Device Description
 - It works with any Java Servlet/JSP Web/Application Server
 - Automatic code generation for local (Javascript-based) and server-side validations
 - Smart Literal Management (literals can be redefined for specific devices or clusters of devices)
 - Based on the concept of mobile visual controls and declarative user interface language
 - Intelligent management of paging, for each visual control, each container ...
 - Off-the-self (component-based) mobile adaptation of RSS data sources
 - Integrated with JSR-170-based CMS

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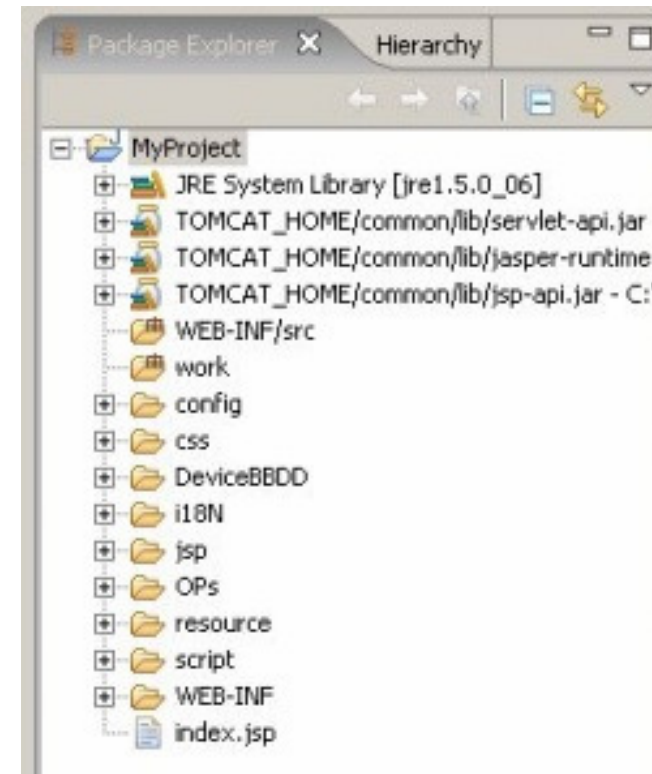
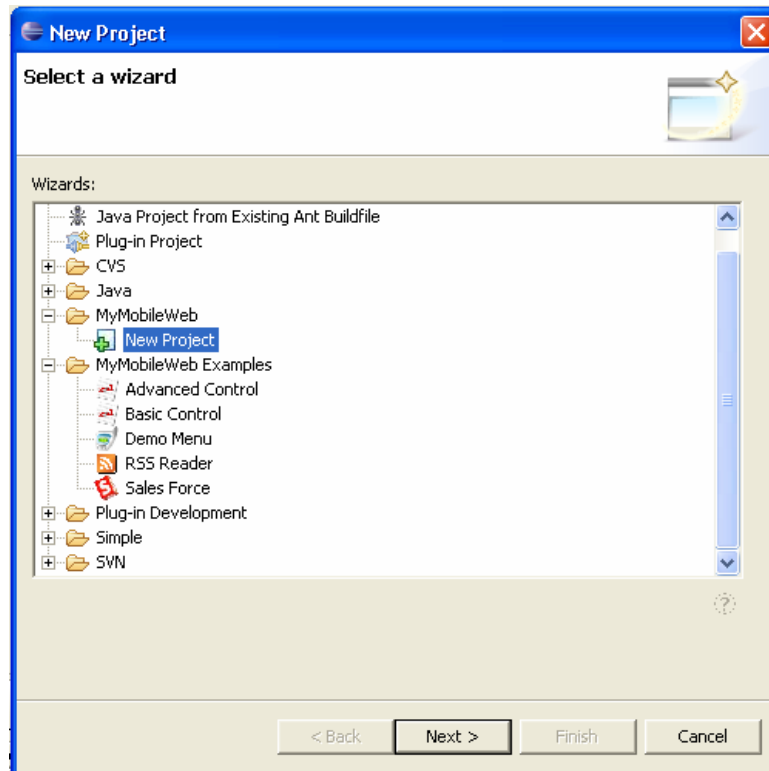
Development cycle (I)



Development cycle (II)

- MyMobileWeb applications are conventional Web J2EE applications that use additional libraries (in WEB-INF/lib)
- Presentation layer need to be defined declaratively using XML + CSS.
- A code generation tool need to be run to create
 - JSP pages, that will render the user interface specified in XML
 - Validation descriptors which will be used to perform automatic server-side validations
 - A set of Javascript functions in charge of performing local validations for devices with client-side scripting capabilities
- At runtime, these JSP pages, in collaboration with a set of libraries and components, will be in charge of rendering the presentation according to different delivery contexts.

Development tools - Eclipse Plugin (I)



Example (I) - MyMobileWeb XML authored unit

```
<?xml version="1.0" encoding="UTF-8" ?>
<?xml-stylesheet href="example1.css" type="text/css"?>

<mymw:document xmlns:mymw="http://morfeo-project.org/mymobileweb" id="menu">
  <mymw:head>
    <mymw:title style="include">SalesForce</mymw:title>
  </mymw:head>
  <mymw:body>
    <mymw:p id="p1" style="nowrap expand" layout="vertical">
      <mymw:menu id="m1" style="mymenu paginate" bind="{menuOption}">
        <mymw:link resourceid="findps" id="cps" longtitle="The Find P/S option is implemented"
          style="consult">Find P/S</mymw:link>
        <mymw:link resourceid="searchclients" id="cc" longtitle="Search Clients in our database"
          style="clients">Search Clients</mymw:link>
        <mymw:link resourceid="contract" id="contr" longtitle="Do you want to contract one product?"
          style="contract">Contract</mymw:link>
        <mymw:link resourceid="opinion" id="opin" longtitle="To know our clients"
          style="opinion">Opinion poll</mymw:link>
        <mymw:link resourceid="exit" id="exit" longtitle="See you soon!" style="exit">
          Exit</mymw:link>
      </mymw:menu>
    </mymw:p>
  </mymw:body>
</mymw:document>
```

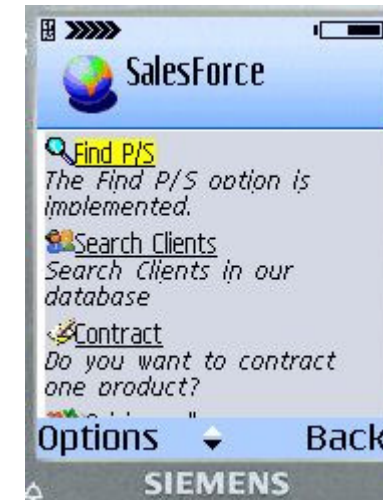
Example (II) - MyMobileWeb CSS style sheet

```
p.nowrap {
    white-space: nowrap;
}
p.expand {
    expand: true;
}
menu.mymenu {
    layout: vertical;
    align: left;
    white-space: nowrap;
    width: 90%;
}
menu.paginate {
    paginate: false;
}

link {
    img-display: both;
}
link.longtitle {
    include: true;
}
link.contract {
    localsrc: 149;
}
link.consult {
    localsrc: 510;
}
link.clients {
    localsrc: 163;
}

link.exit {
    localsrc: roundarrow2;
}
link.opinion {
    localsrc: chart;
}
menu.title {
    color: white;
    background-color: #336699;
    align: center;
    show-separator: false;
    include: true;
}
```

Example (III) - Rendering in different browsers



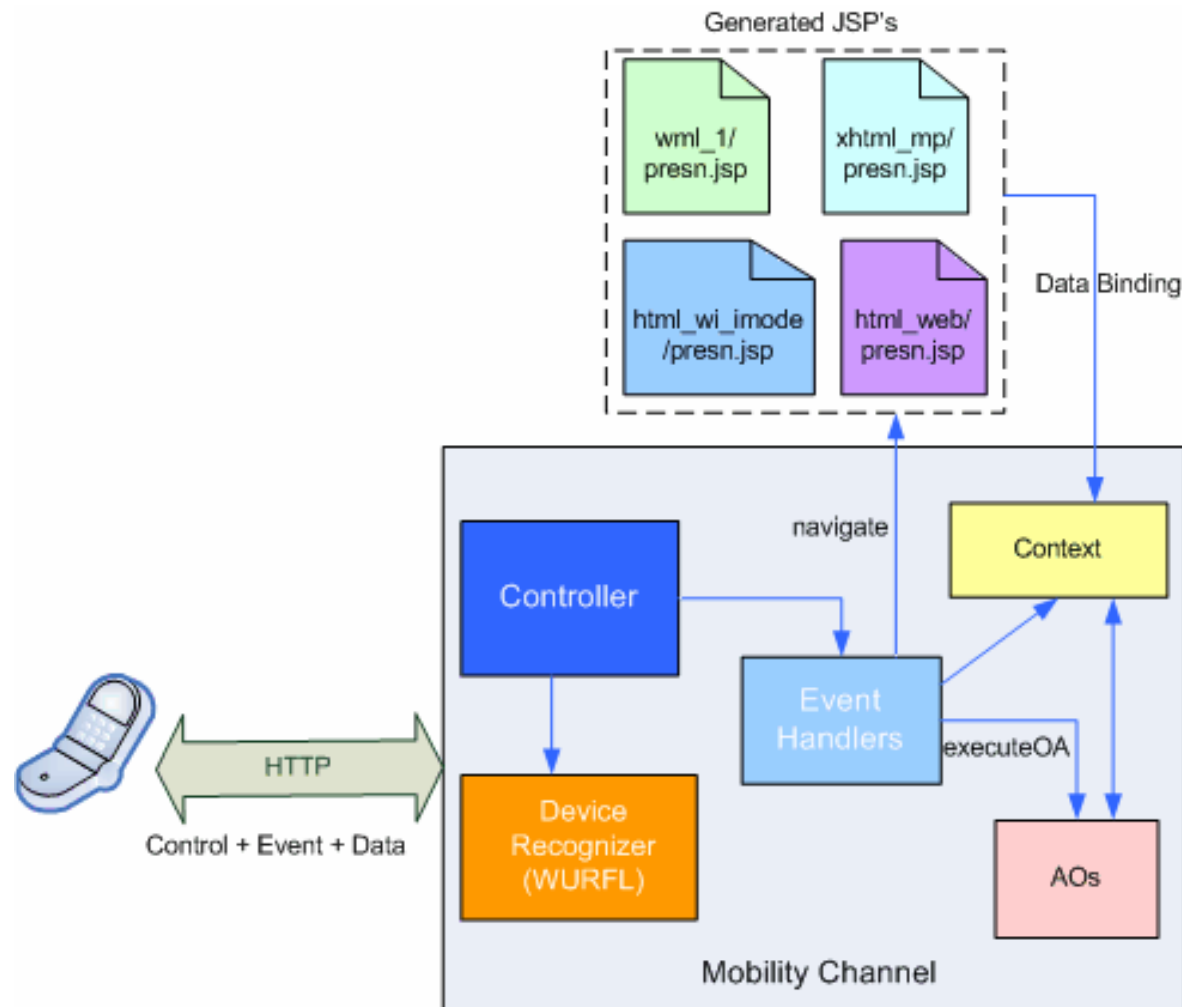
Example (IV) - Explanation

- An XML authored unit defines a user interface view
 - In the example it is defined a tiny screen with a set of menu options to be presented to the user. The menu is inside a container with vertical layout
 - Each menu option has an identifier, short and long descriptions
- The final aspect of the menu is controlled by means of a CSS style sheet declared at the top of the authored unit
 - CSS styles can be redefined for different devices or clusters of devices
- The data binding is specified by means of the attribute bind which defines the model variable that will be automatically updated with the option selected by the user (link identifier).
 - When the user selects an option, it will be raised an event that will be treated at the server side by means of handlers provided by the developer.
 - The event handler will find the option selected by the user in the bind variable menuOption.

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High Level Execution Architecture (I)



Mobile visual controls

- MyMobileWeb provides a suite of visual controls
 - A visual control is a component that provides well-defined functionality for interacting with the user.
- Examples
 - label, select, menu, table ...
 - and other specific for the mobile: telephonecaller, phonebookadder ...
- At runtime, visual controls are rendered via device's preferred markup language.
- A visual control raises events, some of them managed by the application, some of them managed automatically by MyMobileWeb.
- A visual control can be associated to
 - Binding attributes for automatic data population.
 - Validation attributes for constraining user input
 - Display attribute for controlling when the control will be finally rendered

Styling

- MyMobileWeb has adopted CSS style sheets as the mechanism for specifying presentation aspects (look and feel, etc.) with respect to visual controls.
 - Each XML presentation file might be linked to one or more style sheets which must follow the CSS syntax.
 - The properties and selectors that can be used are those specified in W-CSS plus some specific extensions defined by MyMobileWeb.
- MyMobileWeb fully supports the cascading pattern for applying style sheets.
 - For instance, developers can specify a default style sheet that will apply to all the XML authored units.
 - Moreover, MyMobileWeb provides default CSS files that are applied when no style is specified by programmers.
- From a device independence perspective, the most important point is the style overriding feature.
 - Using this feature a developer can change specific style properties of an authored unit depending on the delivery context.
 - For example, if a developer realizes that a background color is not readable on a device, she can easily change it for one another more suitable, by means of style overriding and without needing to change anything in the XML authored unit.

Layout management

- For achieving device independence, the layout of containers need to be specified using CSS properties.
 - Using this method and the style overriding techniques provided by MyMobileWeb, a developer can alternate multiple layouts depending on different families of devices, tiny mobile phones, smartphones, PDAs, etc.
- For example, in a PDA a designer would like to see a grid layout, because she has plenty of screen space whereas in a tiny mobile phone she would like to see a vertical layout.
 - Using MyMobileWeb, this can be achieved easily without duplicating any code and without additional effort by the developer.

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Example (I) - Menu control

```
<?xml version="1.0" encoding="UTF-8" ?>
<?xml-stylesheet href="menu.css" type="text/css"?>

<mymw:document xmlns:mymw="http://morfeo-project.org/mymobileweb" id="menu">
  <mymw:head>
    <mymw:title style="include">Example</mymw:title>
  </mymw:head>
  <mymw:body>
    <mymw:p id="p1" style="expand" layout="vertical">
      <mymw:menu id="ctr" title="Countries" style="countries" bind="{country}">
        <mymw:link resourceid="austria" id="au" longtitle="It's a landlocked country in Central Europe"
          style="vertical">Austria</mymw:link>
        <mymw:link resourceid="usa" id="ee" longtitle="It's a country in North America"
          style="vertical">USA</mymw:link>
        <mymw:link resourceid="france" id="fr" longtitle="His metropolitan territory is located in Western Europe"
          style="vertical">France</mymw:link>
        <mymw:link resourceid="japan" id="ja" longtitle="It's an island country in East Asia"
          style="vertical">Japan</mymw:link>
        <mymw:link resourceid="mexico" id="me" longtitle="It's located in Southern North America"
          style="vertical">Mexico</mymw:link>
        <mymw:link resourceid="spain" id="sp" longtitle="It's a country located in Southern Europe"
          style="vertical">Spain</mymw:link>
        <mymw:link resourceid="sweden" id="ja" longtitle="It's a Nordic country in Scandinavia"
          style="vertical">Sweden</mymw:link>
        <mymw:link resourceid="taiwan" id="me" longtitle="It's an island in East Asia"
          style="vertical">Taiwan</mymw:link>
        <mymw:link resourceid="thailand" id="sp" longtitle="It lies in Southeast Asia"
          style="vertical">Thailand</mymw:link>
        <mymw:link resourceid="turkey" id="ja" longtitle="It's a Eurasian country"
          style="vertical">Turkey</mymw:link>
        <mymw:link resourceid="wales" id="me" longtitle="It's one of the four constituent nations of the UK"
          style="vertical">Wales</mymw:link>
        <mymw:link resourceid="yemen" id="sp" longtitle="It's on the Arabian Peninsula in Southwest Asia"
          style="vertical">Yemen</mymw:link>
      </mymw:menu>
    </mymw:p>
  </mymw:body>
</mymw:document>
```

Example (I) - ... (rendering)

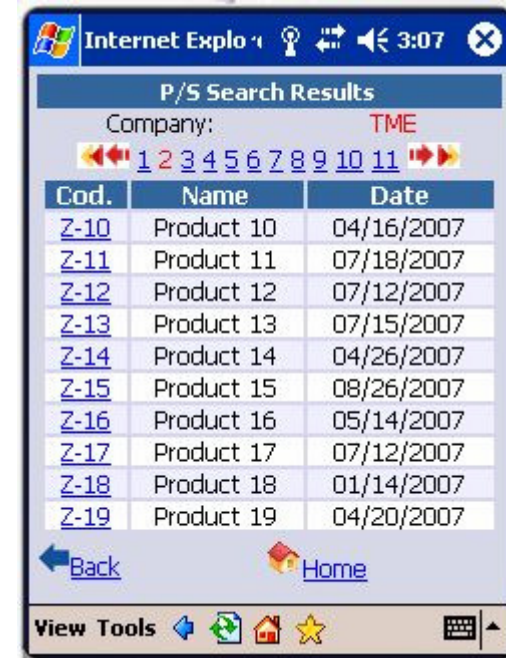
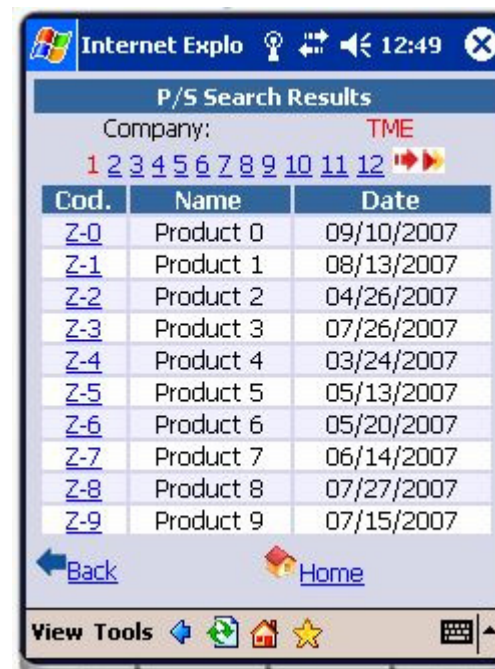


Example (II) - Table Control with binding and pagination

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet href="table.css" type="text/css"?>

<mymw:document xmlns:mymw="http://morfeo-project.org/mymobileweb" id="example">
  <mymw:head>
    <mymw:title style="include">P/S Search Res</mymw:title>
  </mymw:head>
  <mymw:body>
    <mymw:p id="p1" layout="vertical" align="center">
      <mymw:table id="myTable" bind="${selectedPS}" optionsbind="${searchPSResult}"
        keymember="code" paginate="true" style="body selcol0">
        <mymw:th style="headerfont headercolor">
          <mymw:td>Code</mymw:td>
          <mymw:td>Name</mymw:td>
          <mymw:td display="${_MYMW_DEV_BELONGS.PdaDevice}">Date</mymw:td>
        </mymw:th>
        <mymw:tr>
          <mymw:td member="code" />
          <mymw:td member="name" />
          <mymw:td member="date" />
        </mymw:tr>
      </mymw:table>
    </mymw:p>
    <mymw:include content="PSDetail/generic/product/p2" />
  </mymw:body>
</mymw:document>
```

Example (II) - ... (rendering)



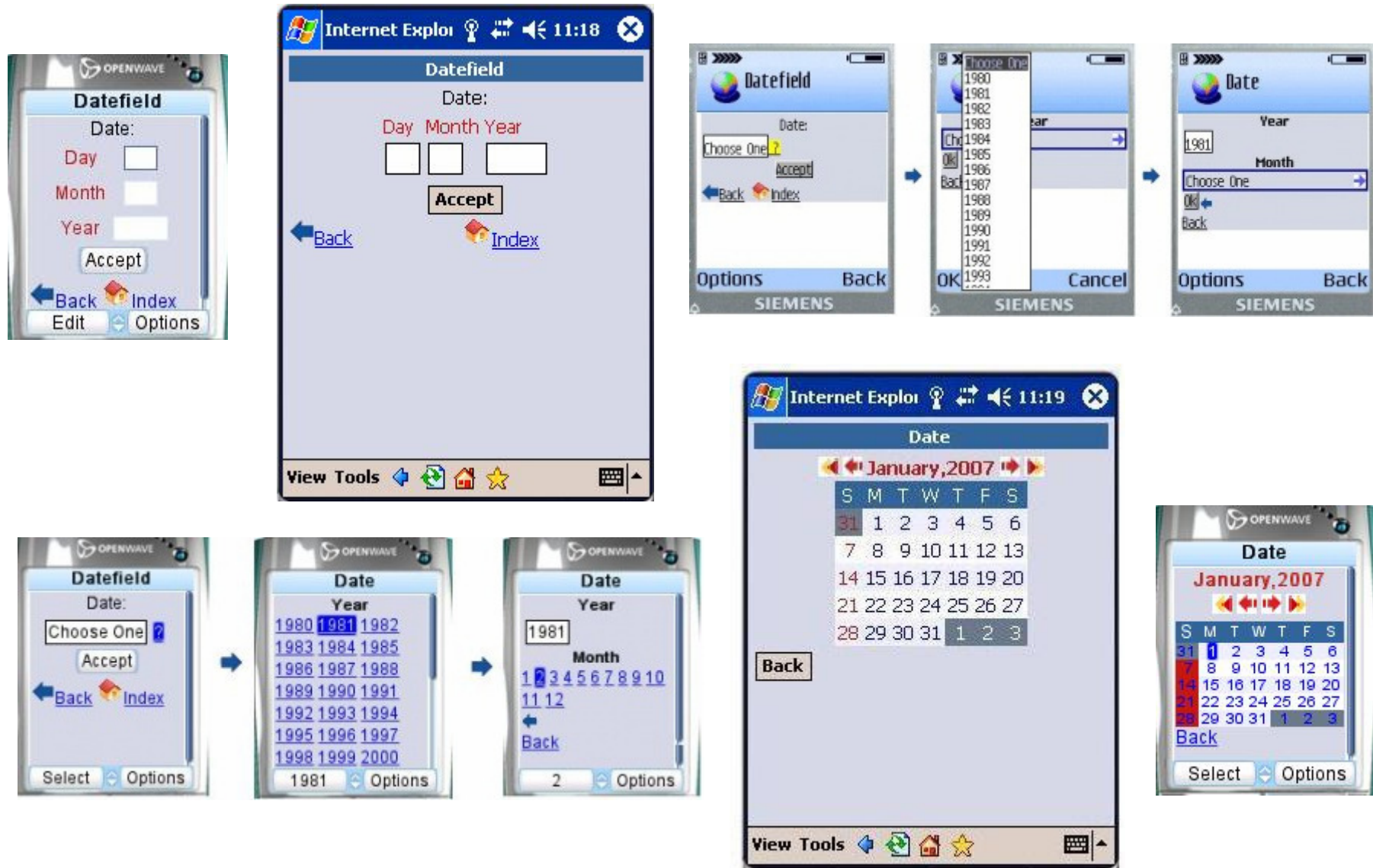
Example (III) - Datefield

```
<?xml version="1.0" encoding="UTF-8" ?>
<?xml-stylesheet href="datefield.css" type="text/css"?>

<mymw:document xmlns:mymw="http://norfeo-project.org/mymobileweb" id="datefield">
  <mymw:head>
    <mymw:title>Datefield</mymw:title>
  </mymw:head>

  <mymw:body newcontext="true">
    <mymw:p id="p1" layout="vertical" align="center" style="nowrap" >
      <mymw:label id="date">Date:</mymw:label>
      <mymw:datefield style="mydate" labelid="date" id="date" bind="{ date }" />
    </mymw:p>
    <mymw:p id="p2" align="center">
      <mymw:submit id="submit" value="Accept" principal="true"/>
    </mymw:p>
    <mymw:include content="Entryfield/generic/example1/foot"/>
  </mymw:body>
</mymw:document>
```

Example (III) - ... (rendering)



Example (IV) – RSSPanel

```
<?xml version="1.0" encoding="UTF-8" ?>
<?xml-stylesheet href="feed.css" type="text/css"?>

<mymw:document xmlns:mymw="http://morfeo-project.org/mymobileweb"
               xmlns:user="http://morfeo-project.org/user" id="feed">
  <mymw:head>
    <mymw:title style="include">White House</mymw:title>
  </mymw:head>
  <mymw:body>
    <mymw:p id="p1" style="expand" layout="vertical">
      <user:rsspanel id="rss" src="http://www.whitehouse.gov/rss/news.xml"
                    paginate="true" />
    </mymw:p>
    <mymw:p id="foot" align="left">
      <mymw:link resourceid="back" id="feeds" style="both">Back</mymw:link>
      <mymw:link resourceid="index" id="index" style="both">Index</mymw:link>
    </mymw:p>
  </mymw:body>
</mymw:document>
```

Example (IV) - ... (rendering)

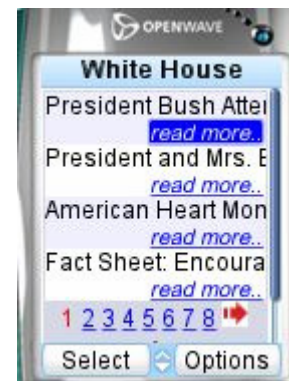


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Additional features

- Image transcoder module (dynamic adaptation of images)
 - Supports SVG also
- CMS integration (JSR-170)
- Semantic annotation of the user interface
 - Automatic form completion library
- DCCI API implementation (Dynamic properties)
- Javascript modules for controlling the device
 - Screen orientation
 - Battery, Agenda, Phone Calling, GPS

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Roadmap (I)

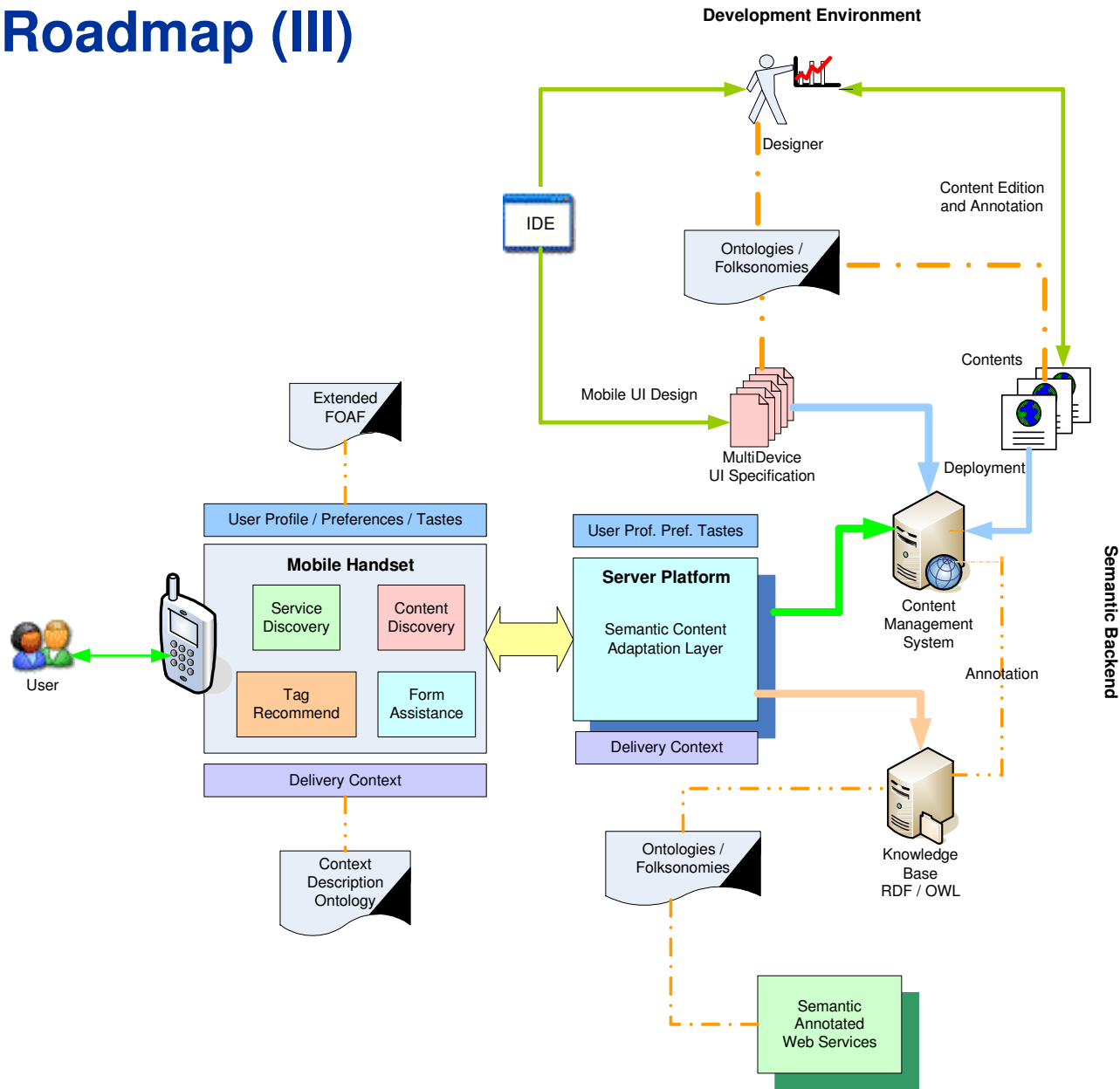
- The project is being funded by the Spanish Government
 - “Proyecto tractor”
 - 9 partners (companies, SMEs and research institutions)
- Towards a “Eureka CELTIC” project (2007)
 - 15 partners
 - 4 countries (Spain, Italy, Germany, France)
- MyMobileWeb evolution is centered around
 - Tools
 - Graphical tool suite for designing the screens and flow
 - Plugins that assist the developer in creation and deployment of projects
 - Innovative standards development and adoption
 - Device Description Repository API
 - Declarative Format for Applications and User Interfaces
 - Device Independence Techniques and languages (DISelect, DIAL, ...)
 - Alliances with other communities (Apache)
 - Mobile Web 2.0 and 3.0

Roadmap (II)

■ Development of the “Mobile Web 2.0 and 3.0” concept

- Semantic Mobile Web that fully exploits ontologies and folksonomies
- Ontologies / folksonomies for the description of user and delivery context
- Semantic-based content adaptation and repurposing maintaining the thematic consistency
- Semantic-based context-awareness
 - Exploiting semantic annotation of the user interface, contents and services
 - Content and service discovery depending on the user and delivery context (broadband, location, time, moment, objects nearby, ...)
- Enrichment of the declarative language
 - Incorporate Mobile AJAX technology transparent to the developer
 - Incorporate rich multimedia contents using CDF standards
 - Incorporate declarative Multimodal Interaction (MMI) mechanisms
- MyMobileSearch
 - Contextual search: Advanced algorithms that exploit page semantics, user and delivery context for producing optimized search results in the mobile web
 - Funded by Telefónica S.A.

Roadmap (III)



References

- MyMobileWeb is production-ready
 - Telefónica de España
 - Workforce Management System for Operation and Maintenance of fixed telephony network
 - 5000 users with different terminals (PDA, WAP, XHTML-MP ...)
 - BP
 - Petrol station auditory application
 - Light client (based on Pocket IE) and PDA MicroWebServer
 - User fills auditory forms off-line
 - Later, forms (stored as XML) are synchronized to backend
 - andalucia.mobi
 - turismo andaluz
- There are ongoing projects that are using MyMobileWeb
 - educamadrid.mobi
 - murcia.mobi (GoogleMaps and Google Earth integration)
- dotMobi Developers Portal
 - <http://dev.mobi/node/208>
 - <http://dev.mobi/node/83>

Who can participate in the MORFEO community?

Anyone who shares our dream and spirit ...

*“I am no longer captive to history.
Whatever I can imagine, I can accomplish”
Gary Hamel, “Leading the Revolution”*

Visit our website !

<http://www.morfeo-project.org>



