Serenoa Newsletter

Multidimensional Context-Aware Adaptation of Service Front-ends

November 2012 / n. 4

Serenoa News

The 2nd year of the FP7 Serenoa project is concluded. During this last phase of the project the theoretical background investigated during the first period was consolidated with the implementation of applications, authoring tools and definition of evaluation decisions. Mainly, the outcomes of the project include:

- A methodology for development of adaptive apps
- An innovative platform for context-awareness
- Authoring tools, software components and prototypes

The main goal of Serenoa includes extending and analyzing existing frameworks to accelerate the design and runtime of UI adaptation development. In this sense, several platforms are considered: mobile terminals, smartphones and tablets, head-mounted devices, web applications and accessibility issues.

These domains clearly involve distinct contexts of use. E.g. concerning different *users* (profiles, preferences, disabilities, languages…), *platforms* (desktop PCs, smartphones, tablets…), *modalities* (touch, voice, GUIs…) and *environments* (location, light and noise level, social aspects…).

Serenoa envisages several benefits, as: the improvement of the user experience, usability and accessibility levels, a cross-platform consistency, a short time to market and easy-to-use software tools for context-aware applications.

Four main beneficiaries are targeted by Serenoa: developers, end users, researchers, and CIOs.

More details about the project, the work conclude during the 2nd year, recent achievement and future plans are reported in this 4th newsletter.

In this newsletter you find further information about our communication channels and progress of the project. In case of suggestions, comments or doubts, please contact us at: serenoa@tid.es

M24 Deliverables

All the 12 deliverables planned for this 2nd year were successfully concluded and approved after the evaluation of the project reviewers. They were presented during the review meeting of the project held in November 12th in CNR – ISTI, in Pisa - Italy.

The deliverables cover several topics, such as: architectural specification, evaluation criteria and results, reference models, algorithms, language, authoring tools, framework, prototypes, and specific actions concerning: the advisory group meeting and the exploitation and standardization of the project.

The public documents are available online in the Serenoa website.

Events

CASFE'2012 Workshop

Date: *November 13, 2012*
Chairs: *Jean Vanderdonckt (UCL), Fabio Paternò (CNR – ISTI) and Francisco Javier Caminero Gil (TID)*

The first Serenoa workshop – CASFE'2012 was co-located with the AmI – Ambient Intelligence Conference at CNR – ISTI venue in Pisa- Italy. The CASFE Workshop is dedicated to discuss and promote the context-aware adaptation domain. The topics of interest involved include: mobile development, multi-modal applications, approaches for adaptation development, conceptual frameworks, prototypes, demonstrations and evaluation with end users.

http://www.serenoa-fp7.eu/casfe2012/

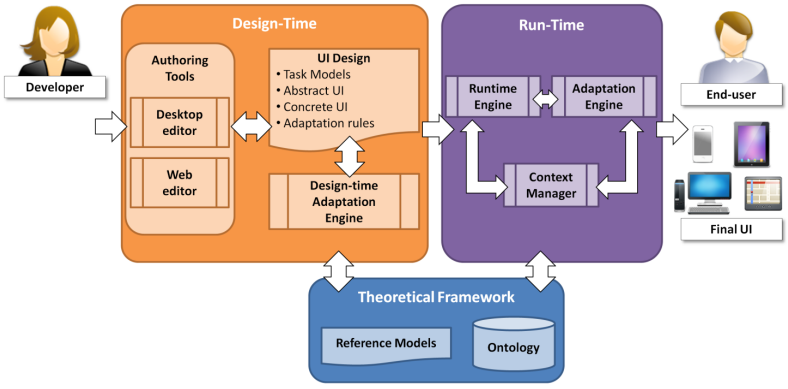
Framework

Serenoa Architecture

A second release of the Serenoa architecture has been released, providing an overview of the various modules that compose the framework: the **authoring tools** (using the **design-time adaptation engine**), the **runtime engine** that facilitates the integration with the **context manager** (storing context information) and the adaptation engine (that indicates the adaptation tasks to be performed).

Adaptation Engine

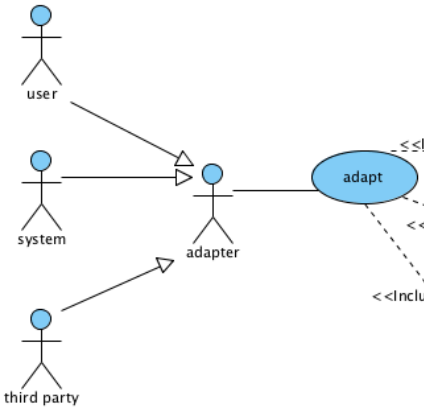
This module is one of the foundations of the Serenoa architectures, as it is in charge of indicating to Serenoa applications what adaptation tasks to perform and when. It uses context information provided by the Context Manager, the user interface specification and the adaptation rules supported by the application, in order to send adaptation tasks to the runtime engine.



Models and Library of Algorithms

Reference Models

The reference models of Serenoa consist of a set of models implemented in UML and MOF that formally defines and specifies the abstractions and concepts that are essential for performing the context-aware adaptation process. Associations, properties, respective methods and attributes are also covered.



Advanced Adaptation Logic

In a first phase of the project, a set of different algorithms that perform adaptation techniques were defined and implemented. During the second phase, such algorithms were combined in order to support the solution of 2 recurrent problems in the UI development domain: the selection of widgets according to the context of use and the definitions of an AUI model based in a Task tree.

Besides the investigation of such algorithms, the common requirements for AAL, user feedback types, and required steps for the adaptation cycle were also defined. For the next phases of the project a comparative analysis of such approaches is planned to be conducted.

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Last Achievements

Tools and Prototypes

Authoring environments

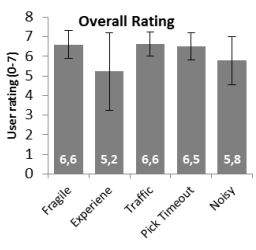
This module provides developers with software tools to facilitate application definition at design-time. SAP has developed an **Eclipse-based tool** which permits the creation of a Serenoa project, a text editor for the AAL-DL and ASFE-DL documents defining the application, and the uploading of application definition to a service repository, thus making it available for the rest of Serenoa modules. W3C has developed a **web-based authoring tool** based on the visual development paradigm. The visual design of the task model and a preview of how the final UI will be rendered in different devices will speed up the design process.

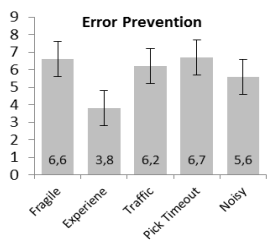
Warehouse management scenario

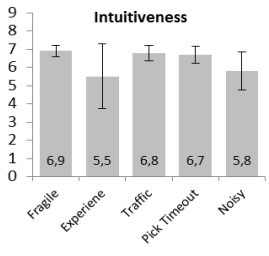
SAP has developed a scenario devoted to improve the picking process in a large warehouse. The prototype is based on 3 software modules: a **voice system** (headset + belt) for vocal interaction based on a set of commands, two **scanner units** (RFID/barcode readers) and a **head-mounted display** to provide additional visual (spatial) information to operators. The system guides operators in the picking process, speeding up the process of executing the picks of each order while assuring service quality –for instance, avoid that items in the same order for different customers are not mixed.

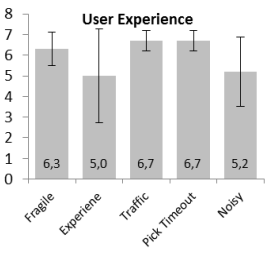
Evaluation

The second release of the deliverable dedicated to identify and analyse the relevant evaluation criteria for adaptive UIs has been already provided by the Serenoa consortium. In this document, a number of technical and user-based criteria for evaluating UI adaptation has been described. Among the technical criteria identified we mention e.g. the granularity of adaptation, its performance, the cost of adaptation; among the user-related evaluation criteria, there are e.g. the predictability of adaptation, the user awareness of adaptation, consistency of the adaptation, its continuity. Those criteria have been actually exploited for driving the evaluation activities on the adaptive prototypes developed so far: a Head-Mounted Display –based adaptive prototype for a warehouse scenario (SAP); a multimodal web-based application for car rental generated through a tool supporting a model-based approach (CNR); two web applications in an e-commerce scenario (W4); two prototypes in an e-Health scenario (TID). For them, initial evaluation with users has been planned and/or actually conducted and then reported in another Deliverable provided by the Project. The main goal of this preliminary evaluation work was to gather relevant user feedback on the adaptation rules that have been identified so far in the Project for the various adaptive prototypes. The preliminary feedback collected was overall good and promising. As an example, below you can find user ratings for some criteria and adaptation rules for the SAP prototype. By the end of the project the Consortium plan to have another round of evaluation.









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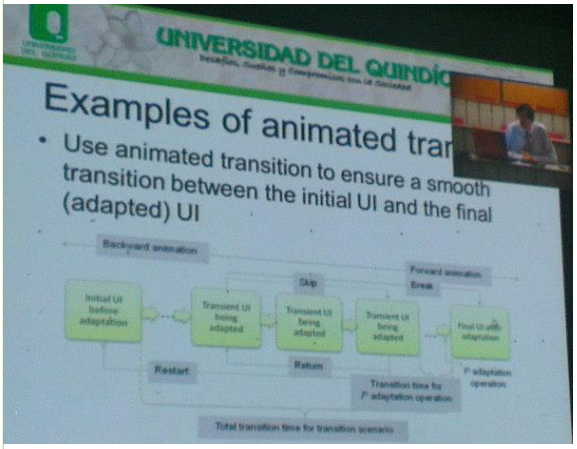
For the complete list of dissemination actions of the project, please access Serenoa website

Contributions to the W3C Model-Based User Interfaces Working Group

Serenoa partners are contributing to the goals of the W3C Model-Based User Interfaces (MBUI) Working Group. This group intends to develop Recommendations and other technical reports to facilitate interoperability across authoring tools for context-aware user interfaces for Web-based interactive applications. More information is available in the page of the group (http://www.w3.org/2011/01/mbui-wg-charter). The work on the **"Introduction to Model-based UI design"**, will soon be released as a W3C Note, defining what an MBUI approach is, explaining its benefits and shortcomings, providing a set of use cases for which MBUI design applies and defining part of the terminology used in this topic. This document is being co-edited by working group participants, including Serenoa partners (W3C, UCL, ISTI-CNR and CTIC). A **"Task Models"** document is also under development, for a final publication as a W3C Recommendation, which defines the highest level of abstraction considered in MBUI, with the researchers from ISTI-CNR as co-editors. In addition, an **"Abstract User Interface Models"** document is being produced for the definition of user interfaces with a high-abstraction approach, with no reference to implementation issues, neither in terms of interaction modalities nor in terms of computing platform. Its final version will be published as a W3C Recommendation, and it is being edited by researchers from UCL. Finally, a **"Glossary"** document will be published, providing a more in-depth definition of the MBUI-specific terms and concepts used in all the previous documents.

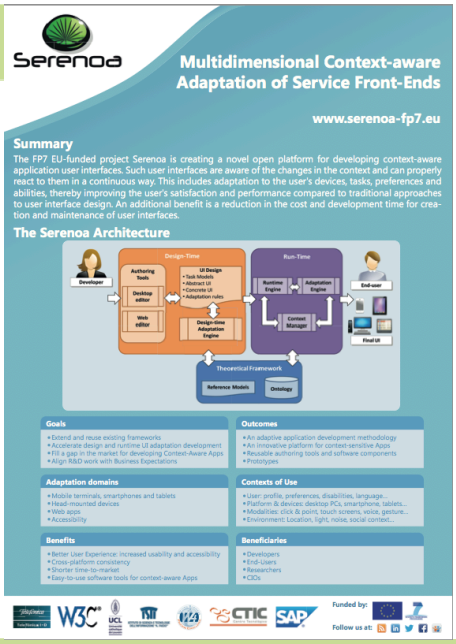
Keynote Speech



During the 2nd Congreso Internacional de Ingeniería de Software in Quindio – Colombia, Jean Vanderdonckt (UCL), in collaboration with Vivian Genaro Motti (UCL) presented the keynote speech entitled '**A Review of Animation Techniques for User Interface Design**'. The presentation took place on October 10th, 2012.
Animation has been considered a promising approach for adapting user interfaces preventing the end user disruption, a common issue in this domain due to the significant changes between original and adapted Uis.
The slides of the presentation are available at:
http://www.slideshare.net/jeanvdd/

Industrial Advisory Board Meeting

The 2nd Serenoa **Industrial Advisory Board meeting** was held in Paris on September 18th, gathering business experts involved in functional domains where adaptation technologies are essential. During this meeting, the project results to date were exposed and discussed. Experts confirmed that the industrial world has huge expectations in terms of self-adaptive and context-aware Service Front Ends, with numerous use cases foreseen. In 2012, some of the main factors driving demand for such system include the proliferation of all kinds of mobile devices, BYOD ("Bring Your Own Device" is a business policy where employees use their personal devices at the office place), and the economical crisis, putting pressure on CIOs lo lower the cost of new apps.



Announcements

Third MBUI Working Group Face to Face Meeting

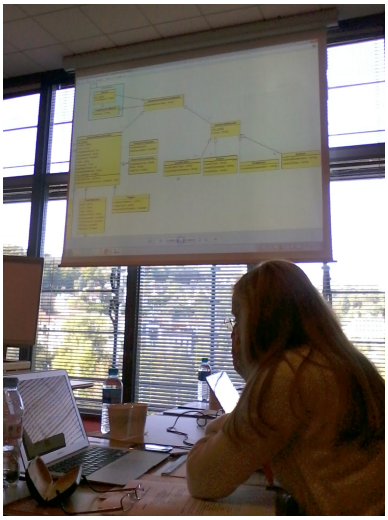
The third face to face meeting of the Model-based User Interface Working Group of W3C took place on October 29th and 30th in Lyon (France). The meeting was co-located with the W3C Technical Plenary and counted with more than 12 participants from 9 institutions, including experts from both industrial and scientific domains. The meeting goals were twofold:

- Refining the Introduction document: discussing the list of main benefits and improving the definition of use cases;
- Advancing the specification of the AUI model: clarifying current definitions and completing the concepts already modeled.

The participants of the meeting also discussed the relevancy of adopting a User Model, and the potential of an authoring environment that supports the specification of UI models at different abstraction levels as well as their respective transformations.

The meeting was concluded with a critical discussion about the main beneficiaries of such standards, their common understanding of the concepts defined by the models, clarifications about the actual scope of the outcomes, as well as the adoption of such standards.

The public drafts of the Introduction document, AUI specification and Glossary are planned to be concluded and published soon.



MBUI Working Group participants during the 3rd W3C MBUI Working Group, in Lyon (France)

Further information about this WG is available online at: http://www.w3.org/2011/01/mbui-wg-charter

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