ITEA
INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

PROJECT RESULTS

Adaptive Content Delivery

easing the development of network terminals and services

Wherever we find them – from TVs to stereos and telephones – terminals are changing radically. Thanks to digital technologies, greater bandwidth and affordable processing power, it is now possible to connect former stand-alone electronic products such as PCs, electronic organisers and playback devices to a network, whether to access information stored on central file servers, or to communicate with other networked products. These advances are accelerating the development of content, new types of terminals and the Internet as a communication and distribution network.

Worldwide connectivity on any kind of terminal

In future, people will come to expect worldwide connectivity with integrated multimedia services. They will require this wherever they are - at home, at work, or travelling between the two - and regardless of the terminal they use. Differences in interface and security between Internet-based and Intranet-based services will also disappear.

Although terminals (set-top boxes for TV, PDAs, mobile phones, network computers, on-board multimedia platforms in vehicles, and public information/ communication terminals) are different in screen size, colours, processing power and storage space, they are converging towards a single paradigm. All will offer diverse configurable applications and network interconnections. The applications will become pluggable or downloadable through the network (e.g. Java byte code).

Smart solutions

The @Terminals project has built solutions to support the development of new network terminals and the services they provide. These terminals must be reliable, cheap, flexible and energy-efficient. Time-to-market must be short.

The project has achieved its two main objectives:

- To define a new architecture that will provide adaptive content and applications for a wide variety of terminals.
- To create methodologies for rapidly developing terminals and services that comply with this architecture.

@TERMINALS (ITEA 99030)

Partners
Amena
Cefriel
CiaoLAB
ESI
Gedas
Olivetti
Philips DSL
Philips Research
TXT e-Solutions

Countries involved
Belgium
Italy
The Netherlands
Spain

Start of the project
October 2000

End of the project
December 2002

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Framework for terminals
Five demonstrators were used to validate the new architecture.

The project explored options for dynamic adaptation according to the type of terminal, as well as user preferences, possible handicaps, terminal usage environment, characteristics of the network, and the integrated use of different terminals. The main result was creating the architecture. This was accomplished by:

- defining needs and requirements
- specifying and designing the architecture

An iterative approach was taken not only to developing the architecture specification, but also to resolving two specific issues:

- colour fidelity on the World Wide Web
- and multimedia client-server architectures.

Because applicable standards were analysed and included in the architecture design, it was not necessary to propose standards. Nevertheless, several partners participated actively in a number of standardisation initiatives using the results of @Terminals.

Terminals engineering
New techniques for application and platform engineering were developed, the former focusing on two main topics:

- **Service engineering for rapid application development based on component integration**. This involved the definition of a so-called “service-engineering framework” based on component-based development so as to contribute to rapid development of new applications. All assets were specified in detail and, to make consistent use of them, an umbrella process was developed.
- **Methodology for the development of services**. This focused on two subjects: Human Computer Interfaces and Load Balancing, resulting in guidelines for the definition of human interfaces of public terminals, and for the development of e-services with a proper load balance.

The techniques for platform engineering centred on three main issues:

- **Process management**, where a process model called “Smiley” was developed. Based on the CMM model, this can be applied to system-level design.
- **Code generation for platforms**. This resulted in an operational compiler for a DSP architecture, consisting of a core compiler, a global scheduler, and a loop scheduler.
- **Verification methodology in system design**, where VeriSoft, SPIN and TorX – three verification methods in system design – were assessed in a large number of experiments. The results were gathered and described in a paper entitled “Terminal and application prototype descriptions.”

Major project outcomes

Dissemination
- 3 papers
- 6 presentations/demos at events

Exploitation
- 7 new products
- 3 cases for internal purposes

Standardisation
2 contributions to new standards (Embedded FINREAD and MHP Automotive)

ITEA Office
Eindhoven University of Technology Campus
Laplace Building 0.04
PO box 513
5600 MB Eindhoven
The Netherlands
Tel : +31 40 247 5590
Fax : +31 40 247 5595
Email : itea2@itea2.org
Web : www.itea2.org

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