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INNOVATION REPORT

High definition experiences in the home

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Introduction

Passepartout focused on the convergence of digital systems architectures and applications for integrated media ambiance in the home. This was achieved by coupling new devices from the consumer electronics (CE) industry to home networks for rendering scalable content for HDTV and interactivity in a seamless fashion. Integral to the concept was reactive access and interactivity via high-resolution graphics using object-oriented media. The project goal was to make a step forward towards ambient intelligence through mass personalisation of reactive content – practical elements of MPEG-4 and MHP-GEM as Blu-Ray Java (BD-J), supported by World Wide Web Consortium (W3C) standards such as synchronised multimedia integration language (SMIL) and synthesis/syndication in XML. Project demonstrations stretched far beyond infrastructure and basic services for home networks, affecting also content and human-system interaction via unique devices.

The architecture of the project was based on standards originally devised for content access using a personal video recorder (PVR). These standards are integrated in the project and extended to cover in-home distributed storage systems with primary and secondary sources from IP and broadcast streams, in conjunction with Blue-ray disks. The new architecture binds networks that supported the creation of new ambient experience concepts with home networks including novelties such as smart tables and pillows, moving 1990s home cinema beyond non-networked MPEG-2 set-top boxes (STBs) and DVD players to a new frontier in HD media on home networks [1,2,3]. These new devices allow the creation of true rich-media networking for family entertainment and participation in the mass media, using content packaging and personalisation to match the cultural and linguistic needs of society.

General goals

The goals of this project were based on four key technologies:

- HDTV and scalable content;
- Blu-ray and Mediacentre (PVR) technologies;
- Packaged rich interactive content flows; and
- Home wireless access network (802.16).

To promote scalable content for a broad class of terminals in a home network, Thomson had promoted the scalable video coding (SVC) standard in the common ITU-T ISO-MPEG video standardisation process as an extension of MPEG4-AVC [4]. In parallel, different clusters of partners melded various standards to adapt content to consumer needs and desires, thus matching languages, learning needs, opinions, lifestyles and habits in a fashion that conventional broadcast TV could not offer.

The consortium has demonstrated and validated a system concept as extension of a PVR. This included a number of new system components such as Blu-ray, wireless technology, MPEG-4-AVC, and TV-Anytime, as well as exciting innovations from university partners in topics such a reactive media, multilingual standards, software development frameworks and media ontologies, all of which formed the basis for the project's common-reference platforms.

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Vision in the project: “Maxima report”

Bringing complex technology into the service of society requires a clear vision of the social benefits that users and business partners can share. There has to be a clear balance between the benefits to the users and the economic viability for the service providers. The traditional broadcast industry had satisfied that need for many decades based on the established model of time-based TV channels. This business model had been weakly challenged by the VCR in the 1980s, and then strongly by the PVR in this decade. Nevertheless on its own the PVR had yet to be seriously embraced by broadcasters as a platform which would use the technology of TV-Anytime to offer packaged content and not time-based channels – linear content. However, the arrival of IP networks with peer-to-peer (P2P) technology and a host of new innovations such as greater user participation – i.e. Youtube – was a much greater challenge. The linear-content-only model of the broadcasters faced a serious challenge and, at the same time, the technical innovation of HDTV demands vigorous investment in new technologies. Yet, without a clear vision of what these changes mean to the viewers in the home, it is not possible to refine the architecture to satisfy the viewers’ needs. To aid the project in this task, the Maxima family was created as scenarios to allow all partners to share the vision of a future home; home where the parent(s) had infinitely more influence over the media than a simple remote control, but would also allow the children to develop as active participants according to their own skills and needs.

The future of broadcasting has its roots in the innovations that DVD media brought to the consumer and industry in the 1990s by allowing content to be packaged into components, mixing rich interactive content with accessible linear sequences. Packaging of content works well with disks and content portals, which give the user a greater range of interaction options than simple interactive TV via the ‘Red Button’. In this project, the vision of media-stream control is based on the Steven Spielberg’s vision of smart surfaces in the film Minority Report. Using gesture-based control, Maxima can manipulate content streams and their own media to present a complete media experience to her family.

Figure 1. Maxima at home sharing content with her son Thomas

Passepartout

The Passepartout project is based on a CE-architecture IP solution, which allows multiple HD media ICs to be used together on an IP bus [5]. This is an IP architecture than can be used to build simple

set-top boxes for MHP and BD-J applications, complex IPTV STBs, PVR-BD combination players, and PC media-player solutions. These are essential stream solutions which need to be used as power-efficient alternatives to expensive PC/console graphics ICs.

In the Passepartout project, the Blu-ray disc ecosystem has been extended beyond the broadcast/IP-enabled disc player to be part of an IP network using ambient experience technologies [6,7]. Using the Passepartout reference architecture, partners applied new technologies to create atmospheric effects building on Steven Spielberg's vision in Minority Report. A cluster of partners also extended the architecture based on Java/OSGi for disk/network portable applications as shown in Figure 2. Using this OSGi model, a form of service-oriented architecture (SOA) can be employed for high productivity service development using Web2.00 technologies.

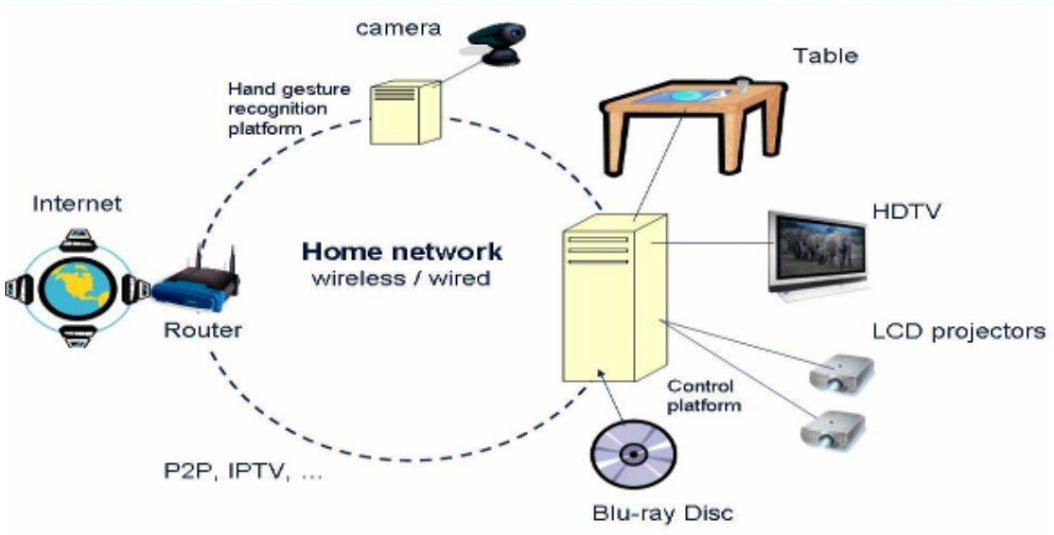

Figure 2. Role of home network for ambience experience with HD media

Conclusions

The Passepartout project has recently completed a two-year programme of co-operation under the aegis of ITEA. One of the key results of the project has been to bring the needs of European society into the architectures and media standards designed for rich high definition media in the home, i.e. Maxima Report. In the ITEA project, the partners focused on the issues of architecture and standards needed for European industry to participate in creating new consumer products and services. The new consumer media products will replace the STB and PVR of the current broadcast networks with network-based systems. These network-based systems offer an ambient-experience-based co-operation and interacting terminals that better serve the needs of a family for participation and localisation of non-linear content.

Future exploitation of the results of this project is balanced on the battle of the formats for HD media. This is a complex situation with the interests of the PC, games console, IC and CE industries in creative conflict.

References

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