

Expanding boundaries

Creating a world of seamless connectivity

With the incredible amount of audio-visual material available today, people expect to have access to this material anytime, anywhere and in anyway that suits them. To address this challenge, Philips initiated the ITEA Nomadic Media project to develop ideas with partners on ways of expanding the boundaries of our personal space, whether in the home or on the move, and create a world of seamless connectivity.

By Ian Crick

Illustrations/photography Philips, Storm Scott

Enabling the connected planet

Philips Applied Technologies, in cooperation with Philips Research, initiated the Nomadic Media project in June 2003. The project, completed in November 2005, was part of the ITEA (Information Technology for European Advancement) program. The Nomadic Media consortium of 12 partners included leading European mobile phone manufacturers, service providers, research organizations and universities. Primarily it addressed the overlap between infrastructure technologies (internet, GSM, LAN networks etc.), media services and content, the users of those services, and their media devices such as home media servers, personal media players, PDAs and mobile phones.

"Consumers today are confronted with too many restrictions in the way they can use their media and the devices on which they can enjoy it," says Nomadic Media project leader Ian McClelland of Philips Applied Technologies. "For a real nomadic-media experience, people should enjoy seamless transition between the different network infrastructures as they move from place to place, and should be able to access interactive services as and when needed."

People also want to be able to use their preferred media device. In the home environment, for example, they may have a home-media server, ➔



Nomadic Media

Nomadic Media usage scenarios

The usage scenarios investigated during the Nomadic Media project all had different requirements with regard to information needed by the user and the network infrastructure through which services would be provided.

The **At the Airport** scenario, led by Nokia Research and SysOpen, featured Robert – the central persona in the usage scenarios – arriving in the departure area where his mobile phone is automatically recognized and logged into the airport's services. He is welcomed with his flight details on his mobile phone and invited to check-in electronically, again using his mobile phone. On entering the departure lounge, his phone automatically informs him of special offers that correspond to his personal profile available in the airport shops, and tells him that a friend with whom he plans to travel is already in the departure lounge. The friends meet up and pass the time before boarding their flight by playing a computer game using their respective handheld media devices and a large public screen within the departure lounge.

The **On the Go** scenario, led by Philips Applied Technologies, Leuven, featured Robert on vacation in a city, sharing media files stored on his handheld media storage device with two of his friends. In this case sharing meant all three simultaneously listening to the same music. The music was shared using a short-range private wireless network – the Enstion wireless audio link system of Philips Semiconductors – that enabled Robert to give conditional listening access to his private audio collection.

Robert was also able to synchronize the content on his handheld device with that of his home media server using a secure Internet connection that directly connected him to his home without the need for a third-party service. The scenario included also voice control by means of an innovative headset developed by Philips Applied Technologies, Leuven. The headset featured microphones integrated into each earphone capable of identifying the voice of the wearer by means of advanced audio processing algorithms.

The **At Home** scenario, led by Philips Applied Technologies, Eindhoven, centered on friends watching a slide show of their recent vacation using a home media server at the home of Robert. The aim was to investigate ways in which people could contribute to a media show without disrupting their enjoyment of the social occasion. The At Home scenario team developed an application – the Collaborative Media Show – to explore various ways in which the friends could spontaneously add photographs to the slide show as it progressed. In one instance this was done from a mobile phone using a simple 'throwing gesture' with the wrist, and in another using the standard Bluetooth protocol to transfer a picture from the mobile phone directly into the slide show. The Home scenario team also developed the 'Watch with Me' application. This enabled the mobile storage device belonging to one of the visiting friends to automatically monitor the meta data embedded with the photographs in the slide show and use this data to extract similar

photographs from its own database that might be interesting to the participants. The aim was to use the underlying technologies including, in this instance, an accelerometer integrated into the phone to detect the throwing gesture and the combined use of GSM and WLAN home networks, to produce an interesting, engaging slide show with everyone participating.

The **Healthcare** scenario was led by Atos Origin. In this scenario Robert, a diabetic, was taken ill while on holiday and needed to contact his doctor urgently using his PDA. His doctor was in conference and out of reach for general calls but Robert could make contact through a 'Selective Presence and Availability' messaging service. This enabled his doctor to set access permissions for particular categories of patient. The message was routed to his doctor's PDA and requested him to call Robert urgently. His doctor contacted Robert and retrieved his files to review his recent medication. He concluded that a further examination was urgently required and arranged an appointment, using a Semantic Web Services Discovery application, for Robert at a local clinic. The results of the examination indicated a change of medication was required for which Robert's doctor needed further advice. His doctor used his PDA and the same Services Discovery application to search for specialist consultants who could help him make the best choice of medication and arranged an on-line consultation with one group. Robert finally received an on-line prescription and electronic authorization to collect his medication from a local pharmacy.

At the airport



1 Robert enters the terminal and is recognized as a passenger...

2 Robert uses his device to access personalized airport services.

3 Robert participates in a game with other travellers using a public screen.

whilst relying on a handheld device when on the move. So the user interface must be capable of automatically adapting to particular device and service combinations without sacrificing any critical functionality.

“ For a real nomadic-media experience, people should enjoy seamless transition between the different network infrastructures as they move from place to place, and should be able to access interactive services as and when needed. ”

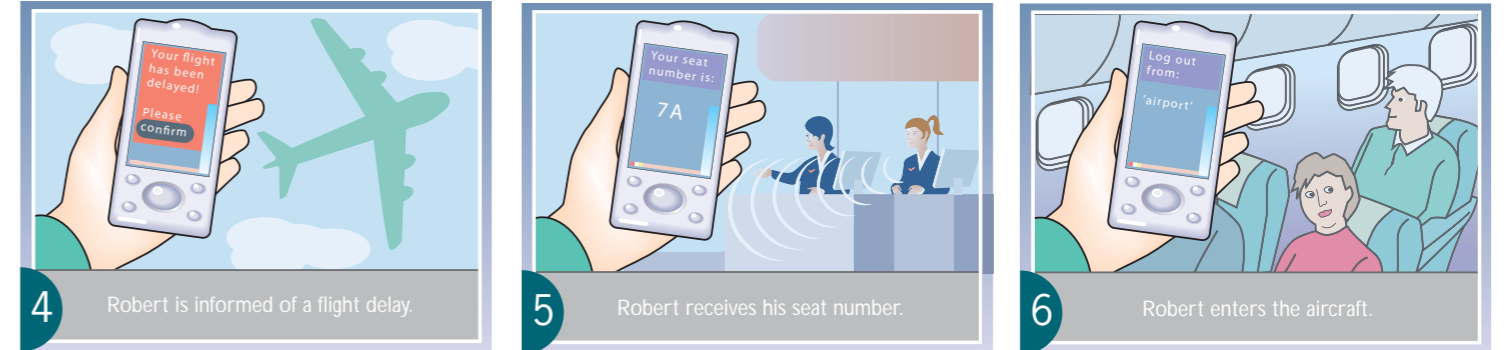
Ian McClelland, Philips Applied Technologies, Nomadic Media project leader

Exploring underlying technologies

“Nomadic Media focused specifically on investigating technologies in the areas of situational awareness, user interaction and interfacing between different network infrastructures,” says Boris de Ruyter, head of Philips Research’s Intelligent User Interfaces cluster. “Since our target was implementation in 2006-2009 we confined ourselves to the technologies available today that could, with some innovative improvements, be reasonably quickly industrialized.”

Philips Applied Technologies investigated technologies dealing with interoperability between home-based devices and portable devices in terms of both communications and applications. Technologies that enabled the intuitive sharing of media, conditional access to media and secure access to a home server over public networks were also investigated. For Philips Applied Technologies, Eindhoven, the focus was on an enclosed social context in a private setting – people at home. For Philips Applied Technologies, Leuven, the focus was on an enclosed social context in a public setting – friends together in public spaces. Philips Research cooperated closely with both parts of Philips Applied Technologies mainly contributing in the area of user interface development and media synchronization technologies.

To explore the underlying technologies, the project adopted a user-centric view



4 Robert is informed of a flight delay.

5 Robert receives his seat number.

6 Robert enters the aircraft.

focused on four usage scenarios: On the Go, At the Airport, At Home, and Healthcare. “These scenarios were developed by drawing on the knowledge and experience of the Marketing Intelligence departments of the respective partners,” stresses Ian McClelland. “The usage scenarios envisaged the way people would use these technologies in the future and were used as ‘the common theme’ throughout the project.”

An eye on the future

The results of the Nomadic Media project were presented as proof-of-concept demonstrations to the ITEA Review Board in Bilbao, Spain, on November 17. The demonstrations showed how the scenarios could be realized in practice and received a very positive reaction. In the case of Philips, Philips Applied Technologies supported by Philips Research is currently engaged in discussions with Philips Consumer Electronics to investigate how the technologies and applications developed during the project might be commercially exploited in the period 2006 to 2009. [PW](#)

i Ian McClelland • Philips Applied Technologies • ian.mcclelland@philips.com
Boris de Ruyter • Philips Research • boris.de.ruyter@philips.com

Extra info www.research.philips.com/password • Nomadic Media project • user-centered design • Ambient Intelligence

Nomadic Media partners

Industrial Organizations

Philips Research	the Netherlands
Philips Applied Technologies	the Netherlands, Belgium
Nokia	Finland
Euskatel	Spain
Atos Origin	Italy
Vodafone Omnitel	Italy

Small & Medium-sized Enterprises

Cybelius Software	Finland
SysOpen	Finland

Research Institutes and Universities

VTT	Finland
University of Oulu	Finland
Cefriel	Italy
University of Paderborn	Germany

ITEA is a strategic, pan-European Program that was launched in 1999 and will end December 31, 2008. It is now building on its success with a follow-up program, ITEA 2. ITEA 2 aims to further strengthen Europe’s position in the area of embedded software-intensive systems and services by stimulating and coordinating industry-driven, pre-competitive R&D.