

## An Architectural Foundation for Freeband Services Provisioning

According to the Freeband vision, we are at the edge of a paradigm change, which will move the centre of information and communication control away from the providers to the individual. It envisions a world in which people have access to a plethora of information services, wherever they are. Moreover, these services will adapt transparently to changes in the capabilities of the communication infrastructure, to whatever the user is doing, and to his personal preferences and needs. In this vision, almost anyone will be able to develop, market and provide services. In order to realise this vision, advanced methods and tools are required to facilitate the development and provisioning of new services.

The vision of ubiquitous, mobile, context-aware, personalised services has serious consequences for service providers. Currently, a few large telecommunications companies dominate the market for communication service provisioning. They develop, market and provide the service offering and thus have full control over the user experience. Once the ubiquitous and transparent communication infrastructure is realised and users can take control over their own service offering, existing telecommunications companies will have to compete with many new service providers for the user's favour and revenues. In the Freeband vision, almost anyone will be able to develop, market and provide services. In order to realise this vision, advanced methods and tools are required to facilitate the development and provisioning of new services. These tools should shield the developers from the heterogeneous nature of the communication infrastructure and the diversity in devices through which their services will be provided. In addition, these tools should provide the developers with intuitive notations for capturing the high-level design while largely automating

the transformation of their service designs to platform-specific implementations.

### The A-Muse project

The goal of the A-Muse project is to develop knowledge, technology and tools for the development and provisioning of advanced Freeband services, such that these services can be correctly designed, readily deployed, properly used and easily maintained. Advanced Freeband services are typically mobile, attentive, context-aware and personalized.

The project combines a number of developments that can contribute to the Freeband vision on advanced service design and deployment support: model-driven design,



# A-MUSE

as a way to raise the level of abstraction at which services are specified; service-oriented computing as a new paradigm for distributed computing; and semantic services as a solution for making service more 'intelligent'. These developments have recently drawn substantial research interest, and produce an impact on current standardization.

## Research questions

- how can we properly address issues of mobility, attentiveness, context-awareness, and personalisation in the design process?
- how can we model, evaluate and quickly prototype the usage of contextual information for service discovery, configuration, composition and other "intelligent" service management functions to provide better personalized services in pervasive environments?
- what levels of abstraction and platform-independence are needed to separate application domain, service and platform issues, so that design artefacts can be re-used to target different platforms, and applications can withstand changes in the underlying technology?
- how can we incorporate bottom-up knowledge in the design process, so that available components and infrastructures can be (re-)used?
- how can we capture and re-use the knowledge to perform various design operations, and to what extent and how can we automate these design operations?

## Main results

The main results planned in the project are:

- a conceptual framework that can be used for the design of services; a (formal) language that is aligned with this conceptual framework;

- a technique for representing semantic descriptions of run-time resources and information (user context, service capabilities, user needs and preferences);
- a service design and service architecture definition methodology;
- an integrated software tool to support design operations and analysis of design results (both behaviour models and semantic descriptions);
- case studies in which the above mentioned results are applied and evaluated.

## Economic benefits

The economic return of the project lies in the delivery of intuitive, fast and reliable methods and tools for advanced service development and deployment. In the future market for service provisioning, with many competing providers of Freeband-like services, these methods and tools will contribute to a competitive advantage of Dutch service providers.

## Freeband

The A-Muse project is part of the Freeband Communication research programme. For more information: <http://www.freeband.nl>

## Project website

<http://a-muse.freeband.nl>

## Project manager

Dr. Ir. Marten J. van Sinderen  
University of Twente  
Centre for Telematics and Information  
Technology (CTIT),  
P.O. Box 217  
7500 AE Enschede  
The Netherlands  
Tel: 053-4893677  
E-mail: [m.j.vansinderen@utwente.nl](mailto:m.j.vansinderen@utwente.nl)

