



PROJECT RESULTS

Embedded Electronic Vehicle Architecture

Meeting the challenge of integral electronic vehicle control



The next challenge in the evolution of cars is implementation of integral electronic control of in-vehicle and extra-vehicle functions in order to achieve active and predictive safety functions, enhanced comfort, improvements to the vehicle's ability to make progress on existing roadways and protection of the environment.

Integrating new in-vehicle functions

European vehicle manufacturers, together with their suppliers, are recognised world leaders in vehicle innovation and vehicle safety. To extend their competitive edge they invest substantially in R&D.

The task is to integrate different electronic systems, subsystems, modules and components, all delivered by different suppliers, into a complete vehicle network system. The challenge is to manage efficiently the constantly increasing complexity of electronically controlled functions in the vehicles of today and tomorrow.

The EAST-EEA architecture, its software engineering methods and their validation are prerequisites for this advanced technology. Through the project, Europe will be able to

influence and/or set the standards for manufacturers abroad and so sustain its automotive leadership.

The project results

EAST-EEA provided an open and layered middleware architecture with interfaces and services that support portability of embedded software modules on a high quality level. The middleware, as well as the communication layer concepts, were implemented and validated in demonstrators in the different automotive areas of body electronics, powertrain, chassis, telematics and human machine interfaces.

The software development model created by EAST-EEA consists of successive development and validation processes that act as a foundation into which all development phases and support software requirements can be incorporated for traceability. The techniques and tools developed in the project ensure conformity between requirements, design process, and the resulting products. The work resulted in a dedicated description language ADL that is available publicly.

In addition to the technical work, EAST-EEA provided a widely accepted technical glossary and elaborated a general framework for a future reference architecture. Suitable new business models for such embedded software have been defined. These not only cover the usual cost issues but also deal with the rather complex legal situation.

A common middleware

EAST-EEA enables effective in-vehicle electronic integration by

EAST-EEA (ITEA 00009)



Partners

- Audi
- BMW
- CEA-LIST
- Centro Recherche Fiat
- DaimlerChrysler
- ETAS
- IRCCyN
- INRIA
- Linköping University of Technology
- LORIA
- Magneti Marelli Sistemi Elettronici
- Mälardalen University
- Opel Powertrain
- Paderborn University – C-Lab
- PSA Peugeot Citroen
- Renault
- Robert Bosch
- Royal Institute of Technology
- Siemens VDO Automotive
- Siemens Automotive
- Siemens Business Services – C-Lab
- Technical University of Darmstadt
- Valeo
- VECTOR Informatik
- Volvo
- ZF Friedrichshafen

Countries involved

- France
- Germany
- Italy
- Sweden

Start of the project

July 2001

End of the project

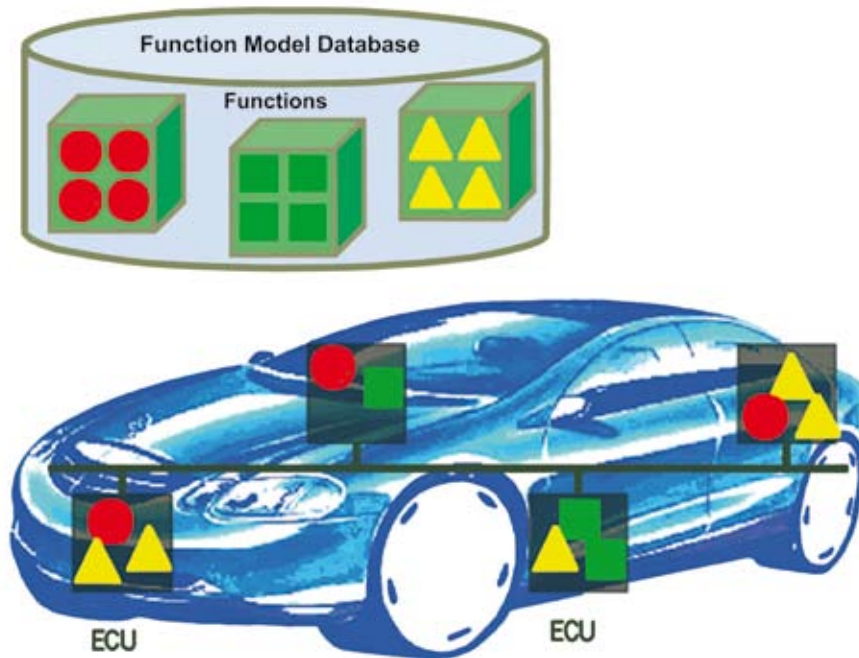
June 2004



PROJECT RESULTS

using an open architecture to achieve hardware and software interoperability. Subsystems and components provide additional cost-efficient services and features, which cannot be realised stand-alone. The layered middleware architecture provides interfaces

car designers to implement new functions, or adapt to new legal requirements through existing hardware and firmware during after-sales service. The diversity of cars on the market will also be maintained through brand-related features.



Various car functions are distributed over several Electronic Control Units (ECUs)

and services to support high-quality portability of embedded software modules. The architecture focuses on body electronics, power train, telematics, human machine interface, and chassis as well as the vehicle as a whole.

In tomorrow's vehicles high-level programming languages will enable

Thanks to the EAST-EEA approach, vehicle manufacturers will be able to use an integrated framework for software and communication interfaces, tool environments and rules. Suppliers will benefit from standard solutions and re-use will become possible. New vehicle models will be developed faster and product quality will be improved.

Major project outcomes

Dissemination

- The project glossary and the Architecture Description Language (ADL) have been released to the public
- 39 presentations and demonstrations have been given at conferences and fairs

Exploitation

The project results form the basis for the industry initiative AUTOSAR and the EU Framework 6 project EASIS.

Standardisation

While the project aimed to provide an open vehicle architecture, no formal standardisation efforts have been undertaken.

Patents

Since the project aimed for an open architecture no patents were applied for.

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

ITEA - Information Technology for European Advancement - is an eight-year strategic pan-European programme for pre-competitive research and development in embedded and distributed software. Our work has major impact on government, academia and business.

ITEA was established in 1999 as a EUREKA strategic cluster programme. We support coordinated national funding submissions, providing the link between those who provide finance, technology and software engineering. We issue annual Calls for Projects, evaluate projects, and help bring research partners together. We are a prominent player in European software development with some 8,000 person-years of R&D invested in the programme so far.

ITEA-labelled projects build crucial middleware and prepare standards, laying the foundations for the next generation of products, systems, appliances and services. Our projects are industry-driven initiatives, involving complementary R&D from at least two companies in two countries. Our programme is open to partners from large industrial companies, small and medium-sized enterprises (SMEs) as well as public research institutes and universities.



Σ! 2023