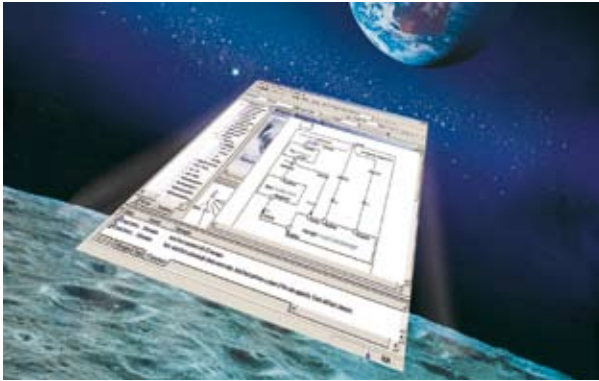




PROJECT RESULTS

The best of both worlds

a powerful real-time UML



In today's high-tech business environment the ability to rapidly master complex software development is essential. This is a key issue in design technology. UMSDL results are currently allowing software developers to advance from the UML set of notations to an efficient language supported by powerful tools, and thus improve Europe's position as a major player in the market for tools for real-time software design.

Alternative routes

There are currently two main options for real-time software design:

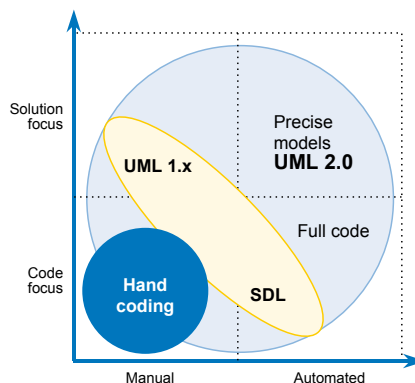
- UML (Unified Modelling Language), proposed and standardised by the OMG (Object Management Group). UML gathers and unifies the most widely used Object-Oriented (OO) notations. The definitions are cosmetic with few semantic foundations (Ovum report).
• SDL (Specification and Description Language), a well-proven language invented in the 1980s and standardised by ITU (International Telecommunication Union). SDL incorporates the most advanced capabilities: graphical and textual notations, object orientation, simulation,

automatic verification, testing and code generation, although there's no facility for complex data modelling. Its influence has grown in the telecom, avionics and automotive industries. It originated in Europe, where the biggest users (Alcatel, Siemens, Ericsson, Nokia, and Philips) and the most active standardisation body (ITU) are.

A likely future scenario:

- Due to strong marketing and recognition by OMG, UML will remain the standard notation for most new software projects in future.
• UML will become a generalist notation: one size fits all.
• SDL will continue to be used for maintaining and improving large existing systems.
• SDL, which is particularly well suited to distributed real-time software design, fits current (and future) users' needs.

This would not benefit the software industry, because the dissemination of the current UML will fail to realise the potential that advanced technology (e.g. SDL) can achieve. In addition, today's users (mostly Europeans) risk losing investments in millions of SDL lines.



Defining the next UML to support model-driven development of advanced systems

UMSDL (ITEA 99028)

Partners

Parvis
Politecnico di Milano
Telelogic Technologies

Countries involved

France
Italy

Project start

November 1999

Project end

December 2003

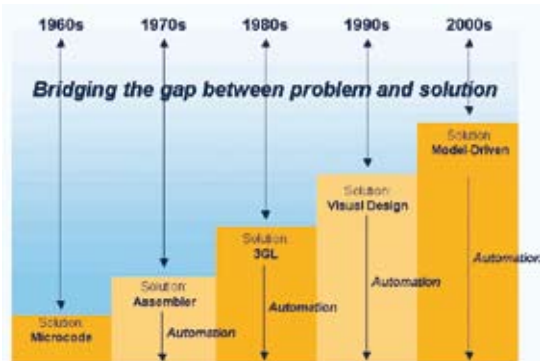


PROJECT RESULTS

A powerful real-time notation

UMSDL has created what specialists in methods and tools for real-time care have needed for a long time: UML Real-Time. The UML notation has become a powerful real-time UML with SDL technologies and tool kernels. The project has:

- incorporated into UML characteristics that make it more valuable for real-time software development (simulation, verification, automatic coding)
- provided efficient support tools
- accelerated the dissemination of UML, extended with unique features of SDL, in real-time systems development. Users can now benefit from the advantages of UML (popular, multi-domain) and have access to the unique features of SDL.
- secured investments in SDL in the telecom, avionics and automotive sectors, particularly in Europe.



The impact of UMSDL

UMSDL is contributing to improving Europe's competitive position in:

- **Telecommunication:** with the most mature users of SDL worldwide (Alcatel, Ericsson, Siemens, Nokia, Thomson, and Philips). The big challenge for this community is to preserve investments with a smooth migration towards UML-RT.
- **Automotive:** a newcomer to SDL. Distributed architecture and standardisation (OSEK) are making use of the expressive power and rigour of SDL.
- **Avionics and Space:** SDL is the best choice for reliably incorporating communications and distributed architectures into safety-critical designs based on synchronous software and purely deterministic behaviour.

- **Industry:** this highly fragmented market is still following the mainstream UML without appreciating the value of SDL.
- **Any sector making real-time software:** UMSDL results contribute to bring better productivity, quality and time-to-market.
- **Technology vendors:** The UMSDL tools allow European vendors to increase market share in the rapidly growing market for software design tools (30% per year).

The project results

UMSDL has combined the advantages of UML with SDL in order to offer a powerful real-time UML notation. The project team has defined, demonstrated and experimented the process, notations and tools appropriate for the development of complex, real-time, distributed and embedded systems. The results have been incorporated as extensions of Telelogic's new generation of tools (Tau Generation 2), tested in about 15 industrial pilot projects, and disseminated worldwide. Parvis is using the project outcomes for the development of its next generation systems for quality control in banknotes. Politecnico di Milano uses the project outcomes for consulting and teaching at both academic and professional level.

The partners have also contributed to the following important standards organisations:

- ITU, where SDL evolutions have been proposed and integrated into the standard.
- OMG, where Telelogic has participated in the definition of UML 2.0.
- Telelogic is also involved in defining guidelines for the use of UML at ETSI.

Major project outcomes

Dissemination

- 11 publications
- 11 presentations at conferences/fairs

Exploitation

- 1 new product
- 2 new services of which one is intended for internal use

Standardisation

5 contributions to standardisation bodies (OMG, ETSI, ITU)

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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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 7,000 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.



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