



PROJECT RESULTS

Developing market enablers

Retargeting embedded commercial-off-the-shelf components

To remain competitive, European companies must cut costs, reduce time to market, differentiate their offers and innovate. The challenge is to move from a performance-centred approach to one focused on complexity without loss in performance or support. MERCED has delivered various and precise enablers to encourage the emergence of a market for reusing real-time and embedded (RT/E) software components. These will enable industry to augment software development productivity by properly retargeting appropriate commercial off-the-shelf (COTS) components aimed at the embedded systems market.

and assembling COTS components instead of developing specific software. The main benefits are shorter development times and cost reductions. Quality is also improved as reusable software components are more robust since they have already been applied by multiple users in different domains.

New paradigms required

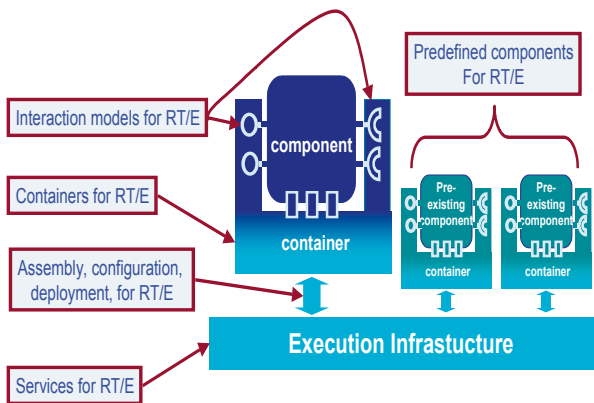
To ensure and validate the development of systems based on RT/E components, it is necessary to have a *development environment and execution platforms whereby reusable RT/E components can also be retargeted*. However, these new challenges for RT/E components are not supported by existing models.

New paradigms are required to take such challenges into account. A very promising approach is the *component/container* model that complements object orientation. This provides clear separation between the business logic then hosted by the component and the technical logic then hosted by the container.

Encouraging component reuse

Software is widely acknowledged to account for more than 80% of system development effort. Increasingly, software organisations are facing pressures to reduce time to market and costs, while increasing product quality and reliability. The use of COTS software is therefore becoming more common and the emerging software component market is expanding.

However, most current effort is aimed at building components



As RT/E systems become increasingly complex, industry has recognised the need for a transition from the design of individual devices to that of complete systems based on the integration of software components reusable with new targets.

In a component-based development scheme, designers build up complex systems by browsing catalogues from multiple vendors

MERCED (ITEA 03002)

Partners

- Axlog
- CEA-LIST
- DS2
- ENEA
- ESI
- MSI
- Robotiker
- Schneider Electric
- Telvent
- THALES Communications
- TIMA-INPG
- Trialog
- UPM

Countries involved

- France
- Spain
- Sweden

Start of the project

July 2004

End of the project

July 2006



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while little effort has been made to ensure that these components are easily exchangeable and reusable. A software component market place cannot exist without appropriate definition of standards to facilitate trans-domain component reuse. MERCED has defined an abstraction layer concerning interfaces and technical services required by the application software and made a reference implementation based on representative middleware and component technologies.

Supporting software-intensive systems

MERCED aimed at enabling a real development of new businesses that serve European industrial designers of software-intensive systems. Principal results are:

1. An infrastructure for reusable RT/E components employed in a standardised manner.
2. A framework for RT/E systems consisting of:
 - A platform composed of *an execution infrastructure* providing technical services and *the containers* to fill in the space between the components and execution infrastructure;
 - The *administration* service enabling assembly, configuration and deployment of the components and their containers;
 - A tool enabling the *construction of the containers* according to the application requirements.
3. Realisation of various execution infrastructures and their validation, including ones based on:
 - The Open Systems and the Corresponding Interfaces for Automotive Electronics (OSEK) real-time operating system specification – an automotive industry standard likely to be endorsed by many other sectors;
 - The real-time object request broker (RT-ORB) with operating system embedded (OSE) on general purpose and digital signal processors, used in software-defined radio (SDR); and
 - A metal-processing application.
 Execution support was also developed in SystemC.

Major project outcomes

Dissemination

- 15 publications
- 25 presentations and 11 presentations/demonstrations at conferences/fairs

Exploitation

- Four new product versions are being developed as a direct follow-up to MERCED:
 - eV-Define, eV-Implement and eV-Resolve that form the eV-Manage suite (eV-Manage is a web-based tool based on variability management technology developed in the framework of various European projects)
 - ECU-Sim with personalities for OSE and OSEK – ECU-Sim is an environment for developing and debugging complex real-time applications on host stations without target equipment
- One module for the existing Generic Modeling Environment by Vanderbilt University is formed by a metamodel for microCCM and a plug-in for CORBA component model (CCM) artifact generation.
- One new product called eV-Manage Server that is the backbone of the MERCED project and provides connectivity, persistence, security and business logic to the other MERCED modules.

Standardisation

- Contribution to the Object Management Group (OMG): quality of service (QoS) for CCM

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