



CESAR

Cost-efficient methods and processes for safety relevant embedded systems



EXECUTIVE *summary*

CESAR aims to reduce costs of safety relevant embedded system development by improving methods, processes and tools for the system engineering and by introducing fundamentals for interoperability including the Reference Technology Platform (RTP) in Automotive, Aerospace, Automation and Rail.

CONTRIBUTION *to SRA*

CESAR contributes to the following SRA high-level targets:

- > Integrated chain of European sourced tools, based on ARTEMIS results, to support embedded systems development from user requirements through system design to system-on-chip production.
- > Generation of at least 5 'radical innovations' of a paradigm-breaking nature similar to the microprocessor and digital signal processing. A general indicator of the innovation will be a doubling of the number of relevant patents granted annually to European companies engaged in ARTEMIS.
- > To close the design productivity gap between potential and capability, CESAR will:
 - reduce system design cost by 50%
 - reduce development cycles by 50%
 - reduce re-validation and re-certification time and effort by 50%
 - achieve cross-sectoral reusability of embedded systems

MARKET INNOVATION *& impact*

CESAR will increase the productivity and, therefore, the competitiveness of European manufacturers through shortening development time and reducing the certification costs of safety-critical embedded systems while ensuring the quality and safety

properties. Covering the entire product life cycle, CESAR targets the following industrial objectives:

- > Reduce lead time and time to market
- > Reduce Non Recurring Costs (redesign, V&V activities costs, ...)
- > Improve maturity at entry into service (EIS)
- > Ease the introduction of technological breakthroughs while minimizing risks
- > Re-enforce a strong product lines concept
- > Develop the reuse approach in design, V&V and certification/qualification processes
- > Efficiently manage HW and SW obsolescence
- > Increase availability and long term support for the tools

RELEVANCE & CONTRIBUTIONS *to Call 2008 Objectives*

The share of the value for embedded systems components in the value of the final product is expected to increase to a level well above the market growth and almost twice the growth of general R&D expenses. CESAR is positioned within the ARTEMIS Industrial Sector and directly addresses key ARTEMIS challenges within the Sub-Programme N°1 of the Call (Methods and Processes for safety relevant embedded systems):

- > Strengthening the European SME sector by creating new market opportunities, improving interoperability, easing access to the embedded systems market and spinning off new technologies
- > Contributing to the creation of an integrated chain of European sourced tools
- > Contributing to the reduction of non-recurring cost in embedded systems development as well as accelerating the time to market for embedded systems

- > Managing the exponential complexity increase in embedded systems while maintaining or reducing development costs
- > Reducing the time and effort required for certification/qualification upon changes and during system evolution
- > Improving product maturity at entry into service,
- > Pushing interoperability of components within and across the covered domains, thus contributing to cross-sectoral reusability of embedded components.> Reducing the time and effort required for certification/qualification upon changes and during system evolution
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R&D INNOVATION *and technical excellence*

CESAR addresses the industrial needs for embedded system development for safety relevant applications by developing ultra-reliable embedded components for use in an extremely competitive global market requiring drastic cost reductions.

One of the major CESAR objectives is to reduce the costs for the development of safety critical systems while ensuring the quality and safety. CESAR believes this cost reduction can be achieved in system engineering by discipline improvements and by establishing a seamless tool chain. Therefore CESAR takes the following approach:

- > Introducing innovations in RE (Requirements Engineering) tools and methods
- > Introducing innovations in CBD (Component Based Development) tools and methods and extending CBD with multi views and multi criteria
- > Combining improved RE and Design System Engineering since close collaboration between RE and CBD is necessary to achieve the ambitious CESAR goals

Only by integrating these disciplines and providing adequate tool support can a seamless tool chain (CESAR Reference Technology Platform - RTP) emerge that will give free rein to realise the full potential of the CESAR approach. This CESAR RTP is not based on a specific implementation or technology, but on an "open specification", the CESAR Interoperability Specification (IOS).

Through its strong commitment of a wide community of major end-users, tool vendors and technical experts from academia and industry, CESAR is ideally positioned to create sustainability impact around the CESAR Reference Technology Platform (RTP).

PROJECT *partners*



www.artemis.eu



PROJECT COORDINATOR

Josef Affenzeller

INSTITUTION

AVL List GmbH

EMAIL

cesar@avl.com

WEBSITE

www.cesarproject.eu

START

March 2009

DURATION

40 months

TOTAL INVESTMENT

€58.5 M

PARTICIPATING ORGANISATIONS

54

NUMBER OF COUNTRIES

10