ARTEMIS Call 2009 Project
100203

iFEST

industrial Framework for Embedded Systems Tools

EXECUTIVE *summary*

iFEST will specify and develop an integration framework for establishing and maintaining tool chains for engineering complex industrial embedded systems. The project will promote standardisation of integration technologies with an emphasis on open tool chains targeting HW/SW co-design for heterogeneous and multi-core solutions, and life cycle support for an expected operational lifetime of several decades.

CONTRIBUTION *to SRA*

iFEST contributes to several high-level targets set out in the SRA:

- a potential reduction by 20% of both time-to-market and engineering lifecycle costs, including the cost of poor quality
- improved ability to manage complexity while reducing development effort
- integrated tool chains supporting the whole engineering life cycle, including independent hardware and software
- well-functional tool chains for HW/SW co-design
- efficient integration of validation- and verification tools into all parts of the process flow
- software and hardware instantiation from abstract high-level models.

MARKET INNOVATION *& impact*

- iFEST aims to remedy the highly fragmented market of tools for embedded systems by providing an open tool integration framework that can be used across domains.
- The iFEST open integration framework will reduce the problem of tool lock-in, which is currently a major barrier for a well-functioning tool market.
- iFEST will enable industry to shift from a situation where tool usage in practice is sub-optimal to one where innovative products and services can be designed much more efficiently due to well-functioning tool chains.
- European tool vendors are leaders in open tool chains, which will prove to be a competitive edge for the future. For iFEST, such tool chains are validated by major industrial companies. Enabling the exchange of individual tools will open up market opportunities, in particular for tool vendors in the SME sector.

RELEVANCE & CONTRIBUTIONS *to Call 2009 Objectives*

iFEST is in compliance with *The ARTEMIS-JU 2009 MASP which defines a strategy aiming to form an agreed set of specifications dedicated to well-defined applications and aspects of the complete design tool chain, referred to as a Tool Platform*.

iFEST is also in compliance with the main goals of ASP5 as it enables:

- transition from separate sectoral, vertically structured tool markets to a horizontally structured one.
- establishment of tool suites to support massive real-time data-processing in multiple domains.
- abstract modelling combined with HW/SW co-design for systems with multi-cores, which enables composition of platform independent software over highly concurrent systems.

As required by the Work Programme of the Call, iFEST contributes to the following:

- establishment of a common design tool platform for advanced multi-core solutions.
- establishment of tool suites that can be integrated and interoperated to support massive real-time data-processing.
- system-level model-based tools and design processes that contribute, in an integrated fashion, to elevating the abstraction level for architecture exploration and product design.

Project results will be demonstrated with application case studies derived from several application domains, such as data intensive multi-sensor applications and control systems.
One of the main contributions of iFEST is to produce a set of interface and service definitions that can be advanced to become standards; thereby supporting ARTEMIS' ambitions for cross-domain synergies.

R&D INNOVATION *and technical excellence*

In current practice, only parts of the engineering life cycle are supported by tool chains, including those supporting model based development. The use of integrated tool chains, which support abstract modelling combined with automated transformations to low-level software/hardware, will be a major step forward for the industry.

iFEST will offer an integration framework that will allow different tool chains to be efficiently derived and maintained. Key ingredients in the framework include shared concepts, models, meta-models, transformations and tool integration services. Through the integration framework, iFEST will provide an enabling technology for full model-based development encompassing requirements engineering, analysis, design, implementation, verification and validation.

A key feature of the iFEST framework is that a tool in the tool-chain can, with minimal effort, be exchanged with another equivalent tool. This reduces the problem of tool lock-in iFEST will make progress beyond the state-of-the-art by appropriately integrating modelling and HW/SW co-design. The iFEST framework will allow a smooth transition from abstract models to low-level code and components, and moreover will enable integration of state-of-the-art tools for design-space exploration where targets are heterogeneous and/or multi-core.

iFEST will address the embedded system's life cycle from requirements to product demobilisation.

PROJECT *partners*

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iFEST

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START
April 2011

DURATION
36 months

TOTAL INVESTMENT
€15.8 M

PARTICIPATING ORGANISATIONS
20

NUMBER OF COUNTRIES
8