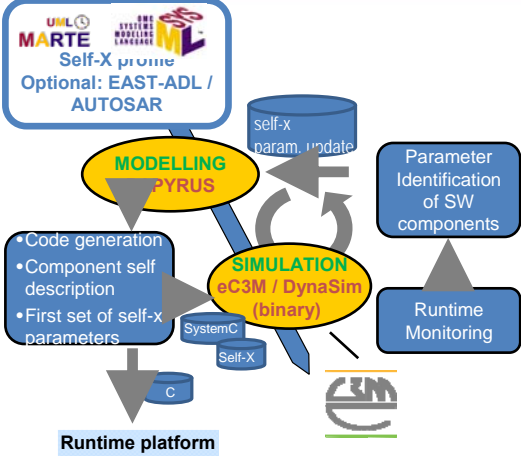


RT 
DESCRIBE


Iterative Design Process for Self-Describing Real-Time Embedded Software Components

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Objectives of the project and challenges

Self-X - mastering system's complexity

- Complexity of upcoming embedded systems can not be managed by traditional methods
 - Exemplary application area facing this problem: automotive domain 
- Self-adaptive systems and self-organization paradigms are promising approaches to tackle arising challenges.
- No suitable design methodology for self-adaptive systems allowing design and evaluation of self-adaptive behaviour:
 - Today's systems are developed statically at design time and lack the ability to describe their structure and status at runtime. Inevitable information for self-adaptive systems to identify the context and adapt adequately
- Adaptability of systems needs to be well defined, especially in real-time embedded systems

⇒ Need for early and iterative simulation with validation of adaptive behaviour ⇒ ease optimizing and refining the design.

Creation of long-term strategic French-German alliances

Contacts between CEA LIST and Fraunhofer ESK began in April 2008 with the first workshop between clusters  and . CEA LIST and Fraunhofer ESK (cluster members) have expertise in very similar fields including communication and software systems.
⇒ First step for a long-term partnership and cooperation between the two institutes and associated clusters, in particular in transport domain.
⇒ First exchanges of clusters in December 2008 with conclusion to propose first collaboration projects in the domain of new methods, tools and architectures for embedded system development. RT-DESCRIBE is an answer to this objective focusing on introduction of new paradigms for a more efficient implementation of automotive, and more largely transport embedded systems.

Expected results and market opportunities

Component-based design paradigm in automotive systems has become import with the creation of AUTOSAR several years ago.
• Now: integration of safety concerns into AUTOSAR according to the new ISO standard 26262.
• Next technological steps: more dynamic interaction facilities among components for controlled update, vehicle maintenance or car interactions with road infrastructures and other cars. These facilities are also important for other domains (e.g. railways, embedded infotainment)
⇒ Foreseen new services will require more dynamic system adaptation together with a high level of confidence of their impact on safety and performance related aspects. RT-DESCRIBE will propose a basis to answer to these new needs.