



the Brainware company



R&D and Topcased (led by Silvia Mazzini)



- Study and experimentation of system and software engineering innovative techniques
- One of the Intecs main capacities acquired through
 - Well-established cooperation with major Italian and European industries, academic and research institutes
 - R&D projects
 - partially funded from European and national organizations
 - EC
 - ESA/ESTEC
 - Italian Space Agency
 - MIUR (Italian Minister of Research)



- *Provide a "forum of experts" in Model Driven Engineering*
- *Share of knowledge and expertise across Intecs divisions*
- *Maintain and improve the expertise through training, workshops, conferences, papers, etc.*
- *Promote R&D initiatives*



- Reference techniques
 - Model Driven Engineering
 - Reuse and Domain Engineering
 - Predictability, Dependability
 - Model Checking
- Focus on the Unified Modelling Language (UML) and other OMG Standard Modeling Languages (SysML, MARTE, etc.) since 1996
- Applications to the domain of embedded systems since 2001
 - Definition of the HRT-UML Method since 2001
 - Participation to the definition of the HRT-UML/RCM Method in the ASSERT Project in 2004
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- **ASSERT (Automated proof-based System and Software Engineering for Real-Time Applications), CE 6PF Integrated Project, Prime ESA/ESTEC**
 - HRT-UML/RCM Methodology and Tool, supporting the Ravenscar Computational Model (RCM)
- **COrDeT (Component Oriented Development Techniques), ESA/ESTEC Contract, Prime Astrium**
 - Definition of the domain engineering methodology, languages and tools, based on OMG SysML and HRT-UML/RCM
- **System and Software Functional Requirements Techniques, ESA/Estec Contract, Prime Intecs**
 - Methodology and guidelines for system and software co-engineering based on OMG SysML

Current R&D Projects (1/2)



➤ Composition with Guarantees for High-integrity Embedded Software Components Assembly (CHESS), ARTEMIS Call 2008 Project, INTECS coordinator

- Model driven and component-based engineering for high-integrity embedded systems (methodology and toolchain development)
- Exploring dependability and predictability non functional properties
- Multi-domain application
 - space, telecommunications, railways and automotive



➤ Certification of Software-intensive Systems with Reusable Components (pSaferCer), ARTEMIS Call 2010 Project

- Composable and reusable safety certification

➤ Open Platform for Evolutionary Certification Of Safety-critical Systems (OPENCROSS), FP7, TECNALIA Coordinator

- Common certification language and platform



- Next Generation Requirements Engineering (NextGenRE), ESA/ESTEC Contract, INTECS Prime
 - Enhancing requirements representation to capture the semantics of engineering and mathematical constraints
 - Enabling full integration into a well-defined MBSE process

- Time-predictable Multi-Core Architecture for Embedded Systems (T-CREST), FP7 STREP
 - Platform solutions for time-predictable multi-core and many-core system.

- Functional Requirements and Verification Techniques for the Software Reference Architecture (FoReVer)), ESA/ESTEC Contract, INTECS Prime
 - Systematic approach for formal verification of functional and non-functional system and software level properties around MBSE and MDE



- Intecs started the development of tools in Eclipse (Ecore, EMF, GMF) in 2004 within the ASSERT Project

- Since 2004 Intecs works on the use/customization/extension of tools both in Eclipse and TOPCASED
 - MDTPapyrus
 - TOPCASED SysML
 - TOPCASED Requirement Tool

Current interests related with TOPCASED/Polarsys



- The CHESS project is managing to provide open-source tools (possibly in TOPCASED)
- Intecs is interested to cooperate with the Polarsys initiative, that is managing the TOPCASED future business model
 - As Technological partner
 - Contribution to TOPCASED maintenance/development
 - Promotion of its use in the industrial context
 - Provision of training and consultancy
- Development of Intecs R&D capabilities in France