

PROMETEO

Plataforma Tecnológica Española de
Sistemas con Inteligencia Integrada



Métodos y Herramientas de Diseño

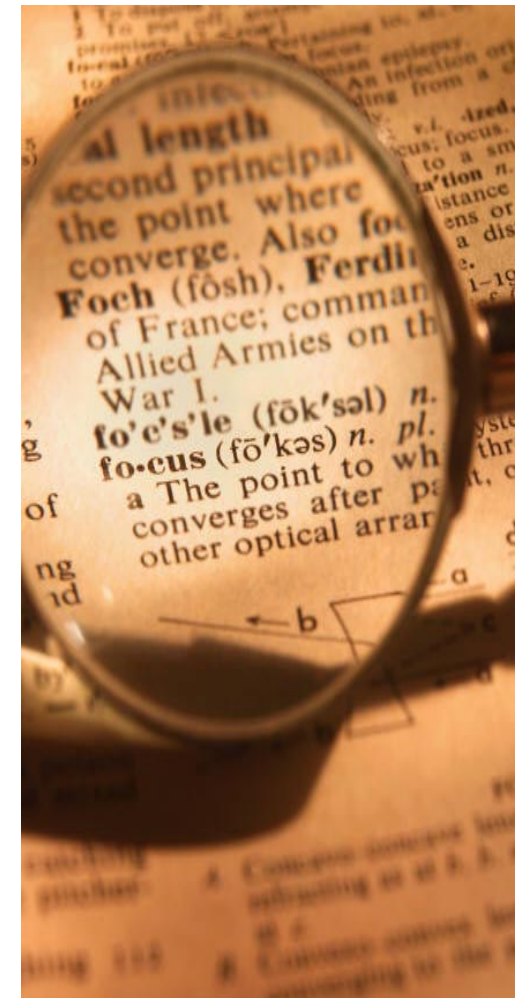
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18 Diciembre 2006

Auditorio Kursaal (San Sebastián)

IT Competitiveness

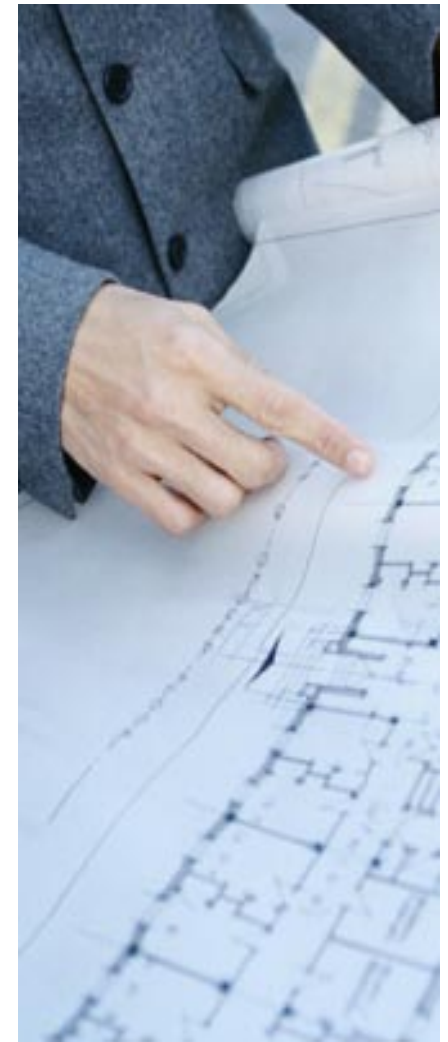
- Software is a key factor for industry competitiveness in an increasing number of sectors
- ESI focus is in helping companies to increase their capacity to produce and deliver high quality software systems and services in time and within budget and thereby improving their competitive advantage.
- Embedded Software as key research and technology transfer area.



- **Quality Technologies**
 - Software Process Improvement
 - Total Quality Management for software-intensive organisations
 - Quantitative management techniques and metrics to establish IT and business alignment

- **Productivity Technologies**
 - Systematic Reuse, Product Family Engineering & COTS
 - Model-driven Development
 - Service-centric Enterprise Interoperability

- **Key transversal Technologies**
 - Information Security Management



- ✓ 5 years in the area of **Model-Based Developments**: Models and abstractions to derive systems and foster reuse (MDA, MDD, model validation etc).
- ✓ 10 years in the area of **Product Line Engineering & Systematic Reuse**: Managing variability of complex software projects. Specific tools and techniques for embedded software.
- ✓ 12 years in the area of **Software Development Methodologies**: Providing management and engineering best practices and frameworks for software process improvement, in all application domains (CMMI, Eclipse Process Framework, etc).

Areas de interés / Experiencia

Sistemas

Entornos

Espacios

Infraestructura pública

Ciencia y Tecnología Fundacionales

Privacidad y protección

Tiempo real estricto

Física & Software

Arquitecturas innovadoras

Diseños de Referencia y Arquitecturas

Seguridad y Confiabilidad

Plataformas Hardware

Movilidad y Accesibilidad

Control Inteligente

Periféricos e Interfaces

Sistemas Críticos y Tiempo Real

Conectividad y Middleware

Inteligencia Artificial

Middleware Distribuidos

Gestión Compleja de Datos

Sistemas Operativos

Tecnología de Servicios

Gestión de Recursos

Comunicación y Transmisión

Reacción al Contexto

Sensores y Actuadores

Interfaz de Usuario

Métodos y Herramientas para el Diseño de Sistemas

Met., lenguajes y herramientas

Validación y Verificación

Reutilización, Líneas de Productos

Certificación

Reuse & Product-Family Engineering

- **ESI Approach**

- Achieving Systematic Reuse involves **organising software production in an industrial way:**

- At the **organisational level**, differentiating between the productions means and the production itself
- At the **process level**, standardising the norms and the techniques
- At the **engineering level**, automating the process through component-based production.

- **Benefits**

- Achieve **dramatic productivity increase** by eliminating redundant work and streamlining production process.
- For software development organisations with a potential demand of similar products and with experience in developing them.

Reuse & Product-Family Engineering

- Areas or work

- **Variability Management Method and tool for embedded systems**

Techniques to identify, model and trace variability through different kinds of documents (design, code, etc.). Evolving tools.



- **Reuse Based Software Factory for large software systems**

Component based. Achieves 80% of reuse (average). Mature product.

- **Product Family Evaluation Framework**

Integration of Product Family practices into CMMI framework as a discipline

- **Third-party components in software development**

Address market and quality issues of COTS (including Open Source). Emphasis in overcoming technical and non-technical barriers to develop a component market.

Reuse & Product-Family Engineering

- Some past projects (ITEA)

Product family engineering



- Ongoing projects (ITEA)

Open source & inner source development



SERIOUS Software evolution & Refactoring



Model-Driven Development

- **ESI Approach**

- Facilitate the successful **industrial adoption** of Model-driven Development
- Ensure a **complementary and compatible approach with other process improvement initiatives**
- Provide the technology **change management measurements** to guarantee business alignment

- **Benefits**

- Productivity gains from the automation of significant parts of development of software and other work-products
- Protect investments in business architecture from changing and heterogeneous technological platforms
- Better use of qualified and skilled human resources

Model-Driven Development

- **Areas of work**

- **MDD Process Framework**

MDD-compatible structured collection of engineering and management practices, integrating agile practices and using SPEM as process modelling language.

- **MDD Maturity Model**

A staged approach to adopt MDD practices in an industrial context

- **MDD Technology Change Management and Metrics**

Guidelines for planning and quantitatively tracking MDD transition.

- **Model-driven Service oriented architectures**

A contact point with Service-centric Enterprise Interoperability

- **Model checking and simulation**

To provide indicators for quality of models and quality of their implementations.

Model-Driven Development

- **Some past projects (ITEA, FP6)**



Agile software development concepts (methods, tools, techniques, practices) in the domain of embedded systems

Modelware Modelling solution for software systems



- **Some ongoing projects (FP6)**

AD4 4D Virtual airspace management system
Development supported by MDA



ASSERT Automated proof based System and Software Engineering for Real-Time Applications

Modelplex



Service-centric Enterprise Interoperability

Conceiving new applications as dynamic composition of interoperable e-services

- Areas of work related to embedded systems development
 - **Developing quality Services**
Modelling languages and methodologies for creating verifiable high quality services
 - **Service Composition**
Dynamic discovery and aggregation of elementary services preserving desired qualities
- **Projects (ITEA)**
 - Merced Market enabler re-use of embedded Commercial-off-the-Shelf components



Service-centric Enterprise Interoperability

- **NESSI: Networked European Software and Services Initiative**
 - Applied for seat in Steering Committee
- **INES: Iniciativa española de Software y Servicios**
 - Promotor and SRA working group leader



Information Security

Methodologies and techniques for the secure software development of distributed, interoperable and interconnected systems.

- **Projects (ITEA)**

Trust4All: Development of a middleware software architecture specifically targeted at embedded systems.



- **eSEC: Spanish initiative for Trust and Security**

- Leaders of one SRA working group



- **Active in standardisation bodies**
 - **OMG: Software process metamodel working group**
 - **ISO working groups**
 - ISO/IEC 17.504
 - ISO/IEC 24.744
 - **W3C: Web Accessibility Initiative (WAI)**
 - **Promoters of EIC - Enterprise Interoperability Center**

- **Committed to open source initiatives**
 - **Committers to ECLIPSE Process Framework**
 - **Research on inner/open source development schemes (COSI project)**



Business Card

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