



ECSI

Who We Are?

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ECSI



History

- **European Non-Profit Association created in 1993**
- **Initial objectives:**
 - **Support of standards in EDA domain: VHDL, Verilog, EDIF, ...**
 - **Standardisation process within IEEE, Si2, OMF**
 - **Adoption and deployment of standards**
 - **Dissemination of information to European industry**
 - **European standardisation activities: VHDL-AMS, VHDL Synthesis Subset successfully accomplished**
- **New objectives (defined 1998-99):**
 - **Support of industry in system design concepts and methods development and promotion**
 - **Exchange of knowledge, experience, best practice**
 - **R&D projects creation**
 - **Training and education**



ECSI Mission

- To identify, develop and promote efficient methods for electronic **systems design**, with particular regards to the needs of the system-on-chip
- To provide ECSI members with a **competitive advantage** in this domain for the benefit of the European industry



ECSI Strategy

- Identification and optimization of appropriate **design paradigms** applicable to System-Design and with special emphasis on efficient reuse
- Benefitting from the **synergy** among members while combining systems, EDA and IP business know-how with academic knowledge
- Professional involvement and **education** of the member companies to increase their awareness and knowledge
- Exchange of knowledge and best practices with academia and practicing communities
- Having an ambition to be representative of European industry and to assure this industry being offered maximum opportunities to share the results



Means

- **Study Groups & Interest Groups**
 - Forums around hot topics
 - Exchange of knowledge, experience, best practice, identification of requirements
 - Co-operation with standardization bodies

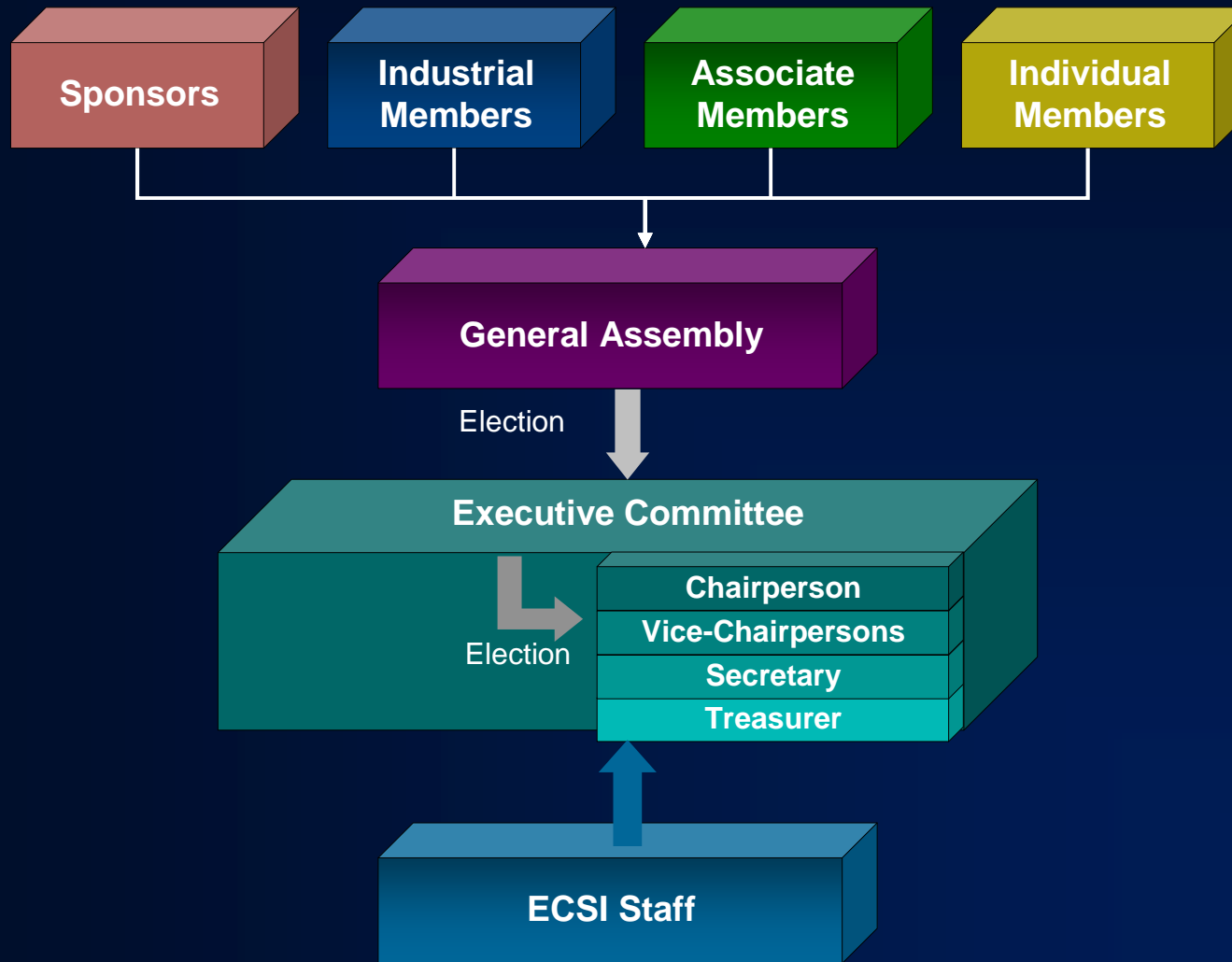
- **R&D Projects**
 - Creation of focused consortia
 - Initiation and conduction of projects

- **Services for competence**
 - Organization of workshops, seminars and courses
 - Training of engineers/managers to new design methods
 - Gathering and dissemination of relevant information

- **Services for Promotion**
 - Promotion of results through all channels
 - Visibility and competence among electronic systems users and designers
 - Academic excellence through ECSI Associated Centers



Legal Order





ECSI Chairpersons

- **ECSI President**
Kari Tiensyrjä, VTT Electronics

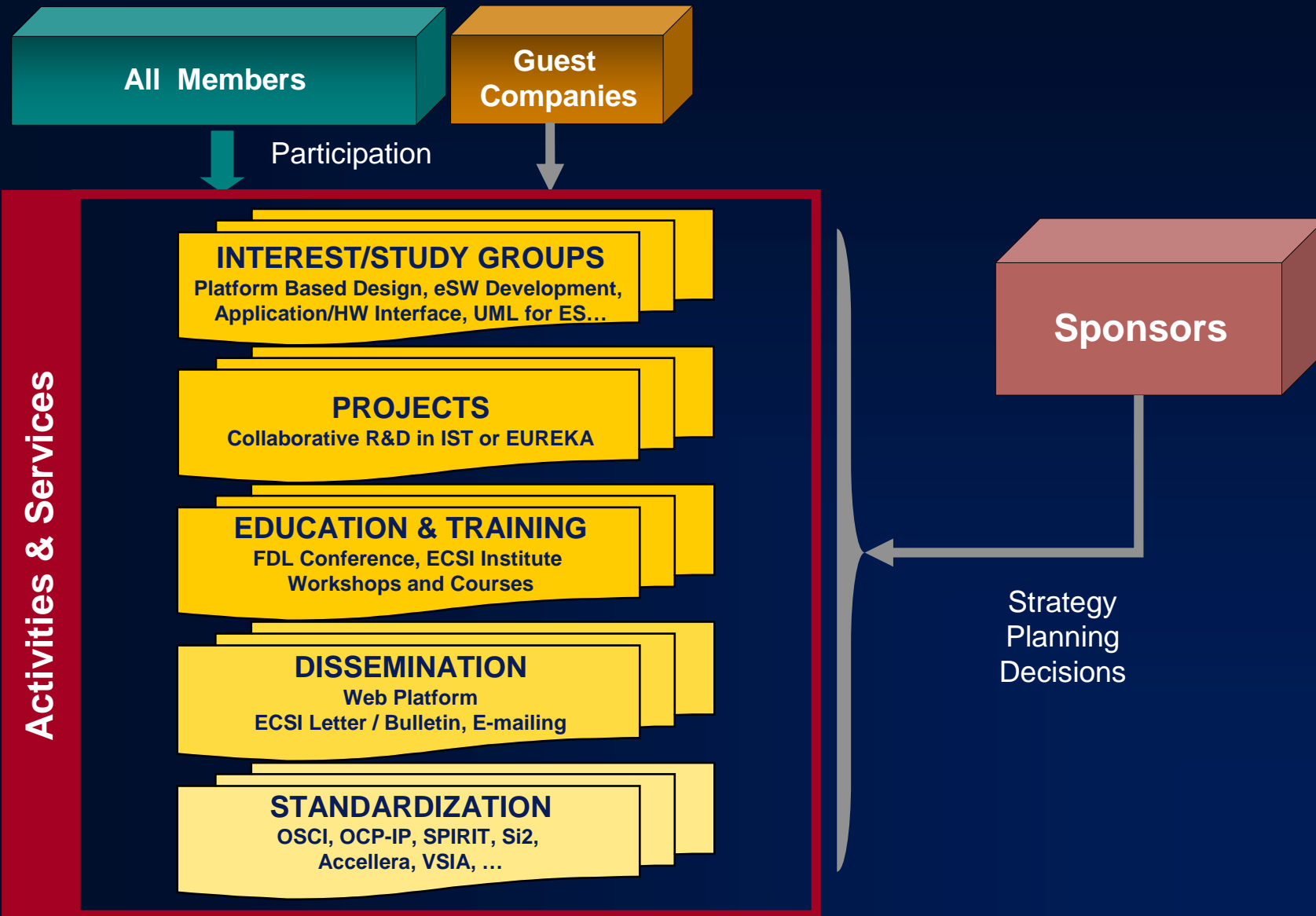
- **ECSI Vice-President**
Klaus Kronlöf, Nokia

- **ECSI Secretary**
Pierre Boulet, LIFL

- **ECSI Treasurer**
Bruno Ragué, JESSICA France



Technical Order





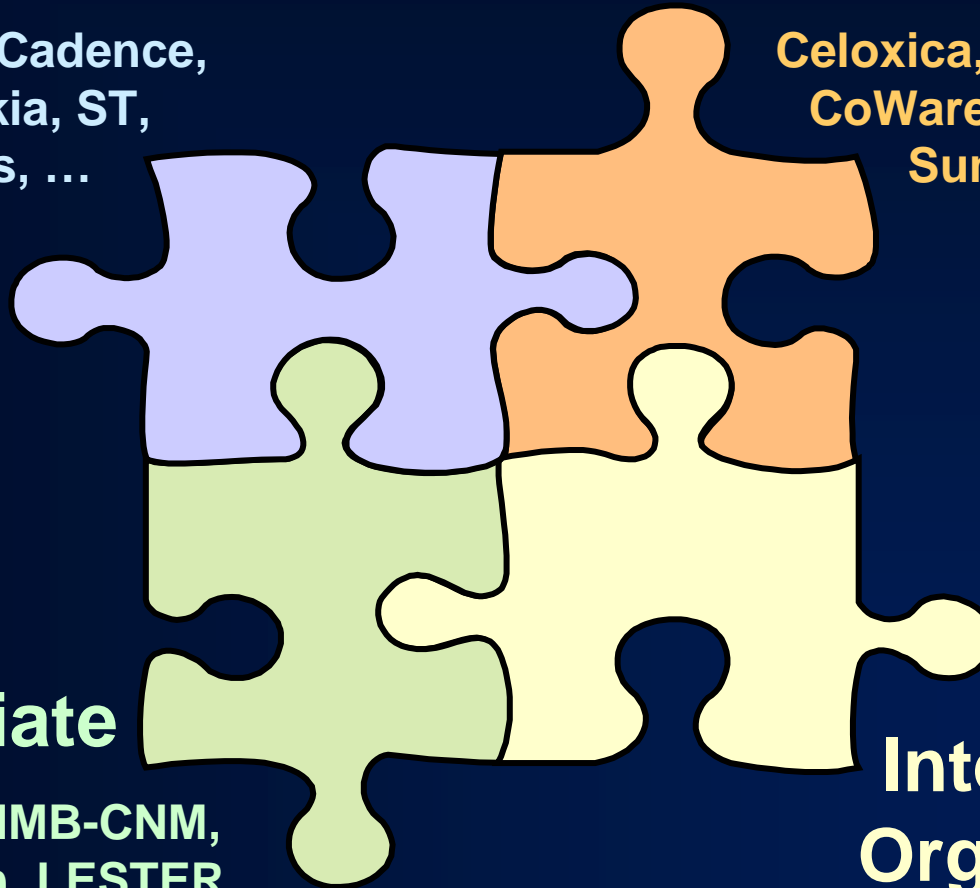
ECSI Membership

Industrial

Alcatel, ARM, Cadence,
Mentor, Nokia, ST,
Synopsys, ...

Industrial Associate

Celoxica, Dolphin, Evatronix,
CoWare, Synplicity, Forte,
Summit, VaST, ...



Associate

C-Lab, CETIC, IMB-CNM,
ISLI, KU Leuven, LESTER,
LETI, LIFL, U Cantabria,
U Tuebingen, TU Munich, ...

International Organizations

Accellera, IEEE/DASC, OCP-IP,
VSI Alliance, ...



ECSI Membership

Current & Past Members

Industrial

- ALCATEL
- ARM
- CADENCE
- JESSICA
- MENTOR GRAPHICS
- NOKIA
- ST MICROELECTRONICS
- SYNOPSYS

- BAE SYSTEMS
- BULL
- ERICSSON
- ICL
- INTRACOM
- ITALTEL
- MBDA
- MOTOROLA
- PHILIPS
- SIEMENS
- SNI
- THALES
- THOMSON
- VIEWLOGIC

Industrial Associate

- CELOXICA
- COWARE
- DOLPHIN INTEGRATION
- EVATRONIX
- FORTE DESIGN
- OCP-IP
- SI2
- SILICOMP
- SPIRATECH
- SUMMIT DESIGN
- SYNPLICITY
- VAST
- VSI ALLIANCE

- AMPHION
- TNI-VALIOSYS
- XEMICS
- PROSILOG

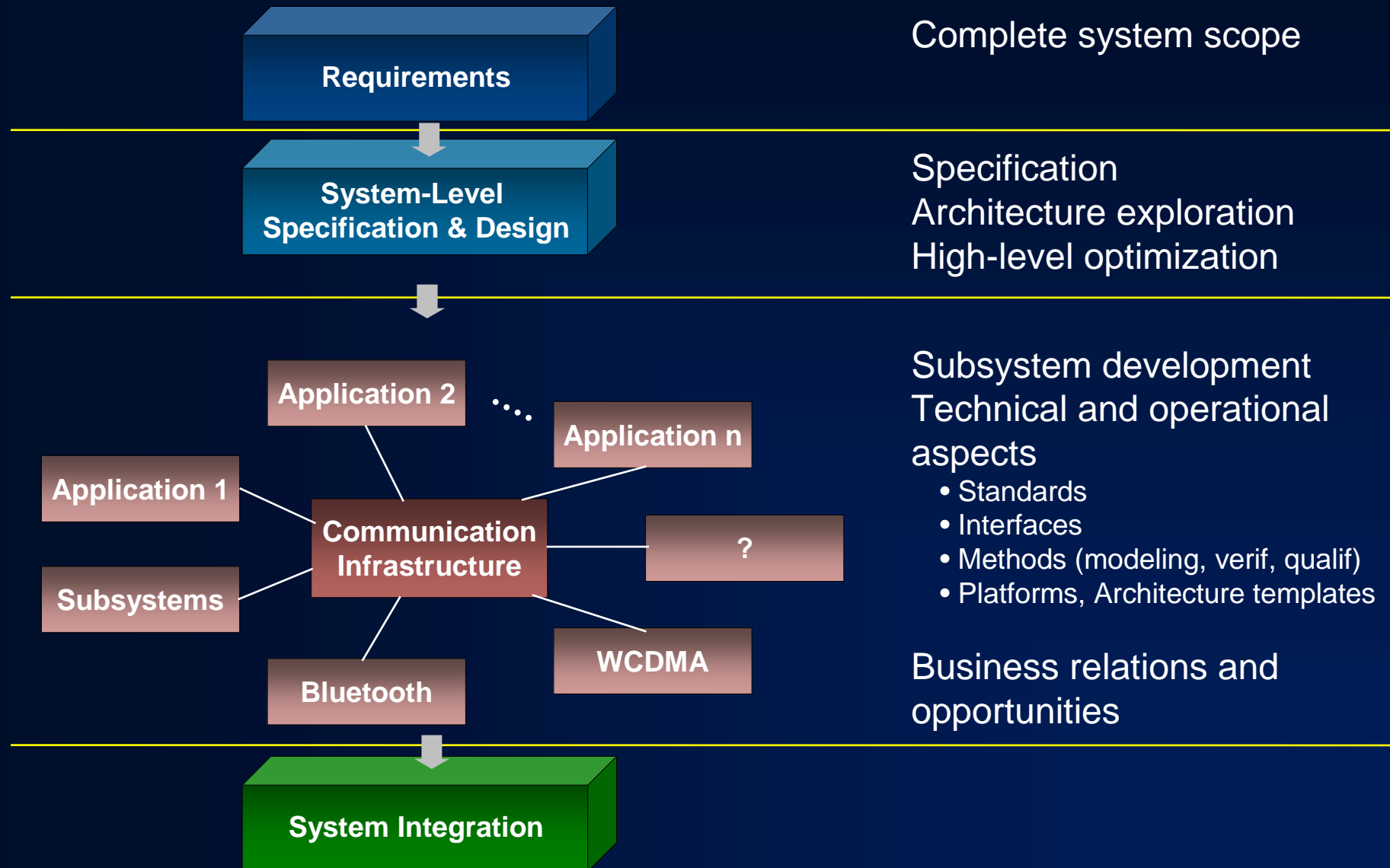
Associate

- CETIC
- EPFL
- EUT
- FZI / U TÜBINGEN
- IMB-CNM
- INTIA FUTURS / LIFL
- ISLI
- KU LEUVEN
- LESTER
- LETI / CEA
- OFFIS
- TU MÜNCHEN
- U CANTABRIA
- U LINKÖPING
- U PADERBORN
- VTT ELECTRONICS

- IMEC
- ITE
- UPM
- POLITECNICO MILANO
- U PATRAS



High Level Vision: Subsystem-Based Development of Systems





High Level Vision: Subsystem-Based Development of Systems

System scope: complete system, system-of-systems (SoS) providing services to users, characterized by quality-of-service (QoS) properties, supported by validation and test data



Service and interface specification of subsystems, non-functional properties (NFP), collaboration and interaction, system architecture, system-level exploration and NFP estimation and analysis, system-level optimization, subsystem validation and test data



Subsystem development and optimization (exploiting and developing IPR and domain expertise), verification through reference architecture and toolset

Technical issues

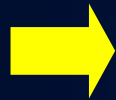
- Standards
- Interfaces
- Methods (modeling, analysis, verification, qualification)
- Platforms and Architecture templates

Business relations and opportunities (IP providers, SW&HW design houses, tool vendors, subsystem providers,..., infra providers)

System integration, subsystem conformance testing, NFP evaluation, system prototype, system validation against requirements and constraints



ECSI Activities



Activities & Services

INTEREST/STUDY GROUPS

Platform Based Design, eSW Development,
Performance Modeling, UML for ES...

PROJECTS

Collaborative R&D in IST or EUREKA

EDUCATION & TRAINING

FDL Conference, ECSI Institute
Workshops and Courses

INFORMATION EXCHANGE

Web Platform
ECSI News Bulletin, E-mailing

STANDARDIZATION

OSCI, OCP-IP, SPIRIT, Si2,
Accellera, VSIA, ...



ECSI Interest/Study Groups

□ Objectives

- Community of interest around a strategic area
- Exchange of knowledge and point of views
- Share of best practice & experience
- Focused scope
- Strong industrial content
- Common understanding

□ Information Forums

- Meetings 4 times/year
- Regular information exchange
- Information on current /advanced trends
- Promotion of solutions, user experience

... and possibly

□ Working Activities

- Definition of objectives
- Definition of results
 - State-of-the-art summaries
 - Requirements specifications
 - Standard proposals
 - R&D project proposals
- Planning of actions and tasks



Areas

- UML for Embedded Systems and SoC
- TLM / Platform-Based Design
- Performance Modeling and Analysis
- Embedded SW Architecture & Development
- AMS (IP Modeling, Reuse & Standards)

- ESL Standards
- Application-Platform Interface (Application vs HW)
- Intersection of ESL and formal methods domains
- Model representation & transformations
 - Tool and platform independent representation
 - Transformation methods

Started
Planned



ECSI SG: UML for Embedded Systems

Goals

- To define and standardise the **UML for ES / SoC Profile**
 - Covering both behavioral and structural concepts
 - SystemC
 - Increase level of abstraction
 - Link to SysML, MARTE and other relevant profiles

- To provide the representative, industry size UML **Design Case Studies** for Embedded Systems / SoC

- To develop and maintain an UML web database **repository** to create a complete source of UML related scientific, educational and industrial material applicable to embedded system and SoC design
 - Support of industry in education and skills
 - Database of resources: scientific articles, workshop presentations, tutorials, practical examples, guidelines
 - UML profiles for ES design (SysML, MARTE, UML for SystemC and UML for SoC)

- To provide a **collaborative environment** for UML and model driven based design of embedded systems and SoC:
 - Exchange of knowledge between members
 - Organisation of workshops, conference tracks
 - Set-up of collaborative R&D projects

- To Define interface between System Design and ESL
 - Terminology, taxonomy



ECSI SG: UML for Embedded Systems Partnership

■ Current:

- STMicroelectronics
- Philips
- Nokia
- Airbus
- Cadence
- Mentor Graphics
- KU Leuven
- CETIC
- U Cantabria
- U Paderborn
- U Milano
- LIFL
- CEALIST
- VTT Electronics
- Eindhoven University of Technology

■ Invited:

- Fujitsu, EADS, Infineon, IBM, Thales, NEC, Hitachi, Sony, SonyEricsson, Alcatel, Volvo, Saab, Quinetiq
- Telelogic, Artisan SW, Softeam, Sparx Systems, CATS



ECSI IG: Platform Based Design

Scope

□ Open questions:

- What can the platform creators provide as **measurable characteristics** to facilitate the use of a platform?
- What **tools** do platform users need?
- What kind of **business model** is likely going to work, for platform creators and users (for both tools and IP)?

□ Scope:

- Interface between platform users and platform providers
- Set of models and interfaces to be provided by platform creators
- Degree of platform extensions, adoptions
- Platform user activities (writing models, or just configure them?)
- Parameters, metrics provided to platform users: cycles, power, bandwidth, delay, ...?
- Availability of relevant models for parallel SW development
- Levels of accuracy of platform models
- Tradeoffs between accuracy and speed
- Testing the platform (HW and SW)
- Verification
- Debug



ECSI Activities



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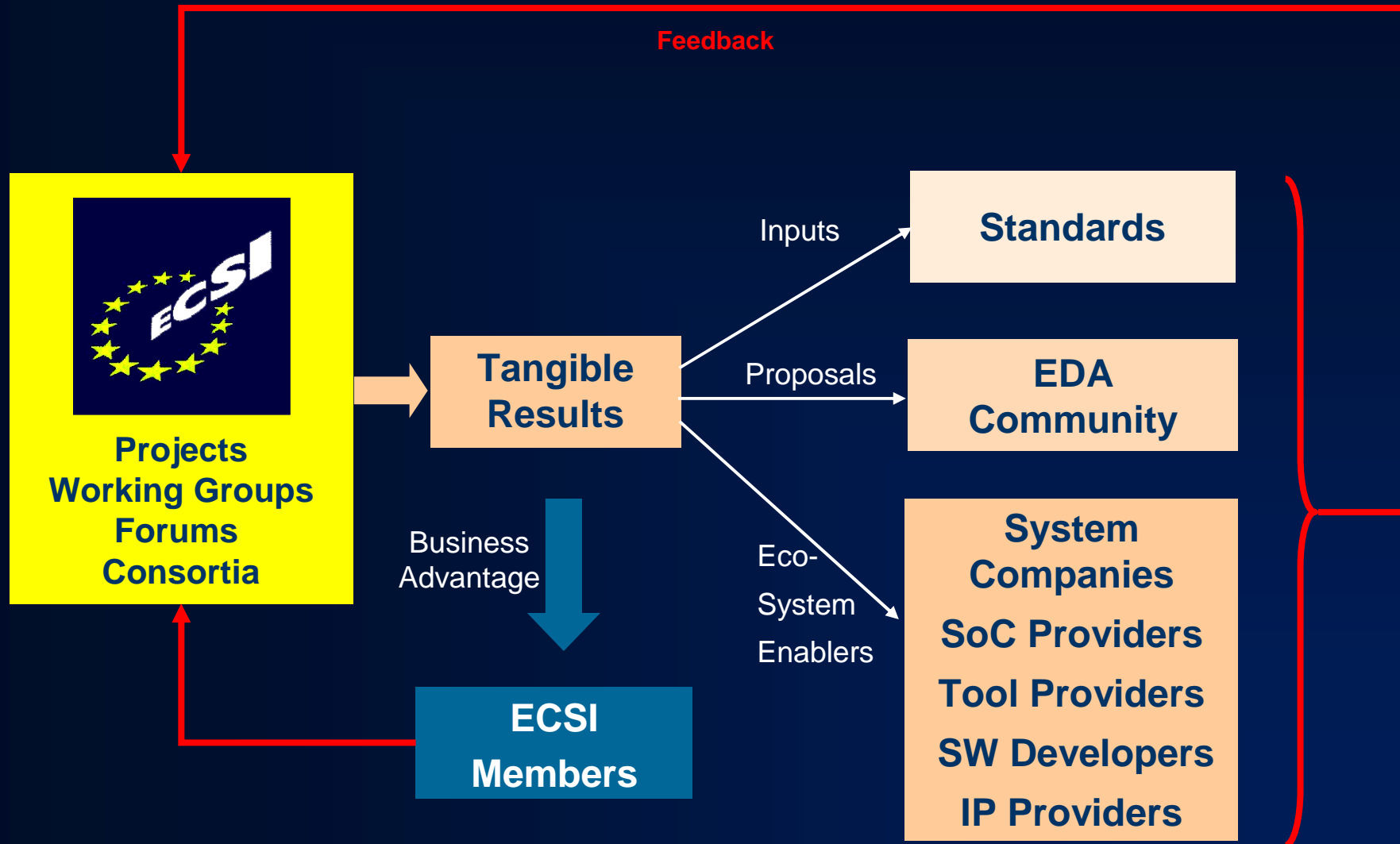
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ECSI Projects

Results Exploitation





ECSI Projects

ICODES

- Interface and COmmunication based Design of Embedded Systems
- Partners: OFFIS, Thales, Siemens, Bosch, Prosilog, ECSI

- STREP Project in IST Framework 6 Project
 - Strategic Objective: Embedded Systems
 - Call 2 (October 2003)
 - Duration: 36 months
 - Start: August 1, 2004

- Objective:
 - Development of new modelling and synthesis technologies for embedded systems with many communicating components in HW and SW
 - A methodology to model, evaluate and implement embedded HW/SW systems from the specification at system level to a standard industrial back-end design flow
 - Definition of a system specification language based on SystemC 2.0 to enable a holistic view on the design as it provides a single formalism to model hardware, software, and communication objects. properties



ECSI Projects

SPRINT

Open SoC Design Platform for Reuse & Integration of IPs

Objective:

To provide an open SoC design platform (methodology, standards) together with matching tools and IPs, enabling SoC design environments that support the development and integration of interoperable and reusable IPs, including system verification

Partners:

■ SoC Integrators

- Philips (NL)
- ST (FR + BE)
- Infineon (GE)

■ IP Vendors

- ARM (UK)
- Evatronix (PL)
- SyoSil (DK)

■ EDA Providers

- Prosilog (F)
- Spiritech (UK)
- KeesDA (F)
- Lauterbach (D)

■ Research

- TIMA (F)
- U Paderborn (D)
- ECSI (F)
- KTH (S)

Starting: February 1st, 2006 in IST Embedded Systems



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Education & Training Activities

- Forum on specification and Design Languages (FDL) Conference

- ECSI Institute
 - Training Courses in Advanced System Design
 - Workshops
 - Hot topics in System Design
 - Overview of state-of-the-art
 - Education
 - Experience share



FDL

- **Forum on specification and Design Languages**
- **Scope: application of languages and models for the specification and modeling of electronic systems**
- **Since 1998: Lausanne, Lyon, Tübingen, Marseille, Frankfurt am Main, Lille, Lausanne – Darmstadt in 2006, Barcelona in 2007**

- **4 Thematic Areas:**
 - **C/C++-Based System Design (CSD)**
 - **Analog, Mixed-Signal and Heterogeneous System Design (AMS)**
 - **UML-Based System Specification and Design (UML)**
 - **Formalisms for Property-Driven Design (FPD)**

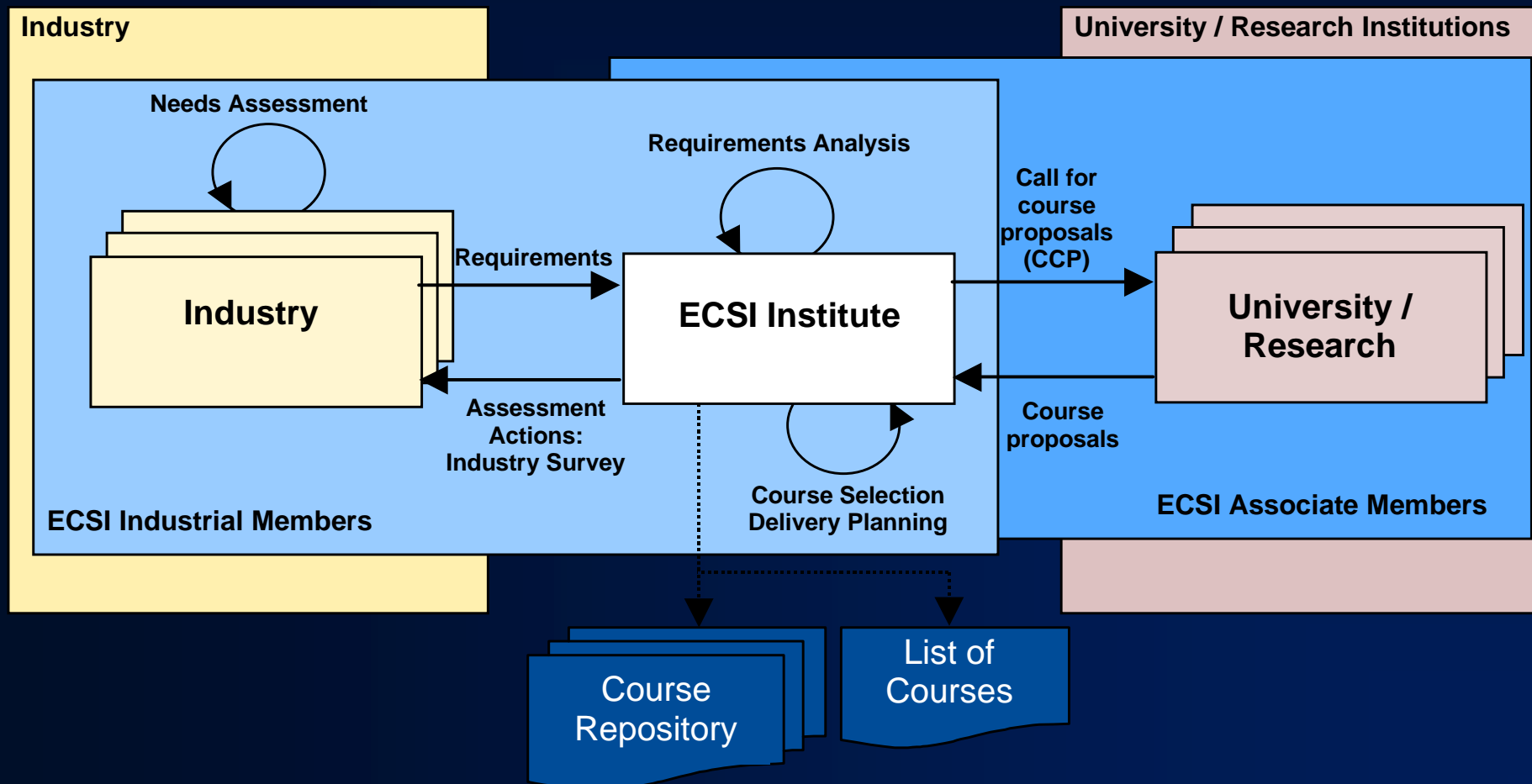
- **Last year:**
 - **78 submissions, out of which 54 accepted**
 - **Keynote presentations / special sessions / invited speakers**
 - **Participation: ~150 (50% industry / 50% research)**

- **Book with best papers edited by Springer**
- **CD-Rom / Proceedings**



ECSI Institute Operation

- EI offers an open environment for the delivery of **advanced courses** in the domain of design for electronic systems





ECSI Institute

Training Course Examples

- **Embedded Systems Design**
 - U Linköping (2-3 days)

- **Low Power Design: Energy Estimation and Optimisation of CMOS Based Systems**
 - OFFIS (2 or 3 days)

- **Advanced SystemC Modeling**
 - SUMMIT DESIGN (3 days)

- **Verification with SystemC**
 - SUMMIT DESIGN (1 day)

- **System level design with SystemC and SystemVerilog**
 - FZI (3 days)

- **More: www.ecsi.org/training**



ECSI Institute Workshops

Events organised last years

- ❑ **UML to SystemC System Design Flow**
- ❑ **Advanced System Design in Practice – Extended Workshop**
- ❑ **System Synthesis**
- ❑ **System Verification**
- ❑ **Efficient Transaction Level Modelling**
- ❑ **Industrial Application of Formal Methods**
- ❑ **SystemC/TLM**
- ❑ **Platform Modelling & Performance Analysis**

Platform-Based Design Book



- **Foreword: Enabling Platform-Based Design**
Grant Martin
- **The Need for Standards**
Mark Burton and Adam Morawiec
- **Programmable Platform Characterization for System Level Performance Analysis**
Douglas Densmore, Adam Donlin, and Alberto Sangiovanni-Vincentelli
- **Use of SystemC Modelling in Creation and Use of an SOC Platform: Experiences and Lessons Learnt from OMAP-2**
James Aldis
- **What's Next for Transaction Level Models: The Standardization and Deployment Era**
Laurent Maillet-Contoz
- **The Configurable Processor View of Platform Provision**
Grant Martin
- **Peripheral Modeling for Platform Driven ESL Design**
Tim Kogel
- **Quantitative Embedded System Architecture and Performance Analysis**
Graham R. Hellestrand



ECSI Institute Workshops

Events in 2006

□ UML Profiles for Embedded Systems

- March 27-28, 2006 – Paris, France

- 51 participants

- Airbus, Alstom Transport, Artisan SW, Cadence, CETIC, C-Lab, CNM, Cofluent Design, COWARE, ECSI, European Space Agency, Fujitsu, IMB-CNM, K.U. Leuven R&D, Lester/USB University, LETI, LIFL, MBDA France, Mentor Graphics, Nokia, Philips Semiconductors, Schneider Electric, Selex Sensors&Airborne Systems Ltd., Softeam, SparxSystems, STMicroelectronics, Summit Design, Supélec, Tampere University of Technology, Thales, University of Cantabria, University of Catania, University of Milan, Vitrociset

□ TLM Users Experience

- June 8, 2006 – Paris, France

- 47 participants

- ARM, CADENCE, CoWare, DOLPHIN INTEGRATION, DOULOS, ECSI, Electronique International, EPU Sophia Antipolis, EVATRONIX, FZI, LEAT, LETI, LIFL, MENTOR GRAPHICS, NOKIA, OCP-IP, OFFIS, Opticon A/S, PHILIPS, ROBERT BOSCH, SIEMENS, SILICOMP, SpiraTech, STMicroelectronics, SUMMIT DESIGN, SYNOPSIS, TIMA, VaST, Verimag

□ High-Level Synthesis

- September 18, 2006 – Darmstadt, Germany

- 39 participants

- ALCATEL, CADENCE, CANTABRIA U, COLUMBIA UNIV., COWARE, DOULOS, EUT, FORTE DESIGN, FRAUNHOFER, FZI, LESTER, MENTOR GRAPHICS, MICROSWISS, NEC, OFFIS, ROBERT BOSCH GMBH, STMICROELECTRONICS, SYNFORA, SYNPLICITY, TALLIN UNIV OF TECHN, TEXAS INSTRUMENT, UCSD, VTT ELECTRONICS

□ TLM Standards

- December 4th, 2006



ECSI Institute Workshops

Plans 2006/2007

Reconfigurable SoCs

- November (end)
- TU Munich, OFFIS

SoC Debugging

- Target: mid-February 2007
- Focus on methodology and interface standards
- Mentor Graphics, CoWare, ARM, SPIRIT, Eclipse (WindRiver), Lauterbach
- Target audience to be discussed with members (MG, ARM)

Multilanguage SoC Design – SystemC/SystemVerilog

- Target: DATE (April 2007)
- Focus: mixed-language modeling (SC, SV), simulation, verification, design flows, interfaces, standards

Virtual Prototyping



ECSI Activities



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Awareness & Dissemination

Documentation Access

- ECSI News Bulletin
- ECSI Letters
- ECSI Publications (e.g. books, reports)
- Conferences/Workshops material
- VSI Alliance material

Database of more than 7000 addresses

Events announcements

- Project specific events: workshops, web material
- Training courses

ECSI WWW Page / ECSI CD-ROMs

- Members only material (e.g. workshop slides, proceedings, reports)

Discounts on Springer publications (40% on regular prices)



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Cooperation with International Organizations

□ Accellera

- Cooperation on VHDL, Verilog, PSL, Verification
- Accellera's sessions at ECSI events (FDL, workshops)
- Cooperation within ECSI projects

□ IEEE/DASC

- Long-standing liaisons (VHDL, Verilog, now SystemC)
- Inputs for standardisation from ECSI members, support of standardisation process

□ VSI Alliance (Virtual Socket Interface Alliance)

- Mutual membership, cooperation since the creation of VSIA
- ECSI provides VSIA documents at the European level (with discount to ECSI members)

□ OCP-IP

- Mutual membership, cooperation established in 2003

□ OSCI

- ECSI became member in 2003 to establish the link between the ODETTE project and OSCI

□ SPIRIT

- Links created through the SPRINT project and ECSI Membership



Membership Advantages

- **System development high-level long-term vision**
 - SYDIC: Subsystem-Based Development of Systems

- **Knowledge and experience**
 - Workshops on advanced topics
 - European Network of 20+ specialised centres
 - ECSI Publications: monthly ECSI News Bulletin

- **Interest / Study Groups**
 - Exchange of knowledge, point-of-views, tendencies
 - Best practice, skills and industry experience
 - State-of-the-art
 - Collaborative work
 - Impact on standardisation

- **Documentation**
 - Reports, books, specifications, proceedings, workshop material

- **Projects**
 - On-going: early visibility of results
 - Access to new projects



Contact

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