
The Fraunhofer Institute for Experimental Software Engineering

Fabio Bella



The Fraunhofer-Gesellschaft e.V.

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| Named after: | Joseph von Fraunhofer (1787-1826) a successful researcher, inventor and entrepreneur |
| Role of the Fraunhofer Gesellschaft: | Germany's leading organization for applied research and technology transfer 58 institutes with approx. 12.500 employees |
| Size: Funding Volume: (as of 2004) | about 1.3 billion €, consisting of: <ul style="list-style-type: none">• 1/3 base funding (government)• 1/3 industrial projects• 1/3 public sector projects |

Fraunhofer research units in Germany:

80 research units
at approx. 40 locations

- Institutes
- Branches of Institutes, Research Institutions, Working Groups, Branch Labs, Application Centers



Fraunhofer IESE: International



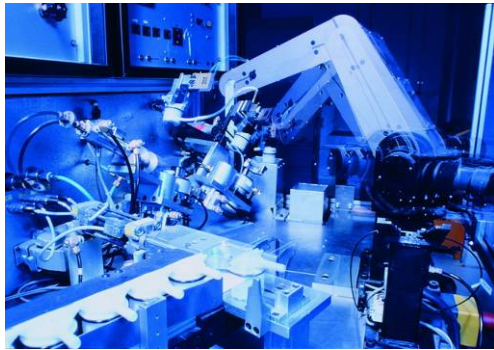
Presentation of Fraunhofer IESE

Fraunhofer IESE

- Applied Research and Technology Transfer
 - approx. 180 employees
 - 11 Million Budget (75% ext. funds)
- International Positioning
 - USA, Japan, India, Hungary
- Innovative Cooperation model
 - **Research Labs**
- High International Reputation in “Systems & Software Engineering”
 - **No. 1 in Europe (JSS, 2005)**

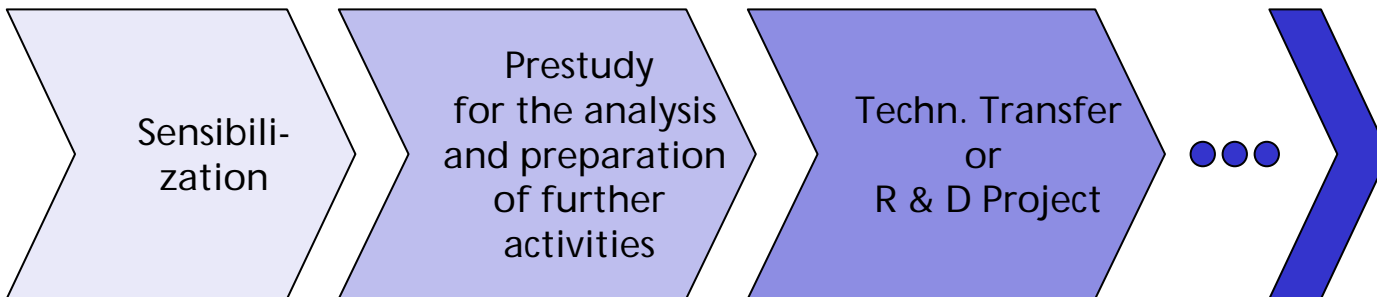


Our Approach



- Software development must be understood as an engineering activity
 - “Experimental” learning cycles must be established (observing - modeling - transferring - observing ...)
 - Experimental learning must be supported through measurements
- in **industrial practice**, this makes it possible to
- plan/manage/control software processes
 - successfully select and introduce innovative technologies
 - establish effective quality management systems
- in **research**, this makes it possible to:
- work on application-oriented research issues
 - practically evaluate new technologies

Forms of Cooperation



- Lectures
- Initial visits

- Structured interviews
- Check of process handbooks and other available data

- Concurrently:
 - Training
 - Coaching

- Regular refocusing on new topics in subsequent projects

IESE Expertise

BOSCH

BMW Car IT



DAIMLERCHRYSLER

SIEMENS



KEIPER

HITACHI
Inspire the Next

Valeo

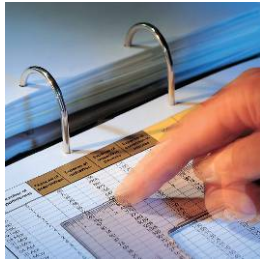


c a r m e q

software & systems

- Experience in the automotive domain from projects with
 - Audi, BMW, BMW Car-IT, Bosch, Bosch Blaupunkt, Carmeq, DaimlerChrysler, Keiper, Hitachi, Siemens-VDO, Valeo
- IESE core competence
 - Requirements and Usability Engineering
 - Product Line Architectures
 - Component Engineering
 - Processes & Measurement
 - Security & Safety
 - Inspections & Testing
 - Experience Management
 - Education & Training in SE

PAM Competences



Processes & Measurement (PAM)

- Goal-oriented measurement: **GQM**
- Descriptive process modeling: **Spearmint**
- Goal-oriented product/process assessment: **FAME** (ISO/IEC 15504-compliant process assessment method), Subcontracting, COTS Acquisition, Risk Management

Thank you for your attention!



Fraunhofer Institut
Experimentelles
Software Engineering

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Presentation of Fraunhofer IESE

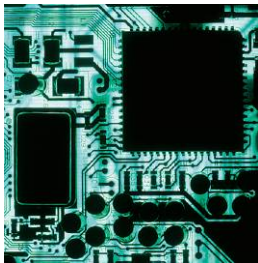
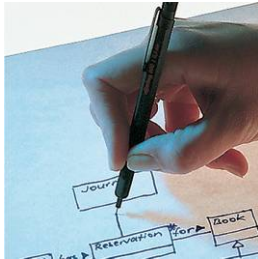
Backup slides

Internationalization



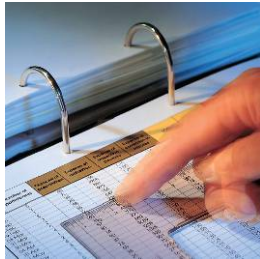
- Europe
 - Hungary (BUTE): Aml
 - Ireland (U. Limerick): SE
 - etc.
- USA
 - Fraunhofer Center Maryland
 - BMW/U. Clemson: Automotive SE
- Asia
 - Japan (Ricoh, METI, Hitachi, Fujitsu, Jaxa): Product Lines, Measurement
 - China (PC Chair - SE 2006, Siemens)
 - India (Siemens): Measurement
 - Korea (University of Busan)
- ISERN (50 partners worldwide)

IESE Core Competences (1/3)



- **Requirements and Usability Engineering (RUE)**
Requirements Engineering, Usability Engineering:
Multi-Modal Interfaces, e.g., Aml
- **Product Line Architectures (PLA)**
Architecture recovery, Architecture development
& evaluation, Scoping & modeling of domains &
decisions, PuLSE
- **Component Engineering (CE)**
Component-based software development, KoBRA

IESE Core Competences (2/3)



- **Processes & Measurement (PAM)**
Goal-oriented measurement: **GQM**, Descriptive process modeling: **Spearmint**, Goal-oriented product/process assessment: **FAME**, Subcontracting, COTS Acquisition, Risk Management



- **Testing & Inspections (TAI)**
Systematic inspection techniques: **PBR**, reliability testing, **integrated inspections & testing strategies**

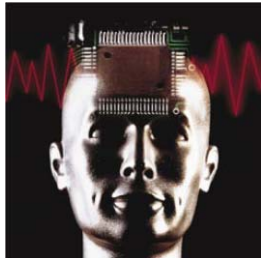


- **Security & Safety (SAS)**
Security Assessments: **Crocodile et al**, EF for Security, Automated checking of infrastructures, Safety analysis, **Dependability testing**

IESE Core Competences (3/3)



- **Experience Management (EM)**
SPI planning & setup, EF buildup and
Organizational Learning: **Experience Factory**



- **Education & Training (EAT)**
Evaluation and Certification, Technology-enabled
Learning, Simulation-based learning and decision
support, **e-Learning & -Coaching: e-Workshop**

Presentation of Fraunhofer IESE

Some references

| | | |
|--|---|--|
| ABB Corporate Research Ltd. | HealyHudson | Polarion GmbH |
| Allianz Lebensversicherungs-AG | Hitachi Ltd. | Polizei Rheinland-Pfalz |
| andrena objects AG | IBS AG | proALPHA Software AG |
| Atmos Medizintechnik GmbH | ICT Solutions AG | PSI Logistics |
| Audicon GmbH | JAXA | RICOH Image Processing |
| Axess AG, Salzburg | Keiper Recaro Group | Robert Bosch GmbH |
| Blaupunkt GmbH | Lion Bioscience | SAP AG |
| BMW AG | Lucent Technologies Network Systems GmbH | SAS Institute GmbH |
| BMW Car-IT GmbH | market maker Software AG (part of the vwd group) | Siemens AG |
| Böhringer Pharma GmbH & Co. KG | MBtech GmbH | Siemens-VDO |
| Carmeq GmbH | METI/IPA | Stadt Kaiserslautern |
| DaimlerChrysler AG | Microsoft AG | Stadtkasse Köln |
| Deutsche Post IT Solutions GmbH | Ministerium der Justiz Rheinland-Pfalz | Stadtsparkasse Kaiserslautern |
| Deutsche Telekom AG | Ministerium des Innern und für Sport Rheinland-Pfalz | Tenovis |
| Diamant Software GmbH&Co.KG | Ministerium für Wirtschaft, Verkehr, Landwirtschaft und Weinbau Rheinland-Pfalz | Testo AG |
| E-plus | Ministerium für Wissenschaft, Weiterbildung, Forschung und Kultur Rheinland-Pfalz | T-Mobile GmbH |
| ESA | Mitsubishi | T-Online GmbH |
| EUROCAT Institute for Certification and Testing GmbH | Nokia GmbH | T-Systems Enterprise Services GmbH |
| Fiducia IT AG | | Uniserv GmbH |
| FinanzIT GmbH | | Valeo Schalter und Sensoren GmbH |
| Fujitsu Enabling Software GmbH | | Wellington Partners Venture Capital GmbH |
| Giesecke & Devrient GmbH | | |