‘Best practices for new project creation
- a Large Industry view’

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Best practices for new project creation - a Large Industry view

content

1. Motivation for funded projects
2. General approach to set up a project
3. Challenges
4. New trends
5. Ongoing research activities
6. Demand for research
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Motivation for funded projects

Best Practices??

• a committed team
• structured work
• a good portion of luck

Stick to your own creative ideas !!!
Motivation for funded projects

Advantages

- Acquire public funding budgets
- Contribute to standards and market platforms
- Find long-term R&D partners
- Generate IP
- Build strategic alliances
- Create new application opportunities
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January 27th 2016, Artemis Strasbourg

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General approach to set up a project

project proposals are not for free

Conservative cost estimation:

• preparation phase: at least 1 year
• 2HC at co-ordinator;
• 3PM per core member (5);
• 1PM per partner (50);
• 1PM = 15k€ → 89PM → 1,335Mio€
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General approach to set up a project

..select the appropriate funding scheme..

European funding
- **Horizon 2020**
  - ICT collab. R&D
  - ERC
  - Marie Curie
  - EC funding
  - EC contract

Joint Undertakings
- Downstream R&D „Top down“/Industrial driven
  - ECSEL
  - Shift2Rail
  - FUEL CELLS
  - CLEAN Sky2
  - EC and National co-funding
  - EC and National contracts

EUREKA
- Downstream R&D „Bottom up“/Ind.driven
  - Penta
  - ITEA3
  - Euripedes
  - ERA.net
  - National funding
  - EU & National contracts

National & Regional Programmes
- BMBF
- BMWi
- BMU
- Bayerische Forschungsstiftung
- SAB (Saxony)
- National funding
- National contract

National funding – example Germany
- National Consortium

European Consortium
- European Consortium
General approach to set up a project

- Build a core team
- Establish the tool environment (document exchange server, web conferences)
- Create necessary templates (contacts, partner contributions, PO, FPP, task structure, ressources, presentations, ...)
- Establish a working procedure
- Define responsibilities and a time schedule
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General approach to set up a project – example time schedule

**Productive 4.0 proposal**

<table>
<thead>
<tr>
<th>date</th>
<th>activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec – Feb 2016</td>
<td>consortium building + draft concept setup</td>
</tr>
<tr>
<td>15 Feb 2016</td>
<td>Draft proposal structure</td>
</tr>
<tr>
<td>24 Feb 2016</td>
<td>Core group formation (F2F in Munich)</td>
</tr>
<tr>
<td>15 March 2016</td>
<td>Initial PO description + work distribution</td>
</tr>
<tr>
<td>31 March 2016</td>
<td>Consortium closed for PO (F2F in Munich)</td>
</tr>
<tr>
<td>10 May 2016</td>
<td>Submission PO</td>
</tr>
<tr>
<td>8 Sept 2016</td>
<td>Submission FPP</td>
</tr>
</tbody>
</table>

**ECSEL call 2016**

<table>
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<tr>
<th>date</th>
<th>activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 March 2016</td>
<td>Publication date</td>
</tr>
<tr>
<td>10 May 2016</td>
<td>Deadline PO phase</td>
</tr>
<tr>
<td>8 Sept 2016</td>
<td>Deadline FPP phase</td>
</tr>
</tbody>
</table>
H2020 Evaluation criteria (also for ECSEL; Impact bei IA *1,5)

**Excellence**
1. Clarity and pertinence of the objectives
2. Credibility of the proposed approach
3. Soundness of the concept, including trans-disciplinary considerations, where relevant
4. Extent that proposed work is ambitious, has innovation potential, and is beyond the state of the art (e.g. ground-breaking objectives, novel concepts and approaches)

**Impact**
1. The expected impacts listed in the MASP for each relevant topic under the title “Impact”
2. Enhancing innovation capacity and integration of new knowledge
3. Strengthening Europe and the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets; and, where relevant, by delivering such innovations to the markets;
4. Any other environmental and socially important impacts (not already covered above)
5. Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant

**Implementation**
1. Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources
2. Complementarity of the participants within the consortium (when relevant)
3. Appropriateness of the management structures and procedures, including risk and innovation management
General approach to set up a project

Life cycle of a funded research project

Outline/Proposal
Submission/Evaluation
Runtime
Project completion
Audit

1 – 2 years
3 years
Up to 10 years
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Challenges

• focus on the technological and scientific topics
• submission of a high quality proposal
• Short preparation time for FPP
• increased competition for limited funding resources
• unsatisfactory funding conditions
• conflicting interests at national and European level
• too much regulation
• evaluation based on paper
• SME involvement

*unfortunately things are getting more and more complex*
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New trends

- **Holistic system approach**
- **Research along the entire supply chain**
- **Covering the entire product life cycle**
- **Involve partners globally**
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Ongoing research activities

- 98 Partners
- in 16 EU-Countries + Israel
- co-ordination by Infineon, Germany
- 800 person years
- with a total Project Budget of about 100 Mio €
- duration 3 years, started: April 1st 2014

**EMC²**

Embedded multi-core systems for mixed criticality applications in dynamic and changeable real-time environments

- **EMC² project workspace**
- Technology Sub-projects
- Living lab 1
- Living lab 2
- Living lab n

**External sources**

- Other research projects
  - Artemis, Tc, national
  - e.g. INDEXYS, ACROSS, ANAMIS, GENESYS
- Artemis RTPs
  - e.g. Cesar Ref. Technology Platform
- Commercial available
  - HW/SW/Tools
- Communities
  - e.g. Hipac

**Management**

- Technical coordination
- Roadmapping
- Dissemination
- Coordination
- Chatroom
- Celli Middleware systems

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Norway, United Kingdom, Ireland, Netherlands, Belgium, France, Portugal, Spain, Italy, Finland, Sweden, Denmark, Germany, Czech Republic, Austria, Greece, Israel

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Ongoing research activities

**Multi-core Technology**

INDEXYS - INDustrial EXploitation of the genesYS architecture
SCALOPES - Scalable LOw Power Embedded platformS
iLAND - mldeLwAre for deterministic dynamically reconfigurable NetworkeD sys.
ACROSS - ARTEMIS CROSS-Domain Architecture
ASAM - Automatic Architecture Synthesis and Application Mapping
SMECY - Smart Multicore Embedded Systems
PRESTO - Improvements of Industrial Real Time Embedded Systems Development Process
CRAFTERS - ConstRaint and Application driven Framework for Tailoring Embedded Real-time Systems
PaPP - Portable and Predictable Performance on Heterogeneous Embedded System
COPCAMS - Cognitive and Perceptive Camera Systems
R3COP - Robust and Safe Reasoning Robotic Co-operative Systems

Cost-efficient methods and processes for safety relevant embedded systems
Critical and High Assurance Requirements Transformed through Engineering Rigour
Composition with Guarantees for High-Integrity Embedded Software Components Assembly
System Level Modeling Environment for SMEs
Industrial Framework for Embedded Systems Tools
Reduced Certification Costs Using Trusted Multi-core Platforms
Combined Model-based Analysis and Testing of Embedded Systems
Certification of Software-Intensive Systems with Reusable Components
Certification of Software-Intensive Systems with Reusable Components
DEvelopment platform for Safe and Efficient dRIVE
Variability in Safety Critical Embedded Systems
Verification and Testing to Support Functional Safety Standards
Guaranteed Component Assembly with Round Trip Analysis
for Energy Efficient High-integrity Multi-core Systems

**Safety-critical Systems**

Number 1: ARTEMIS has been the largest programme ever, focused on Safety Critical Systems
Number 2: ARTEMIS has been the largest programme ever, focused on Multi-core Technology
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Ongoing research activities

‘Embedded Multi-Core Systems for Mixed Criticality Applications in Dynamic and Changeable Real-time Environments’

98 Partner, 16 EU Countries, 100 Mio € Budget

Scientific Communities

Multi-core Technology

Safety-critical Systems

Innovation Pilots

EMC²

Number 1:
ARTEMIS has been the largest programme ever, focused on Safety Critical Systems

Number 2:
ARTEMIS has been the largest programme ever, focused on Multi-core Technology

INDEXYS
SCALOPES
iLAND
ACROSS
ASAM
SMECY
PRESTO
CRAFTERS
PaPP
COPCAMS
R3COP
CESAR
CHARTER
CHESS
SYSMODEL
iFEST
RECOMP
MBAT
pSafeCer
nSafeCer
DESERVE
VeTeSS
CONCERTO

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Demand for research

holistic system approach:

- Design challenge – deterministic, predictable, heterogeneous, RT
- Performance and energy challenge, ultra low power
- Programming challenge
- Test, Verification and maintenance challenge (even at runtime)
- Simulation, Modelling, Virtualisation
- RT-communication challenge, even wireless
- Safety and security challenge
- Reliability challenge – test at runtime, lifetime prediction, monitoring
- Autonomous challenge – fail operational

transition towards autonomous systems

fail-operational
holistic system approach with various challenges:

- Dynamic adaptability challenge
- Evolution over lifetime, Uncertainties, open environment
- Mixed criticality
- Cross-domain deployment
- Standardization challenge
- Manufacturing challenge
- Application and domain specific requirements
- 3D-integration – smart modules
- Cost challenge
Productive4.0
Flagship/IA Approach – 1st draft project structure

TRL2-4

IoT-enabling HW: sensors, actuators, communication, security, embedded computing

Analysing methods and modeling of Big data

Secure realtime data processing

Manufacturing automation

Supply chain management, Big data handling

Fab/Supply chain virtualisation and simulation

Production planning & control, Logistics, Maintenance

Production use-cases

Scope of Productive4.0

Research

Product Development

Manufacturing

Product In-use

Recycling
Efficient deployment of multicore microcontrollers for demanding real-time IoT applications

contact

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