ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

## Project Results

# Speeding change in large companies

## Scaling-up agile development technology for embedded systems software

***The FLEXI project resulted in major improvements in productivity for embedded systems software development across large enterprises. Some 58 trials of the agile approach demonstrated concrete impacts on production innovation, reduction in lead times for new products and cutting integration time in major software development projects.***

Few industrial or consumer products can now function without software. Agile offers a particularly flexible approach for embedded software by promoting development iterations throughout the project life cycle. This approach was demonstrated successfully at the team level in the earlier ITEA AGILE project, where it obtained radical improvements in productivity and time to market.

### SCALING UP FOR LARGE ORGANISATIONS

FLEXI applied the agile approach to improve performance in embedded software development across large, multi-site enterprises. Problems that had to be overcome included:

- Multi-product synchronisation and cultural variations between sites and locations in large, multi-site, distributed development environments;
- Value-chain management in a global production landscape;
- Enabling and managing innovation;
- Tool support;
- Contracting; and
- Clashes between research and business operations.

The ITEA 2 project scaled up agile techniques to very large domains with hundreds or thousands of people involved. Those involved appreciated the ability to reduce reaction time using new organisational structures that permit feedback on new ideas in minutes or days rather than weeks or months. A survey of a 1,000 people indicated that they highly rated the agile approach as it easier to change directions and it is more transparent.

### FOCUS ON THREE WORK AREAS

FLEXI focused on three areas: market-shaping innovation; product portfolio management; and large-scale agile production. The result is a 'hyper-performing' organisation which offers a high level of agility in decision-making processes and in its ability to respond to market needs.

A major outcome is the 'agile positioning system' – a strategic and practical tool to assess and analyse how agile a company is and what it can do to improve its situation. This is being taken further in other

## FLEXI
## (ITEA 2 - 06022)

### Partners

ABB
Answare
Callatay&Wouters
Confirmit
DS2
EB
European Software Institute
Exoftware
Fidelity Investments Systems
Freemind
F-Secure
Geomatikk
ICT Embedded
INDUTRAUX
Innovalia Association
Kongsberg - Spacetec
Mälardalen University
National University of Ireland, Galway
Nokia
Nokia Siemens Networks
Objectnet
Océ Technologies
On2 Technologies Finland
Opcat Systems
Philips Applied Technologies
Prosource
Reaktor Innovations
Rovsing Ireland
Scia
SINTEF
Sirris
Spanish Public Authorities
SQS
Tampere University of Technology/ PORI
Telefonica I+D
Universidad Politecnica de Madrid
University of Limerick
University of Oulu
University of Utrecht
VTT - Technical Research Centre of Finland

### Countries involved

Belgium
Finland
Ireland
Israel
The Netherlands
Norway
Spain
Sweden

### Project start

April 2007

### Project end

December 2009

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projects – and more widely than just agile development but also as an overall measure about how a company is succeeding in its markets.

FLEXI packaged lessons learnt about innovation in a very concrete way. This included a book entitled *Building blocks of agile innovation*, published at the end of 2009. And a spin-off company in Finland is selling capability development dealing with new innovation aspect. Other major outcomes included development of tools to solve problems with concrete impact. Seven such tools are already in commercial development.

### SIGNIFICANT ADVANCES POSSIBLE

The agile approach can go as far as those involved have influence in an organisation. For example, Finnish company F-Secure with its fast-growing anti-virus range used this approach to launch a product that requires 70% less resources in terms of memory than before. This is a significant advance for its customers.

Major industrial robotics and power systems manufacturer ABB develops software for its own use. When it started with agile, it was able to consult companies such as Nokia Siemens Networks (NSN) which had already experience changing. As a result of applying agile techniques, ABB has been able to reduce lead time for new products by 63%.

NSN cut integration time for one new system from three weeks to 96 minutes. However such change does not happen overnight – it took NSN more than two years and investment to build the technical ability required for agility. The company has already trained over 5,000 people around the globe to make use of this approach.

### BENEFITS FOR EUROPE

The impact and wide adoption of the results are a major benefit to many of Europe's big players. An organisational development philosophy where accepting change is seen as a competitive advantage has given Europe the possibility of being a front runner in terms of time to market and productivity. It has also had an influence on standardisation through IEEE 1648 and ISO SC7.

## Major project outcomes

**DISSEMINATION**

- 249 papers (including conference presentations)
- 2 books, 3 PhD theses
- 20 seminars and workshops
- 7 keynote talks at major software conferences
- 5 international conferences (XP08, XP09, Profes09, ScanAgile08,09)

**EXPLOITATION**

- 58 trials with impact data
- 7 new products / tools including:
  - Product Backlog Management (Reaktor)
  - PLUM (ESI)
  - Releasious (Sirris)
- Several new services – e.g.:
  - Agile Positioning System (VTT)
  - Innovation Enablement Framework (TUT)
  - Product Mangement Framework (Sirris)
- Several new methods for companies' internal use – e.g., 77% of 5000 Nokia Siemens Network's developers want to continue to use new methods

**STANDARDISATION**

- Influence on 2 standards: IEEE 1648, ISO SC7

**SPIN-OFFS**

- 2 spin-off companies: Invicor (FI) (www.invicor.com) and Yoso Services (FI) (www.yoso.fi)

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ITEA 2 – Information Technology for European Advancement – is Europe's premier co-operative R&D programme driving pre-competitive research on embedded and distributed software-intensive systems and services. As a EUREKA strategic Cluster, we support co-ordinated national funding submissions and provide the link between those who provide finance, technology and software engineering. Our aim is to mobilise a total of 20,000 person-years over the full eight-year period of our programme from 2006 to 2013.

ITEA 2-labelled projects are industry-driven initiatives building vital middleware and preparing standards to lay the foundations for the next generation of products, systems, appliances and services. Our programme results in real product innovation that boosts European competitiveness in a wide range of industries. Specifically, we play a key role in crucial application domains where software dominates, such as aerospace, automotive, consumer electronics, healthcare/medical systems and telecommunications.

ITEA 2 projects involve complementary R&D from at least two companies in two countries. We issue annual Calls for Projects, evaluate projects and help bring research partners together. Our projects are open to partners from large industrial companies and small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

EUREKA

**FLEXI**
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