

Innovation Reports

FLEXI

(ITEA 2 ~ 06014)

Developing methodology and tools for widespread use of agile development technology

LINDO

(ITEA 2 ~ 06011)

Speeding access to distributed video and multimedia details

TECOM

(ITEA 2 ~ 06038)

Enabling Trust for Safety and Security in Embedded Systems

FLEXI

(ITEA 2 – 06014)

Pekka Abrahamsson, University of Helsinki
Finland

Developing methodology and tools for widespread use of agile development technology

The ITEA 2 FLEXI project has resulted in major improvements in productivity for embedded systems software development across large enterprises. Adoption of the agile approach has grown rapidly within consortium partners with two-thirds of users unwilling to return to previous methods. Some 58 trials demonstrated concrete impacts in terms of production innovation, reduction in lead times for new products and cutting integration time in major software development projects from weeks to hours.

Few industrial or consumer products can now function without software. Yet companies involved in their design and manufacture are still managed by people with little or no software development experience. There is a particular problem for global enterprises in how to deal with this fast-growing software need across their organisations – especially as much of this software is still developed using traditional manpower-intensive techniques.

FLEXI set out to improve performance in embedded software development across large, multi-site enterprises and so boost productivity. The preceding ITEA AGILE project had demonstrated that agile methodology offered important savings at team level. It led to radical improvements that made it possible to

develop products much faster. Moreover, those involved appreciated the ability to reduce reaction time to a bare minimum by automation, leading to new organisational structures that permitted feedback on a new idea in minutes or a very few days rather than weeks or months.

SCALING UP TO LARGE DOMAINS

Agile offers a particularly flexible approach for embedded software by promoting development iterations throughout the project life cycle. FLEXI worked on scaling up the agile approach to very large domains with hundreds or thousands of people involved.

Problems identified included:

- Multi-product synchronisation and cultural

variations between sites and locations, even within a single country, 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.

There are also many pinch points in a large organisation that had to change – mainly in non-software areas such as marketing and performance-reward systems that focus on individuals rather than teamwork. Adoption of agile technology also required the development of a new type of tooling that supported flexible integration and innovation.

THREE WORK AREAS IDENTIFIED

FLEXI worked on three areas:

1. Market-shaping innovation – developing new mechanisms rather than following the market;
2. Product portfolio management – market changes, new technologies and customers who want own their own competitive advantage mean there is often a need to react to last-minute changes; and
3. Large-scale agile production – the R&D engine that acts in every company required scaling up and integration. With many people working on a development, it is necessary to integrate their individual contributions.

The result is a 'hyper-performing' organisation which offers a high level of agility in decision-making processes and also in its ability to respond to market needs.

A major outcome was an 'agile positioning system' – a strategic and practical tool for a company to assess and analyse how agile it is and what it can do to improve its situation. This is being taken further in other 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 which was 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 were published of which some are already in commercial development. These included Product Backlog Management (Reaktor), PLUM (ESI) and Releasious (Sirris). Sirris also encouraged technology transfer with integration of the agile approach into a service offering by ProSource.

CHANGING DIRECTIONS MORE EASILY

A survey of a 1,000 people carried out as part of the project indicated that they highly rated the agile approach as:

- It makes it possible to change directions much more easily than before; and
- It is more transparent to both those responsible for the business side and those who do the work.

In practice, the agile approach can go as far as those involved have influence in an organisation. For



example, by using this approach Finnish company F-Secure with its fast-growing anti-virus range has managed to launch a product that requires 70% less resources in terms of memory than before. This is a significant advance for F-Secure's customers. Overall, F-Secure has already implemented the agile approach across 800 employees in its two sites in Finland as well as in Malaysia – its largest operations outside Finland.

Major industrial robotics and power systems manufacturer ABB does not consider itself as a software company but develops a lot of 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%. Pilot projects involved only a relatively limited number of participants – 30 to 40 people – but they were widely distributed over eight or so ABB sites around the globe.

NSN itself cut integration time for one new system from three weeks to 96 minutes. However such change did not happen overnight – it took 2 to 2½ 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 their agile development approach.

INDUSTRY-DRIVEN APPROACH

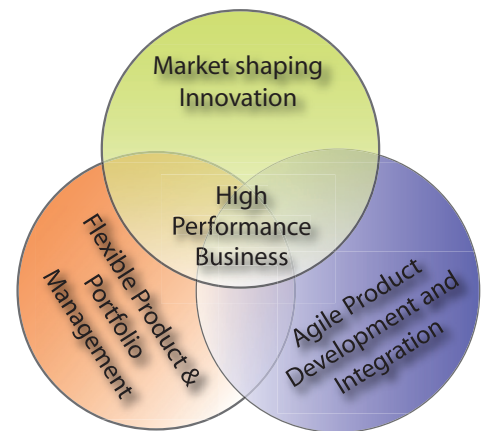
FLEXI developed as an ITEA project for three main

reasons: ITEA is industry driven; it offers an international platform where it is possible to adjust targets once they have been set; and it provides a well-developed platform in terms of procedures, support and expertise.

Putting together companies with different levels of expertise in different areas was also very useful – and many company-to-company collaborations emerged. ITEA also allows SMEs to work with large companies and see what they do. Moreover, in this project, some of the SMEs had specialist expertise that would not have been known otherwise.

BENEFITS FOR EUROPE

The impact and wide adoption of AGILE and FLEXI results have now put many of Europe's big players in the right place. 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 on agile methods and ISO SC7 on software and systems engineering.



MORE INFORMATION:

www.flexi-itea2.org