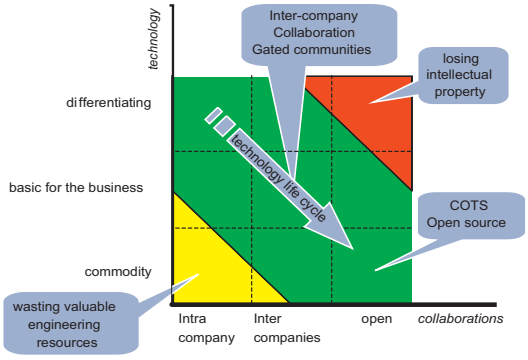
ITEA
INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

PROJECT RESULTS

Co-operating with open source

Distributed heterogeneous development is an economic imperative



Efficient and effective development

Only a small proportion of embedded software represents a real differentiating element for most products. The remainder is commodity ware, which does not justify heavy investment in proprietary development. COSI explored strategies drawing on the resources of open-source communities to complement in-house efforts and so reduce software development costs while achieving high quality.

Typical software products begin at the leading edge of technology, but progressively revert to commodity-like status, performing functions shared by different hardware platforms.

Truly differentiating components remain important, but often accounts for less than 10% of a total package. Efficient development focuses in-house effort and resources on these, while acquiring commodity elements through lower cost routes – such as by distributed working or purchasing commercial off-the-shelf (COTS) offerings.

Open-source software offers new solutions

Open-source software (OSS) provides new options to solve the problem. COSI examined the approaches, business models, architectures, processes and priorities appropriate to control and manage ownership in such scenarios. The project studied commodification and its implications for competitiveness with both large and small company partners from the European software-intensive sector, complemented by research institutes.

Because much software is no longer product specific, various trends towards networked collaboration are emerging: through subcontracting and integration; in coalitions – for example, around open platforms; and, to a lesser extent, by direct co-operation with OSS communities.

Practical experiences detailed

A series of case studies illustrated lessons learned from entering into open sharing arrangements.

- COSI partners Philips Healthcare and Agfa Healthcare, as early protagonists of the Digital Imaging and Communications in Medicine (DICOM) standard for hardware-independent sharing of diagnostic images, developed an interoperability validation toolkit known as DVTk. Launched as freeware, it initially conferred commercial advantage on the authors. But, as more competitors adopted the standard, DVTk became increasingly commodified.

COSI (ITEA 04031)

Partners
Combitech Systems
European Software Institute
Gamelion
Helsinki School of Economics
Högskolan i Skövde
ICT Norway
Meritie
Nokia Siemens Networks
Philips Applied Technologies
Philips Medical Systems
Philips Research
Telefónica
Telvent
Universidad Politécnica de Madrid
VTT Technical Research Centre of Finland

Subcontractor partners
eZ systems
Keymind Computing
Linpro
NTNU
Roland Systemutvikling

Countries involved
Finland
The Netherlands
Norway
Spain
Sweden

Start of the project
November 2005

End of the project
October 2008

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The originators therefore released the source code as OSS, and motivated participation by hosting community events. Development continued, sustaining product viability and extending functionality in new areas.

- Nokia Siemens Networks (NSN) uses Linux and open source, both previously considered disruptive technologies by the telecommunications industry. In 2002, Nokia joined forces with other major players to define carrier-grade Linux (CGL) as an open-architecture alternative to proprietary platforms in the Internet Protocol (IP) environment. NSN created its performance Network Database Benchmark tool that was first distributed to database vendors under non-disclosure agreements and later made open source. When this proved successful, NSN produced an application-specific OSS macro-benchmark, the Control-Plane (C-plane) Benchmark, for monitoring communication to establish connections and ensure correct payload routing and logging.

Taking intermediate steps

'Inner-source' development offers an intermediate step towards full integration of OSS. Further COSI case studies presented different inner-source models, in which internal teams co-operated using open-source processes and tools within a restricted ecosystem. This implies distributed ownership and control of code, but exploits existing organisational mechanisms for roadmapping, prioritisation and conflict resolution.

Such sharing with external partners must be based on mutual trust, whether or not competition is involved. Big companies should determine where to draw the boundaries to open source, and what level of investment is to be committed.

While most partners focus on technical infrastructure, key social aspects must also addressed, such as attracting contributors and obtaining the right contributions. Co-operation provides access to a pool of developers with talents that might not otherwise be available. Furthermore, it offers a safeguard against third-party vendor lock-in that can occur with COTS, and opens the door to use of other related software.

For new or smaller enterprises, involvement enables them to be part of large, complex development projects and helps them build new business opportunities. Academic institutions can contribute more knowledge content and innovation – vital to Europe's global competitiveness.

European strength

As the volume of OSS grows, it is in industry's economic interest to incorporate its benefits into their products. Europe leads this field; maintaining and strengthening this position should help combat the dominance of its US competitors in the global marketplace.

Major project outcomes

Dissemination
- More than 50 publications by COSI members, including 22 conference papers and 12 workshop papers at international conferences
- 4 main events organised, with participation in many more events
- Significant internet-based dissemination. Website has been maintained alive and full of content

Exploitation

Companies (small & large):
- Improved engineering models, methods and techniques
- Improved distributed heterogeneous software development process
- Adopted OS practices and are involved in OS developments
- Introduced policies

Academia
- Use results in software engineering courses and programmes

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ITEA - Information Technology for European Advancement - is an eight-year strategic pan-European programme for pre-competitive research and development in embedded and distributed software. Our work has major impact on government, academia and business.

ITEA was established in 1999 as a EUREKA strategic cluster programme. We support coordinated national funding submissions, providing the link between those who provide finance, technology and software engineering. We issue annual Calls for Projects, evaluate projects, and help bring research partners together. We are a prominent player in European software development with some 10,000 person-years of R&D invested in the programme so far.

ITEA-labelled projects build crucial middleware and prepare standards, laying the foundations for the next generation of products, systems, appliances and services. Our projects are industry-driven initiatives, involving complementary R&D from at least two companies in two countries. Our programme is open to partners from large industrial companies, small and medium-sized enterprises (SMEs) as well as public research institutes and universities.

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