How to know when agile is efficient – a context awareness model for successful agile software development

In the mid-1990s agile practices emerged as an alternative to more plan-driven development approaches aiming at overcoming their limitations. Since then many different organizations have applied different types and different levels of agility on different projects. However, the circumstances under which agile is efficient have not been well explored.

The main objective of EASE research on agile methods (project C1) is an increased understanding of agility. This will be manifested through identifying a set of agile practices that have been applied in different contexts as well as exploring their effects on specific outcome variables (e.g., customer satisfaction). It is initiated with reviewing relevant research literature in parallel with regular discussions with industrial partners of the project. The ongoing step is to define agile in terms of what practices and to what extent they truly claim being agile.

– The outcome of this research project is a general framework that will help project managers in investigating the applicability of certain agile practices based on their current situation when setting up agile projects. Furthermore, it will provide a basis for defining and measuring agility in software industry, says Samireh Jalali, PhD student in theme C.

Context awareness

Since agile practices can be successful in one context and fail in another, the research project focuses on viewing agile software development from different perspectives such as team, project, product, organization and customer.

– One of the tricky parts will be to collect agile setups and project outcomes from a sufficient number of real projects to cover the main combinations of projects contexts. To study this we will primarily use the EASE industry partners but also other companies, says Samireh.

One of the industry partners involved in the project is Softhouse Consulting that in collaboration with their customers will assist in finding real projects to test the framework.

– The resulting framework will help us to assess and support clients wanting to improve performance based on the agile toolbox. The different perspectives and the unified model to measure agility will hopefully be a good contribution to the agile community – and to our business, says Anders Sixtensson, Business Unit Manager at Softhouse.

Samireh Jalali intends to present her licentiate thesis on the subject late 2011.
Market-driven software development is becoming more common in the software industry, and at the same time, size and complexity of today’s products are continuously growing. To increase the chance of market success, it is important that the software product is released to the market at the right time, and offers a higher level of quality than the competitors’ products.

The objective of the MARS research project (associated with EASE Theme D) is to develop surveys, method development and pilot studies to develop an efficient method for early analysis and specification of quality requirements, a.k.a. non-functional requirements.

To support release planning of quality requirements, the project has developed the QUAility PERformance (QUPER) model that incorporates quality as a dimension in addition to the cost and value (benefit) dimensions used in prioritization approaches for functional requirements.

The purpose of the model is to provide concepts for qualitative reasoning of quality levels in the decision-making of setting actual targets of quality requirements for coming releases of the product, says Richard Berntsson Svensson, Ph.D student in the project.

– So far, the evaluation results of QUPER, both in the mobile handset and the electronic payment domain, indicate that QUPER is relevant in release planning, in particular the visualization of the roadmap view, which provides a clear picture of the current market situation and what level of quality to aim for, says Richard Berntsson Svensson, Ph.D student in the project.

The next step is to further improve the model’s concepts and practical guidelines based on the evaluation results. All the improvements will be used as input to a large-scale piloting of QUPER in industry, planned to start spring 2011. In addition, to enable easier adoption of QUPER by practitioners, tool support for QUPER will also be developed.

Richard Berntsson Svensson will present his PhD thesis on the subject late 2011.

Published in 2010
Theme A - User Experience-Driven System Configuration
Petra Lodén: Blodflöde i realism; VINNOVA-nytt No 4, October 2010

Theme B - Flexible Execution of Software in Parallel Embedded Systems


Christophe Wolinski, Krzysztof Kuchcinski, Kevin Martin, Antoine Floch, Erwan Raf-fin, and Francois Charot: Graph Constraints in Embedded System Design, accepted to Workshop on Combinatorial Optimization for Embedded System Design, in conjunction with CPAIOR 2010, 7th International Conference on Integration of Artificial Intelligence (AI) and Operations Research (OR) techniques in Constraint Programming, June 15, 2010, Bologna, Italy.


Theme C - Efficient Software Development
ers of services to do such adjustments using a simple script language, says professor Boris Magnusson, coordinator for EASE theme A.

Health care, home and robots

The PalCom middleware was originally developed as part of an EU IST project, but have been further developed in EASE and other VINNOVA and SSF projects. It is currently used in healthcare systems such as blood flow meter, in combination with dna equipment to enable flexible combination with remote and mobile devices, in combination with AXIS cameras and remote sensors. Current development include applications to real-time control of mobile robots in the ENGROSS project. The main deliveries from the project will be an architecture, a reference implementation and some demonstrators. Early versions are available as open source [http://www.ist-palcom.org].

Communicated in 2010

- EASE 2010 Industry-Academy workshop and industry evaluation (45 participants from industry and academia at Bäckaskog 2010-02-10–11)
- Licentiate Seminar: Understanding and Supporting Large Scale Requirements Management (Lund 2010-02-17)
- LUCAS-breakfast: EASE research overview 2009–2010 (Lund 2010-02-17)
- Guest lecture: Prof. Anneliese Andrews (Ronneby 2010-02-25)
- Presentation at Qterma Stockholm (Stockholm 2010-05-13)
- EASE-presentation at Axis - Multiple presentations of results (Axis Communication AB, Lund 2010-05-19)
- EASE was presented for VINNOVAS Director General (Ystad 2010-05-19)
- Guest lecture: Dr. Austen Rainer: Perspectives on evidence (Lund 2010-05-24)
- LUCAS-breakfast: Open source in commercial organizations - current research (Lund 2010-06-09)
- EASE presented at Mobile Heights workshop (Ystad 2010-06-30–07-03)
- PhD thesis: Implementing Lean and Agile Software Development in Industry (Karlskrona 2010-09-07)
- Multicore Day, presentations: An evaluation of four static analysis tools for Java concurrency bugs and Beyond von Neumann - weakly programmable processor arrays and their programming. (Stockholm 2010-09-09)
- Product Management Conference (IBM, Stockholm 2010-09-10)
- EASE Theme B presented at DTU: Flexible Execution of Software in Parallel Embedded Systems (DTU, Copenhagen 2010-09-16)
- EASE was presented at Lund Circuit Design Workshop (Lund 2010-09-21)
- EASE Scientific Advisory Board Meeting (Lund 2010-11-11–12)
- Embedded Conference Scandinavia 2010 (Exhibition and multiple presentations Stockholm 2010-10-19–20)

EASE booth were exposed to 1400 industry practitioners on Öredev 2010.

- Öredev (Exhibition in cooperation with Mobile Heigts, SIGRUN and 1TH Robot lab in Malmö 2010-11-08–12)
- VINNOVA Evaluation Hearing (Stockholm 2010-11-24)
- EASE findings presented at Ericsson Software Research Day (Stockholm 2010-11-25)
- Guest lectures and discussions on joint research opportunities at Aristotle University, Thessaloniki (Thessaloniki, Greece 2010-12-07–09)

- Guest lectures and discussions on joint research opportunities at Aristotle University, Thessaloniki (Thessaloniki, Greece 2010-12-07–09)


Mahvish Khurum, Sebastian Barney, Nina D Fogelström and Tony Gorschek: Requirements Management for Continuous Software Product Development, Evaluation and Assessment in Software Engineering (EASE), Keele, UK, April 2010

Theme D - Aligning Requirements and Verification


Quotes from EASE evaluations 2010

Industry evaluation 2010-02-12:
The work performed and the collaboration from the industrial partners is promising and should be maintained and improved. More collaboration and stronger involvement of industrial partners in both the definition of research themes and participation in actual research is expected in coming evaluation results.

Academic Evaluation 2010-10-12:
Centers such as EASE, bridging research and practice, are of high importance to Swedish innovation. Challenges are many in starting and running such a center but the expected benefits are enormous.

VINNOVA evaluation 2010-11-24:
The Centre has a vision to be a world-class research facility for the development of “embedded software applications with physical and logical mobility”. The Centre has core competence, a regional research milieu, and industrial partners appropriate to this vision and has already demonstrated the strategy and capability to deliver on this vision through the development of technologies already taken up by its industry partners.

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This is EASE

EASE aims to be a world class applied software research facility for embedded software applications. The objective is to ensure that industrial partners have a competitive advantage with respect to competency and innovation of novel solutions and effective engineering of embedded software applications with physical and logical mobility.

The centre impacts on the innovation system through provisioning of competency, via a continuous exchange loop between industry and academia, involving research challenges, industry personnel, researchers, students and research results. These range from technical solutions that can be used in products to improved work procedures for the development.

Research themes
A User Experience-Driven System Configuration
B Flexible Execution of Software in Parallel Embedded Systems
C Efficient Software Development
D Aligning Requirements and Verification

EASE takes part in the Mobile Heights cluster

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