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Software Engineering Management System for SME's in the SW Product Business

3.4.2002

Jarno Vähäniitty
http://www.soberit.hut.fi/sems/

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Agenda

- SEMS Facts and focus
- SEMS Deliverables and Status
- SEMS in practice: contents for 2002

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SEMS Project

- Three-year research project (2001-2003)
- Team of 5 researchers
  - Teachers of SW Engineering from HUT + venture capitalist's perspective
- Budget 900 000 €
- Funding
  - Tekes 80 %
  - Industry partners 20 %
- Industry partners in 2002:
  - QPR, Eficor Ventures w/Bluegiga & oPLAYo, Smilehouse, Softatest AKK w/ePlanet

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Background

- Problems
  - There are many SME's that struggle with the quality of their products and controllability of development
  - Many good business ideas can fail through poor quality of execution
    - Both development and sales!
  - Money and time is lost in ad-hocracy
    - Effort on the wrong things
    - Products are patched until the code is degenerated
    - ...
- No holistic approach exists for managing the software engineering activities of SME's!
  - Business aspects are not considered together with product development aspects
  - Process-centered approaches do not take into account the differences between project types, for instance,
    - Requirements-driven projects
    - Schedule-driven projects
  - CMM, for example, is too heavy and documentation-centered for SME's and best suited for limited types of software engineering

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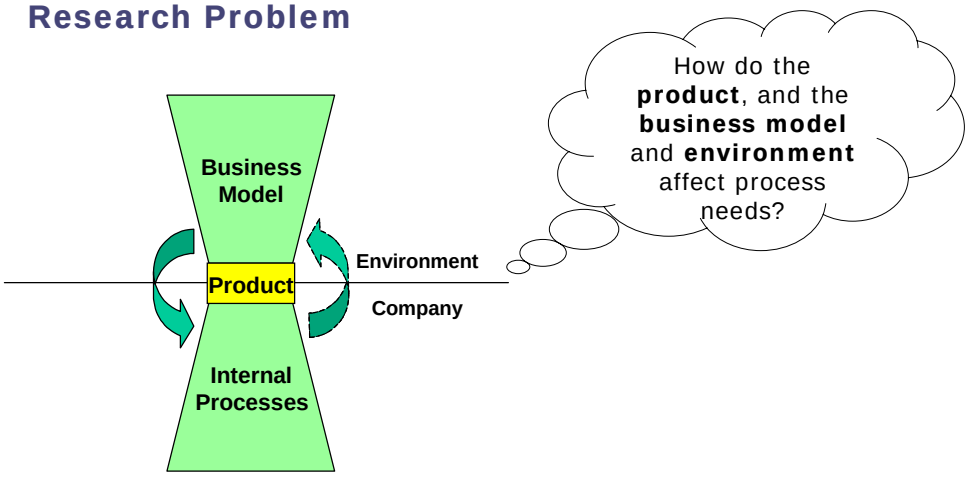
Research Problem



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SEMS Objectives

- To improve the **profitability** and help the **growth** of **small** and **medium-sized software product** businesses by improving the **controllability** and **quality** of **relevant** software engineering activities
- To help potential investors and the companies **assess** the **fit-for-purpose** of the software engineering activities in relation to the activities' **maturity** and intended **business model**

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SEMS Deliverables (1/6)

Software engineering management system
framework for SW product engineering in SME's

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SEMS Framework – Purpose

- Create a common language and understanding about organizing and managing software product development in SME's
- Bring forth the most important dependecies between business drivers and product development
  - Combine business management and product development
- Bring a degree of control into software product development and at the same time accomodate faster response to change

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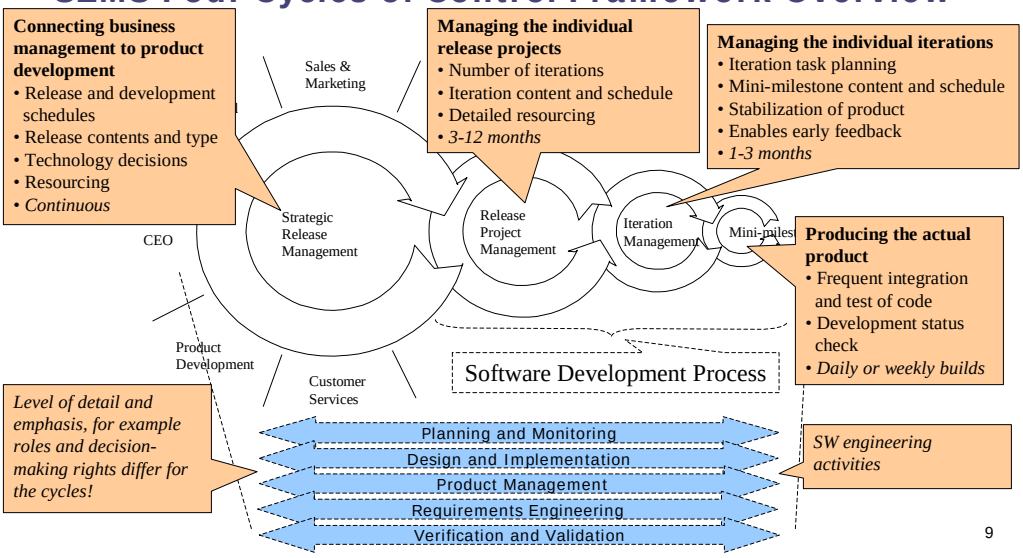
SEMS Four Cycles of Control Framework Overview



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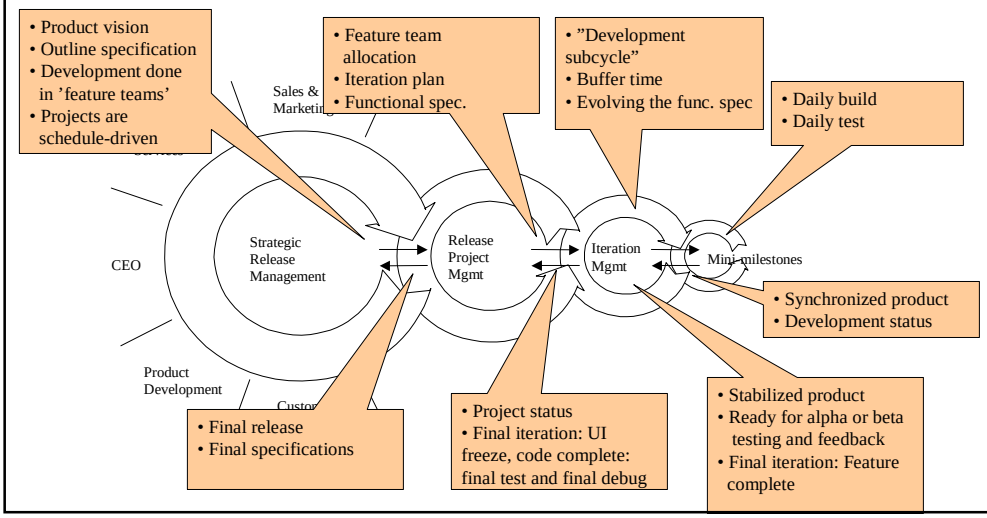
An Example: Microsoft's Synch-and-Stabilize in Our Terms



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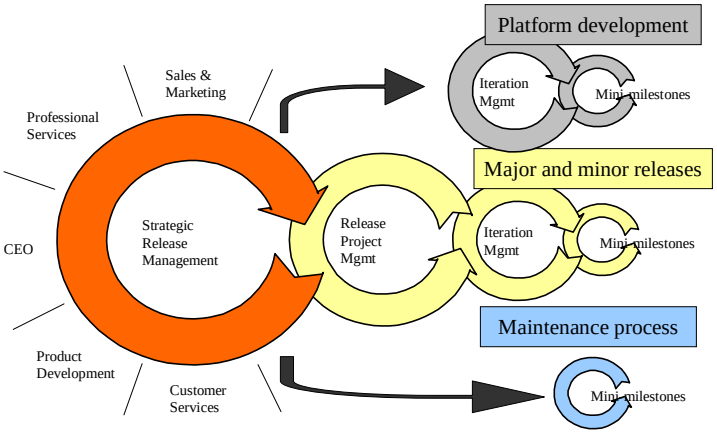
Approaches to Development May Vary Within A Single Company!



- Variables:
  - Roles
  - Resourcing
  - Decision-making rights
  - # and duration of cycles
  - Communication patterns
  - …

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SEMS Deliverables (2/6)

Software engineering management system *framework for SW product engineering in SME's*

Gathering, evaluating and developing ***methods***, ***processes***, ***templates***, ***measures*** *and* ***checklists*** *for management system instantiation.*

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Help for Instantiating the Management System

- We are currently working on and / or looking at
  - An approach to product and release planning
  - The most famous agile methodologies (XP, SCRUM, ASD, DSDM, Crystal Family) from the perspective of SW product development and small teams
  - Clarifying the role of Verification & Validation in iterative software product development for a small company
  - An approach to improving the testing process in SME's from the business model's perspective
- Not re-inventing, but re-directing the wheels!

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SEMS Deliverables (3/6)

*IT **toolset** for planning, tracking and **visualising measurement data***

***Software engineering management system** framework for SW product engineering in SME's*

*Gathering, evaluating and developing **methods**, **processes**, **templates**, **measures** and **checklists** for management system instantiation.*

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Tool Support for Measurement: Lucos Tools

- Purpose
  - Designing and publishing customized views to measurement data
  - Collecting measurement data from other systems
    - Integration to MS Excel, MS Project, CSV Data
- Platform
  - client: Java/www-browser
  - server: Windows/Linux
  - dbms: Sybase/Solid/PostgreSQL

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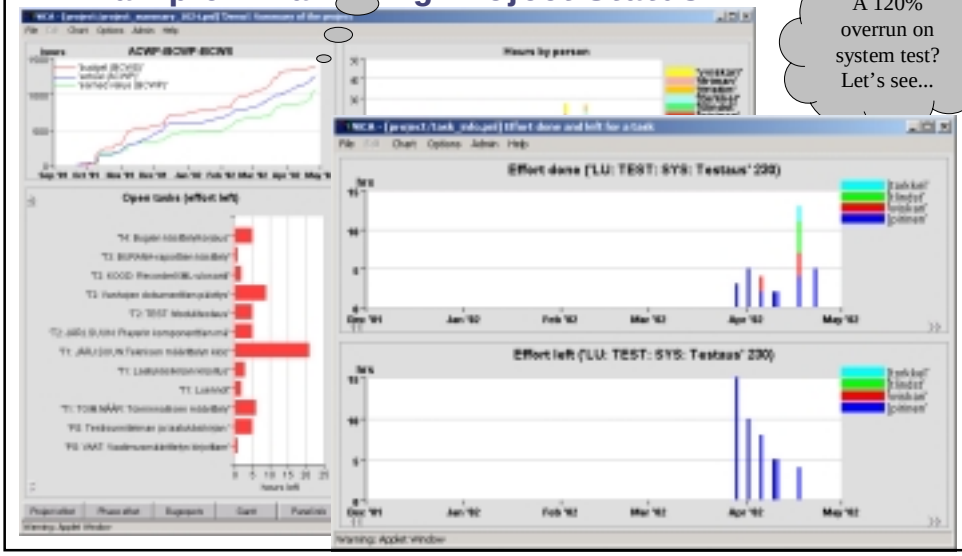
Example: Examining Project Status

Spent & achieved less than planned...

A 120% overrun on system test? Let's see...



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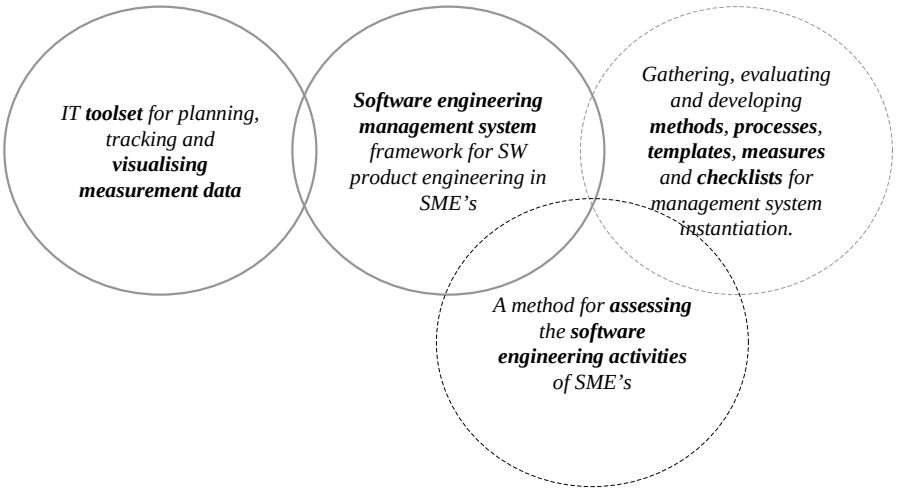
SEMS Deliverables (4/6)



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Assessment Method

- Objective: to assess the fit-for-purpose of the software development activities of an SME in the product business
- Fitness is defined in relation the intended business model and the maturity of the relevant development process areas
- 2nd version of the SEMS questionnaire and 1st version of the assessment method published for partner companies in Q2/2002
  - Tested on several companies in 4/2002
- Venture capitalist's perspective

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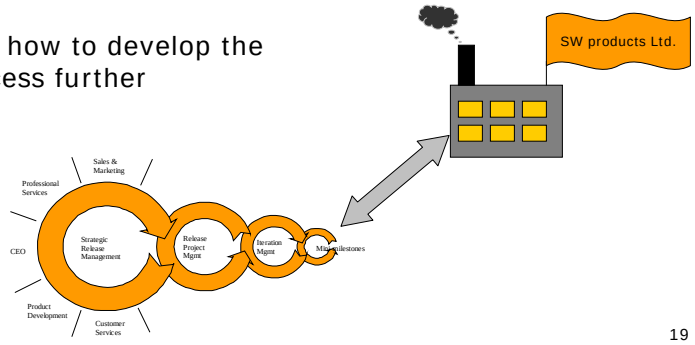
Assessment by Applying the Four Cycles Model

- Benchmarking the companies' activities to existing methodologies and real-life processes through the 4CC
- Suggestions on how to develop the company's process further



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SEMS Deliverables (5 & 6)

*A **workbook** to package the results of the project*

*IT **toolset** for planning, tracking and **visualising measurement data***

***Software engineering management system** framework for SW product engineering in SME's*

*Gathering, evaluating and developing **methods**, **processes**, **templates**, **measures** and **checklists** for management system instantiation.*

*Consulting and training **material** for **building** a software engineering **management system***

*A method for **assessing** the **software engineering activities** of SME's*

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Co-operation with Partners

Current State Analysis

1-2 Research Areas

Benchmarking to the 4CC Model
- Interviews (4-6 people)

Deliverables:
- Case summaries and improvement suggestions
- Summary of all cases
- Presenting and discussing the results

Developing / deploying the measurement system

Applying/Implementing the 4CC
- Literature study, + N cases

Follow-up for selected companies

Decision Making in SW Product Merchandising
- 2 + 2 cases

Strategic Release Mgmt. by Product Roadmapping
- 2 cases

Business Drivers and the Development Process

Validation and Verification in the Four Cycles
- Defect management review

Holistic approach to improving the testing process (2 cases)

Agile Development Literature Study

Agile Development Processes Case Work

Case Work Continued

Seminars and Training

Requirements Engineering Expert Seminar

Current State Analysis Experience Exchange

Product Roadmapping and Defect Management Theme Seminar

V&V Workshop

Agile Processes Theme Seminar

Expert Seminar

Decision Making in SRM Theme Seminar

Final State Analysis Experience Exchange

3/02 4/02 5/02 6/02 8/02 10/02 1/03

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Thank You For Your Attention!

Questions and Comments?

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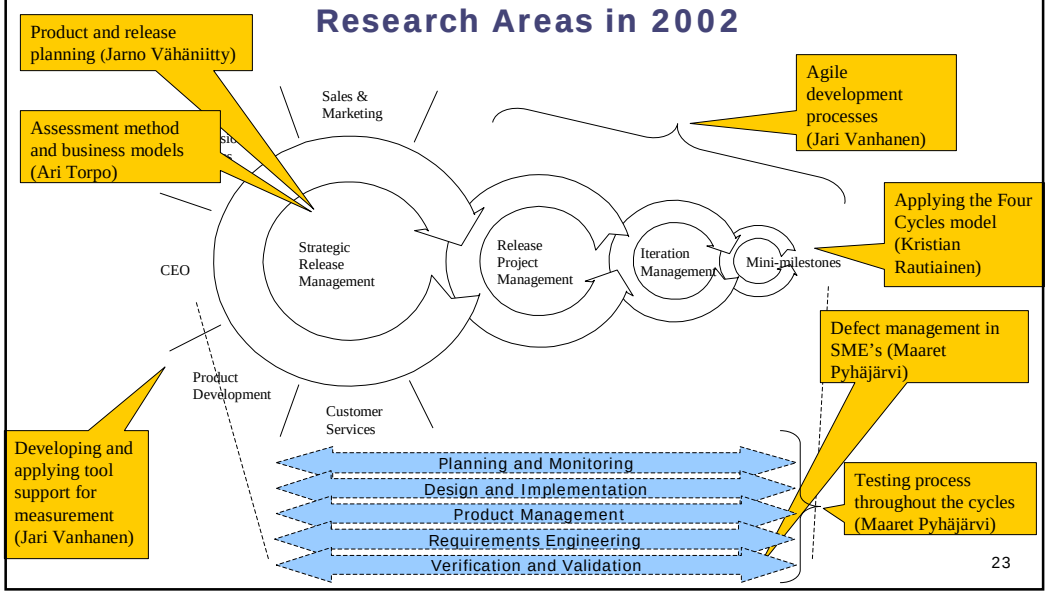
Research Areas in 2002



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The Team

- Jarno Vähäniitty
  - Research on measurement in SW engineering, strategic management of NPD, developing Lucos Tools, and various teaching activities between '99-'02
- Maaret Pyhäjärvi
  - Teacher-in-charge of Software Testing course (3cr) at HUT
  - Former test manager, tester and consultant of software testing
- Kristian Rautiainen
  - Teacher-in-charge of Software Processes course (2cr) at HUT
  - Research on controllability of New Product Development and Software Processes
- Ari Torpo
  - Investment partner at Eficor Ventures, formerly technology manager at Andersen Consulting
  - Extensive experience from large programme and project management in building custom systems and technology management of small SW companies
- Jari Vanhanen
  - Teacher-in-charge of Software Project course (5cr) at HUT
  - Developing a toolset for NPD measurement (Lucos Tools), former teacher-in-charge of SW Configuration Management course (2cr) at HUT

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