SW Design Ericsson Radio Access products using Modeling

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What is my role

• Radically increase support for SPEED in the Radio Product development operations
• Propose hands on solutions in the time ranges 6, 12, 18 months (and long term)
• Focus
  • Present time (6,12,18) 80%
  • Future (long term) 20%
Areas Covered

- The products
- Way of Working
- Tool support
- Tech trends
Ericsson Engineers “Systems of Systems”

Code gen in significant parts
Serious yearly growth together with reuse
Models Help Solving Complex Problems

Abstraction is the key to building complex systems
Modeling is a “tool” to support the process of abstraction
Why modeling at Ericsson

- Excellent Development Efficiency Implemented in terms of
  - Quality
  - Lead Time
  - Flexibility
- One Source of Information supporting different views used
- Raised abstraction level
- Improved information flow between development phases such as predevelopment, system, design, integration, test, delivery etc.
- Supporting simplified processes (Agile etc.)
- SW architecture awareness on all levels
- Improved information access and navigation support
- Early design execution / simulation / validation
- Extensive use of automation and generation
The importance of model driven design

- UML modeling is currently used within Radio for the following systems:
  - WCDMA, 80-90% of the SW + Systems design RBS
  - LTE, big parts of the SW
  - GSM, Systems design RBS
  - CPP (Platform), 20% of the SW + Systems design parts
  - M-MGw, major part of the SW

- The above Business based on model based design corresponds to around 60% of the Ericsson yearly turnover of more than 200 Billion SEK, $ 27 Billion
Tool support
The RSA RTE story

- 1998 Started to use modelling with code gen large scale (Objectime and later Rose RT)
- 2005 Ericsson Engineers visits IBM Ottawa and the requirement discussions on a modeling tool on eclipse starts
- 2010 Parts of Ericsson SW design migrate from Rose RT to RSA RTE
- 2011 Large scale Ericsson deployment
  - SW Design former Rose RT parts
  - Model Based systems design
  - New areas
RSA RTE 2011

New areas

- Logical Graphical Model Merge
- Green field LARGE scale systems modeling
- UAL trials will be conducted
- Transformation Engine
- Model markings
Other modeling tools used

- Rhapsody
- Nucleus Bridgepoint
Ways of Working

Using modeling
Team processes

- Cross functional teams
  - Systems design
  - SW Design
  - Test
- Scrum and other Agile team processes
Continuous integration

- Short inner loop
- Fast feedback
The innermost Loop

Code -> Test -> Build

Several 100s of times per day
Observations & Trends

- **SW, SW, SW**
  - Consolidation
  - Responsiveness
  - Flexibility
  - Speed
  - New Business models

**Shift in focus from HW to SW Rationalization**
- Secure future margins

**Increased Industry focus on Product Portfolio efficiency**
- To enable lower cost and higher responsiveness

**IP Market Ways of Working Differ**
- Customer is an integral part of the Value Chain

**Likely truth – Continuous strive for competitiveness**
- “When the rate of change exceeds the rate of change inside, the end is in sight.”

**Trend description**
- **Short leads lead to higher revenue growth**
  - Responsiveness is a business advantage
Tech trends in the SW Modeling area

- SW modeling a mature technology
- Open source and modeling
- Executable UML now OMG standard
- Model Based Testing
SW modeling a mature technology

- Tool support more streamlined and complete
- Better support for end to end development flows
Open source and modeling

- ‘Large’ scale modeling supported
- UML2
- Ongoing projects developing Papyrus to cover e.g. Logical model merge (Eclipse project)
Executable UML now OMG standard

Ericsson supports the IBM proposal
Model Based Testing

- Tool support more streamlined and complete
- QTronics
- Quich Check
- Other
Discussion
Thank you!