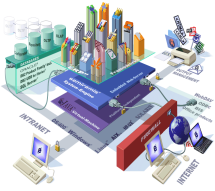






<p>Xiaohong Jin Pia Stoll Mariana Olsson Corporate Research ABB</p> 	<p>ATAM Experiences</p>
	
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<h2>Outline</h2> <ul style="list-style-type: none"> ■ Background ■ Performed evaluations <ul style="list-style-type: none"> ■ Architecture used in 3O3P project ■ SA-AFL architecture ■ General experiences ■ Future work
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Background

- Why ATAM?
 - Frequently referred method
 - Structured way of evaluation
- Emphasized in Strategic Technology Plan (STP) at ABB
 - Supported by ABB technology managers

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Performed Evaluations

- Two late evaluations performed
 - Architecture used in 3O3P project
 - SA-AFL architecture

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3O3P: On-line Optimization of Pulp & Paper Production



Pilot Installation

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3O3P: Overview

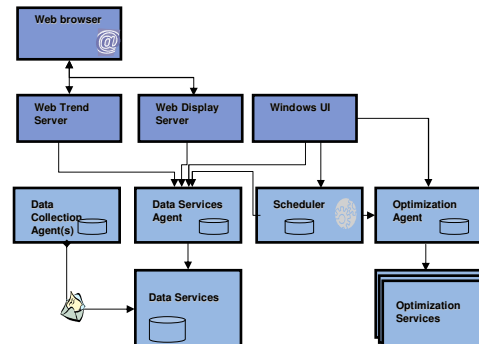
- Online Optimization Of Pulp & Paper Production (3O3P)
 - Higher production rate due to superior co-ordination of loads in different sections of a mill
 - Reduction in number of operators
 - Better planning of maintenance stops
- .Net architecture focused on performance mainly
- Interest of reusing the architecture

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3O3P: System Solution

- Follow the Service Oriented Architecture
- Use Microsoft .NET
- Use standards
 - MS SQL Server Database
 - Stable and portable data storage,
 - Built in Security handling from Operating system
- Create
 - Data Collection Agents
 - Data Services, storage, retrieve, update and delete of data
 - Trending Services, Windows form and Web trending.
 - Code generator for process models.
 - Web based Displays
 - Optimization Services
 - Scheduling service



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3O3P: Experiences

- Swedish ABB Corporate Research initiative
 - Hard to motivate stakeholder participation
- No architecture documentation available
 - Less time for evaluation because of the need for documentation
- Project organization unclear
 - Difficult to gather stakeholders for scenario reasoning
- New .NET technology changes on the fly
 - Architecture details changed during evaluation period
- Sometimes technical acrobatics take over on the cost of easily maintainable and easy-to-grasp codes
 - Difficult to understand architecture approaches

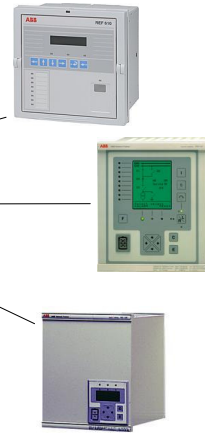
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SA-AFL: Overview

(Substation Automation – Application Function Library)

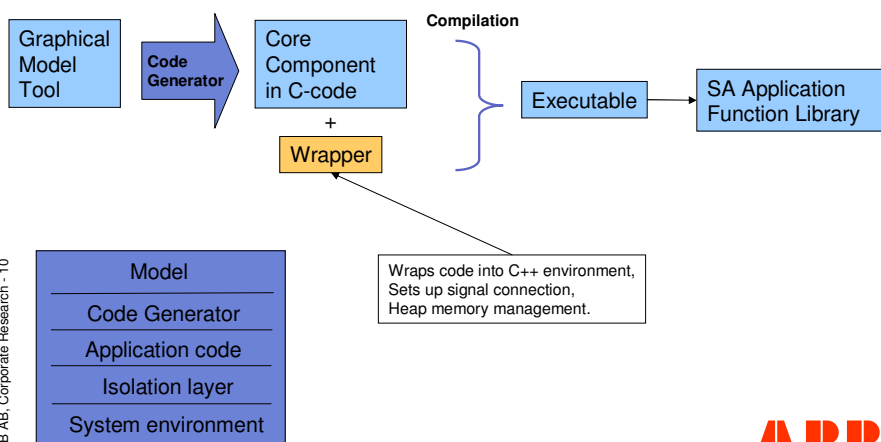
- Motivation of the evaluation
 - Is the performance of auto-generated code effective?
 - Is it cost-benefit if the auto-generated code is replaced by hand-coded one?
- AFL is the base of SA products such as:
 - Protection relay for protection of incoming and outgoing feeders in MV distribution substations
 - Feeder terminals for protection, control, measurement and supervision of medium voltage networks.
 - Protection terminal for phase and residual over-current protection applications.
- Independent evaluation requested



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SA-AFL: Architecture overview

- Evaluation of Code Generator for automatic generation of C-code from graphical model tool



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SA-AFL: Experiences

- Management initiative
 - Stakeholders available for support
- Well documented architecture
 - Evaluators can focus on evaluation
- ATAM evaluation important
 - Supported stakeholder make right decision concerning the existing architecture of SA-AFL
- No sufficient domain knowledge
 - Difficult to ask right questions concerning system related quality attributes
- Expert assistance more important than expected
 - Experts help only in review not necessarily in questioning

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General Experiences

- ATAM related
 - + ATAM steps easy to follow
 - + Make non-functional requirements visible
 - + Trade-off discussions lead to prioritized quality decisions
 - Absence of artifact repository
 - Late evaluations make scenarios discussions difficult, i.e. hard to gather stakeholders
 - Normally smaller-than-required evaluation teams at ABB
- Stakeholder related
 - + Stakeholders' initiative and support very important
 - + Stakeholders gain better understanding of the architecture
 - + Help stakeholders to make right decision
 - Stakeholders busy, do not prioritize evaluation
- Evaluator related
 - Evaluators must possess domain knowledge and good architectural insights
 - Hard to market ATAM to other stakeholders at ABB without sufficient successful stories

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Future Work

- Continue activities in the area and produce successful stories within ABB
- Other Software Architecture Technologies (AADL, Software reconstruction etc.) can be used in combination with ATAM
- An infrastructure for spreading experiences at ABB
 - Databases
 - Seminars

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