J2EE Design in UML using RUP and Agile Software Development

Charles Jobson

Callista Enterprise AB

Cj@callista.se

http://www.callista.se/enterprise

J2EE Design in UML using RUP and Agile Software Development

- **Target audience**
  - Process Engineers, Project Managers, Designers
- **Objectives**
  - To get an understanding of the RUP J2EE Developer Roadmap and how Agile concepts can improve the System Development Process
- **Non-Objectives**
  - Sell a Religion

Agenda

- Why Agile is a challenger to RUP...
- The RUP J2EE Developer Roadmap
- Agile Software Development
- A proposed RUP & Agile process based on practical experience
- References

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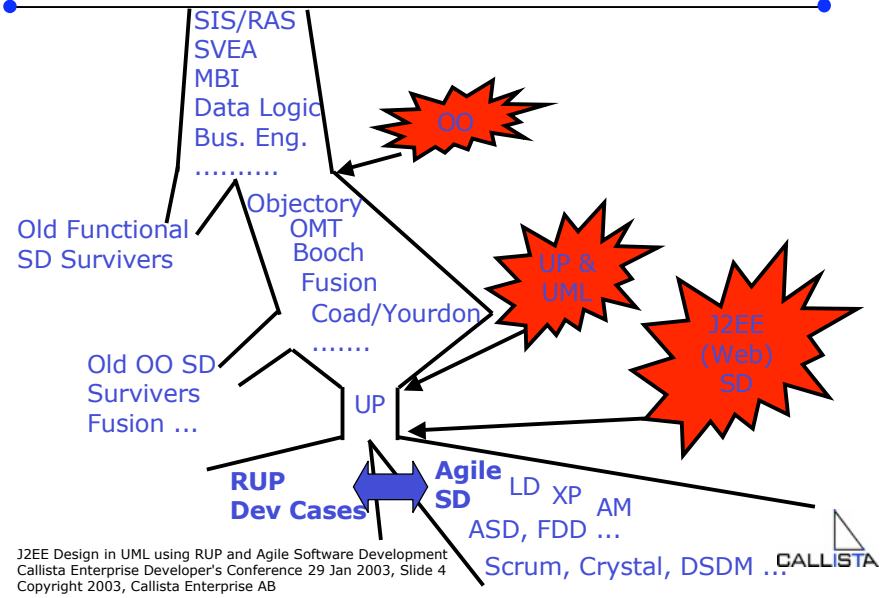
A Meandring River of SD Methods



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Why Agile has become a Challenger to RUP

- Up front planning will be wrong anyway, adapt as you go along ...
- An advantage with non rigid methods, when one adjusts under way ...
- Messy unreadable UC doc's, we must ask the Customer anyway ...
- Business req's are unpredicatable and change all the time ...
- To build for future features will fail, build for min. req's ...
- A timeboxed delivery and a Customer flood of must-req's does not work...
- Not having working code available often enough, a menace ...
- Allways changing/increasing features creates competetiveness ...
- Believing in control, causing unprepareness when "things happen"..

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Why Agile has become a Challenger to RUP

- A "rich" process does not compensate for less competence anyway ...
- IT personell making inapropriate business priorities, lack of collaboration...
- Customers taking IT decisions, lack of collaboration ...
- Unsensitive, time pushing, ignorant, not caring project managers ...
- Buggy code with tons of useless documentation to go with it ...
- A lighter backpack makes the traveller more endurant ...
- Simple solutions are easier to adapt ...
- People get stuck in roles, causing resource allocation problems ...
- Agile is recognized as a more "open source" methodology than RUP ...
- ...

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Why RUP still is strong

- Widely spread, a lot of people with RUP experience
- Serious RUP Customers have made tailored Development Cases
- Strong connection to UML
- Easy choice in Company policy ...

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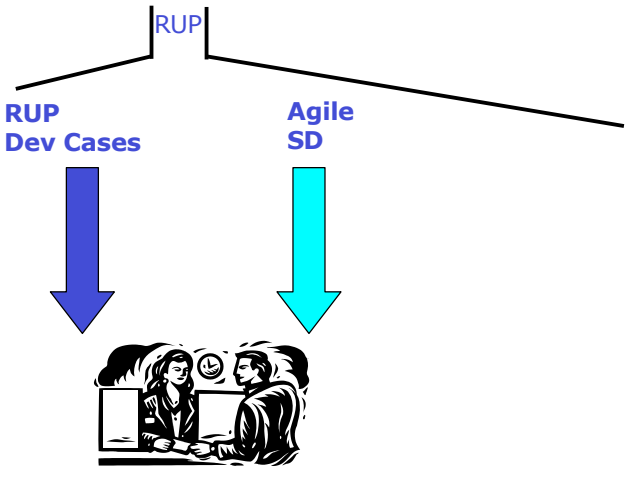
Picking the candy from both bags



J2EE Designers

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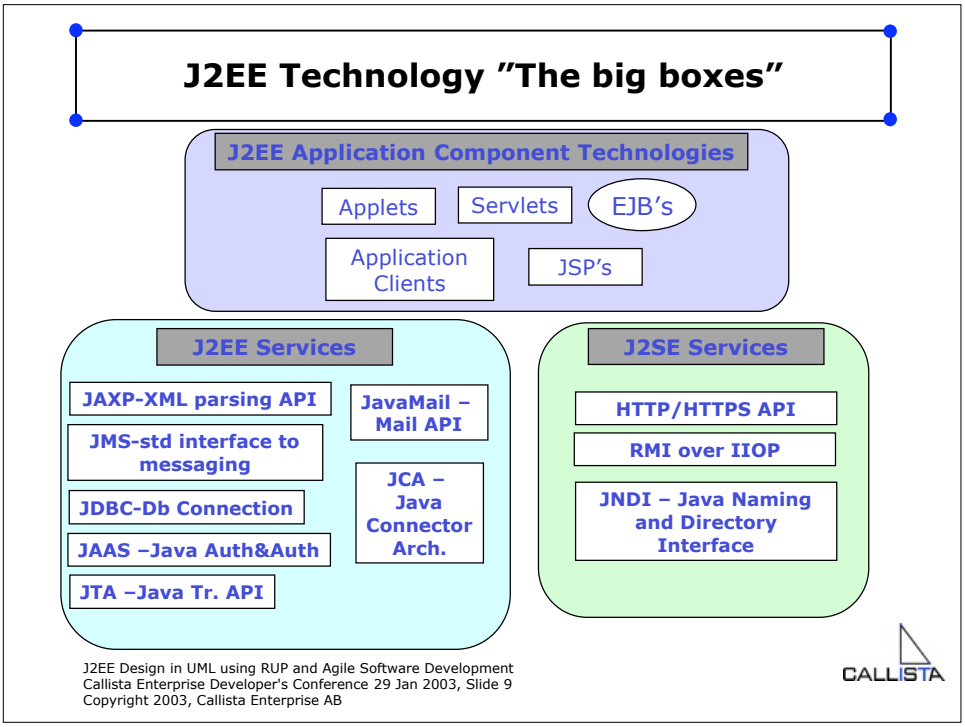
J2EE Technology "The big boxes"
J2EE Application Component Technologies
Applets
Servlets
EJB's
Application Clients
JSP's
J2EE Services
JAXP-XML parsing API
JavaMail – Mail API
JMS-std interface to messaging
JCA – Java Connector Arch.
JDBC-Db Connection
JAAS –Java Auth&Auth
JTA –Java Tr. API
J2SE Services
HTTP/HTTPS API
RMI over IIOP
JNDI – Java Naming and Directory Interface
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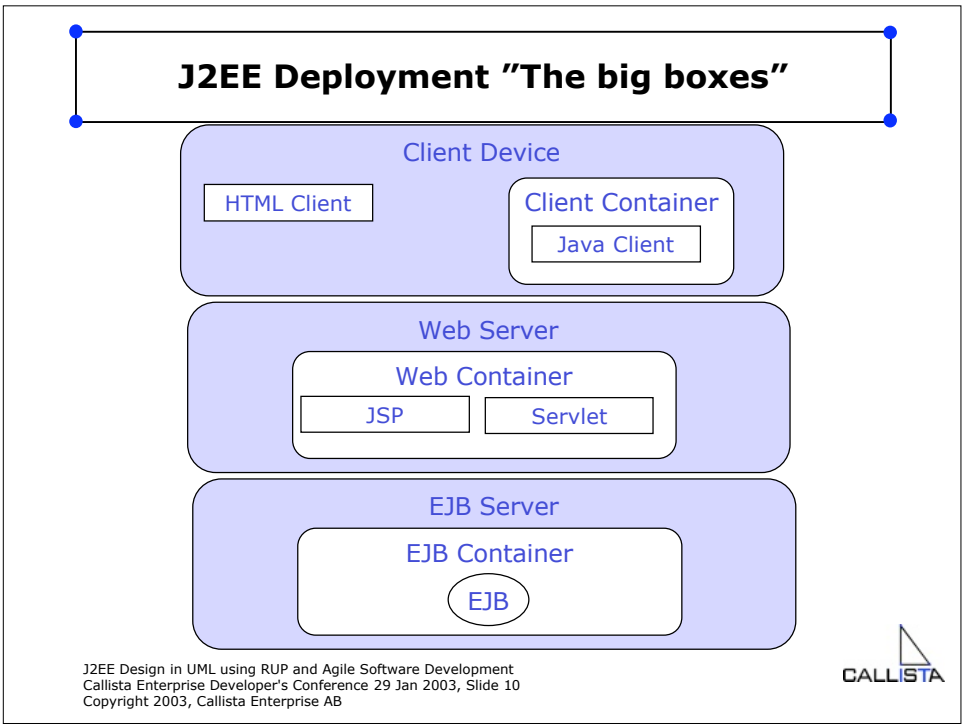
J2EE Deployment "The big boxes"
Client Device
HTML Client
Client Container
Java Client
Web Server
Web Container
JSP
Servlet
EJB Server
EJB Container
EJB
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RUP – J2EE Design
RUP Definitions

RUP

Rational Unified Process
"A SD Process Framework from which customized Processes can be Developed"

The J2EE Developer Roadmap

A Customized SD process that has been tailored to meet the needs of the "J2EE Developer". Developed by Eeles, Houston, Kozaczynski

J2EE Developer

"...responsible for taking a Vision of a System through to an Implementation of the System using the J2EE platform"
= J2EE Spec. Role "Application Component Provider"
= RUP Roles: Architecture Reviewer, Database Designer, Designer, Design Reviewer, Implementer, Implementation Reviewer, Requirements Reviewer, Requirements Spcifier, Software Architect, System Analyst, User-Experience Designer, User-Experience Reviewer

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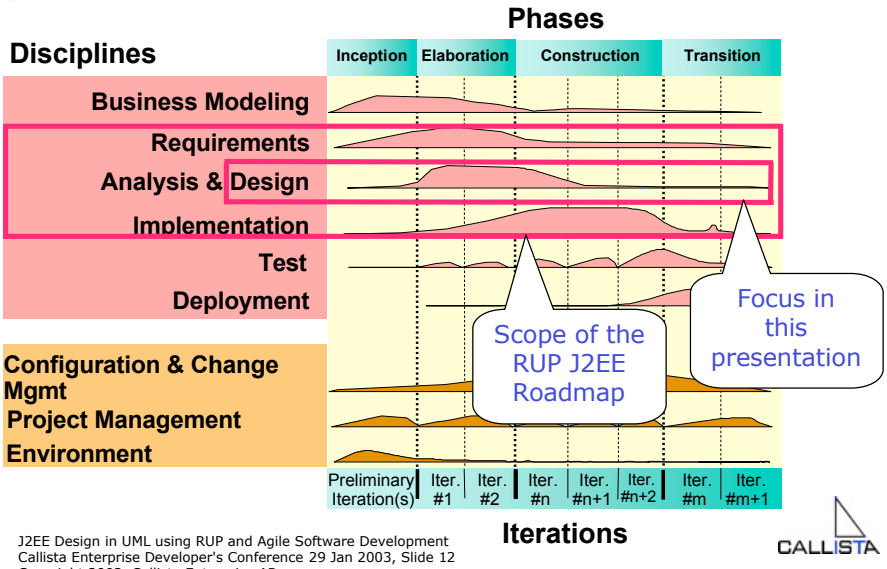
RUP - J2EE Design
Roadmap Overview



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RUP – J2EE Design
J2EE Developer Roadmap

Disciplines	Workflow details	Activities
Requirements	Define the System	Capture a common vocabulary
		Find Actors and Use-Cases
		Prioritize Use-Cases
	Refine the System Definition	Detail a Use-Case
		Structure the Use-Case Model
Analysis	Define an Initial Architecture	Architectural Analysis
	Analyze Behavior	Model the User Experience
		Use-Case Analysis
Design	**Refine the Architecture**	**Identify Design Mechanisms**
		Identify Design Elements
		Incorporate existing Design Elements
		Describe Concurrency and Distribution
	Detail the Design	**Use-Case Design**
		Subsystem Design
		Component Design
		Class Design
		Database Design
Implementation	Structure the Implementation Model	Structure the Implementation Model
	Implement Design Elements	Implement Design Elements
		Perform Unit Tests

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RUP – J2EE Design
J2EE Specific in Roadmap

Disciplines	Workflow details	Activities	J2EE Specific Content
Design	Refine the Architecture	Identify Design Mechanisms	Identify what J2EE patterns are going to be used
			Identify what J2EE technologies are going to be used
		Identify Design Elements	Identify JSP's, Servlets, EJB's and other J2EE elements
		Incorporate existing Design Elements	None
		Describe Concurrency and Distribution	Describe the use of Java threads and message-driven EJB's
			Map J2EE modules to nodes
	Detail the Design	Use-Case Design	Describe the intercations between collaborating J2EE elements
		Subsystem Design	Describe subsystems in terms of their internal J2EE elements
		Component Design	Produce a detailed design of EJB's
		Class Design	Produce a detailed design of JSP's, Servlets and other Java classes
		Database Design	Define the mapping between entity EJB's and the underlying database

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RUP – J2EE Design
J2EE Specific Content Highlighted

- Identify what **J2EE patterns** are going to be used
- Identify what **J2EE technologies** are going to be used
- Identify **JSP's, Servlets, EJB's** and other J2EE elements
- Describe the use of **Java threads and message-driven EJB's**
- Map **J2EE modules to nodes**
- Describe the **intercations between collaborating J2EE elements**
- Describe **subsystems** in terms of their **internal J2EE elements**
- Produce a **detailed design of EJB's**
- Produce a **detailed design of JSP's, Servlets** and other Java classes
- Define the **mapping between** entity **EJB's** and the underlying **database**

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RUP – J2EE Design
3 Contributions

- Predefined Input from Analysis
- A configured chain of worksteps for J2EE Design, with J2EE specific content
- UML mapping to J2EE concepts and suggested package structure in Design Model is done as part of the Roadmap

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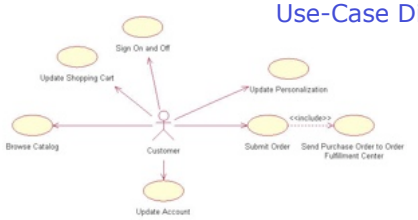
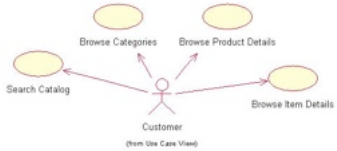
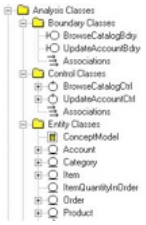
RUP – J2EE Design
1 Input from Analysis

Use-Case Diagrams

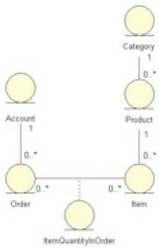




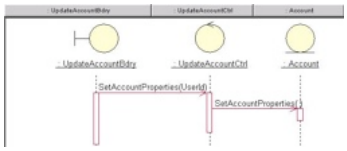
Analysis Classes



Class Diagrams



Sequence Diagrams



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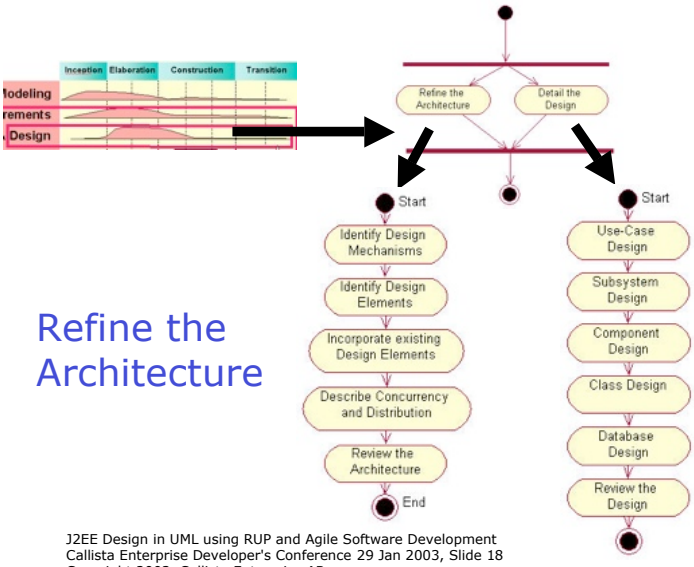
RUP – J2EE Design
2 A ”clear” chain of worksteps …



Refine the Architecture

Detail the Design

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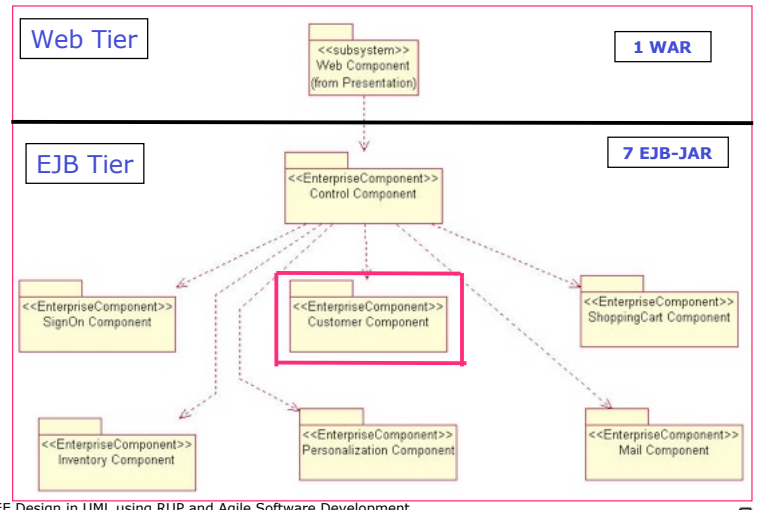
RUP – J2EE Design
3 UML Mapping – UML Package to J2EE Components

J2EE Component Structure in Java Petstore



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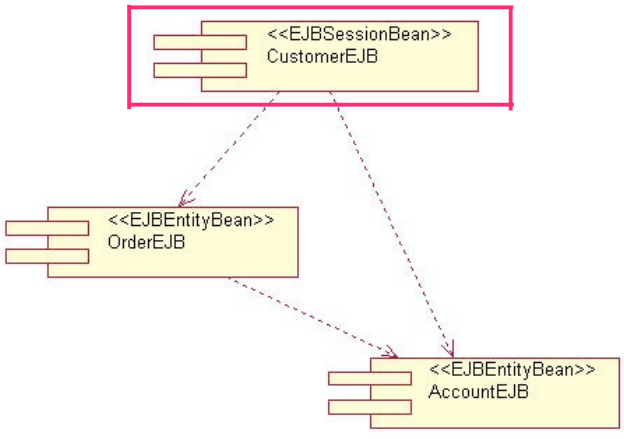
RUP – J2EE Design
3 UML Mapping – UML Components to J2EE EJB's

J2EE EJB Model for the Customer Component in Java Petstore



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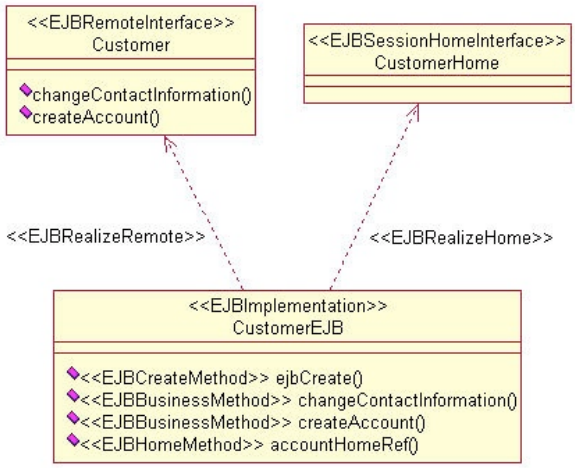
RUP – J2EE Design
3 UML Mapping – UML Class to EJB Implementation



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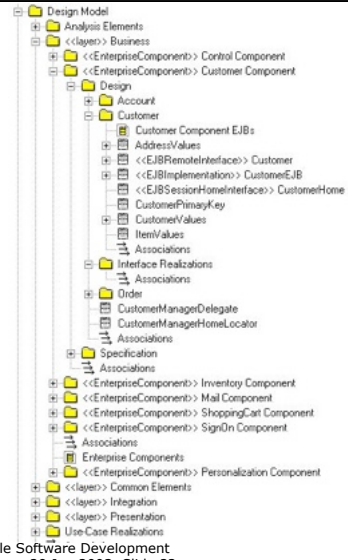
RUP – J2EE Design
3 Design Model Package Structure

Design Model Package Structure of Java Petstore based on "the J2EE Developer Roadmap"



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Agile Software Development
The Manifesto

Manifesto for Agile Software Development

”We are uncovering better ways of developing software by doing it and helping others to do it. Through this work we have come to value:

- **Individuals and interactions** over process and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

That is, while there is a value in the items on the right, we value the items on the left more.”

Kent Beck, Mike Beedle, Arie van Bennekum, Alistair Cockburn, Ward Cunningham, Martin Fowler, James Grenning, Jim Highsmith, Andrew Hunt, Ron Jeffries, Jon Kern, Brian Marick, Robert C. Martin, Steve Mellor, Ken Schwaber, Jeff Sutherland, Dave Thomas

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Agile Software Development
Core Methods & Practises

Core Agile Methodologies & Practises

- LD – Lean Development (Robert N Charette)
- ASD – Agile Software Development (Jim Highsmith)
- Scrum (Ken Schwaber et al)
- XP – eXtreme Programming (Kent Beck et al)
- Crystal methods (Alistair Cockburn)
- FDD – Feature Driven Development (Jeff De Luca, Peter Coad...)
- DSDM – Dynamic Systems Development Method (Robin Smith et al)
- AM - Agile Modeling (Scott Ambler)

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Agile Software Development
Main Focus

Main focus of Agile Methodologies & Practises

- A Customer focused way of working with many deliveries that requires an active Customer participation in the actual development work.
- A Feature driven way of working, delivering at each time ”good enough functionality”, continously reevaluating what’s been delivered and what’s to be delivered in the next iteration.
- A way of working that encourage changed requirements at any time. The customer not only adds requirements but also cut off req’s, focus on timebox.
- The project is setup to use a minimum of up-front planning and documentation. Instead focusing on constant adaptions and face to face communication between all team members. Working software is a primary focus, documentation secondary.
- Self organized Project teams, constantly reevaluating their way of working and changing accordingly. A major focus is on motivated and trusted individuals.

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Agile Software Development
Prereq’s

- **A trusting Management**
- **A participating Customer that takes decisions**
- **A self organized very skilled development team with XP mindset**
- **A non formal project management with focus on people**

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Agile Software Development
3 J2EE Design Contributions

- A New/Changing Architecture such as J2EE benefit from a built in **constant process improvement**
- Major focus is on **Continous Design** not a heavy initial one
- Agile SD Design is built on extremely usefull **Design principles and Patterns**

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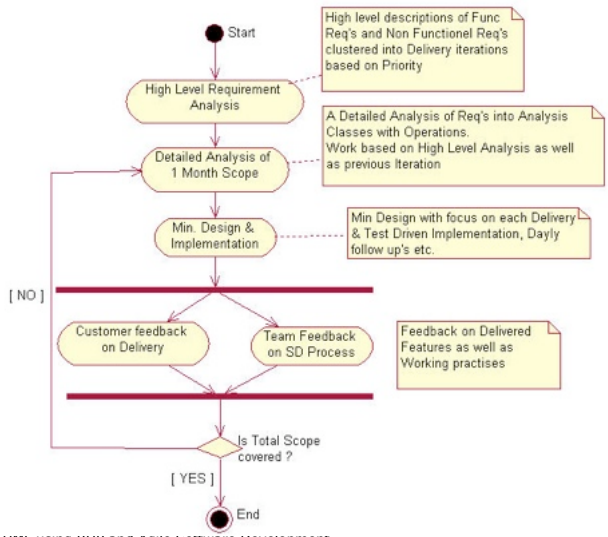
A proposed SD Roadmap based on RUP and Agile SD
Overview



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References

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Building J2EE Applications with the Rational Unified Process
ISBN 0-201-79166-8 Peter Eeles, Kelli Houston, Wojtek Kozaczynski

Agile Software Development principles, patterns and practices
ISBN 0-13-579444-5 Robert C. Martin

eXtreme Programming in Practice
ISBN 0-201-70937-6 James Newkirk and Robert C. Martin

Planning eXtreme Programming
ISBN 0-201-71091-9 Kent Beck and Martin Fowler

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Links on Agile

http://www.agilealliance.com/home

http://www.extremeprogramming.org/

http://www.agilemodeling.com/

http://crystalmethodologies.org/

http://www.dsdm.org/kss/default.asp

http://www.featuredrivendevelopment.com/

http://www.controlchaos.com/

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