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IBM Rational Unified Process

A scalable software development process ?

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Agenda

- An introduction to RUP 2003 tool family
- What makes a process scalable ?
- RUP in small projects
- RUP in large projects





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RUP – a scalable development process ?

An introduction to RUP 2003

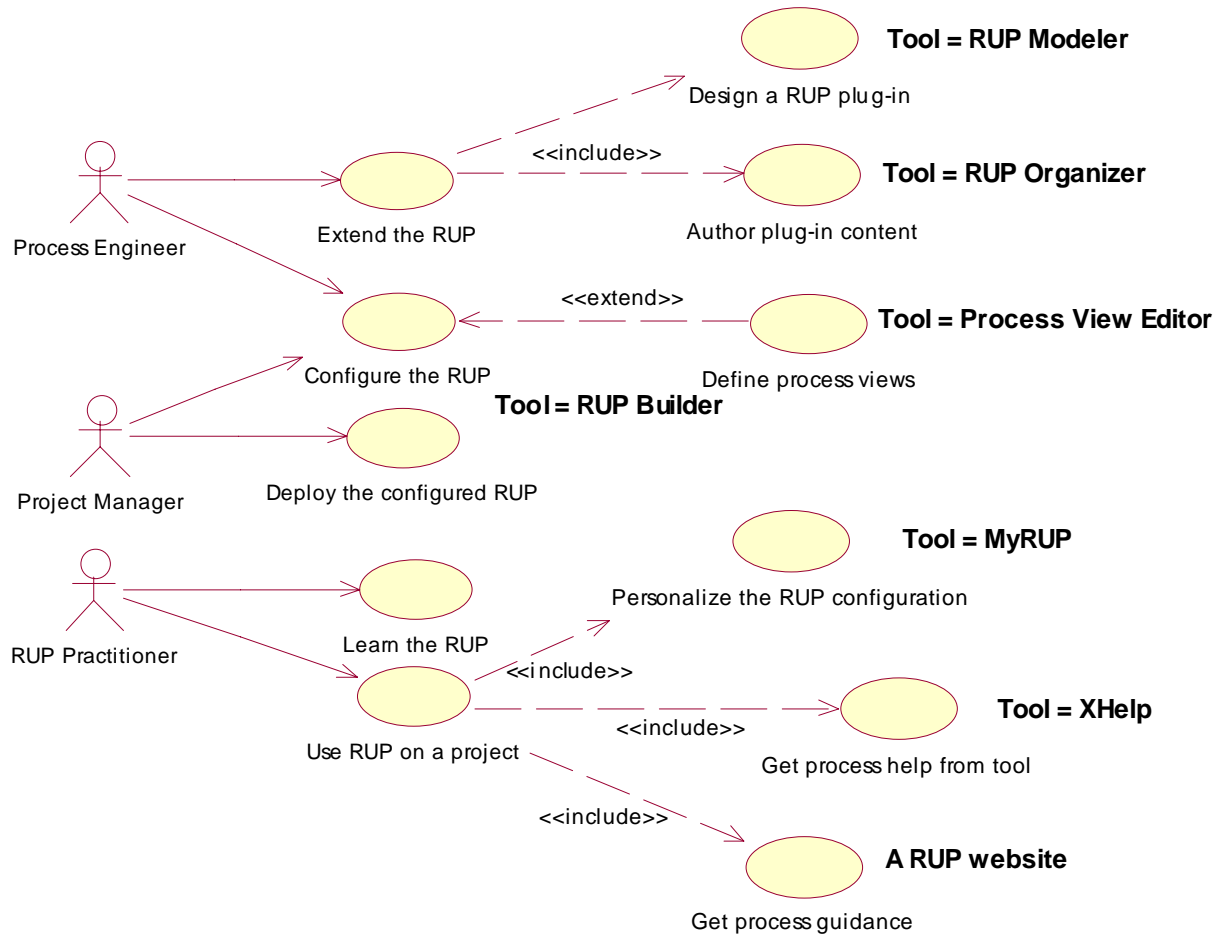
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Infrastructure support for the essential use-cases



Practitioner: *Using the RUP*



*Practitioner:
"I want to easily find
the info I need"*

- Finding the right information
 - ▶ Using the RUP tree browser
 - ▶ Searching the RUP website and RDN
 - ▶ Process guidance through tool context via ExtendedHelp
- Personalized views through MyRUP
 - ▶ Role-based and personalized views into your project's process
 - ▶ Add new links to external and internal resources

Easy access to relevant
process guidance

Practitioner: *Using the RUP*



*Practitioner:
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the info I need"*

**MyRUP
personalization**

Role: Software Architect

The software architect role is responsible for the software architecture, which technical decisions that constrain the overall design and implementation for

Topics

- [Description](#)
- [Related Information](#)
- [Staffing](#)
- [Further Reading](#)

Deployment Model, Analysis Model, Design Model, Software Architecture Document, Refere Archite

Prioritize Use Cases, Architectural Analysis, Construct Architectural Proof-of-Concept, Software Architect, Asses of Arc Proof-

Structure the Implementation, Incorporate Existing, Describe Distribution



Configuration Tools: *RUP Builder*



*Project Manager:
"I need to adapt RUP to
my project needs"*

- Right-size your process through fine-granular process selection
 - ▶ 50 to +100 selectable units
- Easy access to latest content through RUP plug-in exchange
- Produce role-based views
- Jump-start your process configuration using ready-made template configurations

Assemble the right process

Configuration Tools: *RUP Builder*



Project Manager:
"I need to adapt RUP to my project needs"



Process Customization Tools: RPW (*RUP Organizer*)



*RUP Content Developer:
"I need to modify or add
content"*

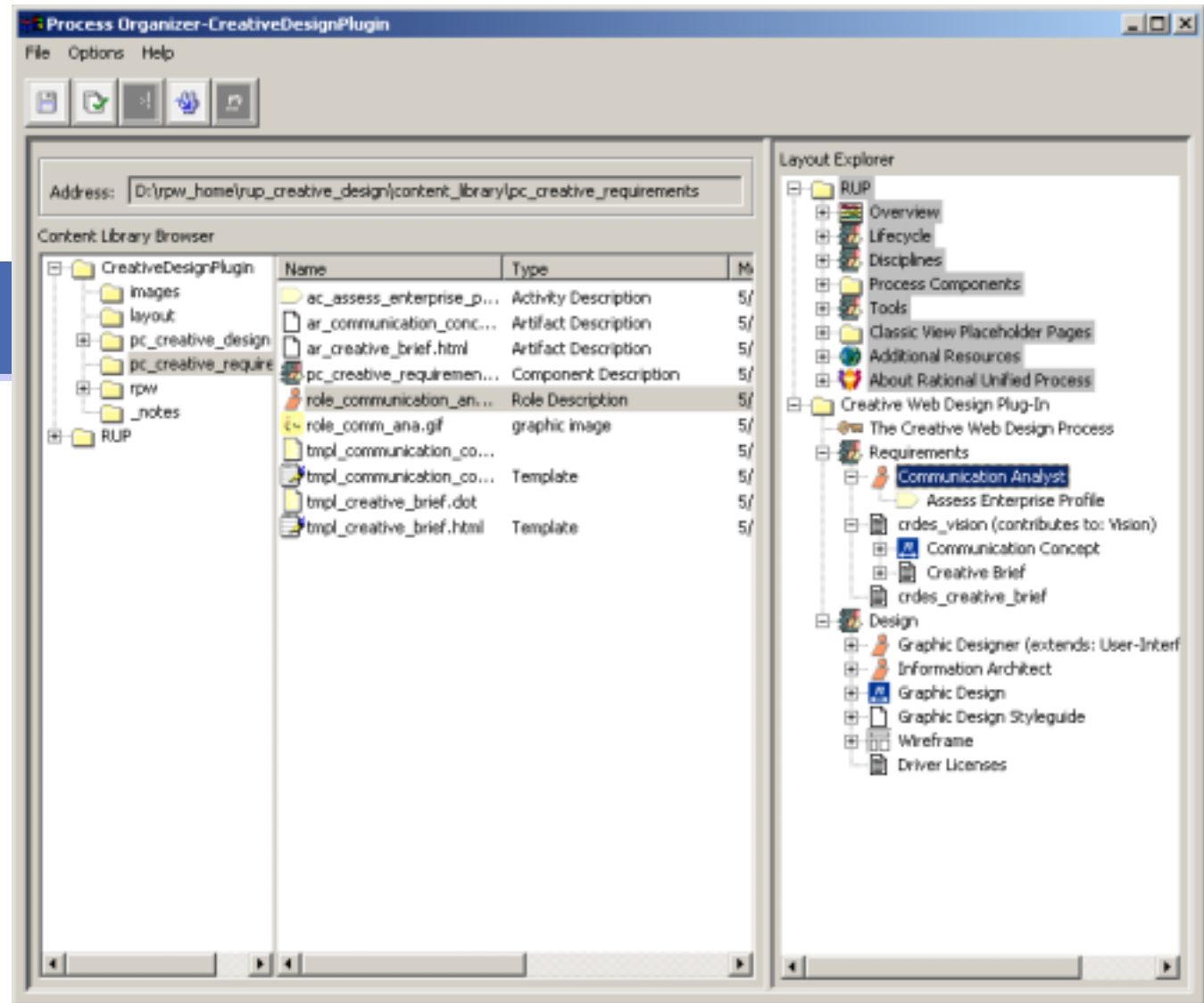
- Create *thin plug-ins* from scratch
 - ▶ Provide your own examples, guidelines, and RAS assets through an intuitive user interface
- Complete *structural plug-ins*
 - ▶ Describe process elements and get the RUP look & feel through ready-made templates
- Create links for extended help
- Localize all of RUP

Simplify content changes

Process Customization Tools: RPW (*RUP Organizer*)



*RUP Content Developer:
"I need to modify or add content"*



Process Customization Tools: RPW (*RUP Modeler*)



*Process Engineer:
"I need to modify or
add process elements"*

- Create *structural plug-ins* to RUP
 - ▶ By adding, removing or modifying activities, artifacts, roles, etc.
- Open and extensible: Based on OMG's SPEM (Software Process Engineering Meta Model)
- Built on top of Rational XDE

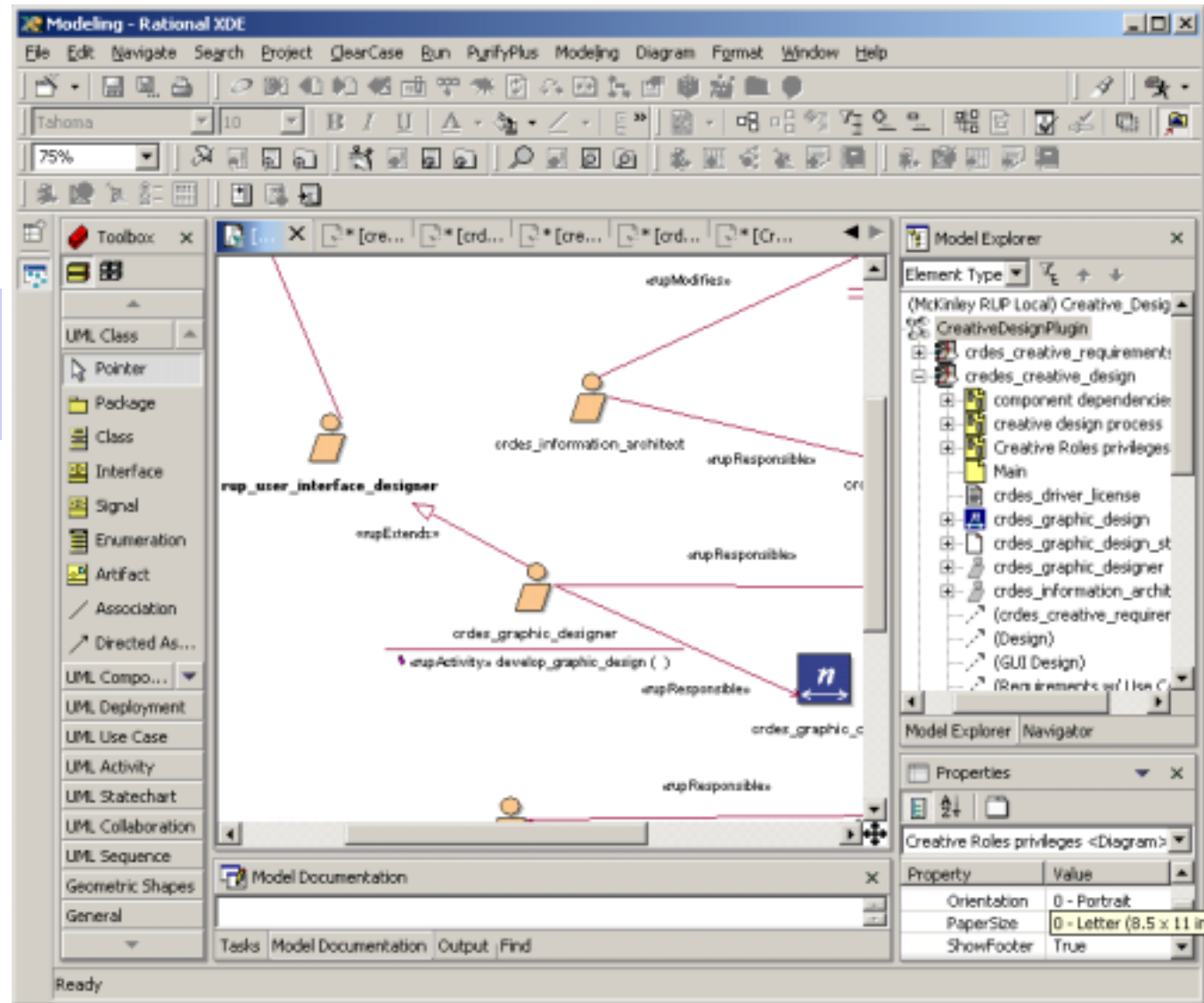


Accelerate advanced
process modeling

Process Customization Tools: RPW (*RUP Modeler*)



*Process Engineer:
"I need to modify or add
process elements"*



RUP is more than a process

- RUP is a **Process Framework** with tool automation for
 - ▶ Extending the process
 - Creating process know-how not covered by the RUP framework, by adding new process elements and content
 - Providing your company's own process assets, such as templates, guidelines and examples
 - ▶ Configuring the process to the needs of a specific project
 - 50 – 100 selectable units of process
 - Creating process views aimed at focusing the process for different stakeholders
 - ▶ Deploying and personalizing the configured process
 - Creating your personal touch by linking up content outside the RUP that you frequently make use of
 - Suppressing information not directly relevant to your tasks
- RUP is a **huge knowledge base** of proven software engineering practices
 - ▶ Harvested over decades from real projects
 - ▶ Applicable to a wide range of project types
 - ▶ Contains detailed guidance in 9 S/E disciplines, defining 30+ roles and 150+ activities – only in the **base RUP**

but does it really scale ?



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RUP – a scalable development process ?

What makes a process scale ?

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RUP and scalability

- Said about the RUP
 - ▶ The RUP is only working for large projects
 - ▶ The RUP is useless to us, because we use less than half of the artifacts
 - ▶ The RUP has so many roles, and we're only a handful developers
 - ▶ The RUP doesn't support large-scale development

- Real problems or misconceptions ?? A bit of both maybe...



Properties of a scalable development process

- Customizable
 - ▶ Allows for creation of process know-how not covered by the RUP framework
 - ▶ Supports the addition of guidelines, templates, and examples relevant to your business

- Configurable
 - ▶ Allows you to select only process elements applicable to project at-hand
 - ▶ Has mechanisms to provide different views of the process to different stakeholders

- Content coverage
 - ▶ Guidance on different types of development, ranging from “greenfield” to maintenance, from in-house to sub-contracted
 - ▶ For different problem domains, from technically straight-forward to very complex
 - ▶ Ready-to-use assets to suite formal as well as informal artifact production

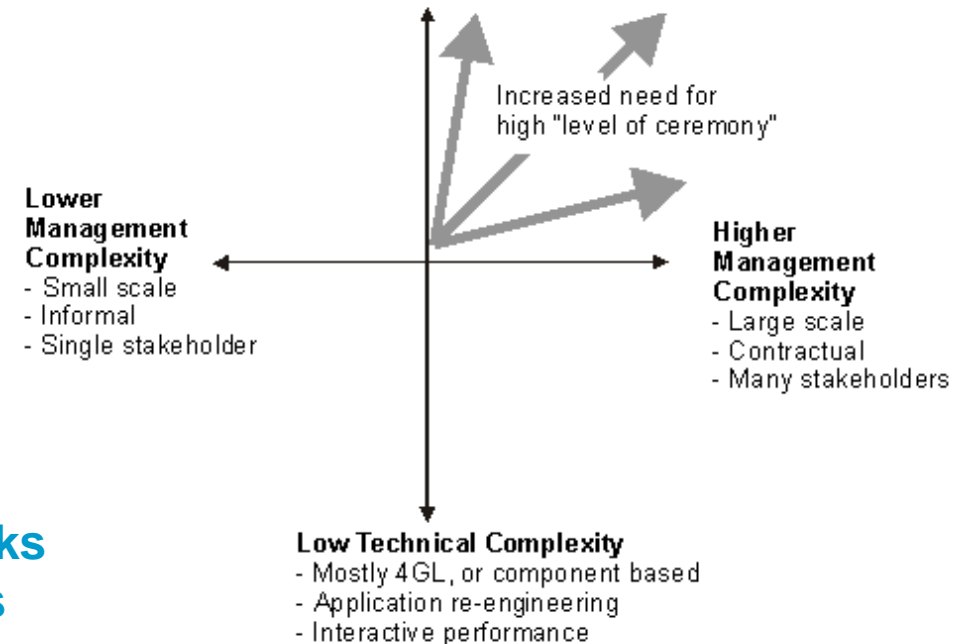
One size does NOT fit all

Process discriminants

- Factors that impact the choice of development process
 - ▶ Size of development effort
 - Number of people, number of teams, location of teams
 - Duration of development cycle in calendar time
 - ▶ Formality requirements of the deliverables
 - ▶ Chosen technological platform
 - ▶ Domain
 - ▶ Type of development
 - Greenfield vs. maintenance
 - In-house vs. sub-contracted
 - ▶ Technical complexity
 - Embedded vs. administrative

Higher Technical Complexity

- Embedded real time, distributed, fault tolerance
- Custom, unprecedented, architecture re-engineering
- High performance



A process that scales works well in all four quadrants





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Characteristics of small projects

- Size
 - ▶ Less than 10 people
 - ▶ A couple of teams at the most, co-located
- Duration
 - ▶ Less than half a year
- Formalism
 - ▶ Internal and informal deliveries, no artifact sign-off
 - ▶ Informal quality management (e.g. code reviews by peers)
 - ▶ Light-weight artifact templates
 - ▶ Model/code centric artifacts



Predefined RUP configuration for Small Projects

- Low Managerial Complexity
 - ▶ Light-weight Project planning & control
 - Phase and Iteration planning
 - Essential Risk Management
 - Metrics (time, size, defects)
 - ▶ Configuration and Change Management
 - Guidance on basic check-in / check-out capabilities
 - Standard change management
 - ▶ Formality
 - Informal resources (light-weight guidelines, artifact templates and examples)
 - Internal technical reviews

- Low-to-medium Technical Complexity
 - ▶ Known problem domain – no business modeling
 - ▶ User intensive systems (no real-time design)
 - ▶ Low ceremony production
 - Installable deployed to the web
 - User documentation is on-line help

Is RUP an Agile development process ?

- We're **agile** if we
 - ▶ can move fast
 - ▶ are allowed to be creative
 - ▶ can respond appropriately to external stimuli
- ...without being burdened with process overhead, the focus is on getting the job done !
- Not every light process is agile (Ivar Jacobsson)
 - ▶ An Agile process is **perceived** to be light, even if its very rich
- A process itself is NOT agile, it's the way you use it that makes it feel agile

-
- **The RUP will be perceived Agile if**
 - ▶ it is Right-sized for the job-at-hand
 - ▶ it is followed while applying common sense
 - ▶ you use tools to do more by doing less



RUP vs. XP

- Its like comparing apples and oranges
 - ▶ RUP is a process framework for software engineering
 - ▶ XP is a documentation of good practices for small s/e projects

- RUP configuration for small projects and XP
 - ▶ Most XP practices make sense in a small RUP setting
 - Planning game, test-first design, refactoring, continuous integration, small releases, “on-site” customer, pair programming
 - ▶ Some of these don’t scale well, though
 - Metaphor, collective ownership, small release
 - ▶ More ? See [Concept: Agile Practices and RUP](#), in RUP 2003.



There exists a RUP plug-in for XP practices

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Customer Team > XP Customer

Role: XP Customer

The XP customer has the responsibility of defining what is the right product to build, the order in which features will be built and making sure the product actually works

Other Relationships: Extends: [System Analyst](#)

Topics

- [Description](#)
- [Related Information](#)
- [Staffing](#)
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Responsible For

XP Iteration Plan, XP Release Plan, User Story, XP Vision

XP Customer

Define Iteration, Define Release, Define Vision, Write User Story, Report Project Status, Adjust Iteration Scope, Revise Release Plan

Description





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RUP – a scalable development process ?

RUP in large projects

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Characteristics of large projects

- Size
 - ▶ Project of more than 50 people
 - ▶ Distributed teams

- Duration
 - ▶ Development cycles of more than a calendar year

- Formalism
 - ▶ Often required to comply with some standard reference model, such as CMM or SPICE
 - ▶ Tends to be document centric (or report driven) because many different stakeholders have an interest in the artifacts produced by the project
 - ▶ Many external reviews, often followed by formal sign-offs
 - ▶ Strong focus on Process Improvement



Predefined RUP configuration for Large Projects

- High Managerial Complexity
 - ▶ Includes development of sub-plans for Quality Assurance, Product Acceptance etc.
 - ▶ Detailed project control through continuous assessments
 - ▶ Detailed guidance on Configuration Management for distributed development teams with branch and merge
 - ▶ Formality
 - Includes both Informal and Formal resources to allow a project to
 - Internal technical reviews
- High Technical Complexity
 - ▶ Includes full-blown business modeling
 - ▶ Appropriate for embedded systems as well as high performance, high load administrative systems

RUP for Systems Engineering

- Provides guidance on Systems development, RUP SE is useful for
 - ▶ Concurrent hardware and software development
 - ▶ Large development efforts requiring more than one development team

- Use principles of abstraction, modularity and encapsulation to
 - ▶ Decompose a large system into subsystems
 - Development of subsystems often “outsourced” to extended development teams and managed separately (still **coordinated**)

RUP and CMM / SPICE (ISO 15504)

- Numerous articles that demonstrates that the RUP match the goals of highly mature organizations.
- Stories are available where RUP has been used to achieve CMM certifications at different levels
- Volvo IT in Sweden use SPICE to assess the improvement of software process capability by implementing the RUP



Summary

- The RUP is customizable
 - ▶ You can add your own process to the framework
- The RUP is configurable
 - ▶ You can right-size the process for the project by picking & choosing process components
- The RUP contains content ranging from informal, light-weight process to more rigid / formal descriptions of how to perform s/w projects

The RUP scales



Hot-off the presses: *Available Plug-Ins for RUP 2003*

New Process Plug-Ins

- RUP Plug-In for System Engineering
- RUP Plug-In for Creative Web Design
- RUP Plug-In for Asset-Based Development
- RUP Plug-In for IBM Rational Rapid Developer
- RUP Plug-In for Sun iAS

Updated Plug-Ins

- RUP Plug-In for Extreme Programming (XP)
- Java™ 2 Enterprise Edition (J2EE) Plug-In
- Microsoft .NET Plug-In
- Plug-In for IBM WebSphere Application Server
- BEA WebLogic™ Server
- RUP Plug-In for User-Experience Modeling

