

# The Lifecycle Approach to Delivering Value through Enterprise Architectures

## The Case for Enterprise Architecture Planning

Far more than a government funding and audit requirement, enterprise architecture planning is a sound development practice. An enterprise architecture (EA) is the representation of all the enterprise systems and their relationships, as well as the process of creating and maintaining that blueprint for the business. Enterprise architectures exist to capture a consistent layer of functioning in the enterprise, a description of the entities that make up the enterprise, along with a specification of how the systems work together to meet the enterprise's purpose or mission. When a sound architecture is in place, interoperable, non-redundant systems can be built that better address stakeholder needs and are more easily adapted to changing business objectives.

Enterprise architectures impose requirements across the project lifecycle. A specific process must be followed to ensure that all dependencies, stakeholder needs, and interoperability requirements are discovered and addressed in an architectural plan. Additionally, systems must be built using component-based architectures. In the area of system testing, guidelines and best practices recommend that testing begin early and continue throughout the process to ensure quality.

## Enterprise Architecture Benefits End Users, Organizations, and System Development Partners

As software's impact on corporate survivability continues to rise, the complexity of development and deployment remains. A lack of an enterprise architecture, over time, may result in numerous information systems being developed individually to resolve specific business issues. Unless each new system is integrated into the whole as it is developed, a new "stovepipe" will be the result. As many organizations have come to realize, maintaining the

large number of different systems performing similar functions becomes intractable. A sound enterprise architecture, and process for its development and maintenance provides benefits including:

- Increased collaboration with multiple stakeholders – through precise, standardized communication about the essential elements and functioning of the enterprise
- Centralized, stable and consistent information about the enterprise system
- Faster response and flexibility in the face of change – making it easier for an organization and its system partners to manage changes as they occur
- Improved ROI on an organization's various IT implementations - by reducing the duplication and inconsistencies in the information and accelerating the delivery of systems from integration or outsourcing partners
- More predictable results - when the information about the enterprise is more precise and supported by automated traceability, higher quality and better decisions can be made

Only Rational offers an integrated software development platform that help organizations build and deploy mission critical, highly complex and available systems their stakeholders depend on.

## Requirements Management and System Definition: Defining What You Have or Are Going to Build, or Buy

Having decided that an enterprise architecture might be important, how does one go about creating and maintaining it? Enterprise architectures have a wide range of both high-level and low-level requirements. Rational's requirements management solution enables you to capture and manage a large volume of require-

## HIGHLIGHTS

The Rational software development platform includes integrated tools supported by proven software engineering best practices and services that support keys to enterprise architecture:

- Defining what systems and software you have today and requirements for what you are going to build or buy in the future
- Describing, documenting, and communicating what already exists in use cases and visual models
- Implementing your architecture with automatic code generation from visual models
- Tracing the architecture and its requirements to code and to test cases while managing changes as they occur

## From Design to Implementation

ments even as they change. These requirements can be leveraged to create and maintain traceability between visual models that define what the system does for a specific user or set of users. These models are valuable in gaining agreement on the problems being solved.

### Visual Modeling and System Development: Building and Executing Component Based Architectures

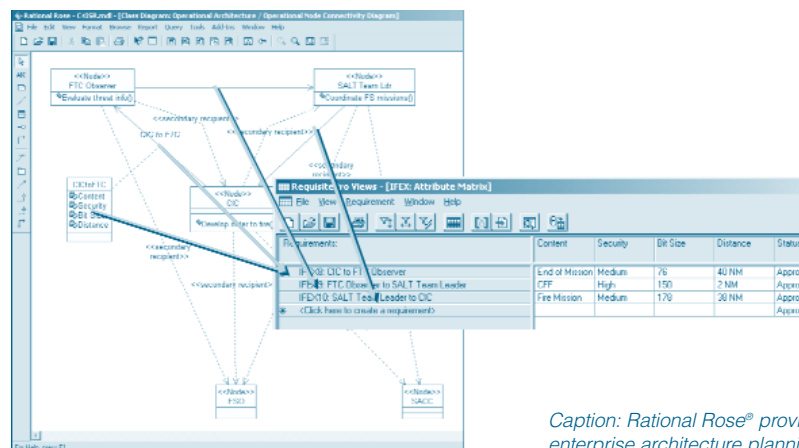
From visual models, developers can define all levels of the architecture—from inter-related major systems down to specific classes in a specific module and even database models. Users can automatically generate code from models, applying patterns and templates as a means of further accelerating development.

Rational modeling tools are based on the industry-standard UML to allow extended development teams to work in a single language and tool as they create complex software. Unlike other approaches to EA, the UML provides a single, rigorous notation for documenting all of the disparate views of an EA. By leveraging tools that automate the power of a single language, seamless mapping from the high level architectural framework to the implemented system can occur. Communication also flows more freely once you remove the barriers that naturally develop when functional teams work in different tools and languages.

### Linking Design to Implementation: Process, Documentation, and Reporting Support

While designing and visualizing an enterprise architecture is a good first step, charts and documentation alone do not make an enterprise architecture effective or deployable. The enterprise architecture must permeate the entire software development lifecycle, including requirements, design, and test implementation. Developing and implementing an enterprise architecture is an iterative process, may span years, and involve hundreds of stakeholders distributed within and across enterprises. The choice in software development tools is crucial to the success of an EA project. The software environment must support large scale development, re-use of components, and help demonstrate compliance of the enterprise architecture. This can only be achieved through a fully integrated lifecycle development solution.

Process—The Rational Unified Process® makes process practical. Its iterative development approach mitigates risk by breaking down development into a series of iterations that allow high-risk requirements to be properly implemented before additional complexity is added in later iterations. RUP® supports component-based development and UML-based visual modeling.



Caption: Rational Rose® provides a critical element in enterprise architecture planning: traceability of various artifacts to one another as seen in mapping the visualization of the Operational Architecture View to its original requirements

Automated Documentation—Rational offers automated documentation and reporting tool capabilities that creates system documentation, technical reports and specifications by automatically extracting information from project databases and Rational tools. Its automated template-based approach dramatically reduces creation time from an hours-long manual process to several minutes. These reports can be included as a supplement to the enterprise architecture and by the development team as well.

Web Reporting & Project Metrics—When you must broadly disseminate information or gain the approval of many stakeholders, the ability to publish development information to the Web is extremely valuable. In addition, the ability to measure progress and demonstrate conformity across all aspects of the enterprise architecture is a key component to assessing, building, and deploying IT systems in the most cost effective and accurate way. Several Rational tools provide this capability, enabling you to easily publish requirements, visual models, change and defect information, and project metrics on the Web.

### Verifying Quality & Controlling Changes Throughout the Lifecycle

Poor application performance and reliability are common factors which dramatically inhibit the acceptability of today's software applications and systems. Hence, quality should be reviewed with respect to the requirements based on reliability, functionality, application performance and system performance. Rational's solutions seamlessly integrate testing throughout the development process. Quality

assessment is not treated as an afterthought or a separate activity performed by a separate group. By building quality in all development team activities and leveraging objective measurements and criteria, teams are uniquely empowered to build and maintain a quality product from requirements to release.

### Control Changes to Enterprise Architectures

The ability to manage change—making certain that each change is acceptable, and being able to track changes—is essential in an environment in which change is inevitable. Rational's market leading software configuration management solution combines Rational ClearCase® and Rational ClearQuest® — providing an effective way to manage changes to all artifacts including requirements, models, source code, and test cases.

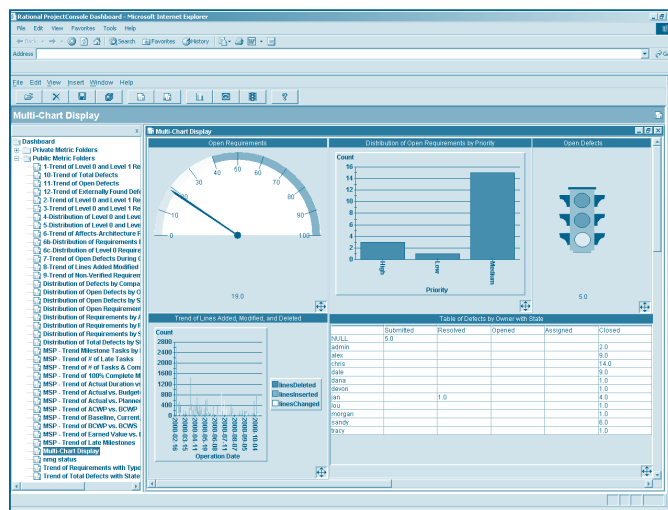
The Rational Product family scales from small project workgroups to the distributed global enterprise, enabling you to:

- Accelerate release cycles by supporting unlimited parallel development
- Unify your change process across the software development lifecycle
- Scale from small teams to the enterprise without changing tools or processes
- Bring a team together to work as a single unit by describing how to automate integration, build management and leverage access to common data

### Rational Software Best Practices

- *Develop Iteratively* – to identify and eliminate risks before they threaten your project.
- *Manage Requirements* – to ensure resilience in the face of inevitable change.
- *Use Component Architectures* – to make your architecture tangible to all practitioners.
- *Model Visually* – to attain and preserve a high-quality architecture.
- *Continuously Verify Quality* – to ensure quality throughout the development life cycle.
- *Manage Change* – to enable efficient parallel development within teams and across the enterprise.

Dashboard view of key project metrics and their status empowers team decision making.



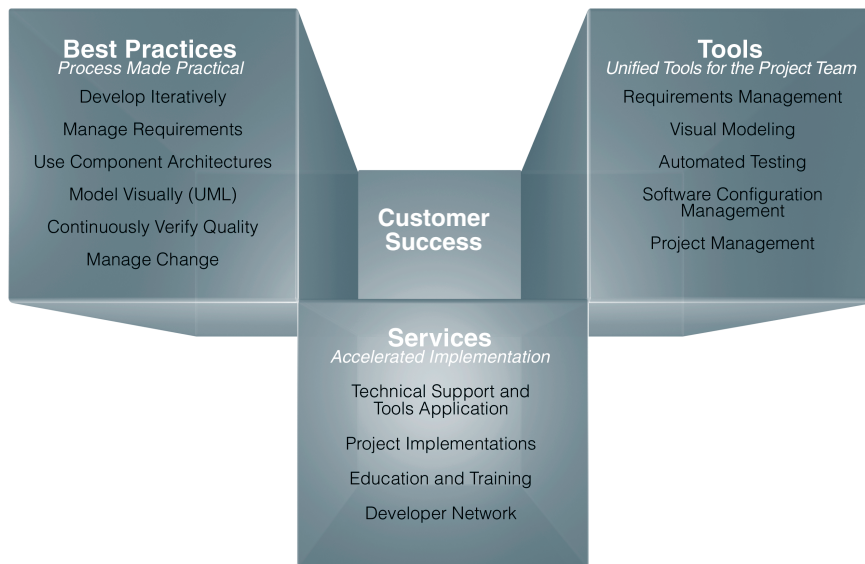
## Leverage Automated Lifecycle Support to Deliver EA Value

Defining, developing, and implementing enterprise architectures requires automated tools to coordinate the efforts of distributed teams and truly gain value from the documented system. Only Rational provides an integrated software development platform that help organizations:

- Ensure traceability from the enterprise architecture to the implemented system
- Control and manage changes to all artifacts from a disparate set of stakeholders in a distributed, parallel development environment
- Leverage automated process support to increase team communication and accelerate delivery of the software or system
- Make more informed budget and resource allocation decisions leveraging objective metrics collection throughout design, development, and implementation

## About Rational Software

Rational Software provides a software development platform that improves the speed, quality, and predictability of software projects. This integrated, full lifecycle solution combines software engineering best practices, market-leading tools, and professional services. Ninety-eight of the Fortune 100 rely on Rational tools and services to build better software, faster. This open platform is extended by partners who provide more than 500 complementary products and services. Founded in 1981, Rational is one of the world's largest software companies, with revenues of \$666.4 million in its twelve months ended June 30, 2002, and over 3,500 employees worldwide. Rational is a member of the S&P 500 Index and a component of the Nasdaq-100 Index®. Additional information is available at [www.rational.com](http://www.rational.com) and [www.therationaledge.com](http://www.therationaledge.com), the monthly e-zine for the Rational community.



### Rational's Unique Software Development Solution

*Rational's unique approach combines software engineering best practices, unified tools for the project team and services that accelerate implementation.*

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