



Accelerating software innovation on the IBM System z platform.

Highlights

- ***Enables you to extend the value of existing enterprise assets by transforming them into reusable components***
- ***Helps you leverage and modernize the existing and new skills of your traditional IT professionals***
- ***Supports innovation with technology advancements while reducing time to market***
- ***Helps improve team collaboration and responsiveness with consistent development processes***
- ***Optimizes business flexibility and change across the software lifecycle***

Traditional IBM System z™ or mainframe applications are large, complex solutions that address specific business functions. However, today's business systems increasingly involve composite applications that support a business process and include sets of related and integrated services that come from different existing application silos. While these applications—along with the information and functions they contain—are invaluable to your business, they may be compartmentalizing your processes or hiding duplicate functions and information. Such inefficiencies can inhibit agility, decrease responsiveness and slow your time to market. Further, this complexity can increase application maintenance expenses, diverting your valuable resources from strategic business initiatives and innovation.

Repurposing enterprise applications for today's SOA environments

To make your business more agile and responsive, you need to make your existing applications more flexible, reusable and easy to maintain. But rewriting them can be expensive, time consuming and risky. And replacing them with packaged solutions can also be problematic because you risk losing the intellectual capital that's buried deep in your systems.

Repurposing or modernizing existing mainframe applications is a time-tested approach to modifying legacy assets so they can be included as part of a Web services architecture, such as a service-oriented architecture (SOA). By modernizing your applications, you can make them more agile, flexible and robust, increasing your organization's responsiveness to marketplace dynamics and changing business needs.

Additionally, by streamlining application and operational processes, you can free up more of your resources to focus on developing new business requirements and capabilities. Best of all, modernization can be done in an evolutionary—not a revolutionary—manner, helping to minimize the risks to your organization.

Asset modernization: extending the value of existing enterprise assets

Successful modernization initiatives require deep insight into targeted applications. Asset discovery and transformation tools can help your development teams generate detailed reports and graphics that enable rich understanding of existing applications. With this knowledge, developers can quickly identify the business rules embedded in core business processes, and they can restructure code, remove dead code and create reusable components that can be enabled as services within an SOA. In addition, asset modernization tools can help you:

- *Manage and govern the design, development and consumption of software assets and services.*
- *Eliminate the need to research, catalog and assemble the information for each service request.*
- *Identify assets that could be affected by proposed changes.*

- *Reduce the cost of ongoing application maintenance.*
- *Shorten the learning curve for new developers.*
- *Improve the productivity of existing IT staff.*

Analyze existing enterprise applications

Often, enterprises have hundreds of project teams simultaneously making changes to application code and data structures. An automated asset analyzer application, such as IBM WebSphere® Studio Asset Analyzer software, can help your people cut through the complexity of the applications and interdependencies across your enterprise to increase productivity and improve product quality. Such applications enable developers to scan mainframe and distributed software assets and store related application information in a repository on your System z mainframe.

Transform existing software assets into reusable components

IBM Rational® Transformation Workbench software helps you identify business rules that can be extracted and converted into a Web service, which is a key part of enterprise modernization. Identifying these

rules can help accelerate strategic and tactical modernization initiatives by allowing development teams to quickly transform existing assets and discover reusable business logic for creating services. Once you begin the process of creating reusable assets, it's also important to properly manage and govern your services. By establishing a comprehensive picture of your software assets, you can improve asset reuse, which in turn can help you more quickly deliver innovative IT solutions and help you control costs, reduce application backlogs and improve business flexibility and responsiveness.

Architecture modernization: driving innovation with technology advancements

Your modernization initiative must also address the complex dimensions of architecture. Fragmented business processes, workflows, data and tightly coupled application architectures reduce your flexibility and agility. To transform your core systems into flexible applications and services while avoiding costly and high-risk rip-and-replace approaches, you can work with what

you already have. Architecture modernization can help you reduce time to market, improve business alignment for growth, cut costs and limit business risk. Design and construction tools from IBM are designed to:

- *Speed the efficiency of System z development, Web development and integrated mixed-workload development.*
- *Break skills silos by simplifying and accelerating cross-platform development.*
- *Increase productivity and reduce training costs by extending host applications to modern user interfaces.*
- *Accelerate the adoption of SOA by rendering existing IT assets as service components, which encourages reuse and efficiency.*
- *Create enterprise data standards, verify compliance and generate compliant models.*

Speed maintenance of your traditional applications

As you transition to a more modern enterprise, it's important to maintain your traditional applications even as your developers begin doing more Web-based development. IBM Rational Developer for System z software includes capabilities that

help improve the speed and efficiency of development projects, including System z development, Web development, integrated SOA-based composite development, and COBOL, PL/I, C, C++, High Level Assembler (HLA) and Java™ projects. Optimized for WebSphere and System z environments, Rational Developer for System z:

- *Supports multivendor run-time environments.*
- *Runs on the Eclipse open source platform so developers can adapt, extend and customize their integrated development environment (IDE).*
- *Supports creation of services deployable to the IBM CICS®, IBM IMS™, IBM WebSphere Application Server and IBM DB2® stored procedure environments.*
- *Supports development of multiple types of user interfaces, including traditional 3270, HTML, JavaServer Faces (JSF) and JavaServer Pages (JSP).*

Exploit EGL, an advanced new business language

Because larger enterprises can have numerous development platforms and skill sets, a platform-neutral development approach can help eliminate skills silos and create a unified pool of business-oriented developers who can be freely shifted across projects

according to business demands. IBM Rational Business Developer software can help you build such an environment by enabling your developers to focus on the business logic rather than the platform on which the solution will be deployed. The application is based on Enterprise Generation Language (EGL), an end-to-end rapid development approach that provides:

- *Higher development productivity through a powerful, platform-neutral, business-oriented specification and a wealth of rapid development tools and wizards.*
- *Simplified SOA support and tools to help quickly define, test and deploy services to a variety of platforms, including automated services generated from models.*
- *An easy-to-learn coding language that enables developers with general programming skills to become productive with Rational Business Developer in a matter of weeks.*
- *Extension and modernization of existing applications through built-in interoperability with COBOL, PL/I and other programs, enabling you to reuse existing investments as new services or Web systems.*

Easily extend your applications to the Web with reduced cost and risk

Making your existing mainframe applications available via the Web can help extend their value while increasing efficiency and promoting asset reuse. With IBM Rational Host Access Transformation Services (HATS) for Multiplatforms software, you can create Web applications, including portlets, rich client applications and applications targeted for browsers on mobile devices, that provide a standard and easy-to-use GUI for your 3270 applications running on the System z platform. You can also use Rational HATS to create Web services that provide standard programming interfaces to business logic and transactions contained within host applications. These Web services can then be reused as building blocks within your SOA solutions. Rational HATS is also designed to:

- *Help improve the workflow and navigation of your host applications, without access or modifications to the application source code.*
- *Transform host-screen components in realtime.*
- *Enable you to add lists, hot links, tables, buttons, valid-value lists, tabbed folders, graphs and other elements, such as logos, graphics and backgrounds.*
- *Help you create programmed navigation through multiple terminal screens to improve the productivity and usability of your host applications.*

Leverage modeling tools to improve software design

Model-driven development can increase the productivity of your developers across the enterprise. The IBM Rational Software Architect application offers a powerful, integrated design and construction environment that helps software architects understand, design, manage and evolve enterprise solutions and services across the team and across different areas of technical expertise. The software also includes powerful visual modeling and editing features to help improve productivity, enhance architectural control and ease the design-to-code experience for Java; Java Platform, Enterprise Edition (Java EE); Web services; SOA and C/C++ applications. Further, the Rational software supports model-to-code and code-to-model transformations, allowing developers to concentrate their development efforts on the business requirements at hand rather than on the tedious underpinnings of the application. Tooling, such as Rational Business Developer and Rational Developer for System z, can transform Unified Modeling Language (UML) generated by Rational Software Architect into EGL or COBOL. It also provides transformations from UML to structured query language (SQL)-based logical data models as supported by IBM Rational Data Architect software, and from UML to SOA constructs via the transformation from business process to service model.

Develop an understanding of heterogeneous data assets

Companies today are facing numerous problems associated with enterprise data modeling and information integration due to the ever-growing complexity of enterprise databases and environments. One of the biggest challenges is gaining a thorough understanding of the multitude of enterprise data assets and how they relate to one another. If you don't have a full understanding of these relationships, even simple changes can have a larger-than-anticipated impact and can result in costly redevelopment.

Rational Data Architect helps data architects design relational and federated databases, understand information assets and their relationships, and streamline database projects. Combining traditional data modeling capabilities with unique mapping capabilities and model analysis, Rational Data Architect organizes the functionalities in a modular, project-based manner. Further, the application is integrated with requirements management and team tools to help improve project time to value and facilitate enhanced consistency and accuracy in the enterprise environment.

IBM Data Studio software provides an integrated data management environment that can help you design, develop, deploy and manage database applications throughout the data lifecycle. Rational Data Architect can also be used with Data Studio to help improve collaboration between data architects, developers and database administrators.

Skills modernization: leveraging and modernizing existing and new skills

Your traditional IT professionals have decades of experience and domain knowledge. The question is: how do you leverage this experience to improve your current enterprise applications and take advantage of the new architectures and technologies that are available on these platforms? IBM offers several tools that support higher development productivity through the powerful, platform-neutral, business-oriented EGL. Because it's platform independent, EGL enables developers to build cross-platform applications and automatically generate and deploy native Java and COBOL code that's optimized for the target platform. EGL hides the details of the target execution platform and associated middleware,

enabling developers to focus on the business problem rather than on the underlying implementation technologies. Even developers with little or no experience with Java and Web technologies can use EGL to create enterprise-class services and applications quickly and easily.

IBM skills modernization tools can help your company:

- *Exploit new technologies and innovation without retraining your existing staff.*
- *Assign new employees to any project, no matter what the target platform is.*
- *Speed the efficiency of System z development, Web development and integrated composite application development.*

Processes and infrastructures modernization: improving team collaboration and responsiveness

Organizations have traditionally managed mainframe development separately from other platform development. However, this separation not only can hinder collaboration and productivity across the software lifecycle, it can also lead to errors that result in application failure or downtime. IBM process,

quality, and change and release management tools help automate and enforce development processes and enhance collaboration and productivity across multiple operating platforms throughout the application lifecycle.

These tools help you:

- *Enforce software governance policies and procedures across functionally diverse and geographically distributed teams.*
- *Ensure that business goals and requirements drive downstream design, development and testing.*
- *Lower costs by eliminating duplicate tools and processes.*
- *Realize improved end-to-end communication and traceability across the lifecycle.*
- *Verify software builds and document the exact software versions that are deployed.*
- *Manage quality across the software delivery lifecycle.*
- *Strategically integrate application security throughout the software development lifecycle.*
- *Validate the scalability and reliability of complex applications before deployment.*

Create a consistent development process

No two software development projects are alike. Each project has different priorities, requirements and technologies. Yet on every project, you want to minimize risk, ensure predictable results and deliver high-quality software on time. IBM Rational Method Composer software is a flexible software development process platform that can help you deliver customized yet consistent process guidance to your project team. By organizing your projects by disciplines and phases, each consisting of one or more iterations, you can better address risk early and continuously.

Manage changing requirements

Software development is a team endeavor, so it's critical that team members possess a shared understanding of a project's vision, goals, specifications and requirements. But this can be difficult to achieve when project teams are geographically distributed and functionally isolated. IBM Rational RequisitePro® software can help you improve communication and facilitate better project management. It can also help enable project teams to manage their requirements, write good use cases, improve traceability, strengthen collaboration, reduce project risk and ultimately improve product quality.

Govern change and release processes

Change and release management solutions can help boost productivity, improve visibility into projects and processes, unite distributed teams, and provide audit trails and traceability across the software development lifecycle for fast delivery of high-quality software. Further, tools such as IBM Rational ClearCase® software, with its support for the IBM z/OS® operating system, can unify software configuration management and software change management workflows. They can also help manage the software development lifecycle by using built-in replication and synchronization capabilities to provide integrated version control, workflow management and defect tracking.

Enterprise change management applications such as IBM Rational ClearQuest® software can help protect your software assets globally and help ensure that changes are linked to approved requests—and that those changes are driven by a valid business requirement. IBM Rational Build Forge® software provides build and release management and helps IT groups automate repetitive tasks and enable consistent, repeatable processes. IBM Rational solutions can also help your globally dispersed teams manage the complexity of parallel development when multiple changes and releases are going back and forth.

Automate functional testing

Though functional testing can be performed using a purely manual approach, automation can deliver a number of benefits to your software development organization. IBM Rational Functional Tester software helps you automate functional and regression testing on a number of platforms, allowing you to create a test and execution process that's resilient in the face of application change. Functional testing solutions from IBM help reduce complexity and improve test efficiency and reuse with a set of manual and automated tools designed to address your unique needs. Additionally, IBM testing solutions can help you:

- *Free quality assurance (QA) staff from maintaining and executing basic tests, allowing them to focus on more complex or customized tests.*
- *Automate nontesting activities such as test-lab machine preparation and database configuration.*
- *Reduce human error during test-step execution and test-result recording.*

Validate application scalability with performance testing

Your Web presence says a lot about your organization. To help ensure that your customers, suppliers, partners and employees can access the information they need in realtime, it's important to take steps to prevent application failure due to performance-related problems. IBM Rational Performance Tester software can help ensure that your z/OS applications scale to meet your customers', suppliers', partners' and employees' demands for realtime information.

Development investments modernization: enabling business flexibility

Modernizing how you invest your development dollars is the final key to enterprise modernization. Investments modernization includes moving investments to key platforms and architectures and then training your developers to be more productive in those environments. Organizations that continue to rely on inefficient legacy applications and prerelational databases are finding that their ongoing maintenance costs are skyrocketing. To avoid this scenario, you need to

make the transition to open, modular and proven software development platforms that span the entire software delivery lifecycle. Application development offerings from IBM can help you:

- *Devote resources to new development rather than to maintenance.*
- *Move to supported platforms and leverage the capabilities of the IBM Rational Software Delivery Platform.*
- *Make incremental improvements within the context of a long-term strategic modernization plan.*

Test environments to help you gain hands-on experience

Now you can get hands-on experience with IBM enterprise modernization solutions for the System z platform. Available on the ibm.com® Web site, enterprise modernization virtual test-drives allow you to evaluate solutions in modernization areas: assets, architectures, processes and infrastructures, and skills. Each solution is based upon real customer experiences and offers a proven path to get you started with your modernization projects today.

This virtual technology exploration site makes it easy and fun to quickly try practical scenarios guided by self-paced exercises. Leverage existing assets, architectures and skills to quickly develop modern applications for the System z environment. You can also integrate, test and deploy applications in a live test environment.

By modernizing its legacy applications, a car manufacturer drives sales

When a car manufacturer examined its ability to increase its 2010 sales in the United States by 400–500 more units per dealer over its 2005 sales, it quickly realized it was facing some challenges. The company's flexibility and ability to support the initiative were limited by its more than 130 supply chain applications, many of which were developed in the 1980s. IBM helped the organization develop an application modernization and renovation plan that leverages SOA technology and positions the organization to reap the benefits of a portfolio of newly modernized supply chain applications. When implemented, the applications will be less expensive to maintain, more flexible, better able to accommodate new requirements and easier to leverage across the company and with external stakeholders. Best of all, the company will be able to handle its planned business growth.



Why enterprise modernization solutions from IBM?

With decades of leadership in enterprise modernization, IBM is well positioned to provide the capabilities you need to incrementally and cost-effectively evolve your enterprise systems toward modern architectures and technologies. Plus, IBM can help you modernize the people, assets and business intelligence you already have, and put your organization on the evolutionary—not revolutionary—track to success.

Enterprise modernization solutions from IBM are designed to help you modernize your applications while controlling costs, minimizing architectural complexity and unifying siloed teams. Offering an array of products, services and best practices, the IBM Rational Software Delivery Platform supports developers throughout the software and systems delivery lifecycle. And IBM Rational Software Delivery Platform desktop products enable global teams to better implement and

manage the delivery of software and systems architectures while improving lifecycle quality. Rational software products are designed to help simplify communications and collaboration across geographically distributed teams, allowing team members to integrate and trace requirements across the delivery lifecycle; synchronize, deploy and test assets remotely; and help ensure architectural integrity and product quality.

For more information

To learn more about IBM tools for enterprise modernization, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/software/info/developer/solutions/em/systems/z

To experiment with real-world enterprise modernization solutions for the System z platform, visit:

ibm.com/developerworks/downloads/emsandboxes/systemz.html

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