Optimize your IBM i assets through enterprise modernization

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Accelerating software innovation for the IBM i operating system.

Highlights

- ***Enables you to extend the value of enterprise assets by transforming them into reusable components***
- ***Helps you leverage and modernize your IT professionals' skills***
- ***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***

Businesses that have deployed the IBM i operating system (formerly IBM i5/OS®) typically have a large inventory of RPG or COBOL programs. While reliable and scalable, these applications tend to be complex, and each usually addresses a specific business function. However, today's business systems increasingly involve composite applications—applications that support broader business processes and include sets of related and integrated services that originate from different application silos.

While these applications—and 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 valuable resources from more strategic business initiatives and innovation.

Repurposing enterprise applications for today's SOA environments

Businesses and software development teams face a dilemma: How can they make existing applications more flexible, reusable and easy to maintain, without having to rewrite them?

Repurposing or modernizing existing mainframe applications is a time-tested approach to modifying legacy assets so they can be included as part of a more flexible 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 reduce risks.

Asset modernization: extending the value of existing enterprise assets

The IBM Rational® Software Delivery Platform offers an array of products, services and best practices that span the entire software systems delivery lifecycle. A successful modernization initiative requires an understanding of the functionality of targeted applications. With this understanding, developers can quickly identify the business rules embedded in core processes, and then they can restructure code, remove dead code and create reusable components that can be enabled as services within an SOA. This ability can greatly improve the productivity of your IT staff and reduce maintenance costs by eliminating the need to research, catalog and assemble the information for each service request individually.

IBM and IBM Business Partners have developed asset discovery and transformation tools that provide analysts, developers, architects and operations teams with detailed reports and graphics that enable rich understanding of existing applications.

A new tool from IBM is the application diagram, a component of the IBM Rational Developer for System i™ and IBM Rational Developer for System i for SOA Construction software products. This tool can prepare you for understanding and modernizing your application architecture by providing a graphical view of the different resources in a native application based on the i operating system, and it can also show the resources' relationships to one another. There are two different diagrams that you can look at in the application diagram view: a source call diagram and a program structure diagram. The source call diagram takes integrated language environment (ILE) RPG and ILE COBOL source as input and displays a call graph showing subroutine and procedure calls. The program structure diagram takes program and service program objects as input and displays the binding relationships between them as well as the modules bound into each program and service program.

Another tool for initial discovery of assets is X-Analysis, a validated Ready for IBM Rational software offering from IBM Business Partner Databorough. X-Analysis helps development teams discover and analyze existing RPG and COBOL applications, enabling them to understand and gain intellectual control over application relationships and structures. X-Analysis can be used to accelerate strategic and tactical modernization initiatives by allowing development teams to quickly transform existing assets and discover reusable business logic for creating services.

Architecture modernization: driving innovation with technology advancements

Design and construction tools from IBM can help organizations:

- *Speed the efficiency of i 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.*

Speeding maintenance of your traditional applications

As you transition to a more modern architecture, it's important to maintain your traditional applications, even as your developers move toward Web-based development. Rational Developer for System i for SOA Construction software helps simplify and accelerate the development of SOA applications and the modernization of traditional RPG and COBOL systems by allowing developers to reuse and extend existing assets. By using the software's wizards, developers can turn existing callable RPG and COBOL programs into reusable Web services.

The Rational Developer for System i for SOA Construction application includes IBM Rational Business Developer, IBM Rational Developer for System i, and IBM Rational Host Access Transformation Services (HATS) Toolkit software.

Rational Developer for System i for SOA Construction is designed to:

- *Simplify and accelerate the development of Web and SOA applications.*
- *Help users exploit advances in middleware and technology to write business applications.*
- *Support edit/compile/debug for IBM i RPG and COBOL application development.*
- *Help users modernize and extend existing RPG and COBOL business applications.*
- *Help reduce development costs.*
- *Require little retraining for experienced business developers.*

Exploiting EGL, an advanced new business language

Because enterprises may have more than one development platform and more than one skill set, a platform-neutral development approach can help eliminate skill silos and create a unified pool of business-oriented developers who can be freely shifted across projects according to business demands. Because Rational Developer for System i for SOA Construction includes the Rational Business Developer tool, users can access the integrated Enterprise Generation Language (EGL). A high-level, business-oriented modern development language, EGL leverages a robust suite of Eclipse-based tools to help users create modern SOA, Web, 5250 or batch applications. EGL generates Java™ or COBOL run-time code, and it implements an SOA service construct within the language. Additionally, it can interoperate with existing RPG or COBOL programs.

IBM Rational Business Developer software helps developers focus on business logic rather than on the platform on which an application will be deployed. The software uses EGL to potentially provide:

- *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.*

Extending applications to the Web with reduced cost and risk

Making your existing IBM i applications available via the Web can help extend their value while increasing efficiency and promoting asset reuse. With IBM Rational HATS for 5250 Applications 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 5250 applications running on the IBM System i platform. You can also use Rational HATS to create Web services that provide standard programming interfaces to the business logic and transactions contained within host applications. These Web services can then be reused as building blocks within your SOA infrastructure.

Rational HATS is 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 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.*

Leveraging modeling tools to improve software design

Recognizing that model-driven development can increase developer productivity, IBM includes a powerful, integrated design and construction environment in its IBM Rational Software Architect application to help 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, Rational software supports model-to-code and code-to-model transformations, allowing developers to concentrate their efforts on the business requirements at hand rather than on the tedious underpinnings of the application. And Rational Business Developer can transform Unified Modeling Language (UML) code generated by Rational Software Architect into EGL. Rational Business Developer can also provide 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.

Skills modernization: leveraging and modernizing existing and new skills

How do you leverage the decades of experience and the domain knowledge of your development staff while improving current enterprise applications and taking advantage of the new architectures and technologies that are available on the i operating system? The answer is 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 IBM i environment or practically any other 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.

Processes and infrastructure modernization: improving team collaboration

Organizations have traditionally managed i operating system development separately from development on other platforms. However, this separation 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 can help automate and enforce development processes and enhance collaboration and productivity across multiple operating platforms throughout the application lifecycle. These tools can help you:

- *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.*
- *Enforce software governance policies and procedures across functionally diverse and geographically distributed teams.*

Managing 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 allow project teams to manage their requirements, write good use cases, improve traceability, strengthen collaboration, reduce project risk and ultimately improve product quality.

Governing change and release processes

Change and release management software from IBM can help boost individual and team 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.

IBM Rational ClearCase® software, with its support for traditional IBM i RPG and COBOL development, can help unify software configuration management and software change management workflows. Using the built-in replication and synchronization capabilities in Rational ClearCase, you can better manage the software development lifecycle through 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 functionality 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.

Addressing testing requirements

If your development teams are performing at least a portion of their testing manually, IBM Rational Manual Tester software can help reduce the impact of software changes on your testers and business analysts. A manual test authoring and execution tool, IBM Rational Manual Tester promotes test-step reuse and is designed to add control and organization to manual testing processes. It can also help improve the efficiency and speed of efforts to measure application quality.

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 can 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.*

Validating 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 allows developers to put applications through their paces, simulating the way people will use the applications and testing the scalability and performance of Web applications running under loads on the IBM i platform.

Development investments modernization: enabling business flexibility

To modernize your enterprise, you must modernize your development investments by moving to proven platforms such as IBM i and architectures such as SOA. Then you need to train your developers to be more productive in those environments. Enterprises that continue to rely on inefficient legacy applications and prerelational databases are finding that their ongoing maintenance costs are skyrocketing. The solution is to transition to open, modular and proven software development platforms that span the software delivery lifecycle. IBM Rational application development offerings 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.*

Nonprofit copyright management provider enables customer self-service

As the number of its copyright registration requests increased, a European copyright management organization for musicians and other artists saw its manual data input efforts proportionally increase. The organization realized that it needed to update its systems, reduce staff workload and become more responsive to its clients. At the same time, the company wanted to leverage its existing investments and development expertise while taking advantage of the benefits offered by newer, open technologies.

The organization worked with consultants from IBM Business Partner Xact Consulting to Web-enable its copyright registration system. A small team of developers with limited Java experience used EGL to rapidly develop a solution based on Java and Web technologies that integrates with the organization's existing registration system. While the company expects its total processing time for new registrations to drop significantly, it's already enjoying the benefits that EGL's short learning curve, high level of abstraction and automatic code generation capabilities have provided—namely, substantial productivity gains, time savings and on-schedule project completion.

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 Rational Developer for System i and IBM Rational Developer for System i for SOA Construction software, contact your IBM representative or IBM Business Partner, or visit:

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

Experiment with real-world enterprise modernization solutions for the IBM i platform by visiting:

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

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