Develop enterprise mobile applications with IBM Rational software

Providing comprehensive mobile application development and lifecycle management solutions

Highlights

- Helps streamline and optimize the software delivery lifecycle
- Enables cross-platform enterprise mobile application development using a common code base
- Enables delivery of high-quality mobile applications with a first-class user experience
- Helps accelerate time to market and supports frequent release requirements
- Extends existing enterprise back-end data and services to mobile applications
- Supports an agile methodology using tools built on our leading ALM platform

When it comes to transformational business approaches, enterprise mobile applications, or "apps," represent a great leap forward. Rapid advances in mobile device connectivity and the evolution of new capabilities such as global positioning system (GPS) functionalities, accelerometers and cameras have compounded opportunities and helped drive explosive growth in the mobile marketplace. Businesses everywhere are now strategically employing enterprise mobile apps to support business objectives. The possibilities are only limited by imagination—and development capabilities.

IBM Rational® software provides comprehensive capabilities for enterprise mobile application development and lifecycle management using an agile methodology. This tightly integrated solution—which includes a leading open-standards-based mobile application platform and application lifecycle management (ALM) capabilities—delivers mobile-specific capabilities for key development lifecycle stages. Teams can use the solution to more easily support multitier mobile application development and to develop and deliver high-quality apps more rapidly, successfully and cost-efficiently.

Helping optimize the software delivery lifecycle

Software delivery is frequently challenging and often results in a failure to meet expectations. And while enterprise mobile application development is similar to other types of software delivery in many

ways, mobile app teams face special challenges that make it critical to optimize the entire delivery lifecycle and accelerate the delivery process:

- **Fragmentation**—The mobile marketplace includes a wide array of mobile devices and mobile operating systems. Yet native programming models (that is, using operating system–specific software development kits [SDKs]) are cost prohibitive when targeting multiple mobile device types. And testing for different configurations, devices and carriers can be extremely complex.
- **User experience and design considerations**—Not only are enterprise mobile applications critical to brand image, but the expectations around user experience are also particularly high and constantly evolving. Given the importance of apps, business stakeholders are often more involved in design and development processes, and the entire team must stay aligned to figure out how to meet requirements and delight users.
- **Time to market and frequent releases**—In the mobile marketplace, new devices and capabilities are introduced constantly, creating a mobile apps "arms race" where speeding time to market and staying current can pay big dividends. To stay competitive in this race, teams need to avoid rework caused by disconnects between stakeholders and hand-off errors that slow the development process.
- **Integration with existing enterprise systems**—Enterprise mobile applications are often multitier and need to connect to existing back-end services and data sources. And many times these services, especially those on traditional enterprise platforms, must be refactored to be made mobile-consumable. Alignment and collaboration between the mobile front-end and back-end services teams are essential to ensuring that time-to-market requirements and quality goals are met.

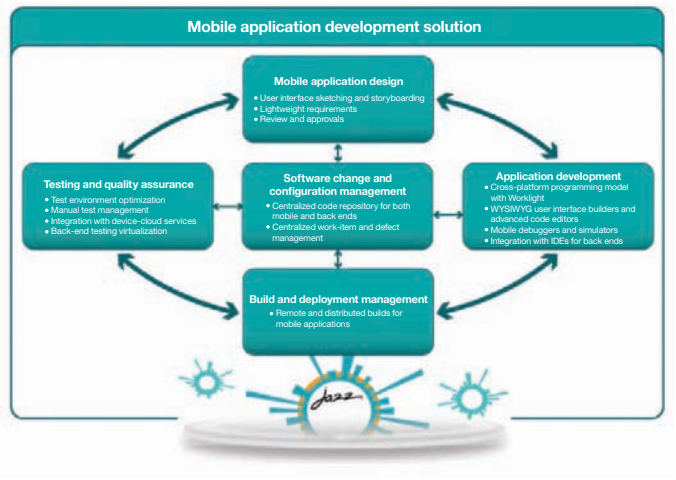

Figure 1: The IBM integrated solution for enterprise mobile application development and delivery

IBM Rational software can help you transform the software delivery lifecycle and speed delivery processes using integrated capabilities designed to support the entire range of key processes involved in enterprise mobile application development.

Building on an open mobile application platform to optimize flexibility

The IBM Worklight mobile application platform provides an open-standards-based approach to enterprise mobile application implementation that dramatically simplifies development for multiple devices and mobile operating systems. Not only does the platform provide tools and a console for easy deployment

and maintenance of mobile apps, but it also supports enterprise integration with features that can enable security-rich device-server connectivity and security-rich storage on a device.

By leveraging the Worklight platform, your organization can develop apps with enterprise connectivity for smartphones and tablets using one of several enterprise mobile application programming models, including the hybrid programming model that supports cross-platform development using familiar web technologies, such as HTML5, Cascading Style Sheets (CSS) and JavaScript. Using the hybrid or web programming model allows your developers to write a mobile application once that is designed to run on a diverse device ecosystem that may include the iOS, Android, BlackBerry or Microsoft Windows operating systems. You also have the option to add native customizations to the application to take advantage of the various features on a specific device.

Key capabilities include:

- **IBM Worklight Studio**—provides a comprehensive, extensible development environment that helps optimize reuse of code across devices and includes what-you-see-is-what-you-get (WYSIWYG) mobile user interface tools, advanced code editors and mobile simulators
- **IBM Worklight Server**—offers a middle-tier runtime environment that delivers unified notifications, runtime skinning, version management, security features, integration and delivery
- **IBM Worklight Device Runtime Components**—provides code that executes on the mobile devices, providing extensive client application programming interfaces (APIs) that expose the native device functionality using a single common programming model
- **IBM Worklight Console**—delivers a web-based administrative console for real-time analytics and control of mobile apps after they have been distributed and installed

The Worklight mobile platform is further extended to support remote and distributed builds through integration of the IBM Rational Team Concert™ build engine with the Worklight mobile build utility. Remote mobile app builds provide a way for developers to use multiple mobile operating system SDKs without the need to install and maintain each of them on their local workstation. Specialized build server machines are maintained with an approved, governed version of the mobile operating system SDK, and individual developers in the team do not have to spend their time upgrading and maintaining (and juggling) the versions of the SDKs. Distributed build capabilities are designed to provide a way to schedule multiple builds for all desired target mobile operating systems automatically, maintaining project alignment and better ensuring that builds happen quickly and consistently. Most important, IBM Rational Team Concert software tracks the distributed mobile app builds, recording information about each build such as the code changes that went into the build and what work items a given build contains. Users can access testing capabilities from the same development environment, and the solution provides online, real-time collaboration capabilities to facilitate the replication of issues to help speed the delivery of fixes.

Improving the application design process to deliver first-class experiences

IBM Rational Requirements Composer software helps optimize the alignment of business and technical stakeholders by supporting enhanced collaboration among stakeholders and development teams. Users can rely on intuitive user interface sketching, storyboarding and lightweight requirements management tools for eliciting and defining requirements. Features such as in-context commenting and reviews and approvals help ensure that all team members are on the same page. The ability to relate rich requirements content to other lifecycle assets, including test cases created in IBM Rational Quality Manager software, also enables easier determination of test coverage and traceability for requirements.

Accelerating enterprise mobile app testing while helping optimize quality

IBM Rational Quality Manager software, a web-based test management portal built on the IBM Jazz™ architecture, helps teams drive quality from a business perspective and better align activities across development, testing and delivery teams.

Rational Quality Manager software employs a test plan–centric view of testing assets that enables users to access and view testing assets from role-based perspectives. For example, managers can review timelines and status reports for testing cycles, and business analysts can concentrate on test coverage for business requirements.

Given the fragmentation in the mobile marketplace, testing of enterprise mobile applications can quickly become an involved process. Many times, testing all of the variables and combinations in a given app can be cost prohibitive. Capabilities in Rational Quality Manager software can help you cut the number of test cases while still maintaining adequate coverage to combat fragmentation. The software includes technology that is designed to automatically identify and select the minimum number of test configurations required for a given level of environment coverage. This helps testers ensure that they optimize configuration coverage within their time and resource constraints.

With advanced features in mobile devices, such as accelerometers and cameras, as well as novel ways of interacting with mobile devices, some level of manual testing is inevitable. Rational Quality Manager software provides manual test management capabilities that can help your teams clearly describe test procedures and expected results and track execution status to improve the productivity of your manual tests.

Because of differences in hardware specifications, it is also important to perform some level of testing on actual devices. However, given the large number of mobile devices in the marketplace, maintaining a large library of devices to support such testing can be cost prohibitive. Integration with device-cloud services provides a way to cost-effectively support testing for a wide variety of devices without the need to maintain in-house versions of all of the devices. Enterprise mobile application development with IBM Rational software can enable you to grant access to physical devices for testing or defect reproduction on a rental or time-share basis.

Supporting multitier mobile application development

For enterprises, mobile apps are quite often multitier apps that send transactions to back-end servers for completion. As a result, as you develop mobile apps you often must also make changes to existing back-end services by adding new APIs or changing APIs. IBM Rational software provides a number of integrated development environments (IDEs) that target Java Platform, Enterprise Edition (Java EE), IBM System z® and IBM Power® systems back ends, enabling integrated management of front- and back-end development with the help of shared planning and work-item and defect management.

Multitier apps not only complicate development processes, but they also lead to greater testing complexity because testing a multitier app requires that all of the systems associated with the app be set up, available and in a specified state for testing. This coordination is especially challenging when different groups are working on different tiers. Instability in any given tier can also hinder testing progress. IBM Rational software provides capabilities to provide test virtualization and enable continual integration testing at a system level. Services, applications and systems are introduced into a continual integration cycle in a prioritized and controlled fashion. Automatically running test suite scans as regression tests when new components are introduced can help you find issues well before integration, which can save time and money.

Speeding delivery with an ALM platform that supports agile practices

Using an agile methodology is key to keeping projects on a fast track, and IBM Rational software supports agile planning and provides built-in agile methodology templates through Rational Team Concert software. Ultimately, however, success using the agile methodology depends on the ability of team members, including stakeholders, various developer specialists, testing, documentation and project managers, to collaborate effectively—making tool choices all the more critical. Poorly integrated tools can create silos, which can lead to hand-off errors and slower progress. Well-integrated tools, on the other hand, can facilitate collaboration and break down barriers among members of teams with different roles.

Capabilities from IBM Rational software are built on an ALM platform that integrates critical ALM activities in the software development lifecycle. In addition to providing tools that promote real-time collaboration between globally dispersed teams, the solution can automate time-consuming and repeatable tasks, such as documentation, metric collection, progress reporting, audit preparation and regression testing. These capabilities are designed to meet the five ALM imperatives that the IBM Rational team has determined to be key to consistently delivering high-quality applications on time:

- **Real-time planning**—enables the flow of information and ideas in real time and improves collaboration between globally dispersed teams
- **Lifecycle traceability**—links related assets, such as requirements, code, test assets and builds, so your team can answer questions that span multiple roles and repositories. It also provides formal reviews to establish agreement and prevent rework.
- **In-context collaboration**—helps improve the quality process for collaborating project teams, no matter what the role
- **Development intelligence**—helps ensure that project deliverables such as development work items and test cases accurately reflect your business goals and requirements even as changes occur
- **Continuous improvement**—combines fact-based reporting and metrics with best practices and a web-based test management portal built on the Jazz architecture to help teams improve quality and better align development, testing and delivery team activities

Why IBM?

Enterprise mobile applications have opened up enormous opportunities for companies to increase worker productivity, improve processes, boost revenues and build greater customer satisfaction. Succeeding in this new application frontier, however, requires faster-paced and more-collaborative development and updates. And given the complex, multitier nature of enterprise mobile applications—and the large, often geographically dispersed teams involved in development processes—the right approach is critical to addressing requirements and controlling costs and risks.

IBM Rational software provides one of the only comprehensive solutions that integrates a mobile application platform with extensive application lifecycle management capabilities in a holistic manner. IBM has deep expertise in application lifecycle management and a long history of helping clients successfully deliver software. And we can put our experience to work to help you deliver high-quality, standards-based, cross-platform enterprise mobile applications that help meet the high expectations of users and address business objectives while improving time to market and predictability.

For more information

To learn more about the enterprise mobile application development solution from IBM Rational software, contact your IBM sales representative or IBM Business Partner, or visit: **ibm.com**/software/solutions/mobile-enterprise/build

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit: **ibm.com**/financing

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