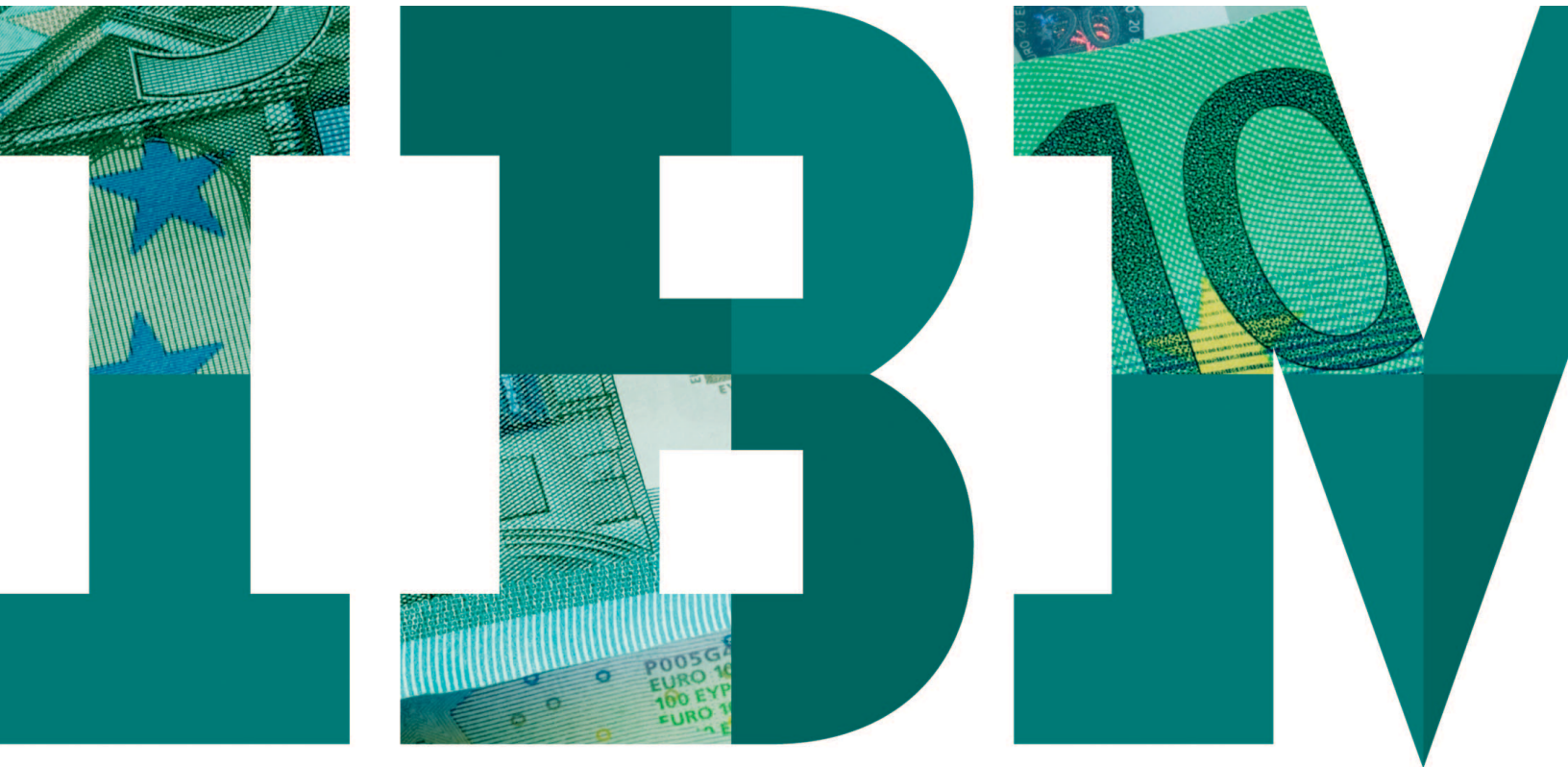# Driving and managing innovative mobile banking applications

Leverage a full development lifecycle to help meet and exceed customers' ongoing mobile banking needs

Contents

Dramatic growth in smartphones and tablet computers

Since the release of the Apple iPhone, there has been a dramatic adoption of smartphones across the globe. The release of the Apple iPad is leading to a similar dramatic adoption of tablet computers. The global smartphone market is expected to grow 49.2 percent in 2011 to more than 450 million units shipped, compared to 303.4 million units shipped in 2010.[1]

The mobile market is changing rapidly – driven by consumer demands. New vendors to the space are entering the mobile marketplace, such as Google, with its Android operating system and its acquisition of Motorola. They are now challenging Apple's iPhone for market leadership.

In order to keep up with the rapidly changing market space and technology pace, integrated tools are required to help quickly plan, design, build and test the mobile applications.

IBM® Rational® software has extended its integrated application lifecycle management capabilities to support banks' mobile application development—to help meet the strong customer demand for more sophisticated and integrated mobile banking capabilities.

Customer mobile-banking needs
Customer mobile-banking needs in growth markets

It is believed that the largest mobile opportunity will come from replacement of cash transactions in growth markets.

This opens a major opportunity to monetize part of these transactions with a secure and easy-to-use mobile-payments service. Payments services can become a stepping stone to credit, savings and insurance capabilities.

Customer mobile-banking needs in developed markets

Mobile users today expect high-fidelity access to the same information they have on the desktop, presented in an easy-to-learn mobile-friendly (often touch-friendly) format. Most customers already use mature payments instruments, which appear to present no pain points. In developed markets, new payments alternatives need to provide persuasive value propositions in the form of direct savings. For example, receiving coupons based on device location or significantly improved experiences that are one or more of the following:

- More relevant
- Safer
- Faster
- Cheaper.

Although smartphone applications have garnered much of the visibility and hype, it has been suggested for some time and the public appears to be demanding that banks offer all three mobile solutions, namely:

- Downloadable applications
- Mobile browsers
- Short Message Service (SMS)-based services.

Mobile-banking applications being developed by banks

Customers are looking for integration between mobile banking applications and more traditional payments solutions, ideally including: Consolidation of payment instruments; deal sources; and rewards, in a streamlined user experience that suits the mobile interface.

The scope of broader mobile-enablement projects falls into the following three categories: Informational, transactional and value-added services.

Informational

Informational mobile-enablement projects include capabilities such as:

- Checking account balance
- Checking transaction history
- Receiving alerts (balance, transaction limits and more).

Informational data provides limited revenue potential for payment providers and, for the most part, is already included in current retail banking offerings.

Transactional

Transactional mobile-enablement projects include capabilities such as:

- Transferring money to another person.
- Paying for goods and services.
- Paying utility bills.
- Receiving remittances.

Transactional data has a large revenue potential in growth markets, but there are potential adoption hurdles in developed markets, which are highly regulated.

Value-added services

Value-added services mobile-enablement projects include capabilities such as:

- Receiving coupons based on device location.
- Transaction flagging for fraud detection.
- Accessing goods and services of cross-industry offerings (retail, health services, travel and more).

There is a large revenue potential in developed markets for value-added services. However, these services usually require richer and more secure client sessions and associated device and network infrastructures.

We can see that banks are already providing significant banking functionality for mobile users in areas such as remote deposit capture, viewing individual account balances and transactions and locating ATMs. What appears to be missing are the value-added services mentioned above, including capabilities such as receiving coupons based on device location and total balance information from all accounts of a customer.

Leveraging device location has the largest revenue potential in developed markets. As banks move toward this model, there will be a far greater need for sophistication and integration between applications. This in turn will necessitate an integrated approach to mobile application development, including planning for mobile and collaborative mobile development integrated with more sophisticated mobile quality management.

Creation of new mobile-banking applications

Why are mobile applications different?

Mobile applications are different because:

- Mobile users require efficient and timely access to information
- Interactions are short and focused; interruptions are common
- Devices are often exclusively touch-based
- User interfaces must be easy and obvious
- Screen real estate is precious
- Typing should be minimized
- Applications must still be usable when out of wireless coverage
- Timeliness of data must be communicated
- Security is critical
- Social interactions are important
- Mobile hardware and user interfaces evolve much faster than the typical enterprise software cycle

What are the unique challenges for mobile-development teams?

Web application	Mobile web application	Hybrid mobile application	Native mobile application
Desktop and mobile using open web programming models	Mobile only using open web client programming models	Mobile only, application runs on device leveraging open web via JavaScript bridge	Mobile only, using native languages
Limited to no device-specific functionality	Off-line capabilities	Native device capabilities	Native appearance, device capabilities, performance

Mobile browser execution   Application Store download and install

Richness of mobile presentation/services
Portability (cross device reuse)
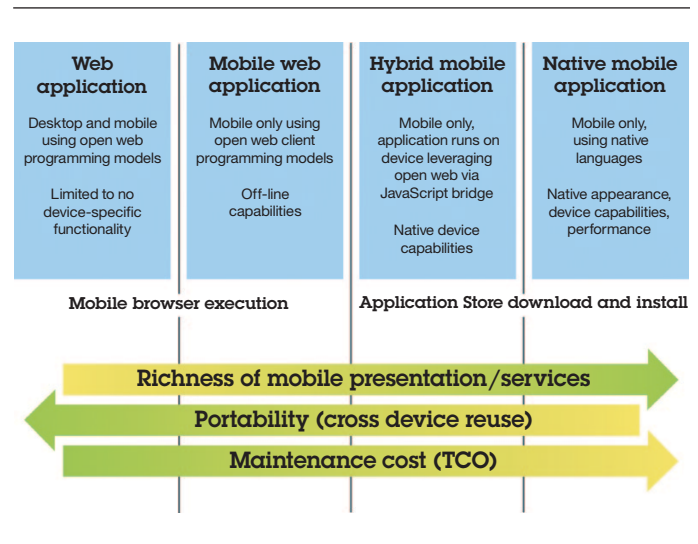Maintenance cost (TCO)

Figure 1: A spectrum of development approaches has emerged.

Mobile projects present the following unique challenges for development teams:

- Supporting the same application on multiple and different mobile device platforms and form factors
- Keeping consistent development environments between the various team members (for instance, emulator configurations)
- Ensuring that the mobile application and its data are secure and safe
- Managing the cost of application testing for diverse devices, network carriers, device models and more
- Capturing and tracking details of test-case failures on the actual devices
- Tracking requirements throughout the development lifecycle and including testing results

IBM Rational solutions offer value to teams that are developing mobile applications and software, regardless of the application architecture, which could include the following:

- Web programming model
- Hybrid programming model
- Cross-platform native programming model
- Single-platform native programming model
- SMS and feature phone software

Planning and development of mobile-software applications

We can see that mobile banking is already becoming more complex as the number of customers with smartphones and tablets continues to grow, technology improves and customer tastes becomes more sophisticated. With this complexity, there is an increased need to thoroughly plan out the development of new applications and the integration with existing applications and back-office systems.

The IBM Rational software approach to planning for mobile application development includes two different levels of planning and decision-making, as follows:

- Enterprise mobile planning, which entails understanding the business strategy, the current IT landscape, the technologies available and applicable regulations; planning, to help organizations decide which investments to make and which initiatives to fund; and prioritizing the different options at this level
- Project execution planning, which occurs once the decision has been made to establish and fund a project and its objectives have been set; this phase enables the tracking, management and visibility in the actual execution of the project.

The planning-for-mobile-application-development approach focuses on the use of IBM Rational Focal Point™ software to support the enterprise mobile planning effort. Rational Focal Point software is integrated with IBM Rational Team Concert™ software to provide collaboration support in project execution planning.

IBM Rational System Architect software contains the enterprise architecture and can be used to offer a more complete enterprise mobile planning and decision domain. Rational System Architect would be used to map not only business and IT relationships, but also to map existing assets to the requirements.

Mobile-application lifecycle management

In order to be more agile and flexible when developing new mobile applications, banks need an integrated set of products that provide collaboration, linkage and transparency that span the following application development stages:

- Requirements
- Modeling and design
- Code development
- Build and packaging
- Testing and quality management
- Software delivery

IBM Rational software uses and recommends a collaborative approach for software delivery, based on the IBM Rational Jazz™ platform. Uniquely attuned to global and distributed teams, the Jazz software is designed to transform how people work together to build software, making software delivery more collaborative, productive and transparent. You can think of Jazz as an extensible framework that dynamically integrates and synchronizes people, processes and assets associated with software development projects. The Jazz platform enables collaboration among business stakeholders, subject matter experts and anyone who plays a role in the successful delivery of software—not just software professionals. This represents a transformational leap in the value of software delivery teams, because they can now make software a focal point for driving innovation throughout the enterprise.

Jazz is not a product. Product offerings that are built on the Jazz platform can leverage a rich set of capabilities for team-based software development and delivery. The following products are built on the Jazz platform:

- IBM Rational Requirements Composer. The Rational Requirements Composer solution empowers teams to define, manage and report on requirements in a lifecycle development project.
- IBM Rational Team Concert. The Rational Team Concert solution enables and accelerates complete agile, formal and hybrid planning coverage from work inception through planning, development and build of mobile applications.
- IBM Rational Quality Manager. A web-based centralized test management environment, Rational Quality Manager software provides a collaborative and customizable solution for test planning, workflow control, tracking and metrics reporting.

Specifically for the development of mobile applications, banks need a development environment that supports:

- Native applications, which are platform-specific. They require unique expertise and are expensive and time-consuming to develop, but they deliver the best user experience.
- Hybrid applications, where the source code consists of both native and standard web code, balancing development efficiency with user experience.
- Web and mobile-web applications, which are written in web languages such as JavaScript, HTML5 and CSS3. They are quick and inexpensive to develop, but less powerful than native applications.
- The ability to facilitate code reuse among form factors to support:
  - Different screen sizes.
  - Various screen densities.
  - Different input methods.
  - HTML5.

IBM Rational's software business partners have extended the Rational mobile development solutions. One example includes: The "Worklight Studio" from DeviceAnywhere. This solution is a ready-for-Rational integrated development environment (IDE) for developing Worklight-based applications.

Mobile application build environment

In order to be able to respond quickly to market forces and technology changes, high-quality products need to be released to market as fast as possible. The IBM Rational Team Concert solution provides build awareness, control and traceability to the team. Team members can track build progress, view build alerts and results, request builds and trace builds to other artifacts like change sets and work items. The build support is designed to accommodate your existing infrastructure, not force you to rewrite it. Out of the box, it supports Ant, Maven and any build command line you wish to invoke. There is a tight integration with IBM Rational Build Forge®.

Rational Build Forge provides build management and release management software to help improve compliance management and improve software quality. These solutions provide a flexible, agile and controlled build environment for mobile applications—both native and hybrid.

Mobile testing
Types of mobile testing

There are several types of mobile testing that banks need to consider, including:

- Manual. This allows for flexible, ad hoc testing; good for catching usability issues, but time-consuming and expensive.
- Emulator/Simulator. This is quick and easy to load and enables you to test code at a low cost.
- Real device tethered to a workstation. This involves testing on a real device, which is accurate and automated. There is an associated high cost of setup and it is limited to one device or class of devices.

- Real device in a "device cloud." which supports a broad range of devices that may exist anywhere around the globe, at a lower cost, as automation applies to multiple devices.

Most customers say that testing mobile applications is becoming an increasing problem. The challenges primarily include how to test mobile applications on many different devices from different vendors and the ability to execute automated tests against multiple devices, with different form factors and connected to different network providers.

To address these challenges, an ideal arrangement is a "device cloud" with devices accessible over the Internet, a single automation script language for all devices and the ability to capture failure data directly from a real physical device.

IBM Rational software already provides best-in-class testing solutions that assist clients with server-based computing quality management. In conjunction with DeviceAnywhere, IBM Rational software now provides a solution to meet the mobile-applications testing. The solution offers unique capabilities to make it easy to generate automated functional test cases for mobile device software and to execute those automated test cases in a scalable fashion, exploiting a "device cloud" to supply on-demand device access.

Additionally, the integration of DeviceAnywhere and Rational Quality Manager software allows companies to test their products on real mobile devices. The solution includes test case maintenance and execution scheduling and test results capabilities.

Runtime testing for mobile applications
In order to be more agile with mobile-application development and to help increase time to market, banks need to ensure that testing takes place earlier and often in the application lifecycle.

Rational Quality Manager software helps organizations optimize project quality with a single, shared test management hub that provides integrated lifecycle support for virtually any platform and type of testing.

Banks also need to be able to detect a wide range of client-side security issues. As the role of JavaScript in modern web and mobile applications becomes greater through technologies such as AJAX, JS Frameworks and HTML5, security and compliance vulnerabilities increase. IBM Rational Appscan scans and tests for all common web application vulnerabilities, including those identified in the WASC threat classification. Rational AppScan® JavaScript Security Analyzer (JSA), which is an extension of Rational AppScan Standard, has been developed in order to provide the same level of security checks for mobile applications. It performs static taint analysis of JavaScript, detecting a range of client-side security issues.

Additionally, mobile solutions need to comply with existing banking regulations. IBM Rational Policy Tester software provides automatic "regulatory-view" compliance reports for server-based and mobile-applications development. These reports include regulations such as the Electronic Funds Transfer Act, Sarbanes-Oxley and the Payment Card Industry Data Security Standard (PCI DSS).

Summary
There is an ongoing dramatic growth in the adoption of mobile technology, especially smartphones, and a major opportunity for retail banks in developed markets. However, by far the largest mobile opportunity will come from replacement of cash transactions in growth markets. The requirements for mobile solutions are becoming more complex and sophisticated, so banks need an integrated strategy for their mobile applications provision, which

in turn means that they need more sophisticated integrated tools to help them plan, design, build and test these applications. IBM Rational software has always been exceptionally strong in the provision of application lifecycle tools to help organizations drive innovation in web-based, client-server and mainframe environments. IBM has now extended these capabilities to support banks' application development in today's mobile environment.

For more information

To learn more about mobile applications in the banking industry, please contact your IBM marketing representative or IBM Business Partner, or visit the following website:
ibm.com/software/rational/solutions/banking/

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