RED HAT®
MOBILE

ENTERPRISE MOBILITY:
A WEALTH OF OPPORTUNITIES FOR FINANCIAL SERVICES

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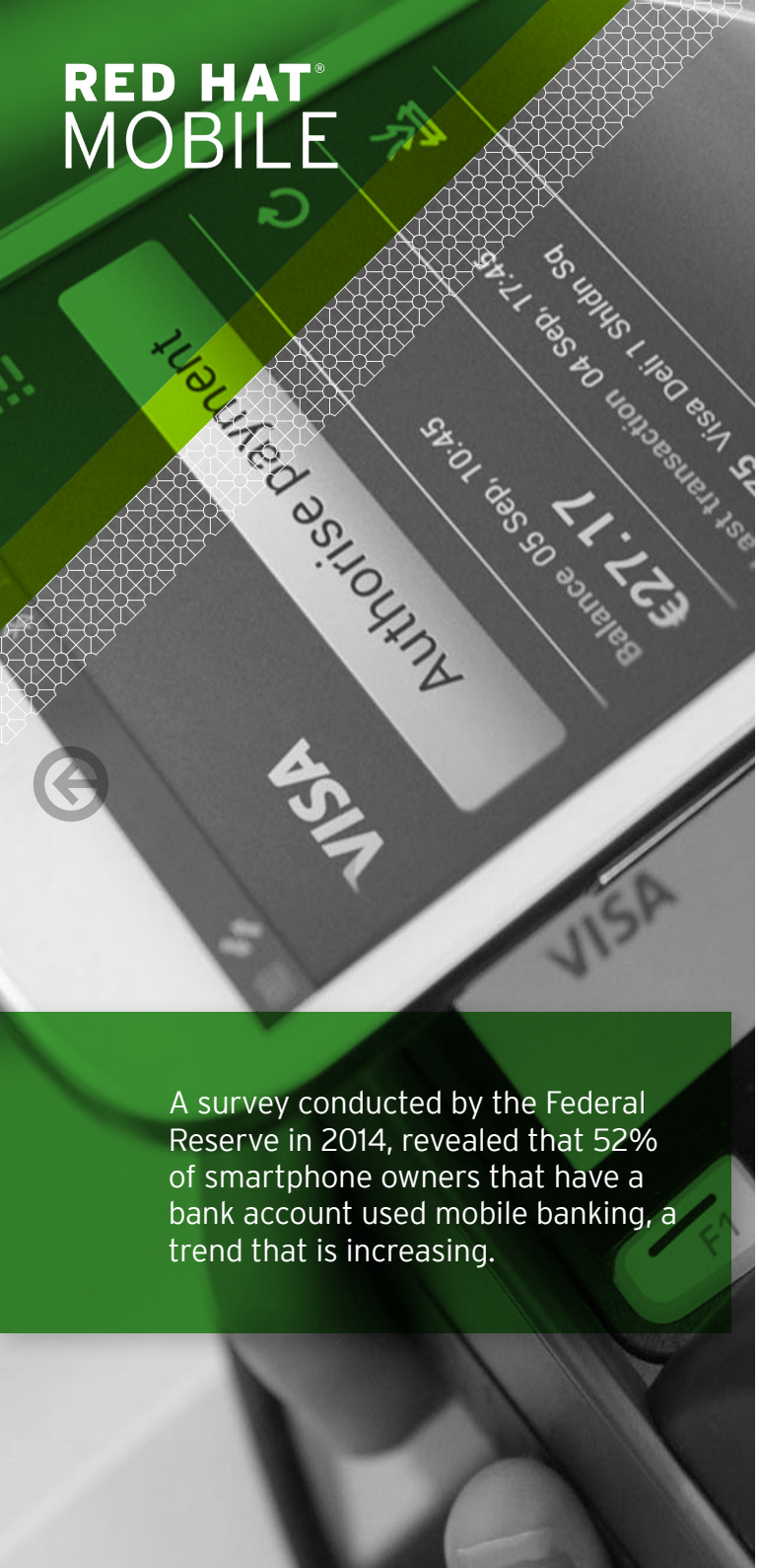
CONTENTS



A survey conducted by the Federal Reserve in 2014, revealed that 52% of smartphone owners that have a bank account used mobile banking, a trend that is increasing.

INTRODUCTION

Financial services is a powerful force in the global economy, touching every consumer and sector. As mobile banking has taken off at an explosive pace, the demand for mobile solutions, supporting technologies, and developer skills has skyrocketed.

Millennials[1]—as consumers, employees, and startup entrepreneurs—play a significant role in shaping mobile banking and finance. In the U.S., millennials now account for 25% of the population, and as they become a more significant part of the workforce and society, businesses are responding. The financial services industry is driving digital transformation in order to capitalize on the changing habits of these consumers and employees and innovate products, services, and processes for future success.

However, the increased appetite for mobile solutions faces a headwind of scarce developer resources, with demand fast outstripping organizational capacity to keep pace. Gartner predicts that by 2017, demand for mobile app services will grow at least five times faster than internal IT organizations' capacity to deliver them[2]. To tackle this, developer tools, mobile app development platforms, microservice architectures, agile methods, open source software, cloud models and solution ecosystems are evolving to meet demand.

[1] Millennials are referred to as those born in the 1980s and 1990s, also know as Generation Y.
[2] Gartner, Inc. Gartner says demand for enterprise mobile apps will outstrip available development capacity by five to one, June 2015

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TWO SIDES TO THE MOBILE COIN

1. Transforming the financial customer journey

Smart devices deliver information right to our fingertips. With them, we shop from home or on-the-go, order a car service with the touch of a button, deposit a check with a few clicks, and access more innovative products and services than ever before.

Millennials have compelled financial institutions in particular to make dramatic shifts in how they hire, manage, market, and sell to this unique group of tech-savvy, highly-educated individuals. The concepts of brick-and-mortar banks, engaging with branch staff, and paper-based transactions are alien to this group. Instead, they expect online convenience, 24×7 mobile banking services, and an impeccable user experience. They have few ties to traditional financial institutions and will bank through any channels—Apple, Google, Amazon—that provide a better overall experience. This obliges traditional financial institutions to reinvent their engagement models and business processes.

Opportunities exist for mobile apps to replace cumbersome paper-based processes, enhance customer service, and offer more personalized products and services. Sleek app design and innovative, easy-to-use features, combined with security, integration, and performance, quicken app adoption and usage—which influences customer loyalty.

Prediction: By end 2015, 74% of U.S. adult millennial internet users will bank digitally via any device, vs. 59% of baby boomer internet users[3].

[3]eMarketer, "Millennials embrace Mobile Banking," Aug 2015

2. Creating operational efficiencies

Retail banks, insurance companies, and wealth management companies rely on a transaction-based, distributed network of brokers, agents, partners, and field personnel. However, mobile apps are gradually replacing cumbersome, error-prone paper-based workflows that can incur costs and delays. Use of mobile-based forms reduces the workflow while improving accuracy levels, enriching processes with intelligent data collection, and giving users timely access to back-end data.

Mobile tools improve efficiency not only by allowing sales agents to set more appointments—reducing downtime—but by providing them a more interactive and valuable experience with their clients. The ability to summon digestible information quickly, even when offline, and to update back-end systems with payments, photographs, signed documents, and more, greatly increases their efficiency in the field.

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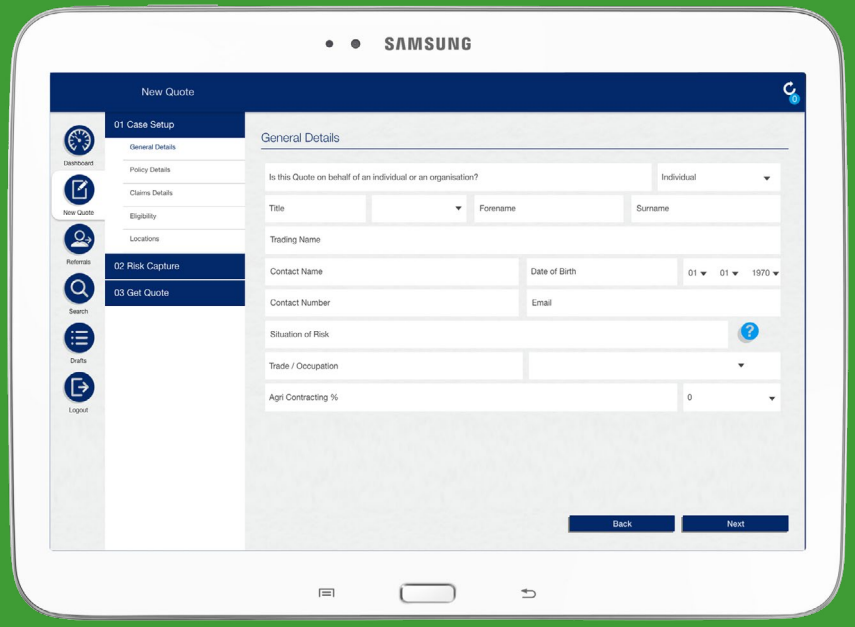
SPOTLIGHT: USE CASE

REDEFINING INSURANCE SALES PROCESS

A farm insurance provider with complex, multi-peril insurance product saw that a tablet app could simplify sales processes.



WHY RED HAT MOBILE APPLICATION PLATFORM?

- Reduced turnaround times helped brokers can sell more
- Flexibile front-end tools allowed user interface/user experience (UI/UX) development
- Mobile Backend-as-a-Service (MBaaS) enabled secure integration with back-end systems
- Saw return on investment within one month

VALUE FOR BROKERS IN THE FIELD:

- App transforms complex farm protection insurance into a simple, user-friendly process that helps brokers quickly generate customer quotes
- Mobile device captures images of the farm outbuildings and equipment for risk requirement assessment
- Data sync enables operation even without network coverage
- App fully integrates with back-end systems, so brokers receive all customers information instantly

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WHY MOBILE MAKES SENSE

► User-friendly

A streamlined, intuitive, touch-based interface aids widespread adoption and continued adherence.

► Unique capabilities

Camera, geo-location, notifications and more create new possibilities for data. Built-in sensors already enable a broad range of additional intelligence.

► Affordable

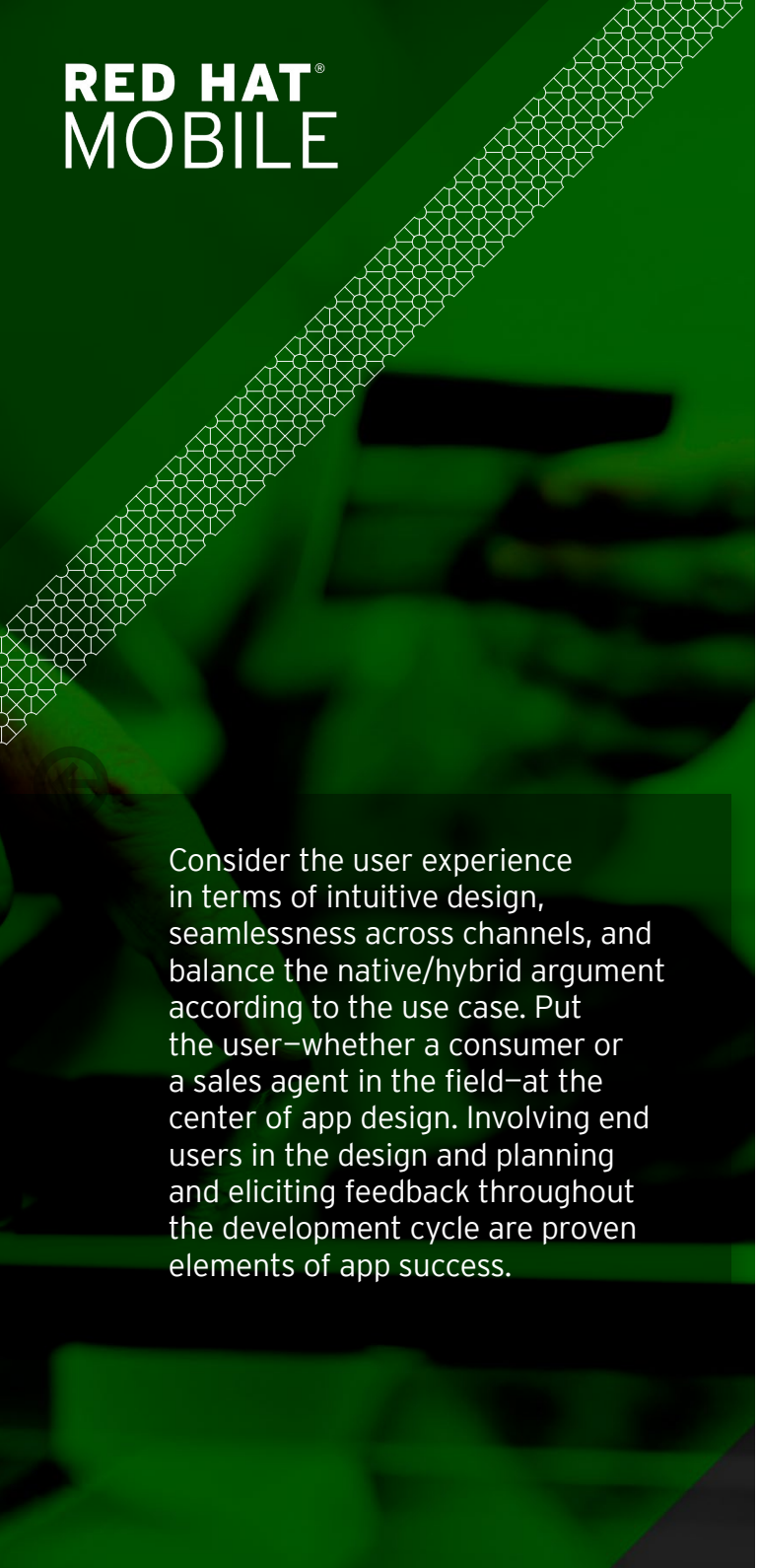
Rapid mobile application development (RMAD) tools, MBaaS platforms, APIs, and open source communities all reduce development effort and costs.

► Agile to develop and deploy

Modern mobile app development platforms cater to agile development environments and are designed for rapid deployment and scalability.

► Flexible

Based on open and cloud technologies, mobile app development platforms offer greater flexibility without vendor lock-in. Apps can be continuously updated in short release cycles.



Consider the user experience in terms of intuitive design, seamlessness across channels, and balance the native/hybrid argument according to the use case. Put the user—whether a consumer or a sales agent in the field—at the center of app design. Involving end users in the design and planning and eliciting feedback throughout the development cycle are proven elements of app success.

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SEVEN MOBILE MANTRAS

1. Keep it simple—and valuable

Mobile and data capabilities let you truly personalize the customer journey, but never at the expense of usability. As consumer apps compete heavily with other apps, superb UI/UX creates stickiness and build loyalty.

Omnichannel retail banking offers a seamless customer experience across different channels. Mobile apps are part of a broad, multi-channel digital strategy, requiring collaboration across the business.

Mobility solutions that integrate with back-end systems now enable specialists in the field to securely access real-time investment or client information on the go. Brokers in the field with clients can enrich the engagement by enabling scenario planning, accelerating approval processes, retrieving client information, downloading notes, signatures, photos, and more.

In the race for maximum audience reach, a debate surfaces between native and hybrid. Native apps have the feel, UI fluidity, and features access that can make them more attractive to a highly consumer-centric banking audience. This does not mean, however, that a hybrid approach cannot deliver on UI/UX, or that the advantages of this approach may be attractive to certain use cases.

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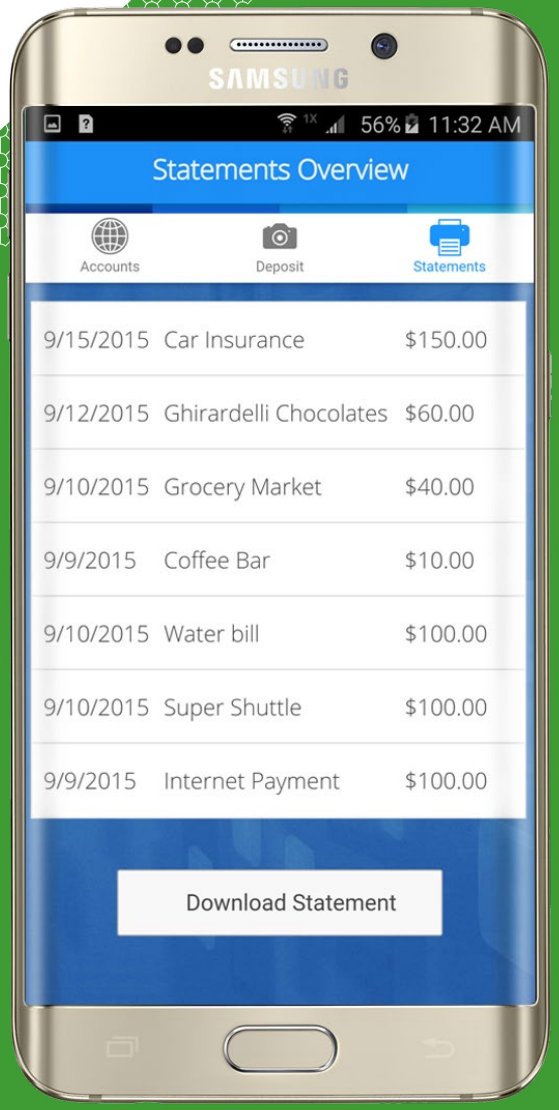


SPOTLIGHT

QUICK-TO-DEPLOY MOBILE BANKING APP

To get mobile projects up and running fast, consider the use of semi-custom apps—like the one Samsung Business Services used. It delivered simple yet powerful mobile banking functions such as mobile deposit, account balance look-up, and statement printing. Combining fingerprint and two-step verification with secure back-end integration via the Red Hat Mobile Application Platform, this app delivers a mobile banking solution that can be customized to a client's use case and systems.

FEATURES INCLUDE:

- Multi-device availability for phones, tablets, and wearables.
- Print and camera features.
- OTP key generator for two-step verification.
- Integrated MBaaS using Red Hat Mobile Application Platform.
- Modular design for easy implementation in any environment.
- Enhanced form experience to capture richer customer data.

"There are many approaches to RMAD, including drag-and-drop codeless tools, code generation and orchestration, model-driven development, virtualization, forms construction, and others. These approaches are allowing those with no programming skills or coding ability, such as people in business roles, to rapidly assemble mobile app prototypes and continuously iterate on these designs[4]."

Gartner

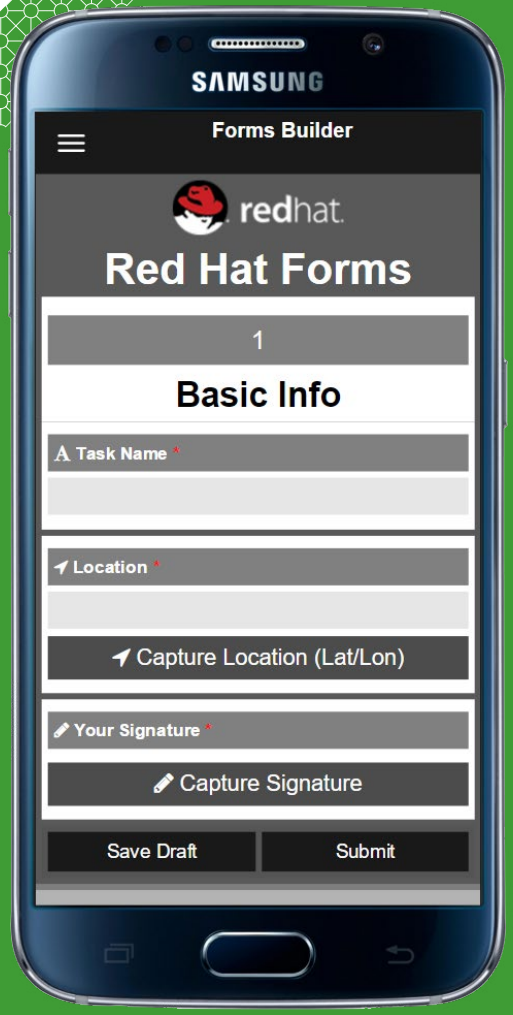
2. Automate and innovate

Besides the difference in screen sizes and touch interfaces between desktops and smart devices, the capabilities of mobile devices are a significant source of new data. At minimum, they reduce process steps. At full potential, they can redefine a business model. Consider the possibilities for an insurance company that has an app allowing agents to photograph damaged property and automatically upload images for faster claims processing and claims settlement.

Innovation is at the heart of mobile, changing the way organizations interact and engage with customers, partners, agents, and employees. By combining device-specific features, data, and mobile-to-mobile (M2M)/Internet of Things (IOT)capability, new revenue-generating possibilities and transformative ways of working can emerge. Innovations such as mobile wallets, like Apple Pay and Google Wallet, are revolutionizing payments processes, simplifying credit and debit card payments with user-friendly yet secure features.

Prioritize key business processes that lend themselves to quick success through mobilization. Paper-based transactions are usually suitable for mobilization, and forms-based apps can be created quickly and simply if supported by codeless or RMAD approaches. By taking advantage of device features such as automatic GPS stamping, pre-filling information, and barcode scanning, mobile forms can also help reinvent paper-based transaction processes.

[4]http://www.gartner.com/newsroom/id/3076817



SPOTLIGHT

REPLACING PAPER FORMS WITH MOBILE

The Red Hat Mobile Forms Builder lets you create form-based apps based on intuitive drag and drop components for iOS, Android or Windows Phone devices. Whether you're prototyping ideas or transforming a paper-based workflow, you can build the exact fields and workflows without coding.

► Back-end connectivity

The Red Hat Mobile Forms Builder connects with back-end systems or services, allowing the form to fetch data and automatically populate specific fields.

► Device-specific capabilities

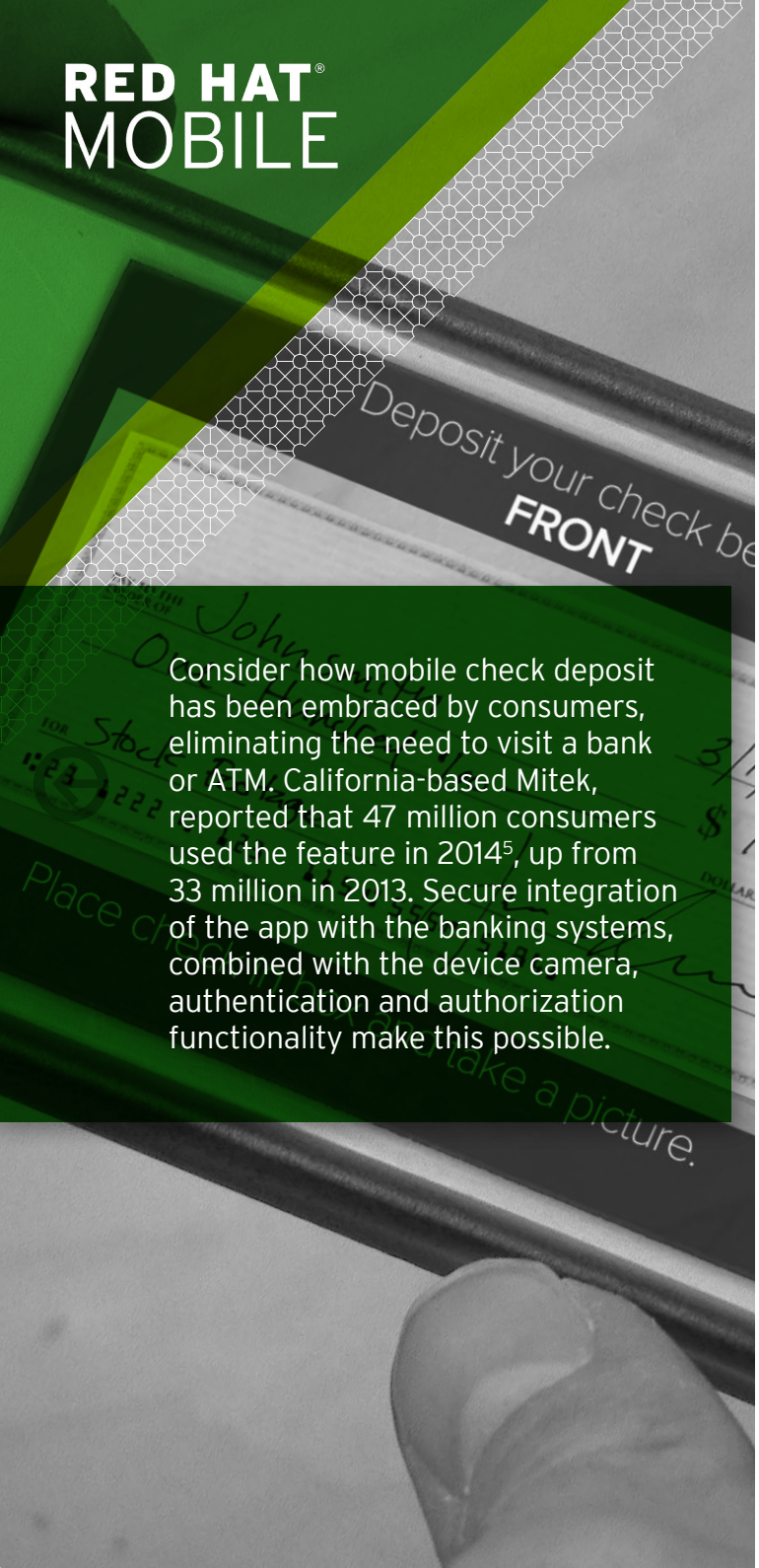
The Red Hat Mobile Forms Builder easily incorporates device features—including location-awareness, camera, accelerometer, barcode and QR scanners, motion detection and biometrics—into the forms.

► Secure integration

The Red Hat Mobile Forms Builder integrates with the Red Hat Mobile Application Platform, providing access to all platform features—including secure connection to enterprise back-end systems, data storage and caching, and automatic scaling.

► App Lifecycle Management

App Lifecycle Management functionality supports a development environment that is distinct from the production environment—so code changes won't impact live deployments.



Consider how mobile check deposit has been embraced by consumers, eliminating the need to visit a bank or ATM. California-based Mitek, reported that 47 million consumers used the feature in 2014[5], up from 33 million in 2013. Secure integration of the app with the banking systems, combined with the device camera, authentication and authorization functionality make this possible.

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3. Data Rules

Mobile apps are not just a user-friendly interface but are the point where data is generated and consumed. Personalizing a customer transaction is highly dependent on the information that resides in back-end systems, as well as the data captured from customer behavior, device features, and intelligent sensors.

Managing the vast and growing volumes of customer data and making it available to mobile in a timely, secure, compliant, and contextual way is what makes or breaks a digital business. Infrastructure and cloud technology advancements have enabled increased data storage, management, and scaling between device and back-end systems—improving data management and enriching mobile experiences.

Mobile apps have to connect with data from distributed back-end systems and apps, many of which are legacy. Integration of mobile apps with business process management (BPM), business rules management systems (BRMS), customer relationship management (CRM), and other critical systems can be transformative.

Mobile Backend-as-a-Service (MBaaS) functionality excels at integrating disparate systems of record, acting as an access hub between mobile clients and back-end systems. It offers the APIs, security, storage, and other services for easy, controlled access to back-end data—including proprietary systems that weren't originally designed with mobility in mind.

[5]http://www.enterpriseappstoday.com/crm/6-top-tech-trends-shaping-financial-services.html

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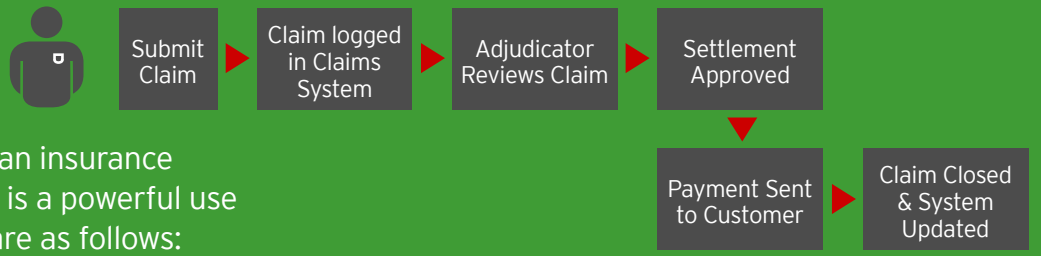
SPOTLIGHT

BUILD AN INSURANCE CLAIMS APPLICATION

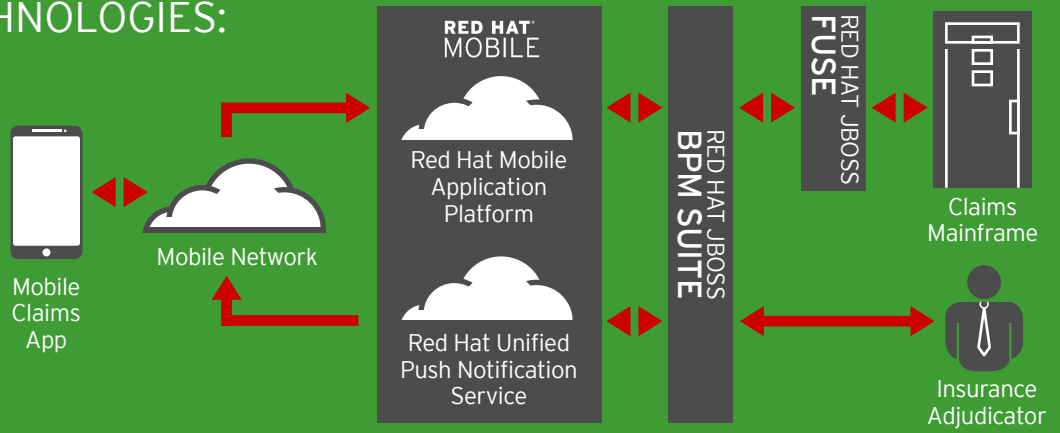
BUSINESS PROCESS STEPS



A mobile app that allows clients submit an insurance claim quickly following an auto accident is a powerful use case. The basic business process steps are as follows:

POWERED BY RED HAT TECHNOLOGIES:

As an example, the following Red Hat technologies can be integrated to provide the complete functionality from mobile device to legacy backend system for this use case scenario:



A form can be created quickly without much coding skill requirement on the mobile app platform. A RESTful API made available in the BPM Suite is invoked to kick off the BPM process and pass the data submitted. The BPMS integrates with JBoss® Fuse to file the claim with the back-end legacy claims system, and automatically moves the claim to adjudication, sends it to an adjudicator, gets a decision, and returns that decision to the claimant via the Red Hat Mobile Application Platform and a push notification to the mobile claims app.

4. Build fast, build repeatedly

Mobile app development places demands on faster development and deployment cycles as apps are continuously created, updated and retired. This requires as much agility and flexibility as possible—from front-end development to back-end integration, testing, and deployment. This "build fast, build repeatedly" model can be supported by microservices architecture and DevOps approaches.

Microservices architecture, in contrast to monolithic architectures, represents a modular way of building enterprise apps. Complex apps are restructured into small, modular, independent services. Each performs a single function, and all communicate using language-agnostic APIs. Using microservices as part of MbaaS to mobilize existing enteprise systems improves agility and performance. While microservices communicate using RESTful APIs and lightweight messaging, they also provide modern wrappers for legacy enterprise systems.

A DevOps culture evolves as developers and operations collaborate, bringing infrastructure and deployment awareness into the early stages of creation. This helps prevent unnecessary surprises are when mobile apps go live. Development teams collaborate in building autonomous services to serve specific business requirements; at the same time, operations handles security, compliance, deploying apps, and managing infrastructure. DevOps can help IT teams coordinate mobile app creation and the enterprise back-end integrations that support them.

As short, iterative cycles become the norm for mobile app development, DevOps culture and microservices architectures emerge as key facilitators.

5. Extend security from device to back end

Since it allows access to sensitive financial data beyond the company's four walls, mobile adoption is not without risk. The main concerns consumers have about mobile banking apps is the security of the mobile technology and protection of their sensitive financial data.

User identification, verification and authorization have advanced due to innovations in biometric technologies for recognition. For example, Dutch bank ING now offers customers a means of making payments using voice recognition rather than PIN codes[6].

Mobile security technologies extend beyond the device to every aspect of data integration and handling. They have to span all touch points, enabling user authentication, remote wipes, app lock-down, data protection, and more. Enterprise mobility management (EMM) solutions have evolved beyond pure device management (MDM) to encompass more mobile app management (MAM) and mobile content management (MCM) capabilities, while mobile app platform technologies build security into the development process.

Security, however, is as much about people and process as it is about technology. A more collaborative approach to managing security needs to be fostered. Greater user accountability, improved monitoring, and better user experiences will help reduce employee use of shadow IT and other unauthorized solutions.

[6]http://www.rt.com/news/311409-voice-bank-password-netherlands/

6. Collaborate across functions

For a mobile app to offer seamless customer experiences, its development requires strategic, cross-functional collaboration between lines of business, developers, IT, employees, and all other stakeholders. With retail banking moving from a multichannel to an omnichannel approach, this collaborative model becomes even more important.

Like all companies in highly-regulated industries, financial firms must take all possible steps to protect the storage and transmission of sensitive data and intellectual property. Mobile app security isn't the sole preserve of IT, however—it demands involvement from multiple business units and stakeholders. Security needs to move out of individual silos and become more centralized and with more collaborative management. This can be aided by structures such as a Mobile Center of Excellence (MCoE) where best practice in mobile security governance, compliance and technology can be centrally decided, maintained, and shared.

A second challenge relates to the app development process itself, coordinating the efforts of a multi-disciplinary, geographically scattered team of in-house and outsourced developers, spanning design, client-side development, back-end development, DevOps, and administration. With mobile, this activity unfolds in the context of multiple concurrent projects and frequent iterations. To support such a multi-disciplinary team effort in mobile app development, mobile development frameworks and platforms that support discovery, development collaboration and sharing of code and developer services have emerged.

7. Choose the right infrastructure

An important part of mobile strategy is the infrastructure and architecture that supports the scaling, security, and maintenance of mobile initiatives.

As apps become more sophisticated and the user base grows, off-device data storage and processing power become imperative. The cloud environment can play an instrumental role in storing and managing the data that moves through the apps. Its elasticity allows rapid scaling to meet growing demand without sacrificing performance or availability.

However, financial institutions have been cautious about cloud environments, especially in the U.S., perceiving them as less secure than on-premise solutions. In many cases, policy and compliance issues have influenced a preference for on-premise deployment. Certain banks opt to use a private cloud solution, keeping servers within the institution's own data center, behind the firewall. However, the flexibility, affordability and scalability of public cloud is becoming an increasingly attractive option and has sparked the emergence of a plethora of banking and financial startups that take advantage of modern cloud and mobile technologies to creat innovative financial products and services.

For use cases that do not involve storage of highly sensitive data, it may be more economically efficient to deploy in a public cloud environment than in a private cloud. In response, many banking institutions are turning to hybrid cloud models using private cloud or on-premise infrastructure for the storage and management of highly sensitive data such as client account information, while also using public cloud environments for less critical applications. As financial institutions dip their toe in the water with cloud infrastructure, they increasingly move critical applications to the public cloud. The benefits of cost-savings and scalability on-demand dovetail with with increased competitiveness in the face of a growing number of innovative financial startups.

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NEXT STEPS

Financial services companies are under incredible pressure to meet consumer demand for new and innovative products and services. Remaining competitive demands a strategic approach, but one that is flexible enough to respond to the rapid pace of change. With developer resources at a premium, organizations are looking to more open technologies and modern architectures that can help position them to compete in the digital marketplace.

Red Hat's experience and leadership in enterprise IT and its portfolio of open source enterprise software, mobile solutions, and cloud technologies can help your organization accelerate its mobile app development initiatives.

The Red Hat Mobile Application Platform offers the development framework, tools, and environment to accelerate the high-volume development and deployment of enterprise-grade mobile apps. It simplifies mobile app integration with data stored in legacy systems and applications by providing APIs and pre-built connectors—as well as storage, security, management, and other back-end development services. It also streamlines app deployment and updating. As mobile app development grows, this platform—based on a trusted technology stack and open technologies—brings greater efficiency, control, and scalability to app development and integration.

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