

A large, vertical, grey decorative shape on the left side of the page, with a curved right edge that tapers towards the top and bottom.

THE ROAD TO **MOBILE BANKING**

White Paper
June 2008

Table of Contents

Introduction	2
The Road to Mobile Banking	3
Short-message Service (SMS) Banking	3
Simple Banking.....	3
Complex Banking	4
Person-to-person Payments.....	4
Mobile Commerce.....	4
Keys to Mobile Banking Success	5
Sun and Mobile Banking	6
Java™ Technology.....	6
Mobile Services Architecture (MSA).....	6
NetBeans™ Mobility Pack	7
Java CAPS Middleware	7
Identity, Directory, and Security	7
Professional Services.....	8
ISVs.....	8
Mobile Gateways	8
SMS Platforms	8
Security.....	8
Resources	9

Chapter 1

Introduction

Much was made of mobile electronic commerce in the dot-com era, with fantastic projections regarding usage and capabilities. But the early efforts were difficult to use, and virtually all initiatives from this time failed. Now, efforts by major banking players are again underway to create readily-accepted mobile banking applications, though they are in their infancy. The reasons for proceeding seem more compelling:

- **Changing customer demographics:** A new generation of consumers—Generation Y—use cell phones for everything, and it appears they want mobile banking. A recent U. S. survey¹ showed that 21 percent of consumers 18-34 use a cell phone for banking, compared to about 10 percent for the general population. This demographic group is entering into their peak years for earnings and spending habits.
- **Tactical cost savings:** A large percentage of call center volume originates from cell phones, and analysts predict that by 2010 this will account for almost 70 percent of requests², mostly comprising simple balance inquiries. Servicing customer inquiries using mobile phones instead of a call center is expected to save costs, reduce transaction times, and increase customer satisfaction for these types of requests.
- **Increase revenues:** Mobile banking applications can generate additional revenue streams in two ways. Some mobile banking applications can be positioned as premium service, with associated fees. Second, these services may attract new customers who want them, but whose current banks do not offer them.
- **New forms of competition:** As an emerging demographic demands that banking practices adapt to their lifestyle, most major banks are offering, or will offer in the near future, some form of mobile banking. While banks are the incumbent suppliers, new, non-bank players, such as PayPal and Zopa, are offering services such as money transfers and loans. Technology is opening up the market to new forms of competition.
- **Surging growth:** American Banker predicts that U.S. households using mobile banking will grow five-fold in the next year, to five million, and reach 11 million households by 2009³. Worldwide, analysts predict that ten times as many consumers are expected to use mobile banking services—customer service, financial information, bill payments, money transfers, and account management—within three years⁴. Analysts cite consumer confidence (security), fees, and regulations as factors that could inhibit growth.

1.<http://ap.google.com/article/ALeqM5gmBQFe7NB0vflcm2Blyj-s0205GAD9066EF00>

2.<http://www.celent.com/PressReleases/20070517/MobileBanking.htm>

3.<http://www.sundog.net/index.php/sunblog/entry/ing-direct-launches-mobile-banking/>

4.<http://www.informationweek.com/news/internet/ebusiness/showArticle.jhtml?articleID=207400015>

Reducing Costs, Increasing Revenues

A bank located in the northeast U. S., offers both *free* and *fee*-based mobile banking applications. In general, the bank's free mobile banking applications are those things that help the bank reduce costs. These include password changes, balance inquiries, and account lockouts due to failed attempts (reset password). Premium, or fee-based, applications include opening balance information, threshold alerts, one-time bill pay, and wire payment activity—those services which many customers believe provide value. The bank is evaluating customer acceptance of these applications, and evaluating new ones, such as virtual safe deposit box.

Mobile banking represents an opportunity to retain existing customers, while increasing loyalty and customer satisfaction, by delivering innovative new services to a technology-savvy demographic segment. Sun offers a comprehensive set of products, technologies, and services that provide a complete platform for mobile financial services, enabling flexibility and innovation from the handset to the back-end. This paper provides a high-level recommendation for how to approach this new market segment, and a brief description of the relevant Sun products and technologies.

Chapter 2

The Road to Mobile Banking

Mindful of their previous experience, many banks are cautious in their approach to this new generation of consumer banking products. There are many technological and behavioral obstacles to overcome—some analysts⁵ predict that it could take 10 years for mainstream adoption. But in order to participate in this market, banks need to get started now, or risk losing customers. Drawn from its collective experience in this space, Sun has identified five steps to mobile banking, as well as key underlying concepts for each stage.

Short-message service (SMS) banking

Typically, the first step banks take when creating a mobility service is to enable some form of SMS alerts. SMS is easy to use and deploy, and it's available on virtually every handset. After registering a cell phone by sending a short code to the bank's SMS address, consumers can use the system to get alerts—for example, if their balance falls below a certain level, or a check above a certain amount is processed. Some banks offer a two-way service, enabling consumers to make balance inquiries.

But SMS does have limitations. Messages are limited to 160 characters in total length, and confidentiality can be a concern because all information is sent as clear text.

Simple banking

Functionality beyond SMS can be enabled using a more robust application environment, which allows more complex activities, such as request transaction histories and transfer funds between different accounts at the bank. In general, there are two ways of doing this:

- Use the wireless application protocol (WAP). WAP is similar to HTML, and is designed for use on a mobile phone. Consumers use the browser in their phone to access a specialized Web site, entering and receiving any information while connected.
- Use Java™ technology MIDlets, which are a small application runtime technology that offers an enhanced user experience by taking advantage of the unique

5. http://www.bankrate.com/brm/news/chk/20070302_mobile_banking_a2.asp

characteristics of a particular handset — for example, a large screen or more function keys.

Complex banking

With more robust security and transaction capabilities in place, the next step is the ability to pay one-time bills (positive payment). A customer is alerted that a one-time bill is due, payment is enabled, and the payment is confirmed. At this stage, other bank services and financial information, such as credit card management, foreign currency exchange rates, interest rates, can also be made available.

Person-to-person payments

Transferring funds from one user to another via mobile phones is the next step. This is an appealing capability, because there is a large, existing market of people who are paying fees to make person-to-person payments (or remittances). The infrastructure requirements are much more demanding, as trust, security, and interoperability must reach from one cell phone across one or more bank systems, to another cell phone. This stage demands robust security, as it is very difficult to reverse a transaction in case of fraud.

Mobile commerce

The mobile banking end game is more than checking balances and paying bills. The goal for mobile banking initiatives is to replace credit and debit card products with cell phones — *mobile commerce*. Multiple credit cards, debit cards, and any other current form of transactions, along with membership cards, library cards, and loyalty cards can be conducted with a specially-enabled cell phone or PDA. Mobile commerce is expected to allow banks to generate greater electronic payment volume through the combination of electronic loyalty programs, mobile marketing, and contactless payments.

Mechanisms to instill and maintain trust are needed at this stage. Consumers are understandably concerned about the safety of their bank accounts, and banks need to trust all partners, and protect data as it moves across the network to multiple partners and service providers.

- Banks and cell phone providers are in very early trial stages with near-field communication (NFC) payment chips, similar to PayPass, embedded into cell phones. Customers can enable transactions at new POS terminals by placing the phone near the terminal. Additional transaction approval can be authorized by entering a PIN on the handset. Pilot tests show that consumers enjoy a greater sense of security with this technology.
- Companies acting as a “Trusted Service Manager” are working to provide a firewall between the multiple back-end entities, enabling banks, and carriers to control customer data.

Chapter 3

Keys to Mobile Banking Success

Sun is a leading supplier of IT products and services to the financial services industry, and recognizes that the innovative technology is only part of a successful solution. With the experience gained from working with mobile banking efforts of banks, credit unions, and financial institutions worldwide, there are some broadly applicable guidelines when defining service requirements.

- **Make it easy.** By designing in simplicity, a good mobile banking application understands and works with the limitations of the mobile phone. Generalized solutions, such as those based on WAP browsers, can suffer from poor implementations and interfaces, resulting in a slow and cumbersome experience.
- **Make it small and fast.** Any mobile banking application must be easy, fast, and intuitive to use on customer handsets. Applications need to be bite-sized and accomplish small, defined tasks. Users should be able to easily find your mobile banking application among all those available on the handset, authenticate and execute the transaction in a few keystrokes—all in well under a minute.
- **Fail fast, scale fast.** This is a period of tremendous technological innovation and change in consumer behavior. Banks must be able to quickly identify and try out new applications, scaling them if they work and removing them if they don't.
- **Bank-grade security overall.** Consumer confidence is a cornerstone of adoption. End-to-end bank-grade security is a requirement for every application. This means comprehensive security must be built into the deployment architecture, not added on to each application.
- **Mobile commerce is the goal.** Keep clear line of site to mobile commerce. Every application and service in this space should be a step toward “owning” your customer’s ability to conduct mobile commerce—mobile payments, account information and services, and more.

Enabling innovation means getting the basics right from the beginning. While there is virtually no agreement among analysts and industry players as to what a successful mobile banking offering will look like, conventional wisdom holds that increasing the integration of all of a customer’s banking relationships increases their “stickiness.” In order for this to happen, back-end systems must be integrated and extensible, with functionality capable of supporting mobile applications.

Chapter 4

Sun and Mobile Banking

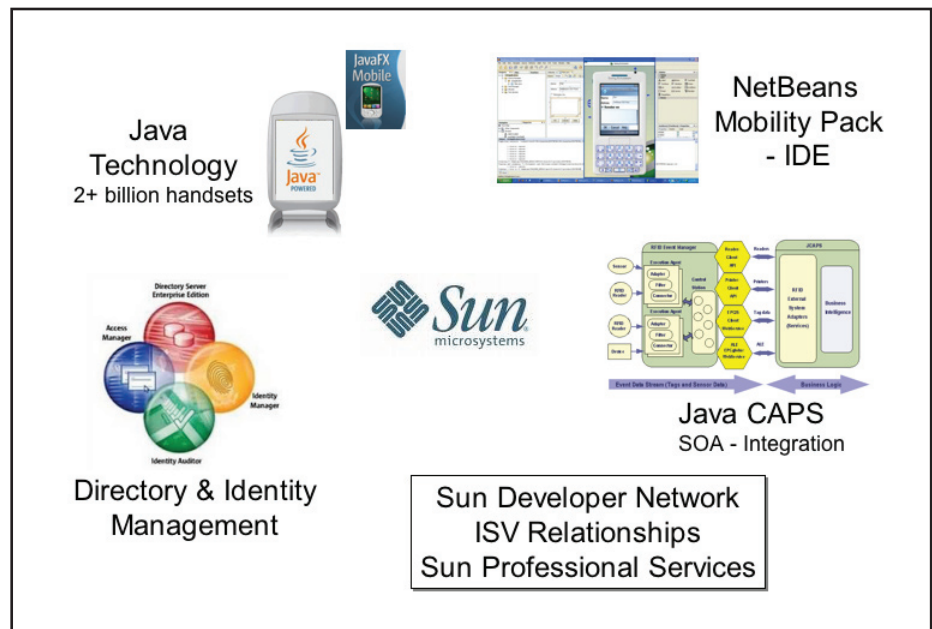


Figure 1. Sun provides end-to-end technology and services for mobile banking.

Sun is a major provider of IT to every layer in a mobile banking solution, from handsets to IDEs, to directory and identity management, to back-end systems and middleware. Sun products and technologies, along with those of third-party suppliers, can be used to provide mobile banking and applications as another service delivery channel, similar to existing capabilities such as online banking. The following products and services make this possible.

Java™ technology

With over two billion mobile handsets shipped with Java technology, it is a leading application deployment platform for this environment. Community-driven Java tools and technology provide a robust, flexible environment for applications running on mobile and other embedded devices, and include flexible user interfaces, strong security, and support for networked and offline applications that can be downloaded dynamically.

JavaFX is the next-generation family of products for creating rich Internet applications (RIAs). A complete mobile platform, it is highly portable and supports the Mobile Service Architecture (MSA) and the billions of Java-enabled devices in place today.

Mobile Services Architecture (MSA)

As the wireless device market continues to evolve and incorporate new technologies and services—from Bluetooth to vector graphics to Web services—in mass-market handsets, there is demand to create a platform that standardizes on those new

technologies. Led by Nokia and Vodafone, The Mobile Services Architecture (JSR 248) is a Java ME platform umbrella specification with the goal to eliminate the fragmentation of Java ME handsets by creating a standard platform. It streamlines and simplifies the development of Java ME applications deployed across multiple handsets. The MSA platform contains specification for graphics, content, communication, location, security, trust, and more. The MSA builds on the Java Platform, Micro Edition (Java ME) specifications that have come before it, including the Mobile Information Device Profile (MIDP), Connected Limited Device Configuration (CLDC), and Java Technology for the Wireless Industry (JTWI).

NetBeans™ Mobility Pack

The award-winning NetBeans™ Mobility Pack is an integrated developer environment (IDE) designed to create MIDlets (small, rich-client application files for mobile devices) from a common source base. This visual IDE provides a comprehensive development environment, and includes over-the-air (OTA) and wireless device emulation, debugging, and other capabilities for mobile application development.

With thousands of different handset models in circulation, each with different capabilities and characteristics, it is difficult to create downloadable applications that optimize the customer experience. The Sun NetBeans Mobility Pack enables developers to create one set of source code and customize it for each targeted mobile device, simplifying deployment efforts.

Java CAPS middleware

Mobility projects are also back-end integration projects. Inflexible, tightly-coupled legacy infrastructures do not easily lend themselves to new product and service delivery channels. Java CAPS can be used to extend an existing IT infrastructure into a service-oriented architecture (SOA) where mobile applications can be developed, deployed, managed, and monitored. Java CAPS adds flexibility and extensibility to an existing application delivery infrastructure.

Java CAPS was recently certified with the SWIFT Gold Label, for the ninth year in a row, and is fully compliant with the 2007 SWIFT standards. Java CAPS is used in solutions where compliance is needed with the SWIFT ISO 20022 XML industry standard.

Identity, directory, and security

Mobile banking application users ultimately access multiple systems, often supplied from multiple partners. Maintaining end-to-end security can be difficult. The environment can change over time as new users are added, users change phones and passwords, and sign up for new services. Sun identity management products streamline and simplify the process of managing user identities across all varieties of computing infrastructures and application environments, creating a more usable and manageable environment.

Access management solutions enable rule-based access control and single sign-on (SSO) for secure interoperability. Comprehensive federation services create and extend trusted domains of multiple business partners, with on-the-fly credentials management. Sun identity management solutions enable over the air (OTA) provisioning, bank-grade authentication, and encryption over the entire solution set. All Sun identity management solutions are easily integrated with heterogeneous IT environments.

Professional services

When creating a mobile banking application, few things are more important than delivering it correctly. As the inventors of the Java language that led to the creation of J2ME, Sun can provide the expertise that can make your mobile strategy and services successful. Sun Professional Services capabilities can save time and money by eliminating needless experimentation, and a proven end-to-end service delivery architecture can shorten time to deployment without sacrificing scalability. Sun offers strategy, planning, development, and education services, as well as a Wireless Centre of Excellence in Stockholm to take full advantage of regional innovations in wireless solutions.

ISVs

A rich ecosystem of third-party ISVs provides products and technologies that can enhance any mobile banking solution. These include:

Mobile gateways

Products from mFoundry and c-sam can help reduce or eliminate device fragmentation issues, enabling enhanced application functionality. Mobile gateways can also enable mobile banking services to non-Java technology devices while maintaining a unified code base.

SMS platforms

SMS functionality is nearly universal in its appeal, not only for delivering banking information to low-end phones without a rich UI capability but also as an alert mechanism and communication mechanism for more capable handsets. Sun is working with Clairmail, Sybase 365, and other vendors to integrate SMS as part of an overall solution.

Security

Security capabilities need to be an integrated part of every level of the mobile banking solution. No single entity controls security on the handset, which means that maintaining security can be a complex task. Cassis and Tyfone offer solutions that provision secure elements (both hardware and software) into the phone.

Resources

Mobile financial services are becoming a reality, and virtually all major banks have mobile application initiatives underway. Sun and its partners have relevant solutions that can help. More information is available below.

NetBeans Mobility Pack

www.netbeans.org/kb/60/mobility/javame-devicefragmentation

Java-enabled Handsets

java.sun.com/javame/technology/msa/devices.jsp

Best Practices

Working with Orange (France Telecom), Sun created a set of best guidelines for simplifying the development of mobile application files.

developers.sun.com/mobility/reference/techart/design_guidelines/overview.html

Java Mobility

developers.sun.com/mobility

Java CAPS

sun.com/javacaps

Identity Management

sun.com/identitymanagement

Mobility Service Architecture

java.sun.com/javame/technology/msa/

Sun and the Financial Services Industry

sun.com/solutions/landing/industry/financial_services.xml