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Mobile Banking

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Foreword

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This IBIT Report *Mobile Banking* analyzes the banking and financial needs of people in the 14-25 age range. This group is the vanguard for demand for future financial services and has shown the desire to access these services via their mobile phones. Are today's technological capabilities and financial functions able to support their needs or are there gaps that provide new opportunities for technology and service providers?

Bruce Fadem
Editor-in-Chief
January 20, 2010

Introduction

A young woman checks to see if her mortgage payment has cleared while she waits for the train. Across the street, an electronics enthusiast checks the balance of his checking account before making the decision to purchase a new big screen television. On the street in front, a new college graduate hurrying to a job interview passes them on a bus and pays her bills. This is mobile banking. This is how many millennials, ages 14-25, prefer to manage their finances. For this generation, a teller is pretty much unnecessary and an ATM is only useful to get cash. The cell phone is the preferred tool for executing their financial transactions.

The imperative of mobile banking is being felt today and will, over time, completely change the landscape of financial management and banking. Organizations which fail to position themselves to leverage these changes will face a major disadvantage. According to a study by financial consultancy Celent, 35% of online banking households will use mobile banking by 2010, up from less than 1% today. Upwards of 70% of bank center call volume is projected to come from mobile phones.

For the next generation of users, mobile phones are used for much more than voice communication.

For the next generation of users, mobile phones are used for much more than just voice communication. Enabled by the capabilities of continuously expanding wireless technology, the mobile phone provides "always on" connectivity to voice and text based communication, multimedia entertainment, the Internet, and access to the systems and applications which are integral to their daily lives. Millennials are among the most rising and influential consumer groups and are the most important early-adopters for new products and new technologies. The intersection between the needs and desires of this demographic group and the capability of the next generation of mobile technology provides fertile ground for innovation and the creation of competitive advantage.

In this paper we report on the key findings and recommendations obtained by analyzing the banking and financial needs of millenials (by a group of millenials) and the capabilities of mobile technology. The research identifies a number of key "gaps" where needs are not being met. The recommendations focus on two major areas, account aggregation and location based features. While the research focused on the needs of the next generation mobile banking customer, the findings are relevant for the overall financial industry and mobile technology vendors.

Results

Market research was conducted (see Appendix for full details) to identify mobile banking "gaps" which are not currently being met. Technology research was performed to

Ranking	Weight	Weighted Score
1	Ability to check balances of all accounts within the same institution and across multiple banks	6.34
2	The ability to transfer money to other accounts both within the same bank and among different institutions	6.19
3	Interface to report credit/debit cards/checks lost or stolen	6.05
4	Application shows individual account transactions	5.86
5	ATM/Branch-locator feature	5.86
6	Real-time account activity alerts	5.84
7	Send/receive secure messages to/from institutions	5.80
8	Ease of use of the application interface (for example, larger buttons to click on)	5.52
9	Ability to "hold" all account activities via an interface in the application	5.48
10	Feature to show investments/savings/checking graphically represented as pie chart or bar graph	4.90
11	Ability to sync with desktop banking software	4.83
12	Ability to integrate with PayPal	4.76
13	Make radio-frequency identification(RFID)/contactless payments through application	4.19
14	Sequence of picture matching or screen-taps feature instead of password to access application	4.11

Table 1: Results of closed-end survey

determine the capabilities of the latest generation of mobile technology. The initial market research included open ended input from eight online forums and Facebook groups. The 36 responses were categorized (see Table A-1 in the Appendix) and used to construct a closed ended survey for which we received 70 responses from our target demographic (see Table 1 above). The survey participants were also asked to name any other capabilities they would like to see in a banking application (see Table 2 on page 6).

Some readers of this document may find the raw responses particularly interesting. While many readers frequently review research from more traditional sources, the un-sanitized and unprocessed nature of the raw data collected as part of this project has proven to be surprisingly engaging. Readers should consider reviewing the raw data found in the appendix.

Key Recommendations

We have identified a number of areas where the needs of the next generation mobile banking customers are not currently being met. These areas include:

Where's it all at…at a glance – Increased awareness of spending habits has become essential to individual fiscal responsibility. Applications which facilitate account management and transactions help consumers do just that. Applications must be easy to use, save consumers time, and allow them to view on one screen all of their financial accounts and transactions across institutions. Mobile banking applications must give their consumers the ability to

A "virtual wallet" type of feature that would allow the user to delegate money for bills and expenses, and then show how much spending money is left over.	A "wish list" feature that allows the user to save money for a certain item. The application would show the percentage of the money saved
Ability to interface with financial software, such as Quicken	Ability to pay accounts due
Fingerprint reader	Ability to change username and password through the interface
Retinal Scan	Seamless bank-to-bank transfers with a common interface
Live transaction updates	Automatic application updates, such as security fixes and patches
Automatic transfers	Ability to check the institution's interest rates on CDs and money market accounts
Offline Access	Ability to view investment opportunities, such as available CDs
Ability to open a new account	Ability to cancel a transaction

Table 2: "Additional" capabilities from survey

make transfers, view detailed spending history and trends, and even compare these trends with those of other consumers with just a few swipes of their fingertips. The results of our analysis show that the most popular "gap" is "*the ability to check account activity across multiple institutions."* In second place comes the "gap" of not being able to conduct actual transactions via the handheld device.

Mobile banking applications require feature parity with online banking. Mobile banking applications need to be able to manage accounts and perform transactions across accounts within a single institution and between accounts across different financial institutions including traditional banks, credit card issuers, and investment houses. These applications must show individual transactions along with corresponding balance after the transaction has been completed. Transaction history needs to go back at least to the previous closing date. All transactions should be displayed in real-time. As with online banking sites, mobile banking customers must be able to transfer funds, pay bills, and receive various notifications from the bank (i.e. alert if balance drops below a certain minimum).

User Interface – Applications should take into consideration the small form factor of smart-phones and also leverage new UI innovations in smart phones such as touch screens or

Methodology

We conducted market research to identify mobile banking "gaps" which are not currently being met and technology research to determine the capabilities of the latest generation of mobile technology.

1. The initial market research included open ended input from eight online forums and Facebook groups which focused on what people would like to see in mobile banking applications. The online forums included (we could not limit the age of participants in these groups):

- Howard Forums, www.howardforums.com
- Phone Scoop, www.phonescoop.com
- PDAPhone, www.pdaphonehome.com
- Brighthand, www.brighthand.com
- HTC Forums, www.htcforums.com
- SmartphoneMag, www.smartphonemag.com
- Smartphone Arena, www.smartphonearena.com

The Facebook group was titled "I Want Your Suggestions for Mobile Banking App. Features for Smartphones" (http://www.facebook.com/home.php?#/group.php?gid=48837139183&ref=ts), February 10, 2009. The group had 39 Members limited to people 18 and 30 years old. We received 36 responses from the sources above. We transcribed all the responses and grouped them into different categories.

2. The open ended input was used to construct a closed ended survey which was sent to 550 people which fit the target demographic (we received 70 responses). The target demographic was based on Management Information Systems majors, minors, and alumni that attended Temple University within the last three years. We asked this group to consider fourteen features picked from the functions named by the forum and Facebook group participants and order them from greatest importance to least. The survey participants were also asked to name any other capabilities they would like to see in a banking application.

the accelerometer. Mobile banking applications that leverage these capabilities are starting to appear. For instance, one-touch technology is available in the mobile banking application from Bank of America running on the iPhone, iPod Touch, or the Blackberry Storm.

Available balances can be checked, bills can be paid, funds can be transferred, and ATM locations can be sought via screen touch technology[1].

Aggregation –As indicated earlier, the number one requirement which is not being met by the current generation of mobile banking applications is "*the ability to check account activ-*

1. Some online-based setup may be required beforehand.

ity across multiple institutions." The key here is to not only view account balances across multiple institutions but to aggregate and summarize transactions **by activity** across institutions. Data must be summarized in a variety of ways (i.e. "Today's Transactions", "Snack/Beverage Spending This Week", "Dinning Out This Month", etc.) which provide detailed reports on spending activity and balances over time. This information would be used by customers to help them better manage their spending. This information could be incorporated with a basic budgeting application which would allow the customer to set financial goals and to view spending information before making a purchase. For example, before purchasing a fancy coffee drink at Starbucks or before deciding to have dinner out, a customer could check their "Snack/Beverage Spending This Week" or their "Dinning Out This Month" activity reports and make an educated decision. This data could be integrated with a budgeting application which shows how individual decisions impact savings goals.

> The results of our analysis show that the most popular "gap" is the ability to check account activity across multiple institutions.

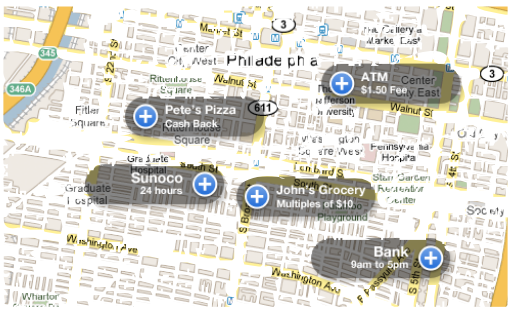
There is clearly demand for this type of aggregation. Web sites like mint.com, purchased in September of 2009 by Intuit for $170 million, offer this type of capability via a web browser. Providing this type of capability should be equally, if not more attractive on the mobile platform, which people will have access to when making spending decisions.

In addition to providing banking customers with added capability that will attract and retain customers, a significant amount of useful marketing data, such as their consumers saving patterns and spending habits, can be collected. Account aggregation allows institutions to track this kind of data. This information can help institutions make better decisions as to what other products to offer their consumers. The tracking of consumers' spending trends will also provide institutions with the data needed to conduct targeted advertising in the future. Access to this information is the lure which will be used to persuade financial institutions to make their invaluable proprietary data available.

Location Based Services - Ranking fifth on a list of fourteen desirable features was an ATM/branch location feature. Users want quick and easy information readily accessible via their mobile device in order for them to make deposits or withdraw cash. We recommend that the developers of mobile banking applications take full advantage of the location based services which are available with the latest generation of mobile devices. Location based services present two very different types of opportunities for financial institutions.

Location based services can provide new or enhanced capabilities to mobile banking customers which can be used to grow their current customer base. For example, while an applica-

tion which allows the user to quickly locate the nearest ATM is nothing new, applications which locate ATMs should be enhanced to provide new capabilities such as showing if a particular ATM is currently working or is currently being serviced, displaying fees associated with each ATM, and displaying any other features/limitations of each ATM (i.e. withdraws only, only withdraws in increments of $20.00, etc.) To increase value-add, users should be able to tag ATM locations with specific details such as ATM fees or hours of operation when not already specified.



But that's not all… – Users are also asking for a variety of miscellaneous features which are not available today including features like integration with desktop applications like "Money" and "Quicken" including the ability to use your phone as a mobile checkbook which can be quickly reconciled with "Money" and "Quicken". Users would like to use their mobile devices as virtual wallets. Again, mobile users are asking for feature parity with online banking websites and the ability to do things like view images of checks, and the ability to communicate with customer service.

The Evolution of Mobile Technology

The last few years have brought dramatic changes to the mobile technology market, blurring the lines between consumer electronic devices by providing phones that can compete with digital cameras, mp3 players and gaming devices all while providing connectivity at increasing speeds. This emerging market has opened the door to possibilities previously unrealized.

For this research, we focused on the three popular smart-phone platforms, the RIM Blackberry, the Apple iPhone and Google's Android, currently available as T-Mobile's G1.

Blackberry

The U.S. accounts for 3 million of the roughly 4 million BlackBerry users globally. There were 500,000 storms sold in Q4 08. The Blackberry SDK is based on Java development. Created as a business platform first, the Blackberry is a leader in productive interface design in a robust but easy to use package.

iPhone

There are roughly 13,250,216 iPhone users in the United States. The iPhone SDK is based on the Objective-C Cocoa Touch framework. The iPhone is responsible for the highest application adoption among users although compared to SDKs like Google's Android, the iPhone is more limited. The iPhone is a leader in media delivery and engaging user interfaces but lacks in business-like features like those in the Blackberry, in particular security. The official statement from RIM indicates (http://na.blackberry.com/eng/ataglance/security/certifications.jsp) *The BlackBerry® Enterprise Solution has been approved for storing and transmitting sensitive data by the North Atlantic Treaty Organization (NATO)* as *well as government organizations in the United States, Canada, the United Kingdom, Austria, Australia and New Zealand.*

Google Android (T-Mobile G1)

Of the three smart-phone platforms researched, the Google android has the most open SDK. It is available for protected by a basic license. The SDK comes in various flavors, including Linux, Windows (Vista and XP), and Mac OS X. In comparison, the SDK for the iPhone is only available for Mac OS X (running 10.5.4 version or later), and only to subscribers of the Apple Developer Connection. The licensing for the iPhone SDK is in the form of a 10-page document.

Google Android is currently available on T-Mobile's G1, and Android's agnostic OS appears to be a promising foundation for other kinds of uses, including a full-fledge operating system for personal computing.

Technical Capabilities

Due to the recent growth in mobile software development, the majority of platforms have well documented SDKs as well as technical specifications provided by their respective manufacturers which have been used to gather information for this document. Additionally, official forums and third party sites have been drawn from to fill in the blanks as needed.

Service Delivery

There are three types of approaches which are used to deliver services to mobile customers, each with their respective pros and cons. In the table on the following page we summarize these approaches as well as the benefits and drawbacks of each approach.

Mobile Platform Options		Benefits	Drawbacks
SMS / MMS	Text messaging in the form of SMS (Short Message Service) and MMS (Multimedia Message Service) is a simple universally accepted form of communication to and from mobile devices.	• Most all devices support SMS and many support MMS. • Devices do not need to be connected to the internet. • Simple to implement universally.	• Most limited feature set. • Cost to end-user varies and can be a deterrent to use. • Security is non-existent.
Browser Based	Browser based applications provide additional security features not available with SMS / MMS and allow you to update the application without significant inconvenience to the end-user.	• Security features not available to SMS / MMS. • Support is for the most part standardized.	• Not all phones have browser support. • Phone-specific features unavailable in browsers.
Native Applications	Most smart-phones feature some form of SDK allowing you to tap into phone-specific features you would normally not be able to take advantage of using the previously described methods, however with these additional capabilities comes additional development overhead and loss of portability.	• Provides the user with richest user interface experience. • Allows access to advanced phone features. • Can provide more options for storage, authentication and security.	• Development can be time-consuming. • Portability decreases with customization and varying development requirements. • Only supported by newer smart-phones.

Table 3: Service Delivery Approaches

Evolution of Capability

The latest generation of mobile technology has shown significant improvement in existing capabilities as well as the introduction of a number of totally new capabilities. These changes in capability from the previous generation to today's represent fertile ground for innovation. Organizations which can leverage these improved and new capabilities to deliver the services which will be demanded by the next generation mobile banking customers will possess a competitive advantage.

The following table highlights the most significant differences in capability between the previous generation of mobile technology and the current generation.

smart-phone platform to the next. Organizations must consider these differences, particularly when leveraging the native capabilities of each platform. Multiple development initiatives may need to be undertaken to deliver a single service to multiple smart-phone platforms. Some capabilities do not exist on all platforms; for example, the iPhone 3G does not support GSM and a number of the Blackberry devices do not support 802.11.

The table on the following page provides a side-by-side comparison of the various smart phone capabilities. As expected, the models from the Blackberry family share a number of common features. This cross-model compatibility is particularly valuable for corporate-wide

New-to-old Capabilities Comparison Matrix		
	Previous Generation	**Current Generation**
Location Services	Limited	Extensive
Media Playback	Limited	Extensive support, many formats
Accelerometer	No	Some newer phones
Graphics Acceleration	No	Far improved specifically OpenGL ES
Networking support	Limited, expensive and slow	Fast, extensive, peer-to-peer
Touch Screen	Limited	Extensive
Cameras	Poor	Higher quality, video support.

Table 4: Next Generation Capability Differences

Capability by Smart-Phone Platform

Just as capabilities vary from one generation of smart-phone to the next, capabilities and technologies vary from one current generation deployments of smart phones. A different SDK is used for each of the brands which adds a layer of complexity for developers who want to release their applications under different platforms.

That said, except for the iPhone, all of the other phones support Java which provides for some level of application portability. Similarly, the different brands support different browsers, although the models of the Blackberry all share the same kind.

Common Smart Phone Capabilities Map					
	iPhone 3G	**Blackberry 8800**	**Blackberry Bold (9000)**	**Blackberry Storm**	**T-Mobile G1**
Operating System	OSX	RIM OS 4.0	RIM OS 4.0	RIM OS 4.0	Android
Java Virtual Machine	Not Supported	RIM JVM 4.7	RIM JVM 4.7	RIM JVM 4.7	JVM
SDK	Cocoa Touch	Blackberry MDS	Blackberry MDS	Blackberry MDS	Android SDK
Development Language	Objective-C. C, C++	Java	Java	Java	Java
WiFi	802.11 a/b/g	None	802.11 a/b/g	None	802.11 a/b/g
Interface	USB, Bluetooth	USB, Bluetooth	USB, Bluetooth	USB, Bluetooth	USB, Bluetooth
Networking Capabilities	EDGE, 3G	GSM, EDGE, 3G	GSM, EDGE, 3G	GSM, EDGE, 3G	GSM, EDGE, 3G
Resolution	320x400	320x240	480x320	460x480	320x480
Browser	Safari	RIM Browser	RIM Browser	RIM Browser	Android
Javascript Support	Yes	Yes	Yes	Yes	Yes
Camera	1.2MP	Varies	3.0MP	3.2MP	3.2MP
Video	No	No	Yes	Yes	Yes
Location Services	Yes	Yes	Yes	Yes	Yes
Expandability	No	Micro-SD	Micro-SD	Micro-SD	Micro-SD
Keyboard	On-Screen	Qwerty	Qwerty	On-Screen	Qwerty

Table 5: Common Capabilities

Mapping the Gaps to Capabilities

The intersection between the needs and desires of millennials and the next generation of mobile technology provides fertile ground for innovation and the creation of competitive advantage. New capabilities such as increased bandwidth, improved user interfaces, and location-based services are required to deliver the desired features. The previous generation of technology simply cannot meet these requirements.

All of the smart-phones evaluated have the basic capability needed to deliver the next generation of applications. However, some of these devices provide more appropriate platforms than others. In this section, we discuss the ability of each smart-phone to deliver the desired capability.

Capability Delivery Map					
	iPhone 3G	**Blackberry 8800**	**Blackberry Bold (9000)**	**Blackberry Storm**	**T-Mobile G1**
Where's it all at…at a glance	High	Low	Medium	High	Medium
User Interface	High	Low	Medium	Medium	Medium
Aggregation	High	Low	Medium	High	Medium
Location Based Services	High	High	High	High	High

Table 6: Capability Delivery Map

Where's it all at…at a glance and Aggregation – While all of the smart-phones we looked at have the basic capability to deliver on each of these two requirements, the ability to effectively deliver this type of information is greatly constrained by the size of and resolution of the display. It is simply a question of available real estate. The Blackberry 8800 scored very low due to the display resolution. On the other hand, the Blackberry Storm scored very high in this area due to the size and resolution of the display. The Apple iPhone also scored very well. While the resolution of the iPhone is slightly less than the Blackberry Storm, the user interface capability is a major factor when it comes to delivering these types of capabilities. This is an area where the iPhone truly shines.

User Interface – Even with the lack of some of the more business-like features, particularly security related, when compared to the Blackberry, the iPhone is the undisputed leader in media delivery and applications with engaging user interfaces. This is apparent to anyone who spends just a few minutes browsing Apple's iTunes store. From the touch screen utilization to leveraging the accelerometers and location based services, no other platform can compete with the iPhone when it comes to providing the breadth or depth of engaging applications.

Location Based Services – All of the smart-phones evaluated have comparable capabilities when it comes to location based services. One platform does not appear to stand out among

the others. The key lesson here is that, while location-based services were either primitive or non-existent on the previous generation of devices, the current generation of smart-phones all have the capability to support feature rich applications which take advantage of location-based services.

Implications and Recommendations

Implementing aggregation capabilities presents a variety of challenges. From a technology perspective, financial institutions will need to agree to make this information available in a secure manner using industry standards, some of which may yet need to be developed. The most significant challenges have nothing to do with technology. Rather, they have to do with persuading financial institutions, to share their data, a potentially priceless asset, as a commodity. Financial institutions will not commoditize these assets unless the benefit to them is clear.

Financial institutions should also look at creating new revenue streams from data collected from applications that utilize location based services. For example, in addition to providing the location of the nearest ATMs, the physical location of the customer who is searching for an ATM should be reported to the financial institution. Data regarding where customers are when they are searching for ATMs could be marketed to organizations which deploy ATMs.

For three of the four key user requirements for smart phones, the size, resolution, and the user interface capability are key. As such, the Apple iPhone should be seriously considered as the ideal platform for exploring new capability. Combine this with the current installed base of iPhones and the argument becomes even more compelling. One arguably significant downside to this approach is the proprietary nature of the iPhone platform. Not only is it proprietary, but the basic paradigm for designing applications for the iPhone is radically different than the development paradigm for the other smart-phone platforms. Multiple, very diverse development efforts will need to be undertaken to develop applications for the iPhone and any other smart-phone platform. In contrast, the differences between the various Blackberry platforms and the open-source Android platform are limited and a single development effort could yield applications which run on all of these platforms.

Conclusions

Organizations should not underestimate the importance of and the potential impact of mobile banking. Organizations which can anticipate and position themselves for changes in the demand for mobile banking and the changes in the types of services offered through this channel will have clear advantages. Of the capabilities of modern smart-phones, the increased connectivity through 3G, peer-to-peer communications and Wi-Fi combined with location-based services provide the most interesting options for mobile banking. Additionally, user interface advancements such as accelerometers and touch screens provide a richer experience,

which can increase the usability and effectiveness of applications across the board. Organizations must leverage these new and improved capabilities to create the applications which will be in demand by the next generation mobile banking customer.

There are still some gaps between online banking and mobile banking. As seen in this study, the online banking user community would like to have access to all the online banking features they are familiar with under the mobile banking platform. In addition, users of mobile banking hope to enjoy other benefits specific to the mobile platform such as location-awareness, and anytime / anywhere access. While there is usually limited compatibility among brands, the availability of SDKs offers the potential for the development of all sorts of enhancements and new features is virtually unlimited.

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Appendix – Market Research

In this section we report the raw data which has been collected from the various forums, discussion groups, and surveys. In addition, we include the original questions posted to these groups.

"Call to action" Used for Market Research in Forums and Facebook Group:

I am a Management Information Systems major at a Philadelphia university and am in my final semester of my Senior year. My capstone project has to do with creating a mobile banking application for smart phones. One member of our three-person team is actually being trained by his employer to program applications for iPhones, and I and the third member are avid BlackBerry users. My question to all of you is- what would you like from a mobile banking application? For example- you'd obviously want to be able to check your balance... but what else? Any suggestions-no matter how tame or how outlandish are welcomed. This is part of the "market research" portion of the project.

Thanks in advance!!!

Verbatim Responses to Online Smartphone Forums Postings

Howard Forums

- **transfer money** to other accounts and other member accounts. Wire Money to other banks?? first things that came to me. ionoe.
- BofA's mobile banking is the only one I've used so far, but I would like bigger buttons to click on for the screen. And my biggest pet peave, is that their regular website shows my withdrawls/ deposits with a balance next to it, but the mobile one only shows the amount I spend/deposit with no inline balance. I don't know if that made sense so I mean
  Groceries -$80 Balance: 1020.00
  Gas -$40 Balance: 1100.00
  etc...
  One other nice feature, would be that instead of having to type in my password, if I could do some sort of slide to access account feature (like when you unlock your G1!).
  That'd just be cool!
  I would also like it to link to my Investment accounts (and actually be able to use that on my mobile would be great as well).
  Well, hope this helps somewhat...
- being able to access the transactions menus. Like show what and when has been deposited, what and when has been withdrawn, where payments have gone to, stuff like that.
  And being able to access transactions from at least a month before is really nice too. For screen **real estate** tho, I'd keep those in seperate links. Like "todays transactions", weekly transactions, monthly transactions.
  make it so that the system can "remember" more than one device. Like with bank midwest, if I set it to "remember me on this **computer**" it will NOT let me log in from another computer, or device. Saves it as a failed attempt to log in. And after two of those, you have to call **customer service** to get the online access restored to the account. Very nice for security reasons, but bloody annoying too.
  Better **online security** than just a password. I kinda like that suggestion about having to tap certain areas in a sequence like you have to do on the G1 to unlock it. Or maybe even something like several pictures or icons that you have to set a sequence for. Because honestly, keeping the account password on your **phone** is just bloody stupid. These things get lost or stolen all the time. No sense giving the thief access to your bank account, as well as to your phone.
- I would love to see something I can use with my SunTrust account. Everything always involves BOA! lol! But with my suntrust account online I am able to transfer money between my savings and **checking account** as well as my brother's because he had to make an account with me as a co-signer due to him being undeage. Something like that would be great. The ability to check your account balance is, of course, a given.
- I would really like an app like Money or quicken that you track your register with but can reconcile with your mobile banking site. It could be an integration of a register to track your spending,

but instead of having to deal with receipts, it will connect and download into your register and you can manually reconcile and add an expense category so you can track budgetary items.
By default you have a cash account.
You can add checking, savings, **money market** accounts.
You can merge your accounts with their **online banking** info.
I know these suggestions go beyond what Online Banking does, but Online Banking apps are usually offered by the bank themselves or a specific bank app and not universal. If you're going to go universal support, might as well add registry support too!!! haha Yes I'm a dreamer!

- **Transfer funds** from accounts. And maybe a detailed report of your spending.
- maybe Im simple minded but the only thing I want to do on my **phone** is check account balances.
  There is a very small chance that I might use to to **pay bills** or review previous transactions but account balances are the key.
  not sure how it would work but an view account balances **only** with less security IE me not having to type information, would be better to me then more features but I have to enter my information for security.
- Work with ANY bank...
- Check balances, transfer funds to/from accounts and pay bills.
- This is probably obvious, but the absolute most important thing is some strong well implemented open-source type encryption. SSL with a proper cert to the bank is a must at the very least.
  If the bank's API supports something better like a proper pub/priv RSA key, with AES-256 use it and be clear to the users about what you are using.
  As far as features the you'd want the same things you'd want in any online banking. Ability to see balances, **transfer money** between accounts and to/from your visa if supported. Ability to see a history of transactions for each account. Ability to see **bills online** if your bank supports it, and remind you if they are coming due. Then pay them. Perhaps integrate paypal in someway to quickly send money to a buddy if he wants it. Logging into any **online banking** site should be enough to show you what would be desired, they will put the most used functions out in front.
  EDIT: Do NOT allow your users to save both username and banking password or the bank will have your *** (and putting yourself out there for litigation if people lose their phone and consequently their money).
- I think the last post nails it for me. I would also like the ability to sync with my **desktop** banking **software**.
- This is where programs like pageonce and mint come in. They're read-only methods to your accounts. Just for the fact that I could lose my phone and give away access to my accounts, I don't ever want write access to any of my bank accounts on my phone.
- Well, I have Pageonce, Chase, and Mobile Banking and they're all good. Balances, transfers, **pay bill.** Only thing I would like is **microsoft** money on Iphone.
  Other than that I think the new thing will be RFID/contactless payments like Japan and Korea have been using for over 4 yrs now.
- use the BofA app for most everyday banking, checking balances, paying bills, etc. It works perfectly.
- I would like the ability to move money from one account to the other, along with possibly online bill pay.
- second the moving money from one acct to another. Possibly the feature for it to notify you of transactions as they happen...might be good just to monitor your acct more actively.....??
- Have you looked at Pageonce?
- How safe is it?
- FYI- not sure if it helps PNC offers a Mobile Banking App (could be cleaned up a little bit, but otherwise good basic feature sets) Not sure whose it is but it does work well on the BB.. Perhaps you could look at that as a basis?
- I'd like it to be secure as fort knox
- Definitely transfer among accounts (internal & external), bill pay, view images of checks, **communicate** with **customer service**, locate branches/ATM's, order checks, report lost/stolen cards.

Phonescoop

- -Multiple accounts, with RSS type updates, although I would settle for having to hit an "update" button.
  -Ability to transfer money
  -Credit Card info support as well
  -Small file size, especially for the BB crowd
- One that works- simply that it works. Little to no noticeable load time. Cut out the excess junk and make it elegant and easy to see/use on a small screen. Cut out the fancy programming and make it something a phone browser will read.
  Half my banking sites take forever to load and are too jumbled on their regular site on my home computer. I shudder to think what their mobile versions look like.
- Minimalism is really ideal for banking sites for me.
- My credit union has mobile banking, the only thing missing is a view of my accounts activity. so i can transfer from account to account, view my current balance available vs total (pending trans) and of course this availabe 24/7.
  when i had chase bank it had text to phone info but no wap/ mobile banking site and i would see it not useful at all for the reason that even if i did transfer monies, it was not available for immediate use.
  so the reason i stay with my credit union is immediate acces to what ever i deposited the same minute, only one time overdraft fee nor none of this a week later and get smacked with another "fee" (you been overdraft for 14 days), or fees for balance under a set amount, no mothly maintenance fee (which i think most banks no longer charge). i'm happy with them.
- balance, activity, the ability to make transfers between accounts, and bill pay.
- i have a credit union that lets me do all that BUT activity, which i would love to have. plus i like that fact that for transfers into checkings my balance is available for immediate use. which i found out that at least bank of america does not have.
- Check ordering, ability to change/update your address, starting a loan.

PDAPhoneHome

- How about the ability to transfer funds between accounts?
- I got a few for you. Currently my bank (chase) only allows the viewing of your balance and a few links to transfer money/pay bills (from what i've seen of the site so far).
  I would like to be able to view transaction history, send/receive secure messages, transfer money, maybe view interest rates and other valuable account information.
  Are you building a website or would it be a downloadable application? I think a download would be cooler - i could also have it synchronize history at certain times (encrypt the data of course) and that would allow me to view everything 'offline.' maybe a history of monthly account balances on a graph or something would be nice too. real time alerts to the application (outside of your public email system) would be great.
  hope this helps. and i hope you make it so i can buy it
- how would you go about getting it to communicate with different banks (example - it's a third party application tapping into a private banking system)?
  and I thought of something else just now - account aggregation. multiple accounts with different banks. if you could make them display together (example orange savings with wachovia checking and chase credit or something).
  can you make it display 10x the amount of money i actually have so i can impress friends? ok, just kidding.
- Don't reinvent the wheel. The best banking application would be a mobile version of Quicken or Microsoft Money for the **iPhone**.
  If you could get a national standard of banks automatically **emailing** some form of an encrypted OFX file, daily, for a patron's account activity(obviously the patron would sign up for this service) to a designated storage area or cloud on the internet. This storage area would then have all your relevant OFX files for each of you checking, savings, credit cards, loan accounts etc. The bank that you have your primary checking account would offer a service that allows you to

access all these OFX files under one **software** umbrella.

Now a mobile Quicken and/or Microsoft Money version for the **iPhone** would simply tap into the OFX storage area via wifi or 3g and do a one step update/sync of all your pertinent account information, as well as send instructions for bill payment, funds transfers, electronic checks, etc.

It would operate like this....your primary checking account for ABC Bank would offer a service to access an OFX storage area. On your **iPhone** you press "sync" in your financial application, which is linked to ABC Bank, and the software fetches your Citbank OFX file, your AMex OFX file, etc, and of course your ABC Bank checking OFX file, processes them and updates the **iPhone** and your financial software.

At this point you would have all the information you would need to pay bills online and send money, all on your **iPhone**, and of course a PC or Mac synced version as well.

Do that and you have yourself a winner. National banking standards are important and you have to share the standards or else nobody will adopt them and you will have Lotus versus Outlook, versus Google all over again.

- - Check balances of accounts (including a list of pending items that are going to clear that night, etc)

  - Transfer funds between accounts

  - E-Bill payment ! (this is a good one)
- Now that riley mentions it, Quicken compatibility would be awesome.

  Back in my **Palm** III days, I believe, I used Landware's PocketQuicken to make entries on my **Palm** and then sync them with Quicken on my Mac. Unfortunately, when I switched to an iPaq (**PocketPC** device), the compatible version of PocketQuicken would only sync to Quicken on a PC (I guess the folks at Landware assumed that all **PocketPC** users were also PC users--majorly wrong assumption).

  I would gladly pay $30 or so for a version of PocketQuicken (or the equivalent) that would allow me to enter data on my **iPhone** and then sync it to Quicken for Mac. I'd imagine a lot of Windows users also would pay to be able to use PocketQuicken for **iPhone** but to be able to sync data with Quicken for Windows. Hmmmm.....

time to go check out Landware's site to see if they have any plans.
- Landware's software was ok. I owned a copy for my **PocketPC** but inputting the data was not at all user friendly, nor was it practical. I have been doing quality control on my bank accounts for 4-5 years now and I have yet to have a charge show up that I did not make, and when i reconcile the charges always add up with my receipts. My point is that we are beyond entering in purchases/transactions made with your atm or visa card. What we should be doing with the **iPhone** is approving daily OFX files as they come in, just like you check email. Hit a button, review your financial transactions from the previous day, accept all transactions after you quickly review them or reject a transaction here and there. This type of feature would allow you to reconcile your accounts very easily at the end of the month, and you would need to enter in only a small handful of transactions.

Brighthand

- How about doing it from an application created from the purpose, but underworking the communications to the bank through SMS. A feature I once thought would work is that it established a 3 SMS visit to solve any transaction. Or this kind of mechanics in which you type #*191* or something similar to get into some menu; the latter may be better that the SMS for the reason that it doesn't store any sensitive data easy to retrieve by fiendish hands, and it may easily include an "erasing" command and timeout commands. Another point in favor of the #*191* or similar, menu, is that only significant data may be sent and whether charged or not, the bank is not establishing a heavy connection for lots of users, but only those that span options that do involve a transaction. Oh, another thing in favor of this option is that you can establish it so it works "in the phone side" of a device, regardless of platform. For instance, this very option of course was not my inception, and my carrier uses it as its online services gateway; so, whether you use a smartphone, a feature phone, or a dumbphone, you can use it to buy OTA credit, or ringtones, or check on your airtime credit, etc.

HTC forums

- The ability to transfer, both to and from accounts within the same bank and perhaps other accounts outside the bank. The current one (Mobile Banking) does this only within the institution, there is no capability to make transfers to other institutions.
  2) List pending transactions. Only cleared transactions are shown in the current application.
  3) The ability to submit loan applications and make payments from the device. Bill Pay features may also help.
  4) Include major credit card institutions to easily make payments on the device.
  5) Statement copies easily uploaded in pdf format.
  6) Graphs to show investments, savings, checking, etc Most times, looking at one may help with the big picture rather then seeing a balance number.
  This is my wish list so far, but not holding my breath for these features to come out anytime soon though! LOL
- I would like it to function as a mobile checkbook register so I can enter my purchases as I'm making them on the fly. I would also like it to be compatible with my Quicken Deluxe on my home PC. If it could do that I wouldn't need things like graphs & charts on the app as I could get that when at my PC.

Verbatim Responses to Zoomerang Survey

- A "Virtual Wallet" type feature that allows you to set aside money for bills, vacations, and then see how much is left aa spending money. "Virtual wallet" is a service offered by PNC - I don't know too much about it, but if you check it online, it might give you some good information.
- Ability to interface to financial software application like Quicken
- fingerprint reader, retinal scan, live transaction updates....good luck guys. Personally as u could guess i do not trust the mobile tech yet to have my $ transactions go through. .. as i am typing this on my G1 :) this thing cashes every password there is unless u tell it not to...and since the browser is not windows based i was able to get into email clients without having to enter password at all...say hello to Munir
- Automatic Transfers; Creating "wishlist" to save money for showing a percent of money saved
- Ability to open an account, i.e: CD account.
- Offline access
- Question 8 * Make radio-frequency identification(RFID)/contactless payments through application is a little unclear, just an FYI.
- Abiltiy to pay accounts via mobile application
- ability to change username and password through the interface
- Seamless bank-to-bank transfers w/ a common interface.
- Application should be able to update itself over the air. Clients should be made aware of updates, security fixes, and patches as soon as they are made available.
- The ability to check the institutions interest rates on CDs/Money Market accounts. What types of CDs would be available. Maybe something in Investments?
- Ability to cancel a transaction, stop a payment or history of logins and their times.

Common Features of Online Banking Solutions

- Electronic bill presentment and payment
- Funds transfer between a customer's personal checking and savings account
- Funds transfer from one to another customer's account
- Investment sale or purchase
- Loan transactions and applications, such as repayments
- View bank statements
- Apply for a new loan
- Apply for a new account
- Support of multiple users having varying levels of authority
- Transactional approval process
- Wire transfer
- Personal financial management support, for example- the ability to import data into personal accounting software
- Account aggregation among banks

- -According to Wikipedia's "Online Banking" article: http://en.wikipedia.org/wiki/Online_banking

Common Features of Mobile Banking Solutions

Account Information

- Mini-statements and checking of account history
- Alerts on account activity or passing of set thresholds
- Monitoring of term deposits
- Access to loan statements
- Access to card statements
- Mutual funds / equity statements
- Insurance policy management
- Pension plan management
- Status on check, stop payment on check
- Ordering check books
- Balance checking in the account
- Recent transactions
- Due date of payment (functionality for stop, change and deleting of payments)
- PIN provision, Change of PIN and reminder over the Internet
- Blocking of (lost, stolen) cards

Payments, Deposits, Withdrawals, and Transfers

- Domestic and international fund transfers
- Micro-payment handling
- Mobile recharging
- Commercial payment processing
- Bill payment processing
- Peer to Peer payments
- Withdrawal at banking agent
- Deposit at banking agent

Category	Features
ACCOUNT MANAGEMENT	• Show individual deposits/withdraws with corresponding balance after the transaction is made (as does online banking sites) • Manage investment accounts • Show individual transactions • History of transactions (last 30 days, etc.) • Ability to check balances of all accounts across multiple banks • Real-time account activity alerts • Real-time credit card activity • Ability to update address • Alert if balance drops below a certain amount • Alert when money is deposited into accounts • Bill-pay reminder feature
TRANSACTIONS	• Transfer money to other accounts (within same bank) • Transfer money to other accounts (w/ in same bank and among different institutions) • Bill-pay feature • Ability to request loan information • List pending transactions • Submit loan applications from the device • Function as a mobile checkbook register to enable recording of purchases
USER INTERFACE	• Larger buttons to click on/ease of use of application interface • Slide or tap-to-access feature instead of password to access app • Pictures/Icons in sequence instead of a password • Button/Interface to report credit/debit cards/checks lost/stolen • Update button to show recent transactions • Button to "hold" all account activity • "Skins" to customize screens

SECURITY	• Allow memory from more than one device (in case you lose your phone, or if settings on a home computer say "Remember this computer"-- so it's still accessible from the mobile device etc.) • Don't allow "saving" of username/password • Send and receive secure messages to/from bank
AGGREGATION	• Have different screens for "today's" transactions, "weekly" transactions, "monthly" transactions • Detailed Report of spending • Graph feature to show investments/savings/checking, etc. • "Net worth" function from aggregated balances of accounts
MISCELLANEOUS	• Application like "Money" or "Quicken" that allows you to track your cash register that will reconcile with mobile banking site • Integrate with PayPal • Sync with desktop banking software • RFID/contactless pay • View images of checks (as online sites allow) • Communication with customer service • ATM & Branch location feature • Ability to order checks using application • Exchange rate information feature • View current and historical interest rates

Table X: Results of open-ended market research

Mobile Banking Technologies

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Business Week, *Mobile Banking Set to Boom, http://www.businessweek.com/globalbiz/content/jun2008/gb20080618_147746.htm?campaign_id=rss_daily, 2009*

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