



# wireless-i banco

Technical Whitepaper



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# Chapter 1

## Overview

The wireless market has been one of the fastest growing and most interesting markets in the world over the last years. It is still growing at a rapid pace, a recent study done by In- Stat/MDR claims that the number of mobile subscribers worldwide will reach 2 billion before the end of 2007. Mobile users have just started to fully utilize the data capabilities in their mobile phones.

This opens up huge possibilities for financial institutions interested in offering value added services to increase their efficiency, by giving their customers the possibility to get banking tasks done using mobile phones giving a competitive advantage over their competitors. According to the German mobile operator Mobilcom, mobile banking is going to be the killer application for the next generation of mobile technology.

But why wait until 3G is realized? There are several technical challenges in the existing technology that makes it hard to make an outstanding mobile banking application. These challenges include:

1. Multiple bank support
2. Multi device support
3. Security
4. Multi platform support
5. Making resource effective applications
6. Scalability and reliability

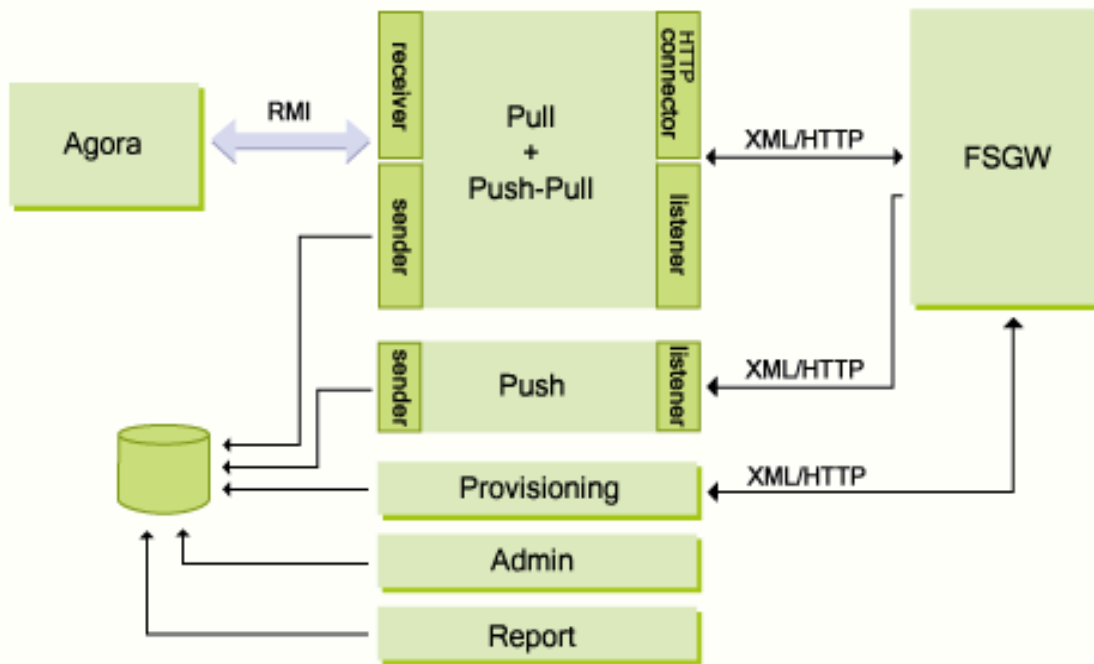
**wireless-i banco** addresses and solves all these challenges. **banco** supports multiple banks, multiple devices, and has a high degree of security. It can also be run on several different platforms without consuming all available IT resources in your company and is highly scalable and stable.

**wireless-i banco** has an extensive administration module which allows the bank to customize and configure through a user friendly graphical user interface. The report module is a valuable tool for any bank that wishes to have control over its customers

and financial flow. The provisioning module allows the bank to securely and quickly add new customers.

The features available to the bank customers include fund transfer, account balance inquiry, account statement, cheque book requests, cheque status request, alerts, utility bill payment, credit card bill payment etc.

## Chapter 2



## System Architecture

This is a graphical demonstration of the architecture of wireless-i banco. It shows how the different components come together to provide a complete solution for mobile banking. Agora is a service delivery platform provided by the Irish company Network365. It delivers SMS connectivity by providing message queuing, routing, persistence, logging, etc. It also handles a variety of messaging protocols and the connection set-ups between the applications, messaging servers or mail servers. Agora is the link between the bank's system and the user's mobile phones. Agora is connected to the Pull and Push-Pull module. They are connected using RMI (Remote Method of Invocation). The Pull and Push-Pull module is also connected to the Financial Gateway (FSGW), which is the bank's system or the bank server. This backend connection can be done using any kind of protocol. It can also integrate with any kind of bank server.

The Financial Gateway is also connected to the Push module, situated under the Pull and Push-Pull module in the diagram. This is an independent module, pushing data to the users. To do that, it accesses the database shown on the left hand side of the diagram. Provisioning, Admin and Report modules are also all connected to this database. Provisioning module allows the bank to add new user accounts. Admin module is where the administrator can configure and customize the system to his/her liking. The Report module supplies the bank with a large array of reports and inquires.

## Chapter 3

# Mobile banking today, developments and Challenges

The challenges involved in making an outstanding mobile banking application are as follows;

1. Multiple bank support
2. Multi device support
3. Security
4. Multiplatform support
5. Making resource effective applications
6. Scalability and reliability

### 1. Multiple bank support

Banks need a mobile technology system that supports the most widely-used data transfer protocols to facilitate their mobile banking service offerings. The ability for a mobile banking system to be able to serve several different banks is an important one. A group of banks may want to coordinate their wireless efforts, or decide for a mobile banking solution. Unfortunately, this is made difficult by the fact that they all use different protocols.

One of the banks may use a XML and HTTP protocol. That wouldn't be compatible with the rest of the banks, since they might be using SOAP, a bank proprietary protocol, XML over TCP-IP or direct database accessing. All these different protocols make it near to impossible in integrating all the systems into one solution.

### 2. Multi device support

Today, there is vast number of different mobile devices in circulation. The fact that mobile users have different mobile phones and devices, make it very hard to construct a system that supports all the different standards. Adapting and testing

your product on one device does not guarantee that it will work on another. Banks need access to mobile technology that supports all existing devices and is “future-proof” for all upcoming devices.

Some phones support the new technology J2ME, and some support only SMS. Others again may have a WAP browser on the phone and someone just have an old mobile phone that doesn't even support SMS. Some users even have PocketPCs. PocketPCs have large color screens with point and click functionality, making them a breed apart from other mobile devices.

As if that wasn't enough, there are different Operating Systems in the market: Windows CE, Symbian and Linux to mention some. This makes it even more complicated. There are also different networks that the mobile banking application has to support, such as CDMA, TDMA and GSM

All these differences pose challenges to system developers: how to offer a service that the consumers can use? Some suppliers have restricted access to their services to one or two handsets. This is a pragmatic approach, but to get more consumers using these services, that's what banks have had to do

### 3. Security

Mobile telephony understandably creates the fear of someone hacking in and listening or stealing data. The data is sort of “flying through the air” and it feels very vulnerable. Although it's now possible to buy goods and conduct several financial transactions via your phone, not many people are taking the full potential out of their phones.

At the current time people who understand both wireless and security are thin on the ground and you would be well advised to consider external specialist help before you declare your wireless application to be fully security tested.

Today, even wired internet security is still a developing area. The security in the wireless world is still very much an unsolved issue. Especially so because there are so many different mobile devices in use. It is hard to find a secure way of conducting transactions that works on all the different models of all the different producers. Any security failure will certainly have a devastating effect on the customers trust in both your mobile banking solution but also in your whole operation

## 4. Multiplatform support

There are several different platforms in the market on which a mobile banking application can be run. Supporting different server systems can be a problem. Some use one of Microsoft's products, some use Linux and some use Solaris. This makes administration of the mobile banking system very hard, you have to adapt the product to the customer's OS, or even worse, the other way around.

## 5. Resource use

These kinds of applications are generally very tough on the company's IT resources. They require heavy computing power and expensive investments. The fewer internal resources required the better. A mobile technology system that integrates with existing business systems, handles multiple device protocols, data transfer protocols, has a simple administrative interface and round-the-clock live support will allow the company IT staff to focus mainly on the company needs, not the consumer needs.

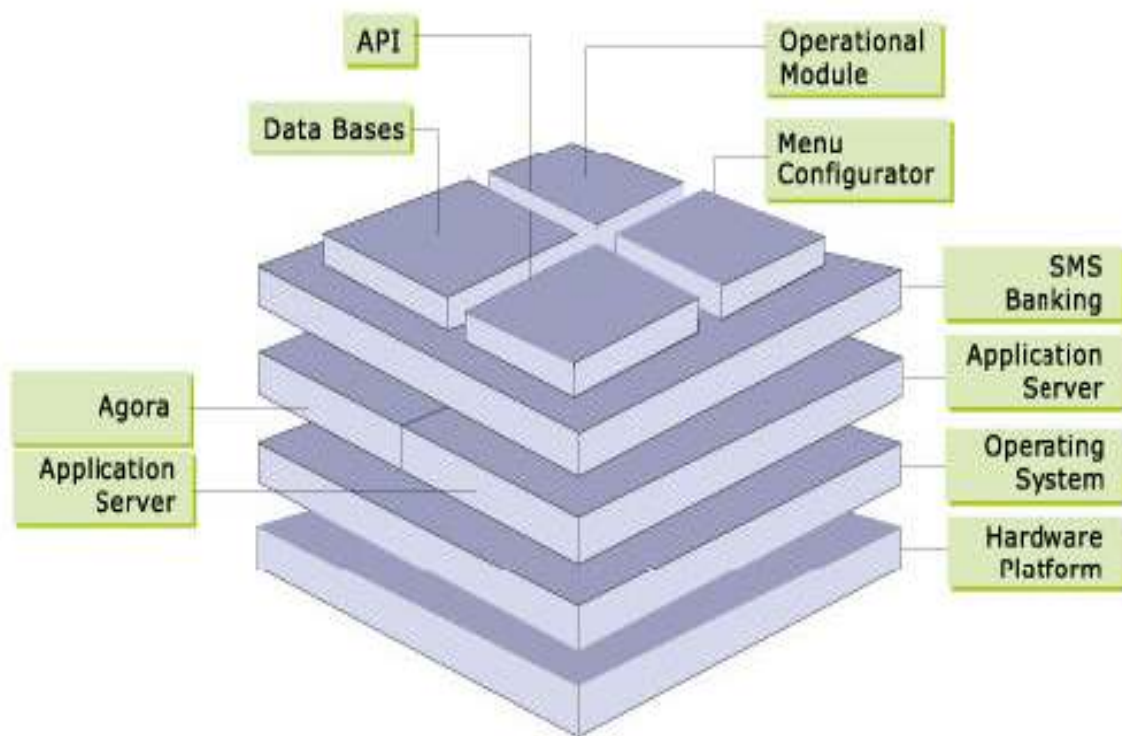
## 6. Scalability and reliability

One big challenge for system developers of these kinds of applications is how to scale the system up to be able to handle bigger amounts of data. What if the bank's new mobile banking strategy pays off and attracts new customers? How will the system cope with all this new traffic? If it can't handle the bigger workload, the investment in the system will have been for nothing. Customers will lose confidence in the bank and the mobile solution, and take their business elsewhere.

In this kind of business the application is time and mission critical. There should be absolutely no down time, the customers should be able to trust the system. This is because banking is very important for the customers. If the system is down, they can't get their business done. If their bills don't get paid on time or if the vital information didn't reach them on time, the consequences can be big for them. Reliability and scalability are thus two very important points for any bank with mobile ambitions.

## Chapter 4

# Meeting the challenges of mobile banking



**wireless-i banco** is made to liberate bank customers from the stress of going to the bank to get their daily needs done. They can now use SMS, WAP, J2ME, PocketPC or IVR to do it. The system uses a SUN J2ME framework, and is developed using JAVA.

**wireless-i banco** solves the technological challenges in making mobile banking applications. It is constructed to support multiple banks, multiple devices, and multiple platforms, has a high level of security, is resource effective and is stable and scalable.

## 1. Supports multiple banks

The administrator's module allows for several banks to be serviced within the same system. Banking integration is made easy with the simple GUI provided in the admin guide. Adding banks is an easy process. The same can be said about modifying banks. Alerts, menus, commands, account codes, billing details and alerts can be changed by a few simple operations in the GUI.

This is possible because **wireless-i banco** supports all protocols that the different banks could use. That allows them to be connected in one system. The banco server uses API (application programming interface) together with connectors to integrate with banks using different protocols. This way a bank using SOAP and a bank using XML / HTTP can be served by the same system.

## 2. Multi device support

**wireless-i banco** supports most mobile devices available today. If the user has a mobile phone, he can use the IVR (Interactive Voice Response) function to communicate with the bank. SMS, WAP, J2ME or even PocketPCs is supported by the system.

The problem with different networks and different operation systems is also eliminated by **wireless-i banco**. Windows CE, Linux, Symbian as well as CDMA, TDMA and GSM is supported. This way the mobile banking solution can be utilized everywhere by everyone.

## 3. Security

The problem with poor security is also solved by **wireless-i banco**. By using different encryption and security technologies, all different aspects of mobile bank security are taken care of.

The SSL (Secure Sockets Layer) technology is being used to handle security on Internet and PocketPC. For J2ME KSSL is being used. For the bank connection we use SSL / VPN (Virtual Private Network). Triple DES Encryption is being used for database storage. WTLS makes transactions made via WAP secure.

In addition to all these technologies, normal security features such as username, password and PIN authentication is being used to make the system unbreakable.

## 4. Multi platform support

**wireless-i banco** is platform agnostic, any platform can be used. It is designed to be used on all windows versions, Linux and Solaris. This solves the problem that the multitude of different operating systems poses.

## 5. Resources

**wireless-i banco** can be deployed on any fairly modern computer. It doesn't require tough hardware specifications. This limits the strain on the bank's limited IT resources, and helps keep costs down.

## 6. Scalability and reliability

The big problems that arises with regards to reliability and scalability is solved by **wireless-i banco**. By using load clustering the data transfer capability of the system is made dramatically higher than it would have been without. Load balancing routes the traffic to where there is available capacity, helping to reduce the load caused by peaks in traffic.

Clustering reduces the critical downtime of the system. By having redundant servers in back up, one can always guard oneself against the dreaded down time that strikes so often. If one server crashes, the other one takes over. This is extremely important since the nature of this application is time and mission critical.

**wireless-i banco** also uses a multi threaded system for reducing the waiting time of each customer. All the customers are run parallel, ensuring that nobody have to wait too long for service.

All these features allow **wireless-i banco** to process huge amounts of data. In one month over 95 million messages can be processed (37 / sec). That allows the bank to handle huge amounts of customers without reducing the quality of the service.

## Chapter 5

### Features

**wireless-i banco** is a complete and comprehensive mobile banking solution, and is packed with features

- Supports WAP, J2ME, SMS, IVR and PocketPC
- Secure Corporate Fund Transfer solution
- Extensive Bank Management Module
- Administrator's module
- Provisioning Module
- Report module
- Real time alerts:
  - Alerts sent to customer based on customer defined criteria
- Batch alerts:
  - Alerts sent to customer periodically
- Push/pull transactions:
  - Bank initiated bill payment / credit card payment
- End User Features include:
  - Fund transfers between own accounts and from your account to other accounts
  - Account balance inquiries
  - Account statement requests
  - Check book requests
  - Check realization/status requests
  - Check realization cancellation
  - Mini statement
  - Bill payments
  - Credit card payments

## Chapter 6

### Deployment

The installation procedure of **wireless-i banco** is fast and hassle free. If there already exist a connection between the mobile operator and the bank, the deployment can be finished within 48 hours. If this connection is not present, some additional time must be allowed for the installation crew.

There will be 2 specialized engineers available on-site for the deployment.

There are some minimum requirements for the installation of **banco**. There should be available a Database Server and an Application Server. The OS can be either Windows, Linux or Solaris. The database should be either Oracle 8i or a SQL Server.

### Support

The support given by hSenid staff will be given on a 24 hours, 7 days a week basis. There will always be at least one of the specialized engineers on call to answer and solve all problems that might arise.

First, the support will be given over e-mail. If the problem can't be solved using mail, telephone will be used for communication. If the problem is that severe that a phone call will not solve it, on-site support will be given to accommodate the customer's needs.

## Chapter 7

### Conclusion

**wireless-i banco** addresses all the key challenges in the mobile banking industry today. The application can be run on all platforms, mobile devices and networks. It is even possible to manage several banks with **wireless-i banco**. It is a powerful tool for lowering operating costs and adding value to your banking services. By offering the customers the ability to transfer money, check account balance, review check status and much more by just using their mobile phones, any bank would gain a substantial competitive advantage.