



Mobile Financial Services: The internet isn't the only digital channel to consumers

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Across Europe as a whole, mobile phone penetration is now around 25% (ranging from the low teens in Belgium to more than half the population in Finland). Pre-paid packages were the catalyst for record sales for all four UK mobile network operators in the final quarter of 1998. Vodafone, for example, added 933K new customers in this time (of which 755K were pre-paid) and connected its 5 millionth customer on 15th January. Some 2.5 million mobile phones were sold over the Christmas period alone. The number of digital mobile handsets in circulation in the UK is now around 15 million and climbing steadily, with penetration expected to exceed 50% by 2004.

Note that penetration is likely to exceed 100% in some countries by 2002, because many people will have several mobile phones: a conventional handset in their briefcase, another built in to their car, one in their laptop computer and another in their PDA (personal digital assistant).

PCs (personal computers), despite their power and functionality, are not necessarily the best platform for the delivery of all financial services. According to ICM (a market consulting firm), 29% of the UK population were online at the start of this year. Of these, less than half (14%) access from home and there is a wide variation in household penetration, ranging from 33% of AB homes to only 2% of DE homes. For reference, UK-based market research companies use the ABCDE breakdown for demographics, so the richest households are represented by groups A and B, whereas the poorest are groups D and E. Many people access from a shared PC at home, from work, from educational establishments, libraries and so on. The mobile phone by contrast is, generally, a personal device. People carry their phones with them all of the time and don't share them with others. This makes them a good platform for

such things as financial services.

Mobile phones are also digital (at least outside the US!) and GSM (Groupe Speciale Mobile) and PCN (Personal Communications Network or PCS [Personal Communications Systems] in US and Japan) services dominate. GSM has almost half of the global wireless telephony market and more than two-thirds of the digital wireless telephony market. But who cares if phones are digital or not? Well, digital mobile services are based on the use of a tamper-resistant smart card (the Subscriber Identification Module, or SIM) that provides a much higher level of security than anything available on the internet in software. The SIM was originally designed to hold a user's identification data, enabling subscribers to use their GSM handset on any network world-wide. It also allowed subscribers to receive Short Message Service (SMS) messages and store personal information such as telephone number directories. By the way, SMS is exploding. Usage in Western Europe exceeds 1 billion messages per month and is currently doubling every six months.

The GSM/SMS architecture has been wildly successful, but even back in 1993 it was clear that it would have to be extended to support the next generation of value-added services. For reasons of compatibility, it was decided to extend SIM functionality to support additional services on the existing infrastructure and exploit SMS further. The result was the SIM Application Toolkit Specification, often called the "SIM Toolkit" (STK). In this way, applications loaded into the SIM can communicate using existing network infrastructure cost-effectively and operators can add their own applications into the mobile handset using a standard platform (STK) for accessing the keyboard, menus, network and so on.

In addition to the expanding power of the SIM, the data capabilities of the mobile platform are expanding. Data rates will reach 144Kb/s with the introduction of the Universal Mobile Telephone Service (UMTS) and will then move on to 2Mb/s by 2005. UMTS is the new world-wide standard for mobile phones, and it's not that far off: NTT DoCoMo in Japan recently placed the first commercial order for UMTS equipment and expect to launch in 2001. While the higher speeds of UMTS are a year or two away, interim solutions are being found to push GSM data rates up to 14.4Kb/s and then on to 28.8Kb/s in advance of the introduction of High Speed Circuit Switched Data (HSCSD) and General Packet Radio Service (GPRS).

To summarise the situation, then, in Europe alone there are expected to be some 175m GSM users in 2001 (with 67m in Asia-Pacific and 11.5m in North America), with a couple of million new digital subscribers getting connected every month. Jupiter (5/99) forecast that Western Europe internet household penetration will triple from its current 9% by 2003: but almost half of all UK households already have a mobile phone in them. Every one of these handsets has a tamper-resistant smart card at its heart: one supplier alone (Gemplus) shipped it's 100 millionth SIM card in February 1999.

The installed base, the security and the standardisation combine to make the digital mobile handset a formidable platform for personal financial services so operators, networking companies, financial institutions and others are entering a new phase of competition to offer them. A few early examples:

» Scandanvia is, of course, way ahead in combining financial services and mobile phones. The Swedish Postal Bank (Postbanken) and Telia have a service, called Mobil Smart, that allows consumers to make Giro payments from their handsets. MeritaNordbanken's customers can check their balance and transaction logs from their mobile phones: and they do, with 50,000 customers generating 200,000 SMS messages every month. Dagens Industri, Europe's fourth largest business daily, have a pilot running allowing subscribers to receive financial data and trade on the Stockholm Exchange using Ericsson GSM PDAs.

» Citibank have a mobile banking service currently available in Singapore. Consumers can use their mobile handsets to access their account balance, pay bills and transfer funds using SMS (at a cost of Sing\$0.20 per transaction). The software uses STK, in either an Alcatel or Motorola StarTAC X handset, to provide menus and functionality.

» SmartAxis, a Unisource spin-off, has been running a pilot service using both Proton and Mondex electronic purses over mobile networks.

There are also a number of imaginative schemes around linking the power of banking and mobile networks to deliver strong customer propositions other than financial services. For example:

» Over 50% of Portuguese mobile phone customers are anonymous pre-paid subscribers. They use ATM bill payment facilities to 'reload' their mobile phones for more talk time. The advantages of this scheme, to anyone involved in the distribution of pre-paid vouchers for mobile telephony in the UK, are clear.

» Pilot schemes in Scandinavia allow consumers to use their mobile phones to pay at unattended car parking, soft drinks in vending machines and car washes. The goods and services are charged through the telecommunications operators and show up on the consumers' bills. The benefits of such schemes, to everyone except banks, are clear.

The simplest way to exploit the mobile platform is to use the mobile phone as a personal information delivery platform in combination with banking services. A good example comes from Spain, where customers with certain banks have their account balance sent via SMS to their handset every time they make an ATM withdrawal (which is also a good way of finding out if someone else is using your card!). It would be relatively easy for my bank to send SMS messages out overnight so that when I switched on my phone in the morning I got my current account balance. Two-way SMS can extend the range of services into the transactional. Okobank, the second largest bank in Finland with 4 million accounts, was the first bank in the world to launch transactional services over GSM. Customers can now request balance and transaction reports, access Visa card services, make domestic payments and pass on instructions over encrypted SMS links. The bank has the same SMS number (1996) with both network operators, making it very easy for customers to send messages. Operators are keen to expand these kind of services: phase 2+ SIMs with 16Kb of memory will soon be superceded by SIMs with flash memory and 32-bit processors and operators want these (at the right price) because they can only differentiate themselves on value-added services, of which finance and banking will be prime examples.

The next level of integration might be to use the mobile phone in conjunction with the internet to personalise the offering, much as Cellnet has done with the Genie service. If consumers can be persuaded to self-configure their financial services over the web, with the results (e.g. share limit minding alerts) delivered to the handset, the cost savings and increased functionality look good together. I might, for example, use my bank's internet banking service to ask for an alert when a particular debit takes place. First Direct recently launched this kind of service (for UKP2.50 per month) and other UK banks cannot be far behind. Mobile operators are implementing over-the-air (OTA) systems for their own use (such as allowing subscribers to update the phone directory in their handset by going to a web site, as Danish operator Mobiltek does), so these systems ought to be available for financial services at reasonable cost. For customers with STK handsets, these personal financial services can be surprisingly sophisticated. Swedish internet broker Teletrades is already projecting 10% of its revenue from SMS-based transactions (each transaction is accomplished using four SMS messages). Italian trading house Directa has launched a similar service. Thus the combination of STK and a handset (with no keyboard, mass storage, big screen or any other 'luxury') can deliver powerful services.

An altogether higher level of integration is to use the mobile phone as a platform for the next generation of smart card-based banking services by moving the SIM on to a multi-application platform and then providing additional functionality by adding applications. Telecom Italia Mobile (TIM) and Swisscom have placed orders for several million Java cards for deployment this year. The cards, which cost around double the \$7 per card that operators pay for volume STK cards, incorporate Java SIM and Java STK applications. Operators and third party providers can then download new Java "applets" over the air to phones out in the field, a good example being TIM's equity trading application.

Secure mobile applications do not have to be based in the SIM. The synergy between, for example, a bank-issued smart card and the mobile handset looks very powerful. The bank card provides security and payment services, the handset provides the most flexible and convenient platform for using those services. Therefore, perhaps the most flexible approach comes through the addition of a second, external, smartcard interface to the mobile handset. This would have many benefits, allowing the use of third-party smart cards without using the SIM and supporting independence between network operators and other card issuers. The use of an additional slot (in fact an additional 8 slots) is already a standard within the GSM world as it has been defined as an optional Class 3 service for STK. This structure means that an STK application (a mobile banking application, for example) can control a second card, such as an EMV card (Europay MasterCard/Visa which is the standard for chipcard credit/debit cards), for example,

through the handset.

A number of manufacturers have already announced 'dual slot' handsets and work on integrating third-party cards is already underway. One of the first trials of this combination of technologies is the VisaCash pilot, enabling a thousand customers in the Leeds area to download e-cash over Cellnet's GSM network on to a smart Barclaycard by inserting it into a specially designed Motorola StarTAC mobile phone. Merita Nordbanken is to pilot a WAP-based service using smart Visa cards for online payments. France Telecom is planning to launch a service with Carte Bancaire later this year so that consumers can pay for goods and services by inserting their CB card into the second slot. Further afield, Mobile One in Singapore will soon launch second slot phones to take the NETS e-purse and for remote loading and payments.

It is important to note that all of the technological aspects of these services are in place already: it's really not difficult to get personal financial services on the move. For many organisation, the imperative for doing so is more about positioning for the arrival of 3rd generation (UMTS) services in the near future. The thinking is straightforward: service providers can learn about business models and relationships by deploying basic services using STK, SMS and two-slot handsets. This means that they have all of the non-technical factors in place for the arrival of the powerful next generation handsets, WAP (Wireless Application Protocol, the emerging standard for mobile handsets) and high-speed data connections that will become consumers' indispensable companions.

It is the non-technical factors that pose all of the really hard questions about the branding of services (and the smart cards that drive them), applications, loyalty schemes and even the money used in transactions. It is a reasonable technological prediction that multi-application smart cards and financial services will be central to the next phase of the evolution of mobile services, but it is virtually impossible to predict what this will mean in business terms.