money goes mobile

Business White Paper

Mobile Payment
From Electronic Business to Mobile Business

The Internet has revolutionized the economy. In recent years, new forms of Business-to-Business collaboration and new marketing opportunities in the consumer business segment have developed, met with widespread popularity and established a firm place for themselves. The gigantic growth rates for electronic business prove this.

Enormous rationalization potential has been achieved in the Business-to-Business (B2B) segment, e.g. logistics chains have been streamlined and sourcing processes optimized. And the Business-to-Consumer (B2C) segment, too, is striking out in new directions. Goods and services are being marketed over the Internet, an option that is being utilized by numerous consumers. Online banking, securities trading and shopping for books and music CDs are now well-established practices. In the case of digital goods (information, programs, electronic banking and brokering, etc.), the entire business process between customer and provider is now often handled electronically.

The next wave of electronic business, market observers agree, will be fueled by developments in mobile telephony.

Going mobile – Telecommunication market trends

Analysts and market researchers are predicting enormous growth rates for mobile business in the years to come. Emerging technologies like General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS) will dramatically alter the way mobile phones are used. Overall, there are four major trends that will generate tremendous demand for new mobile services:

- Increasing mobile phone penetration
- Enabling new and powerful mobile applications by increasing the bandwidth of new mobile networks with upcoming technologies like HSCSD (High Speed Circuit Switched Data), GPRS and UMTS
- Fast market introduction of UMTS to shorten the payback period
- Technology innovations in the devices, e.g. larger displays

Mobile phones are evolving into personalized, universal devices. They are no longer limited to providing voice communication only; they now afford access to applications and services for information and entertainment – anytime and anywhere.

Even though mobile devices are not as powerful as PCs, they offer several major advantages, along with other features. With GPRS and UMTS, they are ‘always-on,’ personalized and easy to use. In addition, their users accept the built-in payment method, in the form of either their familiar monthly phone bill cleared via bank accounts or a prepaid account. Up until now, these payment methods have been used mainly for voice communication and SMS messages. There are established business models and experience in splitting revenues with
other market players by charging for premium rate services (e.g. ‘0900’ service numbers). But further enhancement of payment capabilities is a vital success factor for mobile business.

**Address customers wherever they are – Mobile Business**

Mobile business – purchasing information, goods or services via a mobile device – is likely to have a far greater impact on the economy than electronic business conducted on stationary devices like PCs. It will give rise to new applications and services for a variety of everyday transactions, ranging from mobile commerce (e.g. banking, brokerage, trading, ticketing, auctions), mobile services (e.g. emergency, control, fleet management), mobile office (e.g. scheduling, e-mail) to mobile entertainment (e.g. music, videos, games, gambling).

Mobile Business – A variety of services

Analysts expect electronic commerce volume to reach US $120 billion by 2002, with mobile commerce volume rising to about US $ 40 - 50 billion. Growth rates will be 50% until 2005. By the end of 2005, analysts anticipate there will be some 500 million mobile business customers throughout the world. Western Europe will be the key region, followed by Asia-Pacific and North America.

The rules that apply to mobile business are not the same as those for the Internet. Mobile business users expect applications to be easy to use and offer a high level of personalization, in addition to being localized and satisfying the requirements of highly time-critical transactions.

**Mobile Payment – Key success factor for mobile business**

Mobile service providers are developing strategies and business models that differ from those used in electronic business. Their personalized and highly specialized information and
services will only be made available to customers who are willing to pay for them – unlike the typical practices on today’s Internet, where business models that are driven by advertising and sponsoring cover the cost of providing the information. So it’s the question of payment and revenue flows that will deeply affect mobile business.

When people use their mobile phones to surf the Internet, they may be charged on the basis of the quantity of data transferred, and not the length of time they spend online. New modes of payment are a necessary consequence of the introduction of new mobile services – such as buying lotto tickets or accessing value-added information services that are charged on a pay-per-use or pay-per-content basis.

A broad variety of products are marketed in mobile business, and different offerings – surfing the Internet, downloading information, electronic commerce and brick-and-mortar purchases – require appropriately tailored payment methods.

Different charging modes for content and / or volume (premium information or streaming video content), for goods (via Internet shops or brick-and-mortar stores, vending machines, restaurants) and usage-based charging (using such applications as games, e-mail applications, unified messaging) have to be provided to satisfy the demands of mobile business transactions.

What users want is an easy-to-use, secure, flexible and universal payment method that can be employed in mobile business, and this will impact both electronic business as well as the brick-and-mortar world.

**Business relationships – Who’s in the game**

Support for different types of business relationships is every bit as important as the different charging modes that are covered by mobile payment. Mobile payment will cover the various business relationships – Business-to-Consumer, Business-to-Business and Consumer-to-Consumer.

In a Business-to-Consumer relationship, it is often higher value goods that are sold. In some cases, the buyer’s creditworthiness is known and a business can act accordingly. In many countries, credit cards are an accepted means of payment. However in some countries, like Germany, less than 25% of the population holds a credit card. For this segment, mobile payment transaction systems have to tie in credit cards and bank accounts.

Business-to-Business is different: The players are usually well known, and well-established procedures exist to assess and monitor creditworthiness. Given the increased anonymity resulting from mobile and e-commerce, the mobile payment transaction system offers additional means of protection, be they in the form of additional authentication or rules.

Consumer-to-Consumer relationships are typically ad-hoc transactions, like selling old books at a flea market. It is impossible to be sure that the partner will pay for the goods provided unless the money is received before the goods are handed over. In using mobile commerce to conduct such transactions, it would be much more preferable to have a trusted means of
payment. A straightforward approach is to use prepaid accounts for such transactions: A sufficient account balance can be assured, and a transfer can be made between two prepaid accounts.

Universal payment in the mobile business arena necessitates that different business relationships be covered and that differing charges be made for different types of services.
Open up a world of opportunities – From value chains to value networks

Today, consumers in the telecommunication world mainly pay for a combination of airtime and access. In the emerging mobile business arena, new players will come onto the scene. More and more service and content providers, content aggregators/portal providers and payment service providers are entering the market.

Mobile Business Value Chains

The value chain and the flow of cash will not remain as simple as they have been. Both service and content providers as well as content aggregators/portal providers want to receive money from consumers in return for the services and content they provide. On the other hand, they will have to compensate network operators for providing the infrastructure that allows them to deliver their services to end-users. The role of payment service providers in distributing and clearing all financial transactions along the mobile business value chain will be crucial.

Mobile operators

Mobile network operators are challenged by declining margins in their traditional business. Furthermore, their very high investments for UMTS licenses heighten the need for mobile network operators to tap into new sources of revenue as quickly as possible. Value added services will become an important new source of revenue and will accelerate the rapid growth of mobile commerce.

Mobile operators are in the process of expanding their share along the mobile business value chain. Forecasts estimate that by 2010 besides airtime revenue, mobile services will be generating about 50% of operators’ average revenue per user. Their new, additional role as portal providers and content aggregators – often through alliances with content and service providers – will allow them to offer their customers a new, more personalized and
comprehensive range of information and services, while at the same time enabling them to
differentiate themselves from the competition.

It is not only the role of content providers or aggregators that is attractive for mobile
operators but also the role of payment service providers. They have recognized the demand
for flexible payment solutions and will offer a variety of payment options for information,
services and goods, and they will take the lead as payment providers in the field of mobile
business.

Mobile operators have important assets for the role of a payment service provider. They have
an established customer base, effective micro-billing systems (handled by prepaid accounts
or monthly phone bills), authentication capabilities and established business models for
splitting revenues (e.g. ‘0900’ service numbers) with other market players.
In addition, customers need to be retained through value-added services and attractive
reward programs, since they are the targets of many market players.
Mobile business is a top priority source of additional revenue for mobile operators. These
new revenue sources consist of additional airtime, commissions or annual fees for payment
transactions and higher customer retention thanks to a complete portfolio of services.

Payment service providers
Payment service providers make a secure, attractively priced payment service available for
mobile business and combine the skills of network operators and financial services compa-
nies that are relevant for mobile payment. They write invoices for content, airtime, services
and goods, and efficiently process even the smallest sums – so-called micro-payments.
When linked with the applications and processes used in the financial services industry,
payment service providers have to ensure secure payment of larger sums – known as
macro-payments. It is very likely that both mobile operators as well as financial institutions
will broaden their business into the field of payment service providing.

Financial institutions
Financial institutions have been quick to identify mobile business as one of their strategic
lines of business. They already possess information about their customers’ financial situation
and creditworthiness. Their skills and experience in e-banking and e-brokerage give them a
head start as service providers in the field of mobile business. Furthermore, the financial
services sector strives to occupy a key position in billing and clearing financial transactions
made through mobile business services.

Mobile payment will fundamentally change the way financial institutions do business. This
means that financial institutions have to proactively shape the market now to ensure their
market position in the future. Important assets in connection with the role of mobile business
payment services are the ability to process, clear and settle larger sums of money, in par-
ticular, with other financial institutions. The have the necessary risk management know-how
and a trust-based customer relationship for all kinds of financial transactions.
There are many business opportunities for financial institutions in the field of mobile business. Mobile business is a new sales channel for their offerings and a platform for new personalized services based on realtime information that generates higher customer retention and satisfaction. New customers can be won by introducing a mobile business prepaid card for young people who do not yet qualify for a credit card. This will create additional revenue and expand their customer base.

**Content and application providers**

Content and application providers earn their money by providing up-to-date information and services or by selling goods. The flexibility with which they are able to charge for their products via payment service providers – securely and with minimum overheads – is the key to their business success and enables them to provide higher personalized premium information and services.

**Content aggregators / portal providers**

Content aggregators / portal providers repackage available information for distribution to wireless devices. Their added value lies in delivering content in the most appropriate package via mobile portals.

Mobile portals are created by aggregating applications – e.g. calendar, e-mail – and content from different providers in order to become the prime supplier of mobile information. Mobile portals are characterized by a higher level of personalization and localization than Internet portals. The success of mobile portals hinges upon ease of use and the ability to deliver the right information at the right time. The services provided by content aggregators and portal providers are charged via payment service providers.

**Mobile value chains require universal payment solutions**

The success of mobile business will hinge upon customer acceptance and a smooth interplay between all of the partners in the value network. Simple and secure payment is a key factor for both the customer and the partners along the value chain.

Mobile business payment solutions have to be intuitive and reliable for the customer. It has to be just as simple and efficient to pay small amounts (micro-payments) as to pay larger amounts. In addition, seamless integration into the existing processes and applications at financial services providers has to assure that existing mechanisms, e.g. for reviewing creditworthiness and clearing by the financial services providers, can be utilized in handling larger transactions. This will turn the mobile phone into an electronic wallet.

For mobile business providers, the focus is on the high availability and scalability of the payment system. Mobile payment solutions have to be able to be used universally, both in electronic business (Internet) as well as in mobile business (WAP) and the brick-and-mortar world (point-of-sale systems). Payment transactions, even for small amounts, have to be able to be handled dependably and at low cost. In addition, mobile payment solutions also
have to support bonus and reward programs to enable mobile business providers to offer their customers attractive incentive programs.

Administration access has to be available to both, providers and customers. Customers should be able to create and modify their personal profiles. These profiles can also contain instructions for handling payments, e.g. small amounts should be charged to a prepaid account, while larger amounts should be direct-debited to a bank account.

Providers should also be able to generate statistical analyses in order to optimize their offerings to suit the needs of their target groups.
The payment solution from Siemens and Brokat

Siemens AG and Brokat AG offer a comprehensive payment solution for both, mobile and electronic commerce, as well as brick-and-mortar businesses (supermarkets, car washes, etc.). It satisfies the entire spectrum of requirements, allowing content, volume, airtime, services and goods to be charged and the revenue to be distributed among the various partners in the mobile commerce value chain.

The solution combines the experience Siemens has gained in the design of intelligent networks and the efficient administration of millions of prepaid accounts throughout the world with the comprehensive know-how in building electronic business solutions of Brokat. This unites the advantages of realtime charging as practiced in the prepaid-card business and extensive interfaces to existing payment methods and processes used in the financial services industry. The solution thus guarantees fast, secure and convenient processing of payment transactions. The joint solution will be evolved based on the Siemens products Prepaid@vantage and Payment@vantage and the Brokat products, the e-services platform Twister, and the Mobile Payment Suite.

Siemens and Brokat Universal Payment Solution

The included mobile payment suite is based on the tried and tested e-services platform, which handles customer interactions and the clearing activities with financial institutes. It offers a modular software architecture that combines the added value of various individual technology concepts like Enterprise Application Server, Customer Interaction (CI), Enterprise Application Integration or Customer Relationship Management in one patented product. The integration of electronic distribution channels and existing back-office systems (e.g. traders, banks, credit card companies) is handled via pre-configured standard modules. Customer Interaction Services enable customers to use a wide range of electronic channels for mobile...
payment transactions. Enterprise Application Integration Services handle clearing into back-office systems and applications. Security aspects are satisfied through support for all established security procedures, such as SSL and global server IDs. Furthermore, encryption of internal communication is also an option. Security is rounded out through the integration of numerous authentication methods, such as PIN/TAN, Certificates, Mobile Digital Signatures or Public Key Infrastructures (PKI).

The Mobile Payment Suite ensures secure and fast handling of payment transactions. The system supports various payment methods such as credit cards, customer cards, debit payments and prepaid cards. The Mobile Payment Suite consists of the Mobile Payment Merchant Server and the Mobile Payment System. This basic package can be supplemented by a Clearing Interface, a Customer Card Management system, a Merchant Accounting package and a Wallet Server.

To process and manage customer data and handle payment transactions, mobile payment providers use what is known as a wallet server (eWallet). The wallet server stores data (such as address data) entered by the customer and records the available modes of payment in a server-based application that supports mobile access. Consumers can access this information and make further changes at any time.

The Account Management System affords access to internal accounts to provide

- Aggregation of micro-payments that can not be efficiently billed directly to bank or credit card accounts, or

- Corporate accounts for the payment service provider or third parties that are run on a prepaid basis or are cleared by sending regular invoices, e.g. by a postpaid policy.

The administration capabilities allow for role-based management of consumers and merchants and all associated data, as well as such service data as currency conversion tables. Operators and users can administer this data via Web interfaces or via Customer Care or Customer Relationship Management systems.

This data is used to control the payment service, thus providing account and amount supervision, multi-currency support, individual discount plans and bonus systems on a realtime basis.

In cases where appropriate bearer control can be applied to supervise network activities and initiate automatic payment transactions, GSM authentication can make explicit user identification obsolete.

All payment transactions are archived into a Statistics Warehouse that provides a wealth of reports on a per-user or per-merchant basis.

The analyses that can be performed by this reporting tool range from electronic bill presentation, i.e. efficiently providing a detailed online payment transaction list including micro-payments, right through to statistical risk management.
An online billing component stores account transactions and enables merchants and consumers to retrieve electronic bills via WAP-enabled mobile phones or PC-based Internet access. The system is managed by means of a feature-rich administration tool. Consumers and merchants can register and then add or change their account profiles, e.g. account thresholds.

The broad variety of business scenarios supported by the Siemens and Brokat payment solution, which is unrivaled by any other product, as well as its realtime capability, telecommunication grade availability, scalability and reliability will be essential for customer acceptance of mobile payment.
How it works – Payment process examples

After subscribing to the payment service of a specific payment provider, a consumer surfs the Web using the infrastructure of a (communication) service provider. He finds goods or services that are offered by a merchant, who is also a subscriber to the payment service of (initially the same) payment provider.

Mobile Payment Example

After the consumer decides to buy the goods or services offered, the merchant initiates the payment sequence. The request, together with appropriate identification of both consumer and merchant, is passed on to the payment transaction system of the payment provider, who first checks the creditworthiness of both parties against blacklists and whitelists. The transaction amount is reserved on the consumer’s account. After the consumer verifies his intention to buy and the merchant accepts this offer, ownership of the goods passes and the reserved amount is transferred from the consumer’s account to the merchant’s account. Finally, both the merchant and the consumer are informed that the transaction has been successfully completed.

The payment provider accounts are cleared periodically with financial institutions. The merchants receive their money, while the consumers replenish their payment accounts.

Mobile lottery

With lotto-on-call, mobile users can buy and pay for their lottery tickets over a mobile phone. Users can employ the Wireless Application Protocol (WAP) to access the lottery provider’s Internet pages and buy their ticket. They confirm the payment for this transaction with their Personal Identification Number (PIN).
The payment service provider handles the revenue split – the price of the lottery ticket plus an extra charge for provision of the mobile channel – and clears the financial transactions with the lottery provider and the mobile operator.

**Ticketing**

Users can select their tickets for local transit on the transit operator’s WAP pages. They confirm the purchase by entering their PIN. The payment service provider handles clearing of the financial transactions – in interaction with financial institutions – with the local transit authority and the mobile service provider.

**Get-a-Song**

The mobile operator can provide information about songs being played on the radio, promotional items (e.g. T-shirts) and ordering concert tickets by mobile phone, including payment for these items. Clearing of all financial transactions can be handled on a prepaid account or phone bill basis.
What the future holds – The role of mobile payment solutions

Consumer acceptance of easy-to-use and convenient payment systems will be a cornerstone of mobile business. New roles and new value chains will emerge. Partnerships along the value chain will be crucial. Mobile operators and financial institutions will expand into the role of payment service providers. To succeed in mobile payment business, know-how and experience in these business areas are every bit as important as the solutions themselves.

The partnership between Siemens AG and Brokat AG unites market and technology leadership in the fields of mobile telecommunication and mobile business with extensive e-business experience in the financial industry. Siemens AG and Brokat AG provide comprehensive know-how and a solution that offers key customer benefits.

This realtime mobile payment solution is an excellent way of setting mobile network operators and financial institutions apart from their rivals. Not only do they help shore up existing customer relationships, they can also play a significant role in attracting new business customers and consumers. At the same time, these new services form the basis for building innovative, creative service offerings – which in turn increase connection times and raise the volume of mobile network traffic. Furthermore, the solution is cost-efficient for micro- and macro-payments in both electronic and mobile business as well as in the brick-and-mortar world. High transaction rates at the lowest possible transaction costs, support for prepaid and postpaid accounts and the integration of various clearing networks make mobile payment a universal payment method.

Flexible rating – on the basis of time, volume, content, source – and broad support for various bonus, discount and reward programs is a prerequisite for attractive customer incentive programs. And, last but not least, it is the commitment to open standards and interfaces that characterizes mobile payment from Siemens AG and Brokat AG.

Looking further into the future, we can expect the mobile phone to develop into a personal wallet.