AnyTime, AnyWhere.

eMobile
Information at your fingertips

eMobile Pte Ltd focus is to provide wireless Mobile Banking, Mobile Share Trading, Mobile eCommerce solutions and turnkey services.

eMobile's Customers include:

- PT Bank Panin (Indonesia)
- The Hongkong and Shanghai Banking Corporation Ltd (various countries)
- PT Bank Buana (Indonesia)
- Goodrich Wallcoverings & Carpets (Singapore)
- PT Telekomunikasi Selular Indonesia (Telkomsel)
- The Ministry of Information, Communications and the Arts (Singapore)
- Wakeboard Association of Singapore
- Keppel FMO, FOSPEX, Nanyang Technological University (Singapore)
- Singapore Police Force

eMobile Multi-Bank Mobile Banking System

- Strategic Offering for Mobile Operators

Mobile Operators' Challenge

After years of monumental growth, the wireless market has reached a new phase where qualitative development will be the key to success. Operators face falling average revenue per user (ARPU) due to voice service price wars. There is a lack of brand loyalty, as subscribers switch to other operators to enjoy lower pricing. Delays in new product launches caused by the slow delivery of 3G network equipment, amidst overly aggressive bidding, unrealistic market projections and expectations, coupled with huge deployment costs, are causing many large players to take a hard look at their strategies. Nonetheless, it is clear that a **migration to data** is needed to increase revenues. To do this as smoothly as possible the market is looking for open, scaleable infrastructures that not only boost return on investment but also allow for future service integration.

Differentiation is key and it is through data services - billing, roaming, localization, customer profiling, etc. - that carriers will set themselves apart. More and more mobile operators are beginning to turn their attention to less traditional sources such as the corporate market space and offering services to help complement the way corporations do business. The value proposition from the mobile operator to the corporation is the introduction of a new range of mobility & lifestyle offerings to help improve customer service & support. It is in this light that we have introduced **eMobile Multi-Bank Mobile Banking System.**

eMobile Multi-bank Mobile Banking System

eMobile MMBS was developed after many months of speaking with and soliciting feedback and requirements from major banks and mobile operators. Our participation in international forums such as the *Mobile Payment Forum* (see box on left side) has helped us capture the current best practices in the mobile commerce industry. In addition, eMobile's experience in successfully implementing mobile banking solutions across the region for the single bank environment was essential in designing and packaging a solution which would meet the needs of today's banks and the banking clientele.

A key feedback was to design a mobile banking system that was fast, convenient to use and had a low usage cost. Offering the ability to carry out meaningful day-to-day financial transactions and gaining access to personal information, ***anytime & anywhere***, valued highly by banking customers.

Another key feedback was that the financial institutions preferred to ride on a service provider such as the mobile operator, to offer such a service. This would help reduce the cost of investment for each bank, while increasing the economies of scale for the mobile operator supporting.

Mobile Operators wanted a service offering which could optimize on the use of existing networking equipment and infrastructure. At the same time, they wanted a service which was low cost to deploy and could give them a quick return on investment. In addition, the solution had to be on an open platform that allowed the Operator to have the flexibility to add new services and embrace new technologies in future.

Typical eMobile MMBS Bank transactions include:

1. **Banking Transactions**
   - 1.1. **Account Balance**
   - 1.2. **Fund Transfer (intra-bank and inter-bank)**
   - 1.3. **Transaction Summary**
   - 1.4. **Bill Payment**
2. **Rates Information**
   - 2.1. **Term Deposits**
   - 2.2. **Loans**
   - 2.3. **Foreign Exchange**
3. **Pre-Paid Top-Up**
4. **Change PIN (and optionally, access to an instant PIN)**
5. **Service Settings (Bank, Account, Billers)**

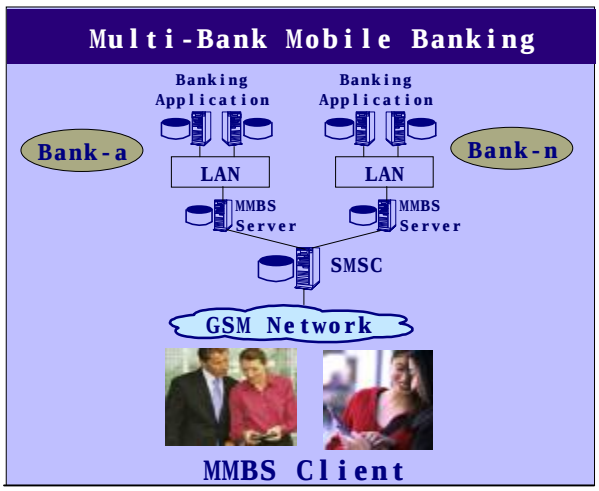

Figure 1: Typical MMBS Configuration

eMobile MMBS Solution Overview

eMobile MMBS is essentially a mobile operator-based service offering, catered to participating banks ("*Member Banks*") and corporations interested in participating in the MMBS Bill Payment Service program ("*Billers*"). eMobile MMBS introduces an additional channel for delivering banking and bill payment services directly to customers that are mutual to the banks & the mobile operator. Since many customers typically maintain relationships with multiple banks, a rapid market acceptance can be expected.

Figure 1 shows a typical configuration for eMobile MMBS. The MMBS Server runs on Windows NT Server (or higher), with a leased line connection to the Mobile Operator's SMS Message Centre (SMSC) and a local connection (e.g. LAN) to the member bank's host, where the banking application resides. The MMBS Server is physically located at the member bank's premise. All transactions received from MMBS subscribers will be forwarded by the Operator's SMSC to the MMBS Server. All messages sent out by the MMBS Server will also be passed to the SMSC for distribution to the correct message's recipients.

Client's PIN verification function is provided by the MMBS Server in conjunction with the member bank's PIN Verification Server.

MMBS services may be accessed using any Phase 2+ or WAP mobile phone equipped with a customized SIM Application Toolkit (STK) that has been expanded to include the MMBS client access menu (menu-driven) interface for entering banking transactions (i.e. transaction type, transaction data and customer PIN) and for constructing and encrypting the resulting SMS message to be forwarded to the MMBS Server.

All sensitive data exchanged between the MMBS Client STK & MMBS Server will be 3-DES encrypted during transmission. Figure 2 illustrates an example of a user interface menu provided the MMBS client.

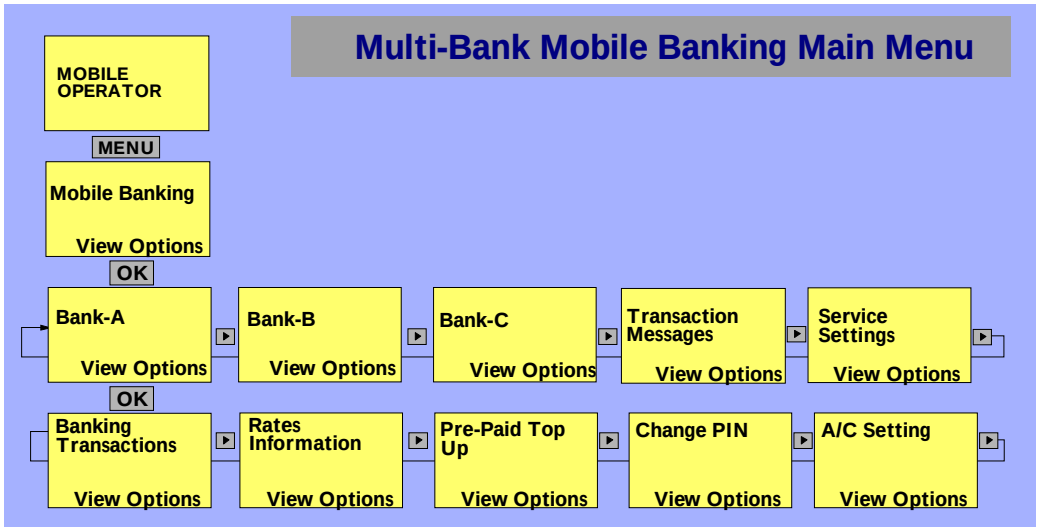

Figure 2: Example of a User Interface Menu for MMBS Client

Connectivity & Interface Support

A wide range of connectivity and interfaces are supported by MMB System server to communicate with the member bank's existing hosts and application servers. Examples include, but are not limited to, LU6.2 APPC, LU0, LU2 3270 and MQSeries client (see Figure 3).

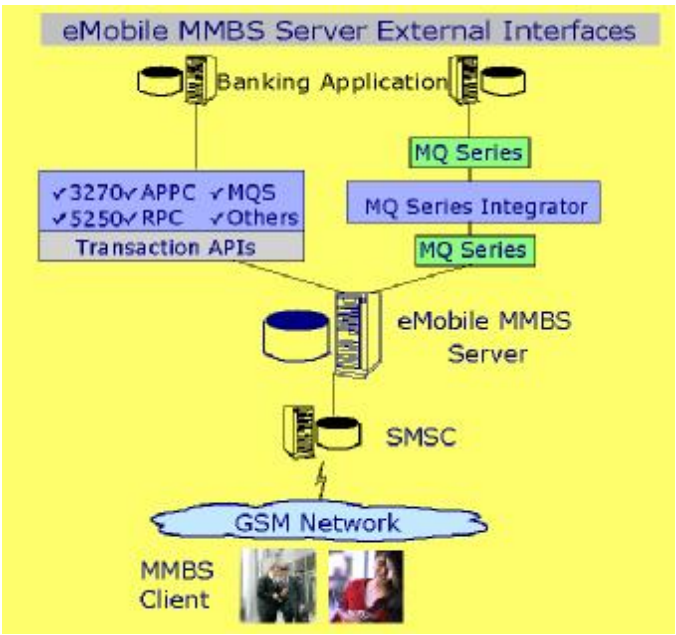

Figure 3: MMBS Server External Interfaces

MMBS Services

With eMobile MMBS, a range of mobile banking services can be introduced to the Mobile Operator's post-paid and pre-paid subscribers. While the service requires a one-time replacement of the SIM card for existing subscribers, **no further SIM replacement** will be necessary when subscribers activate & deactivate mobile banking access with any member banks. The following subsections provide a summary of each of the MMBS services.

Client-Initiated Transactions

Some typical Client-Initiated Transactions include:

- **Account Balance -** accessing up-to-the-minute bank account or credit card balance at the member bank
- **Fund Transfer** - transfers between accounts within the same bank as well as inter-bank transfers.
- **Last 5 transactions summary**
- **Prepaid Top-up -** enables subscribers to debit their bank account at the member bank to top-up airtime for their pre-paid SIM cards.
- **Bill Payment -** enables the clients to debit their bank account at the member bank to pay outstanding bills for corporations/institutions participating in MMBS bill payment service
- **Direct Debit Services** - enable MMBS clients to debit their accounts at an MMBS member bank to pay for purchases at participating institutions.
- **Rates Information -** access current rates of Loans, Foreign Exchange and Term Deposit offered by member banks.
- **Change PIN** - change client's transaction PIN.
- **Instant PIN** - enables clients to request an instant PIN from a member bank to authenticate instructions issued through an alternate channel that is not secured (such as telephone or fax instruction).
- **Service Setting** - enables the clients to set up their mobile banking profile to include frequently accessed member banks and bank accounts and companies participating in MMBS bill payment service program.

System-Initiated Transactions

Some typical System-Initiated Transactions* include:

- **Client notices** – e.g. Inward remittance notice
- **Credit Card Transaction Notification & Authorisation** – verification & confirmation on credit card purchases, based on user-defined parameters.
- **Banking Transactions Notification & Authorisation** – transactions that require clients' confirmation/acceptance in real-time before the bank can proceed with the transactions.
- **Bill Presentment & Payment** - where the bank will present their clients with a notice of outstanding bills due. Clients authorise payments from their bank account by responding with a valid transaction PIN.

(* - Some of these features require ***eMobile Scenario Server*** software & back-end application customization of bank systems)

System-initiated alerts & notices – making Sure you "won't forget to remember"

> *"We see SIM-based solutions as a key factor for success in the wireless market. The SIM's unique position and capabilities enhance customer relationships, enable content delivery and secure mobile payment, which combine to help Operators increase their ARPU."*
>
> *Gemplus SA*

Co-existence with WAP/GSM & WAP/GPRS Services

The MMBS services are intended for the majority of the Mobile Operator's existing subscribers who already use Phase 2+ GSM mobile phones (see Figure 5). Access to these services is provided using a SIM Toolkit (STK) application which is incorporated in the clients' SIM cards. These services do not preclude additional services that the clients may access using other access mechanism that their mobile phones support such as a WAP browser over either a GSM connection or GPRS connection. For subscribers who use WAP enabled mobile phones and who subscribe to both the MMBS services as well as WAP based services, they will be accessing the MMBS services through the 'standard' mobile phone's menu system (since the access menu has been incorporated on the SIM card) and WAP services through the mobile phone's internet facility (see Figure 4).

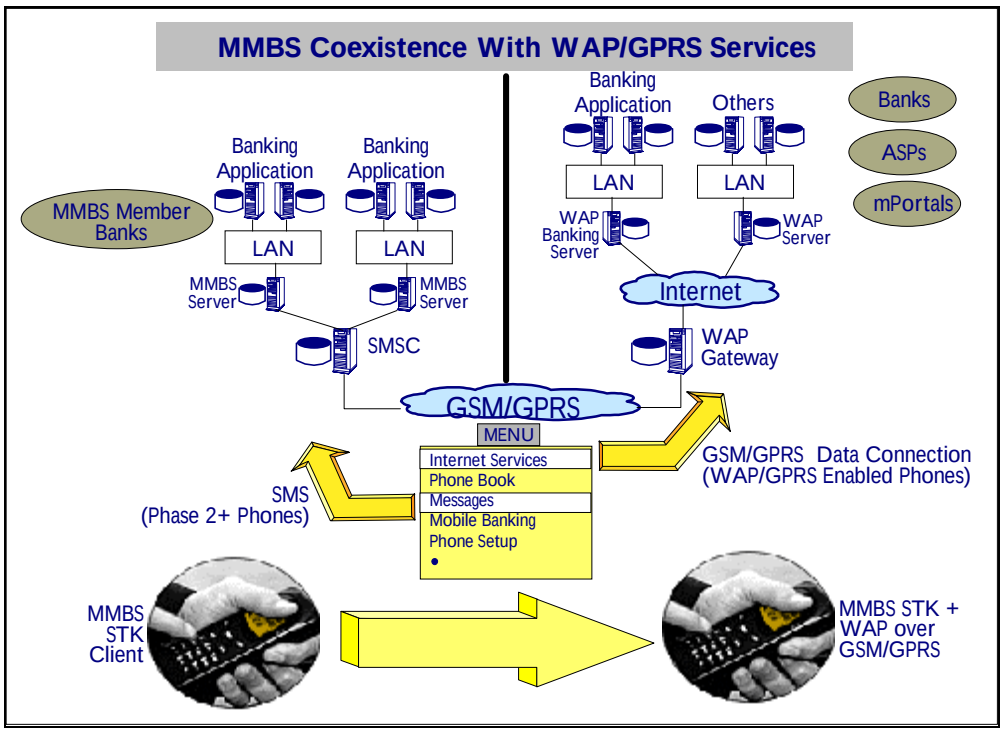

Figure 4: Co-existence with WAP & GPRS Services

The WAP services can be accessed either through a standard GSM connection or through GPRS connection, if the clients have also subscribed to the GPRS services. As such, the MMBS services will be complimentary to other WAP-based services that are being introduced by the mobile Operator and other service providers. From a service positioning standpoint, MMBS services are intended to deliver to subscribers a simple, quick, and cost-effective channel to access the day-to-day business transactions they require.

Examples of Phase 2+ Compliant Mobile Phones

Nokia 3210, 3310, 3350, 5210, 5510, 6150, 6100, 6510, 6610, 7110, 7210, 7650, 8210, 8250, 8310, 8850, 8910
Motorola StarTacX, L Series, V2099, V3088, V3688, V8088, 2688, T189, T190, V.66, T66
Sony Ericsson T18, T20, T28, T29, T39, T39m, A2618, A3618, T65, T68, T68i
Siemens C2588, S25, C35, S35, M35i, SL42, SL45, S40, C45, S45, ME45
Samsung SGH-N100, N100, N200, A200, SGH-T100
Panasonic GD75, GD76, GD 90, GD92, GD93
Handspring Treo180/180g, 270
Philips OZEO 988
GroupSense GSL e938

Figure 5: Example of Phase 2+ Compliant Phones

Benefits of eMobile's Solution

Rapid consumers acceptance
MMBS has been designed to address consumers' day-to-day basic transaction needs. Specific to financial transactions, where users generally require simple, fast, and cost-effective facility to perform their transactions, conventional STK offers a clear advantage to the equivalent browser alternatives.

Minimum impact to Mobile Operator's card management logistics
MMBS has been designed to enable the Mobile Operator to introduce ONE common-purpose MMBS SIM card (prepaid and postpaid) for delivering multi-bank mobile banking and payment services.

Minimum impact on Mobile Operator's system and business infrastructure
MMBS is designed to work with existing system and business infrastructure (SMSC, billing system, and pricing policy) to deliver multi-bank mobile banking and payment services. MMBS does not require change existing system and business infrastructure. The risk associated with MMBS implementation is therefore much lower.

Short time-to-market
MMBS has been structured in such a way as to provide Operators with maximum flexibility in introducing multi-bank mobile banking and payment services with little dependencies on other institutions. Initially, the Mobile Operator can deliver MMBS SIMs as standard SIMs to their customer base, without requiring the presence of any member banks. If/when member banks and corporations sign-up for MMBS to deliver banking services and accept payments on MMBS SIMs, users will benefit from incremental services accessible from their MMBS SIMs.

Multi-vendor SIM support
MMBS is based on eMobile MBank technology that has been designed to support SIMs from multiple SIM card manufacturers.

System Requirements for eMobile MMBS

Minimum Hardware Configuration for MMBS Server
- *Intel Pentium III 800MHz or higher*
- *At least 256MB RAM*
- *50 MB Hard disk space (only installation of MMBS Server; database not included), 10GB or more is recommended*
- *Leased line connection to SMS Center*

Software Requirements
- *Windows 2000 Professional or higher*
- *eMobile MMBS Server license*
- *Relevant software for connectivity to the Host application*

For more information
Contact:
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Or Visit our website:
http://www.emobile.com.sg