

Creating competitive advantage in an ever-changing payment landscape

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Executive Summary

Banks and financial institutions today are under tremendous **regulatory** and **competitive** pressures – be it to mitigate credit card fraud with initiatives such as EMV (EuroPay, Mastercard, Visa) or Line Encryption implementations; or to reduce churn and increase consumer card spending with initiatives such as Loyalty programs or Customer Retention campaign; to optimize and streamline costs by outsourcing non-core banking operations or even just to keep up-to-date with the latest technological innovations to maximize productivity. In the meantime, they also have to keep a lookout for new competitors entering the fray such as telecommunications providers offering multi-purpose micro-payment schemes, financing, private-label credit schemes, or even traditional insurance companies offering mortgages.

As such, the management of banks and financial institutions are often caught in the difficult situation of trying to justify their returns on investment in spending millions of dollars in upgrading their existing payment infrastructure which have been serving them well for the past 15 – 20 years.

Compounding the situation is the fact that newer technologies are coming into the payments marketplace much faster such as new digital and wireless communication technologies, smart-card technologies, biometrics and the like, while consumers today are also becoming increasingly savvy and particular in terms of demand for convenience and service levels expected. Payment transactions have become more diverse as these transactions can now originate not only from EDC terminals, but also from mobile cellular phones, personal digital assistants (PDAs), personal computers (PCs), automated teller machines (ATMs), Internet web sites, call centres, interactive voice response (IVR) systems, and more.

Recognizing the uphill battle that banks and financial institutions are currently facing in having to cope with an ever-changing payment landscape, continuous technological advancements and rising security threats, GHL Systems has engineered its **Adaptive Secure Payment Architecture (ASPA)** with the aim of specifically assisting Banks in overcoming these issues and more importantly, empowering them beyond merely existing as just another player within an increasingly competitive industry.

With ASPA, Banks have a robust and rapid deployment foundation which enables them to gain their competitive edge by introducing new applications and services quickly and securely with minimum technology obsolescence. This is achieved through a holistic treatment of the Banks' entire payment infrastructure instead of taking a fragmented and silo approach to each payment channel.

Introduction

Changing Payment Landscape

The world is currently witnessing a milestone shift in the international payment landscape as the world migrates from magnetic-striped payment technology (cards, terminals, network, etc) to EMV (EuroPay, Mastercard, Visa) technology. The existing payment infrastructure has been around for 20 years with minimal changes, mainly supporting old and dated technology such as analog leased lines (with limited bandwidth and value-added services) and PSTN (Public Switched Telephone Network) dial-ups.

Today, however, the payment landscape is fast-changing, accelerated by the adoption of digital, wireless and smart-chip technology. This poses a new challenge for Banks to keep up with evolving technology to maintain competitive advantage while ensuring maximum returns on their payment infrastructure investment.

Meanwhile, Banks are also facing another threat from non-bank competitors brought about by the convergence of new technologies and players – commonly known as the **3Cs – Communications, Computers and Consumer Electronics!** Telcos are already offering alternative form of payments – micro-payments for the purchase of ring-tones, picture-messages, stock-quotes, etc. Some telcos are also offering their subscribers to pay for their post-paid phone bills using their prepaid mobile reload cards typically transacted through cash while it is also possible now for subscribers to top-up a prepaid account with the top-up values being charged to their post-paid bills!

The world is moving towards a ‘smart’ payment landscape!

- Banks that use the changing payments landscape to improve their performance stand to bolster their long-term competitiveness at a time when payments are becoming holistic, not a fragmented, business
- Banks “typically lack an enterprise-wide focus on payment-related risk because it occurs over multiple payment methods and mechanisms

Source: Tower Group – 2004 Perspective on Global Payments report


- Payments costs can be up to 40 per cent of total bank costs”
- 75 per cent of bankers said refocusing on revenues, is a top priority for 2003
- Banks “can use a payments strategy to rebuild competitive advantage”

Source: BCG Global Payments 2003 report

EMV = Exploit More Value

Trends and Opportunities

With the explosion of cutting edge technologies, now is the perfect time for Banks to take a step back to holistically review and re-architect their payment infrastructure in a move to align themselves to this 'smart' payment landscape. But first of all, Banks need to understand the underlying trends in order to capitalize on the opportunities brought about by this changing payment landscape.

Trends	Opportunities	Examples
<p>'Smart' Cards / Applications</p> <ul style="list-style-type: none"> ➤ Offline transactions <ul style="list-style-type: none"> ○ Areas with limited line connectivity ○ Variable risk profile / floor limit (Eg. Fast-food outlets) ○ Faster transaction time ➤ Multi-applications and Localized storage on cards <ul style="list-style-type: none"> ○ Personalized information ○ Vouchers for cross-selling at point-of-sale 	<ul style="list-style-type: none"> ➤ New application potential <ul style="list-style-type: none"> ○ Combination of services ➤ Personalized offerings (CRM) <ul style="list-style-type: none"> ○ One-to-one marketing ➤ Pro-active management <ul style="list-style-type: none"> ○ Reduce churn ○ Increase service level 	<p>Malaysia's MyKAD (GMPC)</p> <ul style="list-style-type: none"> ➤ NRIC (National ID) ➤ Driving License ➤ Passport ➤ Health Info ➤ Toll ➤ ATM / e-Purse ➤ Digital Certificate (PKI)
<p>New Channels / Devices</p> <ul style="list-style-type: none"> ➤ Wide Area Communications <ul style="list-style-type: none"> ○ GPRS / 3G ○ SMS / MMS ○ Internet / VPN ➤ Local Area Communications <ul style="list-style-type: none"> ○ Wi-Fi (Wireless LAN) ○ RFID (Contactless) ○ Bluetooth 	<ul style="list-style-type: none"> ➤ New market segments <ul style="list-style-type: none"> ○ Remote area ○ Exhibition / Convention ○ Micro-payments ➤ Lower costs <ul style="list-style-type: none"> ○ Charging models (Data size) ○ Wireless / No cabling costs ➤ New business models 	<p>NTT Docomo & Sony 'Felica'</p> <ul style="list-style-type: none"> ➤ Phone card ➤ Transit card ➤ Prepaid card ➤ ID card 
<p>Fraud migration</p> <ul style="list-style-type: none"> ➤ EMV <ul style="list-style-type: none"> ○ Protects against card skimming and cloning ○ Provides strong authentication infrastructure for issuers and acquirers ➤ Liability shift <ul style="list-style-type: none"> ○ EMV ○ 3D-Secure ➤ Line Encryption <ul style="list-style-type: none"> ○ Protect against line-tapping, ghost terminals and host-spoofing frauds 	<ul style="list-style-type: none"> ➤ Lower costs <ul style="list-style-type: none"> ○ Due to lower charge-backs ○ Liability shift ➤ Greater consumer confidence <ul style="list-style-type: none"> ○ Enhanced with marketing program on secured infrastructure ➤ New markets / offerings <ul style="list-style-type: none"> ○ Aggressive marketing to target 'high-risk' merchants, etc. 	<ul style="list-style-type: none"> ➤ EMV infrastructure <ul style="list-style-type: none"> ○ EMV smart cards ○ EMV terminals ○ EMV network ○ EMV hosts ➤ Line Encryption Solution <ul style="list-style-type: none"> ○ Encryption / Decryption ○ Authentication ○ Keys Management / Injection

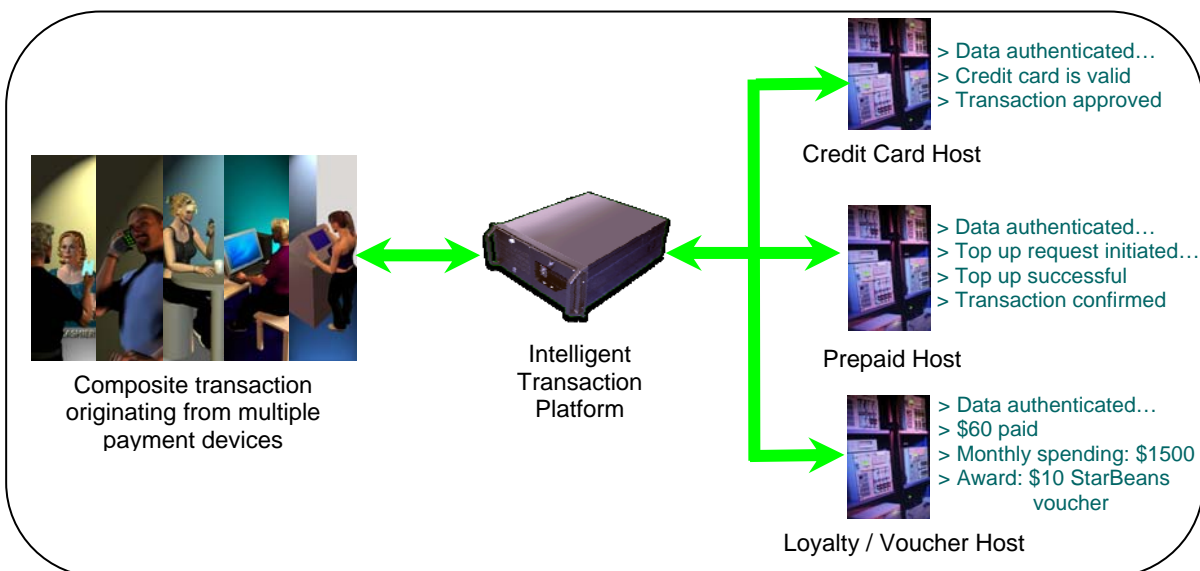
Competitive advantage through service innovation

With the introduction of 'smart' cards and 'smart' terminals, Banks now have the capabilities which use to be exploited by the largest smart-card users in the world – the Telcos. Telcos have over the years innovate what they can do with the 'smart' SIM (Subscriber Identity Module) cards ranging from contacts information, SMS mailboxes, games and on-demand applications such as live stock quotes, video streaming to electronic wallets, etc. to increase its subscriber spending.

Banks are now able to leverage on these features of the smartcard to have multiple applications residing on the smart card and localized storage of information to create customized offerings or personalized services for card holders. This allows Banks to create one-to-one marketing program, tracks consumer spending patterns more efficiently and offer cross-selling opportunities at the point-of-sale through the download of vouchers or promotions. At the same time, utilizing the ability to perform off-line transactions, Banks can be more business friendly to merchants by instituting variable floor limits so as reduce transaction time while managing credit and fraud risks, especially in fast-food outlets where quick service turn-over is of paramount importance.

As highlighted above, with customers' increasing demand for greater convenience and service level, a simple card payment transaction no longer suffice to fulfill customer needs. More complicated and complex transactions incorporating loyalty program, privilege program, voucher program, personalization program, etc. together with card payment transaction is going to be the norm in the near-future.

In order to achieve the above goals, Banks need to have an **intelligent transaction platform** which supports a key concept termed **Active Transaction Routing (ATR)** which allows a single '**composite transaction**' to carry multiple constituent transaction messages. These messages can then be composed into various combinations to create a wide variety of unique services. With this platform, the Banks are equipped with the flexibility of implementing new applications and complex business rules that extend beyond the Banks' hosts to third party service providers, etc. with minimal customization to back-end hosts. This capability and agility to create new services will not only enhance revenue or reduce costs but will also further strengthen the bank's competitive edge.



An example of such a service is the ability for a cardholder to purchase prepaid mobile airtime reloads via credit card and the subsequent award of loyalty points or vouchers for the transaction. Creating this service will bring about the following benefits:

- Provides service differentiation and convenience to the bank's cardholders; thereby reducing churn and encouraging spending
- Generates additional revenue stream through prepaid mobile top-up transaction margins
- Attracts merchants participation in the bank's loyalty program and also, creates the potential to introduce cross-selling via the award of electronic vouchers

Competitive advantage by leveraging on communication technologies

An immediate and simple way to realize quick returns on investments is to consider newer connectivity options, which also determine the devices that can be used to originate payment transactions. Another area for considerations is the built-in security or additional security required to secure the payment transactions.

Connectivity options	Benefits
Integrated Services Digital Network – ISDN is a digital based network	<ul style="list-style-type: none"> ➤ Higher speed of 64kbps vs 9.6kbps for Analog leased line or typical PSTN line. ➤ Allows normal PSTN (Public Switched Telephone Network) dial-ins. ➤ On-demand dial capability to achieve cost-savings on a 'as-needed' basis where the charging model is based on connection time ➤ Alternative dialing numbers to achieve high-resiliency ➤ Better clarity and connection resulting in less dropped calls
General Packet Radio Services – GPRS is a mobile data service provided by cellular companies	<ul style="list-style-type: none"> ➤ Lower costs due to charging model by data size rather than by connection time (typical card transaction is less than 1kB). ➤ Increase revenue by reaching out to new market segments where fixed-line connectivity is limited or not practical such as remote areas, exhibitions/conventions, mobile merchants like as real-estate agents, insurance agents, police, etc. ➤ Reduce deployment time as there is no waiting time for installation and commissioning of lines as all configurations and preparations can be done before hand.
Asynchronous/Synchronous Digital Subscriber Line - ADSL/SDSL is a low-cost broadband alternative utilizing existing copper phone lines	<ul style="list-style-type: none"> ➤ High speed typically starting at 128kbps to 512kbps ➤ Fixed monthly fee typically much lower than leased lines

As such, it can be seen that numerous benefits can be derived such as **cost-savings, better performance, new market penetration capability, reduced deployment time**, etc. With proper implementations, **customers and transactions immediacy (real-time information) for better decision-making** can also be achieved.

Besides, with the right equipment, Banks can also achieve multiple communication channels fall-back policies to further increase the availability of the underlying communications infrastructure while reducing costs. An example is the usage of ADSL as a primary connectivity channel, while falling back to GPRS as a secondary channel and ISDN as a tertiary channel should the ADSL channel and/or GPRS channel become unavailable. Through a combination of such technologies, Banks may be able to achieve the reliability of a leased line connection while paying only a fraction of the costs!

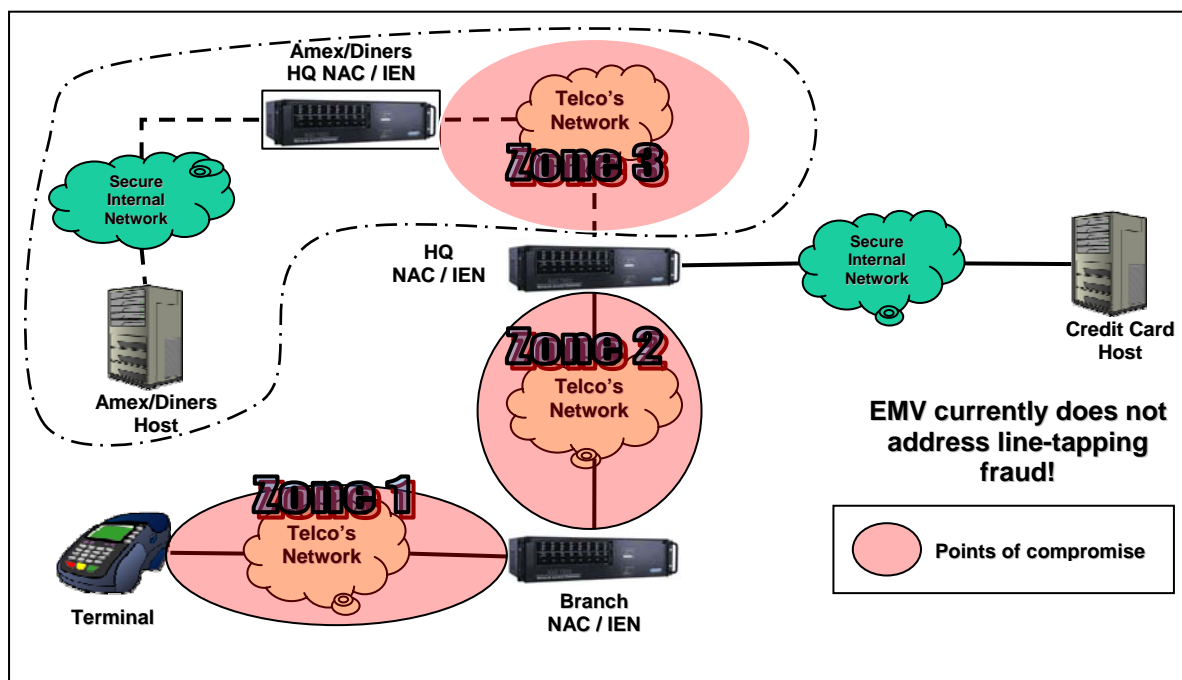
Competitive advantage through fraud reduction

Turn challenges into opportunities by addressing fraud head-on

Armed with a secured infrastructure, Banks are able to compete in areas or markets where they have not ventured before such as 'high-risk' merchants that attract higher Merchant Discount Rate (MDR) thus increasing merchant acquiring revenue. Coupled with the right marketing program, Banks are also able to gain greater consumer confidence thus encouraging consumer spending while at the same time lowering their operating costs through lower charge-backs and riding on the Card Associations (Visa, MasterCard, American Express, etc.) liability-shift policies.

Even with EMV, the payment network remains vulnerable

Even though one of the key objectives of EMV was to curb the alarming rise of card and payment frauds, unfortunately, many do not realize that this objective is hampered by the disparate EMV adoption datelines worldwide. Lured into a false sense of security in thinking that EMV is the silver bullet for tackling all types of fraud, many Banks are unaware that the payment network continues to remain the most susceptible and vulnerable to security threats and fraud risks – especially line-tapping or wire-tapping fraud. Without the proper security mechanism in place, more advanced level of fraud such as Host-spoofing (a 'fake' host is inserted in the payment network giving false responses) could also occur.



The solution then is to implement a Line Encryption solution. This is where Malaysia's Bank Negara (the Central Bank of Malaysia) has taken a pro-active approach which is also the first nation in the world to mandate that all acquirers put in place a line-encryption solution to protect sensitive card holders' information as the payment transaction is sent across the network. Together with industry players ranging from Banks, Vendors, Card associations and independent consultants, a comprehensive working paper was drafted which served as the foundation to implement a line-encryption solution.

Do not let your payment infrastructure be a hot-bed for fraudulent activities!

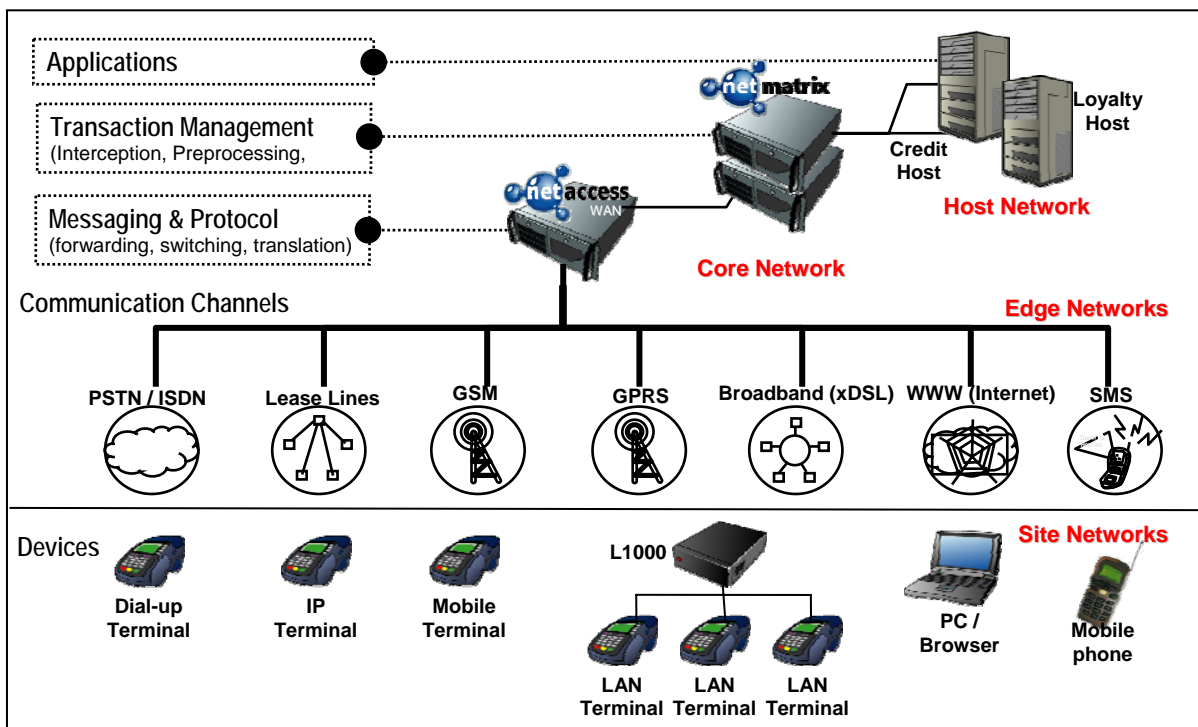
The need for an Adaptive Secure Payment Architecture

Recognizing the uphill battle that Banks are currently facing in having to cope with an ever-changing payment landscape, continuous technological advancement and rising security threats, GHL Systems has pioneered its **Adaptive Secure Payment Architecture (ASPA)** with the aim of helping Banks overcome such issues and more importantly, to go beyond merely existing as just another player within an increasingly competitive industry.

ASPA Vision
Tomorrow's Technology for Today's Bank

ASPA Mission
To help our customers create a competitive advantage in an ever-changing payment landscape addressing today's needs and tomorrow's opportunities through a holistic approach

ASPA is GHL Systems' architecture for establishing a highly-available and flexible end-to-end payment infrastructure that addresses challenges arising from security threats and fraud risks while protecting against technology obsolescence. ASPA's blueprint goes further to take into account the Banks' future needs to have rapid and seamless implementation of new applications and services (whether developed in-house or by third-party service providers) into their payment infrastructure. These innovative applications such as personalized loyalty and cross-selling programs leveraging on advancement in chip-based technology, are critical to facilitate consumer spending.



In summary, ASPA allows Banks to create additional value by introducing innovative applications and services rapidly and securely, with minimal obsolescence by leveraging on new technologies and capabilities. This will give Banks the following competitive edge - the ability to achieve competitive differentiation while concurrently exploiting more value out of their investments through revenue enhancements and cost reduction opportunities.

ASPA Building Blocks

NetAccess Intelligent Transaction Network Device

The distinguishing feature of NetAccess lies in its ability to deliver multiple types of payment transactions (credit, debit, prepaid, loyalty, generic data, etc) over multiple secure and redundant uplink / downlink channels (analog / digital leased line, PSTN, GPRS/GSM/SMS, ISDN, xDSL, VPN etc.) in a highly scalable and cost-effective way. With a plug-and-play architecture, this device can integrate seamlessly into an existing payment network consisting of IENs or NACs.

As NetAccess was developed from the ground-up based on the ASPA framework, driven by an intelligent messaging and routing software layer across industry-standard hardware, its strengths lie in its simplicity and flexibility to adapt quickly to new requirements such as variable message length, customized message formats, message filtering capability, etc. to protect existing investments and also to realize a quicker returns on investments compared to proprietary firmware and hardware based approaches.

NetMATRIX Active Transaction Platform

NetAccess can be further be enhanced with NetMATRIX (**M**ulti-**A**pplication **T**ransaction **R**outing and **I**dentification **eX**change) as an additional software layer, which provides an **intelligent transaction platform** to support the rapid introduction of complex and innovative applications requiring transactions management capability with minimal customization to back-end hosts. It also supports the key concept of Active Transaction Routing (ATR) introduced earlier; which allows a single 'composite transaction' to carry multiple constituent transaction messages which can be composed into various combinations to create a range of varied and unique services.

NetMATRIX TLE (Terminal Line Encryption)

NetMATRIX TLE is a multi-faceted security and key management solution that addresses wire-tapping, ghost terminals and host-spoofing frauds. Leveraging on NetMATRIX active transaction platform, it integrates seamlessly into existing payment infrastructure with full EMV support while providing functionalities for key management, encryption, authentication and deployment. Its bi-directional (uplink/downlink) encryption together with its unique Remote Key Injection feature allows Banks to manage the key injection process securely and centrally, thus reducing costs by reducing the number of trips required for on-site deployment.

NetMATRIX TLE can be extended to support encryption/decryption beyond EDC Terminals to devices which requires a low overhead in terms of processing power and memory space such as Automated Teller Machine (ATM), Electronic Cash Register (ECR), Mobile applications, etc.

NetMerchant

NetMerchant is a real-time enterprise payment processor capable of handling credit/debit card payment transactions that processes and manages on-line card authorization between merchants and Banks. It functions as a 'software version' of the physical credit card EDC terminals. It is specially designed to automate and streamline the operation of credit card payments processing for higher productivity and profitability.

NetMerchant is also designed with value-added features that automates and simplifies the processing of credit card payments by integrating to merchants' applications such as Call Centres, Interactive Voice Response (IVR) systems, Electronic Cash Registers (ECR), E-Commerce web sites, etc. It can also be programmed to generate recurring payment transactions on scheduled dates which are required in environment like monthly insurance premium payment, monthly cable or satellite televisions bills, easy payment / installment schemes, etc.

Conclusion

Banks need to capitalize on the ever-changing payment landscape brought about by the current regulatory and competitive pressures to create their competitive advantage.

ASPA provides the framework for banks to create that competitive advantage by having a rapid deployment platform that encompass their entire payment infrastructure which supports:

- ◆ Products & Services differentiation
 - ◆ To increase revenue by introducing unique 'composite' transaction that allows creation of products and services to meet increasing customer's demands for convenience and service level so as to reduce churn and increase consumer spending.
 - ◆ To reduce cost and time-effort in rolling out these products and services efficiently by minimizing back-end hosts changes so as to be able to roll-out these new services promptly to realize a quicker returns.

- ◆ Market differentiation
 - ◆ To increase revenue by capturing markets not deemed probable or profitable before through the implementation of technologies such as GPRS or terminal line encryption solution to overcome:
 - Technological constraints - limited fixed line availability, costly infrastructure and cabling costs, etc.
 - Risk constraints - high-risk merchants, charge-back issues, fraudulent activities, etc.
 - ◆ To reduce cost and time-effort in rolling out payment services through the deployment of GPRS which could reduce communication charges substantially due to a charging model based on data size rather than connection time.

GHL Systems Bhd. has the *products, services* and *experience* to implement ASPA to achieve the above competitive advantage with much greater value propositions.

About GHL Systems Berhad

GHL Systems Berhad ("GHL Systems"), a company listed on the MESDAQ market of Bursa Malaysia, is one of Malaysia's major payment services enablers that deploys world-class payment infrastructure, services and technology. GHL Systems provides credit, debit, stored-value and loyalty card solutions via Electronic Draft Capture (EDC) terminals to retail merchants nationwide, as well as provides e-commerce payment hosting services through PayDirect.com.my. GHL Systems also offers "Whoops!", the first prepaid reload service in Malaysia that allows mobile phone users to reload their airtime in a secure and convenient way without using Personal Identification Numbers (PINs).

GHL Systems' clientele includes 13 leading local and foreign banks and two non-financial merchant acquiring institutions. In addition, GHL Systems has partnered with three major telcos, two leading loyalty program operators and two retail petroleum players on various payment acceptance services and solutions in both physical and virtual environments.

More information about GHL Systems can be found at www.ghl.com or email us at corpsales@ghl.com