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OMNIBUS National Switch of Bangladesh goes live with Phoenix

BRAC Bank Ltd, the fastest growing bank in Bangladesh, and ITCL (QCash), a private ATM network currently serving 12 member banks, have launched OMNIBUS, the first neutral inter-bank switch of Bangladesh.

OMNIBUS is an independent association of member banks and financial institutions that will operate and manage the shared switch. As a first step, OMNIBUS integrates the ATM & POS networks of BRAC Bank and Q-Cash, enabling cardholders of BRAC Bank and QCash member banks to access their accounts from any of the 150+ ATMs and 1,200+ POS terminals. OMNIBUS, powered by TPS Phoenix switch, is modeled around the success of 1LINK, the shared ATM switch of Pakistan.

The chief guest addressing the launching ceremony

The shared ATM/POS switch offers significant convenience to customers of its member banks through more transaction touch points, providing 24/7 banking with wider reach.

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Standard Chartered awards contract to TPS for its Integrated Financial Delivery Architecture

Standard Chartered, with a history of over 150 years in banking, operates in many of the world's most dynamic markets with an extensive global network of more than 1,700 branches in 70+ countries. The London headquartered group leads the way in Asia, Middle East and Africa representing some 115 nationalities.

Standard Chartered Bank (Pakistan) Limited is the largest and fastest growing locally incorporated international bank in Pakistan with 174 branches spread across 39 cities.

In line with SCB's stringent governance and corporate responsibility ethos, SCBPL has opted for TPS Phoenix for its end state ATM / Debit Card platform in the country.

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http://www.tpsonline.com

TPS

expands its horizon of e-Banking

The dawn of e-banking has revolutionized the way financial services industry conducts business. As a result, financial institutions have been empowered with new business models and innovative ways to offer worldwide, 24x7 accessibility to their customers. Habib Bank Limited has always been on the forefront of offering value-added services through its diversified alternate delivery channels. HBL, over the past 11 years, have constituted an unparalleled and robust financial delivery architecture with an extensive network of 1400+ online branches, 270+ ATM machines and around half a million cards serving over 5 million customers. TPS is a longtime e-banking strategy and implementation partner of HBL for its global operations in 25 countries. The latest highlights of this valuable partnership are outlined below:

Phoenix to revamp ATM infrastructure in Oman

To offer completely characterized self-service banking services to its customers in Oman, HBL has chosen TPS Phoenix switching middleware. At HBL Oman, Phoenix will replace the existing switching technology to offer reliability, flexibility, maturity and focused services at par with HBL's commitment to excellence.

Phoenix is an EFT switch and middleware that dovetails various remote banking channels into an integrated alternate distribution schema for delivery of various financial and non-financial services through a unified interface. TPS Phoenix will be implemented as an ATM Controller and a debit card issuance system besides providing connectivity to the country's shared ATM network and Al-Watani Switch.

"Serving a vast global clientele , HBL carries with it an equally critical responsibility of serving its customer base with convenient and innovative products and services. Technology, supported by competent and timely services, play a momentous role in a business' success. We found TPS as a reliable technology partner with professional commitment towards delivering cost-effective and efficient solutions. At HBL Oman, Phoenix delivered seamless integration while involving minimum risk and disruption to the bank's operations. We are confident that Phoenix will be a significant platform for the bank now and in the future to continue offering value added services to its customers"

Mr. Ekram-ul-Haq,
VP & Head ADC, IT Group, HBL

HBL credit card holders get online access to their accounts

Adhering to its commitment to provide greater convenience and global acceptability, HBL has launched its VISA flagged Credit Card, packed with the international power of Visa, with over 24 million acceptance locations in 25 countries.

Having country's second largest ATM network and added delivery channels to offer convenient, secure & accessible services to its customers, HBL offers various financial and non-financial credit card services for its cardholders on its 24x7 available electronic channels. The introduction of VISA credit card marks HBL's latest addition to a series of new initiatives aimed at adding value to its vast product repertoire.

HBL selected TPS to have an online integration between TPS enterprise switching technology, Phoenix, and CTL Credit Card Host, and to enable the services on the delivery channels driven by Phoenix. CTL, now TSYS Card Tech, is a UK-based global provider of innovative systems to the payment card industry and is one of the largest card processor in the world.

TPS, with 100+ satisfied customers across 25 countries, feels proud to be associated with HBL as a trusted technology partner and selection for HBL's operations worldwide is a testimony to the trust and confidence placed on TPS.

Improved customer services with InSight 3.1

For empowering its customers with enhanced services and greater uptime of its vast network of ATMs, HBL has implemented Insight 3.1, the next generation web based self service terminal monitoring and management solution from TPS.

InSight 3.1, implemented and live at HBL, is the next generation web based solution for monitoring the ATM network from anywhere, anytime. This allows HBL to help its clients decrease customer service calls, maintain a healthy customer service relationship, improve operational efficiencies and reduce downtime to the best possible. InSight is a one stop cost effective solution and serves as the central point in the banks for Information acquisition related to any aspect of the ATM network, enabling suspect transaction resolution, reporting, quick and proactive alert notifications for any issues relating to the ATM network or Hosts.

"With over 1.5 million terminals worldwide, the ATM channel has become a key touch point and has attached increased value to it beyond simple cash dispensing. Any ATM network downtime therefore impacts customer satisfaction and loyalty. Having a all-in-one solution like InSight, for monitoring the entire ATM network enables HBL to monitor ATMs remotely and cost-effectively, which ultimately impacts our customer services and return on investments."

Mr. Ekram-ul-Haq,
VP & Head ADC, IT Group, HBL

Case Study : 1LINK goes live with Utility Bill Payment Service

The Need

A significant increase in the number of utility services subscribers has drastically increased the number of transactions, making deposit and collection of utility bills tedious, inefficient and costly. In addition faulty reconciliation of bills from different collection points has been hampering the growth and quality of service of these companies. To make this process efficient and cost effective, the need for an automated Utility Bill Payment Service was felt.

The Challenge

The bill payment process and customer service standard could only be solved with a centralized platform that facilitates bill payment any-time & any-where, whereby removing reconciliation anomalies and overheads.

1LINK was a perfect platform to present an advanced payment service as it had the connectivity to all major banks and electronic transactions from ADCs were already being routed through it. Responding to the customer needs, TPS yet again came up with a model of service (Utility Bill Payment System) which the 1LINK member banks readily adapted.

The Solution

Utility Bill Payment Service (UBPS) is an Electronic Bills Presentment and Payment (EBPP) system, intended to facilitate 1LINK member banks to offer bill presentment and payment service through their electronic delivery channels.

Member banks that choose to present UBPS to its customers will have the advantage of offering the service through its ATM network or any other delivery channel that the bank prefers. This provides an added benefit to the bank as new utility companies are being interfaced with 1LINK, enabling the member bank's customer can easily pay a greater variety of bills. Now the bank does not have to interface with different utility companies to offer bill payment, rather just have one interface with 1LINK which can cover all utility companies.

The Success

Utility Bill Payment System (UBPS) on 1LINK switch was successfully launched on 31st July 2007 for the gas sector of Pakistan, powered by TPS technologies; which have taken 1LINK to new heights towards modernizing e-Payment systems and e-Commerce objectives of the e-Banking marketplace.

Currently eight banks are LIVE with 1LINK-UBPS service and more banks are gearing up for certification.

"Utility Bills Payment System(UBPS) is a one window facility, whereby customers of 1LINK participating member banks would be able to pay their Utility bills through various electronic delivery channels like ATMs, Internet, IVR and call centers etc., round the clock on 24 x 7 basis anywhere in Pakistan."

Khayyam Mahmood Butt
Chief Executive, 1LINK

1LINK goes 3DES and PCI DSS compliant with VISA

1LINK (Guarantee) Limited, Pakistan's largest shared ATM network is now 3DES and PCI DSS compliant with VISA. Visa Inc., is the world's largest retail electronic payments network and the most recognized global financial services brand.

As per VISA mandate, the middleware/switching system's processing, storing, or transmitting payment card data must be PCI DSS compliant to prevent compromise in customer's valuable data. Additionally VISA has mandated all banks to upgrade their ATMs and implement a more secure data encryption standard, 3DES. 1LINK being VISA certified and compliant, offers its valuable members access to VISA's global transaction processing network – VisaNet present in 170 countries and territories with unsurpassed acceptance at 29 million merchant outlets and 1 million ATMs across the world.

1LINK, now being 3DES & PCI DSS compliant, offers its valuable customers a multifaceted security standard that caters to security management, policies, procedures, network architecture, software design and other critical protective measures. 1LINK, is the largest shared ATM network in Pakistan, with a network of 2200 + ATMs and will help banks proactively protect customer account data. The 3DES encryption standard, implemented by 1LINK, will help prevent sophisticated frauds.

This is one of the latest initiatives taken up by 1LINK after the VISA connectivity, Inter bank funds transfer and utility bills payment service on the 1LINK platform. TPS, the e-banking domain expert, provides support of 3DES and PCI DSS for the latest in industry-mandated advanced security standards for solutions meeting the need of e-banking industry.

ABN AMRO Pakistan contracts TPS for Debit Master Card

ABN AMRO Bank, one of the most reputable foreign banks in Pakistan with over 80 branches covering 24 cities, has inked a deal with TPS to acquire technology for Debit MasterCard program.By becoming a member of MasterCard, ABN AMRO Pakistan will empower its customers the ultimate convenience and financial control through worldwide acceptance and benefits of MasterCard; with 24 million POS terminals in 996,000 locations and more than a million ATMs in 210 countries across all 7 continents, no payment card is more widely accepted globally than MasterCard.

TPS, is a strategic technology partner of ABN AMRO Bank in the area of remote banking.

1LINK successfully migrates its Data Centre infrastructure

1LINK, the largest financial shared services switch in Pakistan, has accompanied the banks, from the front, in their growth and enhancement of their ADCs, by offering innovative services. 27 Member Banks are currently using 1LINK platform to facilitate their customers while benefiting from the array of 1LINK services; from simple ATM network sharing to more complex inter-bank funds transfer facility, VISA, Utility Bills Payment etc.

Recently, 1LINK achieved a major milestone by shifting its full fledged operations to 1LINK Data Center at Park Towers. This major commotion was planned in two phases, first being network migration - 18th August '07 and other being Server Migration & Movement – 28th October '07.This phased approach resulted in minimum downtime and service interruption.

TPS congratulates 1LINK team on successful migration to their newly constructed Data Center and office.

National Switch of Bangladesh goes live with Phoenix (continued from page 1)

OMNIBUS creates a more efficient national payment infrastructure by electronically switching payment transactions between member banks. In addition, the instant increase in the number of ATMs enables the banks to improve their operational efficiency and customer services.

OMNIBUS is expected to catalyze the growth of e-Banking in Bangladesh, setting a firm foundation for the introduction of more value-added services like bill payments and transfers, on diversified electronic channels. The shared network will soon offer services to facilitate the customers to access their accounts conveniently.

"BRAC Bank is proud to have TPS as its key technology partner in its alternate delivery channel proliferation strategy. BRAC Bank's proprietary ATM network, launched in 2005, is driven by Phoenix and more recently, TPS has also provided the inter bank switching solution for the OMNIBUS shared ATM network sponsored by BRAC Bank. What differentiates TPS from other technology partners is that it is a forward looking and agile institution that has not only held our hand during these critical technology implementations but also shared freely of their vast repertoire of knowledge in this area"

Mr Kaiser Tamiz Amin
DMD & COO, BRAC Bank Ltd.

Saudi Pak Bank signs TPS for Disaster Recovery Solution

Saudi Pak Bank is an avant-garde organization differentiated by professionalism, dedication and a broad spectrum of innovative, customer-oriented & technologically advanced products & services. It currently spans across 21 cities of Pakistan with 50 online branches. In line with its customer-centric policy, Saudi Pak has inked a deal with TPS for Veritas Cluster Server, a solution which will provide disaster recovery and business continuity for the bank's enterprise transaction switch, Phoenix, to cater to the requirements of Saudi Pak Bank for e-Banking facilities to the customers and the operational staff.

TPS will provide industry's leading cross-platform clustering solution, for minimizing application downtime and ensuring high-availability of Saudi Pak's mission critical services with ideally zero data loss. This robust and reliable solution also guarantees data consistency and integrity at primary as well as disaster recovery site.

Cluster Server, through central management tools, automated failover, features to test disaster recovery plans without disruption, and advanced failover management based on server capacity allows IT professionals to capitalize on resources by moving ahead of reactive recovery to proactive management of application availability.

Standard Chartered Bank Pakistan selects TPS for its Integrated Financial Services Architecture
(continued from page 1)

TPS Phoenix middleware competence will be used by the bank for deploying various value-added financial services, for its customers on diversified delivery channels, while maintaining a single, consistent and reliable interface to their back-end core banking systems. This will effectively shield and isolate SCBPL's delivery and channel management from its core business functions allowing the bank to concentrate on core business development. Phoenix will provide interaction and transaction capability to all SCBPL ATMs.

broadens its service spectrum with TPS Technologies

United Bank Limited (UBL) is one of the largest commercial banks in Pakistan having more than 1,000 branches inside the country, 15 overseas branches, customer base of more than 3.5 million and international presence in 10 countries. With UBL's state of the art online banking, customers have the convenience of accessing their account from more than 350 branches located in 71 cities across Pakistan. UBL has assets of over PKR 300 billion and a solid track record of forty six years. UBL has over 14,500 employees worldwide. With a wide-ranging and dynamic portfolio of globally competitive products and services and nearly half a century of a proven track record, UBL is considered to be one of the leading banks at the forefront of the banking sector.

UBL launches Inter Branch Transfer Solution (IBTS)

UBL in its zealous strategy to serve customers better is continually offering technically advanced and operationally enhanced services to its customers. In line with this strategy, UBL, having customer service at the heart of its operations, has launched Inter Branch Transfer nationwide in 682 Online Branches.

The idea originated from the use of 1st inter branch solution called Non-Financial Push (NFP) being used to send non-financial transactional messages across branches, of size up to 2 Kb. This could be particularly used for blocking pay-orders or exchanging critical branch information. However, where NFP could be initiated from a few branches only, IBT can be instigated from any online branch. The machines from where the message was initiated would send it to a central server where hosts from each bank would poll for their message. This system incurred speed limitations and traceability issues. With a total of more than 750 online branches and their X tellers polling for Y messages, the system could not be relied in the long term.

UBL and TPS together developed the program of IBT using Phoenix by TPS. Now, customers are empowered to transfer funds from an account in a branch to another account in a different branch, while the transaction can be initiated from any of the two or a third branch. Any Teller machine in a branch will forward the fund transfer details to the Phoenix server which will decide, through its communication with concerned hosts, that account A from a branch X shall be credited and account B from branch Y shall be debited.

This is a major boost in services for non card holders who do not use IBFT facility on ATM machines to transfer funds. Equally, there is a limit to the amount of fund transfer on ATM where as IBT transfers fund with no regard to the amount. Cheque clearing is independent of location and faster than ever, consequently increasing branch's efficiency. IBTS is also idyllic for cross city inter-bank payments as it allows funds transfer in a real-time, faster, secure and cost efficient manner. The IBTS origination also unlocks possibilities of unmarked and exciting product designs over this fundamental service infrastructure in the areas of customer to customer (C2C), business to business (B2B) and customer to business (C2B) transactions.

UBL, with its extensive branch network offers its customer international access through IBTS, delivering promised customer satisfaction, ease-of-use and cutting heavily on bank's operational costs.

UBL Middle East implements effective Dispute Resolution system

In the previous years there has been a tremendous increase in the number and dependency on ATMs for providing value added banking services with greater convenience. This has led to a pressing need to monitor and control all elements of ATM networks more closely to increase network reliability, especially when financial institutions are seeking to introduce new revenue-generating services for their customers.

UBL, inline with its goal to maximize customer convenience, has opted for TPS InSight & EYE/EJ for monitoring and management of its extensive ATM Network in Middle East.

TPS InSight has proved to be the most fundamental solution for SST monitoring by significantly reducing management overheads, improving services, network uptime and providing flexible remote banking network monitoring and management platform. TPS has customized InSight and made the core application versatile by incorporating the bank's unique requirements like monitoring cash and cheque deposit transactions. This upgraded version of InSight is a rewrite of all legacy backend and front-end part of the application into the new and mature environment of .NET. This version is not only a technological upgrade but also moves the product ahead of other similar products in the market.

With the implementation of TPS EYE/EJ, UBL Middle East is enjoying the advantage of high quality, winning solution from TPS to enjoy a higher level of customer satisfaction, convenience and faster dispute resolution, in addition to operational efficiency and moderation.

Growing e-Banking trends in Pakistan

E-Banking made its debut in UK and USA during 1960s and became prominently popular through electronic funds transfers and credit cards. The ATM is now more than 40 years old, with the first transaction being made at a branch of Barclays Bank in Enfield, London, on June 27, 1967. The concept of Web-based banking came into existence, in Europe and USA in the beginning of 1980s. Today, a wide range of services are being rendered by banks using the electronic channels. Since that time, ATMs have gone from being an exciting new technology to a tried-and-trusted part of banking infrastructure. Estimates developed by ATMIA place the number of ATMs in use at over 1.5 million as of August 2006.

Similarly in Pakistan, Information technology has transformed the banking industry drastically and paved way for banks to present differentiating products and services to meet the changing needs of their customers, while at the same time optimizing cost savings and improving operating efficiencies. ATMs, phone banking, internet banking, credit and debit cards have changed the face of traditional banking products. Banking is no longer confined to the four walls of a branch.

Decreasing costs and increasing efficiency

The several advantages of e-banking to the financial institutions include lower transaction costs, 24 hour services availability, expanded business territory and dramatically increased operational efficiency in day to day business. In addition the banks benefit from better branding and better responsiveness to the market.

Figure 1: Growth in the number of ATMs and Online Branches: 2002 to 2007
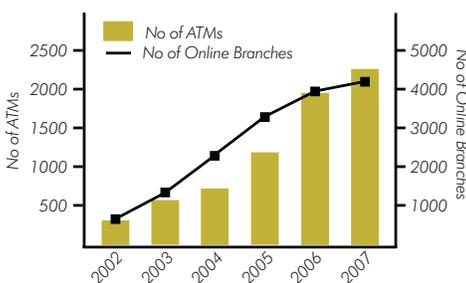
Those banks that offer novel and innovative services are perceived as leaders in technology implementation, and therefore enjoy a better brand image. The obvious advantages to the consumer are convenience and flexibility on top of powerful, continuous and quick access to information and e-Banking facilities.

Superior governance and effective implementation

Supportive policies by the government & State Bank of Pakistan have been a key factor in the growth of electronic banking. The formulation of E-commerce task force has been a big step towards the development of e-banking in the country. The ISP network has also been expanded across Pakistan with good bandwidth to facilitate the e-banking infrastructure. Other then that SBP has also played an important role by encouraging & promoting e-banking in the country.

Figure 2: Transactions through ATMs, 2002 to 2007
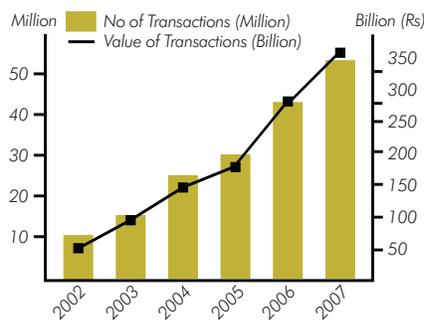
From late nineties to date, e-Banking and self service industry has seen rapid growth and revival. Be it introduction of ATM middleware switch or management of ATM networks, retail and corporate internet banking or phone banking, banking in Pakistan has been revolutionized.

Improved services, greater penetration

Expansion of alternate delivery channels to distant cities and villages has enabled banks to penetrate deeper into Pakistan's socio economic system by offering various standard and novel e-banking services from tier I to tier III cities. The biometric ATMs were launched in unbanked areas to cater to the

shopkeepers, cottage industries and small entrepreneurs. A recent addition in electronic transactions has been allowing clients to access their accounts for fund transfers, remittances and even utility bills payments from almost any ATM or the internet. In the past 2-3 years banks have also launched internet banking and the internet banking is now improving with more sophistication and services for corporate banking customers. Within the local banking sector, Allied bank has established the largest ATM network with 405 ATMs. Its nearest competitors are UBL and HBL, having networks of over 300 ATMs. 1LINK, the largest shared ATM network in Pakistan, is a consortium of 27 major banks, catering to a network of around 2200 ATMs in Pakistan.

Strengthening channels, emergent trends

The number of ATM machines has increased to 2,293 with the installation of 681 new machines during FY 2007 reflecting a growth of 42 percent over the previous year. Similarly online branch network has also expanded with the addition of 1,164 new online branches raising the total number of online branches to 4,179.

Figure 3: Number of ATM/debit /credit cards (000's) in issue: 2002 to 2007
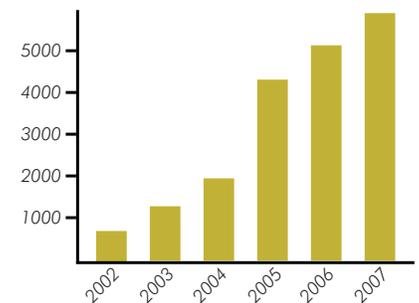
The number of ATM transactions during FY 2007 have also increased by 16.5 million showing an impressive growth of 47 percent over the preceding year while the value of ATM transactions increased by Rs. 141.4 billion to Rs. 352.4 billion, registering a growth rate of 67 percent over the previous year. However, ATMs were largely used for cash withdrawals and only marginally for other purposes like Cash Deposits, Payment of Utility Bills and Account to Account Fund Transfers.

Continuous innovations & Future Prospects

The future of e-banking can be found in the intersection of changes in technology, lifestyles, regulation, demographics and geopolitics. A properly configured e-banking infrastructure will ensure orderly growth and sustainable economic progress for Pakistan. Consumers will evaluate e-banking products and services based upon trust, confidence, user privacy, transaction legitimacy, security, system dependability and merchant acceptance and conveyance.

The newest industry buzzword is 'm-banking'. This latest abbreviation stands for 'mobile banking' which is the current focus of many bank's strategy. M-banking would provide customers with an additional channel form services and increased mobility. M-Banking offers much more potential and now the race is on to see who will provide the first services.

Moving forward, a careful balance of regulatory reform that includes an industry-wide architecture and affiliated governance structure, coupled with well-managed bank initiatives, will be needed. Moreover, increased financial transparency, clear banking standards and predictable regulatory enforcement will be of enormous help.

In the 21st Century there will be a lot of banking but there will be no banks"- Bill Gates

TPS moves to its new facility in Dubai Internet City

TPS inaugurated its new office in Dubai Internet City in August 2007. Besides the elite clientele in Pakistan, TPS Middle East serves banks in Kuwait, Jordan, Lebanon, Syria, Egypt, Bahrain, Qatar, UAE, Oman and Morocco. The primary function of this front office is to provide first line customer support and services to its customers in MEA region, being closer to them geographically. The office manages support of

TPS Regional Office in Al Thuraya 2, DIC, Dubai

over 35 customer sites including QTEL, Etisalat and MTC Vodafone. This has led TPS to emerge as a dominant player in the Middle Eastern market.

The breakthrough in the Middle East was venturing into cash deposit automation software. TPS SMART deposit, is the defacto standard in terminal based deposit automation solution in the Middle East. TPS solutions are robust, mature and stable, targeting vital sectors of high economic importance, banking and telco sectors.

TPS holds its annual GBM for 2007

TPS organized one of its regular events, Annual General Body Meeting for the year 2007 in August, at the Avari Towers, Karachi. The event was represented by over 120 members. The meeting started on time with a welcome address by TPS' Executive Vice President, Mr. Ovais Habib Khan followed by presentations by the team leads of Customer Support, Marketing, Technical and Human Resource departments.

In his welcome address, Mr. Ovais presented an overview of TPS' objectives and its pivotal role in the e-Banking and e-Payments industry of the nation, and then discussed the agenda of the meeting. The team leads then continued to deliver well-articulated presentations highlighting their department's strengths, achievements and initiatives during the past year and also shared their plans for the future followed by round of applause for the star achievers. Few minutes of break with coffee and snacks was given to rest and socialize with colleagues followed by remaining departmental presentations. These presentations provided a unique opportunity to all the employees of TPS to share, learn and provide input for further enhancing the effectiveness and relevance of departmental services.

The GBM came to a close with an encouraging and well rounded closing note by the CEO, Mr. Mohammad Sohail. The closing speech enlightened TPS family with a clear corporate vision and mission, successful memories of 2007 and great excitement and enthusiasm to step into the year ahead. He discussed a variety of initiatives aimed at enhancing the capacity to take TPS to greater heights and sustain its 'Numero Uno' position in the e-Banking industry. He ended the speech with great momentum where he thanked 'the young pool of energetic, committed and capable individuals for active participation that make TPS what it is today". The closing speech was followed by a question/answer session and constructive feedback from the TPS family members. The event was brought to a close with the announcement of dinner where everybody had an excellent time.

Java Cards: Security coupled with portability & convenience

From the ATM to the self-checkout counter and from inter-bank funds transfer to mobile banking, self-service has revolutionized the way consumers do business. Putting it simple, they expect their expectations to be exceeded. Globally, financial institutions are employing self-service to enhance consumer experience and improve operational efficiency.

On a similar note, the e-banking and self-service industry in Pakistan has witnessed rapid growth & development since its revival in the early nineties, consequently reforming the entire financial industry, particularly the banks. 4000+ online branches, 2000+ ATMS, 30,000+ POS and more than 5.5 million card base are mere outlines of the actual banking revolution.

Card Plastic or Cards are primarily used by banking customers to access their accounts and interact with their banks through different delivery channels for various banking purposes. The two most popular types of cards are debit and credit cards.

As with any platform meant to interact in a networked world, there are security apprehensions that take on a new exigency when it comes to e-banking. When electronic blips are money, the stakes get sky-high. It may be a nuisance to lose a Web server that caters to fancy catalog ware; it becomes catastrophic if the Web server and its coupled backend executes all customer financial transactions.

The two prime aspects of Java card are portability and security. Java Card refers to a technology which allows small java based applications (applets) to be used on smart cards and other gadgets where memory and processing are severely constrained and environments, to which the technology is applied, are exceedingly focused. With Java Card technology you can carry around valuable and sensitive personal information such as your medical history, credit card numbers, or electronic cash balances in a medium that is compact, yet very secure.

A complete Java Card application consists of a back-end application and systems, a host (off-card) application, an interface device (card reader), and the on-card applet, user credentials, and supporting software.. All these components collectively form a secure end-to-end application. The API used in the development is compatible with formal international standards, such as, ISO7816, and industry-specific standards, such as, Europay/Master Card/Visa (EMV). Major industry-specific standards such as Global Platform and ETSI refer to it.

In Sync with the latest technology innovation and adaptation round the globe, TPS offers cost-effective, scalable turnkey solution for EMV personalization, called **SENTINEL**

In the banking industry, smart cards offer users secure access to an extensive range of networked financial services including cash machines, bill payment systems, and bridge tolls. Java Card technology enables a single smart card to host multiple financial applications, and to deliver third-party services such as mileage programs or secure online trading.

For the reason that smart cards are embedded with more nonvolatile storage than other highly portable devices, they make ideal storage compartments for digital identities. They can also compute hashes, session keys, digital signatures, and MACs right on the card. To the extent that a card is tamper resistant, it can be used to store important secrets such as DES keys or RSA private keys.

On the majority of cellular telephone networks, a subscriber uses a smart card generally called a SIM card to activate the cell phone. The card authenticates the user and provides encryption keys for digital voice transmission. When fitted with Java Card technology, SIM cards can also perform transactional services such as remote banking and ticketing. Hundreds of millions of SIM cards based on Java Card technology are already powering innovative services in cell phones.

In Sync with the latest technology innovation and adaptation round the globe, TPS offers cost-effective, scalable turnkey solution for EMV personalization, called Sentinel. It is an open platform solution that supports all leading chip technologies including Java Card. Sentinel helps financial institutions in their EMV migration process while adhering to stringent EMV standards ensuring fraud prevention and offering increased ROI to the organization's investments.

By Syed Faizuddin Alim
Snr. Business Development Executive