eBanking in Saudi Arabia: Trends and Perspectives - Panel Contribution

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Abstract
Saudi banks created on-line, real-time, 24X27 systems in the 1980’s. Saudi Banks are working together on shared e-system for B2B payments and authentication. Because they have already cooperated through SAMA (Saudi Arabian Monetary Agency) in developing shared payments systems (SARIE, ATM, POS) and have established processes for future cooperation. There are three ways in which e-Government; e-Commerce and e-Banking can benefit each other:

1. eGovernment and e-Banking: Banks as "payments facilitators", Banks as "trusted 3rd parties", Government as "funds conduit".
2. eGovernment and e-Commerce: Commerce as "traffic stimulator", Commerce as "process initiators", Government as "process completers", Government as "traffic stimulators"
3. eBanking and e-Commerce: Banks as "payments facilitators", Banks as "identity guarantors", Commerce as "funds conduit".

The aim of the paper is to describe Saudi e-banking systems. The paper will address the following: the Saudi Arabian Monetary Agency role, Saudi Banks experience in e-banking and the role of the Saudi Government. It was concluded that business projects in Saudi Arabia are now moving into electronic banking, but the move is gradual. A lot of customers are still very control-oriented, because the people who authorize the transaction may not have necessarily made the transition [to e-commerce].

Introduction
It is only about 10 years ago that the Saudi Arabian Monetary Agency (SAMA) took its first initiative to lay the foundation for a modern payment system. In 1986 it established an automated cheque clearing system that permitted efficient cheque clearing and interbank settlements. However, for many reasons cheques did not flourish as a payment medium and to fill the void, the banking industry moved rapidly towards plastic cards. Recognizing this trend, SAMA developed a national ATM transaction switch that linked all ATMs and permitted all customers to access their accounts with any bank in the Kingdom. This system, known as the Saudi Payments Network (SPAN), went live in 1990, and was enhanced to support point of sale transactions in 1993. The SPAN system has expanded rapidly, and by March 1998, it linked 1600 ATMs and 16000 Point of Sale terminals and provided round the clock access to their accounts for over 3 million cardholders anywhere in the Kingdom. Also, in the late 1980s, SAMA introduced two key initiatives, important for further rapid development of the payment systems in the Kingdom. First it required all Saudi banks to use the SWIFT network for international payments, and second in 1990 it launched the Electronic Securities Information System (ESIS). The latter is an electronic floorless share trading and settlement system that is operated and supervised by SAMA. This system, which has almost entirely dematerialized share trading, achieves T + 1 settlement as standard, and will soon be moving to delivery vs. payment (DVP). Despite these advances, Interbank settlements until early 1997, continued to be effected by cheque clearing or account transfer at SAMA's head office and branches. This suffered from all the inefficiencies and risks associated with a paper based system. Consequently there was a clear need for an Electronic Funds Transfer (EFT) system that would permit automated inter-bank payments and settlements and become the backbone of the Saudi payments system. SAMA recognized that such a system would need to combine the functionality of both a high value and a high volume payment system that would be the cornerstone for its future payment system strategy. This paper describes what is going in Saudi e-banking. The paper's outline is as follows. Section 1 describes the role of the Saudi Arabian Monetary Agency. Section 2 describes the Saudi Banks experience in e-banking. Section 3 describes the role of the Saudi Government.

1. Role of SAMA
SAMA has two main functions: Establishing the following e-payment systems, and supervising (monitoring) local banks and bank-customer relations

1.1 Saudi e-payment systems
Saudi e-payment systems are as following:
1.1.1 Saudi Arabian Riyal Interbank Express (SARIE)

The Saudi Arabian Riyal Interbank Express (SARIE), is a state-of-the-art interbank payments and settlement system, went smoothly into operation on 14 May 1997. The new SARIE system designed on the concept of Real-Time Gross Settlement (RTGS) will revolutionize electronic banking and commerce in the Kingdom by providing the backbone for a number of advanced and sophisticated payments and settlement systems already in place. These include the Automated Clearing House (ACH), an electronic cheque clearing system, and the Saudi Payments Network (SPAN), which links all ATM and POS terminals; and also the Electronic Securities Information System (ESIS), an electronic shares trading and settlement system.

SAMA operates and manages SARIE and takes full responsibility for its supervision and risk management. SAMA also supervises the liquidity of the clearing process and the orderly completion of settlements. Saudi commercial banks are direct participants in SARIE, while their corporate and individual customers can use the services as indirect participants through their banks. In all instances, payment instructions are validated and endorsed by a direct participant before submission to the system. Thus tight and effective control over the use of the service is maintained.

1.1.1.1 Key Features and Capabilities of SARIE

A. A unique system that combines the functionalities of a high value and a high volume payment system.
B. Permits all Saudi Banks to make immediate Interbank money transfers through accounts held with SAMA. The system features almost 24 hours availability and assures payment finality and irrevocability. SARIE system also gives banks real-time, direct access to their accounts with SAMA and enables them to continuously monitor their financial positions.
C. Provides a rigorous and comprehensive mechanism for controlling risks. Firstly there are intraday limits on exposure of the system to any individual participant; secondly there are requirements to provide collateral against such exposure. The level of limits and the nature and value of collateral are decided by SAMA, which can adjust these requirements if any action is required to safeguard the integrity of the banking system. SARIE also features real-time monitoring of banks’ daylight limits by SAMA and the banks, thus providing enhanced capability for actively managing institutional and systemic risks.
D. Enhances the efficiency of the banking system in the Kingdom in many ways. First, it reduces the liquidity requirements of the funds transfer process. Second, it reduces the elapsed time taken to complete funds transfer operations. Third, by permitting funding positions and liquidity to be managed on a real time basis, it permits banks to control and use their liquidity more efficiently. Finally there is also an efficiency gain arising from the elimination of clerical processes in the paper-based system which SARIE has replaced.
E. In recognition of the importance of international financial operations, the approach used is consistent at every level with current and proposed international standards for cross-border funds transfers.
F. The system processes both same-day and forward valued payments within one framework. Also, SARIE system permits banks to submit these types of routine and non-urgent payments in advance of value date. This service allows banks and their customers to process and submit these payments when it is most convenient for them to do so and not to wait until the value date. Thus banks and their customers can manage their payment administration workload and avoid peaks, for example, at a month end.
G. Integrates the clearing and settlement of all other existing systems i.e. SPAN, ESIS, ACH and MCHs into a single interbank settlement position that is settled through the banks’ accounts with SAMA. This permits the continued use of the existing netting arrangements while reducing the risk associated with the net settlement positions arising from such systems.
H. SARIE system has a number of advanced security features to ensure that it operates smoothly and in a fully controlled environment.

The architecture of SARIE system is illustrated by the diagram in the gover below:
1.1.1.2 Examples of the Benefits of SARIE
While there are many actual and potential benefits of SARIE, some of the most important immediate benefits to the banking system will accrue in the following areas.
- Banks are now able to deal on-line through their account with SAMA, receiving and transferring funds securely, automatically and rapidly.
- It is now possible to settle public utility bills without the customer having to physically visit his bank. A three party arrangement permits a bank to directly debit the customer’s account and transfer funds to the utility’s bank account via SARIE.
- All the payment systems between banks have been connected together enabling clients to transfer money to and from any bank account within Saudi Arabia, automatically, easily, safely and quickly.
- SARIE system enables the electronic, safe salary transfer. In this system, the salary is transferred from the government sector or the company owner to the recipient’s individual bank account, which eliminated the need to personally visit the banks; in addition this expands the possibility of enjoying the benefits of the Saudi Payments Network (SPAN).
- SARIE allows any bank to issue a credit note against the client’s accounts and transfer the money to the beneficiary’s account at any bank in the Kingdom. An upper limit to the regular payment deduction is set by the clients. All of the previously described SARIE services are offered at competitive prices.

1.1.2 Capital Market
In Mid 1980s, the government entrusted the supervision of all share trading operations to SAMA, and authorized commercial banks to act as brokers. With the introduction of the Electronic Share Information System (ESIS) in 1990, the share market witnessed a great development in all its operations. This was followed by steps to improve and update the dissemination of market information. 2001 witnessed the introduction of a new technical infrastructure called “Tadawul” system to underpin market operations. This is a fully integrated trading system providing real time share trading settlement and clearance of transactions on the same day. This technology provides an opportunity to investors to invest from the comfort of their home or offices via the internet. This new technology has also boosted the transparency of the market, with issuers submitting regulatory announcements, such as financial statements, via the internet. While encouraging domestic and regional savings and investment. In 1997, foreigners were allowed to participate in the Saudi equity market through the Saudi Arabian Investment Fund (SAIF), instituted in London. Since November 1999, foreigners have also been allowed to participate in the Saudi equity market through open-ended mutual funds offered by Saudi banks. GCC citizens are permitted to directly invest in the Saudi equity market. A new investment law was enacted in 2000 to pave the way for foreign firms to make direct investments in most of the country’s economic sectors with or without local participation During the past two decades, development and growth have encompassed investment funds which have recorded a great expansion in their investments and the number of their subscribers which grew by an annual rate of 20 percent.

The government securities market (government development bonds, treasury bills and floating rate notes) is witnessing a gradual expansion and the emergence of corporate papers is also encouraging. There are no restrictions on investment by foreign investors in government securities.

1.1.3 Electronic Securities Information System (ESIS)
Stock exchanges have benefited from the automation to improve the operation efficiency, accuracy of trading, settlement processing, information dissemination in addition to enhancing surveillance and better tracking of trades.

Since installing the settlement system in 1989, ESIS has experienced considerable architectural changes to meet the dynamic business requirements. These changes have been very positive to the functionality of ESIS. In developing its Electronic Securities Information System, SAMA opted for a floorless stock exchange for numerous benefits it provides. It concentrates all local securities trading into one single market. The system that supports this market provides the means by which investor orders and data are captured, trades are executed and settled before transfer of ownership instructions are sent to company registrars.

This year witnessed the introduction of a new technical. The ESIS Information Server (EIS) is the latest addition to ESIS. The purpose of this platform is to provide real time market information to a large number of clients throughout the Kingdom. The ESIS Information Server will be a multi purpose platform providing the functionality of ESISLine and ESISPc. SAMA is also planning to enhance the capabilities of existing ESISWEB to allow Mutual Fund Dissemination, Distribution of SARIE/SPAN Daily Reports, and remote Order Routing. The Server (Host) application software is implemented on Stratus which is VOS OS. The client Workstations is implemented on OS/2 2.1.

The ESIS Web Server is implemented on Windows NT 4.0.
Host database Sybase Version 11.0.3 on HP-UNIX C418.
ESIS Web Server database Sybase 11.5.1 on Windows NT 4.0
OS/2 Client data base DB2 Version 1.2.
This subsystem receives at the end of each day executed trades from the Front Office and starts the settlement process. This requires the delivery of the sold shares on the following day by the selling bank,
checking they are not restricted and ensuring the availability of complete data both to the buyer and the seller. Once the settlement is complete, a money clearing report is produced by the system. This report states the net position of each bank based on the settle trades.

The communication between SAMA Host and the Bank Workstations is over X.25 network. ESIS application uses Permanent Virtual Circuits (PVC) over lease lines operating at 9600 Bits/Sec, the packet size is 512 Bytes. Backbone of X.25 switching network is Netrix switch supporting broadcast feature thus reducing data repetition. There are two Stratus Hosts, the main production machine is located at SAMA Central Site (CS) and the backup Stratus machine resides at SAMA Central Contingency Site (CCS). SAMA CS and CCS sites are 5 Kilometer apart. There are two Netrix switches on SAMA site (primary/main, Secondary/backup). Each of the 10 banks also known as Central Trading Unit (CTU), has Netrix switches, there is no backup switch on any of the CTU sites. Each bank is allowed maximum of 25 workstations. Banks are allowed one ESIS Net Wks, one ESISLine Wks, and any number of ESISPCs and Trader Wks.

1.1.3.1 System Operation
ESIS is a true Client/Server application supporting distributed databases. ESIS Host has several System states (Startup, Morning Pending, Morning, Morning Opening/Closing, Afternoon Opening, Afternoon closing Opening two, etc), Each System state corresponds to specific functions. On a normal trading day, when the ESIS application is started on the Client Wks, a hand shake message is sent to Host requesting Login (Workstation can login when the Host System State is Morning Pending). Host sends the version # to the Wks thus initiating the synchronization and the catch process to equalize the data bases.

1.1.3.2 ESIS NET Branch Interface
To allow remote branches to add orders, inquiry about particular order, and print reports. SAMA introduced ESIS Net platform. ESIS Net also known as Order Router acts as a Server to remote ESIS Net branches. This is a SNA link running APPC LU6.2 applications. Interconnectivity between ESIS Net and Client environments varies from bank to bank; Banks can use IBM Communication Manager (CM2) with SDLC card, LAN card or IBM X.25 card. Alternatively they can use Eicon APPC interface with Eicon card. The ESIS Net supports Application to Application Interface (AAI) to allow APPC interconnectivity.

1.1.4 National Payment Systems Saudi Payments Network (SPAN)
The Saudi Payments Network (SPAN) is the National ATM and Points of Sale network connecting all Saudi banks and providing a common service point to the Kingdom. The objectives of establishing the SPAN network in 1990 have been very significant for the Saudi banking sector. Firstly, SPAN aimed to encourage Saudi citizens and foreign residents to utilize the banking system. This includes electronic access to their funds at remote locations thereby reducing the bank notes in circulation. The network has facilitated transaction availability regardless of terminal ownership. Also, the movement toward electronic transactions has reduced the overall demand for bank notes and increased the uptake in banking facilities, and this has led directly to increased deposits. SPAN has increased the efficiency in the banking sector by avoiding ineffective competition at the transaction delivery points.

Since the launch of SPAN, it has become increasingly obvious that its initial objective has been accomplished. For instance, the total number of transactions, SPAN cards, Points of Sale terminals and ATMs has been increasing on an annual basis. The user community, including both citizens and residents, has come to rely on SPAN services. This reliance doubles the responsibilities of the banking system to provide the highest levels of support to the public users of the entire SPAN network.

SPAN provides other banking services as well. These include the support of international association transactions, such as Visa and MasterCard, originating either within or outside the Kingdom. SPAN has direct connections to these associations and provides that connectivity in a pass-through mode to the Saudi Banks. This support includes a full range of credit and debit card transactions at both ATM and Point of Sale terminals.
1.2 Supervising (monitoring) local banks, and bank-customer relations
SAMA encourages banks to establish Internet banking systems. However, it is required that risks in such systems should be properly controlled and monitored. The onus of maintaining adequate systems of control, including those in respect of Internet banking, ultimately lies with the institution itself. SAMA’s supervisory approach involves:

- Holding discussions with individual institutions who wish to embark on Internet banking to allow them to demonstrate how they have properly addressed the security risks before starting to provide such services.
- Including specific Internet banking issues in SAMA’s regular off-site and on-site bank examination processes.
- Encouraging Internal Audit review of Internet banking facilities, systems and processes.

Therefore, institutions intending to offer banking services electronically via an open network such as the Internet should, as a minimum:

- Ensure data accessible by outsiders is encrypted using industry proven encryption techniques. Noting that widely-used may not be the same as highly secure. Minimum 128 bit keys should be used for SSL implementations.
- Take particular care to ensure the physical and electronic security of root keys and any Certification Authority systems used.
- Ensure adequate measures are adopted to prevent intruders from gaining unauthorised access to the bank’s internal computer systems, including physical controls and the risk of electronic eavesdropping.
- Establish a set of comprehensive security policies and procedures to deal with the major aspects of security and security violations.
- Monitor and report to SAMA all security incidents on a timely basis.
- Review the adequacy of security measures (by internal and external experts) on an ongoing basis and report to SAMA the results of such reviews periodically.

At this present stage of development, this is considered to be an appropriate regulatory response to provide a sound and secure platform for the development of Internet banking. The technology and the market for such services will no doubt mature further. There may be legal changes in due course to cover, for example, the establishment of contracts over the Internet using digital signatures, liabilities for cross-border electronic transactions, use of customer information and privacy. As facilities and the scope of services improve, banking through the Internet will certainly become more popular. At that stage, it might be appropriate to codify the security objectives and requirements into a more rigorous guideline which all institutions offering Internet banking services should follow.

Meanwhile, Interim examination procedures will cover many of the principles and proposals discussed in this document, so it will be necessary for banks to demonstrate their responses to these issues in the way their Internet banking services are designed and managed. It is important to remember that many of the major risks are a consequence of poor physical or procedural security, rather than technical weaknesses. Hence, banks should ensure that both system and process security are properly addressed, and that basic access controls to banking technology buildings and equipment are fully maintained.

SAMA believes that an effective internal auditing function can help a bank detect potentially serious technology-related problems. The auditor should report and be accountable to the Board or its designated committee. A well-informed Internal Auditor can help to assure a proper control environment for new technology and its operation. This means that controls must ensure that:
Records are being processed accurately and in a safe and sound manner.
- Accounting data is reliable.
- Operating procedures are efficient and effective.
- Procedures are in effect to assure continuity of services.
- High-risk conditions, functions, and activities are identified and effectively monitored.
- There is proper adherence to management standards and policies regulations, regulatory statements of policy, and other guidelines.

As Internet banking develops, therefore, SAMA will aim to keep the banks informed of best security practice internationally by issuing enhanced versions of this document to assist in maintaining the safety of on-line banking in the Kingdom. However, it is the banks’ responsibility to maintain effective internal and technical controls in keeping with these guidelines.

2. Saudi Banks Experience

Saudi Banks adopted e-banking services for two reasons: First, facing the challenges of financial requirements, and to gain benefits of online banking.

2.1 Facing the challenges

With approximately 18 million Saudis and an additional 7 million expatriates, banks in Saudi Arabia are expanding the way business is done in the kingdom and investing more in alternative delivery channels. In addition, Saudi population is a predominantly young one and in the coming few years this younger generation will demand more from their banks and will also be more willing to change banks if their financial requirements are not met. Internet penetration is also on the rise, creating higher demand for e-banking. E-banking services as current account management (including payments of bills), personal loans, brokerage services, mutual funds, issuance of credit cards, etc., are currently available in several Saudi Banks. More over, many banks have adopted the internet in conjunction with an existing network of ATMs, WAP and mobile payment services.

Most of the Saudi Banks have adopted the integrated approach whereby they keep their existing brand name and offer Internet banking services as an extension to their branch, ATM and telephone based services. By doing so, they offer their customers transactions at a cheaper rate and creates for themselves a way to overcome the low PC penetration rate of 3-5% in the kingdom. But with more banks moving their services online, they are becoming more competitive everyday. Plus, there is also the potential to cut transaction costs and boost efficiency. While there is still a cost cutting benefit, it means that it will take time before it can be realized. Although the unit cost of an e-banking transaction is a fraction of that for other channels, the overall distribution cost of the bank increases initially. This is because customers will only gradually begin to bank from their PC’s, rather than through a branch.

Since more clients want to transact electronically, customers in Saudi Arabia are now moving into electronic banking, but the move is gradual. A lot of customers still very control oriented and that is because the people who authorize the transaction may have not necessarily made the transition to e-commerce.

2.2 Gaining the Benefits

While Internet is perceived to represent a new distribution channel for existing banking products and services, it also provides efficiency in transaction cost and offers a way of reaching a broader range of new clients. For customer, it relieves him of the need to visit the branch to undertake chore banking transactions, offering him instead “anytime, anyplace, anywhere” banking services. The expense saving channels is as in the following diagram:
These expense savings may cause quantity benefits for business projects

And market:
2.3 Managing Customer Relationships

Saudi Banks offering online services may face challenges of:
- Identifying and addressing consumer concerns about transacting online.
- Identifying areas of exposure or vulnerability due to insufficient disclosures.
- Building and sustaining the confidence of customers.
- Customers’ inexperience.
- Persuading customers to accept the impact of secure access technologies.
- Carrying the cost of secure access technologies.

Saudi banks can overcome the above challenges by implementing the following two strategies:

**Disclosing risks to customers, and educating customers.**

### 2.3.1 Risk Disclosure to Customers

Banks should provide clear information to customers about risk and benefits of using e-banking; publish their customer privacy and security policy, dispute handling, reporting and resolution procedures, etc. They must try to communicate to their customers the belief that their online service meets all the security standards. They also have to state the level of encryption used by their system (typically 128-bit Encryption for SSL) and other security controls such as firewalls, explaining their use to the customers.

### 2.3.2 Customer Education

The very open, connected nature of e-business calls for an increased amount of trust among customers, and e-banking service providers. Trust that a customer's confidential data will remain confidential. Trust that the information supplied to others in a network is correct and of the highest integrity. And trust that systems will be up and running-available 24/7, as needed in Internet time. A way to build this trust is by educating the customers.

3. Role of Government
The Saudi Government role in adopting e-business is as the following diagram:

- The Kingdom announced a massive initiative to equip over 21,000 schools with PC equipments, networks, internet access and peripherals. The phase one training program for 1,000 teachers was launched in December 2001.
- Saudi Telecommunication Company (STC) has successfully operated a new digital line with a capacity of 155 million pulses per second linking King Abdul Aziz City for Science and Technology (KACST) with Internet cables in the United States and the world using sea cable. The company has completed phase one of the expansion plan for this year. To this effect, the increase in digital linkage capacity has doubled more than three times. In the fourth quarter of 2000 a similar expansion has been implemented. The Kingdom of Saudi Arabia possessed the world's most modern data network and was considered among the most fast growing in this field in the world.
- A technical committee for e-commerce had been established at 2001 to create a legal framework, improve infrastructure, and present technical support and training.
- The Saudi Government has identified the development of e-Government as an important national goal and is currently developing its policies, strategies, and options. The government is also studying available technological solutions for the electronic delivery of government services.

Conclusions
This paper aimed to describe e-banking in Saudi Arabia. Section 1 shows that there are four e-payment systems were put forward by Saudi Arabian Monetary Agency, which also supervise (monitor) local banks, and bank-customer relations. Section 2 shows that Saudi banks had adopted e-banking services to face the challenges of financial requirements, and to gain benefits of online banking. Section 3 the Saudi Government role in creating a good environment encourages and expand e-business. We can see that business projects in Saudi Arabia are now moving into heavy using of banking, but the move is gradual. A lot of customers still...
very control oriented and that is because the people who authorize the transaction may have not necessarily made the transition [to e-commerce].

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