

***Business Navigator on e-finance for  
SMEs Exporters in Developing Countries***

## **ABSTRACT FOR BUSINESS ADVISORY SERVICES**

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### **Business Navigator on E-finance for SMEs Exporters in Developing Countries.**

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Guide dealing with e-finance instruments for trade financing and implementing a sustainable e-finance system - defines the concept of e-finance and looks at its development; addresses the role of financial institutions (FIs) and banks in promoting the development of an e-enabled financial system; describes various types of e-finance services which may be implemented, and different technologies deployed in various delivery channels; highlights the SME needs and FIs solutions for SMEs in the area of e-finance; includes bibliography and list of related Web resources.

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**English**

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## Executive Summary

The rapid development of ICT application in the trade finance area has helped improving existing financial products; it has also permitted the introduction of new, efficient and less costly mechanisms for payments and transfers of funds. In view of the considerable impact that finance, and e-finance in particular, can have for SMEs expansion, the *Business e-finance Navigator*, a practical guide and an interactive CD-ROM, was designed to assist private sector entrepreneurs, bankers and all those involved in trade development, to better “navigate” in the area of e-finance for trade. The guide aims at improving access to finance, at developing innovative e-finance instruments for trade financing and at implementing a sustainable e-finance system.

The guide is divided into four sections containing, in each of them, examples of best practices from different regions. These relevant e-finance experiences come both from developing and developed countries.

Chapter I, “The current state of e-finance”, clarifies the concept of e-finance and looks at its development from a holistic approach. E-Finance may be very simply defined as a digital delivery of financial products and services. E-Finance is developed to reach more customers and to provide them better services at a lower cost. Brazil and Mexico, thanks to strong ICT based technology, are experiencing a steep growth in e-finance. Brazil leads the introduction of e-finance in Latin America and their on-line banking system is considered one of the five most modern in the world. In the 1990s, major Brazilian banks built an advanced system that produced the services offered today. Bradesco and Banco do Brasil have currently more than 4 million online customers each. In Mexico, the number of online bank users more than tripled from 2000 to 2005, and is expected to continue its growth in 2005.

The e-Navigator describes the main benefits of e-finance and the various challenges that are to be addressed. E-Finance generally provides greater access to accurate information, products and services. E-Finance gives banks the possibility of integrating “seamlessly” with other systems and without the physical limitations of branches. However, as several parties are involved, a good integration is needed and this may be difficult sometimes. Furthermore, access and usage are widespread only when access points are available at affordable prices.

E-Finance is changing the way banks operate and is expanding the area of services they provide. Bankers that have been consulted agree that some of their traditional tasks have been reduced to simple processing. On the other hand, bank officers may focus now on innovative and sophisticated services since several routine operations can be done through electronic transactions, without human involvement and in a speedily manner.

Chapter II, “Demystifying e-finance: What works and where”, gives an insight of the role of financial institutions (FIs) and banks in promoting the development of an e-enabled financial system. In this context, FIs’ role is to ensure low cost and efficient payment systems, to foster efficient delivery of credit and loan information, to enable cash management and an integrated business value chain.

In the provision of e-finance, banks use three generic models. They may set up their e-services on their own website (“Standalone e-banking service”), they may integrate them into a single platform for trade and banking (“Integrated e-platform”), or they may take part in the creation of a “Global Trade Portal”, such as Trade Card, Bolero and CCEweb. These e-banking models are made up of various components. A number of the essential ones are present, for instance, in the Agricultural Bank of China’s (ABC) enterprise portal. This portal allows the bank to publish its financial and marketing information on the Internet and offers a customer banking on-line services, such as account inquiries, transfers and payments, 24 hour/7 days a week. It also has an information exchange platform, allowing for data transfer with the government and with ABC’s enterprise customers.

To create an effective e-finance system, countries are required to develop a basic e-enabling infrastructure. This usually takes place in various phases, but a simple e-banking system may be introduced once banks are linked to a Central Clearing House as well as after the establishment of Automated Teller Machines (ATMs) and Point-of-Service (POS) systems.

An essential issue in network technology is security. The e-Navigator illustrates Internet-related risks connecting them directly to the type of e-services provided. It is important thus for FIs to set appropriate control and security benchmarks for their e-operations. The e-Navigator illustrates best practices to ensure protection of e-operations. An interesting example is Singapore's Citibank Dynamic PIN Pad.

Many Developing Countries, with good telecommunication infrastructures, are successfully implementing e-finance. The e-Navigator lists a number of case studies, seen from a regional perspective. Europe is considered the most e-ready region, whereas Africa seems to be moving on only recently. It has been experiencing a reasonable growth in 2003 and there are cases of extensive usages of ICT in some countries. The Tunisian Post is considered one of the more aggressive users of ICT in the African continent.

Chapter III, "e-Finance services: how to exploit technology to optimise value?", describes the various types of e-finance services which may be implemented, and the different technologies deployed in the various delivery channels. One of the best practices described is Hong Kong's East Asia GE Commercial Finance, which specialises in Asset Based Financing. They were the first FI to launch "e-factoring" services in 2000. Another e-commerce achievement was the launch of their "e-loan" service. The procedure is easy and flexible and the result of the application for loans is shown on the screen immediately. Subsequently, Visual Web Solutions and e-Financial (Brazil) are listed together with other technology providers.

Chapter IV, "e-Finance for SME exporters: A window of opportunity", emphasises the SME needs in this area and FIs solutions for SMEs. In Developing Countries, several SME-oriented e-finance initiatives are being launched. Technology levels are increasing in parallel to acceptance of customers and FIs. The latter have created special units and web portals to cater specifically to SME exporters. Leading players such as ICICI Bank (India), have created risk models for SME financing, coupled with the strengths of their connections with large established technology-based platforms. Another effective approach has been the cluster approach adopted by ICICI, grouping SMEs with homogeneous characters and a similar critical mass. Credit is granted within specific cluster risk parameters.

One of the objectives of the *e-finance Navigator* is to facilitate the transfer, whenever possible, of relevant e-finance practices from market leaders, wherever they are, to emerging and developing economies. The other main objective is to identify areas where technical co-operation in the area of e-finance can make a difference. The development in Information and Communication Technology (ICT) and its direct application to trade finance will lead eventually to a faster, more effective and less-costly response to the needs expressed of the business community involved in international trade. And this applies also to SMEs in both developed and developing countries.

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## Introduction: The Navigator's Purpose and Scope

This e-finance Navigator provides a practical tool to assist individual entrepreneurs, Small and Medium Enterprise (SME) exporters, bankers and all those involved in trade development to better “navigate” in the unknown area of e-finance for trade.

This Navigator provides suitable examples of best practice of the most relevant e-finance experiences both in selected developing and developed countries in order to keep up with development in Information and Communication Technology (ICT) applications in the trade finance field.

Furthermore, the Navigator will identify and describe best e-finance practices and tools currently in use for export finance.

## Background

During the UNCTAD XI Conference<sup>1</sup> held in June 2004, it was re-emphasised that access to finance for trade and working capital is crucial for the competitiveness of SMEs. In developing countries, lack of adequate information on the financial condition and creditworthiness of SMEs is one of the principal obstacles to obtaining adequate financing. For this reason, many SMEs are forced to rely on self-financing or expensive informal financing. Emerging trade-related e-finance and risk management techniques, including ICT-based solutions such as online credit information, credit insurance and e-payments, could contribute considerably to improving the situation.

However, to develop a sound and viable e-finance system requires careful understanding and planning. There are certain pre-requisites that are to be met before a successful e-finance system could be implemented. Infrastructure issues such as telecommunication infrastructures, pervasiveness of Internet and ICT literacy have to be addressed in tandem with the development of an e-finance system.

In some countries, there were proliferations of e-finance products<sup>2</sup>. However, SMEs do not feel comfortable using e-finance services in view of perceived complexity of the financial environment in which they operate.

There is therefore a clear need for SMEs capacity building, in the area of e-commerce and in particular e-finance. SMEs in developing countries will have to learn new skills to understand the advantages and effectively use the e-finance tools available in their countries to secure better and faster finance and working capital.

## Who can benefit

The main targets of this Navigator are SMEs, representative bodies of private-sector enterprises (including chambers of commerce and trade associations), national, regional and international financial institutions, as well as financial authorities and trade development agencies.

The principal benefits that the Navigator aims to bring to its users, particularly in conjunction with existing Trade Finance Programme tools – including the *Trade Finance Pointers*, *Finance for Trade*, the guides and training modules on *How to Approach Banks*, *How to Evaluate Trade Credit Requests*, *the Credit Scorecard* and *Trade Credit Insurance*, are the following:

- Improved access to finance for trade by enterprise – in particular SMEs – through appropriate use of e-finance tools;

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<sup>1</sup> The conference is UNCTAD's highest decision-making body. It meets every four years to set priorities and guidelines for the organization, and provides an opportunity to debate key economic and development issues. This year the meeting was held in Sao Paulo, Brazil from 13-18 June 2004

<sup>2</sup> ITC Regional e-business Forum. Sao Paolo 2-5 November 2004

- Development of new and innovative e-finance instruments for the financing of trade; and
- Development of sustainable e-finance systems through a better collaboration amongst financial institutions, enterprises, government agencies and trade bodies.

## **How this Navigator should be used**

The Navigator provides all those concerned with e-finance development with some fundamental ideas and methods for designing and implementing a sustainable e-finance system. However, the reader should note that the Navigator is only a guide to navigate in the complex topics of e-finance.

### **For policy makers/financial institutions**

E-Finance systems cannot stand on their own. They will depend on a number of factors such as: the overall sophistication of financial markets, the availability of trade finance instruments, the development of telecommunication and internet infrastructures, legislations on e-commerce and the overall ICT literacy of the country.

The reader is therefore encouraged to also consult the *Trade Finance Infrastructure Development Handbook for Economies in Transition* published by the United Nations Economic And Social Commission For Asia And The Pacific (UN ESCAP) and the ITC.

### **For entrepreneurs/SMEs**

Private-sector enterprises, in particular SMEs, could use this Navigator for capacity building. The reader will understand the various e-finance tools and systems that are available or could be implemented.

By understanding these subjects, the private sector could upgrade their skills with the aim to work with financial institutions and government agencies to develop a set of e-finance tools and systems that could fit and meet the requirements of the private sector.

The reader is encouraged to consult other ITC publications such as *Trade Finance Pointers*, *Finance for Trade*, *Trade Finance – A legal guide for cross-border transaction*, the guides and training modules on *How to Approach Banks*, *How to Evaluate Trade Credit Requests*, *the Credit Scorecard* and *Trade Credit Insurance*.

## Chapter 1: The current state of e-finance

E-finance can be a valuable tool in providing access to finance for trade and working capital for SMEs. However, the development of e-finance in a country is dependent on infrastructure developments such as telecommunication, Internet and e-commerce.

From 1999, banks and financial institutions have begun to offer their customers online banking transactions. Such service is generally called Online Banking, Internet banking or e-banking. This new delivery channel, as opposed to the traditional bank branches, has enabled banks to reach a wider customer base without physical limitations and to provide better services at a relatively lower cost.

By 2002, banks and financial institutions began to shift their focus from retail customers to corporate or enterprise customers. This group of customers requires more sophisticated systems because transactions are much more complex and are of higher value than retail customers. Consequently, the demand for higher security and more complex transaction processes were developed in online banking to meet the needs of such customers.

In this Chapter, we will define what e-finance is and look at the development of e-finance from a holistic approach.

### 1.1 Definition of e-finance

E-finance can be defined as the electronic delivery of financial services, including online brokerage, banking and other financial services. Customers who use e-finance will access financial services using electronic channels as opposed to the traditional channels such as bank offices.

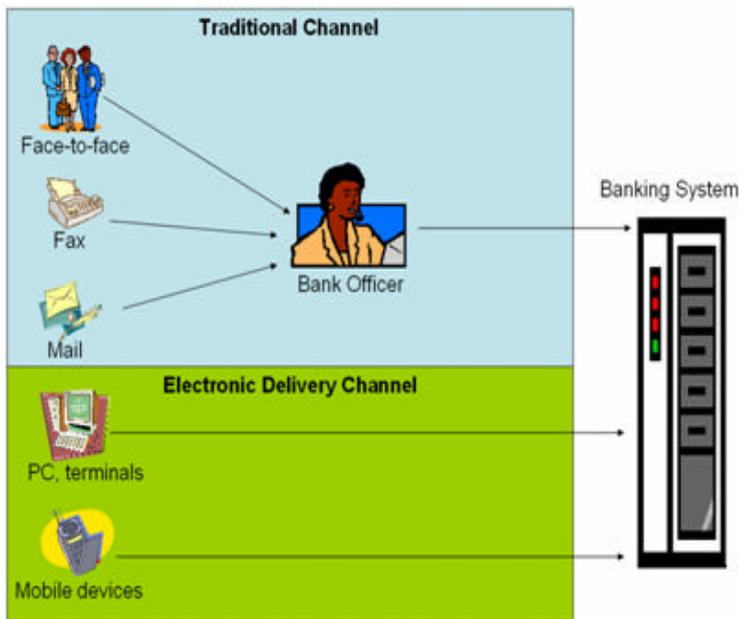
#### Box 1: A typical e-finance Services

YOUR BUSINESS OBJECTIVES	HOW VELOCITY@OCBC CAN HELP
<p><b>When you're managing it all</b></p> <ul style="list-style-type: none"> <li>• Ease of access to account information</li> <li>• Manage with a bird's eye view</li> <li>• Timely and easy account reconciliation</li> </ul>	<p><b>Information Reporting/Report Module</b></p> <ul style="list-style-type: none"> <li>• Account information available 24 hours a day, 7 days a week</li> <li>• Complete view of real-time balances of all accounts</li> <li>• On-line status tracking of all transactions</li> <li>• Electronic archiving for easy retrieval and monitoring</li> <li>• Download soft copy statements</li> </ul>
<p><b>When you're paying/collecting</b></p> <ul style="list-style-type: none"> <li>• Reduce administrative costs</li> <li>• Timely payment to ensure goodwill with staff/vendors</li> <li>• Ease of conducting international payments</li> <li>• Timely and accurate collection from customers</li> <li>• Ensure secure and proper authorisation</li> <li>• Keeping of detailed audit trail</li> <li>• Improve accuracy of cash flow forecasts</li> <li>• Maximise working capital</li> </ul>	<p><b>Payment/Collection Module</b></p> <ul style="list-style-type: none"> <li>• Online submission of payment instructions to eliminate waiting time at branch</li> <li>• Model templates with pre-approved beneficiaries' details to reduce repetitive data entry</li> <li>• Automated processing and delivery via integration with your backend system(s)</li> <li>• Speedy and accurate processing</li> <li>• Simple and secure authorisation process</li> <li>• All activities from log-on to payment creation, amendment or authorisation are logged in the audit trail</li> <li>• Timely updates on payment/collection status</li> </ul>
<p><b>When you're trading</b></p> <ul style="list-style-type: none"> <li>• Simplify import and export documentation</li> <li>• Reduce human error and administrative costs</li> <li>• Improve process efficiency</li> <li>• Improve tracking of documentary transactions</li> </ul>	<p><b>Trade Module</b></p> <ul style="list-style-type: none"> <li>• Eliminate repetitive data entry with the use of models</li> <li>• Online submissions to achieve faster turnaround</li> <li>• Access to documentary transactions details and status</li> <li>• Minimise tedious paper-based documentation with online reports</li> <li>• Prompt online notification on Import Bills</li> </ul>
<p><b>When you're managing foreign exchange</b></p> <ul style="list-style-type: none"> <li>• Improve monitoring of foreign exchange rate movement</li> <li>• Secure favourable exchange rates</li> </ul>	<p><b>Foreign Exchange Module</b></p> <ul style="list-style-type: none"> <li>• Daily commentary reports on major currencies</li> <li>• Real-time live exchange rates for up to 10 currencies</li> <li>• On-line execution of contracts</li> </ul>

Source: OCBC Bank, Singapore

Delivery channels that are considered electronic include: the Internet, mobile phones, leased line connections etc. These electronic delivery channels have the ability to communicate and disseminate information in a digital format. These channels can also provide straight through processing<sup>3</sup> (STP). Since information is captured in digital format, banking transaction information can be easily stored, analyzed and disseminated quickly.

**Box 2: Electronic delivery channels enable seamless integration to the banking system**



It is important to understand that e-finance will not be a complete replacement of traditional banking services. Face-to-face services involving bank officers still play an important role in the overall delivery of banking services. However, routine transactions, such as application of loans, withdrawal of funds, and payment of bills are now best handled by e-finance. Thus bank officers, who can offer professional advice to customers, handle more complex services such as wealth management.

## 1.2 Growth of e-finance

The deployment of e-finance is not limited to developed countries, and indeed some developing countries are experiencing particularly strong growth in e-finance. For example, two Brazilian banks, Bradesco and Banco do Brasil, have more than 4 million online customers each by providing free Internet access<sup>4</sup>. In Mexico, the number of online bank users more than tripled from 700,000 in 2000 to 2.4 million in 2001, and it could reach 4.5 million in 2005.

A recent survey on Internet Usage in Latin American countries revealed that e-mailing was the most common use of the Internet (98 per cent), followed by searching for information (90 per cent), banking and financial services (80 per cent), monitoring the market (54 per cent), communicating with public authorities (53 per cent) and looking for information concerning employment opportunities (27 per cent)<sup>5</sup>.

Adoption of e-finance amongst SMEs has also increased. A survey done on Irish SMEs revealed that 55 percent of SMEs used e-banking in 2002, an increase of 21 percent from 2001.

In Asia, e-banking in China is currently experiencing fast growth. According to the China Construction Bank (CCB), in the first half of 2004, it completed 312.88 million electronic transactions totalling 2,000 billion yuan (about 240.96 billion US dollars). Another leading Chinese bank, the Industrial and Commercial Bank of China (ICBC), also reported fast growth in e-banking business. By the end of June, the bank's Internet-based bank had more than 9 million individual customers.

<sup>3</sup> Straight Through Processing or STP, where customers enter data or requests and information is sent directly to the bank for processing without any human intervention

<sup>4</sup> eMarketer Inc. Money Matters Online in Latin America. 2 October 2002

<sup>5</sup> E-Commerce & Development Report 2004, UNCTAD

### Box 3: Investment in e-banking high in Latin America

Brazil leads the introduction of e-banking in Latin America. In 2000, according to FEBRABAN, the Brazilian National Bank Federation, the Brazilian banking sector invested US\$ 1.4 billion in technology. The Brazilian banking system is considered one of the five most modern in the world of online banking, serving as a role model to banks. In order to deal with the high inflation and foreign exchange swings faced by the country until the early 1990s, major banks built an advanced system that produced the services offered today. Annual investments of US\$ 1.5 billion are made by major Brazilian banks and by American-owned ones.

Source: IDC

## 1.3 What are the benefits of e-finance?

Some of the more specific benefits of e-finance are as follows:

**1. Easier Access to services and information.** In general, large enterprises have greater access to finance on competitive terms than do SMEs. The SMEs of developing and transition economies, which represent the largest portion of these countries' productive capacity, face an even more severe lack of access to finance. However, the introduction of Internet has changed this conception. The Internet can reduce financial transaction costs<sup>6</sup> and increases the speed at which financial services can be delivered. This has significant impact as banks and financial institutions were, in the past, reluctant to provide easy access to financial services for SMEs for fear of the high operating costs. E-finance has enabled the banks and financial institutions to offer ubiquitous financial services regardless of the size of their customers, since the cost of operating the system is the same. Banks and financial institutions can also make use of online transactions and divert the mundane banking transactions, such as deposits and withdrawals, away from the branch office and provide higher value-added services, such as

loans and other investment products, to its customers.

Another benefit of e-finance is the easy access to information that the electronic delivery channel could provide. For example, the Internet can cut down the cost of credit information, which used to be expensive and difficult to obtain.

Availability of credit information is critical for small businesses because the lack of such information reduces competition in the SME lending market. Risk management is a critical dimension of any financial system. Banks and financial institutions need to know the counterparties to these transactions and their credit and payment track records. This need is particularly important for SMEs, whose development is often hampered by a perceived lack of creditworthiness, due to the absence of reliable data and information.

**2. Improved accuracy.** Most e-finance systems now use "straight-through processing"<sup>7</sup>. The once-only data entry process eliminates the need for repeated checking of information, reducing error tracing and correction procedures. This has significantly reduced the approving processes as the transaction is now done electronically. For example, a bank in Singapore took just 3 minutes to approve an application for Letter of Credits through the e-trade finance system, compared with 3 to 5 days turnaround time if the application was done with the traditional approving process.

**3. An "Anytime Anywhere" financial advisor.** In countries with high Information and Computer Technology (ICT) literacy and a developed telecommunications network, online transactions provide added convenience to customers, since they can make financial arrangements wherever they are and at any time.

<sup>6</sup> Industry figures show that a typical transaction involving a teller costs about \$1 and a typical ATM transaction 25 to 30 cents. The cost of a typical Internet transaction is about one cent.

<sup>7</sup> Straight Through Processing or STP, where customers enter the data or request and the information is sent directly to the bank for processing without any human intervention.

**4. Seamless integration with other trade systems.** An e-trade finance system can be easily integrated with other trade systems if it is properly set up and adapted to global standards. For example, the e-trade finance system of a bank can be integrated into its country's Electronic Trade Documentation System. This will contribute to the faster clearing of customs and thus to a shorter business cycle.

**5. Low barriers to entry.** Technologically, the cost of setting up an on-line banking system is lower than the cost of establishing a physical branch outlet. Banks that are technologically more advanced could leverage the use of the Internet as a new delivery channel for the products and services. In countries where there are restrictions on the number of branch outlets allowed for a bank, e-banking will make this restriction ineffective, since any PC with an Internet connection is virtually a "branch".

**6. New Financial Products.** With e-finance, banks are in a better position to access the financial standing of its customers. Through sophisticated data-mining tools, banks could better profile their customers and thus manage their risk exposure better. As a result, banks can develop more sophisticated financial products to different customers with different risk levels.

#### 1.4 What are the issues concerning e-finance?

In implementing an e-finance system, the following issues would be addressed:

**1. Trade Finance can involve multi-parties** – Trade Finance itself is not a simple process and involves many parties: importers, exporters, freight forwarder, shippers, customs etc. As more parties are involved, greater integration is needed to reap the benefits of technology and remove manual procedures. Faced with challenges in meeting the demands from different parties, banks and financial institutions usually choose to develop their e-finance system with their own set of standards and protocols. However, if the standards and protocols are developed

using the banks' proprietary methods, this will make future integration more difficult. Currently, banks usually use industry standards such as XML, SSL and other messaging and security standards. These standards enable banks to link up their system to other systems, in the future. In the competitive banking marketplace, the demands of e-finance go far beyond simple interconnection. Competitive demands have made clear the need for banks to stay at the cutting edge of technology in order to provide high levels of service all the time, anywhere, over any communications channel. Banks need systems that are integrated with the entire chain of back office and business decision processes for optimum flexibility, responsiveness to changing market requirements, and profitability.

**2. Customer acceptance and widespread usage** – E-finance can be successfully implemented in the country provided that there are widespread access points at an affordable price. The government could, through funding, develop a sound Internet infrastructure. It could also help by liberalizing the Internet Service Provider (ISP) market and allowing open market forces to drive down costs. A concerted effort must be made to educate and train the people and businesses in a country in transacting online.

#### Box 4: Banks providing Internet facilities to encourage e-finance usage

The Government of India created the Small Industries Development Bank (SIDBI) alongside the larger Industrial Development Bank (IDB). SIDBI introduced a full range of information technology (IT) facilities, including Internet cafes and mobile telecommunications, and made them available to small enterprises.

Source: ITC,  
<http://www.tradeforum.org/news/fullstory.php/aid/414/>

**3. Security** - The Internet can be subjected to many security risks such as software viruses, hacking and service disruptions. Thus banks will have to "secure" the open network with proper security features such as authentication, confidentiality, integrity

and non-repudiation procedures. On-line financial services applications require state-of-the-art security and encryption. Due to advancements in technology, highly sophisticated encryption programs now provide the required security, at a nominal cost, for users in both developed and developing countries. This sets the stage for e-payments to offer rapid, cost-effective and secure settlement of transactions.

**Box 5: Phishing – the latest Internet fraud**

In a phishing attack, a fraudster spams the Internet with email claiming to be from a reputable financial institution or e-commerce site. The email message urges the recipient to click on a link to update their personal profile or carry out some transaction. The link takes the victim to a fake website designed to look like the real thing. However, any personal or financial information entered is routed directly to the scammer.

Source: [www.keybank.com/html/A-11.2.1.html](http://www.keybank.com/html/A-11.2.1.html)

**4. Legislation** - Among other issues is the need to adapt the legal framework, in particular the law of contract. Legislation that traditionally only recognizes paper documents must now be amended to recognize electronic certificates, contracts and signatures.

**Box 6: Sample of laws and acts on e-finance in Singapore**

Cheques and GIRO transactions:

- **Section 59 of the Banking Act** allows MAS, in conjunction with banks and other financial institutions, to establish a Clearing House to facilitate the clearing of cheques and other credit instruments, and ensure its smooth operation.

- **Banking (Clearing House) Regulations**, Cap. 19, Regulation 1, subsidiary legislation administered by MAS, set the framework with respect to clearing with the Automated Clearing House.

- The Bills of Exchange Act governs how cheques are drawn, accepted and paid.

- The Bye-laws of the Singapore Clearing House Association (SCHA) state the rules and regulations for participation in the clearing of cheques and GIRO.

Stored Value e-Money:

- **Section 77A of the Banking Act** states that only banks authorized by MAS can issue stored value instruments that have multiple payment capabilities.

Real Time Gross Settlement:

- **Section 59A of the Banking Act** makes provision for MAS to establish and operate one or more real-time gross settlement (RTGS) systems. MAS is responsible for the smooth operation of the RTGS system and ensures that participants comply with the rules and regulations.

Issuance of Notes and Coins

- **The Currency Act (Chapter 69)** established the Board of Commissioners of Currency, Singapore (BCCS) in 1967. The Act conferred on the BCCS the sole right to issue currency in Singapore.

Digital Signatures

- **Electronic Transactions Act** was enacted to provide for the legal recognition of digital signatures and establish the framework to facilitate electronic commerce transactions in Singapore.

Electronic Payment

- **Payment Systems (Oversight) Act (Draft)** to provide a uniform basis for MAS' oversight of payment systems and stored value facilities in Singapore.

Source: MAS, Singapore

**5. Implementation Issues** – While e-finance can broaden the range of customer services, some bankers feel that their role is being reduced to that of a simple processing agent. Personal contact between banker and client is diminished, and bankers lose some degree of control over their clients. This issue is, however, overcome by the opportunities for banks to provide innovative services that traditional systems could not provide.

#### Box 7: Micro-finance for SMEs

An example is the provision of micro-finance that consolidates loan requirements of many SMEs. A micro-finance service can link SMEs to the financial sector by aggregating their loans and providing loan tracking and accounting services to them. A good example is Pride Africa. Pride Africa is a micro finance network providing credit access to more than 80,000 African SMEs in Kenya, Malawi, United Republic of Tanzania, Uganda and Zambia. Pride Africa branches located in low-income areas are linked daily to a network called DrumNet (via satellite), which is an interactive computerised information network linked by Information Kiosks. These Information Kiosks use touch-icon display screens that communicate through a central database. Clients are provided with a “swipe card” that identifies them as a unique user and allows them to carry out transactions.

Source: ITC,  
<http://www.tradeforum.org/news/fullstory.php/aid/414/>

#### Box 8: e-Finance changes the way banks operate

The EFMA Internet Banking Survey 2004 reveals a strong change in banking habits. The account officer, who was, in recent years, at the heart of the banking relationship, is no longer necessarily considered as such. Bankers no longer rely on the account officer at the heart of the customer relationship, in order to justify changes in their organisation. In the future, all banking channels must have consistent information, whether the customer goes through the branch, or contacts the bank by telephone or via the Internet. The first objective is to no longer keep account officers as informed as possible, but rather to ensure that customer information is homogeneous in “almost” real time on all workstations.

Source: The European Financial Management & Marketing Association

## 1.5 Conclusions on what is happening

E-Finance is evolving together with the innovation of new technologies. Banks will be moving towards integrating their e-finance services as part of their delivery channels in addition to their traditional channel such as bank branches, telephone banking etc.

e-Finance is not just a tool but also an integral part of an overall e-commerce component. As a result, companies will not be too satisfied with a standalone system but look forward to an open system that may integrate with their own system such as their accounting, Enterprise Resource Planning (ERP) and e-commerce systems.

## Chapter 2: Demystifying e-finance: What Works and Where

To enable the banks to service SMEs, the answer lies in the provision of affordable financial services to SMEs while keeping costs low and in enabling transparency of information that can help banks better assess the credit risks of the SMEs. In this respect, e-finance can provide a solution for both issues.

In this Chapter, we will discuss the role of Financial Institutions in providing easy access to finance through the use of e-finance. We will also discuss the necessary infrastructure development to enable its introduction. Finally, we will use practical regional case studies to highlight some of the best practices in e-finance.

### 2.1 e-Finance and Role of Financial Institutions (FIs)

Financial institutions have a role to play in ensuring:

**1. Low transaction cost** – SMEs generally require high volume low value transactions and financial services. By delivering such services online, FIs should bear in mind such constraints and endeavor to keep the cost low. High transaction costs will eventually make the service not profitable and guarantee its failure.

**2. Efficient delivery of credit and loan information** – The Internet, mobile phones and other ICT technology have the strength of delivering information in a very efficient and effective manner in a very short time. Proper use of such technology will enable the sharing of information and enable the FIs and SMEs to understand each other better. It is a very effective tool in building trust – the very essence of building business.

**3. Low cost and efficient payment system** – One of the costs in doing business is the cost in payment. The costs of payment include the fee incurred in making payment instructions and the opportunity costs due to the time lag

between the time the payment instruction is initiated and the actual release of funds in the payment system. A low cost and efficient electronic payment system is able to handle a large volume of transactions thus reducing the cost and also minimizing the time lag through better integration with the other banking systems.

**4. Cash management** – Beyond getting loans and payment, SMEs require a formal Cash Management system. Many SMEs do not have a proper record of their business transactions. This has caused FIs to be reluctant to extend any financing because of lack of information on the general health of the business. E-finance system should provide such solution to assist SMEs in managing their cash.

**5. Integrate Business Value Chain** – SMEs in developing countries generally are suppliers to large corporations in developed countries. While providing basic e-finance services to such SMEs, FIs should be mindful of their needs and find innovative way to enable better integration of the e-finance system with the business value chain of SMEs.

### 2.2 How does e-finance work?

#### 2.2.1 e-Finance Models

There are three generic models being used by banks to provide e-finance. These models are Standalone e-banking, integrated e-marketplace and global trade portal.

**Standalone e-banking service** - In this model, the banks have set up their e-finance services and products on their own website. The bank customer will have to use the web site to apply for the service and track their application.

**Box 9: Online loan application available for SMEs in Hong Kong**

SMEloan serves the needs of Hong Kong's SMEs. The company offers "Express Loans" up to about US\$ 128,000, which is approved within one minute of submitting an online application. This allows business owners to instantly obtain financing. Although it is not specifically a micro-finance institution, in practice it ends up lending modest amounts to most of its SME loan applicants. SMEloan offers the possibility to borrow more than US\$ 128,000, but this involves more time-consuming procedures.

Source: *International Trade Forum - Issue 4/2002.*  
<http://www.smeloan.com>

**Integrated e-marketplace** - Some banks have integrated their online banking service with e-marketplace providers<sup>8</sup>. The advantage for this model is that companies now do not need to have a separate log in process with the bank after the business is done on the e-marketplace. Trade and banking information can be consolidated and viewed within a single platform that provides better information management and greater transparency. The main issues here will be that of protecting the confidentiality of the clients' banking information. Sufficient security measures must be implemented to prevent unauthorized disclosure of banking information.

**Box 10: Standard Chartered Bank has up Trade Platform B2BeX**

Unlike a lot of other bank platforms, B2BeX is an ambitious web-based system designed to manage every aspect of the trade process. Buyers can search for products online, place orders with suppliers, process documents, coordinate logistics, negotiate insurance and arrange financing. Therefore, the system can be sliced and diced, giving users the option to choose just one or a couple of the available services. Standard Chartered has said the platform transforms its role as a provider of trade finance to a facilitator of international trade. By placing importers and exporters on the same platform it makes them more competitive and efficient.

Source: *Standard Chartered Bank.*  
<http://www.scb2bex.com>

**Global Trade Portal** - The two models above mentioned may be useful in the domestic market. While it helps to speed up financing for companies, it does not provide a total solution for exporters and importers. Manual documentation and traditional trade services will still surface once the goods leave the port. Amongst some of the implementations are Trade Card, Bolero and CCEweb.

**Box 11: TradeCard Service**

TradeCard provide the documentary and financial requirements of a domestic or international trade transaction with the physical movement of goods, eliminating time-consuming and error-prone manual processes. It provides a cost-effective, practical and patented service for financial supply chain management. They have a network of financial institution partners that allows them to facilitate services such as payment assurance, cargo insurance and trade finance in many countries. The system allows a buyer to connect the flow of physical goods with the flow of electronic funds by handling both through the same electronic document. The company had 750 customers at the end of 2003, up from 567 a year earlier. The volume of business it handles is up more than 230% in the first quarter of this year compared with the same quarter in 2003.

Source: *TradeCard.* <http://www.tradecard.com>

<sup>8</sup> E-marketplace is a virtual marketplace whereby buyers and sellers can negotiate a contract using the e-marketplace as a platform. One example is alibaba.com

#### Box 12: Bolero

Bolero.net is a neutral, global platform owned jointly by S.W.I.F.T, a bank-owned cooperative, and the Through Transport Club, which provides insurance to a multitude of ports and terminals, and two-thirds of the global container fleet. The Bolero initiative addresses a glaring lacuna in the area of trade finance automation – the issue of security and authentication – by providing a secure service for the exchange of documentation that is supported by strong authentication and audit trails. The development of global e-business received a major boost as Bolero.net and Identrus announced their joint co-operation late in 2000. Identrus is a global network of financial institutions; it provides a legal and technical framework of standards that enables banks to serve their business customers as trusted third parties for B2B e-commerce transactions.

Source: [www.bolero.net](http://www.bolero.net)

### 2.2.2 Typical Components

While there are various models in implementing e-finance, there are basically 5 major components in it. Typical components of e-finance should have the following components:

**Application Template:** Generally a web based form that provides a full set of application templates to initiate transactions for both importers and exporters. The template will have to include business rules and validation checks. Business rules and checks such as the need to have two signatures for transaction amounts exceeding certain values should be built into the template. A well-implemented Application Template will be able to validate the form online without the need to send the information back to the bank system.

It is also important to ensure that the interface of the application template is user friendly. A cumbersome and complicated form will turn off users and discourage users from future use of the system. One

way to ensure this is to conduct a 'Usability' test on the Website. One of such methods is the Heuristic Evaluation<sup>9</sup> which suggests 10 criteria to assess the usability of a website.

**Transaction Authorization:** The system allows users to create a signature matrix designating who is authorized to apply and approve applications through digital signatures. In simple financial transactions such as fund transfer and bill payment, basic security implementation of user ID and password with proper encryption would have been sufficient. The e-finance system however cannot ignore the need of businesses. They have to implement a flexible and customized system to fit the management and financial requirements of individual companies. For example, some companies will require only one authorizer to approve the financial transaction while another company may set different authorizers based on different values of the financial transactions. A successful e-finance system would need to cater to such requirements.

In general, a complex e-finance system would have the following user types or profiles:

Administrator – maintains the system and its user profiles, controls access to particular features of the system and monitors the way in which the system is used.

Creator – is the person who created the financial instructions for authorization and transfer to the bank.

Authorizer – is the person or group of persons that authorize the transaction prior to transmitting it to the bank.

Sender – is the person who actually transmits the duly authorized files to the bank.

<sup>9</sup> Ten Usability Heuristics by Jakob Nielsen.

[http://www.useit.com/papers/heuristic/heuristic\\_list.html](http://www.useit.com/papers/heuristic/heuristic_list.html)

**Application Tracking & Reporting:** This feature enables users to track all their banking activities and generate reports and analysis. Analysis and reporting are important for both the user and the bank, as they can be used as an effective tool to manage risk associated with trade financing.

One key feature that we consistently find in many successful e-finance implementations is the ability for the customer to download the report in CSV<sup>10</sup> format. The CSV format can enable the customer to import the data to other software such as their accounting system.

**Security Feature:** Users are usually given a smart card to store their digital signature. The security is usually implemented using Public Key Infrastructure.

#### Box 13: Public Key Infrastructure

Public-key infrastructure (PKI) is the combination of software, encryption technologies, and services that enable enterprises to protect the security of their communications and business transactions on the Internet.

PKIs integrate digital certificates, public-key cryptography, and certificate authorities into a total, enterprise-wide network security architecture. A typical enterprise's PKI encompasses the issuance of digital certificates to individual users and servers; end-user enrolment software; integration with corporate certificate directories; tools for managing, renewing, and revoking certificates; and related services and support.

Source: Netscape Verisign

e-Finance systems typically need following security features:

**Authentication.** There must be a way to validate the identity of the user. The simplest form of authentication is the use of username and password. In a more complex environment, digital certificates are used to confidently validate the identity of each party in a financial transaction.

**Data integrity.** Data should be protected to ensure its integrity. One-way is the use of a

digital signature to "sign" the message. The recipient of the message can be sure that the data has not been changed or corrupted in transit, by verifying the signature with the Digital Certificate.

**Data Privacy.** Encryption techniques such as SSL and digital certificates can be used to protect information from interception during Internet transmission.

**Authorize transactions.** With PKI solutions, companies can set up their approval and authorization level for specified online transactions.

**Non-repudiation.** Digital certificates validate their users' identities, making it almost impossible to later repudiate a digitally "signed" transaction.

**Seamless Integration:** With larger companies, the e-finance system must be able to integrate into the back office system. This includes their ERP system and their existing EDI system.

#### Box 14: Agricultural Bank of China integrated e-commerce web portal

The Agricultural Bank of China (ABC) has more than 300,000 employees who focus on fund raising, credit lending, international operations, bankcards and intermediary business. As more foreign and local banks emerge to challenge its role in these fields, ABC must strengthen its competitive advantages and find new ways to satisfy consumer needs. One of the IT initiatives was a highly reliable and available e-banking system. They implemented an enterprise portal that allows the bank to publish its financial and marketing information on the Internet. The e-banking system has a 24 hour/7 days a week customer banking services such as: account inquiries, transfers and payments. It also has an information exchange platform, allowing for data transfer with the government and with ABC's enterprise customers.

Source: IBM. <http://www-306.ibm.com/software/success/cssdb.nsf/CS/BEMY-66SRBP?OpenDocument&Site=>

<sup>10</sup> CSV: Comma Separated Value File Format

## 2.3 Stages in e-enabling Financial Services

Trade finance is just one of the many services offered by financial institutions. In the area of e-trade finance, it is also important to develop the infrastructure for e-banking and e-payment. This will be discussed in the following chapter.

For infrastructure development, a country usually goes through the following phases in e-enabling their Financial Services:

### **Phase 1: Linking up the banks with a Central Clearing House**

Usually initiated by the Central Bank, this involves the setting up of a central clearing house to which payments between banks are cleared. The clearing house generally provides the settlement of funds between member banks for the following services:

- Cheque clearing
- Deposit employees' wages directly into their accounts (GIRO)
- Process transfers and payments of bills
- Execute other debit and credit transactions

Real Time Gross Settlement (RTGS) is now a common place in clearing house function after the Asian Financial Crisis.

To connect to the rest of the world, banks will begin to join international clearing bodies such as SWIFT.

### **Phase 2: Deployment of ATMs and Point-of-Sale (POS) System**

This phase is connected to the introduction of debit and credit cards. Here, banks focus on retail customers and their main aim is to encourage a greater use of plastic cards instead of cash.

For corporations, the use of Purchasing Cards becomes an alternative to cash in their procurement requirements.

### **Phase 3: Simple e-banking**

The success of simple e-banking will very much depend on the success of Phase 2. When customers get used to e-payment and plastic cards, they are ready to enter the next phase of e-banking.

In this phase, corporate e-banking becomes an important service, including management and trade finance services.

The usual first step is to transfer the traditional services to the Internet, e.g. LC applications, DC applications, guarantee and insurance applications. Banks may provide a soft copy of such forms on their website for download. Customers may thus download the forms, print them, fill them in and submit them through the traditional channels such as mail or bank branches. The next step is to convert such forms into online forms. Customers can then complete the forms online and submit the application online.

### **Phase 4: Innovative e-banking**

The degree of development varies between banks and in different countries. Some banks just transfer their traditional banking services from their branch into the e-banking platform. However, some banks, by leveraging the unique strength of the Internet, have managed to develop new financial instruments. One example is the Business Cash Financing service offered by OCBC Bank in Singapore (Please see Box 33 for details). The service, a revolving working capital loan similar to factoring, is only available for SMEs who use their Internet Banking service for all the financial and trade transactions.

One of the reasons why banks are able to offer different products through e-banking is that banks are able to gather more information about their customers through transactions done by the customers. The new found information and knowledge about their customers will enable the banks to know their customers better and thus provide customised products.

### Phase 5: Financial Value Chain Integration

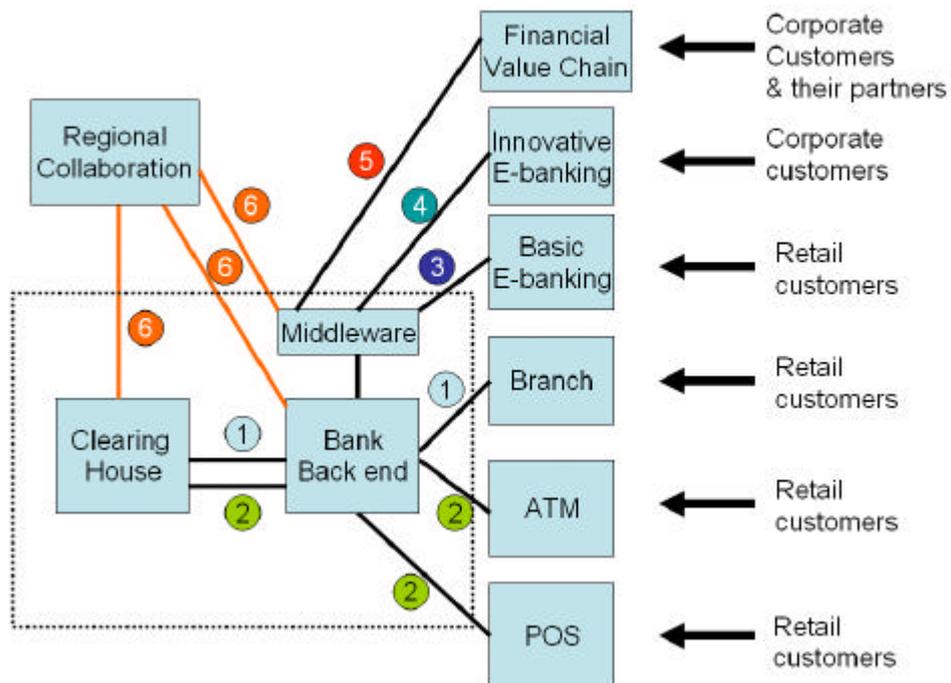
In this phase, banks now go beyond just providing banking services. They will attempt to integrate their services with the business value chain of its customers. One example is for banks to link up their banking system with the country's electronic trade documentation system. An example is the Tradenet in Singapore. Tradenet allows companies to submit their trade documentation online to the various government agencies such as Custom Department and other business partners such as freight forwarders, transport companies etc. Banks have now linked up with Tradenet to provide trade finance services such as insurance and guarantees to exporters. Exporters now do not need to log in separately into their Internet Banking for such services.

In this phase, intermediary organizations are formed to act as processing and integration providers. They would provide the platform to link up the banks with the other parties in the business value chain of the importers/exporters. One example is the Trade Card, you may find useful to look at Box 11.

### Phase 6: Regional Collaboration

Going beyond their own territory, banks will begin to work within their region where their customers trade. Collaborations will see the possible link up of clearing houses, e-payment system etc.

Stages in e-enabling Financial Services



## 2.4 Security Risk Issues

While money authorities should encourage the widespread use of e-banking, regulators must also recognize the risks associated with network technology. Due to the open and complex nature of the Internet, banks will take into account the accentuated risks associated with using this infrastructure in their management process.

One risk relates to the security of systems and transactions, including data confidentiality and authentication of the parties involved. Another risk is the continuous availability of the Internet as a medium for financial transactions. This availability is prone to serious hazards, such as computer viruses and hackers.

It is important for banks to set appropriate control and security benchmarks for their Internet operations. The level of internet-related risk is directly linked to the type of services provided by the banks. Typically, Internet financial services can be classified into:

**1. Information Service** - This is the most basic form of e-banking whereby banks set up their own website mainly as a one way communication channel. The site will provide information, advertisements or promotional material to customers. Risks associated with such services are low.

**2. Interactive Service** - This form of e-banking service enables customers to make account enquiries and fill in application forms for additional services or new products. These services are usually 'offline' and are not directly connected to the Bank's internal network. The risks pertaining to these Websites are similar to the Information Service except that the risks could be higher if the bank decides to offer services that require a connection to the bank's internal network.

**3. Transactional Service** - Customers can execute online the transfer of funds, payment and other financial transactions. In order to perform these transactions, the e-banking system will have to be linked to the Bank's banking system. This is the highest risk category. Because of this risk, strong controls are required, since online transactions are often irrevocable once executed and, without adequate control, the bank's internal systems may be exposed to external attacks.

**4. Third Party Integration Service** - In this category, the e-banking service is tightly integrated with other third party services. For example, a bank's e-banking service may be integrated with the online Custom Declaration System. For a customer to, say, apply for a Letter Of Credit, information is shared between the two systems. Furthermore, risks associated with the Transaction Service also apply. Thus, and in addition, the bank has to take measures to protect the Confidentiality of Customer Information. While certain shared information can be passed on to the two systems, customer banking information cannot be passed over.

While it is not possible to guarantee 100% security proof, FIs should have a set of good practices to ensure that their systems are well protected. Some of the best practices are:

**1. Industry's strongest 128-bit SSL<sup>11</sup> encryption** – Employing a strong encryption can reduce the risk of data integrity and privacy loss. One of the main technology vendors that provide such encryption service is VeriSign. The 128-bit SSL encryption is currently commercially the strongest. Any data sent through Internet Banking will be scrambled into an unrecognized form before it is transmitted to the bank server where only the bank has the special key to decode it.

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<sup>11</sup> Security Socket Layer (SSL)

**2. Personal Identification Number (PIN) and unique User Identification (UID)** – e-finance services generally deploy a two-factor authentication method. In the two-factor authentication method, the customers need to enter their electronic banking PIN that match with their unique User ID in order to access their account information and/or transact online. However, for added security, especially for complex and high value financial transactions, a three-factor authentication method is generally employed. In a three-factor authentication, customers are given a physical device such as smart cards or other types of “tokens” in addition to the UID and PIN.

**Box 15: Citibank introduces Dynamic PIN**

Citibank has implemented a dynamic PIN Pad for their e-banking service. A PIN Pad is displayed on the e-banking login page. The digits on the PIN Pad are randomly ordered and users use their mouse to point and click on the digits to enter their PIN. These methods eliminate common types of threat, such as Trojans.

*Source: CitiBank Singapore <http://www.citibank.com.sg>*

**3. Additional One time Password** – Certain transactions such as transfer of funds to another account will require an additional one-time password which is sent via SMS to the customer’s mobile phone or message pager.

**4. Automatic Logout Feature** – When the system detects that the session has not recorded any activity for some time, the session will be automatically terminated. Hence customers will need to login again.

**5. Constant and Vigilant Monitoring** – FIs have to put in place security surveillance systems to constantly monitor and detect any potential form of illegitimate activities on their networks and systems.

**6. Regular Review and Audit** – Regular security reviews and internal as well as external auditors conduct audits.

**7. Customer Education** – Customers will also have to do their part in protecting their accounts. FIs with e-finance systems have to constantly educate their customers on safe security measures.

## 2.5 Policy Issues related to e-finance

The growth of e-finance raises policy issues with regard to the legal framework, security concerns, the oversight and/or supervisory functions of central banks.

From a central bank perspective, the following policy issues need to be addressed:

**1. Legal issues** – In several countries there is an existing legislation on the legal context for electronic banking and e-payments. Where specific statutes do not exist, the provisions of existing legislation are used. The legal framework generally deals with the rights and responsibilities of the user and the issuer, the provisions for consumer protection and recognition of digital signatures and, in some cases, sets penalties for fraud.

**2. Oversight issues** – To effectively supervise the financial institutions, central banks generally issue guideline to banks in the area of Internet Banking and e-payment as part of their overall oversight responsibilities. These guidelines focus their attention on risk management and on the responsibility of FIs in ensuring that their systems are secure and are regularly audited for security weaknesses.

**Box 16: Example of Policies and guidelines by Monetary Authority of Singapore (MAS)**

“The current framework for prudential **regulation and supervision** already provides flexibility for innovation in new business models. We do not require a new framework to facilitate innovations in Internet banking or to mitigate its risks. However, as certain types of risk will be accentuated in Internet banking, banks will have to emphasize different aspects of risk management, and the focus of MAS supervision will match this.”- MAS Policy Statement on Internet Banking 19 Jul 2000.

Subsequently, an **Internet Banking Technology Risk Management Guidelines** was issued by MAS in September 2002. It was further revised in June 2003.

Source: MAS. <http://www.mas.gov.sg>

**3. Cross-border issues** – At present, central banks can only regulate and supervise systems operating in their home country. Central banks would not have the power and ability to regulate e-finance systems that are located in foreign jurisdictions. To effectively supervise cross-border transactions, central banks generally will work with other major regulators to ensure effective cross-border supervision of banks. They also work through international organisations such as the Bank of International Settlement (BIS).

Since technology is the pivoting element in e-finance, policy issues with regard to telecommunication, digital signature and Certification Authority also need to be addressed. These policies include:

- Recognition of electronic transactions, electronic contracts, electronic records and electronic signatures
- Public key infrastructure and the establishment of a Certification Authority
- Government use of electronic records and signatures

The above policy issues are addressed as a whole in the e-commerce law. Primarily based on the UNCITRAL Model Law on E-commerce 1996, the e-commerce law provides a legal recognition of e-documents, e-contracts and e-signature.

It also covers rules governing timing of dispatch/receipt, acknowledgement of receipt, attribution and retention of e-messages.

## 2.6 Regional Perspectives and Case Studies

E-Finance is not limited to developed countries. Many developing countries with proper telecommunication infrastructures have been successful in implementing e-finance. What are their success factors? What can we learn from them? What are the issues they faced? We will examine these from a regional perspective and highlight the lessons learnt through case studies.

### 2.6.1 Europe – The most e-ready region

Based on an e-readiness study conducted by The Economist Intelligence Unit Limited and IBM Corporation, Northern Europe and the Nordic countries are the most ‘e-ready’ countries<sup>12</sup>. In the ranking, European countries were ranked top 5 (Denmark -1, UK -2, Sweden – 3, Norway - 4, Finland – 5). Some of the reasons that put this region ahead of the other countries are the excellent telecommunication infrastructure, an e-savvy population and greater coordination between EU member states.

With such a high level of e-readiness, e-finance in European countries is enjoying some successes. This is further reinforced by a survey conducted by The European Financial Management & Marketing Association (EFMA). The survey, conducted in 2004, revealed that European net surfers make use of financial services on the Internet much more often than they visit or telephone their bank. The Internet is now being used as one of the many other distribution channels and this channel is considered as important as any other channels.

<sup>12</sup> Source: The 2004 e-readiness rankings, A white paper from the Economist Intelligence Unit

#### Box 17: Danske Bank – Export Finance Online

Danske Bank is the largest bank in Denmark and a leading player in the Scandinavian financial markets. In Denmark, Norway and Sweden, the Group serves almost three million retail customers and a significant part of the corporate, public and institutional sectors. It also has a large number of international corporate clients, particularly in the northern European markets. The bank has 800,000 online customers who use the Bank's e-finance facilities. One of their innovative products is *Export Finance Online*.

When exporters offer financing to their customers either in the form of letters of credit with deferred payment or bills of exchange / promissory notes, both parties must agree on a financing interest rate. The exporter should seek to offer a financing rate of interest that covers the financing costs involved. Therefore, exporters must be aware of the costs involved when granting financing facilities to their customers. Danske Bank's Export

Finance Online gives an estimate of the cost involved, taking into account the buyer's country and bank, credit period, and repayment profile.

#### *Lessons learnt*

Danske Bank has gone beyond providing simple online transactions such as deposits and withdrawals. In the case of Export Finance Online, Danske Bank has gone further by helping their customer to be more competitive through better and more transparent export financing offering. Through an interactive and online system, an exporter can quickly determine the cost of providing such financing. Thus helping the exporter in managing their cost of business.

Source: <http://www.danskebank.com/exportfinanceonline>

#### Box 18: UK – Payment System reform & migration to IP based payment system

Following a review of its operations and governance, the Bulk Automated Clearing System (BACS) of the UK decided to separate into two companies in order to best meet the needs of its customers. This change came into effect on 1 December 2003.

- BACS Payment Schemes Ltd, is the membership based 'not for profit' business dedicated to maintaining the integrity of the Direct Debit and Direct Credit payment schemes. It also governs the rules and legal structures under which payments are made.

- Voca Limited (formerly known as BACS Limited prior to 12 October 2004) is the commercial company that physically processes the Direct Debit and Direct Credit payments, and maintains the payment network.

This follows the global trend to separate regulatory and supervision functions away from implementation and operation functions.

The British banking industry is also upgrading the security of its electronic payments clearing system to safeguard four billion transactions worth more than £2,646 billion a year. The move follows a switch to the Internet for transmissions. BACS is spearheading the use of digital certificates based on smart card-based "chip and PIN" technology to upgrade security on its network.

BACS's Public Key Infrastructure (Please see Box 13) project is part of an overall IT investment programme known as NewBACS. This replaces legacy mainframes with systems based on Sun Microsystems and Oracle technology. NewBACS is intended to prepare the Automated Clearing House for a massive rise in transactions over the next few years. Transaction volume is already growing 10 per cent a year, but the UK government is to replace benefits and pension cheque payments with electronic payments direct to people's bank accounts via BACS.

A key element in the project is the role played by the member banks in guaranteeing the identity of their customers. BACS had originally envisaged using Identrus, the global bank-owned trust authority, as the underlying infrastructure for this facility. But not all UK banks were willing to use Identrus, mainly because they had already set up PKI systems of their own.

*Lesson Learnt*

For better corporate governance, there was a need to segregate the functions between regulatory supervision and implementation. Such segregation will in turn open up the market, such as the e-payment market, to private sectors that may have other innovative services at lower cost.

However, in the area of Certification and the use of a trusted Certification Authority, there seems to be a need for better co-ordination. FIs should work together to implement a single CA and if not possible, work towards cross certification of CA. In BACS example, they would have to go back to each of the banks (involved in transactions) individually to check certificate revocation as some banks use their own PKI.

It is therefore important for all the banks to recognize (cross certify) that each other's trust scheme could be relied on. Most ideally, ACH planning a similar system would be to see if they can find an acceptable single trust provider.

Source: <http://www.bacs.co.uk>

**Box 19: Nordea Trade Finance Net Services – Finland**

Nordea is the leading financial services group in the Nordic and Baltic Sea region. The Group operates through three business areas: Retail Banking, Corporate & Institutional Banking and Asset Management and Life. Nordea has almost 11 million Nordic customers and 1209 bank branches. It employs about 29 000 people. Nordea has over 4 million e-customers. Nordea's Trade Finance Net Services (TFNS) is an Internet based system that enables its customers to make online documentary credit, collection and international guarantee transactions with speed and efficiency. This saves time for the company and widens their overview of concluded trade finance transactions.

The TFNS has been a powerful sales tool for Nordea. It also reduces the administration cost. Signatures and authorization are now checked automatically. Data is captured electronically and can be re-used in the back office system. Thereby the processing average time for each deal is shorter.

*Lesson Learnt*

Trust and security does not seem to be an issue here since users are comfortable with the security measures implemented in TFNS due to the high e-readiness of the region.

From a practical point of view, there are some big barriers when it comes to Trade Finance especially if we are to integrate the entire Trade Finance process. To do this, it would require all parties to be integrated – buyer, seller, customs department, approving agencies, insurance, freight forwarders etc.

Source: <http://www.nordea.fi/>

**Box 20: Online Financial Tools from Export Guarantee and Insurance Corporation (EGAP) of the Czech Republic**

The Export Guarantee and Insurance Corporation (EGAP) was founded in June 1992 as a state-owned export credit agency, insuring credits connected with exports of goods and services from the Czech Republic against political and commercial risks. EGAP, now part of the state export support programme, provides insurance services to all exporters of Czech goods irrespective of their size, legal form and volume of insured exports. In addition, they provide insurance of domestic receivable.

With the aim of serving all segments of Czech exporters and suppliers and in order to simplify access of clients to the insurance, in 2004 on-line access for all clients was introduced. This enables to access “self-service” to credit limits and to an automated issuance of smaller credit limits.

*Lesson Learnt*

Deployment of e-finance can greatly increase the availability and accessibility of funds for SMEs. In the case of EGAP, they provide SMEs with a convenient way to access their credit limit via their online network.

Source: [http://www.egap.cz/index\\_en.php](http://www.egap.cz/index_en.php)

### Box 21: BancoPosta – Italy

Besides providing core postal services, Poste Italiane Group offers integrated products, as well as communication, logistic and financial services all over Italy.

BancoPosta, a unit within Poste Italiane, manages financial services. BancoPosta offers a wide range of financial services to its customers - BancoPosta Account, credit and debit cards, money transfer, funds, bonds and loans. The key element for Poste Italiane to offer financial services lies in their large network – over 14,000 postal counters spread within the country – compared with just 5,000 counters in the largest bank.

Besides leveraging its logistical system and large network of outlet, Poste Italiane also invested heavily in technology. BancoPosta has an Online Business Account for its corporate current account customer. It is a new product designed specifically to meet the needs of businesses requiring a transparent, affordable way to manage collection and payment transactions directly from the work place.

#### *Lesson Learnt*

Postal services all over the globe have great potential, due to strong distribution channels through their wide network of outlets and to its strong logistical capacity. Postal banking services are ideally suited for greater collaboration with FIs to encourage to leverage on the strength of postal services.

*Source: <http://www.poste.it>*

### 2.6.2 North Americas – Re-engineering social habits

Worldwide, American businesses and consumers write more cheques than anyone else. Cheques, introduced decades ago, are inexpensive for consumers, readily available, and reliable and secure enough for transactions. Although automatic debit is popular (and even required) in many other parts of the world, these systems are just beginning to become popular and commonplace in the US.

FIs in the US, have to invest heavily in new hardware and software to migrate their systems, that were once state-of-the-art in the 1970s. As the social habits of users increasingly change and evolve, FIs are forced to seek out newer technologies. These changes require strong push from governments.

In Canada, special focus has also been made on social re-engineering through their successful e-government implementation, where their focus is to enrol citizens and businesses. The Canadian government has placed its citizens and businesses at the core of its e-government initiative by clustering their government services online at these specific sectors. Such efforts have gained acceptance from the population. The population have changed their social habits to getting their things done by visiting the government agency to completing the same requests online, through the e-government website.

**Box 22: Electronic Payments Exceed Check Payments for the First Time**

Surveys conducted by the Federal Reserve confirm that electronic payment transactions in the United States have exceeded cheque payments for the first time. The number of electronic payment transactions totalled 44.5 billion in 2003, while the number of cheques paid totalled 36.7 billion, according to recent surveys of U.S. depository financial institutions and electronic payments organizations.

Previous research by the Federal Reserve found that the number of cheques paid in 2000 was 41.9 billion transactions, compared with 30.6 billion electronic payments. Electronic payments consist of such payment methods as credit cards, debit cards and automated clearinghouse (ACH) transactions, like direct debit.

*Lessons learnt*

FIs in developed countries such as the United States have to cope with the fact that as early adopter of technology, they invested a lot in legacy systems of mainframe computers and propriety closed network. To move away from their legacy system and to embrace new and open systems, FIs have to invest in new hardware and software. They will also need to embrace new technology to introduce new delivery channels and products to cater to the changing social habits of its customers. Such changes sometime take time as can be seen in the US example. While electronic payment was already available a decade ago, it is only since recently that electronic payment finally exceeds traditional cheques payment.

*Source:*

<http://www.federalreserve.gov/BoardDocs/Press/other/2004/20041206/default.htm>

**Box 23: Alternative Banking for Small Businesses – PayPal**

Companies like PayPal (now part of the electronic auction company e-Bay) provide alternative payment mechanisms for consumers and small businesses. PayPal has over 17 million active online users (in comparison, Bank of America, with the largest consumer online presence, has about 12 million active users). But PayPal is no longer just in the business-to-consumer market. Beginning in mid-2004, they began directly offering their services to small businesses as a conduit for business-to-business transactions that do not involve an e-Bay purchase. Since many small businesses sell their products on the e-Bay auction site, they are a natural constituency for PayPal to expand their small business services.

In addition to providing mechanisms to transfer funds between individuals and/or small businesses, funds can originate from major credit cards as well. Funds can be debited or deposited into most traditional bank accounts through by PayPal via the ACH (Automated Clearing House) service.

PayPal was started in 1998 and learned from the previous failures of other payment systems (like Mondex which was acquired by MasterCard and CyberCash which was acquired by VeriSign). PayPal has sophisticated processing systems and large number of business customers. PayPal is neutral in its banking arrangements; it is not aligned with a specific bank or consortia of banks.

*Lessons Learnt*

Being non-bank payment service providers, there must be enough safe guard in the country's legislation to protect the interest of the customers. In PayPal case, funds kept in PayPal are deposited in a consolidated account with a bank that provides FDIC Pass-Through Insurance.

To create trust and build confidence in third-party service providers— especially aggregators, central banks need to monitor and provide clear guidelines and laws on such services.

*Source:* <http://www.paypal.com>

**Box 24: Virtual Trade Commissioner – toolkit for exporters**

Export Development Canada is partnering with the Canadian Trade Commissioner Service to expand the toolkit of the online Virtual Trade Commissioner for Canadian exporters. This free, password-protected website provides customized market information, business leads and, now, a quick entry to EDC's trade finance and risk management tools.

Canadian business can use the Virtual Trade Commissioner to conveniently keep up to date on market reports, business news, trade events, business leads and trade finance services that match their international business activities and interests.

In addition to a direct link to an EDC specialist who can answer questions about EDC's insurance, bonding and guarantees and financing services, Virtual Trade Commissioner users also get access to special EDC online services such as EXPORT Check, to order financial profiles on potential foreign customers, and EXPORT Protect, to insure a single export transaction against the risk of non-payment.

*Source: Virtual Trade Commissioner at:  
<http://www.infoexport.gc.ca/>*

### **2.6.3 Latin America – The Hotbed of E-commerce & e-finance**

In terms of e-readiness<sup>13</sup>, Latin America countries are in the 2<sup>nd</sup> tier (position 25 to 50 of the EIU ranking) with Brazil in the 35<sup>th</sup> place, Argentina (37<sup>th</sup>) and Mexico (40<sup>th</sup>). However, this does not reflect the development of e-finance in these countries. Countries like Brazil and Mexico have successfully implemented e-finance. According to UNCTAD's E-Commerce and Development Report 2002, the most successful e-finance stories in Latin America, include those of banks such as Banco Itau of Brazil and Banamex in Mexico.

One of the main reasons is the existence of thriving IT-related services markets in these countries. This includes software development, telecommunication and network support services. A cost-competitive worker has also given rise to thriving IT businesses.

These two countries have very active e-commerce activities both in the private and public sectors. For example, in Brazil, the Camara Brasileira de Comercio Electronico (Brazil ECommerce Chamber of Commerce) was setup to spearhead the e-commerce development of the countries and served as a focus point for the private sectors to discuss and co-ordinate e-commerce related issues.

Coupled with the rapid increase in the number of Internet users, better accessibility of high-speed network and the rapid expansion of mobile network, e-finance is slowly taking off in this region.

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<sup>13</sup> EIU e-readiness survey 2004

#### Box 25: Banco Do Brasil – Trade Portal for SMEs

Banco do Brasil is presently the major financial institution in Latin America. It is a government controlled publicly listed commercial bank. The Bank is also a Trade Support Institution that provides financial intermediation and trade finance services.

The geographically dispersed nature of Brazil and of the Bank's large customer base with over 1.2 million enterprises, makes the use of web-based solutions a strategy to deliver trade support services to its customers.

Banco do Brasil has developed a web-based Trade Portal, where national exporters receive trade-related information and trade finance service. The Trade Portal is called the "International Trade Bureau" and offers an e-market place for Brazilian exporters by being Banco do Brasil's customers. These exporters can use the e-market place to sell their products to importers from outside of the country. Multi-language support in Portuguese, English and Spanish is available in the Trade Portal.

The e-market place enables the exporter to create an electronic shop and an online catalogue. The importer will place the order through the online catalogue. After receiving the order, the exporter may accept or refuse the order. Upon acceptance, the exporter can arrange for delivery via a partnered logistic company with the Bank.

Upon closing of the business deal, the Bureau provides various trade finance services for exporters. These include: Payment in Advance, Post-Shipment Payment and Payment in Advance with custody (escrow) service.

For financing, two innovative services were offered to the exporter:

- Upon arrival of a financial remittance, the exporter can print the contract and send it to the branch. The branch will release the amount in the national currency and, credit it into the exporter account. Project is underway to further simplify this process through digital signature.
- Pre and post-shipment financing – The exporter can apply for financing upon closing a commercial deal electronically from the Trade Portal on-line. The loan amount will be credited to the exporter own account. This is an exchange contract in which the Bank anticipates the national currency to the exporter, having an export operation as the guarantee.

#### Lesson Learnt

Banco do Brasil does not charge fees for participants. The exporter pays only the regular financial remittance fee, upon arrival. Enterprises have increasingly migrated their financial operations to the Bank to use the International Trade Bureau. The bottom line is: when a financial institution partners with a client, the return in customer relationship, and therefore in revenue, is certainly assured.

Source: <http://trade.bb.com.br>

#### Box 26: AOL Latin America

America Online Latin America Inc.(AOL) and Banco Itau launched a co-branded, customized service available to Itau customers in Brazil, providing one-click access to on-line banking and customized finance for the users.

The service, which is in Portuguese, will allow participating Banco Itau customers to benefit from AOL's functionality.

One important element in the success of e-finance is availability of access to the customers. In countries where access to Internet is costly, it may be necessary for FIs to closely work with the network provider such as the local ISP.

Source: [www.corporate-ir.net/ireye/ir\\_site.zhtml?ticker=aola&script=412&layout=9&item\\_id=204322](http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=aola&script=412&layout=9&item_id=204322)

**Box 27: Banamex – Special financing for SMEs online**

Banco Nacional de México, better known as Banamex, is the leading bank in the country and is part of the Grupo Financiero Banamex, Citigroup affiliate. It provides service to 200 thousand firms and more than 12 million Mexicans with some 30,000 employees at national level, by distributing its operations geographically in 9 regions with close to 1,500 branches, 5,000 ATMs, 30,000 Point of Sale terminals and 650 Kiosks with “BancaNet” Access, and its Internet Banking.

To cater to the special needs of SMEs, Banamex has introduced the service called “Impulso Empresarial Banamex”. This service is made up of two financing instruments – Revolving Credit and Electronic Financing for Suppliers and three banking tools – Checking Accounts, Executive Debit Card and BancaNet Empresarial (Internet Corporate Electronic Banking).

Revolving Credit offers financing to support companies in their working capital needs through a line of credit based on the company’s amount of sales, with automatic monthly recurrent payments – indirect debit- at a checking account and getting cash only through BancaNet Empresarial.

Electronic Financing for Suppliers permits the latter to obtain financing based on their accounts receivable on sales of goods and services, to buyers authorized by Banamex. This is similar to Factoring except that the application is completely electronic through BancaNet Empresarial.

*Lessons Learnt*

With the use of Internet, Banamex is able to offer innovative services to its SME customers. Both the revolving credit and electronic financing for suppliers provide working capital to SMEs at a low interest rate, through their e-finance website BancaNet Empresarial.

Some of the challenges faced by banks in Mexico while implementing e-finance services are:

- The paper culture. Customers are familiar with paper documents signed by the bank. While, BancaNet Empresarial uses Digital Signature and most forms of applications are now done electronically. However, the Government has introduced the Electronic Signatures Law and the Law on Electronic Invoices last year facilitating the expansion of e-finance services.

- PC and Internet Penetration rate in Mexican companies and homes is still low. This makes the access to e-finance a difficult task. To solve this problem, Banamex installed Internet kiosks in hundreds of their branches to allow customers to

access their e-finance services. Special financing with low monthly repayment was also introduced to enable customer to purchase PCs with Internet access included.

- Lack of knowledge and fear of security risks are factors that have eroded customer confidence in electronic transactions. However, through proper and constant education, customers will soon be able to manage such risks together with the banks.

Source: <http://www.banamex.com>

**Box 28: Using Information Technology in the popular markets - El Salvador**

Caja de Crédito de Chalchuapa (CACH) - forms part of the Federación de Cajas de Crédito de El Salvador. Amongst the many services, CACH provide micro loans to small businesses and industries that do not have access to FIs, either because of the size of their business or because of their lack of guarantees.

The main segment served by CACH is the street saleswomen in the western towns of the country, as well as small businesses. One of the problems faced by CACH is that these customers are mainly street peddlers and as such they are very mobile. They also have low literacy and many are not able to read and write.

While loans are given out to customers in banks’ branches, CACH need to dispatch their staff on the street to collect the monthly repayments directly from the customers.

In order to gain better control at the time of collecting the payment of loans or deposits for the customers’ savings accounts, which in many occasions can be as small as \$ 1.00. In this case, it becomes necessary to have a system that delivers simultaneously, the transactions and the information about the credit to the customer.

CACH developed software that makes use of PDAs, automating the collection of the payment. Once the money for the loan is received, the collector writes down the amount on his PDA, which prints two receipts: one is given to the customer the other is used as a document for the collector.

Once the collection is done, the PDA is placed on a database and the information is synchronized with the information on the system, through a workstation. The system updates the loan situation in real time.

*Lesson learnt*

The use of mobile technology can effectively streamline many processes. CACH has gone ahead to expand the service beyond collection of loan repayment. They have included new

services such as collection of savings deposits and application of new loans.

*Source: Asociación Centro Americana de Consultores en Comercio Internacional ACACCI-COMPITE, El Salvador*

#### **Box 29: Banco Nacional de Costa Rica**

Banco Nacional has a wide network of 134 offices, 265 automatic tellers across the nation and 19 drive-through branches. As of December 31, 2004, it is the largest banking institution in the country, with assets of US\$3.000 million and net profits for that year of US\$40 million.

The Bank has introduced a number of e-finance services using the Internet as the main delivery channel. The cost savings in delivery using electronic channels were evident from the following data:

- Transactions in ATMs: were 3 times more expensive than over the Internet

Human Cashiers:

- Transfers: 22 times more expensive than over the Internet
- Check Cashing: 15 times more expensive than over the Internet
- Checking Account Deposits: 15 times more expensive than over the Internet
- Savings Account Withdrawals: 12 times more expensive than over the Internet
- Savings Accounts Deposits: 14 times more expensive than over the Internet

*Lesson learnt:*

e-Finance can thoroughly reduce the cost of transactions. The key is to promote e-finance to SMEs as a viable alternative to traditional banking services. Over time, the benefits of e-finance will become clearer.

*Source: Asociación Centro Americana de Consultores en Comercio Internacional ACACCI-COMPITE, El Salvador*

## **2.6.4 Africa**

Compared to the other region, e-readiness in Africa is inching forward only recently and has been experiencing a reasonable growth in 2003<sup>14</sup>. Africa is the region with the fewest Internet users, although their number has doubled since 2000.

As can be seen on box 30, Africa is experiencing high growth rate in the number of Internet users from 2001 to 2003. This is similar to the transformation experienced in Latin America and in the Caribbean from 2000 to 2002.

In the area of e-finance, the current state is limited to e-mail communication between banks and its customers. However, there are also cases of extensive usages of ICT in some parts of Africa, particularly in Tunisia.

<sup>14</sup> E-Commerce Development Report 2004, UNCTAD

## Box 30: Internet users by region, 2000-2003 (thousands)

## Internet users by region, 2000–2003 (thousands)

	2003	%Growth	2002	%Growth	2001	% Growth	2000
Africa	12 123	21.38	9 988	63	6 119	34	4 559
Asia	243 406	15.25	211 202	40	150 535	38	109 257
Europe	188 997	7.24	176 232	23	143 584	30	110 824
Latin America and Caribbean	44 217	4.19	42 439	45	29 224	65	17 673
North America (2002)	175 110	0.00	175 110	12	156 823	14	136 971
Oceania	11 825	1.88	11 607	21	9 601	16	8 248
Developed countries	396 754	2.06	388 746	15	339 427	19	285 480
Developing countries	246 290	17.53	209 556	50	139 317	48	94 352
Others	32 634	15.41	28 277	65	17 142	123	7 700
<b>Total</b>	<b>675 678</b>	<b>7.84</b>	<b>626 579</b>	<b>26.36</b>	<b>495 886</b>	<b>27.96</b>	<b>387 532</b>

Source: ITU (2004) data and UNCTAD calculations.

## Box 31: Tunisian Post–Electronic Payment on the go

The Tunisian Post is one of the more aggressive users of ICT in Africa. Several projects were launched to ensure that the Tunisian Post still stay relevant in the new world of digital age. These projects include e-commerce, e-administration, e-payment, e-finance (for money transfers and financial services), e-post (for hybrid mail and secure messaging), track and trace electronic logistics, e-counter (the zero-paper postal desk), complemented by in-house e-learning for its 9,000 employees. Currently there are more than 50 e-related projects that are either implemented or in the process of implementation. Some of the e-finance related projects are listed below:

**CCPNet** - This is the Internet Banking service for companies who have postal cheques account with the Post. Basic financial transaction can be done online such as enquiry of balance of accounts, application of financial products, bank transfers electronically to pay their suppliers, paying their bills, paying workers' salaries, etc.

**Yellow plastic card:** This is a debit card system in collaboration with VISA Electron. With this card, customers can withdraw money at ATM machines and shops that are equipped with electronic payment terminals. In addition to that, they can also pay for purchase of goods and services on the Internet up to the amount of the postal current account balance; the amount paid is automatically debited on line from the postal current account.

**E-Dinar** - This is a prepaid, anonymous, multi-purpose card intended for the public at large, for Internet payment. Its main advantage is that it is

accessible to everyone and without any restrictions whether customers have a bank account or a credit card or not. Customers can buy the card by debiting from their account or by cash at the Post Office. Additional value can be added on to the card via the Internet.

The usage of e-Dinar is not exclusively limited to the Internet; it can also be used to pay transactions with retailers that are equipped with electronic payment terminals, as well as for withdrawing money from *automatic cash points*. For payment in the Internet, customers will use an 18-digit authentication code and a personal password. For transactions at automated cash points and electronic payment terminals, the customers will use a 4-digit authentication code and the personal password.

**Various Electronic Fund Transfer Services** – The Tunisian Post has developed a number of Electronic Fund Transfer service to make transfer of funds easier, faster and more convenient. Some of the innovative fund transfer services are:

**Minute Money Order** - This is an electronic money order service, which enables the customers to send money in *quasi-instantaneous* manner from any post office.

**Electronic money order** – Is an online payment system that connects to the institutions of higher learning for the disbursement of scholarships and study loans. It also connects to the social security agencies for the disbursement of pensions. These beneficiaries are paid in any post office by simply presenting their ID and without the need for any other document.

**EUROGIRO electronic money orders** – The Tunisian Post is one of the members of the EuroGiro service. The service enables customers to send and receive funds automatically via their account with the Tunisian Post.

*Lessons Learnt*

The Tunisian Post has moved aggressively into e-commerce and e-finance, which is a general trend worldwide. Postal mail is the main revenue for postal services that have been affected by the e-mail, Internet and mobile services such as Short Message Service (SMS). To evolve, the postal service had to reinvent and align itself with the digital age. With a large network of outlets and trust that the Tunisian Post developed over the years, it is now well placed to offer financial services and leverage ICT technology.

However, to increase its usage of e-payment, access to Internet becomes critical. The Tunisian Post has embarked on the next phase of development by deploying Internet Kiosks in strategic locations. This will further enhance its services to its customers.

Source: <http://www.poste.tn/index.htm>

*Lesson learnt*

These three websites are operated by different departments/divisions of the Bank. Each department created their own online service to cater their own customer needs.

However, this may raise some issues in the long run as a company can be a user of all three services. The customer will find it inconvenient to log-on into separate systems for different purposes.

Source: <https://www.fnb.co.za/>

## 2.6.5 Asia and the Pacific – The great melting pot

Asia-Pacific is the next-most e-ready region after Europe<sup>15</sup> with Singapore (7th) being most advanced and followed by Hong Kong (9th), Australia (12th), South Korea (14th), New Zealand (19th), Taiwan (20th) and Japan (25th). Developing countries in Asia are also catching up with initiatives such as e-government, e-trade, e-community etc.

e-Finance application is a common place in Asia Pacific with different stages of development. Almost every bank in Asia Pacific has a website and in the more developed countries, e-finance services.

Although not as tightly knitted as the European Union, countries in Asia Pacific do cooperate in regional setup. This includes government-to-government (G2G) initiatives such as ASEAN and APEC. The private sector has also set up some regional initiatives such as the Pan Asian Alliance. There is also a strong participation of the private sectors in the area of ICT development and e-commerce development.

### Box 32: First National Bank – Online Banking Portal

First National Bank is the third largest bank in South Africa. It is a division of the FirstRand Banking Group. The Bank has products and services available for individuals and businesses.

For businesses, it offers three types of online services:

**FNB Internet Banking** – Provides low value transactions and supply basic online banking facilities such as balance enquiry, online payments and foreign exchange service.

**BANKit** – Cater to high volume and high value transaction. In addition to the basic FNB Internet Banking service, BANKit also offers customization of payment templates, batch processing of bulk payment, create different levels of user administration, export files for reporting purpose.

**FNB Trade Online** – A special website for FNB customers to apply for import letters of credit provided by the FNB Corporate Trade Services.

<sup>15</sup> EIU E-Readiness 2004

### **Government and Financial Institutions are focusing the SMEs**

The governments in Asia Pacific recognized the importance of SMEs as they form over 90% of the businesses but contribute to less than 40% to the economy. Many of the SMEs in developing countries are also suppliers to multi-national companies who source, manufacture and assemble their products in Asian countries.

With globalization and a shift to knowledge-based economy, governments in Asia Pacific have started to focus their attention on SMEs. Various forms of grants and assistance in the form of loans are being given up.

Financial Institutions have also started to focus on SMEs by providing low cost banking and financial services. As SMEs typically require low value, high volume financial transactions, the Internet has become the natural choice for banks.

### **e-Government Initiative is the main catalyst of e-finance**

e-Government is very much in the agenda of the government in Asia. Countries who aggressively implement e-government would have first developed a national e-commerce strategic plan. The plan would include infrastructure development, legislations and policies development, ICT industry development and education. These developments cover the implementation of a successful e-finance system.

Part of the e-government initiative is to develop an e-payment system in a national level, which will enable FIs in the country to tap on the system and result in better integration of payment system.

The government, as the main pay master, could help to accelerate e-finance development through encouraging FIs to link their banking and payment system electronically to the government accounting and payroll system.

Governments are also the largest buyers to procure goods and services. They are therefore in a position to decide on the form they would like to procure. E-tender, government e-marketplace is common in Asia Pacific.

### **Regional Banking pushes e-finance further**

Most banks in Asia Pacific have a regional focus. For example DBS Bank, a major commercial bank headquartered in Singapore, also has operated in Thailand, Malaysia, Indonesia, India, The Philippines and China.

To operate efficiently and effectively, these regional banks choose to work on a single platform across the region. The implementation of e-finance can provide a standardized view and services across the region without incurring in too much IT infrastructure cost.

### **Late Coming Advantages**

Developing countries in Asia Pacific, who implement their e-finance service, now has the advantage of leap frogging in turn of using the latest technology and avoid the pit fall the other countries who had implemented it earlier.

Technologies such as mobile phones, personal digital assistants (PDAs), Voice over IP, wireless and broadband Internet are some of the better delivery channels that banks could exploit.

**Box 33: OCBC Bank – Velocity@OCBC**

OCBC Bank is one of Asia's leading financial services groups and one of the largest financial institutions, in the combined Singapore-Malaysia market, in terms of assets. E-finance services are offered to companies through its interactive website called Velocity@OCBC.

Velocity@ocbc offers a range of trade and cash management services, including account information, payment and collections, trade finance and foreign exchange. Since its launch in 2000, Velocity@ocbc has been well received by its customers.

Increasingly there are more corporate customers, including SMEs who are using the online platform to better manage working capital, productivity, costs and risks.

The system has gone through several enhancements since the bank constantly reviews feedback received from their customers. Some of the major enhancements include:

- Improved and enhanced interface - a new user interface was implemented with better navigation
- Chinese Language Option - Users can perform online transactions in Chinese.
- Better Online Performance - Users will experience faster access due to the use of better compression technology.

The Bank has also developed new financial product through Velocity@ocbc. Under its **Business Cash Financing** service, it offers financing to SMEs of up to \$500,000 on outstanding accounts receivable with a financing quantum of up to 75% of the eligible accounts receivable. It results in a revolving working capital loan based on accounts receivable and functions on a non-notification basis. The service is similar to Factoring however it requires no physical invoices to be presented subsequently after the loan account is activated. This service has gone down very well with the SMEs, who are mainly family businessmen, very conscious of their financial status. They find it 'embarrassing' if their business partners know that they have pledged their purchase orders to the bank as in factoring. This service is however transparent to their business partner as the SMEs will still issue and collect the payment directly from their business partners.

*Lessons learnt*

It is important to constantly obtain feedback from customers to improve the system. While e-finance may need to use sophisticated technology, FIs need to be mindful to deliver user-friendly systems. One of the key benefits of e-finance is transparency of information. When customers conduct their businesses entirely through the e-finance system, banks can have better information to understand the nature of their clients' business and thus are in a better position to manage their risk. And through better risk management and data mining, new and innovative products can be developed.

Source: <http://www.ocbc.com.sg>

**Box 34: Kasikornbank**

Kasikornbank is the third largest commercial bank in Thailand, as measured by total assets, loans, and deposits. As at end 2003, the Bank had 496 branches, 15 foreign exchange offices and 15 international trade centers, spread throughout Thailand.

The large and disperse branches created bottlenecks and discrepancies in providing trade finance to SMEs. In order to have an economy of scale and to consolidate the processing, the bank has created a centralized trade finance-processing center. A single unified Trade Finance System was developed to enable SMEs to apply, for example, for Letters of Credit using Internet Banking.

At the same time, customers can also submit their applications at branches. These applications will be scanned and electronically sent to the processing center for approval.

*Lesson learnt*

While banks can provide trade finance services through Internet Banking, they must also keep in mind that not all SMEs have access to, or are comfortable with, e-finance. In locations where internet access or usage is low, services can still be delivered through the branches or interactive kiosks. However, a common platform should be developed for both the branches and the Internet Banking system.

Source: <http://www.kasikornbank.com/>

### Box 35: TradeCard – linking supplier in Asia to buyer in US

TradeCard is a US company launched in 1994 that allows a buyer to connect the flow of physical goods with the flow of electronic funds by handling both through the same electronic document. The company had 750 customers at the end of 2003, up from 567 a year earlier. The volume of business it handles was up more than 230% in the first quarter of 2004 compared with the same quarter in 2003. TradeCard solution addressed the following need:

- To reduce the cost of L/C based payments
- To eliminate errors in paper documents causing discrepancies and increasing costs
- To increase visibility into transactions, e.g. salespeople visiting customers have better access to sales transactions pending
- To improve payments and cash flows monitoring

Previously, every time a buyer in the US issued a purchase order to one of its suppliers in China, it had to open a letter of credit with its bank, a process that required presenting a stack of documents. The bank would then courier the letter of credit to the manufacturer's bank, a journey that could often take a week. The Chinese bank would then review the documents and inform the factory that it could receive payment as soon as it shipped the order. The entire transaction could take up to two weeks, during which time the buyer money had left its accounts but hadn't yet paid for the goods.

In the electronic system run by TradeCard, the purchase order and the credit function are part of the same electronic document. That cuts down on the paper-processing time and allows people to track the two functions simultaneously. TradeCard replaces buyer and seller's bank with an insurance company that ensures that the transaction goes smoothly. It does this by charging buyers a subscription fee and pre-approving their credit risk. Suppliers generally pay a transaction fee. Because there is less paper and fewer people involved, the fees for each transaction are lower.

Because the information and funds are transferred more quickly, it is getting its orders faster.

### Lessons learnt

- E-finance can extend beyond simple provision of information to sophisticated Financial Management
- In developing a complex system it is important to have a focus – in the Trade Card case, the focus is on large Buyers in the USA

However, long term viability can only be assured if benefits touch all parties – in Hong Kong, SMEs gained by fast turnaround and lower cost of financing.

Source: <http://www.tradecard.com>

## 2.7 Conclusions

E-Finance can be implemented in many ways, starting from simple online application forms to comprehensive interactive services that link e-finance to an e-marketplace.

Critical is the basic telecommunication infrastructure and high e-readiness of no countries. The lack of such infrastructure and e-readiness will require the FIs to put in more effort– setting up Internet Kiosks, working with ISPs to provide special financing to purchase PCs and Internet access.

FIs must balance between convenience and security. The use of PKI and digital certificates should be encouraged when high value transactions are made. However, efforts should be made to use the same PKI infrastructure. If each bank were to develop their own PKI, efforts will have to be made to cross-certify them.

FIs should view e-finance as a tool to build relationships with its customers due to its lower cost, higher speed and wider reach. They could first use e-finance to provide transaction oriented products such as balance enquiry, funds transfer etc. As the customers build their business transaction around the e-finance service, the FIs could then offer Cash Management services to help SMEs to manage their account. Through such services, FIs can better understand the creditworthiness of its clients and be able to customize financing for them.

It is important to recognise that, while e-finance offers many benefits, such as better access to information and lower costs, it can only be successful in a fully developed banking environment, conducive to international payment. An example is in the Southern African region. While there are some forms of e-finance services offered by the banks, applications in the export arena has been limited, inter alia, in view of the exchange control provisions which are in place.



## Chapter 3: e-Finance services: How To Exploit Technology To Optimise Value?

FIs should focus on using e-finance to lower the cost of acquiring and servicing SMEs while ensuring profit by cross- and up-selling a range of financial services to them. Technology tools such as Internet kiosks, mobile phones and electronic banking offer a low cost, fast and wide spread delivery channels that FIs could leverage on.

Technological development not only is about creating alternative delivery channels, but is also redefining the financial landscape. This includes continually finding new effective ways to provide financial services to SMEs while ensuring profitability of the bank. It is not just about web enabling existing products and services but also being able to provide the complete financial services required by SMEs. It is also not just about implementing technology solutions but being able to customize the product offerings to local requirements and preferences.

Software and content development tools such as customer relationship management systems, credit scoring and application processing solutions, are some of the tools that FIs can employ in their e-finance services.

In this chapter, we will look at the various technologies that are deployed in the delivery channels and various e-finance services.

### Box 36: Upgrading of e-banking system seen as key to competition

DBS Bank has upgraded their Internet banking platform that will deliver online products and services faster, to more users, and across the region, in a seamless manner.

The platform, based on the leading J2EE<sup>16</sup> standards, will resolve the scalability problem of the previous system which was introduced seven years ago and whose technology is now outdated.

DBS' new Internet banking platform is expected to serve more than 800,000 online customers by end of next year, up 45 per cent from the current 550,000 users.

*Source: DBS Bank, Sept 2004*

### 3.1 Types e-finance Services

Chapter 2 of this report highlighted many successful cases, each using different business approach and different services. We detailed below a summary of some of the more common e-finance services:

#### 3.1.1 e-Banking

E-Banking is also called internet banking or online banking. The service enables customers to perform basic financial transactions such as enquiring bank accounts; make bill payments; transfer funds etc. Because e-banking is relatively easy to set up, the barriers to entry are low. As a result, e-banking is not limited to just big and well established banks. In addition, with greater competition, FIs have no choice but to offer such services as e-banking, like ATMs and branches, has become a basic service that customers expect.

<sup>16</sup>J2EE - Java 2 Platform, Enterprise Edition

However, FIs should be cautious when they implement e-banking without making any fundamental changes in their organization structure. More often FIs require to implement a special unit that focuses on marketing and services for the success of the new e-banking service. Only when e-banking is considered mature and stabilised, it may be integrated back to the various banking units.

Due to the low barriers to entry, there will be more service providers in the market. These service providers may take different forms. They may be existing banks from other countries, new banks that operate purely on the Internet, and finally a third party web portal that acts as an intermediary to banks.

Third party non-bank institutions can pose a serious challenge to existing banks. The banks' services would be marginalized and there are risks of turning their products and services into mere commodities.

### 3.1.2 e-Payment

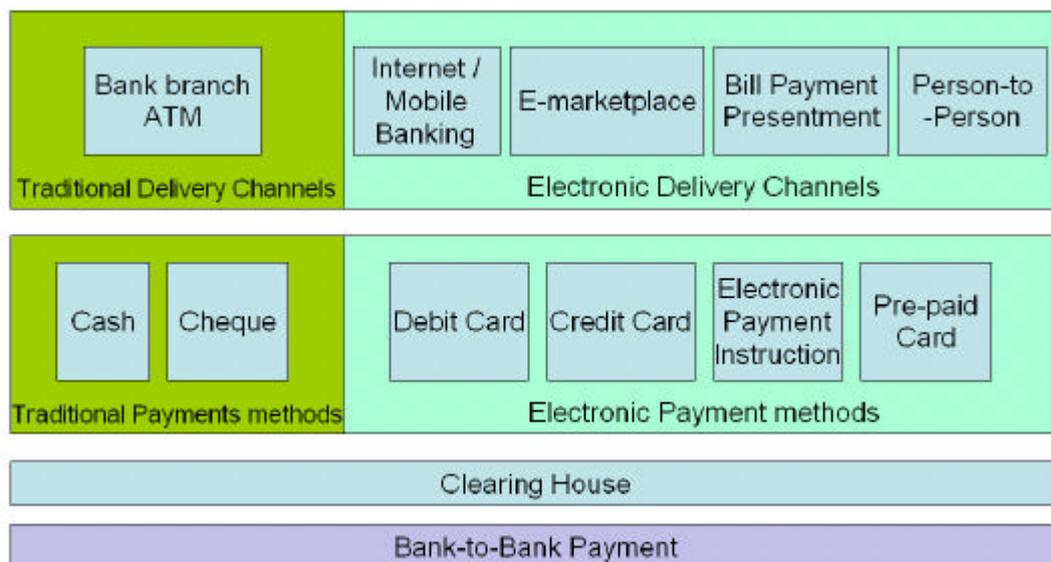
The payment system forms an integral part of the banking and financial system. With the advancement of ICT, affordable e-payment can be a reality. E-Payment includes electronic payment in the physical world and the virtual (internet) world. e-Payments are delivered through channels such as debit cards, credit cards, pre-paid cards, Internet banking and mobile banking.

#### Box 37: DollarDex

DollarDex is a purely Internet Investment Company, based in Singapore. They do not belong to any bank in Singapore. Their main service offering is to consolidate the Unit Trusts and other investments and loan services of the banks and offering them to their customers. To the banks, DollarDex is their re-seller or service agent. DollarDex customers view themselves as independent from the banks, therefore should the banks be able to provide them an unbiased view. Customers can get better service, as they are able to purchase Unit Trust and other investment funds, from different banks, from just one source. DollarDex has since expanded to Hong Kong and Taipei.

Source: DollarDex <http://www.dollardex.com.sg>

## Box 38: A typical payment system



Recently, new methods have been introduced in order to facilitate and simplify economic transactions. Surrounding these driving forces, new services appear and permit the development of transaction around the world. For example, government-to-consumer (G2C) marketplaces are becoming increasingly popular, providing an Internet based platform where citizens can pay their utility bills while avoiding all inconveniences such as queuing, paying during office hours, etc.

Emerging new technologies and, in particular, the development of Information Communication Technologies (ICTs), have had, for the past 10 years, a deep impact on national and international markets. The emergence of new marketplaces on Internet - such as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C) and government-to-consumer (G2C) - enabled consumers to buy goods or services directly from their homes.

Electronic marketplaces (e-marketplaces) allow consumers to make their purchasing decisions taking into account the offer of many sellers offering a similar good or service, irrespective of their physical location. The distance between the buyer and the seller, which used to be one of the

central criteria for purchasing decisions, becomes thus less important.

Electronic commerce has not only facilitated exchange and increased the speed of transactions, but at the same time it has created a need and a demand for appropriate payment systems. For the e-commerce consumer, it is important to effectuate the payment in a secure and safe manner, at low cost, within a short period of time and if possible, from his workstation. At the same time, for the merchant it is important that the system is easy to put in place, safe, reliable and not expensive.

### 3.1.2.1 Types of electronic payment

Electronic payment, in short e-payment, is broadly defined as any monetary transaction between a buyer and a seller that uses digital technology at every stage of the payment process. This broad definition includes credit and debit cards, smart cards (e.g. CASH), bank transfers, and digital peer-to-peer (P2P) payments, such as PayPal or Paybox, as well as electronic cheques.

In most cases, merchants' websites need to provide specific e-payment platforms, which are adapted to the activity of the company. These are called e-payment check gateways. Depending on the method of payment, the e-payment gateway can be implemented jointly with an external service provider or directly by the merchant. In the latter case, the seller can decide to work directly with the system authorized by his bank and use the electronic payment platform of the bank. By doing that, payments are done directly into his bank account.

Different e-payment methods are used in e-commerce transactions:

- **Debit and credit cards.** Upon purchasing the goods the customer enters his card details, usually the card number, expiry date and CSC<sup>17</sup> number. In order to increase the cardholder's confidence, several layers of security are usually installed on the merchants' concerned website. Once the card details have passed the verification process, the system informs the customer that the operation has been successful. The customer then receives a digital invoice showing the payment details. The payment is made directly from the customer's card account to the seller's bank account. Banks or other financial institutions usually issue credit and debit cards. While the cardholder pays an annual fee, the largest share of the cost is borne by the seller who contributes to the maintenance of the system through a percentage of his turnover done using the card, usually amounting to 3%. Credit cards payments can be facilitated using PayPal (see below).

- **e-Banking** is another e-payment option. The customer, when ordering goods online, receives the information and the details of the bank where to pay. At reception, the customer transfers the required amount to the company bank account and the delivery is initiated. Both buyer and seller are required to hold a bank account, preferably with an e-banking access. For the consumer, this method bears the risk of non-delivery, but it is very secure for the seller. Sellers often propose free-of-charge money-back guarantees offered through third parties to reduce the risk for the buyer and make this payment method more attractive.

- **Electronic billing** – a recently developed e-payment method, where electronic bills are sent for information to the buyer's e-mail account and to be established from the e-banking account. The customer pays the bill through, using his e-banking account. Electronic bills facilitate regular payments, such as telephone or utilities.

- **P2P – (Peer-to-Peer) Payment** through a third party provider such as PayPal or Paybox is used. Let's us see the functioning of PayPal, as Paybox is similar.

PayPal is a Web-based application ensuring a secure transfer of funds between member accounts using bank transfers or a credit card. Once the merchant has installed an appropriate platform on his website, PayPal will take care of the entire payment process through the Internet. Both buyer and seller have to be PayPal members and have PayPal accounts. The company relies on the existing infrastructure used by financial institutions and credit card companies. The amounts credited to each PayPal account are placed in pooled bank accounts and then used for transactions. Paypal is therefore a payment facilitator and not a financial institution.

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<sup>17</sup> The CSC (Card Security Code) is a serial three or four digit number printed on the signature field of each card. It is different for each card, appears only on the card itself, not on the receipt statements, is not transferred and known only to the cardholder.

The transactions are secured by standard manners. PayPal verifies users when they register on the website through credit checks and verifications against third party databases. However, PayPal does not guarantee that the identity of the user is correct but only if the payment is in order (an element of insecurity may remain).

The system is free for the user, but there is a fee structure in place for merchants or for those members who wish to receive payments. In addition to the basic service, PayPal offers a number of additional services, such as a money-back guarantee for purchases paid through PayPal.

For all the above electronic payments, the consumer receives an invoice and a payment confirmation via email, which provides him with a tangible evidence for his payment.

#### **3.1.2.2 Electronic-money payment (Wallet)**

Electronic money, in short e-money, is available in two main ways: The first is, as a card-based virtual wallet, substituting banknotes or coins to facilitate the payment of small values in retail shops and other small payments, such as transport tickets, parking fees and tolls. The value is stored in a microprocessor chip implanted in a plastic card. It is a general and flexible type of payment complementing the traditional means such as cash, checks or credit cards.

More rarely to card-based products, electronic money can also be software-based on inbound or store on the workplace. This technology uses specialised software, installed on a standard personal computer for storing the value. The loading of value onto the device is similar to the system allowing the consumer to receive cash from an ATM, and the product is used for purchases through a transfer of value to the merchant's electronic device.

The electronic wallet has been developed and launched successfully in many countries all around the world, equally in developed and developing economies. Usually it is put in place by banks, such as the CASH system proposed by the UBS in Switzerland or by national post office, such as the e-Dinar in Tunisia. In addition, enterprises such as telecommunication companies, public companies (e.g. public transport) have often successfully launched their own products related to their services. The electronic wallet is well established in many countries and appreciated by consumers for high security, easy accessibility and utilisation.

The software-based products, on the contrary, have been less successful. This scheme is less transparent for the consumer and more difficult to understand. It works in a similar way as a credit card and requires an access to the consumer's bank account. They are however, susceptible to hacker attacks, and consumers who focus on security will prefer to use other, more secure methods of payment.

#### **3.1.2.3 An emerging new technology: Mobile payment**

Mobile payment, in short m-payment, is defined as a payment made through the use of mobile phones. The amount is then debited to the monthly phone invoice or from the pre-paid card. This new payment method came into sight in 2002 and is usually used for micro-payments.

The access for mobile payment can be done through a voice access, SMS (Short Message Services) or WAP (Wireless Application Protocol). To secure the payment, the authentication is done through the PIN (Personal Identification Number). Only once the customer has entered the correct PIN, the payment is accepted. The mobile service providers, often in cooperation with banks, put m-payment services into place.

The use of mobile payment is increasing faster than the other methods of payment because of the growing cellular phone penetration in both developed and developing countries. For example, in Japan, the success of mobile Internet can be attributed to the high concentration of population in urban areas, long commuting times, consumer comfort with small electronic devices, and the lack of a ubiquitous fixed line Internet infrastructure. In addition, mobile payment is easy to use and well secured, as the authentication through the PIN allows reducing risks.

#### 3.1.2.4 Legal and security aspects of e-payment mechanisms

With the development of the different e-marketplaces and the need of e-payment mechanisms, different standards and solutions were developed worldwide to increase the security of these systems. These include three main areas: (i) legal regulations such as adopting e-law for protecting users, (ii) national authorities to control the regulations, and (iii) security systems such as different layers of security such as Secured Socket Layer (SSL).

##### Legal aspects

With the growth of e-transactions and e-activities, new issues relating to the legal aspects of cyberspace began emerging. In order to regulate these complex issues e-law came into being.

E-law is a generic term, which encompasses all the legal and regulatory aspects of digital activities including those which take place on the Internet.

E-laws are in constant evolution. New legal propositions and subjects are emerging almost every day in cyber space, such as electronic commerce, taxation, encryption/cryptography, authentication, digital signature, certification, online banking, cyber fraud, cyber crime, intellectual property rights, copyright, trademark, patents and etc.

The increase of e-commerce transactions pushes the government to regulate this area through e-law and appropriate by-laws. In addition, therefore Internet attracts hackers, governments need to create policies for securing electronic commerce.

More specifically, policies related to electronic payments have to cover:

- Legal specifications of new statutes of Internet that did not previously exist,
- Oversight issues to be controlled by central banks since safety and efficiency of payments are part of the responsibility of the central banks.
- Fraud prevention. The level of security depends on the method of payment. When the e-payment system has an access to a bank account, the level of security has to be very high. With the existing measures such as encryption technologies, additional personal questions, PIN mobile requirements, new possibilities are emerging such the one developed by Eurocard, Master Card and Visa (EMV). This new system integrates into each debit and credit card - in addition to the traditional magnetic band - a chip containing personal information of the cardholder and a confidential code.
- Law enforcement. As any other legal regulation, e-law needs to be complemented by appropriate legal procedures, infrastructure and institutions.

Although progress is uneven and national statutes differ, an international move toward more homogeneous standards is under way and countries have taken different approaches.

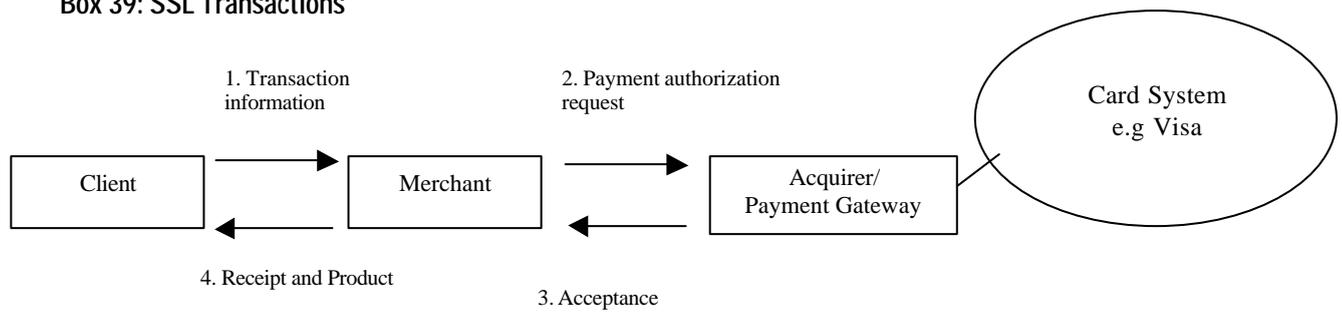
##### Security aspects

The security issue is crucial for the success of the e-payment process. It has both dimensions a technical aspect and a psychological aspect. It is equally important to build consumers' trust into the payment mechanism to make it at least as acceptable as other traditional methods of payment, such as credit cards, cheques or cash.

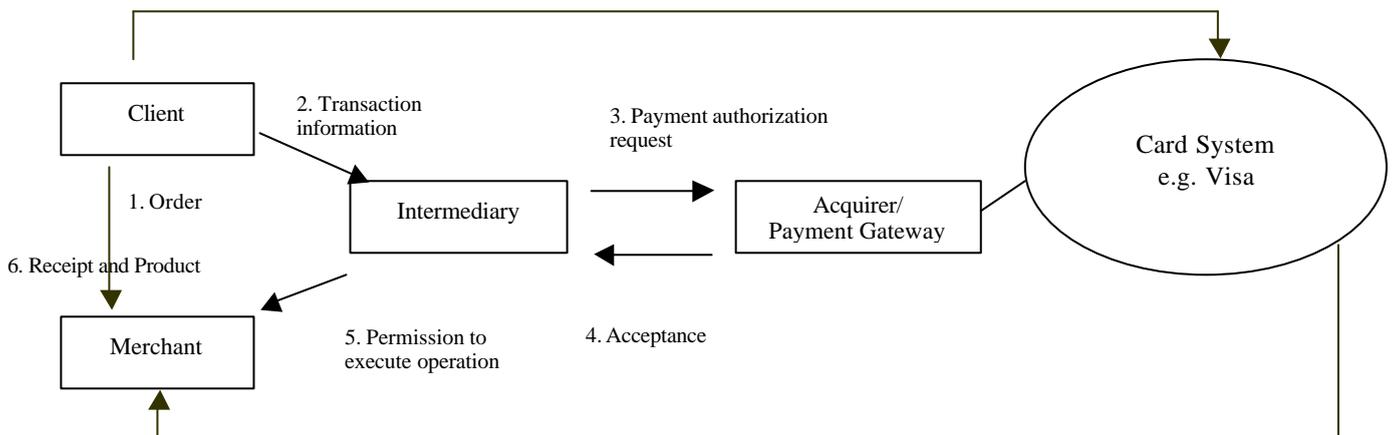
The security of electronic payments is ensured through several layers. The more protective layers the system integrates, the better the consumer will be protected. Encryption, identification and authentication are the three layers that a security system usually encompasses.

The most used security system is the Secure Socket Layer (SSL). It is a security protocol that allows SSL-enabled PCs and servers to authenticate each other. SSL creates single-session key exchanges using – usually 128-bit - encryption for enciphering and deciphering encrypted SSL transmissions. It allows unlocking the block cipher and reading the encrypted data. This coding method requires at least a 128-bit encryption key in order to successfully securing the transaction. This communication protocol makes the data practically impossible to attack.

**Box 39: SSL Transactions**



**Figure 1: SSL Transaction without intermediary**



**Figure 2: SSL Transaction with intermediary**

A merchant wishing to use SSL protection for credit card transactions has to apply for a certificate, which is issued by a recognized certification authority. Many different certification authorities (see below) are operating worldwide and all Internet browsers are pre-configured to recognize their certificates. When the buyer is ready to make the payment and to transfer his credit card number to the seller, the browser will switch to HTTPS. Then, the seller needs to prove that he is certified and agree on a session encryption key that is used to protect the credit card data from hacker attacks. See figure 1 for a schematic overview of the payment process.

The system offers protection against hackers, as well as the security that the seller exists. First, the merchant has no security that the owner is using the card, rather that an unauthorized person. If the cardholder denies making the transaction, the seller is not able to prove the contrary. Secondly, the consumer has no protection that the seller will not store the credit card details and charge other transactions. Thirdly, if the merchant stores consumer data online, the credit card information could be accessible to unauthorized parties. In order to authorize each individual transaction and to reduce their risk, sellers often establish an online connection with their bank or a similar entity.

Another security option is the Controlled Payment Number (CPN) or One-Time Credit Card Number. Under this system, the cardholder's bank provides him with a list of payment numbers valid only once for payments on the Internet. These numbers are similar to credit card numbers and prevent unauthorized use of the credit card account, for example by computer hackers or dishonest merchants

Recently, additional security features have been developed, such as personal questions to identify the Internet client or fingerprint identification.

In order to make these security systems operational and effective, the following conditions need to be met:

- The e-payment security mechanism and architecture need to be adapted to the legal framework of the country in which it operates. In this respect, supportive legal regulations can significantly contribute to strengthening the security mechanism and thus to foster the use of e-payment.
- Data protection on the merchant's computers and in the transaction process is another key issue in order to provide the necessary level of privacy.
- Consumers need to gain confidence into the different payment systems, to be sure to receive the paid product or to not to have the credit card hacked. The related risks are fraud, weak security protocols, software bugs and the like.

To summarize, security and regulation in case of default are the two major issues that have to be solved in order to develop trust and confidence of consumers in the e-payment system.

## **Certification authority**

As already mentioned above, certification authorities (CA) have a key function in securing internet transactions, as they provide security certificates necessary for the most common security techniques to function. They are also responsible for defining the level of security implemented in a country. Each country has such certification authorities, which in most cases are national agencies.

A certification authority is the authority in a network that issues and manages security credentials and public keys for message encryption. As part of a public key infrastructure, a CA checks with a registration authority to verify information provided by the requestor of a digital certificate. If the regulation authority verifies the requestor's information, the CA can then issue a certificate.

The certificate usually includes the owner's public key, the expiration date of the certificate, the owner's name, and other information about the public key owner. Its exact content, however, depends on the implementation of the public key infrastructure.

#### Box 40: NETS - e-Payment consortium

NETS was founded as a result of a need for a centralised e-payment operator by Singapore's local banks. NETS is now owned by DBS, OCBC and UOB. The first product launched was the NETS EFTPOS (electronic fund transfers at point-of-sale) service. This allowed Singaporeans to use a card and a PIN number to automatically withdraw funds from their bank accounts at points-of-sale.

NETS then introduced the shared ATM network in 1988. DBS, Keppel Bank, OCBC, OUB, POSB, Tat Lee Bank and UOB cardholders could use the ATM facilities of any of these banks.

In 1996, NETS introduced CashCards – a stored value smart card for use in retail purchases. In 1997, all vehicles in Singapore were fitted with special readers when the CashCard was adopted as the sole payment mode for Singapore's road toll payment system. By simply driving under an electronic gantry, toll charges are automatically deducted from the driver's CashCard - a fast, unobtrusive payment mechanism that allowed traffic to keep flowing.

Source: NETS, Singapore <http://www.nets.com.sg>

e-Trade Finance is still in the early stage of development and is also dependent on the economy of the country. Countries that rely heavily on trade businesses will find that e-trade finance is a critical tool to help businesses to compete at a global level and at a lower cost.

e-Trade Finance services involve high value transactions and complex document processing. Therefore it requires one of the most advanced technologies to deploy. Some of such technologies include:

- Public Key Infrastructure (PKI) with digital signatures for authentication
- 128-bit SSL encryption for security
- Broadband access for transmission of scanned documents
- Image compression technology for cheques and other paper documents to capture information at the earliest possible point in the business process
- Data compression technology to reduce downloading and uploading time of large amount of data
- Document management technology to manage the large number of documents and store and retrieve them efficiently
- Storage and database technologies to reliably store information and find it quickly, with no possibility of loss of information: requires both technology and management (redundant copies, no single points of failure, etc.)

### 3.1.3 e-Trade Finance

Trade finance is traditionally paper-based, making it slow, costly and error-prone. The advent of Internet has created an opportunity to streamline such processes through electronic documents. Typical services provided in e-trade finance are:

- LC (Letter of Credit) applications
- Apply for shipping/ airway guarantees to clear cargo in the absence of transport document
- Apply for bank guarantees to secure advance payments or as performance or tender bonds
- Apply for import financing (trust receipts/ bills receivable purchased)
- Foreign Exchange

**Box 41: Wellsfargo All in One web portal**

The Commercial Electronic Office (CEO) portal offers cash management, credit, international, and trust and investment services with a single sign on to a secure website. From the CEO portal website, you can access online services to help you maintain check registers, reduce fraud risks, view images of deposited and disbursed checks, print and download activity reports, and much more.

**Foreign Exchange Online**

Gain immediate and secure access to market news, foreign exchange information, and Wells Fargo's competitive exchange rates and expert foreign exchange staff.

**Trade Finance Online**

Streamline your accounts receivable (A/R) financing process and help reduce your company's exposure to foreign credit risk by selling your domestic and international A/Rs to Wells Fargo with Trade Finance Online.

**Trade Services Online**

Receive letters of credit and amendments; create and send import and standby letters of credit applications; and create direct collection instructions and drafts for prompt delivery of your shipping documents.

<http://www.wellsfargo.com/com/ceo/fxo/index.jhtml>

**3.1.4 e-Credit and e-loans**

Together with e-trade finance, e-credit and e-loan are offered as part of the e-finance services to SMEs. In e-credit and e-loan, SMEs are able to apply for credit facility or loan online from the bank. When the credit or loan is approved, the amount will be credited directly to the customers account.

In some e-credit and e-loan applications, the system is not fully automated. In this method, SMEs will apply for the credit or loan facility online. The information will be channelled to a bank staff that will manually access the financial situation of each application. Once the application is approved, the process is then handled back to the computer system whereby the SMEs

will be informed of the status of the application through the e-finance system.

In the area of e-credit, some implementation has gone fully automated. Credit facility is automatically granted once the application is approved. One critical consideration in such situation is that the bank must have sufficient information about the SMEs and have sufficient risk management system built in place.

**Box 42: e-loan and e-factoring service**

Offering tailored financing solutions to Hong Kong's many SMEs, East Asia Heller Limited (EAH), now East Asia GE Commercial Finance, specializes in Asset Based Financing. The company is recognizing, for pioneering, its unique financing services over 30 years ago in Hong Kong, especially to SMEs with a limited choice of financing available to them.

It was the first financial institution to launch "e-factoring" services to its existing clients in 2000. This service provides users with a login ID and password, meaning that clients can access their accounts via EAH's website. This can be used for accounts checking and to apply for local and overseas accounts receivable financing services etc. The operating system runs consistently for 24 hours and is especially convenient for clients applying to increase their credit limit.

Another e-commerce achievement was made when the company launched its "e-loan" service. This was aimed at prospective clients looking to apply for loan amounts of HK\$500,000 to HK\$1,000,000 on EAH's website. The procedure is easy and flexible and the result of the application is shown on the screen instantly.

*Source: East Asia GE Commercial Finance*

### 3.1.5 e-Insurance & guarantees

Available as part of the e-trade finance module in many banks, e-insurance and guarantee services enable SMEs to apply for insurance and guarantee online. As the processes involve fairly complex documents flow, it is usually done through human intervention as soon as the customer submits the application electronically.

As for insurance, banks normally partnership with large insurance companies to jointly provide such a service. In this case, information captured from the bank system will feed the bank's financial partners. This involves the privacy of customer data, thus the bank has to make clear to customers that such information will be forwarded to a third party.

#### Box 43: e-Insurance service by EDC

Export Development Canada (EDC) has an online service called EXPORT Protect. It provides insurance against single export transactions. Through EXPORT Protect, SMEs can enjoy peace of mind, as they will be protected against non-payment of foreign buyers. The application can be done online via EDC secure website.

Source: Export Development Canada,  
<http://www.edc.ca>

### 3.1.6 e-Rating

Credit rating of SMEs is highly important for both: banks and SMEs. To manage their risk and to safely execute their credit or payment transactions, FIs need to know the credit and payment track records of the parties involved in the transactions. This need is particularly important for SMEs, who have difficulty accessing finance due to the perceived lack of creditworthiness. This perception could be avoided if reliable data and information are available.

While banks have their own risk management and credit assessment units, they also rely on specialized services, which provide credit information and assessment data, as well as ways and means, such as credit risk insurance, to reduce the credit and transaction risks. The best-known agencies are Dun & Bradstreet, Coface and Equifax.

## 3.2 Technology in delivery of e-finance

There are several technologies being used by the FIs in delivering their e-finance services. Traditionally, FIs relied on its bank branches as the main delivery channel – the only contact points between the banks and its customers. This has later extended to ATMs, Call Center and Telephone banking.

With the advancement of telecommunication, FIs have embarked on a new form of electronic channels through the use of ICT. In fact, this form of electronic delivery is not new in the banking industry. In the late 1970s, it was already widely used to connect amongst banks through leased line connections. This enables bank branches to be connected 'online' with its head office and offer customers up to date information on their accounts. "Online" bank branches also enable customers to visit any branch to meet banking needs. Customers are not fixed to just one branch.

In the late 1980s, some banks already offered 'online banking' to its high net worth customers. Software is given to the customers and installed onto the PC. Through a leased line or dial up connection, customers can use the software to access their accounts online.

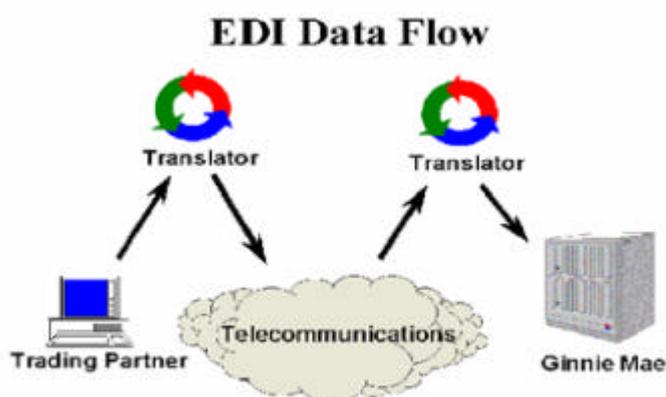
However, this system was costly and difficult to maintain. The proprietary software installed at customers end requires constant upgrade and trouble shootings. Customers also pay a high connection fee when they are transacting online.

FIs are one of the early adopters of technology. They see IT as a catalyst to provide excellent services to customers. Electronic delivery had already been implemented before Internet was made publicly available.

### 3.2.1 Electronic Data Interchange (EDI)

EDI in its simplest form is the application-to-application exchange of data in an electronic format between two entities. The concept and technology have been around since the late 1960s, way before the Internet was introduced.

Box 44: EDI Data Flow



When data are interchanged between trade partners by means other than paper documents, e.g. by electronic transmission methods including direct exchange between computer systems, a common "language" should be used with an agreed mode of expressing it, i.e. common protocols, message identification, agreed abbreviations or codes for data representation, message and data element separators, etc. If a universally accepted standard is not used, the "language" has to be agreed bilaterally between each pair of interchange partners. Taking into account the large number of parties exchanging data for an international trade transaction and the ever-increasing number of potential users of electronic delivery techniques, it is obvious that such a bilateral approach is not viable. In order to set a common 'language', most trading

businesses that use EDI are based on the UN/EDIFACT<sup>18</sup> format.

#### Box 45: NETS Financial Electronic Data Interchange (FEDI)

EDI has also been used in the banking industry. The local banks in Singapore had developed a FEDI (Financial EDI) system to enable banks to transmit bulk transaction data amongst the banks in the network. Introduced in 1997, this electronic message switching facility enables corporate customers of NETS' shareholder banks to authorize payments through the Interbank GIRO system. The system allows payment and collection instructions to be sent electronically in a manner similar to an inter-bank GIRO. The FEDI conform to UN/EDIFACT.

Source: NETS.

The traditional EDI system, like the 'online banking', is difficult and costly to implement. Customers need to install proprietary software, manage the security and subscribe to costly telecommunication networks such as leased line, ISDN etc.

However, with the introduction of Internet, many of the EDI systems have migrated to the Internet. This has enabled SMEs to enjoy the convenience of electronic documents, which was previously not available to them because of cost constraint and lack of in house IT resources to maintain the system.

The EDI on the Internet has been moving towards Web Services and there has been effort in the industry to conform to some agreed standard based on XML<sup>19</sup>. Leading industry players have also formed organizations such as UDDI and RosettaNet to coordinate such effort.

<sup>18</sup> UN/EDIFACT - United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport

<sup>19</sup> XML - eXtensible Markup Language.

New message-based solutions are emerging with the growing popularity of XML-applications. The most notable of the development efforts is the Universal Description, Discovery and Integration (UDDI) protocol. Their development lead to the introduction of ebXML, which is an XML specification suite sponsored by UN/CEFACT and OASIS<sup>20</sup>, and is building on the experience of existing EDI knowledge.

From the SME point of view this development is desirable, as the target is to create an open, consistent, and globally standardized messaging structure. Should the efforts prove successful, SMEs would benefit greatly by having a single standard to invest in, with which they could gain the ability to communicate in all the business networks in which they participate.

RosettaNet is a non-profit organization that seeks to implement standards for supply-chain transactions on the Internet. Created in 1998, the group includes companies like American Express, Microsoft, Netscape, and IBM, and is working to standardize labels for elements like product descriptions, part numbers, pricing data, and inventory status. RosettaNet will also use the ebXML-framework as a messaging standard. In addition, it also includes other e-business processes such as Product management, order management, inventory management and marketing management. However, RosettaNet is only targeted at the electronics industry, and applying it elsewhere requires extra effort.

#### **Box 46: Industrial Bank of Korea adopted ebXML**

The Industrial Bank of Korea (IBK) unveiled, in February 2004, a new system based on ebXML for transactions with some 10 INSURANCE companies. The new system helps IBK take advantage of greater deregulation of Korean financial markets allowing banks and insurance companies to cross sell each other products and services using ebXML as the underlying technology. The adoption of ebXML standards for the Korean financial services industries helps lower the costs of system development and encourages more participation.

*Source: ebXML Forum*

### **3.2.2 Electronic Funds Transfer (EFT)**

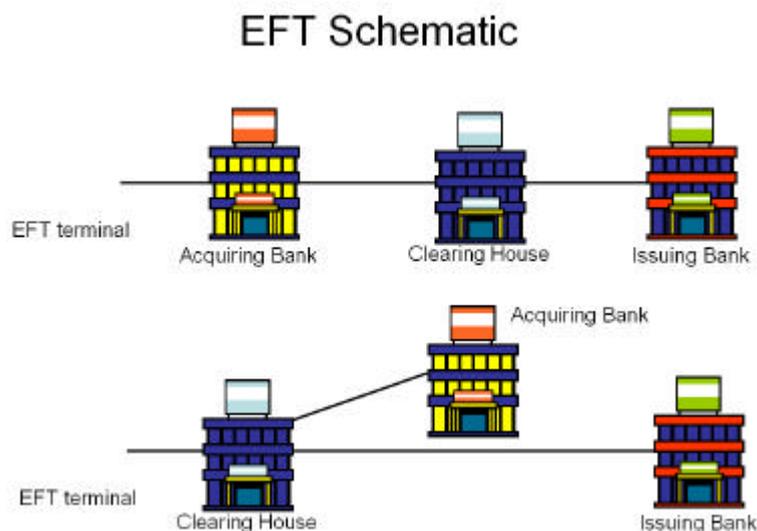
Electronic Funds Transfer (EFT) is critical for the development of electronic payment systems in the country. EFT involved the transfer of money from one bank account to another directly without paper money changing hands.

#### **3.2.2.1 Infrastructure**

EFT exists in both the physical world and the digital world. The underlying requirement is a strong debit and credit card system. Most EFT systems make use of the existing debit or credit card as the vehicle for payment. More recently, EFT has extended its channel to Internet banking and multi-purpose prepaid card.

<sup>20</sup> UDDI is now owned by OASIS

## Box 47: EFT Schematic

**Box 48: HSBC provide EFT service in India**

HSBC has introduced integrated payments solutions (IPS) as part of its efforts to widen delivery channels for payments and cash management corporate services in India having common services platform across Asia.

Introduced already in 18 countries in Asia, the bank with the latest offering allows seamless execution of electronic and paper-based payments. The IPS also enables electronic modes of payment such as electronic funds Transfer (EFT) and Special Electronic Funds Transfer and Real Time Gross Settlement.

*Source: India Times*

For businesses, EFT benefits both the buyers and suppliers. Buyers benefit from reduced costs because it is much cheaper to make a payment by direct credit than by cheque (typically by a multiple of 15 or more). Suppliers benefit because the payment is deposited in their account directly, so that there is no need to go to a bank branch and manually bank the cheque. EFT also avoids delays due to cheque clearance; with suppliers typically able to access the funds a day after the buyers sends a payment instruction to its bank.

Another natural progress of EFT is moving from pure e-payment to Electronic Bill Presentment and Payment (EBPP). In EBPP, invoices are presented to the buyers electronically. Gartner Inc. estimated that an organization could realize a return on an investment in a system that sends business invoices over the Web in one year if just 2.3% of customers opted to view and pay invoices online. The average project costs between \$130,000 and \$400,000, and savings average \$5.7 million annually, or \$7.25 per invoice, according to Gartner's research.

**3.2.2.2 Risks Associated with EFT**

The risks associated with EFT are similar to all risks associated with e-payment. The biggest risk factor is security. Risks associated with Internet banking and mobile banking have already been discussed in the previous chapter.

In the case of debit cards, customers need to ensure that their PIN is kept secret. Their accounts will be compromised if they lose their cards and if the PIN is revealed. There have been cases of 'fake' ATMs capturing victims' PIN number and the card information.

For credit cards, the essential card information, such as card number and date of expiry, can be easily obtained from discarded transaction records as well as reading the data directly from the card magnetic stripe using a card reader.

Pre-paid card or electronic money on the contrary is safer than using debit card or credit card. Usually implemented with smart card technology, it is highly unlikely for a criminal to duplicate the card. Pre-paid cards have a stored value and therefore if they get lost, the customer loss will be limited to the value of the card. Unlike debit cards which have a potential loss of the entire amount in the customers' account.

Risks could be minimised if FIs practice prudent risk management techniques as discussed in the previous chapter – employ technology to secure the systems, audit checks and monitoring and public educations.

**Box 49: Thailand's e-payment strategy**

The Payment Systems Group initiated a project to study and analyze infrastructure of the Thai payment system and its current conditions. Purpose of the study is to create a vision and a strategy for the payment system in order to support commercial electronic payment transactions of the country and to provide an appropriate guideline to parties concerned for the purpose of planning. The Payment Systems Group has proceeded with the project through the following activities:

The three-year development plan for the Thai payment systems comprises of 5 agendas:

1. The Thailand Payment Association - The organization will emphasize cooperation between financial institutions and others. It is composed of 5 groups: regulatory group, standards and security group, card payment group, global payment group and strategy group.
2. National Payment Data - There is a need to stimulate various organizations related to payment systems to recognize the importance of national payment data and to create database to be used in decision - making of the related parties and for policy setting of the Bank of Thailand.
3. Payment System Act - The law will reduce risk and increase efficiency of the payment systems, which will strengthen overall financial stability.
4. Infrastructure and Standards of the Payment Systems - Basic infrastructure of the payment systems for inter-institutional transactions should be underscored with emphasis on straight through processing payment systems.
5. Cross-border Payment Systems - The study of cross-border payment systems for large and small transactions is necessary in reducing risk and increasing efficiency of the system.

Source: Bank of Thailand <http://www.bot.or.th>

**3.2.3 Electronic Benefits Transfers (EBT)**

As an extension of EFT, EBT is an electronic system that allows a recipient to authorize the transfer of their government benefits from a national account to a retailer account to pay for products received.

This has become very common in the USA. In the state of California, EBT is used for the distribution of food stamp benefits. It is implemented with a plastic debit card, making the issuance of state public assistance and federal food stamp benefits faster and easier through the use of electronic transactions.

By using the EBT card, cardholders can access food benefits at the point-of-sale (POS) terminals of retailers authorized by USDA to accept food stamp benefits. In California, each county has the option of also providing clients with the ability to access cash benefits through automated teller machines (ATMs) and cash benefits at POS terminals.

**3.2.4 Electronic Trade Confirmations (ETC)**

Electronic trade confirmation is the part of the trade lifecycle between the execution and settlement stages, where investment managers and brokers exchange trade details pertaining to the allocation, confirmation, affirmation and matching of trades. This will help improve information flows for timely settlement and cash management. The financial industry is moving toward straight through processing to reduce settlement risk. ETC can facilitate straight-through processing and the move towards T+1, next day settlement.

### 3.2.5 Society for Worldwide Interbank Financial Telecommunications (SWIFT)

SWIFT is the financial industry-owned co-operative supplying secured, standard messaging services and interface software to about 7,650 financial institutions in over 200 countries. SWIFT's worldwide community includes banks, broker/dealers and investment managers, as well as their market infrastructures in payments, securities, treasury and trade.

SWIFT provides a wide range of end-to-end services that connect its members globally, verifying every aspect of the financial services processing. These include: Payments & cash management, treasury & derivatives, trade services, securities pre-trade/trade, pre-settlement, clearing & settlement, custody services and reporting.

**Box 50: SWIFT provide KAS Bank customers securities settlement & payment instruction**

SWIFT announced recently that The Netherlands-based KAS BANK is bringing 120 customers on to SWIFTNet over its new service for securities settlement and payment instructions. The new KAS BANK customers on SWIFTNet will be predominantly broker-dealers, investment managers and pension funds located in The Netherlands, in addition to other countries including Belgium, France, Germany, Luxembourg and the United Kingdom. KAS BANK clients will now be able to securely access a portfolio of services via SWIFTNet. To date, KAS BANK's proprietary banking systems (KAS-Web and KAS-Select) have only been available via the Internet. Under the new KAS-Web application over SWIFTNet, these systems will be merged, offering increased functionality and a higher level of security for securities settlement and payment instructions. KAS BANK's clients will also be able to get on-line and real-time overviews of cash and securities accounts, lending and derivatives.

Source: SWIFT, <http://www.swift.com>

### 3.2.6 VISA and other International Payment Agencies

Beside SWIFT, there are other international organizations of networks of financial messaging systems, such as VISA. These organizations mainly deal with the clearing of cross border payments. Visa is a private, membership association, jointly owned by 21,000 member financial institutions around the world. The organization provides services to its members, their cardholders, and their merchant clients with payment services anywhere, anytime, and any way. For SMEs, VISA has the following products that could facilitate payment:

**Visa Purchasing** - Ideal for most business expenditures, Visa Purchasing is a great way to streamline your company's procurement process, reduce paperwork, improve controls, and save time and money.

**Visa Business** - Visa Business is designed to meet the needs of businesses of all sizes and is an excellent way to manage all your business expenditures.

**Visa Business Electron** - Designed for Business sectors that previously might not have qualified for a payment card, Business Electron provides a safe and convenient alternative to paying by cash or cheques.

### 3.3 Providers of e-finance technologies

#### 3.3.1 Technology Vendors

##### 3.3.1.1 Visual Web Solutions (<http://www.vwebsol.com>)

Current clients in Asia include OCBC Bank, DBS Bank and Kasikornbank. Visual WEB Solutions, founded in 1994, is dedicated to the development and deployment of transactional banking applications serving to meet the needs of global banking institutions in today's highly competitive market. Their product line provides for end-to-end processing of electronic transactions in the areas of Cash Management, Trade Finance and Custody Management as well as back office processing of Trade Finance and Cash Management operations.

- The **BALI** product offering is a state-of-the-art web-enabled electronic initiation system and features modules such as Cash Management, Trade Finance and Custody Management, which can be extended to provide additional products and services on a powerful J2EE application framework.
- **Eagle** provides a fully integrated electronic delivery platform for Cash Management, Trade Finance and Custodial Services.
- **Trade Navigator** offers a complete Trade Finance back-office processing solution. It covers all aspects of Trade Finance including Letter of Credits, Documentary collections, Bill financing and Syndications and comes with an Integrated Imaging solution.
- **Cash Navigator** offers comprehensive functionalities for the back-office processing of Payments and Collections transactions.

##### 3.3.1.2 ProtechSoft (<http://www.protechsoft.com/>)

Clients include Electronic Banking Services, Sudan.

ProtechSoft established its operations in 1995 in the United States and since its inception has evolved into a multi-national organization catering to the IT needs of a wide range of industry verticals. From an organization with a few resources in 1995, they have rapidly grown into an organization with global presence with offices in seven countries and resource strength of over 500. Their off-shores development centre in India has the infrastructure to leverage quick project start-up and deliver quality products.

##### 3.3.1.3 e-Financial (<http://www.e-financial.com.br/>)

Based in Sao Paulo, Brazil, E-Financial was created originally to serve Banco Santos Group to service their banking and payment systems. E-financial has now grown into a global financial technology service provider. Some of their key products are:

###### Smart Pag -on-line payments for e-commerce

Smart Pag is a modular service for the integration, processing, consolidation and management of payment, credit and rating, with an easy integration process.

###### SmartCob -Collect and receive payment via Internet

This service allows collection of payments from consumers via the Internet. It is especially designed for recurring billing such as subscriptions of membership fees. It has a simple integration process with a call center application.

**E-Apolice -Total and intelligent control of insurance companies processes**

E-Apolice is an application that controls and manages all the processes of an insurance company. It facilitates the incorporation and development of new insurance products and the control of all related processes. The solution takes care of the proposal from its entrance into the system, through its processing in the sales department, creation of on-line control reports, insurance generation, collection and payment of commissions. All of this may be carried out through the web.

**E-Caad -Secure control of electronic and physical resources**

The solution authenticates authorizations and liberates the resources that users can access. It controls the access to electronic and physical environment, all in a single product. It is highly flexible and totally adapted to the new security trends such as biometry, digital certificates, smart cards, tokens and others. It is directed to financial institutions, corporations, large and medium companies.

**E-SPB -Brazilian Payment System (SPB)**

It is a high performance messaging system for financial institutions in Brazil to communicate with the Central Bank.

**E-Get - On-line management of government and private securities for the SPB environment**

Allows effective control of public and private bond operations communicating in real time with the SPB.

**Processadora -Intelligent solutions for information and card processing**

Processadora is an e-Financial's Card Processor Company. The company is specialized in information processing services and the integration of payment systems. Its focus is on the development of private label cards projects. The company works with a broad vision to create intelligent solutions and tailor-made products for its customers. It works in areas such as co-branded cards, credit cards and consultancy during the whole process of implementation of the project.

**E-Coop - Innovation in the relationship between cooperatives and its customers**

E-coop is an integrated system developed to control the administration of credit cooperatives. The most important characteristic is its flexibility. The product is divided in modules, with a safe and easy to use environment. The implementation costs are low and it allows the institution to work in intranet, Internet and extranet environments. Moreover, e-coop has a single database for the whole system, allows total control of the security politics, a centralized database and total control of the system using a web navigator.

**3.3.2 Critical Technical Issues when developing e-finance system**

Software vendors and integration expert need to address the following technical issues:

**Compression technique to reduce transmission time of lengthy form (e.g. LC application)**

The information that needs to be processed can go up to 40 entries. It is important for the technology vendor to develop a technique to compress such data in order to transmit it faster over the Internet. Although the number of broadband users globally is on the increase, technology vendors should design their system base on the lowest common configuration. This would mean delivering the service through a 56K dial-up network.

**Business rules and validation checks**

e-Finance, in particular e-trade finance, has complex document processes and with higher transaction value. The relative risks for such services are thus higher. In order to manage the complex processes and the associated risks, it is advisable to design the system that includes the mandatory business rules and validation checks. It is important for technology vendors to ensure that their solutions are capable of incorporating such rules and checks in the system.

### **Encryption and security**

Strong encryption and high security is a prerequisite for the e-finance system. The main considerations have already been discussed in Chapter 2.

### **Ease of integration and interoperability (e.g. use of XML)**

e-Finance as part of the trade cycle will have to be integrated to both the bank's own back-end banking system, but also to parties involved in the transactions. These parties could include the seller, buyer, shipper, freight forwarder, custom offices etc. Technology vendors must be mindful of such requirements and should use standards such as XML (or ebXML) to ensure interoperability and integration.

### **Capable of high volume transaction processing**

The system must be scalable to handle high transaction volumes. Based on most e-finance implementations, a capacity increase of 20% per year is not uncommon.

### **High availability**

The e-finance system must also have high availability because it is supporting very critical functions of SMEs. The Quality of Service should clearly show availability of the system.

## Chapter 4: e-Finance for SME Exporters: A Window of Opportunity

In the past, financial Institutions, and sometimes government agencies, did not pay special attention to SMEs. When accessing finance, SMEs have to compete with retail and big corporate businesses to gain a share of the financing disbursed by banks.

However, in the past two years, FIs have started to focus their attention to the needs of SMEs. In providing financial services to SMEs, FIs need to decide whether there are any differences between the needs of the SMEs and other customers such as retail and corporate businesses.

### 4.1 e-Finance for SME Exporters / Importers

SMEs are not much different when it comes to basic banking and financial needs— deposits accounts, withdraw funds, payments and funds transfers are just some of the common financial services that SMEs require.

However, special focus may have to be made on SME Exporters and Importers. Their financial needs are much more demanding because of the multi-party nature of their businesses, their risk exposure to the global markets, their needs for quick turnaround of working capital and their need to improve cash management.

#### 4.1.1 SME Exporters/Importers Needs

For FIs, servicing this sector requires financiers to create solutions, which take into account the specific risk-return perspective of the sector. Mainly, the challenges to SME funding emerge from the lack of information, such as unclear financials, and information on SME borrowers being limited. There is also a lack of comparative data on SMEs. Banks in developing countries, like India, do not have access to transaction data and credit history as available in developed countries, such as the US, through credit bureaus. Also, the other hurdle is relatively higher

costs of acquiring and processing transactions for SMEs, in the light of wide geographical spread and exponentially higher number of transactions.

With these challenges, how should FIs find solutions that could help SMEs? Or, should they even need to focus on SMEs at all?

In many countries, including developing countries, SMEs contribute to a large percentage of the economy<sup>21</sup>. They are also a potential source of revenue, as their needs for financing have largely not been tapped by the FIs. As for the challenges mentioned, they could be solved through the appropriate use of technology. One of the ways is to offer financing through open networks such as the Internet – the term we used as e-finance.

Chapters 2 and 3 of this report, show case studies and approaches of successful e-finance services in both developing and developed countries. ICT Infrastructures such as telecommunication networks, Internet Service Providers etc are important factors but not the absolute requirements.

More importantly is the ability of FIs to understand the needs of the SMEs and to capitalise the use of ICT. FIs could also be the catalyst in accelerating the development of critical ICT infrastructures.

#### 4.1.2 SMEs-Centric Priorities and Strategies

Based on the report on “E-Commerce and Development Report 2002” from UNCTAD, online banking and other form of online financial transaction already represents between 5 and 10 per cent of total retail banking transactions.

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<sup>21</sup> IFC Country Reports on Indonesia, Thailand, Tajikistan to name a few.

The report also noted that numerous SME-oriented e-finance initiatives by banks and other financial service providers are under way in developing countries. Some positive signs are already visible with a high level of acceptance of technology by customers and financial institutions. Some challenges have been identified:

**Adapting global technology to local requirements:** It is important to adopt global technologies such as SSL encryption, Internet security measures etc. However, their applications must be customized to local situations. These include language medium, service availability and an understanding of Internet delivery channels.

**Strengthening public-sector support:** While most banking services are developed through open market competition within the private sector, the experiences from developing countries on e-finance for SMEs revealed that public-sector support and promotion can sometime ensure a better success rate.

**Creating adequate regulatory and institutional frameworks:** Developing countries need to take a proactive role in developing a robust, flexible regulatory framework for e-commerce and e-finance. It is equally important to ensure effective coordination of government agencies, industry associations and other facilitators.

**Mainstreaming SMEs towards e - finance:** Effective promotion and assistance can be provided by the public sector to help SME move into e-finance with as special tax schemes and simplified regulations. Public-sector agencies could also help create an Internet-based credit information database of SMEs, in the absence of international credit rating

agencies. The public sector could lead by introducing government services via the Internet and encourage businesses to utilize them.

FIs have successfully implemented e-finance relying on their leverage on ICT to gain a better understanding of their customers. It is from here that they could build trust and be able to understand the risk involved in providing financing to SMEs. FIs have also set up special units or web portals to cater specially to SME exporters who may need specialised financing such as trade finance.

**Box 51: Engaging the SMEs is the key to success – ICICI Bank**

Bankers are trying to work around these caveats to find effective solutions. The engagement of respective banks in this space depends on the function of risk appetite, capability to leverage on technology for quick decisions, scalability of platforms, and scoring solutions with design enrichments. Leading players in this space, like ICICI Bank, have evolved risk models which factor in the realities of SME financials, coupled with the strengths of its linkages with large established executed on technology based platforms. This strategy builds upon judgmental inferences, and usage of surrogates to come to quick decisions, which adequately factor in the practicalities.

Another approach, which has been effective in extending credit to SMEs, is the cluster approach. Under this, attempts are made to identify and select clusters of SME companies with some homogeneous characters and a certain critical mass. By looking at them as a cluster and understanding their strong inter-linkages with the help of in-house industry experts, ICICI has been able to extend credit within its preferred risk parameters.

*Source: ICICI Bank, India*

## Glossary

<b>Acquiring Bank/Merchant Bank</b>	The bank that provide acceptance of electronic payment to companies. This will enable companies to accept debit and credit cards in their physical outlets or e-commerce website. The companies must have account with this bank and each day, the bank will deposits the value of the day's electronic payment sales to the companies account.
<b>Authentication</b>	The process by which the identity of the users are verified to establish their identity. A typical authentication includes the use of user name and password.
<b>Authorization</b>	The process of determining what types of activities or access is permitted. Usually used in the context of authentication: once you have authenticated a user, they may be authorized to have access to specific services.
<b>Automated Clearing House (ACH)</b>	A regional organization used by member banks to electronically transfer funds between members. ACH is usually regulated and designated by the central bank to provide electronic clearing amongst financial institutions.
<b>Batch Processing</b>	This is a type of data processing and data communications transmission in which related transactions are grouped together and transmitted for processing. Examples of batch processing include GIRO, salary crediting, and utilities bill payment.
<b>Biometric Security</b>	Authentication of persons based on unique combinations of measurable physical or behavioural characteristics. Examples include fingerprints, iris scanning, face and voice recognition.
<b>Business-to-Business E-commerce (b2b)</b>	The exchange of products, services, or information between businesses via the Internet. See e-marketplace.
<b>Business-to-consumer E-commerce (b2c)</b>	The exchange of products, services, or information between businesses and consumers via the Internet
<b>Cardholder / Issuer Bank</b>	The bank that has issued a bankcard to an individual or company.
<b>Certification Authority</b>	Organization that issues digital certificates and vouches for the authentication of the data in a certificate. CA can be setup at national level by which it is governed by the prevailing laws. CA can also be setup privately between transacting parties. In this case, the legal rights are details in the contracts.

Chip Card	See Smart Card.
Clearing	This is the process of exchanging financial transaction details between an acquirer and an issuer to facilitate the settlement of payments.
Comma Separated Value File Format (CSV)	Commonly used text file format used for import from and import to spreadsheets and databases.
Confidentiality of data	The quality of being protected against unauthorized disclosure.
Data Encryption Standard (DES)	DES is a popular standard encryption scheme that 'encrypts' data by using a secret code and a mathematical algorithm. DES is now considered to be insecure for many applications because the length of the secret code is too short. Des is generally superseded by Public Key encryption.
Digital Certificate	Like a unique identity card, digital certificate is an electronic document that establishes the credentials of a person or business.
Digital Signature	A value computed with a cryptographic algorithm and added to the data in such a way that any recipient of the data can use the signature to verify the data's origin and integrity.
E-Check	The electronic equivalent of a paper check
Electronic Banking	A form of banking in which funds are transferred through an exchange of electronic messages based on the customers' electronic instructions conducted through a secure system.
Electronic Bill Presentment & Payment (EBPP)	The electronic delivery of vendor requests for payment. Vendors send customers their invoices or bills via PCs, telephones or screen phones. The customers can make payment electronically after agreeing with the electronic invoices.
Electronic Business Extensible Markup Language (ebXML)	ebXML is sponsored by UN/CEFACT and OASIS, a modular suite of specifications that enable enterprises of any size and in any geographical location to conduct business over the Internet.
Electronic Commerce (E-commerce)	The transacting of business electronically rather than via paper.

<b>Electronic Data Interchange (EDI)</b>	The electronic communication of business transactions; specifically the exchange of trade-related documents, such as purchase orders, invoices and Electronic Funds Transfer (EFTs) in a standard format. Universally acceptable standards include UN/EDIFACT - United Nations Directory for Electronic Data Interchange for Administration, Commerce and Transport.
<b>Electronic Funds Transfer (EFT)</b>	A transfer of funds between accounts by electronic means such as the Internet.
<b>Electronic Funds Transfer at the Point of Sale (EFTPOS)</b>	The technology and practice of making payments for goods and services by means of electronic funds transfer initiated at the point where goods and services are purchased.
<b>E-marketplace</b>	An online community that serves as a virtual marketplace for business-to-business transactions.
<b>Encryption</b>	Encryption is the process of obscuring information to make it unreadable without special knowledge.
<b>Enterprise resource planning systems (ERPs)</b>	These are management information systems that integrate and automate many of the business practices associated with the operations or production aspects of a company.
<b>Extensible Markup Language (XML)</b>	This is a special-purpose markup language capable of describing many different kinds of data. Its primary purpose is to facilitate the sharing of structured text and information across the Internet.
<b>Extranet</b>	Extranet is an extension of organization's intranet through interconnecting consumers and suppliers using internet technology. Extranet has higher security measures such as passwords for a user to gain access to more sensitive information.
<b>Financial EDI (FEDI)</b>	Electronic exchange of payments, payment information or financially related documents in standard formats. See EDI.
<b>GIRO</b>	A type of bank transfer system that enables money to be transferred quickly and cheaply between accounts or between the financial institutions of a country.
<b>Integrity of data</b>	Is the assurance that information can only be accessed or modified by those authorized to do so.
<b>Net settlement System</b>	The settlement of fund transfers between or among banks on a net basis. See also RTGS.

<b>Nonrepudiation of data</b>	Security service that provide protection against false denial of involvement in a communication.
<b>PIN</b>	Personal Identification Number. The confidential individual number or code used by a cardholder to authenticate card ownership for ATM or POS terminal transactions.
<b>Public Key Infrastructure (PKI)</b>	PKI is the combination of software, encryption technologies, and services to protect the security of business transactions on the Internet. PKIs comprise digital certificates, public-key cryptography, and certificate authorities.
<b>Public-key Cryptography</b>	Encryption and decryption is done through a pair of key (secret code). The pair of keys – Public and Private keys - is the result of a complex mathematical algorithm. The keys have the special property that data encrypted with one can be decrypted only with the other. One key (public key) can be shared openly, but the data encrypted with it can only be decrypted with the other (private key)
<b>Purchasing Card</b>	Designed to help companies maintain control of small purchases while reducing the administrative cost associated with authorizing, tracking, paying and reconciling those purchases.
<b>Real-time gross settlement system (RTGS)</b>	A settlement system in which processing and settlement take place on an order-by-order basis in real time.
<b>RosettaNet</b>	RosettaNet is a consortium of major Information Technology, Electronic Components, Semiconductor Manufacturing, Telecommunications and Logistics companies working to create and implement industry-wide, open e-business process standards. These standards form a common e-business language, aligning processes between supply chain partners on a global basis. RosettaNet is a subsidiary of the Uniform Code Council, Inc. (UCC).
<b>Secure Socket Layer (SSL)</b>	A Web-based technology that lets one computer verify another's identity and allows secure connections. These protocols provide authentication and communications privacy over the Internet using cryptography. In typical use, only the server is authenticated (i.e. its identity is ensured) while the client remains unauthenticated The protocols allow client/server applications to communicate in a way designed to prevent eavesdropping, tampering, and message forgery.

<p><b>Smart Card</b></p>	<p>A plastic card resembling traditional credit or debit cards that contains a computer chip; the chip is capable of storing significantly more information than a magnetic stripe and is much more secure.</p>
<p><b>Stored-Value Card</b></p>	<p>A pre-paid payment card that stores a monetary value from which the purchase amount is deducted from the card each time the card is used.</p>
<p><b>Straight through Processing or STP</b></p>	<p>STP enables the entire transactions to be conducted electronically without the need for re-keying or manual intervention. Presently, the entire financial trade lifecycle, from initiation to settlement, is a complex manual process, taking several days. STP is at least 'same-day' or faster, ideally minutes or even seconds.</p>
<p><b>SWIFT</b></p>	<p>Society for Worldwide Interbank Financial Telecommunication: a cooperative organization created and owned by banks that operates a network which facilitates the exchange of payment and other financial messages between financial institutions throughout the world. A SWIFT payment message is an instruction to transfer funds; the exchange of funds (settlement) subsequently takes place over a payment system or through correspondent banking relationships.</p>
<p><b>The Universal Description, Discovery and Integration (UDDI)</b></p>	<p>The UDDI protocol creates a standard interoperable platform that enables companies and applications to quickly, easily, and dynamically find and use Web services over the Internet. UDDI is a cross-industry effort driven by major platform and software providers, as well as marketplace operators and e-business leaders. <a href="http://www.uddi.org/">http://www.uddi.org/</a>.</p>

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Electronic Transactions Act 1998, Electronic Transactions (Certification Authorities)  
Regulations 1999 and the Security Guidelines for Certification Authorities.

## Appendix: e-Finance Web Links

### **International Working Groups<sup>22</sup>**

**The Electronic Banking Group of the Basel Committee on Banking Supervision** issued *Fourteen Principles for Risk Management of Electronic Banking*. The full text of the report can be found at: <http://www.bis.org/publ/bcbs93.htm>

### **International Association of Insurance Supervisors (IAIS)**

The IAIS is reviewing developments in insurance activities on the Internet.

<http://www.iaisweb.org/>

### **International Organization of Securities Commissions (IOSC)**

The Internet taskforce can be found at: <http://www.iosco.org/>

### **World Bank**

The World Bank is reviewing the policy implications of changes in financial services, markets and institutions driven by globalization and technological advances.

<http://www1.worldbank.org/finance/>

### **Financial Action Task Force**

The FATF is identifying the vulnerability of Internet banking to money laundering activities.

[www.fatf-gafi.org/](http://www.fatf-gafi.org/)

### **Committee on Global Financial Systems**

The CGFS is assessing the trends in the use and the nature of electronic trading in financial markets and to study their potential implications on financial stability.

<http://www.bis.org/cgfs/index.htm#pgtop>

### **The International Telecommunications Union (ITU)**

Presently, the ITU serves as a forum to address policy issues related to electronic commerce in developing countries.

<http://www.itu.int/ITU-D/ecdc/wiseworld2000/WISeWorld2000Press/17sepconf.html>

### **UNITED Nations Commission on International Trade Law (UNCITRAL)**

The study focused on issues of transferable bills of lading in an electronic environment.

<http://www.uncitral.org/en-index.htm>

### **World Trade Organization (WTO)**

Working group regarding the protection of consumer privacy and personal data in cyberspace and general analysis of financial services liberalization. [www.wto.org](http://www.wto.org)

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<sup>22</sup> "Finance in Emerging Markets: Is Leapfrogging Possible?"  
by Stijn Claessens, Thomas Glaessner, Daniela Klingebiel

## **Selected Trading Platforms**

Selected Trading platforms for Fixed Income Securities:

### **Auction Systems**

- **MuniAuction:** conducts online auctions of municipal bonds. <http://www.grantstreet.com/>
- **Bloomberg Secondary Market Auction System:** <http://www.bloomberg.com/>
- **Valubond:** a Web-based centralized marketplace for municipal, investment-grade corporate, government and federal agency debt. <http://www.valubond.com/>

### **Inquiry-based Systems**

- **TradeWeb:** allow institutional customers to buy and sell U.S. Treasury and federal agency securities electronically with multiple primary dealers. <http://www.tradeweb.com/>
- **Market Axess:** an Internet-based multi-dealer research and trading platform for credit products <http://www.marketaxess.com/>
- **BondClick:** a multi dealer online trading platform specifically designed for institutional investors. <http://www.bondclick.com/>

### **Cross-matching systems**

- **BondDesk.com:** a comprehensive trading platform for a wide array of fixed-income products. <http://www.bonddesk.com/>
- **BondsInAsia:** regional electronic trading platform for Asian fixed income securities. <http://www.bondsinasia.com/>
- **eSpeed:** an interactive electronic marketplace that allows customers to execute transactions in a range of financial instruments. <http://www.espeed.com>
- **Autobahn:** launched by Deutsche Bank Securities Inc, allows customers to conduct transactions electronically in U.S. , European and Emerging Market fixed income securities, globally on a 24-hour basis. <http://www.autobahn.db.com/>
- **Apogean Technology:** operates an electronic trading system for dealers in emerging-markets debt securities. <http://www.apogean.net>
- **Currenex:** An independent and open institutional financial exchange, linking institutional FX buyers and sellers worldwide. <http://www.currenex.com/>

## **Innovative E-finance Providers**

### **a. SMEs**

**Ghana:** Computerized Mobile Bank, Advanced Engineering Design and Research Corporation  
<http://www.ecpe.vt.edu/ecenews/ar00/report/aedar.html>

**Hong Kong:** On-line financing to SMEs, SMEloan  
[http://www.smeloan.com/en/press/news2000\\_08.html](http://www.smeloan.com/en/press/news2000_08.html)

**Vietnam:** Internet Trading Tool for SMEs, MeetVietnam  
<http://www.ifc.org/ifcext/pressroom/ifcpressroom.nsf/PressRelease?openform&30ECB0F2213B8A998525699A004F0475>

**Various (CitiGroup):** CitiBusiness in Czech Republic, India, and Hungary  
<http://www.citibank.com>  
<http://www.citibusinessdirect.com>

**Various (Pride Africa):** Virtual information and service network and smart cards for SMEs.  
<http://www.prideafrica.com/>

**The World Bank Group's International Finance Corporation:** E-finance Small Business Global Initiative.  
<http://www.worldbank.org>

### **b. Micro-finance**

**Bangladesh:** Grameen Bank and Grameen Phone's mobile phone project in Bangladesh rural areas.  
[http://web.idrc.ca/panasia/ev-9893-201-1-DO\\_TOPIC.html](http://web.idrc.ca/panasia/ev-9893-201-1-DO_TOPIC.html)

**Nigeria:** Smart Cards for microcredit scheme  
[http://www.ecomlink.org/E\\_incubator/Best\\_Sites.asp?CategoryID=954#4](http://www.ecomlink.org/E_incubator/Best_Sites.asp?CategoryID=954#4)

**Various (Accion):** Internet to refinance microfinance organizations  
<http://www.planetfinance.org>

**UNCTAD:** The Virtual Microfinance Market  
<http://www.vmm.dpn.ch/>

**Various (PlaNNet Finance):** Internet to refinance microfinance organizations  
<http://www.planetfinance.org>

### **c. Insurance**

**Mexico:** Mexican insurer Grupo Nacional Provincial S.A. will begin offering online Mexican tourist auto policies through a joint Web venture with International Insurance Group Inc.  
[www.mexicaninsuranceonline.com](http://www.mexicaninsuranceonline.com)

**Philippines:** Yapster's online insurance service. [www.yapster.com/](http://www.yapster.com/)  
[www.2insureall.com/](http://www.2insureall.com/)

**Russia:** Renaissance Insurance Group - e- insurance agency in Russia.  
<http://www.renins.com/indexeng.php>

**Various Countries (Asia):** Asia's full online insurance product by DollarDEX.  
[http://hk.dollardex.com/press/index.cfm?show=i\\_insurance.htm](http://hk.dollardex.com/press/index.cfm?show=i_insurance.htm)

#### **d. Smart Cards**

**Various African Countries:** Mondex e-Cash: multifunctional purse divided into 5 separate pockets allowing up to five different currencies to be held at a time. It can also be used across open networks such as telephony or the Internet.  
<http://www.prnewswire.co.uk/cgi/news/release?id=17939>

**Hong Kong:** i.Life card— multifunctional-credit, debit and other. Hong Kong and Shanghai Banking Corporation Limited (HSBC).  
<http://www.multos.com/library/pdf/01-10-19%20iLife%20CS.pdf> =

**Prismera:** the most complete Proton CALC-based card offer. Application for higher-value day-to-day transactions.  
<http://www.axalto.com/banking/prismera.asp>

**Italy:** Prepaid payment cards, allows teen-agers and others without bank accounts to make purchases using the same point-of-sale and transaction processing networks as debit and credit cardholders.  
<http://www.cardtech.faulknergray.com/cgi-bin/readstory.pl?story=20030218CTDN200.xml>

**Korea:** Mondex e-Cash and MasterCard M/Chip™: multi-functional-credit, debit and other.  
<http://www.epaynews.com/index.cgi?survey=&keywords=Mondex%20Korea&optional=&subject=&location=&ref=keyword&f=view&id=1008935311621726189&block=>

**Smartcards and secure solutions worldwide.** Definitions of different e-finance products and useful articles been regularly updated.  
<http://www.st.com/stonline/products/applications/smartcard/index.htm>

**Latin America and the Caribbean: Visa Cash:** Vendtek Industries, load terminals for Visa Cash TIBC 3.0 (Advantis) loading of smart cards and credit / debit associated accounts have complied with Visa International Latin America and Caribbean Region's requirements.  
[http://www.vendteksys.com/news\\_2003\\_0721\\_visa.htm](http://www.vendteksys.com/news_2003_0721_visa.htm)

**Singapore:** Network for Electronic Transfers (Singapore) Pte Ltd, local bank. (NETS)  
<http://www.nets.com.sg/index.asp>

**Singapore: CashCard® TopUp on Mobile Phones:** the system utilizes a dual slot mobile phone, a smart ATM card and a Home NETS PIN. *Network for Electronic Transfers (Singapore) Pte Ltd, local banks.*  
[http://www.nets.com.sg/consumers/using\\_cashcard.asp](http://www.nets.com.sg/consumers/using_cashcard.asp)

**South Africa: Cash Passport:** card loaded or with predefined value designed for secure payments when traveling and access cash in local currency wherever they are in the world, via the Visa cash machine network.  
<http://www.travelex.co.za/financialinst/cashpassport.asp?content=cp>

**South Korea: e-purse:** with an electronic purse and credit application from the bank. Cards can be loaded or with predefined value designed for secure payments over the Internet, mobile phones and for everyday low-value purchases.

<http://www.cardtech.faulknergray.com/cgi-bin/readstory.pl?story=20020722CTMF232.xml>

**Turkey: Multifunctional-credit, debit and other— *Garanti Bank***

<http://www.cardtech.faulknergray.com/cgi-bin/readstory.pl?story=20030303CTMC173.xml>

**Venezuela: Mondex e-cash:** multifunctional purse divided into 5 separate pockets allowing up to five different currencies to be held at a time. It can also be used across open networks such as telephony or the Internet.

<http://www.qisystems.ca/investors/news/archive/oldnews.php?nid=59> or

[http://www.epaynews.com/index.cgi?survey=&keywords=Mondex%20e-](http://www.epaynews.com/index.cgi?survey=&keywords=Mondex%20e-Cash%20&optional=&subject=&location=&ref=keyword&f=view&id=96711413121212015050&block=)

[Cash%20&optional=&subject=&location=&ref=keyword&f=view&id=96711413121212015050&block=](http://www.epaynews.com/index.cgi?survey=&keywords=Mondex%20e-Cash%20&optional=&subject=&location=&ref=keyword&f=view&id=96711413121212015050&block=)

## **Communications Infrastructure**

International Telecommunications Union [www.itu.org](http://www.itu.org)

## **Public Key Infrastructure and Security**

- **American Society for Industrial Security:** The American Society for Industrial Security is the largest international educational organization for security professionals, with over 32,000 members worldwide. ASIS is dedicated to increasing the effectiveness and productivity of security professionals by developing educational programs and materials that focus on both the fundamentals and the most recent advancements in security management.  
[www.asisonline.org](http://www.asisonline.org)
- **BITS:** The Technology Group for The Financial Services Roundtable, was formed by the CEOs of the largest bank-holding institutions in the United States as the strategic “brain trust” for the financial services industry in the e-commerce arena.  
[www.bitsinfo.org](http://www.bitsinfo.org)
- **MSNBC:** They maintain a very comprehensive and up to date Technology section within their website. <http://search.msn.com>
- **CERT:** The CERT® Coordination Center (CERT/CC) is a center of Internet security expertise. It is located at the Software Engineering Institute, a federally funded research and development center operated by Carnegie Mellon University  
<http://www.cert.org/>
- **ISS:** Internet Security Systems was founded in 1994. ISS is the world’s leading provider of security management solutions for the Internet. Headquartered in Atlanta, Georgia, ISS has additional offices throughout the U.S., as well as international operations throughout Asia, Australia, Europe and Latin America.  
<http://www.iss.net>
- **SearchSecurity.com:** Provides an aggregation of the information security content on the Internet, as well as original featured columns and a highly targeted search engine.  
[www.searchsecurity.com](http://www.searchsecurity.com)

- **National Infrastructure Protection Center.** Established in February 1998, the NIPC's mission is to serve as the U.S. government's focal point for threat assessment, warning, investigation, and response for threats or attacks against our critical infrastructures. These infrastructures, which include telecommunications, energy, banking and finance, water systems, government operations, and emergency services, are the foundation upon which our industrialized society is based. [www.nipc.gov](http://www.nipc.gov)
- Website that documents hacker attacks worldwide. [www.Attrition.org](http://www.Attrition.org)
- **Hong Kong Monetary Authority:**  
[http://www.info.gov.hk/hkma/eng/guide/guide\\_no/guide\\_1511xb.htm](http://www.info.gov.hk/hkma/eng/guide/guide_no/guide_1511xb.htm)

### **Privacy and Information**

- [www.privacy.org](http://www.privacy.org)
- [www.nipc.gov](http://www.nipc.gov)

**ZDNET:** At ZDNet, their mission is to be a premier "full service" destination for people looking to buy, use, and learn more about technology. [www.zdnn.com](http://www.zdnn.com)