Chapter 4

E-BANKING

1. Introduction of E-Banking
2. Objective of E-Banking
3. Scope of E-Banking of Global View
4. Importance of E-Banking
5. Methods and Function of E-Banking
6. Advantages and Disadvantages of E-Banking
7. Banks: On line services
1. **Introduction of E-Banking**:

   E-Banking is any electronic transaction or activity between a party and a bank.

**Definition of E-Banking**:

E-Banking is defined as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels. E-Banking includes the systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network, including the Internet. Customers access E-Banking services using an intelligent electronic device, such as a Personal Computer (PC), Personal Digital Assistant (PDA), Automated Teller Machine (ATM), kiosk, or Touch Tone telephone.

The typical on-line banking features are:

1. View account balances
2. Access account history
3. Transfer funds between accounts
4. Schedule future transfers
5. Pay bills electronically

However, many banks provide additional features to help service their customers.
Informational Websites:

Informational websites provide customers access to general information about the financial institution and its products or services. Risk issues examiners should consider when reviewing informational websites include:

* Potential liability and consumer violations for inaccurate or incomplete information about products, services, and pricing presented on the website,

* Potential access to confidential financial institution or customer information if the website is not properly isolated from the financial institution's internal network,

* Potential liability for spreading viruses and other malicious code to computers communicating with the institution’s website; and

* Negative public perception if the institution’s on-line services are disrupted or if its website is defaced or otherwise presents inappropriate or offensive material.

Transactional Websites:

Transactional websites provide customers with the ability to conduct transactions through the financial institution’s website by initiating banking transactions or buying products and services. Banking transactions can range from something as basic as a retail account balance inquiry to a large Business-to-Business funds transfer. E-Banking services, like those delivered through other delivery channels, are typically classified based on the type of customer they
support. The following table lists some of the common retail and wholesale E-Banking services offered by financial institutions.

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<th>Retail Services</th>
<th>Wholesale Services</th>
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<td>Account management</td>
<td>Account management</td>
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<td>Bill payment and presentment</td>
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<td>New account opening</td>
<td>Small business loan applications, approvals, or advances</td>
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<td>Investment/Brokerage services</td>
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<td>Loan application and approval</td>
<td>Employee benefits/pension administration</td>
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<td>Account aggregation</td>
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**Table 1: Common E-Banking Services**

Since transactional websites typically enable the electronic exchange of confidential customer information and the transfer of funds, services provided through these websites expose a financial institution to higher risk than basic informational websites. Wholesale
E-Banking systems typically expose financial institutions to the highest risk per transaction, since commercial transactions usually involve larger dollar amounts. In addition to the risk issues associated with informational websites, examiners reviewing transactional E-Banking services should consider the following issues:

* Security controls for safeguarding customer information;
* Authentication processes necessary to initially verify the identity of new customers and authenticate existing customers who access E-Banking services;
* Liability for unauthorized transactions;
* Losses from fraud if the institution fails to verify the identity of individuals or businesses applying for new accounts or credit online;
* Possible violations of laws or regulations pertaining to consumer privacy, anti-money laundering, anti-terrorism, or the content, timing, or delivery of required consumer disclosures; and
* Negative public perception, customer dissatisfaction, and potential liability resulting from failure to process third-party payments as directed or within specified time frames, lack of availability of on-line services, or unauthorized access to confidential customer information during transmission or storage.
E-Banking Components:

E-Banking systems can vary significantly in their configuration depending on a number of factors. Financial institutions should choose their E-Banking system configuration, including outsourcing relationships, based on four factors:

* Strategic objectives for E-Banking;
* Scope, scale, and complexity of equipment, systems, and activities;
* Technology expertise; and
* Security and internal control requirements.

Financial institutions may choose to support their E-Banking services internally. Alternatively, financial institutions can outsource any aspect of their E-Banking systems to third parties. The following entities could provide or host (i.e., allow applications to reside on their servers) E-Banking-related services for financial institutions:

* Another financial institution,
* Internet service provider,
* Internet banking software vendor or processor,
* Core banking vendor or processor,
* Managed security service provider,
* Bill payment provider,
* Credit bureau, and
* Credit scoring company.
E-Banking systems rely on a number of common components or processes. The following list includes many of the potential components and processes seen in a typical institution:

* Website design and hosting,
* Firewall configuration and management,
* Intrusion detection system or IDS (network and host-based),
* Network administration,
* Security management,
* Internet banking server,
* E-commerce applications (e.g., bill payment, lending, brokerage),
* Internal network servers,
* Core processing system,
* Programming support, and
* Automated decision support systems.

These components work together to deliver E-Banking services. Each component represents a control point to consider.

2. **Objective of E-Banking**:

The main objective of E-Banking where large number of nationalized and private banks serving its customers is better branding and faster reaction to market changes. Banks offering such services are perceived as leaders in technology implementation, and therefore, they enjoy a better brand image. The ultimate goal of a company is to maximise owners' profit, and banks are no exception. Automated E-
Banking services offer a perfect opportunity for maximising profits. According to a survey by Broz, Allen and Hamilton, an estimated cost providing the routine business of a full service branch in USA is $1.07 per transaction, as compared to 54 cents for telephone banking, 27 cents for ATM banking and 1.5 cents for Internet banking.

The objective of getting banks function via online, it is beneficial for its customers as well in various ways:-

* Reduced costs in accessing and using banking services.
* Increased comfort and saving of time – transactions can be made 24 hours a day, without direct interaction with the bank.
* Quick and continuous access to information. It is easier for companies to check on multiple accounts at the click of a button.
* Better Cash Management. E-Banking facilities speed up cash cycle and increase the efficiency of business processes. For example, it is possible to manage a company’s short-term cash via internet banks (Investments in overnight, short- and long-term deposits, commercial papers, bonds, shares and money market funds).

3. **Scope of E-Banking in global view**:

By 2011, some experts predict that 80 per cent of bank customers in the UK will use the internet to connect to their bank. Others, like Barclays Director, eChannels, Simon Newman, would put that figure at a lower 50 per cent. Regardless, the sheer scope of ebanking is enormous and the resources already committed towards
ebanking have been enormous too. Forrester Research estimate that in western Europe between 1999 and 2001, 13bn Euro was spent on internet and call centre technologies. By the end of 2004, electronic bill payment and presentment (EBPP) around the world will be worth $2.5bn. In 2000, McKinsey’s identified over 2,500 banking websites across western Europe. “Research has revealed,” writes Prof. Feng Li of the University of Newcastle, “that new entrants in their various forms are posing a serious threat to incumbent banks, not necessarily in eroding the latter’s market share and cherry-picking their most profitable customers, but primarily changing the rules of competition and raising the general expectation of customers for services from all financial companies.” Recent researches from brand consultants, Henrion Ludlow Schmit, suggests, however, that established banks like Barclays are much more trusted by consumers in the UK than new entrants. “People tend to be more conservative in judgement when they look for a bank,” according to Chris Ludlow, “even if they are younger. They don’t go for high fashion or trendy style in a bank. They go for someone who looks after their money.” The attractions of ebanking are diverse. In a study of the UK’s online retail banks in 1997 the following were given:

- The internet can protect or enhance the bank’s reputation for innovation
- E-Banking provides added value to customers
- Banking over the internet offers marketing opportunities for reaching new customers
Current customer demand can be met better online

Competitors were offering services and the banks interviewed for the survey felt that they needed to compete with them. There were opportunities to develop mass customised services.

Essentially these can be broken into either marketing opportunities or efficiency gains. From the other side of the relationship, customers are looking for more flexible banking hours, the ‘kitchen table’ fashion in which different accounts can be seen simultaneously, lower interest rates and better access to information.

Of course, E-Banking was not the first new technological banking channel to be introduced. In 1967 Barclays introduced the world’s first automatic teller machine (ATM). In the late 1980s telephone banking was offered as a new service. By the mid 1990s Western European banks and customers were already using a multichannel environment. The E-Banking has related the global activities of the world.

Early predictions of the impact of E-Banking were in tune with the murmurs of revolution that surrounded the internet type of the late nineties. At the very least, some commentators warned, the structure of retail banking will be shaken up; at worst bank branches were doomed. Now, at the beginning of 2003, we are in a position to assess exactly where E-Banking stands. There have been a range of strategies developed by both traditional banking providers and new entrants to the market, some of which have a greater reliance on
branches than others. These business models have been categorised by Li as follows:

**Business models Characteristics:**

<table>
<thead>
<tr>
<th>New channel distribution</th>
<th>Characteristics</th>
</tr>
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<tbody>
<tr>
<td>Internet as part of multi-channel strategy but no radical change in the basic strategy and business model of the bank.</td>
<td></td>
</tr>
<tr>
<td>Ebanking</td>
<td>Use the internet to underpin key processes and integrate different channels, and transform the main brand into an ebrand.</td>
</tr>
<tr>
<td>Baby eBank</td>
<td>Launched by incumbent banks and other financial companies with its own ebrand name and product range, often based on new business models</td>
</tr>
<tr>
<td>Pure play new entrants</td>
<td>Pure virtual bank set up by non-financial companies</td>
</tr>
<tr>
<td>Portal</td>
<td>Aggregate financial product information from multiple sources and act as the access point for customers, often focusing on particular product range or customer segments</td>
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</tbody>
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(90)
Online alliances | A bank out-sources its internet banking solution to a third party, but the services bear the bank's own name
---|---
White labelling | Non-bank company provide internet banking services through partnership with incumbent bank but not bearing the bank’s brand name
Brand stretching | Non-bank players with an established brand provides banking services through the internet.

Table: the different business models used in E-Banking.

Source: Internet banking, some emerging tendencies in the UK, Li, F. 2002.

Of 26 internet banks in the UK identified by Li, all use one or several of these strategies (as they often provide several kinds of ebanking service for different market segments).

The success of these strategies has varied; highlighting the fact that ebanking is an umbrella term for a whole range of business models and experiences. Some of the unsuccessful E-Banking ventures have tried very different business models from the successful examples such as Barclays. However, it is clear that branch banking is far from dead, though it has ‘seen its role and image change to meet the requirements of the changing banking environment.’ And internet banking has become a complementary channel.
The picture that is emerging is complex, largely because customers are difficult to second guess. That said, of course, over time customer usage is starting to show some patterns. E-Banking is changing how we bank, where we bank and when. In doing so, it is changing the relationship between banking and social capital, creating new risks and opportunities for the sector and for society. To assess these risks and opportunities we will firstly consider the data on E-Banking usage in different part of the world and then look at the challenges presented by the multichannel environment for social sustainability.

**Customer usage:**

According to a regular survey on attitudes towards technology by MORI for the internet bank Egg, as of February 2001, 59 per cent of British adults had used some interactive technology (Internet, WAP, IDTV) within the previous six months. Of those 17 million adults:

* 43 per cent had bought products online
* 33 per cent had used internet banking facilities
* 31 per cent had searched for jobs online
* 18 per cent had visited an internet chat room

It is clear that, for a large part of the UK, E-Banking is a present reality. However, there are different patterns of usage.

**Looking** more widely, there may be scope to take banks’ long experience of building and maintaining relationships and apply it
in areas of society where trust has broken down, where, there are high levels of unemployment, crime and poverty. In such places residents are less likely to participate in the social norms that we might call civil society: voting, neighbourhood watches, membership of societies and clubs, etc. The result is often a sense of disenfranchisement and exclusion from wider society, hence the use of the terms social exclusion and social inclusion. In such areas banks have invested heavily. A fine example is the Barclays Site Savers project that Barclays runs in collaboration with Groundwork: it 'aims to use improvements to the physical environment as a stepping stone to greater community confidence, improved public health and reduced fear of crime'.

E-Banking has become a necessary survival weapon and is fundamentally changing the banking industry worldwide. Today, the click of the mouse offers customers banking services at a much lower cost and also empowers them with unprecedented freedom in choosing vendors for their financial service needs. No country today has a choice whether to implement E-Banking or not given the global and competitive nature of the economy. Banks have to upgrade and constantly think of new innovative customized packages and services to remain competitive. The invasion of banking by technology has created an information age and commoditization of banking services. Banks have come to realize that survival in the new E-Economy depends on delivering some or all of their banking services on the
Internet while continuing to support their traditional infrastructure. The rise of E-Banking is redefining business relationships and the most successful banks will be those that can truly strengthen their relationship with their customers. Without any doubt, the international scope of E-Banking provides new growth perspectives and Internet business is a catalyst for new technologies and new business processes.

With rapid advances in telecommunication systems and digital technology, E-Banking has become a strategic weapon for banks to remain profitable. It has been transformed beyond what anyone could have foreseen 25 years ago. However, banks are uncertain about the regulatory framework for conducting E-Business and the regulatory and taxation issues for governing cyberspace presents formidable problems. Developing such a system is not easy as the Internet is not organized geographically and it is almost meaningless to refer to a website as national or local. Any successful attempt at governing cyberspace will involve significant international co-operation. Tax issues are being dealt with through O.E.C.D codes along with intergovernmental co-operation. The Indian experience of E-Banking is gradually merging with its international counterparts. While the private sector and foreign banks have been fast in adopting Internet technology in client servicing, there is a gradual trend for the major public sectors and numerous cooperative units to move in the same
direction. A mix of policy support and security assurance should propel further E-Banking adoption in India.

* **Basic information E-Banking**/web sites that just disseminate information on banking products and services offered to bank customers and the general public;

* **Simple transactional E-Banking**/web sites that allow bank customers to submit applications for different services, make queries on their account balances, and submit instructions to the bank, but do no permit any account transfers;

* **Advanced transactional E-Banking**/web sites that allow bank customers to electronically transfer funds to/from their accounts pay bills, and conduct other banking transaction online.

**Current development situations (in industrial countries):**

* E-Banking products and services are getting more and more advanced and increasing in variety. From providing information at the early stage to providing transactional activities.

* Both volume and share in the total banking business are getting bigger and bigger very fast.

* E-Banking customer base is getting bigger quickly.

**Status in developing countries:**

Developing countries are in catching up in E-Banking:

* The average E-Banking penetration for developing countries by the end of 1999 was close to 5% (World Bank Survey, 2001).
* In Brazil, the number of E-Banking users reached 8 million in 2000.
* In Mexico, the number of E-Banking users reached 1.25 million in 2000.
* In India, over 50 banks are offering online banking services. ICICI Bank’s E-Banking is very impressive.
* E-Banking in Korea, Thailand, Malaysia, and Singapore, Hong Kong and Taiwan (China) is thriving.
* In Ghana and some other African countries, smart cards based on Visa Horizon proximately technologies are getting started.

**Prospects—Impact of E-Banking on traditional banking:**

The early conventional wisdom:

* Internet banking would destroy the traditional banking business model and promote the entry of newcomers from the outside of the banking industry.
* Developing countries could have the “opportunities to leapfrog” in the adoption of E-Finance on a large scale. In reality, E-Banking develops fast, but not damaging as conventional wisdom projected.
* The notion of leapfrog has not worked in many developing countries due to various impediments. This can be verified by UNCTAD report. “Some positive signs are already visible, including a high level of acceptance of technology by customers and financial institutions....however, most projects have not yet
been deployed on a large scale.” (UNCTAD 2002. It provides a comprehensive look at the status of efinance in developing countries. It covers arrange of areas related to E-Finance including E-Banking, E-Payments, E-Trades, and E-Credit information).

* Even in industrial countries, E-Banking is still a complementary tools to traditional banking. Lots of pure E-Banking businesses have been forced out of market.

* Internet-only banks have been substantially less profitable. They generate lower business volumes and any savings generated by lower physical overheads appear to be offset by other types of non-interest expenditures, notably marketing to attract new customers. (De Young 2001).

**Prevailing Vision:**

* The prevailing view today is that Internet banking can only succeed if it is thoroughly integrated within the existing banking infrastructure, which should combine “click” (E-Banking) with “mortar” (physical branches) due to the importance of public trust in banks, the value of an established brand name, and the desire of customers to do something physically.

* According to this view, Internet is regarded simply as another distribution channel as a complement to physical branches, phone banking and ATM networks. The dominance of the so-called “click and mortar” model can be explained by its success on the ground. Two most successful examples are:
* Wells Fargo (US), has actually the highest absolute number of online customers, more than 3 million out of its total 24 million customers in 2001.

* Nordea (Scandinavia), has 2.3 million online customers, representing over 20% of its total customer base. It has the highest share of online customers.

They share the following common elements:

* Both are leaders in their traditional markets and thus can capitalize on a sizable customer base.

* Furthermore, their customer base is technologically sophisticated. California and Scandinavia have extremely high rates of Internet use.

* Both are technologically advanced and started early in Internet deployment. Wells Fargo started E-Banking business as early as in 1989.

* Both have tightly integrated Internet in their operations and their existing infrastructure.

* Both have large number of SME customer base.

**Prospects:**

**Bottom line:** The ability to mainstream SME and individuals into E-Banking.

**Trend: The major application of E-Banking—SME E-Finance:**

E-Banking is used more and more for improving access to finance. Financial constraints for SMEs have never been effectively solved and have been thought inevitable.
Obstacles to SME’s access to finance:

From banks’ perspective:

* High costs and low profitability of SME loans because of the small loan size.
* High risks of SME loans due to lack of business track record, credit history, and transparent information.
* Evaluating SME risk is “too labor-intensive” to be profitable.
* Many banks lack strategies and skills to tackle impediments associated with SME finance. In many developing countries, the staffs of banks lack necessary skills to appropriately assess credit risks of SMEs.

From SME’s Perspective:

* Inappropriate products and services, which are rigidly supply-driven instead of demand-driven. Commercial bank products are usually designed to meet the needs of large corporations; few products and service are specifically tailored to the needs of SMEs. SME sector is usually underserved.
* High interest rates. SMEs usually require much smaller loans than large enterprises. banks, therefore, usually charge high margins to cover the costs.
* Cumbersome procedures.
* Over insistence on collaterals and guarantees. SMEs usually have low-level of fixed assets and relatively high-level of working capital. Therefore, when lending to an SME, a bank needs to
assess the SME’s economic viability and future cash flows instead of collaterals. However, in many developing countries, banks are still in the very early stage of mastering sound lending policies and good credit practices. Their lending appears to simply rely on collateral rather than cash-flow projections. Banks’ lack of capacity of non-collateral credit assessment has caused them unable to provide lending services to SMEs.

* Inflexible credit criteria—one size fits all.

**New Technology, New Hope for SME Finance:**

From bank’s side, new technology (E-Banking) makes SME finance economically possible

(i) Lower operational costs of banks

* Automated process
* Accelerated credit decisions
* Lowered minimum loan size to be profitable

(ii) Potentially lower margins

* Lower cost of entry
* Expanded financing reach
* Increased transparency

(iii) Expand reach through self-service

* Lower transaction cost
* Make some corporate services economically feasible for SMEs
* Make anytime access to accounts and loan information possible
From SMEs' perspective:

E-Banking business makes access to finance from banks attractive. SMEs have benefited from the development of E-Finance and gradually stepped out of the informal sector. In particular, E-Finance offers the following attractive benefits for SMEs:

* Ease of use
* Lower costs of financing
* Convenience
* Time savings
* Operational efficiency

From the government's perspective:

New technologies have provided the incentives/benefits for the government to improve SME finance by:

* Increasing employment.
* Contributing to poverty reduction.
* Contributing to economic development.
* Reducing the informal sector and cash economy.

From the society's perspective:

Challenges:

1. The personal identity
2. Privacy issues
3. Who take the responsibility in case of fraud
Policy implications:

1. Essential are efforts to define the privacy framework and to use technology to solve contract enforcement problems.

From bank’s perspectives:

Risk management challenges:

Adaptation to Technology issues:

The speed of change relating to technological and customer service innovation in E-Banking is unprecedented. This intensifies challenges to the management to ensure that adequate strategic assessment, risk analysis and securities reviews are conducted prior to implementing new E-Banking applications.

Outsourcing issue:

E-Banking increase banks’ dependence on information technology, thereby increasing the technical complexity of many operational and security issues and furthering a trend towards more partnerships, alliances and outsourcing arrangements with third parties, many of whom are unregulated.

Increased legal and reputational risks:

E-Security issue:

The internet is ubiquitous and global by nature. It is an open network accessible from anywhere in the world by unknown parties, with routing of messages through unknown locations and via fast evolving wireless devices. Therefore, it raises significant challenges on security controls, customer authentication techniques,
data protection, audit trail procedures, and customer privacy standards. From the authorities’ perspective (banking supervisor, central bank, related government depts.)

**Challenges from E-Banking:**

1. Oversight of outsourcing and partnership arrangements, and the oversight of security and data integrity and controls and safeguards, especially when the supporting operations are located in another jurisdiction.

2. The ability to adopt global technology to the local requirements: A adequate level of infrastructure and human capacity building are required before developing countries can adopt the global technology for their local requirements.

3. The ability to create the necessary level of regulatory and institutional frameworks: The lack of regulatory frameworks, trust, security and privacy standards, high trade barriers, customer and investor protections impede progress in many developing countries to implement E-Finance projects.

4. E-Security challenges

**Some concluding thoughts about scope of E-Banking:**

* E-Banking can not only improve the access to finance, particularly for SMEs, but also allows access to finance with better and more competitive rates.

* Use online banking as new delivery tools to improve access to finance and alleviate financial constraints.
As a regulatory authority, focus on core principles and Basle capital accord.

4. Importance of E-Banking:

Computer has eased human life. Every day new dimensions of its utility are emerging. E-Banking is one of the gifts to human beings by computer technology. Use of computers have automated banking process and thus has given birth to E-Banking.

E-Banking is a fast spreading service that allows customers to use computer to access account-specific information and possibly conduct transactions from a remote location - such as at home or at the workplace. Use of internet has made everything available at your finger tip. Lot of websites are ready to serve you, just at your mouse click.

ATM cards, credit cards, debit cards, smart cards, all these have eased human life up to such an extent that today life without these seems to be hard, full of misery. Internet made E-Banking trustworthy and useful. International trade has increased significantly in post world war period and with it monetary transactions between different countries have increased.

E-Banking has facilitated trading between distant corners of the world without worrying about monetary transactions.

E-commerce has grown exponentially over last 30 years. Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) were introduced in the late 1970s, to send commercial documents like purchase orders or invoices electronically.
In 1980’s E-Banking got a new dimension by the use of credit cards, Automated Teller Machines (ATM) and telephone banking. This was the revolutionary period in E-Banking. Now whole Commerce seems to be shouldering on these electronic systems.

E-Banking has certain features which makes it important in this fast moving world over traditional banking system.

Features which make it so popular are:

**Real time banking:**

Unlike traditional banking which suffers from time consuming procedures, E-Banking provides real time banking to the customers. You get all the relevant information about your account instantly. You can access all the details about your account sitting at home or at any distant location. E-Banking has turned whole world into a small village.

**24/7 banking:**

E-Banking has removed the time constraint from banking. Now you can withdraw cash or get any banking facility anytime. You are not required to ask bank employees for it. Electronic system will do all of this for you instantly.

**Banking from anywhere:**

Don’t worry if you are sitting in Middle East country and want to check you account in New York. eBanking certainly leaves no room for blaming the distances. Smart banking is ready to serve you anywhere, anytime.
Safe and secure Banking:

Electronically enabled banking is more immune to security and safety related problems. Password Based Encryption (PBE), Secure Socket Layer (SSL), electronic signatures and electronic tokens gives a high level of security. Any malfunctioning or any inconsistency in your account can be traced easily. This makes eBanking more reliable.

Easy Loans, Instant Loans:

Use of smart cards, debit cards, credit cards has eased you from hatred, time consuming loaning procedures. Your banks provide you instant loans. No need to keep cash with you at all, a small chip card has replaced piles of cash. Certain web sites provide facility of online loaning. You can get instant loan there, just by filling a small form.

High Performance and flexibility:

E-Banking is a high performance system satisfying it’s customers for their every banking related queries and desires. What makes it more interesting is its flexibility. E-Banking is using everyday advancements in technology, which makes it smart and banking system of today and tomorrow. Bank customers across the world are now more willing to bank online as they are more comfortable with internet.

They also want to avoid teller lines and telephone queues. Their faith in security of internet banking has encouraged banks to turn from traditional methods to advance electronic enabled banking.
E-Banking is about to replace traditional banking system completely. In near future you will have all services in your pocket embedded on a small chip. These smart cards will provide you facilities and services beyond your imagination.

5. Methods and Functions of E-Banking:

Through a combination of internal and outsourced solutions, management has many alternatives when determining the overall system configuration for the various components of an E-Banking system. However, we will discuss two basic variations. First, one or more technology service providers can host the E-Banking application and numerous network components as illustrated in the following diagram. In this configuration, the institution’s service provider hosts the institution’s website, Internet banking server, firewall, and intrusion detection system. While the institution does not have to manage the daily administration of these component systems, its management and board remain responsible for the content, performance, and security of the E-Banking system.
This diagram illustrates the transaction flow for one possible configuration where the bank relies on a technology service provider to host its Internet banking application.

* Internet banking customer sends an E-Banking transaction through their Internet Service Provider (ISP) via a phone, wireless, or broadband connection.

* The customer’s ISP routes the transaction through the Internet and sends it to the E-Banking service provider’s ISP, which routes it to the provider.
* The transaction enters the provider's network through a router, which directs the E-Banking transaction through a firewall to the application running on the Internet banking server.

* The website server and Internet banking server may have host-based intrusion detection system (IDS) software monitoring the server and its files to provide alerts of potential unauthorized modifications.

* Network IDS software may reside at different points within the network to analyze the message for potential attack characteristics that suggest an intrusion attempt.

* The Internet banking application processes the transaction against account balance data through a real time connection to the core banking system or a database of account balance data, which is updated periodically from the core banking system.

* The Internet banking server has a firewall filtering Internet traffic from its internal network.

Second, the institution can host all or a large portion of its E-Banking systems internally. A typical configuration for in-house hosted, E-Banking services is illustrated below. In this case, a provider is not between the Internet access and the financial institution's core processing system. Thus, the institution has day-to-day responsibility for system administration.
This diagram illustrates the transaction flow for one possible configuration in which the bank hosts the Internet banking application.

* Internet banking customer sends an E-Banking transaction through their Internet Service Provider (ISP) via a phone, wireless, or broadband connection.

* The customer’s ISP routes the transaction through the Internet and sends it to the E-Banking service bank’s ISP, which routes it to the provider.
The transaction enters the bank's network through a router, which directs the Internet-banking transaction through a firewall to the application running on the Internet banking server.

The bank typically has several Internet application servers that could include a website server, E-Mail server, proxy server, and domain name server (DNS) in addition to the Internet banking application server.

The router will typically send the transaction around the other application servers directly to the Internet banking server unless it is a non-banking transaction.

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The Internet banking server has a firewall filtering Internet traffic from the bank's internal network.
E-Banking Support Services:

In addition to traditional banking products and services, financial institutions can provide a variety of services that have been designed or adapted to support E-Commerce. Management should understand these services and the risks they pose to the institution. This section discusses some of the most common support services: weblinking, account aggregation, electronic authentication, website hosting, payments for e-commerce, and wireless banking activities.

Weblinking:

A large number of financial institutions maintain sites on the World Wide Web. Some websites are strictly informational, while others also offer customers the ability to perform financial transactions, such as paying bills or transferring funds between accounts. Virtually every website contains "weblinks." A weblink is a word, phrase, or image on a webpage that contains coding that will transport the viewer to a different part of the website or a completely different website by just clicking the mouse. While weblinks are a convenient and accepted tool in website design, their use can present certain risks. Generally, the primary risk posed by weblinking is that viewers can become confused about whose website they are viewing and who is responsible for the information, products, and services available through that website. There are a variety of risk management techniques institutions should consider using to mitigate these risks. These risk management techniques are for those institutions that
develop and maintain their own websites, as well as institutions that use third-party service providers for this function. The agencies have issued guidance on web linking that provides details on risks and risk management techniques financial institutions should consider.

**Account Aggregation:**

Account aggregation is a service that gathers information from many websites, presents that information to the customer in a consolidated format, and, in some cases, may allow the customer to initiate activity on the aggregated accounts. The information gathered or aggregated can range from publicly available information to personal account information (e.g., credit card, brokerage, and banking data). Aggregation services can improve customer convenience by avoiding multiple log-ins and providing access to tools that help customers analyze and manage their various account portfolios. Some aggregators use the customer-provided user IDs and passwords to sign in as the customer. Once the customer’s account is accessed, the aggregator copies the personal account information from the website for representation on the aggregator’s site (i.e., “screen scraping”). Other aggregators use direct data-feed arrangements with website operators or other firms to obtain the customer’s information. Generally, direct data feeds are thought to provide greater legal protection to the aggregator than does screen scraping. Financial institutions are involved in account aggregation both as aggregators and as aggregation targets. Risk management issues examiners should consider when reviewing aggregation services include:
Protection of customer passwords and user IDs – both those used to access the institution’s aggregation services and those the aggregator uses to retrieve customer information from aggregated third parties – to assure the confidentiality of customer information and to prevent unauthorized activity,

Disclosure of potential customer liability if customers share their authentication information (i.e., IDs and passwords) with third parties, and

Assurance of the accuracy and completeness of information retrieved from the aggregated parties’ sites, including required disclosures

**Electronic Authentication:**

Verifying the identities of customers and authorizing E-Banking activities are integral parts of E-Banking financial services. Since traditional paper-based and in-person identity authentication methods reduce the speed and efficiency of electronic transactions, financial institutions have adopted alternative authentication methods, including:

* Passwords and personal identification numbers (PINs),
* Digital certificates using a public key infrastructure (PKI),
* Microchip-based devices such as smart cards or other types of tokens,
* Database comparisons (e.g., fraud-screening applications), and
* Biometric identifiers.
The authentication methods listed above vary in the level of security and reliability they provide and in the cost and complexity of their underlying infrastructures. As such, the choice of which technique(s) to use should be commensurate with the risks in the products and services for which they control access.

The Electronic Signatures in Global and National Commerce (E-Sign) Act establishes some uniform federal rules concerning the legal status of electronic signatures and records in commercial and consumer transactions so as to provide more legal certainty and promote the growth of electronic commerce. The development of secure digital signatures continues to evolve with some financial institutions either acting as the certification authority for digital signatures or providing repository services for digital certificates.

**Website Hosting:**

Some financial institutions host websites for both themselves as well as for other businesses. Financial institutions that host a business customer’s website usually store, or arrange for the storage of, the electronic files that make up the website. These files are stored on one or more servers that may be located on the hosting financial institution’s premises. Website hosting services require strong skills in networking, security, and programming. The technology and software change rapidly. Institutions developing websites should monitor the need to adopt new interoperability standards and protocols.
such as Extensible Mark-Up Language (XML) to facilitate data exchange among the diverse population of Internet users. Risk issues examiners should consider when reviewing website hosting services include damage to reputation, loss of customers, or potential liability resulting from:

* Downtime (i.e., times when website is not available) or inability to meet service levels specified in the contract,

* Inaccurate website content (e.g., products, pricing) resulting from actions of the institution's staff or unauthorized changes by third parties (e.g., hackers),

* Unauthorized disclosure of confidential information stemming from security breaches, and

* Damage to computer systems of website visitors due to malicious code (e.g., virus, worm, active content) spread through institution-hosted sites.

Payments For E-commerce:

Many businesses accept various forms of electronic payments for their products and services. Financial institutions play an important role in electronic payment systems by creating and distributing a variety of electronic payment instruments, accepting a similar variety of instruments, processing those payments, and participating in clearing and settlement systems. However, increasingly, financial institutions are competing with third parties to provide support services for E-Commerce payment systems. Among the electronic
payments mechanisms that financial institutions provide for E-Commerce are automated clearing house (ACH) debits and credits through the Internet, electronic bill payment and presentment, electronic checks, E-Mail money, and electronic credit card payments. Most financial institutions permit intrabank transfers between a customer’s accounts as part of their basic transactional E-Banking services. However, third-party transfers – with their heightened risk for fraud – often require additional security safeguards in the form of additional authentication and payment confirmation.

**Bill Payment and Presentment:**

Bill payment services permit customers to electronically instruct their financial institution to transfer funds to a business’s account at some future specified date. Customers can make payments on a one-time or recurring basis, with fees typically assessed as a “per item” or monthly charge. In response to the customer’s electronic payment instructions, the financial institution (or its bill payment provider) generates an electronic transaction – usually an automated clearinghouse (ACH) credit – or mails a paper check to the business on the customer’s behalf. To allow for the possibility of a paper-based transfer, financial institutions typically advise customers to make payments effective 3–7 days before the bill’s due date.

Internet-based cash management is the commercial version of retail bill payment. Business customers use the system to initiate third-party payments or to transfer money between company accounts.
Cash management services also include minimum balance maintenance, recurring transfers between accounts and on-line account reconciliation. Businesses typically require stronger controls, including the ability to administer security and transaction controls among several users within the business. The Importance of E.-Banking has related to the business.

The extent of front-end operating controls directly under the financial institution’s control varies with the system configuration. Some examples of typical configurations are listed below in order of increasing complexity, along with potential control considerations.

* Financial institutions that do not provide bill payment services, but may direct customers to select from several unaffiliated bill payment providers.

* Caution customers regarding security and privacy issues through the use of on-line disclosures or, more conservatively, E-Banking agreements.

* Financial institutions that rely on a third-party bill payment provider including Internet banking providers that subcontract to third parties.

* Set dollar and volume thresholds and review bill payment transactions for suspicious activity.

* Gain independent audit assurance over the bill payment provider’s processing controls.
* Restrict employees' administrative access to ensure that the internal controls limiting their capabilities to originate, modify, or delete bill payment transactions are at least as strong as those applicable to the underlying retail payment system ultimately transmitting the transaction.

* Restrict by vendor contract and identify the use of any subcontractors associated with the bill payment application to ensure adequate oversight of underlying bill payment system performance and availability.

* Evaluate the adequacy of authentication methods given the higher risk associated with funds transfer capabilities rather than with basic account access.

* Financial institutions that use third-party software to host a bill payment application internally.

* Determine the extent of any independent assessments or certification of the security of application source code.

* Ensure software is adequately tested prior to installation on the live system.

* Ensure vendor access for software maintenance is controlled and monitored.

* Financial institutions that develop, maintain, and host their own bill payment system.

Financial institutions can offer bill payment as a stand-alone service or in combination with bill presentment. Bill presentment
arrangements permit a business to submit a customer’s bill in electronic form to the customer’s financial institution. Customers can view their bills by clicking on links on their account’s E-Banking screen or menu. After viewing a bill, the customer can initiate bill payment instructions or elect to pay the bill through a different payment channel. In addition, some businesses have begun offering electronic bill presentment directly from their own websites rather than through links on the E-Banking screens of a financial institution. Under such arrangements, customers can log on to the business’s website to view their periodic bills. Then, if so desired, they can electronically authorize the business to “take” the payment from their account. The payment then occurs as an ACH debit originated by the business’s financial institution as compared to the ACH credit originated by the customer’s financial institution in the bill payment scenario described above. Institutions should ensure proper approval of businesses allowed to use ACH payment technology to initiate payments from customer accounts.

Cash management applications would include the same control considerations described above, but the institution should consider additional controls because of the higher risk associated with commercial transactions. The adequacy of authentication methods becomes a higher priority and requires greater assurance due to the larger average dollar size of transactions. Institutions should also establish additional controls to ensure binding agreements – consistent
with any existing ACH or wire transfer agreements – exist with commercial customers. Additionally, cash management systems should provide adequate security administration capabilities to enable the business owners to restrict access rights and dollar limits associated with multiple-user access to their accounts.

**Person-to-Person Payments:**

Electronic person-to-person payments, also known as E-Mail money, permit consumers to send “money” to any person or business with an E-Mail address. Under this scenario, a consumer electronically instructs the person-to-person payment service to transfer funds to another individual. The payment service then sends an E-Mail notifying the individual that the funds are available and informs him or her of the methods available to access the funds including requesting a check, transferring the funds to an account at an insured financial institution, or retransmitting the funds to someone else. Person-to-person payments are typically funded by credit card charges or by an ACH transfer from the consumer’s account at a financial institution. Since neither the payee nor the payer in the transaction has to have an account with the payment service, such services may be offered by an insured financial institution, but are frequently offered by other businesses as well.

Some of the risk issues examiners should consider when reviewing bill payment, presentment, and E-Mail money services include:
* Potential liability for late payments due to service disruptions,
* Liability for bill payment instructions originating from someone other than the deposit account holder,
* Losses from person-to-person payments funded by transfers from credit cards or deposit accounts over which the payee does not have signature authority,
* Losses from employee misappropriation of funds held pending access instructions from the payer, and
* Potential liability directing payment availability information to the wrong E-Mail or for releasing funds in response to E-mail from someone other than the intended payee.

**Wireless E-Banking:**

Wireless banking is a delivery channel that can extend the reach and enhance the convenience of Internet banking products and services. Wireless banking occurs when customers access a financial institution's network(s) using cellular phones, pagers, and personal digital assistants (or similar devices) through telecommunication companies' wireless networks. Wireless banking services in the United States typically supplement a financial institution's E-Banking products and services.

Wireless devices have limitations that increase the security risks of wireless-based transactions and that may adversely affect customer acceptance rates. Device limitations include reduced processing speeds, limited battery life, smaller screen sizes, different
data entry formats, and limited capabilities to transfer stored records. These limitations combine to make the most recognized Internet language, Hypertext Markup Language (HTML), ineffective for delivering content to wireless devices. Wireless Markup Language (WML) has emerged as one of a few common language standards for developing wireless device content. Wireless Application Protocol (WAP) has emerged as a data transmission standard to deliver WML content.

Manufacturers of wireless devices are working to improve device usability and to take advantage of enhanced “third-generation” (3G) services. Device improvements are anticipated to include bigger screens, color displays, voice recognition applications, location identification technology (e.g., Federal Communications Commission (FCC) Enhanced 911), and increased battery capacity. These improvements are geared towards increasing customer acceptance and usage. Increased communication speeds and improvements in devices during the next few years should lead to continued increases in wireless subscriptions.

As institutions begin to offer wireless banking services to customers, they should consider the risks and necessary risk management controls to address security, authentication, and compliance issues.
6. Advantages and Disadvantages of E-Banking:

Advantages:

Convenience:

They offer 24 hours service around the clock, 7 days a week as long as you can get online.

Ubiquity:

The ability to travel freely without having to worry about being able to access your account.

Speed:

The transaction speed of online banks is usually faster than that of an ATM.

Efficiency:

You can access all of your accounts from one secured site.

Effectiveness:

There are many other tools on the site to help and meet the needs and wants of the customer.

Disadvantages:

Security:

Customers worry about the security or accuracy. There are always questions or doubts whether or not something took place. The best bet for protection is to make a copy of every receipt or transaction.
Start-up time:

Sometimes in order to register the services you have to sign a waiver or it may take time to get a password.

Learning:

It may take a while to learn how to navigate around the online system.

Site changes:

Sometimes, the bank will make changes to their site, this may cause confusion or delays.

7. Banks: On Line Services:

Bill Payment Service:

Each bank has tie-ups with various utility companies, service providers and insurance companies, across the country. You can facilitate payment of electricity and telephone bills, mobile phone, credit card and insurance premium bills. To pay your bills, all you need to do is complete a simple one-time registration for each biller. You can also set up standing instructions online to pay your recurring bills, automatically. One-time standing instruction will ensure that you don’t miss out on your bill payments due to lack of time. Most interestingly, the bank does not charge customers for online bill payment.

Fund Transfer:

You can transfer any amount from one account to another of the same or any another bank. Customers can send money anywhere
in India. Once you login to your account, you need to mention the payee’s account number, his bank and the branch. The transfer will take place in a day or so, whereas in a traditional method, it takes about three working days. ICICI Bank says that online bill payment service and fund transfer facility have been their most popular online services.

**Credit Card Customers:**

Credit card users have a lot in store. With Internet banking, customers can not only pay their credit card bills online but also get a loan on their cards. Not just this, they can also apply for an additional card, request a credit line increase and God forbid if you lose your credit card, you can report lost card online.

**Railway Pass:**

This is something that would interest all. Indian Railways has tied up with ICICI bank and you can now make your railway pass for local trains online. The pass will be delivered to you at your doorstep. Right now this facility is limited to some areas like Mumbai, Thane, Nashik, Surat and Pune. The bank would just charge Rs 10 + 12.24 per cent of service tax.

**Investing through Internet Banking**

Opening a fixed deposit account cannot get easier than this. You can now open an FD online through funds transfer. Online banking can also be a great friend for lazy investors. Now investors with interlinked demat account and bank account can easily trade in
the stock market and the amount will be automatically debited from their respective bank accounts and the shares will be credited in their demat account. Moreover, some banks even give you the facility to purchase mutual funds directly from the online banking system. So you need not worry about filling those big forms for mutual funds, they will now be just a few clicks away. Nowadays, most leading banks offer both online banking and demat account. However if you have your demat account with independent share brokers, then you need to sign a special form, which will link your two accounts.

**Recharging your prepaid phone:**

Now you no longer need to rush to the vendor to recharge your prepaid phone, every time your talk time runs out. Just top-up your prepaid mobile cards by logging in to Internet banking. By just selecting your operator’s name, entering your mobile number and the amount for recharge, your phone is again back in action within few minutes.

**Shopping at Your Fingertips:**

Leading banks have tie ups with various shopping websites. With a range of all kind of products, you can shop online and the payment is also made conveniently through your account. You can also buy railway and air tickets through Internet banking.