A THESIS

Study on Practices and Prospects of E-Banking in Nepal

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Submitted to

Office of the Dean

Faculty of Management

Tribhuvan University

In Partial fulfillment of the requirement of the Degree of **Master of Business Studies (M.B.S.)**

Kirtipur, Kathmandu

April 2013

RECOMMENDATION

This is to certify that the thesis

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DECLARATION

I hereby declare that the work reported in this thesis entitled "**A study on practicesand prospects of E-Banking in Nepal**" submitted to Central Department of Management, Tribhuvan University, is my original work for the partial fulfillment of the requirement for the Master's degree in the business studies (MBS) under the guidance and supervision of AssoProf. Ajaya Prasad Dhakal.

Thank you.

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ACKNOWLEDGEMENTS

This study entitled “A Study on practices and prospects of E-banking in Nepal” is essentially an output of partial requirement for the degree of Masters in Business Studies, Tribhuvan University, prepared under the guidance and supervision of Asso. Prof. Ajay Prasad Dhakal, Central Department of Management.

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely fortunate to have got this all along the completion of my project work. Whatever I have done is only due to such guidance and assistance and I would not forget to thank them.

I would like to express my sincere gratitude and deep respect to my supervisor Asso. Prof. Ajaya Prasad Dhakal, who not only guided me without lethargically but also took keen interest in this project by providing all the necessary information for this project.

I am also grateful to my all those friends who helped me during my study period. Similarly, I would like to express my thanks to all those staffs of the banks for providing the data related to the thesis.

I cannot stand without thanking to my brotherMr. Nabin Bhandari, being an IT Engineer he suggested and has inspired me to write the thesis about this topic. Similarly thanks to my brother Mr. Padam Subedi for taking care of typing .Again my thanks goes to my husband Mr. Rudra Pokhrel who helped me a lot during my thesis period along with my parents for their kind blessings, support and help. There are so many who contributed in one way or another to this project that if I have forgotten anyone I apologize for this oversight.

For any error or inadequacies that may remain in this work, of course the responsibility is entirely my own.

Sushila Bhandari April 2013

Central Department of Management

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ABBREVIATIONS

ABBS	: Any Branch Banking services
ATM	: Automated Teller Machine
BIMSTEC	: Bay of Bengal Initiative for Multi Sectorial Technical and Economic Cooperation
BOK	: Bank of Kathmandu Ltd.
CD	: Certificate of Deposit
CVC	: Central Vigilance Commission
DSL	: Digital Subscriber line
EDI	: Electronic Data Interchange
EFT	: Electronic Fund Transfer
EFTPON	: Electronic Fund Transfer at Point of Sale
GB	: Giga Bytes
GPRS	: General packed Radio Services
HBL	: Himalayan Bank Limited
HSCD	: High Speed Circuits Switched Data
HTTP	: Hyper Text Transfer Protocol
IBM	: International Business Machine
ICT	: Information and Communication Technology
ISDN	: Integrated Services Digital Network
I-way	: Information Super- Highway
JIT	: Just in Time
JV	: Joint Venture
KBL	: Kumari Bank Limited
LAN	: Local Area Network
LBL	: Laxmi Bank Ltd
MAN	: Metropolitan Area Network
NABIL	: Nepal Investment Bank Ltd
NBL	: Nepal Bank Ltd
NRB	: Nepal Rastra Bank
PC	: Personal computer
PIN	: Personal Identity Number

RAM	: Random Access Memory
RBB	: Rastriya Banijya Bank
RONAST	: Royal Nepal Academy for Science and Technology
SAFTA	: South Asian Free Trade Area Agreement
SCBNL	: Standard Chartered Bank Nepal Ltd
SCT	: Smart Choice Technologies
SMS	:Short Message Services
SWIFT	: Society for Worldwide Interbank Financial Telecommunication
V-SAT	: Very Small Aperture Terminal
WAN	: Wide Area Network
WAP	: Wireless Markup Language
WTO	: World Trade Organization
WWW	: World Wide Web
EML	: Extended Markup Language

CHAPTER-ONE

INTRODUCTION

1.1 Background of the Study

Presently, we are witnessing dramatic change in the banking industry. Modern technology revolutionizes asking and transforms the ways in which banks and customers do business. The information technology (IT) age has virtually shaped the global financial environment in this stage. E-banking is now considered as the wave of future. It provides enormous benefits to consumers in easily and lowering the transaction costs. But, it also poses new challenges for regulating and supervising authorities who design and implement the banking policies as well as the customers who have no knowledge in the field of E-banking

We don't have a very long history of E-banking. Despite the slow pace of development of E-banking, the rays of hope have emerged due to globalization and entry of multinational company in the recent years. There was a time when somebody talked about E-banking (Electronic Banking); it denoted only automated teller machine (ATM) and telephone transactions .Now, it has been transferred through the internet, a new delivery channel for banking services that benefits the customers and banks both. Access is fast, convenient and available all the hours. Besides this banks can provide services more efficiently at a lesser cost.

IT revolution in the banking industry will help to cope with the explosive growth in the number of transactions and to provide improved customer services. In the process, decision making in banks would get immensely facilitated. We have been witnessing since about early eighties the phenomenon of widespread use of computers and communication technology in most of the industrialized and emerging market economics.This has resulted in faster funds movement across nations and borders. Globalization of economies and financial liberalization within the economies has opened new opportunities of growth for techno-based institutions, while for the others these have resulted in shrinkage of revenues. The large functional and geographical spread of banking has led to a sharp growth in the number of accounts and in the areas of operation of banks. This has necessitated switch over from hard cash to paper based instruments. Computerization of service branch operations, serve as a vital fulcrum point for all clearing operations. All paper based payment instruments whether presented by the bank in clearing or drawn on it, are routed through the service branch; where the relevant accounting entries are passed for inter branch reconciliation. The

average daily volume of cheques processed in clearing operations in the cities has been staggeringly high. Banks have led to therefore computerize the operation of banking services.

E-banking is a tool that allows us to use a personal computer (PC) with an internet connection to conduct your banking online. 'continuous technology, innovation and up gradation have allowed much wider array of banking products and services accessible and delivered to customers through electronic banking.' In other words, E-banking generally means a home user directs dial the bank via a modem, logging on to the internet via an internet service provider and then going to the bank's web page before accessing the secure site i.e. a password. Hence E-banking is the use of electronic channels to communicate and transact the business with both domestic and international customers primarily through the use of internet and World Wide Web (WWW).Providing banking products and services through the electronic delivery channels such as automated teller machine (ATM), point of sale (POS), Debit Cards, Smart Cards, Credit Cards, Telebanking, Remote Banking, Mobile Banking/ SMS banking, Internet Banking. The bank for international settlement has broadly categorized e-banking into 3 categories.

1) Basic Information website, which only transmit information on the banking products and offered to bank customers and the general public.
2) Simple transactional websites, which allow bank customers to submit applications for different services, make enquires about balances and submit instructions to the bank but do not allow transaction.
3) Advanced transactional websites, which allow bank customers to electronically transfer funds to\from their accounts pay bills and conduct other banking transaction on-line.

It's easy to do E-banking, sit down, boot up your computer and dial up a banking center. You can balance your check book, invest in certificate of deposits (CDs) and pay your credit cards right online. No need to go to bank losing your important time. Plus, you can do your banking whenever you want. E-banking is not out to change your banking habits, instead, it uses today's computer technology to give you the option of bypassing the time-consuming. Paper based aspects of traditional banking in order to manage your finance more quickly and efficiently.

1.2 Focus of the Study

The banking system in Nepal is gearing up for another round of competition with second phase of financial sector reform and international standard oriented reforms underway. Nepal government and the central bank (NRB) are working to develop transparent, competitive and strong financial

sector on the one hand and on the other hand want government dominated banking system to survive and run smoothly.

The Nepalese economy is rapidly integrated with the global economy with its outward oriented policies followed by membership of World Trade Organization (WTO), SAFTA and BIMSTEC. The country is in process of institutional restructuring after the adaptation of financial liberalization policy since 1980s. Hence, Nepal is in process to make banking system more transparent and international delivery standard. In such a context, there is no other option left for Nepalese banks than to evolve a strategic vision that builds over the present technology base. In the modern era globalization has played a key role to combine the world together. At the same time the technologies being activities. They should adopt and apply it appropriately but they must be aware of and be open to influences of 'information systems' in order to benefit from new technologies. Information systems must be aligned with the organization to provide information that important groups within the organization need. In the Nepalese business industries, organizations are spending much more on information technologies. These investments would be profitable if managers learn to use the technology and mechanism of information. The key to building and using effective information system is that managers need to know how to apply information technology to solve the problem and make decision. Also the companies that can integrate various technologies to achieve business goals are often very successful. The design and implementation of information system in an organization necessitates the identification of information requirements. It should now be obvious that managers should insist that the societal and personal impact of using computers must be considered when computer based information system is being developed. Besides, the NRB should also promulgate a new law, which will drive banks to computerize total banking business in the country.

We have human capital and opportunities in IT sector so we should consider the fact that a number of countries have developed their financial sector through an extensive use of IT as the medium of growth. The sharp growth of computer use in new consumer goods of durable nature has also given rise to the need for use of computers in the service sectors as well. Banking industries as service provider can't naturally lag behind in this movement towards the new techno-age. Obviously banks in future can't survive without the support of IT. Computerization of branch operations, controlling office and head office has been going swiftly in recent time since, that is the only way by which senior management in banks can gain information on the size of operations on daily basis.

Electronic medium is one of the most reliable medium as the world is getting a wide advantage of rapidly developing information technology. Nepal is also witnessing a myriad of cyber activities both

at private and government levels. The development and use of communication networks has helped the banking industry to gain in terms of improved banking services. Now the customer can check his account details, transfer his money and pay their bills through the internet within small of time. Even the branch is closed, system is up and running 24 hours a day and account holders can access the account and even perform the transactions through ATM and internet banking on real time. From all indications banks seem to be prepared to exploit the opportunities that globalization and financial liberalization will provides. In this context, the environment in which banks are operating in Nepal should be reformed. The central bank's capability for effective supervision of the financial institutions should be enhanced. Similarly, financial discipline based on adequate provisions of disclosure and implementation of internationally recognized accounting and auditing practices and system should be ensured. Competitions oriented policies should be pursed along with strengthening the regulatory and supervisory framework to enhance financial sector efficiency and effectiveness. For the purpose NRB and government are also seem quite serious. In the western countries and some of the largest financial institutions of India offer fully secure, fully functional E-banking at free cost or with taking with small fee. In Nepal most of the joint venture banks likeLaxmiBank Ltd., Everest Bank Ltd, KumariBank Ltd., Machhapuchhre Bank Ltd, also seem to be adopted E-banking services. Some of the advantages of E- banking are convenience, high transactions speed, efficiency and effectiveness etc. This study focuses on the adaptability of E-banking that can be used in Nepalese financial institutions. This study has observed the existing method of banking transactions followed by Nepalese banks and has focused in the present scenario of banking system of Nepal and future prospective of electronic banking system in Nepal.

1.3 Statement of Problems

Any organization has to sustain in today's competitive condition. To reach the sustainability and be an excellent performer, it is most important to observe whether the organization is performing well adopting technology. Different studies suggest that this is possible to use E-banking and it gets success only in case of efficient market where voluminous financial transactions are performed and customers are well known about IT. Many scholars and specialist studied about E-Banking and its implications in the economy in international standard. But in case of Nepal, no sufficient study has been conducted previously, until and unless there is not conducting such study, how can financial institutions take decisions to adopt the technology? And how can be determined that the electronic banking affect the competitive position of bank and other financial institutions? So, E-banking system is needed to test the validity and reliability. We need to be consistent of banking system and practice all over the country with trustworthy technology. For this reason, this study aims to know

whether E-banking is and will be well functioning in Nepal. This study has tried to answer the following questions.

- What impact of E-banking in consumption and saving habits of clients?
- What are the risks involved in E?-banking?
- What type of E-banking services customer want?
- Are the banks using sufficient risks management tools to assure secure financial transactions?
- What affect the E-banking behaves by the demographic factors?
- How much the operating system exercised by the bank is efficient?
- What policies should be reformed by the NRB regarding E-banking to enhancefinancial sector efficiency and effectiveness?

1.4 Objectives of the Study

Primarily payments system is dominated by cash, cheques and other paper credits. However, there has been noticeable increased in the use of electronic payment technologies ,such as Automated Teller Machines (ATM),credit cards, electronics fund transfer at point of sale (EFTPOS), debit cards and credit transfer, mobile banking etc. accounts for a significant volume of no-cash payments undertaken in Nepal. Currently most of the commercial banks are providing E-banking services throughout the country. Nepalese banks and other financial institutions are providing E-banking services like cash withdrawals, balance enquiry, accounts status check, fund transfer with accounts in the same bank, pay bills online, gets balance statement online etc. considering these facts the issue of E-banking in Nepal are raising fast which directly impacts the customer's behavior so the main objectives of this study is to examine the current issues of banking system in Nepal particularly the use of internet and WWW and suggest the ways of implementing the same. Some of the objectives are pointed below:

1. To study and analyze the existing technologies used by the bank relating to E-banking
2. To evaluate the banking habits of customers after implementing of E-banking system
3. To measure the efficiency and sufficiency of E-banking in regards to provide the necessary information to the management for decision making
4. To access the advantages of E-banking to Nepalese people as well as commercial banks

5. To provide suggestions to the concerned for further improvement in the banking practices in Nepal.

1.5 Hypothesis of the study

A quantitative statement about the population parameter is called hypothesis. In other words, it is an assumption that is made about the population parameter and then its validity is tested. By testing the hypothesis we can find out whether it deserves the acceptance or rejection of the hypothesis.

The following hypothesis has been assumed on this study:

Null hypothesis:

A statistical hypothesis, which is stated for the purpose of possible acceptance, is called a null hypothesis and is denoted by h_0.The null hypothesis formulated on this study, has been given below:

1(a) $H_{0:}$ adaptation of E-banking system does not depend on the educational background of customers of the bank. In other words, there is no significant evidence of difference in adopting E-banking by level of education.

2(a) H_0: there is no significant difference between the uses of E-banking and the gender. In other words, adaptation of E-banking by male is not different from the adaptation of E-banking by female.

Alternate hypothesis:

Any hypothesis, which is complementary to null hypothesis (H_0) is called an alternate hypothesis and is denoted by H_1. The alternate hypothesis formulated on this study has been presented below:

1(b) H_1: adaptation of E-banking system depends on the educational background of the customers of the bank. In other words, there is significant evidence of difference in adopting E-banking by level of education.

2(b) $H_{1:}$ adaptation of E-banking by male differs from adaptation of E-banking by female.

1.6 Significance of the Study

The worldwide experience is a clear testimony to the facts that financial system with growth and sophistication in financial markets compromise the main pillar for the accelerated economic growth and development in an economy. Development and sophistication of financial markets helps to pool and utilize resources, reduce costs and risks, expand and diversify opportunities and increase the resources for economic development. Development of financial market is largely depended up on latest technology. The Nepalese financial system underwent significant changes during the 1990's but there still remain a numbers of challenges for ensuring efficient, competitive and stable financial system in the days ahead. But the institutions must be confronting the arising challenges to grasp the opportunities spread out by the globalization. For this, they establish effective information system and fully techno based transactions system. As being a member of WTO Nepal cannot close the door to foreign joint venture company. As per policy formed by the government, many large funded banks will establish till 2010. They come with new technology so to exist in the economy with new technology, the commercial banks and other financial institutions must adopt the latest technology in their daily transactions.

The 9th plan has included the initiation and development of the information system for enhancing working capability and competence of various related institutions. It has further incorporated the building of a networking system to ensure the availability of information to the common people. It further emphasized the simplifying of the banking transactions by expanding the application of computers and new communication instruments such as credit cards and ATM services and facilities into practice to facilitate paying bills, purchasing goods. The implementations and recognition of the information system and information technology has been enhanced in the national level. The 10th plan has focused that the information and communication sector, which is a crucial infrastructure for development plays a vital role in an overall development of the country. It is indisputable that the development, expansion and effective mobilization of information and communication can play and important role in bringing together every citizen in the process of nation building by rising their awareness.

The 10th plan further integrated IT as a vital tool for the socio-economic development of the country. In context of Nepal, it is important to establish IT based industries and expand their services to become and active partner of global IT market and get maximum benefits from latest IT revolution. Flow of information is an important part for socio-economic development of a country. The expansion of IT can contribute in achieving a high economic growth rate trough quick dissemination and availability of necessary information.

As stating above, this study will help the commercial banks and financial institutions for making effective managerial strategy and implementing it in the field of E-banking in such a way that it will maximize wealth of the institutions. In the context of E-commerce and E-governance, the importance of can hardly deny. But there is not abundant research on implications of E-banking by Nepalese financial institutions. The paper, which is focus on analyzing the prospect and practice of E-banking would be helpful and useful to those financial intermediaries who are conducting and want to conduct E-banking. The paper also shade light on the current scenario of E-banking in Nepal. This study will also helpful to those students, researchers and customers who are interesting to gain knowledge in the field of E-banking. Not only this but also it provides a useful feedback to the IT policy makers and NRB for the formulation of appropriate strategies.

1.6 Limitations of the Study

This study is a case study of some of the commercial banks of Nepal so it may not represent the factual conditions of banking transaction through E-banking by all financial institutions of Nepal. But this study will definitely represent the present scenario of bank. Due to the limited time and resources to conduct this study only focuses the E-banking application in behalf of customers; not sighted from bank point of view in much contest. The research study has been limited within the information system, its processes, technology employed in existing information system. The data provided by bank may not be sufficient because they don't want to disclose their confidential information as per their rules and regulations.

The following are the main limitations of the study:

- Time frame and resources are constraints in this study.
- There has not been any research conducted on this topic. So this study lacks of previous related studies in this areas.
- This study is mainly based on primary data. So, the limitations of primary data may exist.
- This study has also taken only few commercial banks (will be specified on the thesis) and few clients as sample and draw conclusions. So, the conclusions drawn are suggestive.
- The research observes only the application of online in banking sectors.It does not include implication of online of other field of economy.

1.8 Organizations of the Study

The whole study comprises five chapters. Each chapter concentrates to some aspect of the study of practices and prospects of E-banking. The rationale behind this kind of organization is to follow a simple research methodology approach. The research contains the following five chapters:

Chapter one: introduction

Chapter two: Review of literature

Chapter three: research methodology

Chapter four: presentation and analysis of data

Chapter five: Summary, Conclusions and Recommendations

Chapter one

This chapter entitles “Introduction chapter”. This first chapter deals about the general background of the study, focus of the study, statements of the problem, objectives of the study, limitations of the study, significance of the study and organization of the study.

Chapter two

The second chapter deals with review of available literatures in the field of the study being conducted. This includes reviews of the theories of the concern topic review of books, review of various empirical studies and research gap.

Chapter three

The third chapter has explained the research methodology employed to conduct the study and tools and techniques used in analysis of the data as well. This chapter includes research design, population and sample, sampling procedure, source of data, data collection procedure, method of data analysis and presentation of various financial statistical tools.

Chapter four

The fourth chapter presents, analyzes and interprets the study through definite course of research methodology. The observe information has been analytically studied and presented the data has been presented in table and charts, quantitative tools have been used and generated quantitative result has been interpreted in this chapter. It consists of testing of hypothesis, analysis of questionnaire and analysis of open-end opinions and major finding of the research.

Chapter five

The fifth and the last chapter is conclusive and suggestive chapter. A brief conclusion from the analysis has been drawn and necessary recommendations have been made through this.

Beside these, bibliography and appendices are being presented at the end of the thesis.

Similarly recommendation, viva-voce sheet, declaration, acknowledgment, table of content, list of table, list of diagram, abbreviations are included in the font of the thesis report.

CHAPTER-TWO

2. REVIEW OF LITERATURE

This chapter aims to establish a conceptual framework and make a view of the relevant studies that have already been done on the research topic so that some new contributions could be given to the established body of knowledge. This chapter has been divided into two main sections; first section will encompass the conceptual framework and the second section will present the review of previous study on the topic.

2.1 Conceptual Framework

2.1.1Historical Background of Banking Industry

The Oxford English Dictionary describes a bank as 'an establishment for custody of money'. At law, however a bank is an entity which borrows money from its customers and re-lends it. Simply a bank is defined as the financial intermediary between the depositors and the credit seekers ,or as a media to collect deposits from the general people and provide them loans by charging a certain rate of interest. Banks and financial institutions are a critical component of any economy. They provide financing for commercial enterprises, basic financial services to a broad segment of the population and access to payment system.

Although the use of banks and bank notes were started in Babylon in 600BC, banking made its first beginning publicly around the middle of twelfth century in Italy. The bank of Venice founded in 1157 was the first public banking institutions. In the ancient Greece, the famous temples of Delphi and Olympia served as the great depositories for people's surplus funds and these were the centers for money lending transaction. The goldsmiths and merchants were the bankers in the ancient period in the England. They too served as depositors and lenders to the government. The public kept their ornaments at the gold smiths for safety and the goldsmiths used to give the receipt in return. These receipts with the passage of time became payable to bearer on demand and gained circulations and currency in due course of time .So the banking is not static but a dynamic concept. It is a product of centuries and the development which has taken place is the product of a method of trial and error and experience which were made and the results that followed relating to the acceptance of money and valuables as deposits and lending them whether to private individuals, to states or other bodies of economy for multidimensional activities.

Bank can be viewed:

- As an information processor ,
- As a regulated firm,
- As a portfolio(or balance sheet),
- As a communication firm

Banks and communication are similar that they both established networking relationships through which they collect, store, process and transmit information for themselves and for customers. The bank lending function concentrates on the gathering, processing and analyzing of timely and accurate information and on establishing customer relationship and incentives to remedy informational asymmetries and hidden actions arising from lender-borrower agency problems. The overall goal of bank regulation and deposit insurance is to maintain public confidence in the banking system. (Mishkin, 1998:34)

2.1.2Development of Banking Industry in Nepal

In the context of Nepal, the banking system is relatively budding. The record of banking system gives the detailed version of the mixture of slow and steady evolution in the financial and global economy of Nepalese life. Even though the specific date of the beginning of money and banking deal in Nepal is not obvious, it is speculated that during the reign of the King Mandev, the coin 'Manank' and 'Gunank' during the reign of the King Gunakamdev were in use. In Nepalese chronicles, it was recorded that the new era known as Nepal Sambat was introduced by Shankhadar, a Sudra merchant of Kantipur in 880 AD. After having paid all the outstanding debts in the country, this shows the basic of money lending practice in ancient Nepal .It is also noted that money lending business, particularly for financing the foreign trade, with Tibet, become quite popular during the reign of Mallas.

During the prime ministership of Ranodip Singh around 1877 AD, a number of economic and financial reforms were introduced. The establishment of the 'TejarathAdda' fully subscribed by the government in the Katmandu Valley was one of them. It used to provide loans to the government officials and the people against deposits of gold and silver .It had also extended its branches outside the Katmandu valley for giving loan, but this office had no right to accept deposit of public and it had no character tics of modern banks, nevertheless, we can say that the institutional banking system had started from then. (BhandariDilli Raj, 2003:27)

After the establishment of Nepal bank limited on 30thkartik, 1994 BS, under the Nepal Bank Act 1994, modern banking system started in Nepal. It was a joint venture between government and private sectors. The Nepal Rastra Bank then came into existence as central bank of Nepal in 14thBaishakh, 2013 BS .It had authorized capital of Rs 10 million fully subscribed by the government of Nepal. It was empowered by Nepal Rastra Bank Act 2012 to have direct control over the financial institutions with in the country .It started issuing Nepali currency since 7thFalgun 2017.The existence of the Nepal Bank Limited was functioning in the field of business only. Hence establishment of another commercial bank was realized to be established: as the result the RastriyaBanijya Bank was came in existence since 2022BS .There is no doubt and dispute about the significant role and the functions of the banks. Without developing the financial institutions no any country can develop its economy properly because of the key role it plays in the economy like intermediations, maturity transformation, facilitating payments flows, credit allocations and maintaining financial discipline among borrowers.

The process of development of banking system in Nepal was not satisfactory up to 2040 BS. No bank was opened from during this period except extending the branches of the banks, which were established in this period. Nepal was observing the events that were taking place in the world also. Nepal was deeply studying and searching what sorts of programs, policies, law and regulations should be brought into practice. The country can't change its status by using only its capital in the country without importing the new technology from foreign country and accordingly, law and policy have been enacted by the state to encourage the foreign investment on banking sector. Considering this fact, Nepal Rastra Bank adopted a more liberal policy in establishing the commercial banks. From this the real form to the development of the banking system started in Nepal. The competitions began to grow .The banks began to offer their valuable services to the people through new technologies. As the result Kumari Bank, Machhapuchhre Bank, Everest Bank, Nepal Industrial and Commercial Bank, Laxmi Bank, Nepal investment Bank Ltd etc. came in existence as joint investment of Nepalese and foreign investors. Now there are 32 commercial Banks in Nepal .The detail of the 32 commercial banks is attached in appendix 1.

2.1.3.1 E-Commerce

E-Commerce in full electronic commerce is a system of maintaining business relationships and selling information, services and commodities by means of computer telecommunication networks. It is originated in a standard for the exchange of business documents such as order or invoices, between supplier and their business customers. Electronic commerce is a modern business methodology that addresses the need of organization, merchants and consumers to cut costs while improving the

quality of goods and services and increasing the speed of services delivery. The term also applies to the use of computer networks to search and retrieve information in support of human and corporate decision making. (Bhattari,Suresh Raj 2007:2)

More commonly, e-commerce is associated with buying and selling of information products, and services via computer network today and in the future via one of the myriad of network that up the information superhighway(I- way)

From the broad perspective e-commerce is well suited to facilitate the current reengineering of business processes occurring at many firms; the broad goals of reengineering and e-commerce are remarkably similar: reduced costs, lower products cycle times, faster customer response and improved service quality .One major goal of reengineering effort is to use electronic messaging technologies, a key building block of e-commerce to streamline business processes by reducing the paper works and increasing automation. For example electronic data interchange (EDI): a fast and dependable way to deliver electronic transaction by computer to computer communication combined with just in time (JIT) manufacturing methods, enable supplier to deliver component directly to the factory floor, resulting in saving in inventory, warehousing and handling costs. And while EDI is primarily inter organizational, electronic mail (e-mail) does much the same thing, enabling firm to accelerate the document based businessman processes both inside and across the organizational boundaries from simple order processing to complete supply chain management.

The effects of e-commerce are already appearing in all areas of business from customer service to new products design. It facilitates new type of information based on business processes for reaching and interacting with customers online advertising and marketing ,online order taking and online customer services to name a few. It can also reduce the costs in managing orders and interacting with a wide range of suppliers and trading partners, areas that typically add significant overhead to the costs of products and services.Finally, e-commerce enables the formation of new types of information based products such as interactive games, electronic books and information on demand that can be very profitable for content providers and useful for consumers .In sum, companies believe that e-commerce can result in Improved efficiency in finding and interacting with customers, in communicating with trading partners, in developing new products and markets.

A key element of e-commerce is information processing .All steps of commerce, except for production, distribution of physical goods are forms of information gathering, processing, manipulation and distribution which computers and networks are perfectly suited to handle. This

information processing activity is usually in the form of business transactions, for which several broad categories can be observed:

- Transactions between a company and the consumer over public network for the purpose of home shopping or home banking using encryption for security and electronic cash. Credit or debit tokens for payment.
- Transactions with trading partners using EDI
- Transactions for information gathering such as market research using barcode scanners information processing managerial decision making or organizational problem solving and information manipulation for operations and supply chain management.
- Transactions for information distributions with prospective customers, including interactive advertising ,sales and marketing

As important as standard forms are for business to business transactions, e-commerce encompasses much wider activity. For example, secure electronic transfer of sensitive information essential to the continued growth of e- commerce .In addition to encrypting Web purchase forms, many individual also routinely encrypt their e-mail. Among other innovations that have contributed to the growth of e –commerce are electronic directories and search engines for finding information on the web, software 'agents' 'boots' act autonomously to locate goods or services; and digital authentications services that vouch for identities over the internet .These intermediary services facilitate the sale of goods (actually delivering the goods in the case of information),the provision of services such as banking, ticket reservations, and stock market transactions, and even the delivery of entertainment. Business often deploys private networks (intranets) for sharing information and collaborating within the company, usually insulated from the surroundings internet by computer security systems known as firewalls. Business also frequently relies on extranets, extension of a company's intranet that allows portions of its internal networks to be accessed by collaborating business. Access to these extranets is generally restricted via password.

From a management perspective, all of these transactions require tight coordination and control among many participating organizations in order to minimize the exposure to risks. If we look at managing these transactions in light of global sourcing, an integral part of the increasingly global market, the complexity is compounded by long transportation distance, currencies, customs regulations and language barriers. Codifying these transactions and coordinating them through software via the I-way can reduce the complexity of the task.

E-commerce enables companies to:

(1)Shorten procurement cycle through online catalogs, ordering and payment;

(2) Cut cost on both stock and manufactured parts through efficient JIT and QR systems that reduce inventory and facilitate automatic replenishment;

(3) Shrink product development cycles and accelerate time- to- market through collaborative engineering and product customization.

Broadly speaking, electronic commerce is a new way of conducting, managerial and executing business transactions using computer and telecommunication networks Electronic commerce is expected to improve the productivity and competitiveness of participating business by providing unprecedented access to an online global market place with millions of customers and thousands of products and services. Bank as the most important type of commerce leads and support to run all types of business by providing finance; the life blood of business. So, it must join with giant e-commerce being as a virtual company.

2.1.3.2M-Commerce

Mobile technologies are significantly changing current business models, even with the fast pace evolution of e-commerce. The principles guiding the evolution of m-commerce are anytime, anywhere, by /for anyone, with anything .Many in the industry like to think of the *m* as representing: multilingual, multicultural, multimodal, multi device and so forth.

Mobile commerce or simply M-commerce is enabling interactions and transactions via mobile communications network and services .The technology is allowing for new communications among retailers, customers, employees and suppliers at the point of need; anytime, anyplace. It has been essential for people who need continuous access to information and is mainly used while traveling. It has now a day mostly been used in shopping, financial travel services. The attraction of mobile commerce has been the personal convenience and efficiency.

The widely used standardized protocol to access network service via mobile device is Wireless Application Protocol (WAP).HTML language is not immediately compatible for the browsers used in the mobile devices and therefore some form of translation is required. One of the WAP'S early pioneers, Unwired Planet (phone.com) developed the concept of a mobile friendly version of HTML called WML (Wireless Markup Language).WAP provides a mini browser into a mobile device and operated by having a server that does all the hard work of filtering HTTP information from the

internet and reformatting it into the WML so that it can be used in the mini browser. On the user's side, the receiver is capable of reading the documents in a language called WML. This is derived from XML(Extended Markup Language).Technologies used in the mobile data communication are GPRS (General Packet Radio Services)and HSCSD(High Speed Circuit Switched Data).These technologies provide efficient e-mail, remote LAN access ,internet access to mobile users. GPRS is a packet switched technology having the data transfer rate of 115 kilobit per second. (Bhattarai,Suresh Raj 2007:5).

2.1.4 E-Commerce Framework

From the business activity already taking place, it is clear that E-commerce applications will be built on the existing technology infrastructure a myriad of computers, communications software forming the nascent information superhighway. The figure shows a variety of possible e-commerce applications, including both inter-organizational and consumer-oriented examples none of these uses would be possible without each of the building blocks in the infrastructure:

- Common business services, for facilitating the buying and selling process.
- Messaging and information distribution, as a means of sending and retrieving the information.
- Multimedia content and network publishing, for creating a product and a means to communicate about it.
- The information superhighway –the very foundation –for providing the highway system along which all e-commerce must travel.

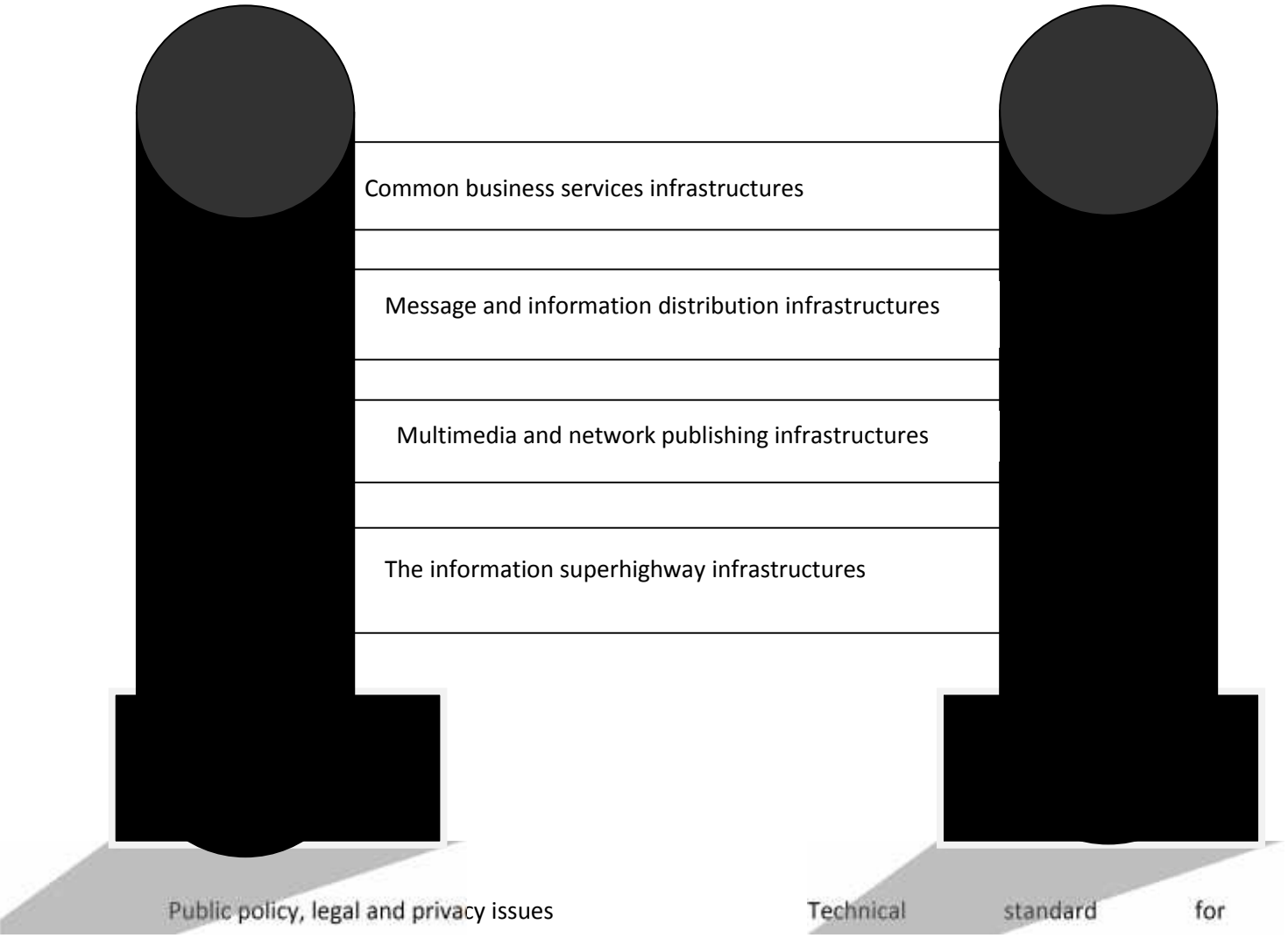

Fig 2.1: Framework for electronic commerce.

The two pillars supporting all e-commerce applications and infrastructures are just as indispensable. Public policy issues deal with other the costs of accessing information, regulations to protect consumers from fraud and to protect their right to privacy, and the polishing of global information traffic to detect information pirating or pornography. The second pillar on which the e-commerce framework rests is technical standards, without which the impact of this revolution would be minimized. Standards are crucial in the world of global e-commerce, to ensure not only seamless and harmonious integration across the transportation network but access of information on any type of device the consumer chooses laser disc, portable hand held devices or cable converter boxes and on all types of operating systems. For example without the adoption of video standards, video

conferencing will never become widespread, as each manufacturer will attempt to develop equipment that maximizes their short term profits rather than working towards customer goals.

2.1.5Elements of E-Commerce Application

Multimedia content, multimedia storage servers, the information transport providers. And the consumer's access devices are the various elements for E-commerce applications.

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1) Multimedia content:

Multimedia content can be considered both fuel and traffic for electronic commerce applications. The technical definition of multimedia is the use of digital data in more than one format, such as the combination of text, audio, video and graphic in a computer file/document .Its purpose is to combine the interactivity of a user-friendly interface with multimedia forms of content. Because most business systems support only a fraction of the information and communications found in the work place, the goal of multimedia is to increase the utility of all information through the processing and distribution of new forms such as images, audio and video.

2) Multimedia storage servers:

Electronic commerce requires robust servers to store and distribute large amounts of digital content to consumers. These multimedia storage servers are large information warehouse capable of handling various contents, ranging from books, newspaper, advertisement catalogs, movies, games, and x-ray images. Theses servers, deriving the name because they serve information upon request, must handle large scale distribution, guarantee security and complete reliability.

In general terms, multimedia server is a hardware and software combination that converts raw data into useable information and then dishes out this information where and when users need it. It captures process, manages and delivers text, images, audio and video. Most multimedia servers provides a core set of functions to display, create and manipulate multimedia documents; to transmit and receive multimedia documents; to transmit and receive multimedia documents over computer networks, and to store and retrieve multimedia documents.

To make interactive multimedia a reality, a server must do the following

a) Handle thousands of simultaneous users.

b) Manage the transactions of these users and

c) Deliver information streams to consumer at affordable costs

The following two types are most useful multimedia servers in the application of E-commerce

a) Client servers: All e-commerce applications follow the client server model. Clients are devices plus software that request information from servers. The client server model, allows the client to interact with the server through a request-reply sequence governed by a paradigm known as message passing. The servers manages applications tasks, handle storage and security and provides scalability-ability to add more clients as needed for serving more customers and clients devices handle the user interface.

b) Video servers: The electronic commerce applications related to digital video will include telecommunicating and video conferencing, geographical information system that requires storage and navigation over maps, corporate multimedia servers and postproduction studios. Consumer applications will include video on demand and a range of interactive services such as shopping, video navigations (e.g. Interactive TV guides) and directories. Video servers are an important link between the content providers(media)and transport providers (wireless/cable operators).One important difference between video servers and the current client servers computer systems used extensively for data processing is that video servers are designed to deliver information to hundreds of consumers simultaneously via public telecommunication and cable networks.

3) Information transport providers:

Transport providers are principally telecommunications, cable and wireless industries; computer networks including commercial networks such as CompuServe or American online; and public networks such as internet. The distributions of information have become a competitive market with a combination offense and defense. Playing on the defense that have e are telephone companies and cable television companies, providers that have enjoyed monopoly positions for decades. Playing offense are computer companies that offer hardware capabilities and software programs with the potential to define new markets.

4. Consumer access device:

A myriad of devices can provide access to information. Videophones, PCs, personal digital assistance like cellular phones, mobile phones and portable computers are the some example of access devices.

2.1.6 E-Banking in Nepal

Across the globe, but specifically in Nepal, current trend in private banking has been the consumer movement from traditional branch banking to more stand-alone banking. In other words, a move towards using E-delivery channels such as the internets, telephone and mobile phones. Many banks are beginning to deliver credit and deposit products electronically. As banks venture into the electronic arena, however, they are finding new opportunities with new operational and strategic risks.

Nepal's journey into the world of information technology began some three decades back with the use of IBM 1401 for the population census, 1972.Royal Nepal Academy for Science and technology (RONAST), for the first time, used the internet. Mercantile Private limited started e-mail services for commercial purposes in June 1994.

Banking industry in Nepal has been taking rapid strides in the advancement of technology and aggressive infusion of information technology in the functioning of the banks. The industry has not been only kept pace with technological developments but has also forced the computer industry to continuously keep pace and innovative products to suits its needs. Banks are using information technology to gain competitive advantage.

Establishment of first joint venture (JV) Bank, Nepal Arab Bank Limited (now NABIL Bank), in 1984 was the first step towards E-banking in Nepal. It introduced credit cards in Nepal in early 1990.Automated Teller Machine (ATM) was first introduced by another JV Bank, Himalayan Bank Limited (HBL) in 1995.Himalayan Bank Limited was also the first bank to introduce Tele-Banking (Telephone Banking) in Nepal. Internet-banking was first introduced Kumari Bank Limited (KBL) in 2002.Laxmi Bank Limited (LBL) was the first bank introduced SMS-Banking (or Mobile –banking) in Nepal in the year 2004.

2.1.7 Present Status of E-Banking in Nepal

E-banking as per international standards is yet to develop in Nepal. At present, several JV commercial banks offer limited services of Tele banking, internet banking and online banking facilities working within the branches of individual bank. As a part of stepping towards E-banking, the JV banks have played the pioneering role with adoption of modern technology in retail banking during the early 2000 whereas the state owned commercial banks (RBB and NB) just started in a limited scale.

The existing form of E-banking in Nepal that satisfies customer demand in banking activities electronically throughout the world is:

1. Tele-banking

2. SMS-banking

3. PC home banking

a. Online banking

b. Internet banking

4. ATM

5. PoS

Electronic banking aspects at a glance

- ✓ Evolution of joint venture bank in Nepal (NABIL Bank) in 1984.
- ✓ Introduction of credit cards in 1990.
- ✓ Establishment of First ATM by Himalayan Bank Limited in 1995.
- ✓ Formulation of IT policy in 2000.
- ✓ Evolution of Private Sector Bank (Kumari Bank) in 2001.
- ✓ Internet Banking was first introduced by Kumari Bank in 2002.
- ✓ SMS banking/ Mobile Banking was launched by Kumari Bank in 2004.
- ✓ Electronic transaction and Digital signature act is implementing in 2005.

Table No. 2.1(History of E-banking in Nepal)

Phone/Tele-banking:

Tele banking refers to the services provided through phones that require the customer to dial a particular telephone number to have access to an account which provides several options of

services. Despite huge potential, Tele-banking services have not been widened enough in daily banking activities in Nepal. Now some of the banks to far provide a few options of Tele banking services such as detail account information, balance enquiry information about the products or services, ATM card activation, cheque book related services, bills payment, credit card services and so on. Funds transfer between current, saving and credit account, stock exchange transactions etc. are still inaccessible through Tele banking in Nepal.

Mobile/SMS banking

Mobile/SMS banking enables customer to access various banking services through mobile phones. This system is similar to Telebanking although, mobile phone is required instead of telephone. Generally there are two types of facility provided by Mobile/SMS banking; Alert such as balance going below the minimum prescribed balance and request such as account balance can be sent on the mobile phones of the customer in the form of SMS so that customer can be view their balance and other information using SMS, reduce expenses and saves time for visiting bank counters. SMS enquires are significantly less costly compared to voice inquires .Customers can save the information received from the mobile banking for later use, which is added advantages over Telebanking.

Requirements of SMS-banking (Banks side)

a. A PC with 40GB hard disk, 1 GB RAMS, Pentium 4 processor, Network card.

b. Nokia GSM device

c. USB infrared adopter

From the client side, a cell phone (mobile phone) is required that is essential that is capable for sending SMS.

PC home banking:

PC banking refers to use of personal computers in banking activities while under PC home banking customers use their personal computers at home or locations outside bank branches to access accounts for transaction by subscribing to and dialing into the bank's internet proprietary software system using password. PC home banking may be categorized into two types: online banking and internet banking.

Online Banking:

Transaction in online banking is performed within closed network for which the customer use specialized software provided by the respective bank. International standard online banking facilities are expecting in Nepal. Most of the banks offer any branch banking services through their respective bank online network; payment against pay order or pay order encashment, demand draft encashment, demand draft encashment, remote fund transfer, cash withdrawal, cash deposit, account statement, clearing and balance enquiry within branches of the same bank, L/C opening, loan repayment facility to and from any branch of respective bank under its own network.

Internet Banking:

Internet banking refers to the use of internet as a remote delivery channel for banking services which permits the customer to conduct transactions from any terminal with access internet. In other words, internet banking is a system allowing individuals to perform banking activities from any place any time anywhere via the internet. Basically, it does not involve any physical exchange of money. It is the www through which bank can reach their customers directly with no intermediaries.

Internet banking in true sense is still not fully present in Nepal. The following services are provided in internet banking:

- Fund transfer within accounts as well as within the bank.
- Get balance statement online.
- Pay bills online.
- Cheque book or pay order request.
- Exchange rate or interest rate enquiry.
- Account summary.
- Standing instructions.
- Loan repayment, loan information.

2.1.8.1 Types of Electronic Payment Systems

Electronic payment systems are proliferating in banking, retail, online markets and even government in-fact, anywhere money needs to change hands. Organizations are motivated by the need to deliver products and services more cost effectively and to provide a higher quality of services to customers.

In the early 1970, the emerging electronic payment technology labeled electronic funds transfer (EFT). EFT is defined as any transfer of funds initiated through an electronic terminal, telephonic instruments, or computer or magnetic tape so as to order, instruct, or authorize a financial institution to debit or credit an account. EFT utilizes computer and telecommunication components both to supply and to transfer money or financial assets. Transfer is information based and intangible.

Work on EFT can be segmented into three broad categories:

A) Banking and financial payments

- Wholesale payments (e.g. bank to bank transfer)
- Retail payments(e.g. ATMs and cash dispensers)
- Home banking(e.g. bill payment)

B) Retailing payments

- Credit cards (e.g. Visa or Master card)
- Charge cards(e.g. American Express)

C) Online E-commerce payment

- Token based payments system

Electronic cash (e.g. Digicash)

Electronic cheque (net cheque)

Smart cards or debit cards

- Credit cards based payments system

Encryption credit cards

Third party authorization numbers

2.1.8.2 Digital Token Based Payments Systems

New forms of financial instruments are being developed .One such new financial instruments is 'electronic token' in the form of electronic cash/money or cheques. Electronic tokens are designed as electronic analogues of various forms of payment backed by a bank or financial institutions. Simply stated, electronic tokens are equivalent to cash that is backed by Bank.

Electronic tokens are of three types:

1. Cash or real time:

Transactions are settled with the exchange currency. An example of online currency exchange is electronic cash (E cash).

2. Debit or prepaid:

Users pay in advance for the privilege of getting information. Examples of prepaid payment mechanisms are stored in smart cards and electronic purses that stored electronic money.

3. Credit or postpaid:

The server authenticates the customers and verifies with the bank that the funds are adequate before purchase. Examples postpaid mechanisms are credit /debit cards and electronic cheques.

2.1.8.2.1 Electronic Cash (E-Cash)

Electronic cash (E-cash) is a new concept in online payments because it combines computerized convenience with security and privacy that improves on paper cash and is the electronic equivalent of real paper cash. To really displace cash, the electronic payments system needs to have some qualities of cash that current credit and debit cards lack. For example, cash is negotiable, meaning it can be given or traded to someone else.

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Electronic cash is based on cryptographic systems called “digital signature”. This method involves a pair of numeric keys: one for locking (or encrypting) and the other for unlocking(or decrypting).Messages encrypted with one numeric key and other i.e. the encrypting key is kept private and the decrypting key is made public.

In electronic cash payments system is usually a bank, responsible for issuing currency, customers who have accounts at the bank and can withdraw and deposit currency and merchants who will accept currency in exchange for goods and services. Every customer, merchants, and bank has its own public/private key pair. The keys are used to encrypt for security and to digitally sign, for authentication, blocks of data that represents coins. A bank digitally signs coins using public key. Customers sign bank deposits and withdrawals with their private key and the bank uses the customer’s public key to verify the signature. (Arnone and Bandeira, 2004:144)

The E-cash systems consist of three main entities:

- Bank which mint(issue)coins validate existing coins and exchange real money for e-cash
- Buyers who have accounts with a bank, from which they can withdraw and deposit e-cash coins.
- Merchants who accept e-cash coins in payments for information or hard goods. It is possible for merchant to run pay- out service where they can pay a client e-cash coins

The followings are the properties of Electronic cash

a. Monetary value

E-cash must be backed by cash (i.e. Currency), bank authorized credit, or a bank certified cashier’s check. When e-cash created by one bank is accepted by others, reconciliation must occur without any problems.

b. Exchangeable:

E-cash must be exchangeable as payments of other e-cash, paper cash, goods or services, lines of credit, deposits in banking accounts, banks notes or obligations, electronic benefits transfers, and the like. In practice multiple banks are required with an international clearing house that handles the exchangeability issues because all customers are not going to be using the same bank or even be in the same country.

c. Storable and Retrievable:

Remotes storage and retrievable (e.g. from a telephone) would allow users to exchange e – cash from home or office or while travelling. The cash could be stored on a remote computer's memory.

d. Security:

E-cash should not be easy to copy or tamper with while being exchanged; this includes preventing or detecting duplication and double spending.

2.1.8.2.2Purchasing E-Cash from Currency Services

The purchase of e-cash from on-line currency server (or bank) involves two steps

a) Establishment of an account

b) Maintaining enough money in the account to back the purchase. Some customers might prefer to purchase e-cash with paper currency, either to maintain anonymity or because they don't have a bank account.

Consumers use the e-cash software on the computer to generate a random number, which serves as the 'note'. In exchange for money debited from the customer's account the bank uses its privacy key to digitally sign the note for the amount requested and transmits the note back to the customers. The network currency server, in effect, is issuing a 'bank note 'with a serial number and a currency amount. By digitally signing it, the bank is committing itself to back that note with its face value in real currency.

This method of note generation is very secure; as neither the customers (payer) nor the merchant (payee) can be counterfeit the bank's digital signature. Payer and payee can verify that the payment is valid, since each knows the bank's public keys .The bank is protected against forgery ,the payee against the bank's refusal to honor a legitimate note, and the user against else accusations and invasion of privacy.

In the case of its implementations, every person using e-cash has an e-cash account at a digital bank on the internet. Using that account, people can withdraw and deposits e-cash. When an e-cash withdraw is made, the PC of the E-cash user calculates how many digitals coins of what denominations are needed to withdraw the requested amount. Next, random serial number for those coins will be generated and the blinding factor will be included. The results of these calculations will be sent to the digital banks .The bank will encode the blinded numbers with its

secret key (digital signature) and at the same time debit the account of the client for the same amount. The authenticated coins are sent back to the user and finally the user will take out the blinding factor that he /she introduced earlier. The serial numbers plus their signatures are now digital coins; their value is guaranteed by the bank. Once the tokens are purchased the e-cash software on the customer's PC stores digital money under designed by a bank. The user can spend the digital money at any shop accepting e-cash, without having to open account there first or having to transmit credit card numbers. As soon as the customers want to make a payment the software collects the necessary amount from the stored tokens.

Two types of transactions are possible: bilateral and trilateral. Typically, transactions, involving cash are bilateral or two party(buyer and seller)transactions whereby the merchants checks the veracity of If satisfies with the payments, the merchants stores the digital currency on his machine and deposits it later in the bank to redeem the face value of the note. Transaction involving financial instruments other than cash are usually trilateral or three party(buyer ,seller and bank) transactions, whereby the notes are sent to the merchant, who immediately sends them directly to the digital bank. The bank verifies the validity of these 'notes' and that they have not been spent before. The account of the merchant is credited. In this case, every note can be used only once (ELY,1996:30).

In many business situations, the bilateral transactions are not feasible because of the potential for double spending, which is equivalent to bouncing a cheque. Double spending becomes possible because it is very easy to make copies of the e-cash, forcing banks and merchants to take extra precautions.

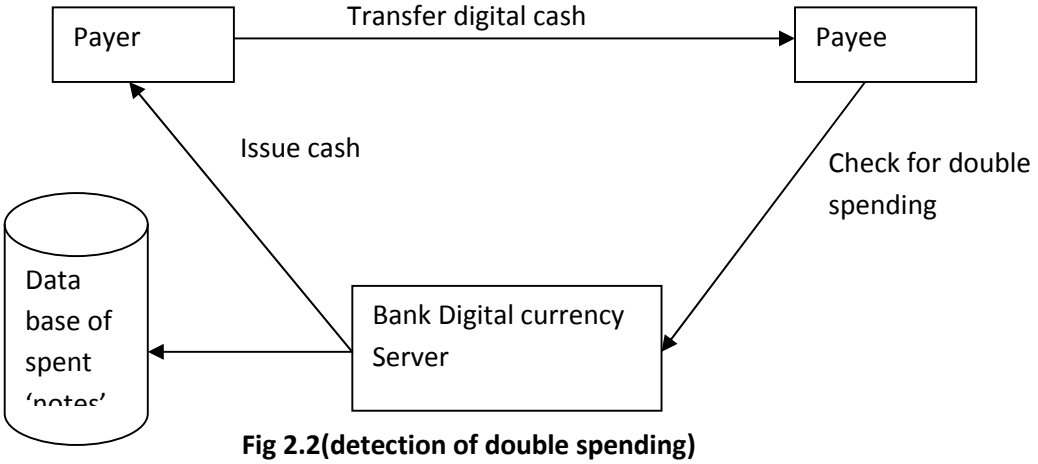


Fig 2.2(detection of double spending)

2.1.8.2.3ELECTRONIC CHEQUES

Electronic cheques are another form of electronic tokens. They are designed to accommodate the many individuals and entities that might prefer to pay on credit or some through some mechanism

other than cash. The buyers must register with a third party accounts server before they are able to write electronic cheques. The account server also acts as a billing service. The registration procedure can vary depending on the particular account server and may require a credit card or a bank account to back the cheques.

Once registered, a buyer can then contact seller of goods and services. To complete a transaction, the buyer sends a cheque to the seller. This cheque may be sent using e-mail or other transport method. When deposited, the cheque authorizes the transfer of account balances from the account against which the cheque was drawn to the account to which the cheque was deposited.

The e-cheque method is deliberately created to work in much as the same way as a conventional paper cheque. E-cheque contains the same information as paper cheques, such as name of the payer, name of the financial institutions, payer's name, name of the payee and amount of the cheque.

Like a paper cheque, an e-cheque will bear the digital equivalent of a signature: a computed number that authenticates the cheque as coming from the owner of the account .And again like a paper cheque, an e-cheque will need to be endorsed by the payee, using another electronic signature, before the cheques can be paid. Properly signed and endorsed cheques can be electronically exchanged between financial institutions through electronic clearing house.

Transfer electronic cheque

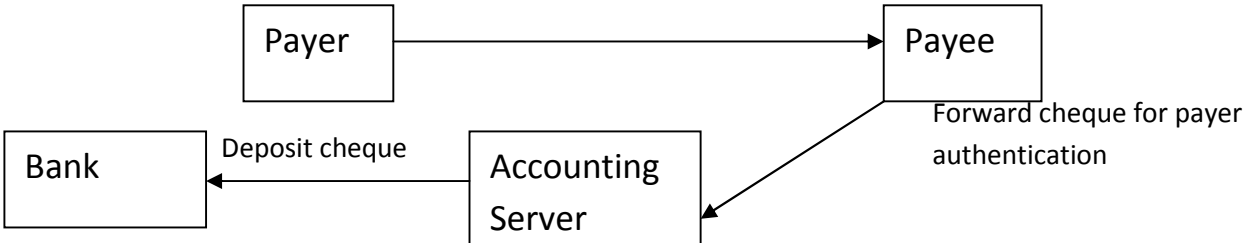


Fig 2.4 (Paymentsequence in an electronic cheque system)

2.1.8.2.4 Credit Cards

Credit card is a small plastic card that we can use to buy goods and servicesand pay for them later. To avoid the complexity associated with digital cash and electronic cheques, consumers and vendors are also looking at credit card payments on the internet as one possible time tested alternative. There is nothing new in basic process. If consumers want to purchase a product or service, they simply send their credit card details to the service provider involved and credit card organization will handle this payment like any other.

To make a credit transaction truly secured the following sequence must be followed:

a) A customer presents his or her credit card information along with an authenticity signature securely to the merchant.

b) The merchant validates the customer's identity as the owner of the credit card account.

c) The merchant relays the credit card charge information and the signature to its bank or online credit card processors.

d) The bank or processing party relays the information to the customer's bank for authorization approval.

e) The customer's bank returns the credit card data, charge authentication and authorization to the merchant.

We can break credit card payments on online networks into three basic categories

(Karki Sabina, 2010:59)

1. Payment using plain credit card details.

The easiest method of payment is the exchange of encrypted credit cards over a public network such as telephone lines or the internet .The low level of security inherent in the design of the internet makes this method problematic. Authentication is also a significant problem, and the vendor is usually responsible to ensure that the person using the credit card is its owner. Without encryption there is no way to do this.

2. Payments using encrypted credit card details.

It would make sense to encrypt credit your credit card details before sending them out, but even then there are certain factors to consider. One would be the cost of credit card transaction itself such cost would prohibit low value payments by adding costs to the transaction.

3. Payment using third party verification

One solution to security and verification problem is the introduction of a third party; a company that collects and approves payments from one client to another. After a certain period of time, one credit card transaction for the total accumulated amount is completed.

2.1.9 Relevance of E-Banking in Nepal

Nepal is in the growth phase of technology. So evolving e-based technology and standards; access to the internet has spread to mainstream users and customers' acceptance across a wider range. Banks in Nepal have to come to grips with the explosive growth in the wider use of the E-banking and consider its implications for retail business.

New Virtual Banks, Paperless branch, Internet based Corporate Banking ,Smart Card Delivery System, E-cash payments systems are the next steps in the information age in Nepal. Competition to banking from Telecom companies, Supermarket and Mass-transit Companies enables bankers to implement E-banking system and to get new idea and vision. Nepalese banks have to convert E-banking into an opportunity. For banks in Nepal, E-banking is a major opportunity for growth, efficiency and marketing initiatives. (Neupane, Hem Prasad, 2008)

The benefits to a bank on offering always –available E-banking services are widespread. The following points conclude what relevance the E-banking in Nepal.

- Developing e-banking mass market will allow the bank to attract new high valued customers and help to expand the banking strength reach to global market.
- The convenience of having personalized wireless access to critical financial information is an invaluable service for customers on the move.
- Enabling the execution of time sensitive financial transaction anywhere anytime provides the opportunity to strengthen the relationship with existing customers and encouraging them to become loyal.
- Enhancement of the banks brand loyalty by granting customers flexible access to financial information and accounts.
- Reducing the unnecessary labor intensive service overhead as well as to reduce the paper work.

2.1.10 Risk Management for E-Banking

E-banking in Nepal is still at early stages because of rapid change in information technology no list of risk can be exhausted .There are likely to be difference in the degree to which a particular risk in applicable across different banking. While future technologies are uncertain it is important that supervisor authorities avoid policies that will hamper useful innovation and experiment.

Though, the time demand for every financial institution to go for e-banking but it is risky for customers and banks too. There are different types of risks such as transaction/operations risk, reputation risk, controlling risk, monitoring risk etc. for e-banking system of Nepal. Out of these risks, the following risks are most frequently happened in e-banking system worldwide:

- Most popular frauds in e-banking are card duplication. In this, the information in the cards is copied to another card.

- Password leakage through emails those are pretending to be from the bank asking to input the username and password to update the information. After submitting the information, the information is captured.

- Cyber criminals are cooperating with one another and improving their techniques. Like hacking site which is difficult to counter since each is different.

One essential challenge of e-banking is risk-management. Out of above risks, operation of the payment systems incurs additional three major risks: fraud or mistake, privacy issues and credit risks.

Managing Risk from frauds or mistakes:

Anonymity is an issue that will have to address through regulation covering consumer protection in electronic transactions. There is considerable debate on this point. An anonymous payment system without automatic record keeping will be difficult for bankers and governments to accept. So the regulation to apply, each transaction would have to be reported, i.e. It would appear on an account statement making mistakes and disputes easier to resolve. However, customers might feel that all this record keeping is an invasion of privacy resulting in slower than expected adoption of electronic payment systems.

Managing information privacy

The electronic payment system must ensure and maintain privacy. Every time one purchase good using a credit card, accesses a server that information goes into a database somewhere. All details of a consumer's payment can be easily aggregated: where when and sometimes what the consumer buys is stored. This collection of data tells much about the person and as such can conflict with the individual's right to privacy. User must be assured that knowledge of transaction will be confidential, limited only to the parties involved and their designated agents (if any).Privacy must be maintained against eavesdroppers on the network and against unauthorized insiders.

Managing credit risk:

Credit risk of systematic risk is a major concern in net settlement systems because a bank's failure to settle its net position could lead to a chain reaction of bank failures.

Accessing risk should be an ongoing process. Bank must engage in a rigorous analytical process to identity and quantify risk. Determine the bank risk tolerance based on the losses the bank can afford to sustain in the event of a given problem. Controlling risk may arise from implementation of security policy and procedures, segregation of duties, dual control and effective and prompt reconcilement, evaluating and upgrading products and services, measures to control outsourcing risk, providing disclosure and customer education and developing contingency plans. Whatever it be deployment of technology will provide bank with large competitive advantages while non-adoption will lead to complete setback.

2.1.11 Designing Electronic Payments Systems

Despite cost and efficiency gains, many hurdles remain to the spread of electronic payment systems. These include several factors, many non-technical factors in nature that must be addressed before any new payment method can successful.

- Privacy

A user expects to trust in a secure system: just as the telephone is a safe and private medium free of wiretaps and hackers, electronic communication must merit equal trust.

- Security

A secure system verifies the identity of two party transactions through user authentication and reserves flexibility to restrict information/services through access control.

- Intuitive interfaces

The payment interfaces must be as easy to use as a telephone. Generally speaking, users value convenience more than anything.

- Database integration

With home banking, for example, a customer wants to play with all his accounts. To date, separate accounts have been stored on separate database. The challenge before banks is to tie these

databases together and to allow customer access to any of them while keeping the data up- to-date and error free.

- Pricing

One fundamental issue is how to price payment system services. For example, should subsidies be used to encourage users to shift from one form of payment to another, from cash to bank payments, from paper based to e-cash.

- Standards

Without standards, the welding of different payments users into different networks and different systems is impossible. Standards enable interoperability, giving users the ability to buy and receive information, regardless of which bank in managing their money.

2.2 Review of Previous Study

2.2.1 Review of Case Study

When considering the role of electronic media in financial transactions and decision making, it is useful to begin with an overall perspective on the mix of electronic payments and other types of payments technologies. Unfortunately, the data to make such companies are incomplete. As it is new concept in Nepal, we compelled to study the research prescribed by the foreigner specialists. For the purpose it is relevant study conducted by Arthur B.Kennickell and Myron LK on the topic of 'Who Use E-banking? It was prepared for presentation at the annual meetings of the Western Economic Association, Seattle, Washington in July 1999.

This study had used the 1999 survey of consumer finances to get a detailed look at the extent of use, and the characteristics of households that use electronic and other technologies to conduct business with their financial institutions, and electronic and other sources of information for making saving and borrowing decisions. While themost common technologyused to conduct business with a financial institutions was the in person visit, it was estimated that about 70% of us households used some form of electronic technologies. However, the more recent electronic instruments were used by much smaller proportions of households. The most popular source of information for saving and borrowing decisions were calling around the friends, relatives, and colleagues. Only 1% of household used an electronic source of information for help in making such decisions. Income, the level of

financial assets, age and education all play important roles in categorizing a household's use of electronic media, households with annual income below $25000 per year seem particularly unlikely to use electronics and households with annual income above $50000 seem relatively likely to do so. Households with larger financial assets were much more likely to use electronic media.

Age had a somewhat mixed effect on the use of electronic technologies although it appeared that household heads under the age of 35 are considerably more likely to use the computer and ATM and debit cards .In addition, the only use of electronic technology that increases with age in direct deposit, a reflection of the importance of direct deposit of social security checks. It appears difficult to overestimate the importance of education in describing the use of electronic products and services at financial institutions. Use of electronic is consistently and positively associated with years of education. An important break point seems to be achieving at least college degree, an educational level currently held by less than one third of US households.

The results had suggested a number of interesting interpretations and speculations.

They concluded with three:

a) The importance of income, financial assets and education for using electronic media suggests that the potential market for many of these products is still highly specialized.

b) The general reluctance of lower income ,lower financial assets, older, and less educated households to voluntarily use electronic media suggested that the upcoming mandated use of electronic deposits for social security, and welfare payments is likely to meet with some resistance ,unless, carefully designed to assuage the concerns of these groups ,This speculation is reinforced by the fact that 25% of US households with annual incomes below $25000 report that they don't have a deposit account at financial institutions.

c) Another interesting aspect of their result is the apparent role of banks as sources of information for households saving and borrowing decisions. Banks are the second least reported source of information, just a head of electronic media. While other research suggests that almost all US households that conduct business with a financial institutions have an account at a bank, the results of the paper suggests that banks have not been very successful at becoming a major source of financial information for these customers.

2.2.2 Review of Unpublished Thesis

E-banking is relatively new concept in Nepal so no more previous studies have been conducted to explore the prospects of E-banking in Nepal. However the similar type of thesis on the topic ‘‘Future prospective of online banking in Nepal’’ has been submitted on 2003 by ThapaDevinder. He has focused on the environment in which banks are operating in Nepal and to the compulsions that work to make computerization in banks an imperative. He has tried to find out the opportunities of the online banking in the context of Nepalese commercial banks and the security threats rose from the online banking system. His study finds out that in the technology based generation, the online banking has pursued the advantage to the people. His study shows that among his respondents 95% are dissatisfied with the traditional banking system and most are aware of the online banking services. Some cases show that the lack of computer knowledge has shaped difficulty in implementing full-fledged online banking in Nepal.

Objectives of his study were:

a) To find out the opportunities of the online banking in the context of Nepalese commercial bank.

b) To find out the security threats on online banking system.

c) To find out the advantages of online banking to the Nepalese people.

d) To suggest measures to improve the IT policy regarding online banking.

Conclusion of his study:

a) 95% of respondents want immediate technical improvement in their service system.

b) SWIFT is the only online service which is used by all the commercial banks.

c) ABBS system is in practice phase.

d) Since it is new concept there is vast opportunities of the online banking in Nepal.

e) Security problem is creating the obstacle.

f) As not necessary to pay additional cost while using online banking, low income level people like Nepalese can afford the online banking system.

His Recommendations:

a) Financial sector reform is most essential to implement online banking at cost effective price.

b) Threat of hacking and tampering of data make unsecure the transaction in online banking so the bank and authorized person of IT should consider the fact and ensure of its customer that the funds will transfer safely.

c) E-commerce will add new dimension to information highway and thus lead to higher business volumes, efficiency, and profitability.

d) The IT industry should be in readiness to provide such full proof solutions of security including the encryption of data based on internationally recognized security standards. The role of certification authority has to be clearly defined in this regard.

e) Constitution of a national payment council by the NRB to design and develop the integrated payment and settlement systems should be a better step in this direction. Many more steps need to be taken in future.

f) CAN with various software vendors under its umbrella and outside and the Nepalese Bank's Association has been initiators of change. More steps are required to be taken to facilitate greater coordination. The IT industry should gear itself to meet the requirements of the banking and financial sector with a spirit of cooperation and partnership in making the banking industry scale the heights of international excellence. A productive approach is therefore, essential between the two sectors.

Similarly, Sharma, Vidya (2004) has conducted a research in the topic "MIS in Laxmi Bank". It is a survey study concentrated on examining the present practice of management information system in Laxmi Bank Ltd., which could be strengthening the management to run bank efficiently if applied it. It depicts how implementing the MIS through computerized system support the decision making function in the organization. Most of the data of research were obtained through primary sources.

Her study was concerned only the MIS of Laxmi Bank not all. Even though, Sharma, in her study report, states that the MIS helps every level manager to designate the information for the decision because the information is vital ingredient for the operation and management of any organization. The development and use of communication networks also helped the banking industry to gain in terms of improved bank services. She argued that now, a customer can check his account details, transfer his money, and pay their bills through the internet with a small span of time, even if the

branch is closed, system is up and running 24 hours a day and account holders can access the account and even perform the transactions through ATM, PoS and internet banking in real time. Viewing these facts, the banks have increase the responsibility to the customers for providing sufficient information about adopted technology to sustain in competitive era, she suggested.

Sharma added that the most of banking are now primarily running without adopting advances MIS. But all the banks must adopt the MIS in the time lag because beneficiaries, in her recommendation, she suggested. For the purpose IT has played the great contribution. She concluded that; an information system in an organization is like the nervous system in the human body; it is the link that connects all the organizations components together and provides for better operation and survives in a competitive environment. The term information system usually refers to a computer based system, one that is designed to support the operations, management and decision function of an organization. Information System in an organization thus provides information support for decision makers. She also described the positive impacts of information system as well as negative impacts of it.

Similarly, KarkiSabina (2010) in her study, 'Credit Card Business in Nepal', stated that the credit card is more attractive, e-banking products that the people having attractive revenue sources use frequently. It was a research on examining the adoption of credit card with reference to NABIL, SCBNL and HBL. In her study she found that 64% of respondent were male while rest were female. Most of the users approximately 50% where higher age level that is above 30 and 48% of card holders were highly literate that is doctorate degree holders. Furthermore she found that most of the card holders that are 34% use theirs cards in shopping where the PoS are established.

'Internet Banking in Nepal' a thesis has been accomplished by GautamSudha(2009) has tried to analyses the present scenario of e-banking in Nepal, though; this is the case stud of LBL. The main objective of the thesis is to find the opportunities of internet banking in Nepal. This thesis focused upon the level of awareness of users and the challenges has been faced by banks. She concluded that because of the customers using traditional banking, they don't have the knowledge what the benefits are inherent in using the internet banking. The customers who have knowledge of internet banking also are not using the e-banking because of fear of manipulation, fear of cyber-crime. In her thesis , SudhaGautam recommended that despite of shine future of e-banking without restructuring the present infrastructure like ;well-equipped banking platform, strong cyber law, trained office personnel of the bank , full mobility internet and communication infrastructure .

A study by Sanjiv Kumar Chaudhary on 'e-commerce and its impact to commercial banks of Nepal' (2010) tried to analyses the impacts through implementation of e-commerce adopted by the bank. Though the study concentrated the performance of BOK in the field of e-commerce, the disseminator tried to enlighten the advantage and disadvantage of e-banking instruments; a part of e-commerce implementation.

His objectives were:

1. To identify in what way the e-commerce has been implemented in Nepalese Commercial Banks.
2. To identify the importance of e-commerce.
3. To explain on how e-commerce helps in generating overall development in the field of commercial banking sectors.
4. To access the level of knowledge and the general opinion of customers and bankers regarding e-commerce.
5. To suggest and recommend on the basis of major findings.

Major findings from the survey conducted by him were as follows:

1. 30% of the customers have heard the term E-commerce.
2. Around 27% of the customers considered online banking as a means to transfer deposits from anywhere.
3. Majority of the customers that is 55% felt that online banking adopted by Nepalese commercial bank is not fully secured.
4. 80% of the respondents use ATM cards. Out of them 30% use ATM cards for payments of bills after shopping while remaining 70% use the card only for drawing purpose.
5. 65% of respondents have no idea about tele-banking.
6. Only 29% of customers trust that Nepal cyber law is able to provide security for the operation of e-commerce.

The conclusion drawn by Mr. Chaudhary is if government and concerned party give emphasizes to implement the cyber law, perform appropriate awareness program and provide prompt reliable services by the bank among the investors and prospects, E-Commerce implementation will be fruitful in Nepal .

2.3 Research Gap

E-banking is term use for delivering various banking services through different electronic channels. The digitization of transaction (e-banking) can help for the standardization of banking products whereby substantial reduction in cost is possible. It offers banks and customers a huge opportunity by way of convenience and reach for. As the e-banking is being popular in Nepal, it is required to be analyzed in depth. Currently intention to provide the e-banking services by the banks is seemed to retain their customers only not for the long term perspectives but the major objective is to be provided with optimum facility to the clients and as a result contribute to uplift the economy. In this regard no any research has been conducted. Earlier worst concluded in the matching topic by the superior ‘ a study on practices and prospects of e-banking in Nepal ’ is useful but they were in the context of preliminary stage, so there is massive research gap on the topic. These aimed at exploring the practices of e-banking suggest its improvement if and where necessary.

CHAPTER-THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the process of arriving at the solution of the problem through planned and systematic dealing. It refers to the various segmented steps to be adopted by a researcher in studying a problem with certain objectives in view. In other words, it describes the method and process applied in the entire aspects of the study for analysis and interpretation of facts and figures. It is significant to have appropriate choice of research and methodology that helps to make the research study meaningful and more authentic. Therefore, here upon appropriate research methodology or research strategy has been followed to meet the proposed objectives of the study and to achieve the goals set out. The methodology of this research includes the research design, the population and sample, sampling procedure, sources of data, data collection procedure, method of data presentation and analysis, tools and techniques of analysis and respondent profile.

The basic objective of the study is to examine the current issues of banking system in Nepal and forecast the prospects of e-banking in Nepal particularly the use of internet and suggests the ways of implementing them. The research methodology used for this study is as follows.

3.2 Research Design

The research design is the task of defining a research problem. It is a plan, structure and strategy of investigation conceived so as to obtain answer to research questions and control variance (cited in wolf and pant2003:74).In fact, the research design is the conceptual structure within which the research is conducted. It constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 1990:39). It is the overall plan of a proposed study to specific the appropriate research methods and procedure for obtaining specific findings with validity, objectivity and accuracy and economically as possible. The research design followed in this study is descriptive and analytical research design. It is based on descriptive survey study.

3.3 Population and Samples

This research work is related to E-banking systems being practiced and will have to practice by the banks of Nepal. Two separate studies are conducted. Given the exploratory nature of the research in the understanding of potential

E-banking adopters a qualitative approach was considered to be appropriate in gaining insight into the issue. The selection criteria for the respondents are mainly the internet surfers. It is logical to assume a close association between internet surfers and potential E-banking adopter. The second part of the research study is an attempt to examine the performance and future prospects of Nepalese banks in terms providing banking products and services through electronic channels. Hence descriptive research design is used.

The population of this study comprised all the commercial banks which are operating their business in Nepal and the persons who are directly or indirectly involve in E-banking. There are few banks conducting most of the products of e banking .Out of these, Machhapuchhre Bank Ltd. (MBL), Everest Bank Ltd. (EBL), Kumari Bank ltd. (KBL), Laxmi Bank Ltd.(LBL) and Kist Bank Ltd (KBL) are selected as sample for this study using a simple random sampling method. Second attempt is to identify the potential E-banking adopters and in this regard the data are collected from general customers by means of questionnaire sent through self-administration. From 3 cities of Nepal, a total of 100 well filled questionnaires are collected and used in the analysis.

3.4 Sampling Method

The process of learning about population on the basis of a sample drawn from the universe is known as sampling. Under this method a small group of the universe is taken as the representative of the whole mass and the results are drawn. Different types of sampling method are used for drawing the sample plan. Among them, stratified has been chosen for this study.

When the population characteristics are heterogeneous, then this sampling is used. Under this method the total population is divided into different groups that a representative sample can be chosen.

3.5 Sources of Data

According to the nature of this study, both the primary and secondary sources of information have been used. Primary data are collected through a schedule of self-structured questionnaires (see appendix no: 5), informal and formal dialogues and interviews with concerned persons.

Published annual reports of banks, articles published in different journals issued by Nepal Rastra bank have been used as secondary data.

3.6 Tools and Techniques of Data Analysis

Analysis is the careful study of available facts so that one can understand and draw conclusion from them on the basis of establishment principles and sound logic. This is important part in research work. Therefore, collected data from primary sources are presented in appropriate and suitable forms.

In this study, the responses are categorized, tabulated, processed and analyze using different methods .Frequency distributions means and correlations are calculated. Besides this, qualitative information has been analyzed using recent theories and concept. Moreover graphs, charts, or figures are included as per the need. Except this chi square test has also been used to test the hypothesis.

CHAPTER-FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

Data presentation and analysis is an important appearance of the research study. Collecting data is the connecting link to the world of reality for the researcher. The data collection activity consists of taking ordered information from reality and transferring it into some recording system so that it can later be examined and analyzed for the purpose. Research as a media can be interpreted as having a content of data and process of methodology. Without the data methodology cannot be utilized to bring us to the conclusion.

The presentation of data is the basis of organization and classification of the data for analysis. After data collection is completed, the data will be the raw data. The data will still be on questionnaires, data collection forms and notes cards. It is necessary to arrange the data so that it makes some sense to the researcher and so that it can later be presented to the readers of the thesis. Different types of data require different method, which can be used to simplify the data. The easiest way to understand the data is by examining it in charts, graphs, and tables. But even before one can arrange data in tables, it is necessary to rearrange the raw data

The main purpose of analyzing the data is to change it from an unprocessed form to understandable presentations. The analysis of data consists organizing, tabulating and performing the statistical analysis.This chapter especially focuses on data relating to the banking transactions executed by E-banking i.e. through ATM, Debit Cards, and SMS Banking by the different clients having different demographic factors. Various tables are presented on the basis of questionnaires used for the study and have been presented below.

4.2 Electronic delivery channel utilized by Customers of Commercial Bank

SMS BANKING	TELE-BANKING	ATM	INTERNET BANKING	NON-USERS	TOTAL
56(23)	17(4)	81(54)	44(8)	11	100

Table No: 4.1 (Numbers within brackets represents numbers of respondents use specific instruments only

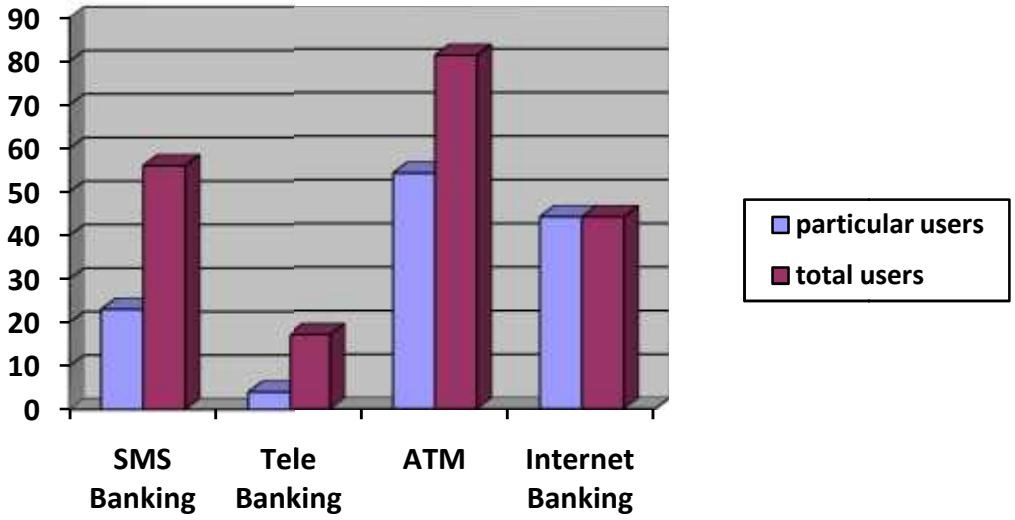


Fig. 4.1 (users of E-banking)

ATM$_S$are undoubtedly the most popular electronic delivery channels for the banking services in Nepal. There are 1090 ATMs operating in Nepal by the commercial banks (see appendix 4). Most of the ATMs are inter connected with the SCT networks and VISA networks so that clients having SCT cards or VISA cards of any institutions can withdraw as well as enquiry balances from any interlinked ATM. The above table (4.1) represents different types of E-banking adopters. Out of 100 well filled questionnaires, it is found that 89 are using E-banking from different means of E-banking. It shows that 89% of the respondents are adopting any one of the E-banking instruments. Out of which 89% of respondents are used ATMs with other instruments. In the table, indicating the number within the brackets reveals the numbers of respondents used the specific instruments only. Considering this, we can observe that 54(60% of E-banking users) respondents use only ATMs. In regards to Mobile

banking and Internet banking, though the banks are clearly making the necessary efforts to provide these services they have no penetrated the market in a big way as yet. Moreover, the research shows that Tele-banking is also in practice whereas PC banking service is not fully available.

4.3 SMS Banking Services

Banks are providing services like enquiry of balance, mini statement, alert messages of every transaction, loan figure alert, and foreign currency rate enquiry through the mobile banking. As per the information provided by the bank the service request is in increasing trend and more customers are using its services. Referring table no4.1, besides ATMs second more respondents (56 out of 89 users) used SMS banking. Furthermore we observe that 25.85% of users of E-banking used SMS banking only. They never practiced other types of instruments related to E-banking.

Because of access of mobile phone,its easy operation with lowest cost, in the future, most of the clients may have to adopt SMS banking. So the bank must manage and essentially update its system so that no fear will live in not responding request by the system of the bank.

4.4 Tele-Banking Services

Services like account status check, balance enquiry, foreign exchange rate enquiry etc. provide by the banks through Tele-banking. Currently, the clients of taking Tele-banking have been increasing because of access of land line and charging less cost. The table (No. 4.1) has shown 10 respondents use Tele-banking along with using other E-banking instruments. But 4 (4.65%) users of E-banking have been using only Tele-banking. This shows that what influence the respondents by Tele-banking. If fund transfer facility provide by the banks with in a call of its clients, it will, no doubt, be a must favorite instruments of E-banking.

4.5 Internet Banking Services

Services that are offered by the banks through internet are shown in the following table.

Service	**MBL**	**KIST**	**KBL**	**LBL**	**EBL**
Balance enquiry	√	√	√	√	√
Transaction search	√	√	√		×

Cheque book replenishment request	√	√	√	√	×
Transfer within own accounts	√	√	√	√	√
Statement down load	√	√	√	√	√
Loan information	×	×	√	√	×
Utility bill payments	√	√	√	√	√

Table NO. 4.3: service offered by the banks

It shows that Kumari Bank is ahead in providing almost all the internet banking services. It may be because internet was first introduced in Nepal by Kumari Bank Limited in 2002. This system allows individuals to perform banking activities like balance enquiry, statement download, inter-account fund transfer etc. from any place anytime and anywhere via the internet. Next in the line isLaxmi Bank Ltd. and then Kist bank limited and then comes Machapuchhre Bank Limited. In the Everest Bank, internet banking is in introducing stage.

From the table 4.1, it is shown that 44 respondents out of 100 (out of 89 E-banking users), are using internet banking. From the users of E-banking, at respondents (8.98%) have been using internet banking only which do not adopt any other services of E-banking.

The following table furthermore is advantageous in studying the rising future of internet banking services.

No of Period	**Work place**	**Home**	**Cyber café**	**Total**
For one year	14	11	14	39
For two year	17	7	12	36
For more than	12	3	10	25

two years				
Total	43	21	36	100

Table NO. 4.4: characteristic of internet surfers

The same number of internet surfers and their surfing characteristics has shown in the following bar chat

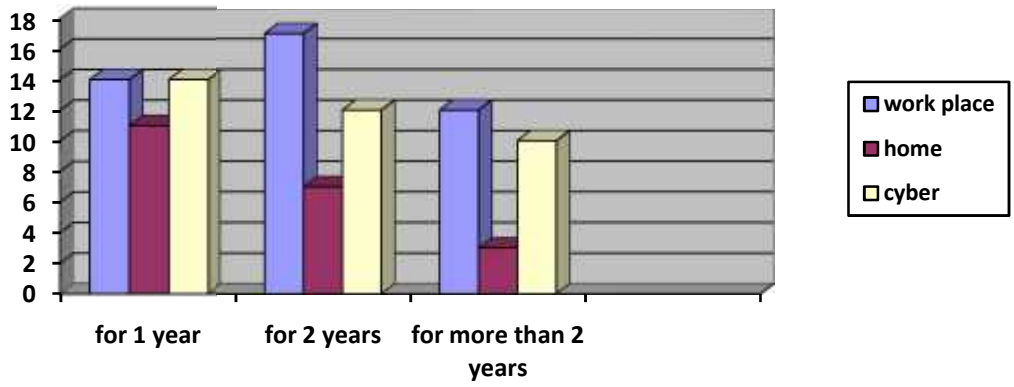


Fig. 4.2 (internet surfers and surfing location)

All the 100 respondents use internet for the different purpose. 21% access internet from their home while large percentages (43%) of adopters surf the internet from their work place, 36% of adopters use internet from cyber café. 25% of the surfer have been using internet from more than 2 years. Table and charts shows the increasing rate of percentage using internet in the recent year. Similarly numbers of internet users from home as well as from the cyber café both are increased in recent year.

This research shows that 59% of respondent use internet for sending mails while 70% use internet for education\research\information gathering and 23 for commercial activities. There are very few i.e. only 11% use internet for online purchasing. One of the most interesting facts is that 67% of the internet users use it for commercial activities are inside the capital city, Kathmandu.

4.6 Means Of Internet Connection

E-banking is now a global phenomenon. Apart from the developed countries, the developing countries are experiencing strong growth in E-banking. In Nepal, ATMs are the most popular

electronic delivery channel for banking services but only a few customers are using internet banking facilities. Among others, Nepal's Commercial Banks have adopted Credit Card, Tele-banking and SMS banking.

There are various means through is bank connect to the internet like DSL, cables, 56 dialup, ISDN and so on. Each medium have its own advantage and disadvantage but some media are superior to other. Kumari Bank has been using optical fiber which can transmit 320 billion bits per second, Machapuchhre Bank has been using DSL which is developed in late 1990 and is digital communications technology that can provide high speed transmission over standard copper telephone wiring. Now most of the providing E-banking is using optical fiber and DSL as well.

Apart from this, telecommunication infrastructure supportive to E-banking includes connection of telephone, mobile phone, internet, intranet, extranet, V_sat and similar other means of communication devices that are used for transmitting information while internet in banking sectors includes uses of PCs, banking software, network infrastructure like router, swift telephone, LAN, MAN, WAN, WWW and so on for performing daily banking activities.

4.7 Electronic Banking Risk Management

Banks have basic tools like fire wall, lightening\power surge protection. Regular update of public website is also in practice but it seems that some of the banks are in lack of having regular back of website information and clear E-banking policy. Some of the banks, now having up to date equipments and network maps, have ability to show rapid response to react to newly discovered vulnerabilities though they are unable to adopt precautionary protection to prevent E-banking frauds.

Risk management factors	**MBL**	**EBL**	**KIST**	**KBL**	**LBL**
Regular backup of website	√	√	√	√	√
Update of public website	√	√	√	√	√
Firewall protection	√	√	√	√	√
Lightening\power surge protection	√	√	√	√	√

E-banking policy	√	×	√	√	√
User id and password verification	√	√	√	√	√
Digital certification	√	√	√	√	√
Automatic log-off controls	√	√	√	√	√
Biometric verification	×	√	√	√	×
Encrypted data transfer	√	×	×	√	√

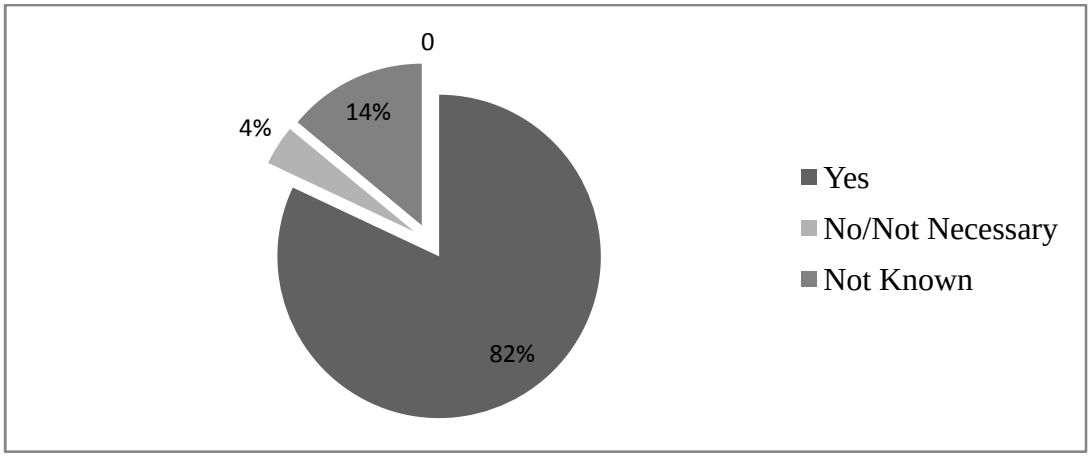
Table No 4. .5.Risk management in financial institution of Nepal

With regards to advance security tools, most of banks are having users ID and password verification, digital certification, encrypted data transfer etc. But all are not in full-fledged. It shows that Nepalese financial institutions should have to recognize the important of these tools and create an environment for more secure E-banking activities. In this competitive era, we have to face the international banking, must give attention to provide full-fledged E-banking with regular back up and up-to-dated information so that the future of the banking transaction will be cashless transaction.

In research, the question “Do you think Nepal Rastra Bank should make it mandatory to introduce E-banking services?” had been asked. Respondent’s answers are tabulated below:

Yes	**No\not necessary**	**Not known**	**Total**
82	4	14	100

Table No. 4.6: compulsion of E-banking



The table as well as the pie chart shows that 82% of the respondents are far of the issue i.e. the central bank of Nepal, regulatory body of financial institution, should make E-banking mandatory. One interesting fact is found in the research that the respondents against in the issue are of higher degree (bachelor and master) of education. It may happen that the generation have been grown up with traditional banking system and are in the favor of it. But the fact is that the entire bank sooner or later should have to adopt the advance banking system. View of 82% of respondents, representative of new fellow people, is considerably enforced to the NRB that should make the issue mandatory.

Considering the growing interest of customers in E-banking and steps that will help to move by NRB in the future in prompting E-banking facility, banks compel to provide E-banking services. So, the financial institutions should develop the system to prevent risk prevailing in E-banking.

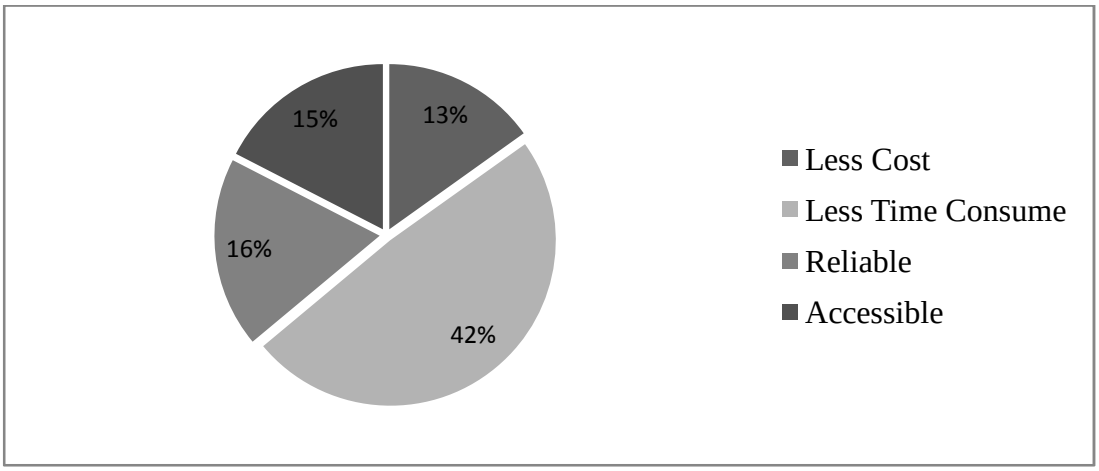
4.8 Reason of Offering E-Banking

E-banking is new concept in Nepal. A number of city centered banks are using this facility within their own limitations and conditions. Although E-banking is extremely popular among the nations of globe and have been used for varied purposes by both of banks and the consumers the nature of this in Nepal seems to be specific and limited to its own situation. Research shows that banks are using this service only because of their own convenience and retaining their existing customers.

The following table has been shown why the customers of bank adopt the E-banking services?

Less cost	Less time consume	Reliable	Accessible	Total
13	42	16	15	86

Table No.4.7: cause of E-banking adoption



Above table describe why the customers afford E-banking comparatively with traditional banking. The result is quite imperative that 48.83% of respondents have been using E-banking, assume that the system takes less time to perform the transaction, similarly, 15.11% use it assuming as cheaper than traditional baking system. But only 18.60% of users trust it as reliable medium of financial transaction and 17.44% accept it as accessible services.

Considering the facts of above data of users of E-banking, banks must make it trustworthy service as well as accessible medium for the public so that everybody wishing the service of E-banking easily adopts it.

4.9 Cost Structure of E-Banking Transaction

Cost analysis of different distribution channels plays dominant role in banking transactions. Lack of cost analysis may result in pushing the bank into deep financial loss. Surprisingly, the cost analysis of most of the banks in Nepal is seems to be either inadequate or not applied due to their narrow space of business transactions or lack of sufficient tools. Unit cost for transactions through full service branch is rupees 2 approximately, through ATM is rupees 25 for users, through SMS banking is rupees 10 and through ABBS at least rupees 100. There is no cost analysis on the part of online banking. However, no more than rupees 30 is payable for an hour internet surfing in Nepal.

4.10 Relationship between E-banking Adopter and Demographic Variables

Out of 100 respondents, 70 are male and 30 are female. Among them 89 adopt the E-banking facilities with different behave. Some (35% of the respondents) are regular user and some (42%) are occasionally, some of them use one of electronic banking instruments or with combinations form which is dependent on age, education and income. According to well filled questionnaire, respondents are categorized under different demographics variables and tabulated as follows.

4.10.1 Relationship between E-banking and Gender

Sex of respondents	Frequency of E-banking use				Total
	Regularly	Occasionally	Seldom	Almost never	
Male	27	30	7	6	70
Female	8	12	5	5	30
Total	35	42	12	11	100

Table No 4.8: frequency of E-banking and gender

The survey provides more detailed information about the male and female users of E-banking. Out of 89 respondents (users in different time frame) 25 are female and rests 64 are male. Among them occasional users are 7.9% more than regular .42.2% of male users use E-banking regularly while 32%.of female users are using it regularly. 6(8.6%) male internet surfers and 5(16.75%) female surfers almost never use E-banking whichare not appeared in the following chart.

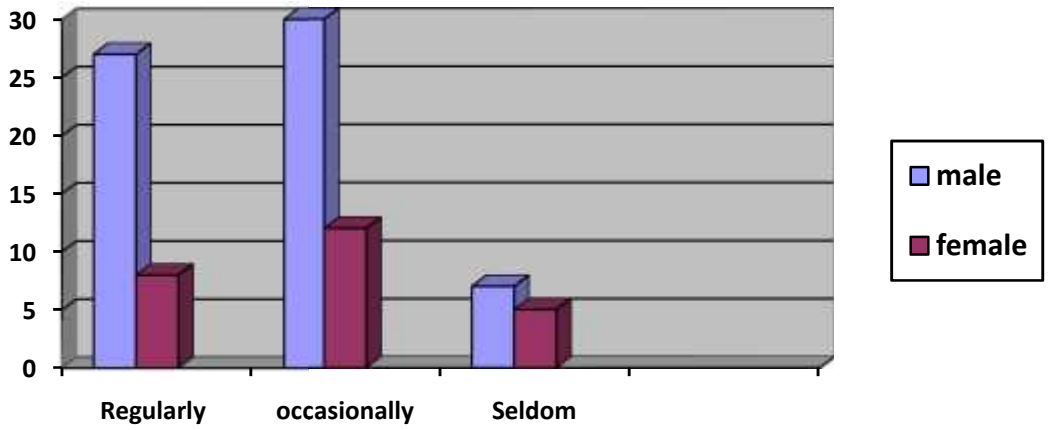


Fig. 4.5 (sex of E-banking adopters and their frequency)

This chart shows the relation of E-banking users (89 out of 100) and their sex. Clearly the male and female respondents are in the ratio of 7:3 though the sex biasness is completely tried to avoid while tracing out the picture. From the chart we can observers the deviation between male and female users and their frequent adoption. Despite it there is not found so strong indication between electronic banking and gender.

4.10.2 Relationship between E-Banking and Age

Age of Respondents	Frequency of E-banking use				Total
	Regularly	Occasionally	Seldom	Almost never	
Under-21	3	2	1	2	8
21-25	8	12	4	4	28
26-30	12	16	6	1	35
31-35	7	8	1	2	18
Above-35	5	4	0	2	11
Total	35	42	12	11	100

Interestingly, the medium age (26-30) of E-banking users are most. But SMS banking users are not found age bounded perhaps the reflecting the fact that mobiles are well-established electronic technology and easy to access it .Users of ATM cards are notably younger (21-30) than the internet banking users. Greater age increases the probability of using direct deposits, but has no effect on the probability of use of the phone. The following chart has explained the same.

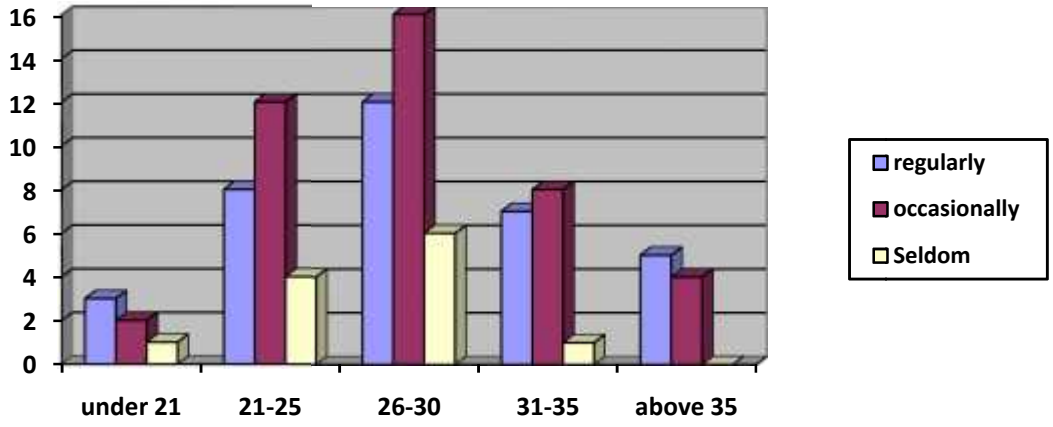


Fig no. 4.6(E-banking adopters and their age)

In the chart there are five age groups which are constructed from the above table: avoiding non user respondents' .It clearly shows that in the mid age groups most of users fall. One important fact can be observed that out of respective age group, more than (43.8%) regular users are within the above 35 group. These users are from higher income level as well as higher educational background.

4.10.3 Relationship between E-banking and education

Education of Respondents	Frequency of E-banking use				Total
	Regularly	Occasionally	Seldom	Almost never	
SLC	3	1	0	1	5
Intermediate	4	3	0	4	11
Bachelor	15	18	5	3	41
Masters	13	20	7	3	43
Total	35	42	12	11	100

Table no. 4.10: frequency of E-banking and Education

The role of education seems stronger than that of any other demographic variables. The higher degree of education holders are substantially adopted all forms of electronic technology regularly. But interestingly it is found that regular users are having more bachelor's degrees than others educational background. The adjoin bar chart also helpful to explain it.

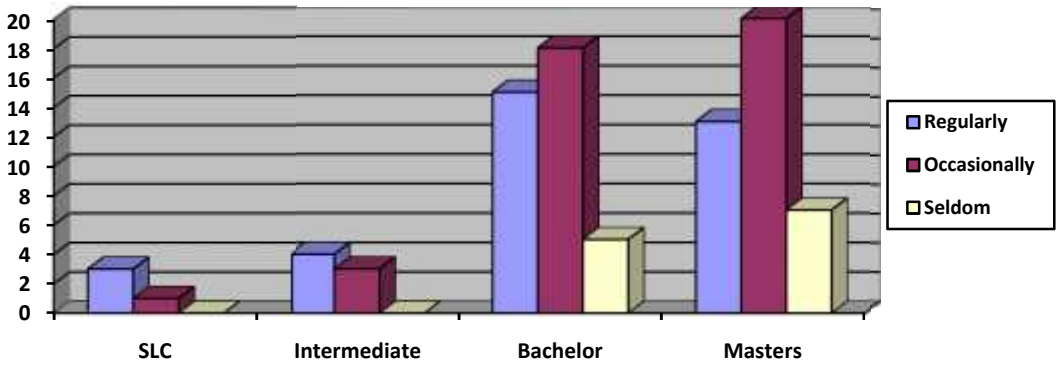


Fig. 4.7(E-banking adopters and their education)

Among 100 respondents,11 respondents have not used electronic banking ,so the chart has constructed taking 89 internet users ,out of them 5 users have SLC, 7 users have intermediate, 38 have bachelor degrees ,48 have masters degrees certificates. Most of the users (44.9%) fall under Masters Level though regular users seemed having bachelor certificates.

4.10.4 Relationship between E-banking and Monthly Income

Monthly income of respondents	Frequency of E-banking use				Total
	Regularly	Occasionally	Seldom	Almost never	
Rs. 10,000 or less	3	3	0	4	10
10,000-15,000	8	5	2	2	17
15,000-20,000	9	15	4	2	30
20,000-25,000	7	12	3	2	24

Total	**35**	**42**	**12**	**11**	**100**

Table no. 4.11 :(frequency of E-banking and monthly income)

Interpreting the table, the roles of income highly effect the adoption of E-banking most of the users 31.5% have the income limit from Rs 15,000-20,000, whereas 20.2% users have more than 25,000 regular monthly incomes. It is 13.5% higher than that of E-banking users having monthly income Rs 10,000 or less. The group with income of Rs 20,000 or more accounts for particularly large users of multiple technologies. It is shown in the following chart.

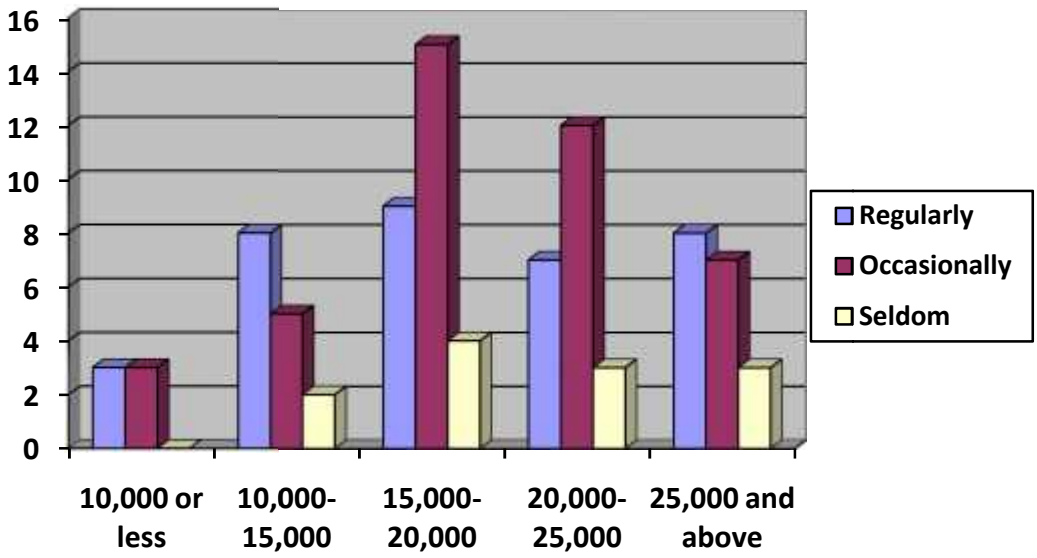


Fig. 4.9(E-banking adopters and their income)

The chart suggests that respondents with monthly income below Rs. 15,000 tend to use electronic technology with a frequency considerably below their frequency in the population. Regular and occasional users with income level Rs 10,000 or less indicates if their income level increases, they will adopt E-banking regularly. It is obviously can interpret observing the substantial income level (100,000-15,000) from the chart.

4.11 Conclusion Drawn With the Test of Hypothesis

This research has developed and tested the following two hypotheses. Let us check all of them one by one.

A. HYPOTHESIS TEST NO. 1.

The necessary table for testing this hypothesis is given below:

FREQUENCY OF E-BANKING ADOPTION AND EDUCATION

`Education of Respondents	Frequency of E-banking use				Total
	Regularly	Occasionally	Seldom	Almost never	
SLC	3	1	0	1	5
Intermediate	4	3	0	4	11
Bachelor	15	18	5	3	41
Masters	13	20	7	3	43
Total	35	42	12	11	100

Table NO.4.13: frequency of E-banking and Education

Null hypothesis H_0: There is no significant evidence of difference in adopting

E- Banking by level of education.

Alternative hypothesis H_1: There is significant evidence of difference in adopting E-Banking by level of education.

Test statistic under H_0 is $\chi^2 = \Sigma \frac{(O-E)^2}{E}$ Refer Appendix no 3.

Where,

O= Observed frequency

E = Expected frequency = $\frac{RT \times CT}{N}$

RT= Row Total

CT= Column Total

N= Total Number of Observation

Now,

Degree of freedom (d.f.) = (r-1) (c-1) = (4-1) (4-1) = 9

Level of significance = 5%

Tabulated value of χ^2at 0.05 levels for 9 d.f. is 16.92

Decision: since calculated χ^2 is less than tabulated χ^2at 0.05 level of significance, the null hypothesis is accepted. Therefore we conclude that there is no significance evidence of differences between adoption of E-banking and educational background.

B. HYPOTHESIS TEST NO 2.

The necessary table for testing the hypothesis is given below.

Frequency of E-banking and gender

Sex of Respondents	**Frequency of E-banking use**				**Total**
	Regularly	**Occasionally**	**Seldom**	**Almost never**	
Male	**27**	**30**	**7**	**6**	**70**
Female	**8**	**12**	**5**	**5**	**30**
Total	**35**	**42**	**12**	**11**	**100**

Table no. 4.14(frequency of E-banking and gender)

Null hypothesis H_0: There is no significant evidence of difference between male and female in adopting E-banking.

Alternative hypothesis H_1: There is significant evidence of difference between male and female in adopting E-banking.

Test statistic under H_0 is $\chi^2 = \Sigma \frac{(O-E)^2}{E}$ Refer Appendix no 2.

Where,

O= Observed frequency

E = Expected frequency = $\frac{RT \times CT}{N}$

RT= Row Total

CT= Column Total

N= Total Number of Observation

Now,

Degree of freedom (d.f.) = (r-1) (c-1) = (2-1) (4-1) = 3

Level of significance = 5%

Tabulated value of χ^2 at 0.05 levels for 3 d.f. is 7.82

Decision: Since calculated χ^2 is less than tabulated χ^2 at 5% level of significance, the Null hypothesis is accepted. Therefore we conclude that there is no significant evidence of difference between male and female in adoption of E-banking and gender.

4.12 SWOT Analysis

The widespread use of IT in the present day, all the sectors has made it necessity than just a mere need. E-banking now has evolved as a major component of the IT. It offers banks and customers a huge opportunity by way of convenience and reach. It increases the banking risks in one hand and it

increases transparency and competition in banking services in other hand. In the present context of Nepal, the SWOT of E-banking has been evaluated in the following table.

STREGNTH	**OPPORTUNITIES**
1. Cost effective 2. Time savings 3. Convenience 4. Reliable 5. No frontier barrier	1.Rapid development of IT 2. Awareness of customers 3. Growth of ICT 4. Increment the HR in the field
WEAKNESS	THREATS
1. Insufficient telecommunication bandwidth 2. Access limitations of dial up, cable, ISDN, wireless. 3. Legal obstacles	1. Competition with international branch banking 2. Too much dependency on information system. 3. Security issues\ Lack of trust 4. Tactical limitations 5. Cultural obstacles, linguistics challenges.

Table no.4.15: SWOT analysis

4.13 Major Findings of the Study

1. Nepalese banks are using E-banking for their own convenience and for the purpose of retaining existing customers.

2. The cost analysis of most of the banks in Nepal is seems to be either inadequate or not applied due to their narrows space of business transactions or lack of sufficient tools.

3 .Currently 25(78.125 %) commercial banks are providing full-fledged (in some instant) E-banking throughout the country.

4 Access to internet among respondents grew. Use of the internet and WWW appeared to have grown substantially

5. Commercial uses of the internet the buying and selling of the products and services are in growth areas. It is found that 87% of the internet surfers have knowledge about E-banking.

6. ATMs are most popular electronic delivery channel for banking services in Nepal. About1100 ATMs are installed in Nepal .Only few customers (8.98%) are using internet banking facility. Most of the internet users used it for commercial activities are inside the capital city, Kathmandu. The willingness of respondents under the age of 30 to use ATMs, SMS banking and Internet banking is high (76%).In other words, younger consumers are more likely to use online banking today.

7.25.84% of users of E-banking used SMS banking only because of increasing access of mobile phone and growing branch of commercial bank, SMS banking transactions are being increased by 9% yearly on an average.

8. Despite of huge potential Tele banking services have not been widened enough in daily banking activities in Nepal. Only 4.49% of respondents use Tele banking for balance enquiry, collection information about new products, activating ATM card and paying utilities bills.

9. The importance of income and education for using E-banking suggests that the potential market for many of these products is highly specialized.

10. The core banking activities like fund transfer to third party, cross border transactions and so on are still not fully covered by internet banking offered by the commercial banks in Nepal.

11. Regulations and supervision of E-products in financial system is still untouched in Nepal. Commercial banks and some development banks are providing these facilities in adequate legal infrastructure. Though cyber law has been enacted, other bylaws are not produced yet.

12.80% of the customers of the banks thought that the NRB should make compulsion to all financial institutions to introduce E-banking. While 4% of customers unwilling to make it mandatory and rest are not want to open their mouth to speak either in against or in far about its implementation.

13. 43.8% regular users of E-banking are within the above 35 group who are from higher income level (above 20,000) as well as higher education background.

14. Saving and consumption both habits may have affected by the adoption of E-banking. 74% of the respondents of internet surfers accept that using of E-banking help to increase in consumption habit.

15. 76.23% of E-banking users' uses only for balance inquiry and rest 5% use other facilities such as inter account fund transfer, online purchasing etc.

16. The important of college education for electronic media use seems quite pronounced. Respondents with a college degree of better are the only group where the use of electronic media always exceeds. The importance of education is reinforced, which show that the incidence of multiple terminology use is very much heavier among respondents with at least a college degree.

17. Risk management, infrastructure development and policy formulation the three major challenges of E-banking in Nepal.

18. Adoption of E-banking by the bank can expand geographical reach, no distance barrier. It is beneficial for the following reasons.

a) Expand customer base

b) Never close, no time barrier, no frontier barrier

c) Less cost of sales

d) Reduction of marketing and advertisement costs.

e) Strategic benefit like, document preparation, error detection and correction, reconciliation, data entry etc.

19. It is beneficial on the client's perspective such as reduction on transaction time, sole decision, reliable, ABBS facility etc.

20. Electronic transactions have reduced the opportunities for human errors and fraud but it is increasing dependence on sound system of security control, customer authentication and data protection.

CHAPTER- FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Electronic banking or E-banking is the use of electronic methods to deliver traditional banking services: accepts deposits, provide loans and settle the payments, using any kind of payment media. Basic functions of E-banking is

not quite different from that of traditional functions of banks like accepting deposits, lending and other ancillary and agency services. Only the difference in the electronic banking is delivery banking services through the medium of ICT. Global markets and technology development and macroeconomic pressures have forced the banking industry and regulators to change the old way of doing business.

Banking like other economic activities is in the midst of rapid structural change driven by the development and application of new IT. The spread of IT has affected the banking industry both directly, through IT applications in risk management and marketing of financial products, and indirectly, through its impact on corporate behavior.

Banking markets are becoming increasingly international on account of financialliberalization and overall economic liberalization and overall economic liberalization and overall economic integration. This paper presents evidence on 'The practices and prospects of E-banking in Nepal'. It is frequently asserted that foreign bank entry can render national banking markets more competitive and thereby can force domestic banks to start operating more efficiently. But larger foreign ownership share of banks with latest technology indeed reduces the profitability of domestic banks.

The potential for rapid development of commercial banking functions offered by alternative delivery channels such as ATMs, debit cards, telephone, internet and electronic banking should not be underestimated. Despite the still low level of usage of such channels (with the exception of ATMs, which are now very wide spread), the vast majority of banks in the emerging economics see such channels as a must for their industry. Branch based transactions are much more expenses than delivery channels. This cost advantage would seem to favors smaller institutions as investment needed to attracted deposits or provide banking services via the internet are in the principal lower than the costs of setting up a traditional branch network. It is obvious that the banks in future cannot survive without the support of IT. This is not a time to think whether to computerize or not, but to think how soon we are going to be connected to the online services.

There are various possibilities to expand and correct the economic condition which leads towards the sound financial position of the country. The constitutional assembly has already been completed and all the political parties have committed to promote the financial status by giving continuity of economic liberalization. The financial system of Nepal will be opened up for the branches of all the international banks and other financial institutions by 2010as per Nepal's WTO commitments. The possibility establishes international banks in Nepal or open branches by international bank can't be denied. The competency of effective services delivery of existing Nepali system, no doubt has to invest on the one hand; the capability of supervisory role and the ability to analyze the current financial scenario must be enhanced by the central bank on the other.

From all the indications, banks should be prepared to exploit the opportunities that globalization and financial liberalization provides .No doubt, all of the financial institutions must have to go in new channels of delivery adopting technology by reducing cost and time while rendering services to their customers on demand.

5.1 Conclusion

Financial institutions are slowly moving from physical branches to E-banking. It is indeed the time to go 'E' otherwise our financial in the situations will lag far behind to cope with the challenges and competition that have will have to face in the coming years as Nepal will have to open its market for the foreign banks fully in order to implement the WTO provisions.

The speed of technological innovation in the field of E-banking is unprecedented. In the limited time frame the products /technology will not be tested in depth nor does the security feature the system. This competition intensifies the management challenges to ensure the adequate risk analysis and security reviews prior to implementation of new E-banking application .Although E-banking has bright prospects, it involves some financial risks as well. The major risk of E-banking includes operational risks

(i.e. security risks, system design, implementation and maintenance risks), customer misuse of products and services risks ,legal risks (without proper legal support, money laundering may be influenced), strategic risks, reputations risks, credit risks ,market risks and liquidity risks. But Nepalese financial institutions till the date have not faced any kind of electronic frauds or risks. Banks have basic security tools like firewall, lightening/ powersurge protection. But it is found that the banks are in lack of having regular backup of website information and E-banking policy. Therefore, identification of relevant risks, and formulation and implementation of proper risk management policies and strategies are important for the banks while performing banking.

A well-functioning E-banking network is dependent on availability of a backbone network connecting whole country; reliable and secure information infrastructure including telecommunication infrastructure including telecommunication infrastructure; skilled operational personnel, legal and regulatory framework. The government, NRB as well as others financial institution are related to these issues. Therefore, both individual and joint efforts are needed to overcome the constraints in prompting E-banking in the country.

In respect to technology adoption, the JV banks have attained greater success relative to other bank categories but their coverage is concentrated mainly in urban and semi –urban areas. The rural part of Nepal still remains outside of their services. Since the RBB and NBL have branches throughout the country including the rural areas, penetration of technology in banking activities of these two banks are crucial to wider spread of E-banking services. For the purpose, management of these banks might allocate a part of their yearly profit for a part of their yearly profit for E-banking activities and human resource development supported by fixed targets.

Reforming the bank is feasible and necessary and its financial performance and outreach need to be greatly improved. For this a real commitment to profitability and sustainability of operations are essential. That the banks built on the principal of self- reliance and wider ownership has better prospects needs to be widely understood, along with reforms to expand outreach, reduce transaction costs, improve banks governance and build up a network of information that helps the banks to evaluate their performance. It need to be emphasized that the bank does not have a future , if its present and prospective clients feel that there are no reasons for them to approach the bank to seek its advice and support. The results of this paper suggest that banks have not been very successful at becoming a majorsourceof financial information for the customers.

E-Banking is expected to substantially reduce the cost of doing transactions in the long run, but the limited business being done on the internet has yet to pay for the infrastructure in which bank have invested. This includes the tie up with technology companies in setting payment gateways, internet solution and the alliance with other business for cross selling products. It shows that the banks have started the E- banking transactions even without calculating cost benefit analysis. The coming yearmay however see a scenario where the margins of conventional banks come under pressure because of competition from E-banking, including virtual banks, which need no infrastructure expenses.

In particular, overall results, suggests a growing willingness and ability among respondents but a strong case can be made that, understanding the present and potential future of electronic technology in banking is critical to understand current and future trends in the financial services

industry. Even the present state affair is unclear and the future of electronic banking is, indeed, controversial, the rays of hope have clearly been regarding implementing E-banking policy

5.2 Recommendations

1. An adequate level of infrastructure and human capacity building are required before banks adopt the full-fledged E-banking.
2. Nepal Rastra Bank (NRB) needs to have proper system of disseminating the information. For example several departments publish various reports, bulletins, important directories and magazines containing articles related to banking, economics and financial matters. But, general people including academics and student do have no idea about them .People are often seemed moving here and there within the bank collecting information. In the context of globalized economy and increasing competency among financial institutions adopting new instruments, the role of public affairs has also become vital. Viewing the situations, all the competitors bank needs to strengthen and modernize its public affairs activities.
3. Central banks should have to established Central Vigilance Commission (CVC) and directs all banks to compulsorily offer ABBS as well other means of E-banking
4. There is no enquiry desk in the central as well as banking office of the banks .So the public has been facing several difficulties such as finding out the relevant departments, relevant information as well as the bank employee they want to see. So an enquiry desk in the front of the banks should be established.
5. It is hoped that Nepal Rastra Bank is closely looking the situation of E-banking to develop appropriate guidelines to protect service providers and consumer at large. Though NRB has not done any study about this, it is imperative to conduct comprehensive study to analyze possible impacts in Nepalese banking sector. Details analysis is possible when we get enough information regarding the volume of transactions and scope of E-banking in Nepal.
6. It is recommended that the bank considerconducting risk assessment in reasonable time frame to evaluate to what extent the realization of bank objectives and policies are likely to be hampered by the present or future trend relating to the status of corporate governance and irregularities and the effectiveness of the policy implementations and so on. This will help the management to manage changes well in advance to respond the issues that the bank is likely to face in future and sequencing such changes for the greater return.
7. The policies relating to long distance and international voice traffic need review to remove to growth of E-commerce that relates E-banking as well.

8. E-banking in Nepal is at its infancy right now so the system is not perfectly secure. No E-banking frauds have been found till the date though many of the inherent risks will however have to be addressed as and when they arise since the impacts of E-banking can't be determine in advance. It is imperative to formulate and design necessary legislations and guidelines to ensure legal recognition of electronic transactions. There is a wise saying in economics; ability to predict weather forecast can't control over the rainfall but it suggests us to carry umbrella.

9. Internet penetration is a key factor for the growth of E-banking. As per international experience, the take-off phase of internet banking need at least 30% internet usage among the population though a latest release data, only about 900,000 people are using internet in Nepal. Moreover, since internet penetration alone is not adequate for online banking expansion, the government may provide subsidy for surfing cost, organize training facilities with private partnership, widen multiple access facilities like web, telephone, ATM etc. and initiate motivation programs for the users and the target population. Adequate legal framework and security are essentials for flourishing internet banking.

10. VSAT operating license should not limit the bandwidth. Moreover, high bandwidth charge is anotherconstraint in widening internet access to a greater number of people. Therefore rationalizing the charge could make the use of internet affordable to all.

11. Mobile banking is aprospective area for two reasons; it covers almost all activities involved in retail banking and mobile phone network has already been spread all over the country covering more than 95 lakhs people. Because of convenience, a sizeable share of the unbanked people can be brought under the network especially in rural areas with flourishing mobile banking. In this context, it is important to formulate relevant acts, policies, and adopt operative guidelines.

12. Banks also have to review their business strategy and create the required space for adopting E-banking services in order to remain competitive and attract new customers. They must strengthen their IT departments through providing training to personnel and procuring required hardware and software. Back up of the information have to be made access if and when search by the clients and prospective clients.

13. At present, Nepal is trailing behind acquiring the required quality of banking services to effectively compete in the global market. Therefore baking system needs up graduation for which urgent measures are needed to create a level playing field for rapid expansion of E-

banking in the country. Despite the constraints, more efficient use of existing capabilities in developing the services can pave the way to quality provision of e-banking in Nepal.

14. A package of required rules, acts, laws, and regulations pertinent to E-banking adoption and development may be formulated. In this respect, lessons and experience of countries that have already expanded E-banking can act as useful guides.

15. The internet is an open network and accessible from anywhere in the world by any persons. This significantly magnifies the importance of confidentiality, data protection, security control, customer authentication and audit trail so the Banks should have to take initiative in formulation of strong cyber laws in association with concerned authority.

16. It is crucial that if security and integrity of the transactions are protected, probability of loss arising out of criminal activities, such as fraud, money laundering and a disruption in delivery systems will be mitigated. In this regard, banks providing and going to E-banking services should take a step to address the following security control.

    a. Authentication of E-transaction customers
    b. Proper authorization control
    c. Data integrity
    d. Confidentiality of information
    e. Establishment of Audit trail
    f. Privacy of customer information
    g. Incident response planning

17. Too much dependency on information technology system may its one drawback which will enhance the technical complexity of operational and security issues, thereby increasing the trend towards more alliances and outsourcing arrangements with parties. The alliance partner and outsourced entity may not be regulated as banks, which may enhance the operational risks of the banker, so the banks should aware to prevent such operational risks through strategic alliance with genuine partner.

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APPENDIX-1

Lists of Commercial Banks

S. N.	NAMES	OPERATION DATE(A.D)	HEAD OFFICE
1	Nepal Bank ltd	1937/11/15	Kathmandu
2	RastriyaBanijya Bank	1966/01/23	Kathmandu
3	Agriculture Development Bank Ltd	1968/01/02	Kathmandu
4	Nabil Bank Ltd	1984/07/16	Kathmandu
5	Nepal Investment Bank Ltd	1986/02/27	Kathmandu
6	Standard Chartered Bank Ltd	1987/01/30	Kathmandu
7	Himalayan Bank Ltd	1993/01/18	Kathmandu
8	Nepal SBI Bank Ltd.	1993/07/07	Kathmandu
9	Nepal Bangladesh Bank Ltd	1993/06/05	Kathmandu
10	Everest Bank Ltd.	1994/10/18	Kathmandu
11	Bank of Kathmandu Ltd.	1995/03/12	Kathmandu
12	Nepal Credit and Commerce Bank Ltd	1996/10/14	Kathmandu
13	Lumbini Bank Ltd	1998/07/17	Kathmandu
14	Nepal Industrial and Commercial Bank Ltd	1998/07/21	Biratnagar
15	Machhapuchhre Bank Ltd	2000/10/3	Kathmandu
16	Kumari Bank Ltd	2001/04/03	Kathmandu
17	Laxmi Bank Ltd.	2002/04/03	Birjung
18	Siddhartha Bank Ltd.	2002/12/24	Kathmandu
19	Global Bank Ltd	2007/01/02	`Kathmandu
20	Citizens Bank international Ltd	2007/06/21	Birjung
21	Prime Commercial Bank Ltd.	2007/09/24	Kathmandu
22	Sunrise bank Ltd.	2007/10/12	Kathmandu

23	Bank of Asia Nepal Ltd.	2007/10/12	Kathmandu
24	Development Credit bank Ltd.	2008/05/24	Kathmandu
25	NMB Bank Ltd.	2008/06/03	Kathmandu
26	Kist Bank Nepal Ltd.	2009/05/07	Kathmandu
27	Janata Bank Nepal Ltd.	2010/04/28	Kathmandu
28	Megha Bank Nepal Ltd.	2010/07/23	Kathmandu
29	Commerz and Trust Bank Ltd.	2010/09/29	Kathmandu
30	Century Bank Ltd.	2011/01/23	Kathmandu
31	Grand Bank Ltd.	2008/06/	Kathmandu
32	Sanima Bank Ltd.	2012/02/28	Kathmandu

APPENDIX-2

Calculation of expected frequency (E) and χ^2 under2 (a)

O	E= (RT×CT)\N	O-E	$(O-E)^2$	$(O-E)^2\backslash E$
27	24.50	2.5000	6.2500	0.2551
8	10.50	-2.5000	6.2500	0.5952
30	29.40	0.6000	0.3600	0.0122
12	12.60	-0.6000	0.3600	0.0286
7	8.40	-1.4000	1.9600	0.2333
5	3.60	1.4000	1.9600	0.5444
6	7.70	-1.7000	2.8900	0.3753
5	3.30	-1.7000	2.8900	0.8758
Σ0 = 100	ΣE = 100			$\Sigma(E-O)^2\backslash E = 2.92$

APPENDIX-3

Calculation of expected frequency (E) and χ^2 under 1 (a)

O	E=(RT×CT)\N	O-E	$(O-E)^2$	$(O-E)^2$\E
4	3.85	0.1500	0.0225	0.0058
15	14.35	0.6500	0.4225	0.0294
13	15.05	-2.0500	4.2025	0.2792
3	1.75	1.2500	1.5625	0.8929
3	4.62	-1.6200	2.6244	0.5681
18	17.22	0.7800	0.6084	0.0353
20	18.06	1.9400	3.7636	0.2084
1	2.10	-1.1000	1.2100	0.5762
0	1.32	-1.32000	1.7424	1.3200
5	4.92	0.0800	0.0064	0.0013
7	5.16	1.8400	3.3856	0.6561
0	0.60	-0.6000	0.3600	0.6000
4	1.21	2.7900	7.7841	6.4331
3	4.51	1.5100	2.2801	0.5056
3	4.73	1.7300	2.9929	0.6327
1	0.55	0.4500	0.2025	0.3682
ΣO = 100	ΣE = 100			$\Sigma\frac{(E-O)^2}{E} = 13.112$

APPENDIX-4

ATMs Established By Commercial Banks

S.N.	COMMERCIAL BANKS	NO OF ATM OPERATION
1.	Nepal Investment Bank Ltd	68
2.	Kist Bank Nepal a Ltd	78
3.	Nabil Bank Ltd	79
4.	Nepal SBI Bank Ltd	73
5.	Himalayan Bank Ltd	71
6.	Bank of Kathmandu	37
7.	Machhapuchhre Bank Ltd	71
8.	Global Bank Ltd	68
9.	Everest Bank Ltd	62
10.	RastriyaBanijya Bank	46
11.	Sunrise Bank Ltd	26
12.	Kumari Bank Ltd	23
13.	Nepal Industrial and Commercial Bank Ltd	36
14.	Standard Chartered Bank Nepal Ltd	20
15.	Citizens Bank International Ltd	33
16.	Laxmi Bank Ltd	39
17.	Nepal Bank Ltd	28
18.	Siddhartha Bank Ltd	16
19.	Nepal Credit and Commerce Bank Ltd	25
20.	Prime Commercial Bank Ltd	22
21.	Nepal Bangladesh Bank Ltd.	25
22.	NMB Bank Ltd	24
23.	Bank of Asia Nepal Ltd	23
24.	Development Credit Bank Ltd	4

25.	Janata Bank Nepal Ltd.	18
26.	Lumbini Bank Ltd	2
27.	Megha Bank Nepal Ltd	29
28.	Commerz and Trust Bank Ltd	9
30.	Century Bank Ltd	12
31.	Sanima Bank Ltd	13
32.	Grand Bank Nepal Ltd	10

APPENDIX-5

Questionnaires

I have been conducting a research entitled "A Study on Practices and Prospects of E-banking in Nepal'' for the requirement of the degrees of Masters in Business Studies, I would be grateful if you supply correct information, desired below. This information will be used only for academic purpose. Your help will be highly appreciated. Here are some questionnaires made for collecting the correct data and figures. So please tick mark or fill in the blanks as per the requirements. If you need, you may also use separate paper.

1. Introduction of yourself:
   A) Name……..
   B) Address……..
   C) Personal contact No. (if any)……..
   D) Sex i) Male ( ) ii)Female ( )
   E) Age ( )
   F) Education

   G) Profession

   H)Monthly income (approximate)

2. Have you ever experienced the E-banking services?
   i) Yes ii) No
3. Do you have internet in your home?
   i) Yes ii) No
4. a) Do you ever use Internet for E-banking?
   i) Yes ii) No

   b) If yes, from where do you surf the internet?

   i) Working Place ii) Home iii)Cyber Café

5. How long you have been using Internet?

i)From 1 year ii)From 2 years iii) From more than 2years

6. For what purpose do you use internet?

i)Mails ii)Information gathering iii)Commercial activities

iv)Online purchasingv)If use two or more than two options, please verify

7. Which of the following services do you offer from E-banking?

i)Balance enquiryii)Statement download iii)Loan information iv)Utility bill payment v)If any others

8)Which type of E-banking services do you use most?

i) SMS Banking ii)Tele banking iii)ATM

iv)Internet banking v) Others

9) How frequently do you use E-banking?

i) Regularly ii) Occasionally iii) Seldom iv) Almost never

10) What purpose do you use E-banking most?

i) Deposits ii)Withdrawiii) Fund transfer iv) Others

11) What difficulties are you facing by the adoption of E-banking?

……

12) Do you think Nepal Rastra Bank should make it mandatory to introduce E-banking services?

i) Yes ii) No iii) not known

13) What impacts do you think that will be made in the flow of remittance by the E-banking services?

i) Increased ii) Decreased iii) Not known

14)Do you think that your consumption / saving s habit will be changed by E-banking?

i) Yes ii) Not at all iii) Can't say

15) Which of the following are the most considerable points that you inspired to accept the E-banking?

i)Less cost ii) Less time consume iii)Reliable iv) Accessible