

Global information system and its impact to Nepal

(with reference to banks)

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RECOMMENDATION

This is to certify that the thesis

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WITH REFERENCE TO BANKS**

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VIVA-VOCE SHEET

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WITH REFERENCE TO BANKS**

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DECLARATION

I hereby declare that the work reported in this thesis entitled “**Global Information system and its Impact to Nepal, A Case Study on Banking**” submitted to Office of Dean faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Master of Business studies (M.B.S) under strict supervision and guidance of Dr. Geeta Pradhan (Associate Professor) and Lecturer Er. Shanker Nath Adhikari, Shanker Dev Campus, Tribhuvan University, Kathmandu Nepal.

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Date: **July, 2009**

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LIST OF ABBREVIATIONS

ABBS	Any Branch Banking System
ADB	Agriculture Development Bank
ATM	Automated teller machine
BIOS	Basic Input Output System
BOD	Board of Director
CBIS	Computer Based Information System
CBS	Core Banking Solution
CEO	Chief Executive Officer
CFCC	China Financial Certification Center
CPU	Central Processing Unit
CTEVT	The Council of Technical Education and Vocational Training
DBMS	Database Management System
DFD	Data Flow Diagram
DSS	Decision Support System
EBS	Electronic Banking Solution
E-Commerce	Electronic Commerce
EDI	Electronic Data Interchange
ERD	Entity Relationship Diagram
GIT	Global Information Technology
GITMA	Global Information Technology Management Association
GUI	Graphics User Interface
IBM	International Business Machines
ICICI	Industrial Credit and Investment Corporation of India
ICT	Information and communication Technology
IS	Information System
ISO	International Standard organization
ITA	Information Technology Agreement
LAN	Local Area Networking
MIS	Management Information System
MNE	The Multi National Enterprise
NAC	Nepal Airlines Corporation
NCC	National Computer Centre
OR/MS	Operational Research and Management Science
ROI	Return on Investment
SCT	Smart Choice Technology
SMS	Short Messaging Service
SWIFT	Social Welfare Inter bank Fund Transfer
TPS	Transaction Processing System
T.U	Tribhuvan University
UNDP	The United Nations Development Program
USA	United States of America
VSAT	Virtual Satellite
WAN	Wide Area Network
WAP	Wireless Application protocol
Wi-Fi	Wide Frequency Modulation
WLAN	Wide Local Area Networking
WTO	World Trade Organization
WWW	World Wide Web

CHAPTER-I

INTRODUCTION

1.1 Background of the Study

This is the age of information system and information technology. The development of information system and information technology makes the world a “Global Village”. In this global village, everything is going to be globalized and everything is converted into modern technological form. The emerging sub-discipline of Global Information Technology (GIT) is also referred to within the Information Systems (IS) discipline as Global Information Technology Management, as International Information Systems, and as Global Management Information Systems.

GIT encompasses multiple levels of analysis:

1. The nation or international policy-making body.
2. the firm(s), the Multi-National Enterprise (MNE) or the IT vendors
3. the group(s) or team(s)
4. the individual
5. the technology overlay

Clearly, these five levels of analysis look to numerous referent disciplines: Political Science, Economics, Law, Management, International Business, Human-computer interface, and Cross-cultural studies, Sociology, Psychology, Telecommunications and Computer Science. There is different advancement in global technology such as, we can see everything computerized, everything robotics, use of expert system, artificial intelligence, neural network and so on. Almost all of the organizational activities such as planning, organizing, staffing directing, controlling etc. are based on availability of

appropriate managerial information. The complexity of modern business management and competitive nature of business requires a best computerized automated system for handling the business operation with skill and precaution to avoid the business management crisis.

The world is becoming more networked with the passing of each day. Not only are the number of interconnections amongst individuals, businesses, and governments increasing, but there is also increased recognition of connectivity as a key component of public infrastructure in general. New definitions portray high bandwidth connectivity as a necessity, perhaps even a public utility on the order of drinking water. Next-generation technologies such as WiFi and WiMAX are being adopted rapidly and are enhancing connectivity. WiFi has quickly evolved from a WLAN application, providing indoor, short-range wireless Internet access for mobile computers, to a broadband wireless service with many opportunities on a global scale. According to estimates provided by local authorities in North America, in a typical city, at least 45 percent of the municipal employees are mobile. Police, fire, public works, parks, and inspections departments are out daily and need to access information. Therefore, cities across the United States and Canada have been setting up networks to allow wireless connections. (Multinational Business Review 2002)

It is amazing to see that the world has really become smaller. News and information travel from one part of the world to other in no time. People are aware of what is going on in each and every corner of the world at this very moment. We can see that every possible person wants to get involved in the world of information technology. In the past decade it was seen that a lot of investment had been made in the field of information technology in almost every part of the world.

Information System, Information and people are key competitive tools for all the organizations. The concept of MIS has evolved over the period of time composing many different facets of the organization functions. MIS is necessity of all the organizations. News and information travel from one part of the world to other in no time. People are aware of what is going on in each and every corner of the world at this very moment. We can see that every possible person wants to get involved in the world of information technology. In the past decade it was seen that a lot of investment had been made in the field of information technology in almost every part of the world.

Whenever we talk about the management information system, generally people in our society think that this is a very complicated system involving computers and much hardware which need many kinds of complicated software to support them. Actually this is not true, the information system can me maintained from the simplest of forms like keeping a particular type of management information in a file or a folder to using automatic software that is particularly designed to support the particular system of an organization. As the name suggests management Information system is just a system of maintaining a record of information in a proper and systematic way so that the information can be used in the future effectively and efficiently to make the right decisions and draw conclusions in making managerial decisions. From the above concept, we can draw that Information Technology can be used in five ways as follows:

- 1) Information processing tasks
- 2) Decision making tasks
- 3) Shared information through decentralized computing
- 4) Bridging the gap between Business, people and technical people
- 5) Innovation.

So for the use of MIS, Information Technology is the most required one.

MIS can be defined as the systematic or organized way of providing informational support to the managerial functions of an organization. The system utilizes computer hardware, software, manual procedures, and models for analysis, planning control and decision-making and a database. In other words, “MIS is an automated system which presents information both internal and external to the business that aids in making a specific set of routine decisions”.

It is mainly related to “Information System, the information and decision system, the computer based information system.

Decision Support System is a system designed to support decision-making activities of organizational personnel. An approach to effective decision making whereby there is an interface from problem formulation to solution between the individual and the computer for the problem being solved. Decision Support system integrates data management and information system with modeling and analysis tools. Decision Support System is playing an increasingly important role in organization, industries and academics. Decision Support System (DSS) is the computer-based systems for supporting qualitative or semi-structured managerial decision-making. A Decision Support System is an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks and make decisions. In addition, Decision Support System refers to an academic field of research that involves designing and studying Decision Support System in their context of use. In general, Decision Support System is a class of computerized information system that supports decision-making activities and it integrate data management and information systems with modeling and analysis tools.

Decision Support System (DSS) is a set of the well-integrated user-friendly computer based tools that combine data with various decision-making models to serve semi-structured and unstructured problems. Such system solves a specific problem or a class of problems such as scheduling, planning, resource allocation and forecasting. Although DSS will initially targeted for helping managers and middle managers, today these system are being developed at all level of the organization. They allow manager to ask to ad hoc queries and receive customized response.

A DSS is an interactive system that helps people make decisions, use judgment and work in areas where no one knows exactly how the task should be done in all cases. DSS supports decision-making in semi-structured and unstructured domain, and provide information, models or tools for manipulating data. (Alter, 1995:p5)

1.1.1 Different Organizations and MIS

Organization is generally understood as a place where the different services like financial, accounting, banking, and so on are offered; of which some are service motive and some are product motive, some works for profits only and some for services only to the customers. There are different organizations which are applying or trying to apply computerized system i.e. MIS and DSS. The thesis is mainly concerned with some organizations such as banks, government sectors i.e. e-Governance, telecommunications, and some other private sectors using computerized system in their organizations.

The age of globalization where people from one place to another being global villagers, has manifested in the development of regional trade blocks, trans-governmental organizations such as World Trade Organization and in the spread of multinational corporations all over the world. The erosion of a state's sovereignty as transnational bodies mediates national concerns and demand for

universal laws. Globalization is also placing governments under greater scrutiny to be more accountable, transparent, effective and efficient.

This is the age of globalization. Now there are computerization every where. Even in a small organization, there can be seen a computer at one corner of the room for facilitating to data management, information gathering and time saving in any aspects. The fifth generation information system is being developed such as artificial intelligence, expert system, neural network and so on. This all can be explained as global information system.

Here is analyzing and describing of some organizations as samples for the topic “*GLOBAL INFORMATION TECHNOLOGY AND ITS IMPACT TO NEPAL*”, which will try to disclose the impact of Global Technology in some organizations and their progression in the technologies. Global technology covers the development in Electronic-Governance, Technology in Nepal Telecom as in mobile, E-Commerce, E-banking in Everest Bank, and computerized technologies in provident fund and so on. E-Government is the most Important factor to influence the nation’s information technology which is handled in Nepal one and only by Nepal Telecom. Nepal Telecom plays and important role to enhance the technology in different sectors such as banking sectors, provident fund, E-Commerce. It also provide the world wide networking system i.e. internet service which is also an advancement of information technology.

The telephone and telegraphic services were specifically introduced after the First World War to help running the government’s administrative, and government system. Later it expanded its role to the business and industrial sectors and later for public use. Starting from a simple network, this sector has developed to become a sophisticated telecommunications network, using optical fiber cable and

microwave and satellite systems to link rural and urban areas throughout the nation and through the world. Nepal Telecommunications Corporation board was established in October 1969 A.D. which was later converted to Nepal Telecom, fully government owned statutory organization in June 1975 and a sole national operator of local, long distance and international telecommunication service provider. Nepal Telecom is playing a key role in the development of the nation in different ways to enhance information technology and e governing process.

1.1.2 E-Banking

Bank is a “business establishment, in which money is kept for saving or commercial purpose or is invested for loans of exchanged” {The American Heritage Dictionary of English Language1}. Banking is “the business of operating a bank” [Cambridge Dictionary2]. E-Banking is mainly transference of money in electronic form, which is one reason why banking services are suitable for Internet. In general, electronic banking service is the service provided by a bank or financial institution, which enables the management of banking transactions and other banking services via networks. In details, e-banking means “the adoption of information or services by a bank to its customers, via a computer, television or mobile phones” The bank has a wide range of customers like individual, institution, trusts business organizations, government and local bodies. The banks deal with number of transactions, which also vary widely in terms of length and complexity. Like in other service industries, in the bank, the customers also want quickly terminal results. The distinctive service in banking is solving the customers’ financial problems and quick services in transaction and execution. For example, the time taken for crediting amount, withdraw of cash, the sanction of loan facility etc. The MIS of banking organization evolves around these aspects.

To avoid the inconvenience of going to a number of places for payments of small amounts, customers need service at the counter to pay electricity bills, telephone bills, taxes and duties to the local bodies and the government. Hence, MIS is to be designed to identify, decide and design a service strategy for offering distinctive services to the wide range of customers seeking variety of services demand.

Consumer Internet Banking, with its ability to reach each and every nook and cranny of the world holds great importance for a nation like India, where conventional Banking services are out of reach for a large proportion of the masses. But to make it a success it requires more than just an adequate internet enabling infrastructure. There is a dire need for an adequate legal and regulatory framework to be put into place. One of the crucial elements of such a legal and regulatory framework will be Data Protection provisions. (Ankur Gupta, Journal of Internet Banking and Commerce, April 2006, vol. 11, Pg.1)

1.1.3 E-Governance

As e-commerce matures and its tools and applications improve, greater attention is being given to its use to improve the business of public institutions and governments (country, state, county, city, etc.). E-Government is the use of Internet technology in general, and of e-commerce in particular, to deliver information and public services to citizens, business partners and suppliers, and workers in the public sector. Electronic government is defined in different ways by different experts. Each definition or thought of e-government has emphasized only one prime entity, i.e. *INFORMATION*. Information creation, information dissemination, awareness of information, information processing, information preserving and the perfect way of using the information are the main activities of E-Government System. Information can be used to provide the better service to the citizen, facilitates the effective way of solving the problem and making the system transparent and reducing the corruption in the government organization within the framework of electronic government. It should be thought how

the information activities are used in proper ways. Electronic governance stands on the **pillar**. These pillars should be strong enough to make the electronic government project success. To make these pillars strong is very big challenge.

Pillars of E-Government System:-

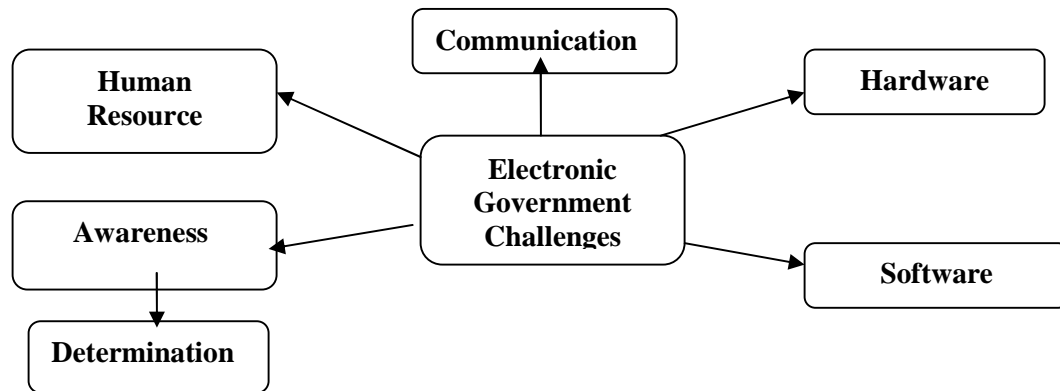


Fig: 1.1 Pillars of E-Government System

The above shown figure shows the important pillars of the e-government system. The role of government in least developed and developing countries like Nepal is vital. Information and communication technologies (ICT) are playing an increasingly vital role in daily lives of people. In the realm of government, ICT applications are promising to enhance the delivery of public goods and services to the citizens not only improving the process and management of government, but also by redefining the traditional concepts of citizenship and democracy. Government is the new buzzword in development discourse. The World Bank and other international financial institutions identify public sector management, transparency, legal framework, accountability and information as the key components of the government. In a country like Nepal, which has the largest number of poor people in the world and also ranked high on the list of most-corrupt nation, governance involves fighting corruption, improving bureaucratic and political accountability and promoting people's participation and public-private partnerships.

The United Nations Development Program (UNDP) gives the more comprehensive definitions of governance as- governance is “the exercise of political, economic and administrative authority to manage a society’s affairs. It is a broad concept that encompasses the organizational structures and activities of central, regional and local government, the parliament and the judiciary and the institutions, organizations and individuals that comprise civil society and the private sector insofar as they actively participate and influence the shaping of public policy that affect people’s lives”

Definition of e-government ranges from “the use of information technology to free movement of information to overcome the physical bounds of traditional paper and physical based systems” to “the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees. (Deloitte and Touché, 2004, p88)

So e-Governance aims to define that it involves the automation or computerization of existing paper-based procedures that will prompt new styles of leadership, new ways of debating and deciding strategies, new way of transacting businesses, new ways of listening to citizens and communities, and new ways of organizing and delivering information.(Rogers, 2003).

1.1.4 E-Commerce

E-commerce means electronic commerce i.e. commercial activities in relation to electronic devices, computers, especially in internet. Its basic form is E-business that is E-commerce is the outcomes of E-business. The main commercial transactions or activities like selling and buying of goods and services, their electronically are included in E-commerce.

E-commerce is an electronic type of business in which commercial transactions such as buying; selling and payments are held in association with different mediums (computers, telecommunications,

and internet) and different companies (banks, producers, insurance agents, distribution channels, and other trading partners). It is based on processing and transmission of data electronic including sound, video, pictures and all features about the products and services. We can do the businesses like selling and buying of electronic books, different computers sources, digital contents, fund transfer, share transactions, consumer marketing, after sales services etc.

Electronic commerce, simply puts, is the automation of business process between buyers and sellers. (IBM Corporation)

Electronic commerce is the application of various communications technologies to provide the automated exchange of business information with internal and external consumers, suppliers and financial institutions. Examples of these technologies include Electronic Data Interchange (EDI), Bar Coding, Scanning, E-mail and Fax to name a few. The bottom line is that Electronic Commerce requires a paradigm shift in the way corporations do business today. (Electronic Commerce Forum)

Electronic Commerce is the process of doing business electronically. It involves automation of a variety of business –to –business and business-to-consumers transactions through reliable and secure connections. (Kapoor, 2003, p197)

E-commerce is an advanced form of commerce. It had been appeared many years ago in the form of different modes from stone era and is going to develop in different phases. In the past business happened in different modes, people use different products for the exchange of different things. The agricultural items such as cattle, shells, skins, rice, maize, potatoes, and so on were used as the items of exchange of form of payments. There was no such money. That type of exchanging or payment was named Barter System. That was very inconvenient to be in business because of the Exchanging of huge amounts (quantities), no measuring tool, difficulties in divisions and so on. So the people

introduced money, that stage is called Money Economy Stage. In this stage people used money in exchanging with the products. The skin of the animals and heavy metals were changed into a small form or size like coin for business purposes and also the paper money are introduced so that exchange becomes easier now-a-days in the commerce or business.

Now a days business becomes worldwide that is the import and export of goods and raw materials. Many means of transportations such as aero planes, buses trucks ships contributes in business in one hand and the exchanges and payments becomes easier due to banking and other e-payments system that is this causes the evolution of E-commerce.

In the past we need to do every thing that is searching for products, scanning their qualities ourselves on the field which is now a days a little or partially eliminated due to the development of E-commerce. It makes the international business easier with a little cost. This evolution of E-commerce eliminates the process cost and different processing errors. We can run the business or can chose the products of our choice without any cost and trouble on sitting inside the room by internet; we can find the cost price of the products, their characteristics, processes of buying, theirs payment methods and modes. In foreign countries, “They say or want to say that the real money will be totally disappeared in some years and there will be all virtual ones in the near future due to E-commerce, and E-cards”.

1.2 Statement of the Problem

Processing information manually while making decision in the organization is becoming increasingly difficulty and to process the needed information efficiently and effectively is not possible if done manually. The advancement in communication, accessibility to global markets, the use of the internet and electronic commerce increase the number of alternative involvement in decisions and many

decisions need to be made within a time constraint. Information Technology and the sophisticated analysis that DSS provides, will become a factor in making a good decision and rapid access to remote information for the banks, institutions, other government organizations etc.

Now the Information Technology has had an uphill struggle in Nepal. A thriving information technology requires complementary telecommunication infrastructure, trained technicians, demanding users, and networking and end user equipment, but these are not abundant in Nepal.

In this technology driven era all private banks in Nepal are fully computerized and are using some sort of MIS. The private banks have also been using various kinds of high tech software system for their daily activities and they provide various technological services to its customers.

After the restoration of democracy, the Government of Nepal launched an economical liberalization policy. This has led to an increasing number of commercial banks in the country, due to such increment of commercial banks, competition also increased among them, which have resulted in enhanced services to the customers getting more advantage that is competitive. This is only possible through proper information technology.

Management Information System is the backbone on which logical business decisions are made in all types of business organizations. Applying this same logic to a bank, we can safely say that a bank must have good Management Information System as a minimum to survive and prosper in this exceedingly competitive world. Also there is no separate department like IT or similar to handle the Information System. MIS and compliance department in Nepalese banks mostly lies under administrative or account department.

To maintain the standard in the banks in Nepal as International level, mostly the joint venture banks and other Government banks uses computerized system and software "Pumori Plus" almost the same in every banks which is technologically outdated.

The current market situation of Nepalese organizations either they are government owned or private, are in weak position in compared to other countries forwarding with information technology. So there are too many things to be done by Nepalese people to integrate with the other developed countries. The present study will attempt to make assessment on the problems regarding the global information technology as follows.

-) Are there rational processes of information system in Nepalese banking organizations?
-) Is the concept of information system and decision system familiar to the staffs and managerial personnel in the banks or Nepalese management system?
-) Are the banking organizations sufficiently use the technologies around our countries and if not what are the reasons not using them?
-) Are all banking sectors use the technologies used all over the world in developed countries?

1.3 Objectives of the Study

- To examine the technology used in Nepalese banks.
- To identify the obstacles on the existing information technologies in Nepalese banks with international banks.
- To analyze the Information Technology in banking sectors.
- To suggest Nepalese banks about international standard technologies in computerized form.

1.4 Significance of the Study

Today the need of updated information has become inevitable to arrive at an effective decision making walks of life. Whether it is industry, commerce, defense, banking, education, telecommunication, economics or philosophy, importance of information is every where for better performance in this competitive world. The misunderstanding of little information means the difference between life and death of the organization. Management information system is extremely important, which is capable of handling large voluminous of data, confirmation of the validity of data and transaction, quick search and retrieval of mass storage communication users on time for the fulfillment of required information.

Technical development is the urge of the present day of the world. Successes of the business organizations ensure the prosperity of the country. Today, the developing countries are confronting a great deal of uncertainty brought by the global economic and technical environment. When technical development exists in the country then certainly the economic condition will be good. But the technical development is only possible when technical equipments are systematically equipped. MIS is always deals with the systematic computerized information system. In the modern age of the economy, the world has done various inventions. These inventions and technologies are very fruitful to the developing countries. But Nepal is unable to apply these inventions for the development of the technical environment in many aspects. Electronics and technical parts are being cheaper and competitive. Every shop has their computer system in the counter but the main problem is the systematic use of such system.

It is only one system which helps to update the information and capable of keeping valuable records for quick retrieval and effective decision making of an organization. It provides data and information

for the future prospects. Banking and its importance are increasing rapidly day by day. Competition between government and Joint Venture banks are very high. Every bank must give better service to the customer for survival in this challenging and fast growing world. Misunderstanding and mishandling of few information impacts the goodwill and reputation as well as decision making to carry out Organization successfully.

Hence the study is mainly targeted to the existing information system, its utilization and different developments relating to this field and the recommendations for how to develop the system for up-growing to global context.

1.5 Limitations of the Study

Although the researcher wants to find out the facts about the research topic or the study this may not be possible due to the lack of authority and different policies and rules of securities in the organization. Some of the major limitations of the study are listed below:

- Time constraints are one of the major factors of limitation of the field study. The researchers were allocated a very limited time.
- This report is based on primary and secondary data collection and which depends upon the answers provided by the staff of the organization and existing reports and researches.
- There was the lack of necessary secondary data since the organizations in Nepal just trying to improve ahead on information technology.
- It is costly to gather the information also. Cost of research also plays a major role in this fieldwork study.
- This study is based on general views and limited interviews.
- Research is based on a few samples around Kathmandu valley.

1.6 Organization of the study

The study will be organized into five chapters, each devoted to some aspects of the study on Global Information Technology, Technologies in Nepal and impact of Information Technology in Nepal, which will be in references to some public and private institutions running fully or partially in this technological era. The contents in each chapter will be as follows:-

Chapter 1 : Introduction

Chapter 2 : Review of Literature

Chapter 3 : Research Methodology

Chapter 4 : System Analysis Design and Presentation of Data

Chapter 5 : Summary, Conclusion and Recommendation

Bibliography

The first chapter 'Introduction' mainly includes background of the main subject, Organizational background, statement of problems, objectives of the study, significant of the study and organization of the study.

The second chapter 'Review of Literature' contains reviews of previous studies, different researchers' view and their analysis. It includes review of different books, various published or unpublished reports, articles and journals, different organizational reports, previous researches, thesis, reports and internet, websites etc.

The third chapter 'Research Methodology' deals with methodology used for interpretation and analysis of data and sources of data used population and samples used in collection of data.

The fourth chapter 'Presentation and Analysis of Data' consist the main framework of the study, which gives the clear eye view of the study. This chapter presents the raw data and their analysis and converts them into readable form.

The last and fifth chapter 'Summary, Conclusion and Recommendation' summarized the whole study and give some recommendations which can be utilized to enhance the performances of the organizations.

The last part of the study contains the 'Bibliography' which presents the reference books and other various particulars used in completing the study.

CHAPTER-II

LITERATURE REVIEW

This chapter highlights the literatures available, related to the present study. It supports the researchers to explore the relevant and true facts for the reporting purpose in the field of study. It also helps to find out the lacuna in the earlier research works and to stop duplication of the previous work. Literature here means the related printing materials about the subject matter of the research work. It may be of various forms like books, articles, booklets, thesis, reports etc.

This section emphasizes on the importance of reference of supporting information that were processed in the duration of the study. A case study can be barely initiated without the review of relevant, appropriate and enough information related to the topic of study. While careful measures were taken to make sure that correct and relevant information have been sorted out and used during the study, enough information through various references and earlier research documents on similar topics was reviewed.

This chapter has divided into three sections- Conceptual Framework, Review of Articles and Review of Master's Degree Thesis.

2.1 Conceptual Framework

2.1.1 Global Information Technology

Global Information Technology during the last decade has played an ever more important role in management decision-making. It has probably also contributed to the recently reported significant increase in labor productivity in some of the technologically most advanced countries, like USA,

Japan. In the coming year investment in IT to support decision-making is likely to grow faster than ever before.

The world is becoming more networked with the passing of each day. Not only are the number of interconnections amongst individuals, businesses, and governments increasing, but there is also increased recognition of connectivity as a key component of public infrastructure in general. New definitions portray high bandwidth connectivity as a necessity, perhaps even a public utility on the order of drinking water. For instance, the Chicago Digital Access Alliance has promoted the notion of universal broadband access as a public right. Similar statements by the European Commission present high bandwidth connectivity as a service of general economic interest.³ Providers have also jumped on the bandwagon of broadband as a “universal service.” For example, in October 2007, the UK Post Office launched a new service specifically designed to attract late adopters of broadband services. (Dutta, World Economic Forum, p19)

Motivation for the emergence of the GIT sub-discipline:

1. The obvious reason: the 1980s brought about increased levels of business globalization, international trade and competitiveness, and corresponding use of IT on a global basis including increased systems integration and convergence.
2. The not-so obvious reason: GIT is a result of the traditional US-centric discipline of IS that has awoken to the practical and intellectual needs of examining IS (and IT) in the global context, rather than as a generic country-agnostic construct, or one in which US issues dominate the research agenda. This is why, in part, one finds "IT in country X," or "IT in (non-US firm) Y" as a legitimate area of research in GIT at this stage.

3. A third reason relates to the impact of culture on the development, implementation and use of IT around the world. With the move away from ethnocentrism, so increased attention is being paid to the impacts that culture, in its myriad variations, exerts. (The Journal of High Technology Management Research, 1991, p63)

The beginning of the new millennium marks a new era in global information technology and its management. While the eighties and the nineties witnessed global business and global IT expansion, the issues in global IT have now reached a new level of interest and maturity. The trends in global IT in the new millennium are irreversible, and it is imperative that we study them and address them in a serious and concerted manner. The Global Information Technology Management Association's mission is to promote the careful examination and dissemination of IT management issues in all parts of the world. The world focus is the primary and key strength of the association. While academic issues are certainly important, the association places an equal emphasis on practitioner and industry issues of information technology. (The Tenth Annual GITMS World Conference, 2007)

2.1.2 Banking Service in Nepal

History of banking service

The origin of banking activity can be traced back to B.S.1994, when the Prime Minister Ronodip Singh established an institution called “Tejaratha Adda” in Kathmandu. This institution provides loan to government employees and public against the bullion. However, it didn't collect deposits from the public and so it didn't incorporated the characteristics of modern banking system. Tejaratha Adda used to provide loan at the rate of 5% interest. The process of modern banking in Nepal was set by Nepal Bank Limited established in Kartik 30, 1994 B.S .Bank of Venice is the first commercial bank

established in 1157 A.D. Over the year, banks have been established classified on the basis of functions performed by them.

To regulate the monetary policy of the country, a central bank, Nepal Rastra Bank was established in 2014 B.S. This has been the government's bank and has contributed the growth of financial sector. Bank of England is the first Central Bank established in 1694 A.D.

Another government owned commercial bank is Rastriya Banijya Bank. It was established in 2022 B.S. This bank served the financial needs of people in urban and rural areas. To enhance agrarian economy of the country, Agricultural Development Bank was established in 2024 B.S.

The Industrial Development Bank was established in 2016 B.S .to provide financial and technical assistance to the industries in the private sectors. The industrial and agricultural revolution in U.K pioneered this type of bank.

Nepal Arab Bank Limited established in 2041 was the first joint venture bank. This bank pioneered with the marketing concept (i.e. considering customers as the top priority), in Nepalese banking system.

Nepal Postal Saving Bank was established in 1996 to encourage the thrift among the poor people. To collect deposit among members and give loan mainly to members, only a cooperative banks were set up, the origin of this of this type of bank dates back to 1800 A.D. in U.K. in the name of Credit Unions. Navajeevan Cooperative Society Ltd, Dhangadi is the first cooperative bank in Nepal, which was set up in 2048 B.S.

A new Era in Banking began in 1984 with the establishment of the first joint venture bank, Nepal Arab Bank Limited .Development of banking continued over the years and after nearly two decades of establishment of private sector banks in Nepal, Kumari Bank Limited, the first National Level Nepali Bank with 100 percent Nepalese ownership and Nepalese Management was established in 2001 Today, 17 Commercial Banks, 17 Development Banks, 5 Rural Development Banks and 57 finance companies are involved in the economic development of the Country. Also the 34 cooperatives and 40 Ingo's are operating limited banking transactions in Nepal Out of the 17 commercial Banks, 7 Banks are joint venture Banks and 2 are Government or semi government and others banks are under 100 percent Nepalese Equity. Out of above 17 banks 10 Banks are operated by Nepalese Management. Out of these, 7 banks operate or are ready to migrate in near future with higher end international banking software. (Surendra Bhandari CEO, Kumari Bank Limited, www.kumaribank.com)

Traditional Banking Model

-) Traditional Banks in Nepal Operate under sheer weight of Manpower
-) Administrative Structure is highly regimented
-) There is traditional division of labor
-) Manual Input of Records and Data
-) Limited competition
-) Transaction are circumscribed by heavy regulation
-) Minimal use of technology
-) Distribution Channels in Traditional Banking
-) Brick and Mortar Branches

-) Few distinct alternative products offered
-) Cost of consumer service is high

Main activities

-) Deposits & Lending ,Monitoring liquidity
-) Manage customer service

New Trends in Banking:

The sphere of banking products and services has crossed the border of local market and has reached in the international community. Consumers in Nepal have become more sophisticated, technology savvy and demanding Banks are now continuously required to introduce new innovative product, processes and technologies. Products are being tailored to meet each individual customer's requirement deregulation has increased competition among banks. Challenges for traditional markets may be disoriented through a fundamental shift in business proposition. Banks would require finding ways to differentiate quality of service and pricing to sustain profitability. Revenue & Growth opportunity will be limited Banks would require a decision support mechanism to help exploit market to innovate and develop new product. To adopt Technology to enhance corporate performance to Customer to retain quality Human Resource Changing business environment, globalization is highly competitive. Increasing customer expectation instant access to information faster information processing universal Banking geographical boundaries is becoming irrelevant now with increased trade and remittances. Distinctions rooted in banking are becoming blurred. Leading to a more visible convergence of markets need of total financial service solution wholesale Banking/Retail Banking is now major segment in the market.

Evolution of Technology has redefined Banking as:

-) Nepalese Banks are slowly moving from Brick & Mortar to Click and Brick.
-) Have started using technology based delivery channels.
-) Technology being used as a tool for survival and as a competitive tool in customer capture.
-) Cost of servicing customer is cheaper.
-) Products evolved with customer in mind.
-) Real time strategic information available for speedy business decision.
-) Phases in Technology adoption Early Phase of technology adoption began with the introduction of JV banks in Nepal. The main features of this phase:
 - ✓ Technology immature.
 - ✓ High risk/high award for early adopters.
 - ✓ We are now in the Growth Phase of technology adoption technology stable more players.
 - ✓ Fair scope for competitive advantage.
 - ✓ The final phase will be the Maturity Phase, which is not very far away.
 - ✓ Technology mature.

2.1.3 Banking Organization and MIS

Bank is generally understood as a place where the financial services are offered; viz. checking, saving and providing credit to the customers. The bank has a wide range of customers like individual, institution, trusts business organizations, government and local bodies. The banks deal with number transactions, which also vary widely in terms of length and complexity. Like in other service industries, in the bank, the customers also want quickly terminal results. The distinctive service in

banking is solving the customers' financial problems and quick services in transaction execution. For example, the time taken for crediting amount, withdraw of cash, the sanction of loan facility etc. The MIS of banking organization evolves around these aspects.

To avoid the inconvenience of going to a number of places for payments of small amounts, customers need service at the counter to pay electricity bills, telephone bills, taxes and duties to the local bodies and the government. Hence, MIS is to be designed to identify, decide and design a service strategy for offering distinctive services to the wide range of customers seeking variety of services demand.

Generally the following points should be taken while designing MIS for Banks:-

1. Customer database

The service expectations and perceptions revolve around the following factors:-

- Customer-individuals, company, institutions etc.
- Operator-housewife, employees, officers of the organizations.
- Range of service-saving, credit checking and payments other financial services
- Class of customers-income group, corporate bodies etc.
- Working hours-morning, afternoon, evening, etc.

2. Service for business promotions

The bank finance can be utilized in a number of ways to increase the banking operations by offering credit to the right kind of customer. Therefore, it is necessary to study the trend in the business industry and solicit the customers from the upcoming and growing business sector. The MIS should concentrate on the data collection from the various sources to

analyses and conclude the business strategy. Such information help the banker to reduce the risk of account going into the red and bad debt as well as move to talk to the customer to obtain business for the bank.

2.1.4 Management

“To manage is to forecast and plan, to organize, to command, to co-ordinate and to control”. Now more modern definitions are vastly different of Foyal’s but with more emphasis on the need guide, lead and motivate people rather than merely command. Management as defined by Mary Follette is “the art of getting things done through and with the people in formally organized groups”. Druker says, ‘management is a practice not a science. It is not knowledge but performance’.(Lucey, 2002:p91)

Management is the art and science of getting things done through others, generally by organizing and directing their activities on the job. A manager is therefore someone who defines, plans, guides, assists, and assesses the work of others, usually people for whom the manager is responsible in an organization. According to Oxford Dictionary, management is the “process of dealing with or controlling people or things”.

The management is the process that visualizes the future, sets goals to be accomplished, has the ability to effectively and efficiently co-ordinate the existing financial human material and technical resources, decentralize operation, build a good team and has a social responsibility towards the nation and its people. Management is a process that is used to accomplish organizational goals; that is, a process that is used to achieve what an organization wants to achieve. An organization could be a business, a school, a city, a group of volunteers, or any governmental entity. Managers are the people to whom this management task is assigned, and it is generally thought that they achieve the desired

goals through the key functions of (1) planning, (2) organizing, (3) staffing, (4) directing, (5) coordinating and (6) controlling. (www.askjeevas.com).

It is especially in dealing with matters of time and human relationship as they arise in organization. It is an attempt to create desirable future keeping the past and the present in mind. It is practiced in and is a reflection of a particular historical era. It is practice that produces consequences and effect that emerge over time. (Stoner, Freeman and Gilbert, 2000:p21)

Management can be viewed as a function, a process, a profession or a class of people. And along with material, capital and labor, management is considered as a resource. It refers to the kind of tasks and activities that are performed by managers. The various functions of management are as follows:

-) **Planning:** It is a process of determining the goals and the objectives. All activities leading to the formulation of objectives or goals and deciding upon the means of meeting them. It is the process of deciding in advance the courses of action to be followed; when and also, how to undertake these actions.
-) **Organizing:** Building a meaningful effective structure of authority and the relationship is known as organization. It refers to the grouping of people and activities in order to facilitate the achievement of the organizational objective.
-) **Staffing:** Staffing involves manning the position in an organizational structure. It requires defining the manpower needs per position or centre of activities. It requires appropriate selection of the person.
-) **Directing:** It is the process of activating the plans, structure and group efforts in the desired direction. It is needed for implementation of plans by providing the desired leadership, motivation and proper communication.
-) **Coordinating:** Coordinating is the function which brings a harmony and smoothness in the various group activities and individual efforts directed towards the accomplishment of goals.

) **Controlling:** Controlling is a process of measurement of an output, comparing it with the goals, the objectives and the target, and corrective actions, if the output shorts of the stated norms. Control is the mode of checking the progress of plans and also, correcting any deviations that may occur along the way.

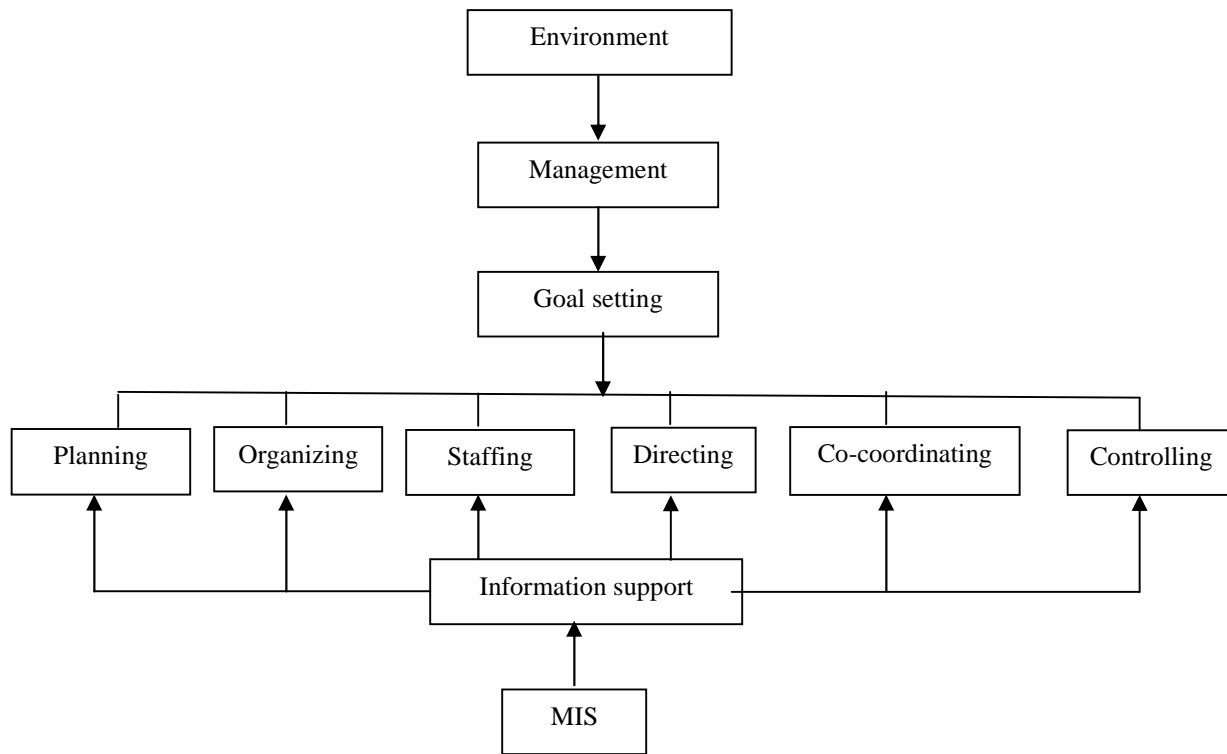


Fig. 2.1 MIS Support to Management process

Source: (Jawadekar, 2003:p17)

Hierarchy of Management

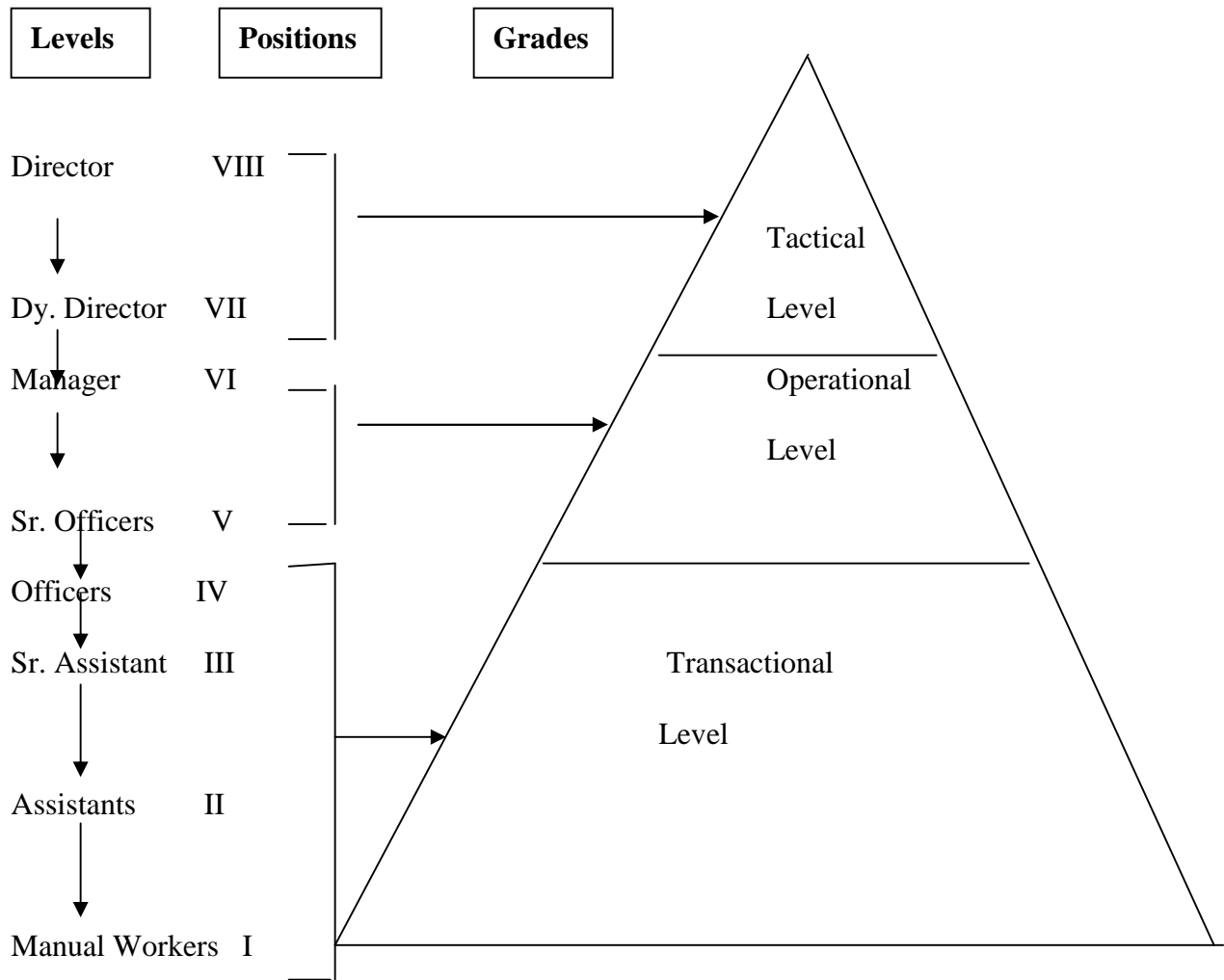


Fig: 2.2 Hierarchy of Management

Top Levels management establishes the policies, plans and objectives of the organization as well as a budget framework under which various departments will operate. Middle management has the responsibility of implementing the policy and overall plans of the top management. Junior level management has the responsibility of implementing day-to-day operations and decisions of the middle management to produce goods and services to meet the revenue, profit and other goals, which in turn will enable the organization to achieve its overall plans and objectives.

2.1.5 Information

Information highlighting on processed data rather than raw data and in the context in which it is used by managers and other end users. Traditional economists of the pre-industrial era considered only land, labor and capital as economic resources. Mass manufacturing placed a premium on technology that emerged as the major resource in later half of this century. With the recent information relevant, the prized resources are actually information. (Sadogopan, 2000:p33)

Information being a vital corporate resources, also an art, it needs to be managed just as any other organizational resources like money, men, materials or markets. Formal methods to plan, monitor, control and evaluate the utilization of this resource are needed along with the provision that this resource, like money, is available to everyone in the organization, with the appropriate authority and accountability. Information also needs to be managed with corporate strategy. (Sadogopan, 2000:p34)

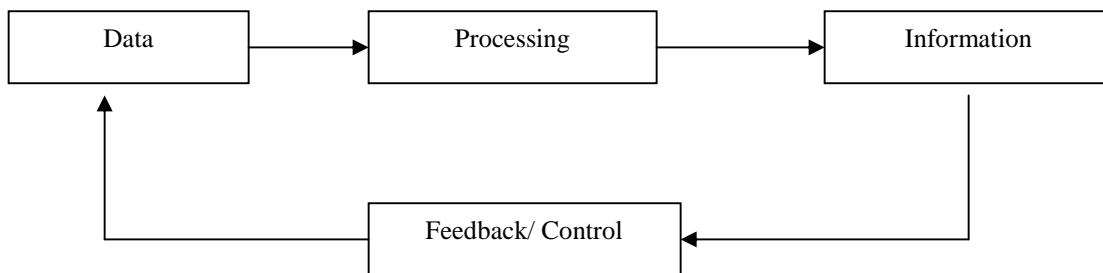


Fig. 2.3 Information

2.1.6 Information System

A system may be defined as a set of elements, which are joined together to achieve a common objective. And the information system and technology have become vital components of successful business and organization. (Davis; 2000:p6)

An information system is an organized combination of people, hardware, software and communication networks and data resources that collects, transforms and disseminates information in an organization. People have relied on IS to communicate with each other using a variety of physical devices (hardware), into processing instructions and producers (software), communication channels (networks) and stores data since the dawn of civilization. (O'Brien, 2000:p9)

Information systems are becoming of ever-greater interest in progressive and dynamic organizations. The need to obtain access conveniently, quickly and economically makes it imperative to devise procedures for the creation, management and utilization of databases in organizations. Management information and information systems, in particular those related to effective decision-making processes in an organization, i.e. MIS, are regarded as valuable organizational resources. Simply put, an information system is a system for accepting data/information as a raw material and through one or more transmutation processes, generating information as a product.

The success of an information system should not be measured only by its efficiency in terms of minimizing costs, times and the use of information resources, success should be measured by the effectiveness of information technology in supporting an organization's business strategies enabling its business processes, enhancing its organizational structures and cultures, and increasing the business values of the enterprises in a dynamic business environment.

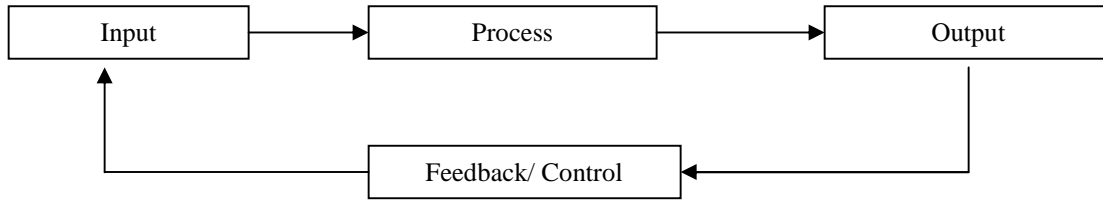


Fig. 2.4 an information system

Components of Information System

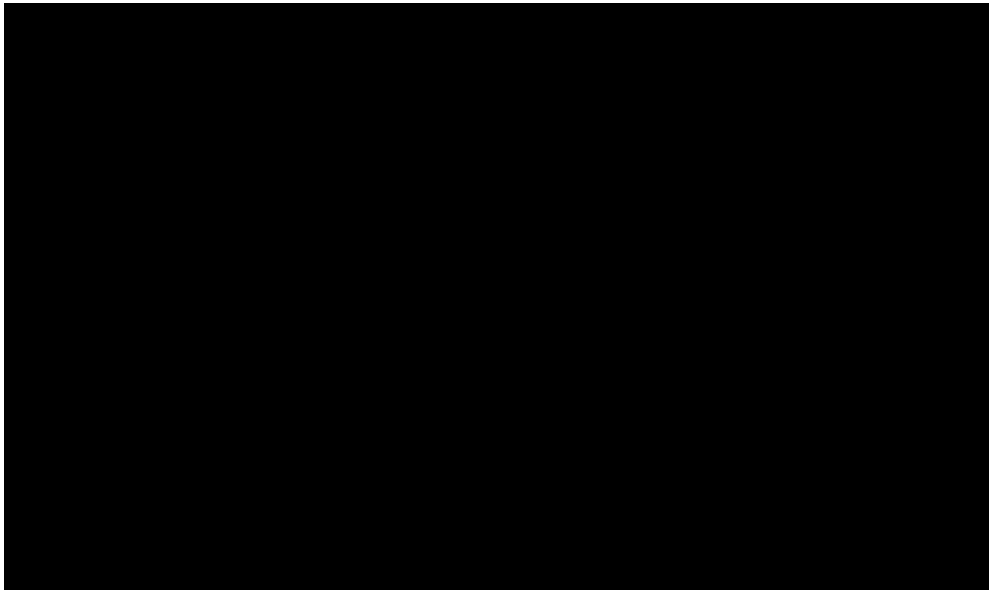


Fig. 2.5 Information System Components

Computer Based Information System (CBIS)

Information technology has become a strategic necessity. Believe it, act on it, or become a footnote in history. The revolution in business caused by the internet and its related technologies demonstrates that information systems and information technology are essential ingredients for the success of today's inter-networked business enterprise. Therefore, as tomorrow's managers, entrepreneurs and business professionals, business students must learn how to use and manage a variety of information

technologies to revitalize business processes, improve managerial decision making, and gain competitive advantage. Thus, a CBIS demonstrates how the internet, intranets and extranets can give a business a strategic technology platform that supports electronic commerce and enterprise collaboration among the inter-networked enterprises in today's global business environment.

System is a collection of interrelated and integrated components and operates in a social context and with a computer based information system; the software usually includes application programs, which perform specific tasks for users. (Lucas, 1997, p67)

2.1.7 Management Information System

It is truly the information age. Information system, information and people are the key competitive tools for all the organization. The initial concept of MIS was to process data from the organization and to present it in the form of reports at regular intervals. The system was largely capable of handling the data from collection to processing. It was more impersonal, requiring each individual to pick and choose the processed data and use it for his requirements.

Every management functions such as planning, organizing, leading and controlling are dependent on steady information regarding happenings in an organization. Only with correct and timely information, managers can monitor progress toward their goals and turn their plans in to reality. If the manager does not anticipate potential problems, do not develop the skills to recognize when corrections are necessary and do not make appropriate corrections and adjustments n every step, their efforts may be fruitless and costly or both.

Information system helps the managers to control how they are doing the business and how they are heading towards their goals. The information needs of the managers vary from one to another business entity, due to the nature of the business.

Now a days, managers at all levels are finding that computer based information systems provide the information necessary for effective operation. The MIS are rapidly becoming indispensable for planning, decision-making and controlling. How quality and accurately managers receive information about what is going right and what is going wrong determines how effective the control system will be. So the information system is playing an important role in managing organization, it has become crucial for managers to understand how these systems should be designed, implemented and managed as per the need of an organization.

MIS is defined as the systematic or organized way of providing informational support to the managerial functions of an organization. The system utilizes computer hardware, software, manual procedures, and models for analysis, planning control and decision-making and a database. In other words, “MIS is an automated system which presents information both internal and external to the business that aids in making a specific set of routine decisions”.

It is mainly related to “Information System, the information and decision system, the computer based information system.”

Management information System deals with the planning for, development, management, and use of information technology tools to help people perform all the tasks related to information processing and management.

Hence the concept was then evolved that “the system should be capable of handling a need based execution reporting. This need may be either of an individual or a group of people.

MIS is a system consisting of people, machines, procedures, and database and data models as its elements. The system gathers data from the internal and external sources of an organization, process it and supplies MI to assist managers in the process of decision making. Here, the word “system” implies that MIS follows a system approach, which means a holistic approach and is based on the concept of synergy, where the output is greater than the sum of its parts. Thus, it clearly indicates that MIS is not a single system rather than it is an integrated system where parts fit into and overall design

From the above we can summarize the concept of MIS as follows.

- IT is the effective design, delivery and use of information system in an organization
- MIS is used for keeping all data together in such a way or form that it can be assessed by any body and can be processed to suit his needs.
- Integrated and meaningful information is the output of the system.
- The primary function of MIS is to provide information.
- MIS is a facilitating or supporting system to aid managerial functions and not merely help operational tasks, that is, the MIS provides information that assists managers at different levels in the organization.
- MIS is formed from a number of components, including hardware, software, manual procedures, models and a database.
- MIS is a system of users and machines, the users are as important to the system as the machines.

From above definitions, the three most important resources of management information system are- “information, information technology and people.”

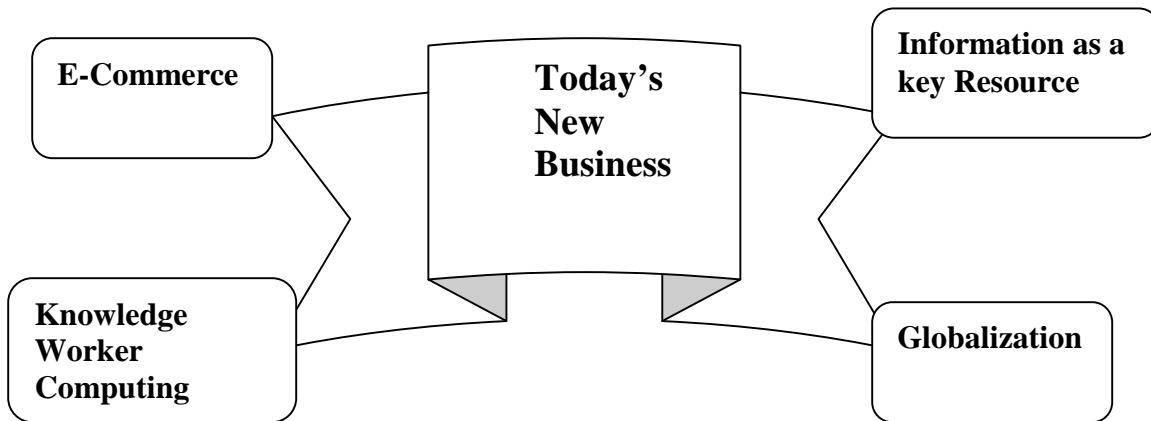


Fig:-2.6 Business Link with MIS

The Management challenges and MIS:

The MIS challenges address in three aspects as-

- 1) What business do: serve their customers
- 2) Customer moments of values: providing services when the customer wants it (time), where the customer wants it (location) how the customer wants it (form), and in a manner guaranteed to the customer (perfect delivery)
- 3) The role of information technology: to supply a set of tools that provides the right people with right information at the right time.

MODEL OF MIS

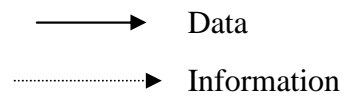
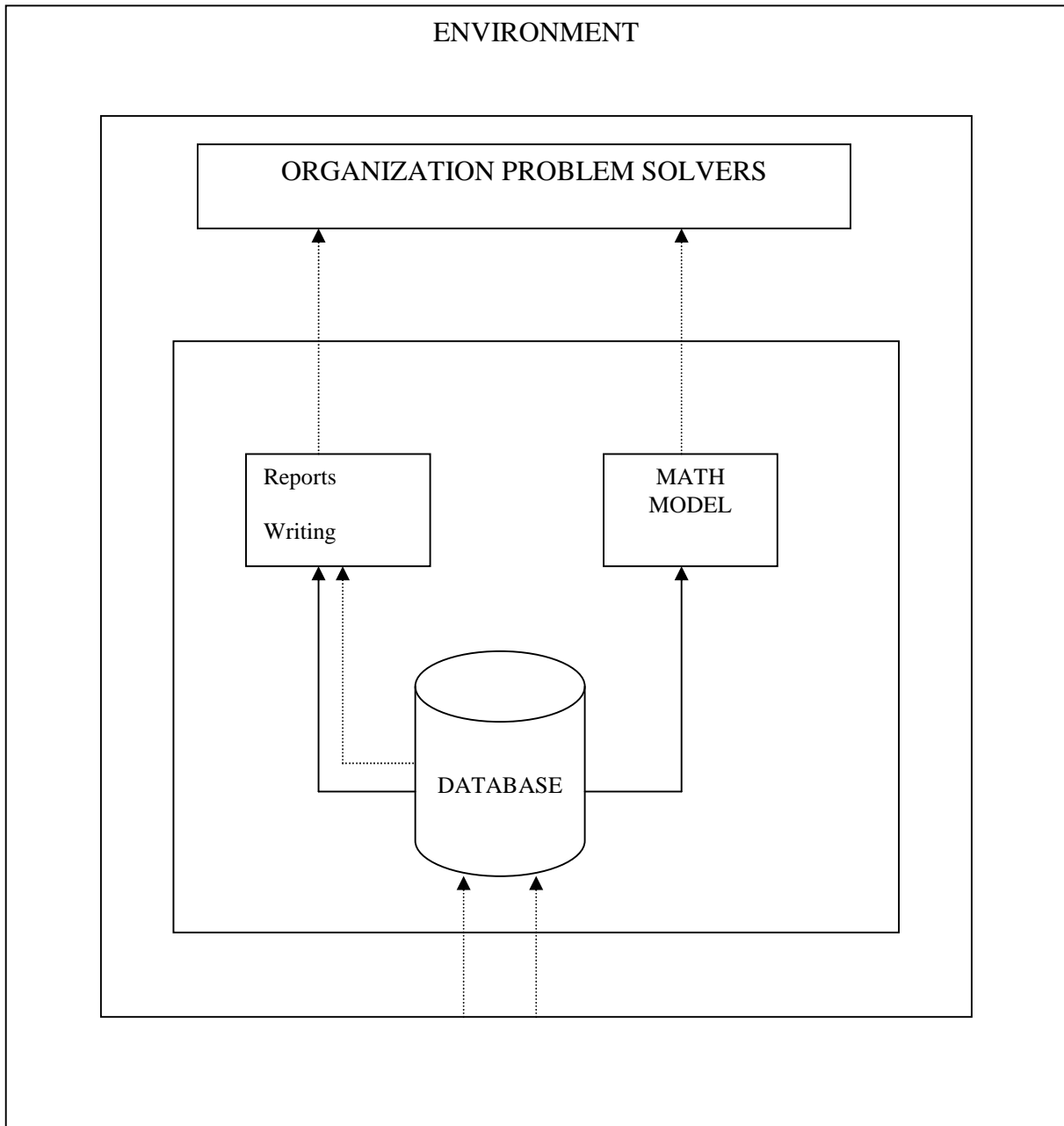


Fig: 2.7 Models of MIS

Role of MIS

-) The MIS satisfies the diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modeling Systems, and DSS.
-) The MIS helps in Strategic Planning, Management Control, Operational Control, and Transaction Processing Role of MIS in an organization can be compound with the role of heart in human body.
-) It ensures that an appropriate data collected from the various sources, processed and send further to the needy destinations.
-) Fulfill the information needs of an individual, group and different levels.
-) Satisfied the needs through a variety of system such as quire system, analysis system, modeling system, decision support system.
-) Help strategic planning, management control operational control and transaction processing.
-) Help lower level managers by providing operational data for planning, scheduling and control.
-) Help middle managers by short planning, target setting and controlling the business functions.
-) Help top managers for goal setting, strategic planning and evolving the business plans.

2.1.8 Decision Support System

The DSS movement grew out of dissatisfaction with two earlier and very successful applications of technology to management.

- Operational Research and Management Science (OR/MS)
- Management Information System

By 1970, both technologies were viewed as too limited to-

- Meet growing demand of managers for more effective decision support
- Make proper use of the expanding capabilities of information processing technologies

The origin of Decision Support System as a domain of study can be traced back to the late 1960s at the Sloan School of management. At the time, general ledger systems, financial planning models, programming languages, databases with query capabilities all came to be referred to as DSS. Was DSS just another buzzword? Contradictory claims and observations abounded on this new concept. First, there were bookkeeping systems, which made it easy to keep track of things and to generate financial statements, with the commercial computer, which automated many bookkeeping functions. Then came Management Information System (Management Reporting System) which proved so cumbersome and inflexible that management could not use them. The next panacea of buzzwords came to be known as decision support system. In 1971, under the idea of management decision systems, Michael Scott-Morton implemented a model of the production/distribution network of a major manufacturing company. The system was the first to do sensitivity (what-if) analysis of possible changes in production, distribution, and marketing. It had two important concepts:

- A convenient interactive graphics interface for users.
- The collective use of the system by individual managers improved over all organizational effectiveness- the aggregate performance of integrated operations within the firm.

Information Technology (IT) during the last decade has played a more important role in the management decision-making. It has probably been contributed to the recently reported significant increase in labor productivity in some of the technologically most advanced countries like the USA. In the coming years, investment in IT to support decision-making is likely to grow faster than ever before. This will not only affect the economies of the industrialized countries, but the entire developing world (low and middle income economies), where more than 80 percent of the world

population lives as well. Developing countries will have to cope with the resulting organizational change and will have to adapt to them to avoid falling further behind and risk execution from economic and progress.

Decision Support System (DSS) is the computer-based systems for supporting qualitative or semi-structured managerial decision-making. A Decision Support System is an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks and make decisions. In addition, Decision Support System refers to an academic field of research that involves designing and studying Decision Support System in their context of use. In general, Decision Support System is a class of computerized information system that supports decision-making activities and it integrate data management and information systems with modeling and analysis tools.

Decision Support System (DSS) is a set of the well-integrated user-friendly computer based tools that combine data with various decision-making models to serve semi-structured and unstructured problems. Such system solves a specific problem or a class of problems such as scheduling, planning, resource allocation and forecasting. Although DSS will initially targeted for helping managers and middle managers, today these system are being developed at all level of the organization. They allow manager to ask to ad hoc queries and receive customized response.

Different writers gave their concepts on DSS which are as follows:-

A computer program that provides information in a given domain of application by means of analytical decision models and access to databases, in order to support a decision maker in making

decisions effectively in complex and ill-structured (non-programmed) task. (Klein and Methlie, 1995:p6)

“Decision Support System couples the intellectual resources of individuals with the capabilities of the computer to improve the quality of decisions. It is a computer-based support system for management decision makers who deal with semi-structured problems” (Keen and Scott-Morton, 1978:p5-9)

Table: 2.1 Concepts Underlying DSS Definition

Sources	DSS Defined in Terms of:
Gorry and Scott-Morton	: Problem Type, System, Function (Support)
Little	: System Function, Interface Characteristics
Alter	: Usage pattern, System Objectives
Moore and Chang	: Usage pattern, System Capabilities
Keen	: Development Process

2.1.9 Decision-making in Nepal

-) Nepalese managers are not much concerned about improving organizational effectiveness through effective decision-making-
- ✓ Public enterprise managers suffer from centralization, instability of tenure and too much political interference in decision-making. Traditional management practices perpetuate centralized decision-making.
- ✓ Private sector enterprises are mostly family owned and managed and they do not believe in participative decision-making.

✓ Much of decision-making by Nepalese managers is concerned with men, money and motors cars.

) Rational process of decision making in Nepalese organization is not very effective. The reasons are:

✓ Very few attempts are being made to clearly identify and understand the problems by Nepalese managers and they lack good listening skills and well-ordered sense of priorities.

✓ Nepalese managers tend to identify too few alternatives for problem-solving, creating methods and participative decision making is lacking.

✓ The evaluation of alternatives was generally based on judgment of the top-level executives.

✓ The choice of the courses of action is based on the managers' experience, hunch and intuition.

✓ Decisions in Nepal are generally not effectively implemented unless the parties benefiting from decision put pressures for implementation.

✓ Decision in Nepal generally lack effective monitoring, evaluation and follow-up.

) The decision-making scenario in the public sector of Nepal is characterized as follows-

✓ Decisions are postponed for tomorrow and tomorrow never seem to come for Nepalese decision makers and it is due to manual calculation, which is time consuming.

✓ Managers are extremely busy in committee meeting and spend a lot of their time in committee but they tend to delay decision-making.

✓ Corruption has infested the process of decision-making and it seems to be on the rise.

DSS: A Support for Decision Making:

-) Explores multiple perspective of a decision context
-) Generate multiple and higher quality alternatives for consideration.
-) Explores and tests multiple problem solving strategies.
-) Facilitates brainstorming and other creative problem solving strategies
-) Explores multiple analysis scenario for a given decision context
-) Provide guidance and reduction of biases and inappropriate heuristics.
-) Increase decision-making abilities to take complex problems.
-) Improves response time of decision-making.
-) Provide control over multiple and disparate source of data.

2.1.10 Simon's Models of Decision Making

1. Intelligence phase

Before one can take a decision the problem for which solution is sought has to understand carefully and the implication of the problem are to be understood fully and grasped. This require extensive data collection, processing of available information, making of a few assumption, if needed and present of data in a form that can be used for decision making. It is well known that two main situation trigger the decision making process.

- i. A situation in which a problem is detected and the solution for the same is sought. For ex. Goods are to be transported to wagon and enough wagon are not available
- ii. A situation in which a rare opportunity comes. For ex. A well-known multinational company provides an opportunity for a joint venture.

Design Phase

In this stage, the data collected from the privilege stage analyzed and various alternatives are arrived at in order to come to a solution. Decision makers adopt various management techniques and decision management tools. All the solutions then ranked according to the various criteria. The criteria may be:

- Practical and implement able
- Cost of implementation
- Return on Investment
- Existing resources and need of resources
- Time of implementation
- Impact as structure and employee
- Outcome of solution
- Image of the company etc.

2. Choice Phase

This is crucial and complex phase in the decision making process, the design stage ranked all the solutions and presents them to decision maker for choosing a solution. Under normal circumstances, decision maker choose solution that are economically viable, which can be implemented within the minimum period of time and where the ROI is good. However, all situations are not alike. There exists a situation which make decision making complex.

- i. How to evaluate the parameter which cannot measure in quantitative value
- ii. What happens the choice if the data are uncertain
- iii. What happens team conflict arises in group decision making

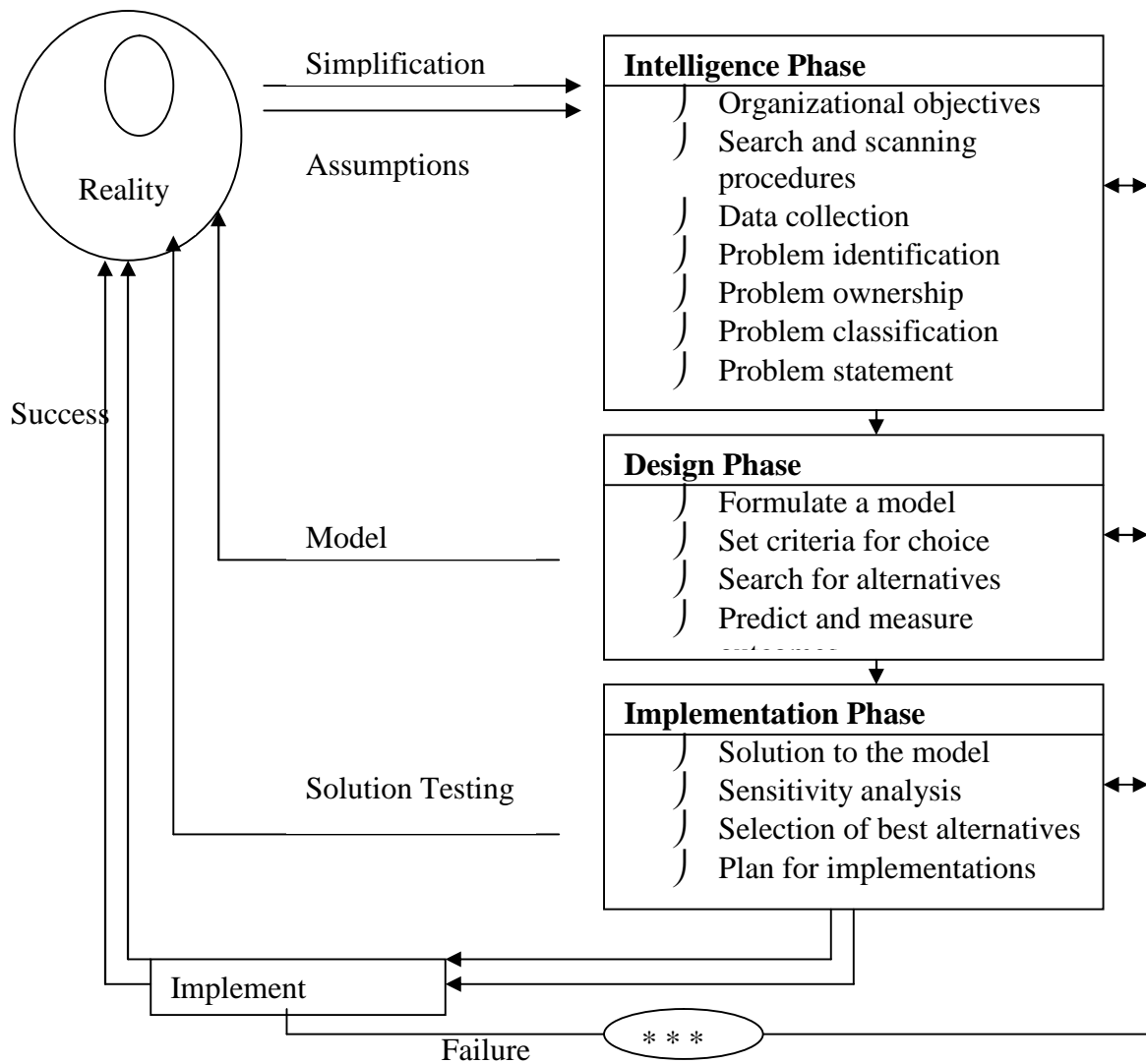


Fig: 2.8 Simon's model of decision making

2.1.11 Integrating MIS and DSS

Some of the earliest applications for supporting management decision making were Management Information System (MIS). MIS primarily provides information on the firm's performance to help managers in monitoring and controlling the business. They typically produce fixed, regularly scheduled reports based on data exerted and summarized from the organization's underlying Transaction Processing System (TPS). Sometimes MIS reports are exception report, highlighting only

exceptional conditions, such as when the sales quotas for specific territory fall below an anticipated levels or employees who have exceeded their spending limit in a dental care plan.

DSS provides new sets of capability for non-routine decisions and user's control. An MIS provides managers with reports based on routine flows of data and assists in the general control of the organization, whereas a DSS emphasizes change, flexibility and a rapid response. With a DSS, there is less of effort to link users to structured information flows and a correspondingly greater emphasis on models, assumptions, ad-hoc queries and display graphics.

MIS primarily address structured problems whereas DSS supports both semi-structured and unstructured problems and issue analysis, DSS is also intended to help designing and evaluating alternatives and monitoring the adoption or implementation process. Decision Support System (DSS) is a special class of system, which is used as a support in decision-making. DSS is a set of well integrated, user friendly, computer based decision making tools that can combine internal and external data with various models to solve unstructured and semi-structured problems. (Laudan, 2003:p405)

2.2 Review of Articles

Dr. Sunity Shrestha (1985) in her article "Information System Management in Nepal", discussed broadly about different types of information needed for various management levels, its management system and how it helps to decision-making process in an organization. It also focuses on problems associated in Nepalese context regarding information management.

The data needed at top levels is different from operational and middle level. An organization needs more aggregate and accurate data at top level, as they are responsible for policy formulation and decision-making. External information in competing organization and technology development are

vital for to compete with others and up-to-date the organization. At the operational level, mostly internal information in detailed form is used for daily activities whereas more summarized information is needed at middle level. Manager at this level are responsible for analyzing the differences and try to find out problem. Such detailed information produced at lower level is used for management functions at upper level.

She further discussed about manual Vs computer processing of information. The choice of processing methods should depend on types of information, volume and nature of data and types of organization. Computer is not essential for MIS. For small organization with low volume of data, manual processing is more economical and effective but while processing of large volume to data computer processing is more efficient.

Jyoti Ratna Tamrakar (2002), with reference to review of articles published in The Rising Nepal entitled 'Importance of MIS'

According to the article, "The greatest achievement of last century is computer. The world now with our computer is simply in imaginable. A work, which takes many days to finish, can be accomplished in a few minutes with the help of computer. It seems that use of computer and other information technology gadgets is slowly coming of age in our country.

The primary function of MIS is providing accurate, timely and relevant information need for efficient decision-making by the manager in an organization.

The history of human resources development in the IT sector of Nepal is not very old. The first computer training was held by the Central Bureau of Statistics of Nepal Government in 1970, in which some 15 people were trained in data processing for the national population census of 1971.

Then in 1981 census, the UK government had provided high level computer education and training to twenty technical officers. Again five senior officers of National Computer Centre (NCC) were given basic training in The UK and advanced in USA in 1986.

At the University front, Kathmandu University started B.E in computer engineering in 1994 whereas the Institute of Engineering under Tribhuvan University started in 1998. Pokhara University and Purbanchal University also followed next by starting bachelor's degree in computer science like BE, BCA, BIT, BIM and BCIS in 2001.

The council of Technical Education and Vocational Training (CTEVT) also offers skill-oriented computer courses as an academic course. About 25 institutes out of 165 CTEVT institutes are running this course at present.

Now a day business and industries are increasingly using computers. Similarly the different ministries and department of Nepal Government, NTC, travel agencies, airlines, hotels, banks and Nursing Homes have also started using computers. This has resulted in the increased demand for trained and skilled computer personnel. (Jyoti Ratna Tamrakar, The Rising Nepal: 2002)

2.3 Review of Master's degree Thesis

An effort was made to conduct a resembling study of the topic mentioned and proposed through existing documents and thesis reports. Though a synonymous report was not found, reports with high relevance in the methods to be applied and the documentation process were of great help.

Ishwar Acharya (2002)'s study on *Implementation of MIS in Nepal Airlines Corporation*' is a case study of the marketing department of NAC. This thesis documented successfully in terms of its ability

to explain the marketing department business processes of NAC and the advantages that the organization will be benefited with the implementation of the proposed management information system. The study has tabulated data strongly and has carefully reviewed the pre-implementation and post-implementation scenario in context to the implementation of the proposed information system.

His study covers the major objectives as follows:

-) To find present and analyze existing IS of the Marketing Department of NAC.
-) To examine the flow of information to co-ordinate and communicate different divisions and units of Marketing Information System.
-) To provide recommendations on the basis of major findings that has been drawn out the research study.

During the research study, there have been some commentaries found. The study has commented upon the lack of IT experts in the organization, the weakly managed marketing department of NAC, reluctance to newer and efficient technologies, diversified but not well interconnected network structure, lack of staff for maintenance of the system, improper infrastructure with poor attention on regular checkup and updates, notion of one time imbursement in infrastructure and less attention paid by the management of NAC to computerize the entire marketing system.

Major Findings:

-) The information system in Marketing Department is based on Traditional paper-based information and manual filing system. Manual flow of documents except computerized Reservation System of international flight ticket through ABACUS and other CRS software.
-) Lack of acceptable manpower and IT experts to handle sophisticated information technology to maintain proper information system within the department.
-) Centralization of authority, manual flow of documents and unnecessary political pressure

generally creates obstacle to perform marketing activities smoothly.

-) Lack of proper informational infrastructure to communicate with different domestic stations causes problems in planning flight schedules.
-) Micro computers in each division are not utilized. They are used only to keep records to some extent and used to type material whenever needed in order to submit the report to the department director and CEO.
-) Information does not flow systematically due to absence of Network Based Computerized information system to coordinate and communicate with different divisions and units of the Marketing Department.
-) Network-based computerized information system is necessary for systematic flow of information.
-) It is difficult to implement MIS due to lack of necessary infrastructure of the Marketing Department of RNAC such as:
 - Lack of equipment and accessories
 - Lack of technical manpower
 - Lack of IT experts.

Yet the study has some amount of incompleteness i.e. gaps which can be expressed in terms of the followings.

-) The study assumes that the organization's marketing department, which is the principal basis of the case study done, has a multidimensional structure. According to the thesis documentation, this assumption has been made to simplify the process of mapping the collected data to the organization structure. Thus the real time evaluation of data tabulated has not been made.

-) The implementation of the proposed system has been expected to be a difficult implementation in terms of the expertise and training required to install, maintain and regularize the usage of the system. This fact has been accredited to the conclusion withdrawn that the organization lacks the expertise in terms of IT enabled manpower.
-) The distribution of task explained is monotonous and centralized. The study could have achieved a stronger scope if it had made an attempt to encompass wider dimensions, and not only look within the boundary of the marketing department but also accumulate the interaction of the department with the rest of the system.
-) The mode of the study is quite conventional. It follows the conventional trend of formal methods of data collection using minimally descriptive questionnaires.

Durga Prasad Neupane(2002)'s Management Information System as a significant tool for effective management of an organization is another case study of NAC which concluded that there is no doubt that use of computerized information system in an organization can help to boost the efficiency and productivity of the organization. He carried out the study with the following objectives:

-) To study the practical and theoretical aspect of management information system.
-) To study existing information system/ flow of information in different departments, especially in personnel and general service department of NAC.
-) To examine the practice of maintaining information system in NAC.

Neupane's study has given the detailed form of employees and their availability and management system. It tried to study the clear work division to the employees. His attempt has been to list out the benefits that RNAC can have if it tries to implement the proposed system and regularize the usage of

the system through effective user training. The study also has a good focus on the observation method that was used as the major method of data collection. It has explained in detail the process of observation and interviews conducted, the core need of MIS that is practical for RNAC and general idea about why and how an effective implementation of MIS helps to make the management effective.

His major findings are as follows:

-) MIS satisfies the information needs of the people in the particular organization pyramid.
-) Network based computerized information system is the first requirement for this organization to maintain modern information system.
-) There is lack of well trained and skilled IT experts and manpower to maintain computerized information system within the organization and departments.
-) MIS is not implemented due to the high cost of technical manpower.

A few major research gaps from Neupane's study which will be relevance to the study of Global Information System have been mentioned below:

-) The conceptual framework that builds the base of the study on RNAC has been explained in detail and has an attractive explanation to the core concepts of the implementation of a management information system.
-) The focus of the study has remained in the conceptual framework, theoretical aspect of implementation of a revised system and the enormous amount of review of existing literature done. This fact has had an indirect impact on the system design part where Neupane's study is weak.
-) The study has fewer details about how the proposed system can be used for a practical advantage.

Lamsal Asim(2003) carried out a study on “Information System Design of ADB of Nepal”. The study is entirely related to use of IS to perform overall activities. The overall objectives of this study is to analyze about system analysis, system design, data flow, and networking as well as information collection and flow through IS, required for process of management, decision making and practice of MIS. His study carried out the following objectives:

-) To find out how the information system help banks to rise the overall performance of the bank.
-) To examine practices of maintaining information system in ADB.
-) To examine the flow of information to coordinate and communicate different units and divisions.
-) To find out existing information system / flow of information in different divisions.

The research methodology followed by him is mainly based upon the primary and secondary sources of information and data. The study is a descriptive and a simply exploratory research design. The major findings of his study are as follows:

-) The bank has brought about changes in its system from time to time in order to cope with problems encountered during the process of program implementation seeking immediate solution to the problems faced.
-) The MIS department has developed an information flow system.
-) The study also finds out the strength and weaknesses of the system and its importance in the banks. The major strengths are: it collects, compiles and analyze data on a regular basis and provides their analyzed result.

Lamsal has given a good description on the simplistic model of MIS implementation. The study has some incompleteness. The fact based on historical data on implementation of MIS concludes that it is not an easy always. He leaves out the other half of the implementation process and explains only about a model that suits ADB. Unfortunately, theoretical studies are not always practically feasible.

The study also has a shortened system explanation. Its data flow diagrams and system overview of the proposed system is not self-explanatory.

2.4 Research Gap

Researches are different from each other. But research that I have made is in the field of ‘Global Information system’ is totally different from previous researches. This study has tried to find out different issues on information system and technologies in the world and also in Nepal. The study has gone through various books, articles, websites and newspapers related with information system and its utilization. Today what I’ve done in my thesis is the result with the help of those materials. After reviewing the thesis present in Shanker Dev Campus and T.U, central library, it can be drawn that all off the thesis are based on information system utilized in different organization. But they do not compare them to any one. Using of information system is not the main issue but the main issue is its proper use and facilities and advantages taken from it. I have tried to focus on the information systems used globally and Nepal’s progression in lagging on it. I have tried to compare Nepal’s information technology with global issue and impacts faced by Nepal.

Chapter-III

Research Methodology

There has mentioned different objectives in the first chapter. To accomplish these objectives, the study follows the following research methodology as described in this chapter. Here methodology means that, what methods are used to find out the fact about the topic. Here mentioned the process of collection of data, different analytical tools and analyzing methods.

3.1 Research Design

In order to examine and evaluate the performance of information system globally and in Nepal, the study has followed a systematic process of collection, compilation, presentation and interpretation of relevant details and data. The study takes descriptive and empirical research approach to achieve its objectives.

Research design is a framework for the researcher in a particular task. The research design of this study is analytical as well as a descriptive approach. The main objectives of study are an examination and evaluation of Information System used. The study is closely related with the various Information System activities is the world and in Nepal.

This study examines the current role of MIS in enhancing global information system and different technologies in use with a view to make suggestions for improving the utilization of MIS. Keeping in view the nature of the study, an exploratory research design is applied because it implies to find out the current role of existing Management Information System in an organization.

The first step in fieldwork is to design the framework of the research. The task begins with the collection of necessary data and information concerning the study. The data and information collected must be studied carefully and presented then systematically and get them analyzed so as to meet the objectives of the fieldwork. The research design phased for this fieldwork is shown in the figure.

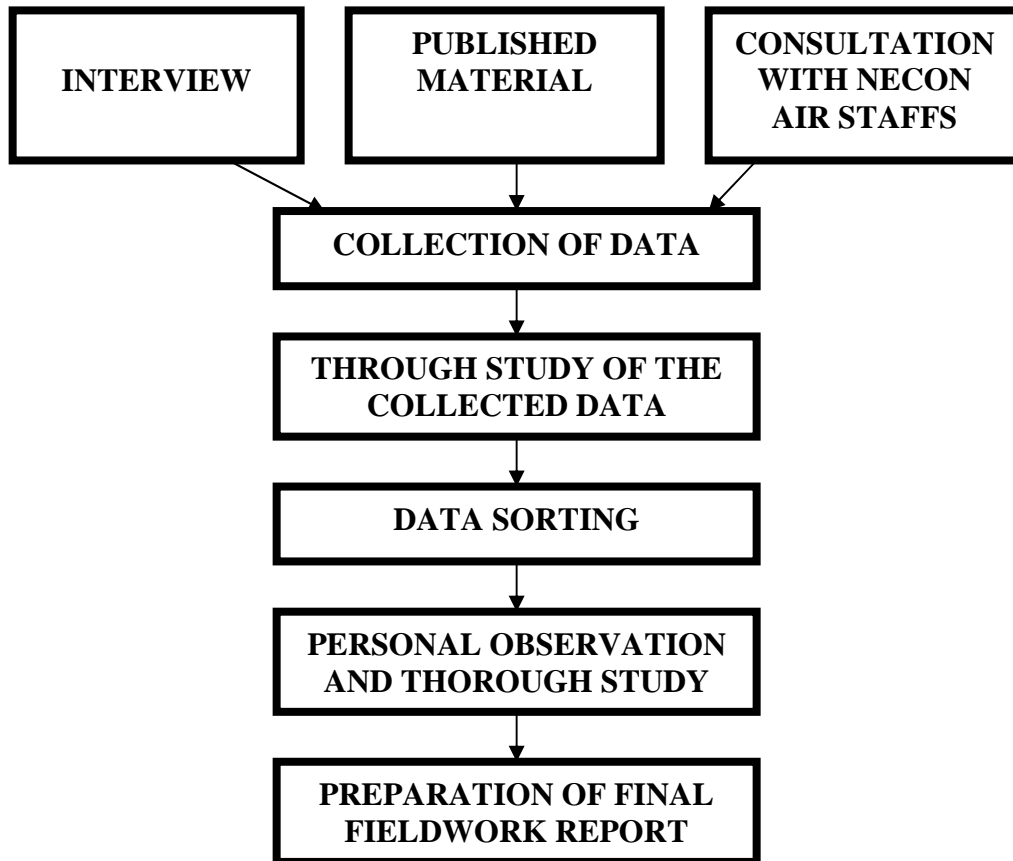


Fig.: 3.1 Research Design Applied for Methodology

As per the above diagram, first of all the necessary data related with Global Information System and Technologies have been gathered. For the collection of data, the researcher made official visits to different organizations and institutions which were using computerized system. Most of the data has been collected from Websites, Internet and books, newspapers since the issue is of Global aspect. Collection of data consists of compiling of data of only that useful information to quantity and

analyzes how the data helps and assists the study of the project. Then the researcher made a thorough study of all the data collected. After that, necessary data have been sorted and analyzed in a systematic manner. Personal interviews and observation have also been conducted as per the requirement. Thus, after the collection of primary and secondary data, the final fieldwork report has been prepared.

3.2 Population and Sample

The concept of information system is still in its initial phase in Nepal. Banks have adopted the computerization instead of manual only a few years ago. The concept of information system has just entered in joint venture banks. Mostly the banks follow the same process and software for information system utilization. So altogether banking sectors in Nepal and other global banks are taken as the main key for the study.

3.3 Sources of Data and Information

Most of the study is based on the secondary data collected from different newspapers, internet, and articles. Data may be obtained from several sources. It also depends on the objectives and necessity of the field report. The research design for this fieldwork was based mostly on the exploratory design method. Thus, the sources of data collection were both based on primary and secondary sources. The sources of data collection can be explained as:

Primary data:

The data is collected for meeting the specific objective of the study. During the fieldwork, the primary data has been obtained by conducting structured interviews with the concerned person, personal observation and also by conducting personal interviews in public places.

Secondary Data:

Apart from the primary data, other data has been also collected from the secondary source. The main sources of Secondary data are the brochures, annual reports, published reports and statements, published official documents etc. The secondary data are the main sources of the research for world issues. Secondary data has been collected through the following methods.

) **Book and Internet review:**

It is one of the popular methods of collecting secondary data. Pre-published reports like Articles, Reports, official documents of related fields, brochures of institutions relating to information system, booklets, related IT magazines, newspapers internet, different websites etc has been reviewed to collect information about the issue itself, its history and performance over the years, possible competitors, and users, and many others has been analyzed. Similarly, unpublished reports and seminar papers were also reviewed.

) **Review of previous study:**

The method of collecting data where there has already been some previous research or study so as to provide information to its readers or researchers who are working to gather information about the similar subject. If there has been any kind of research done in previous years then the data and information gathered from such a source is termed review of previous study.

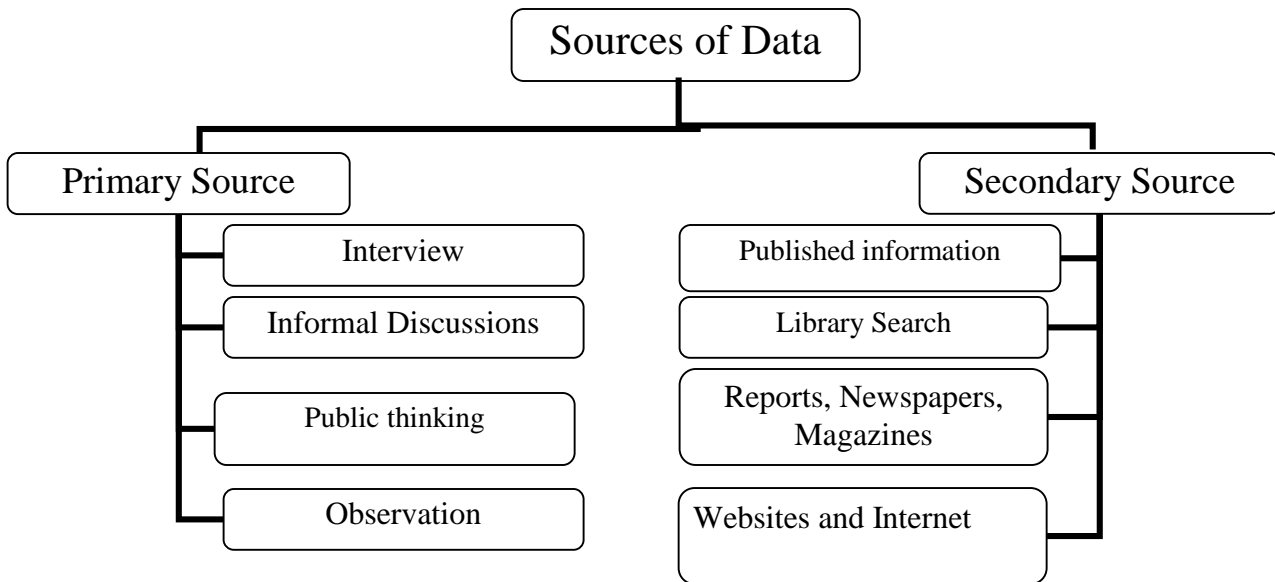


Fig. 3.2 Sources of Data

3.4 Data analysis tools

Collection of requirements, tabulation of data, tables, charts, graphs and reports are inevitable in a process of study when numerical figures are taken into account. A software design process is incomplete, and often cumbersome, if a proper tool is not used to assist the system analyst and the system design team.

At various stages, various tools has been analyzed, designed and developed. Focus here is the analytical aspect of the phases of study, where the tools and technology used have been described below.

3.4.1 Microsoft Office Visio Professional 2003

Microsoft Office Visio Professional 2003 is a CASE tool that gives business and technical users the power to visualize and communicate ideas, information, and systems. During the study, the simple,

flexible tools in Visio 2003 were used to create business and technical charts and graphics that capture and communicate the general idea of the application and the stages of process diagrams and application modeling with impact.

The following jobs have been done with the help of Visio 2003.

) *Block diagrams:*

Using it, a wide range of diagrams as use case diagrams and activity diagrams were created to assist in understanding and planning concepts, systems, and processes.

) *Business Process:*

The ability to express business process through its diagrams using templates and tools to create common business graphics to analyze and communicate complex systems as the MIS implementation including conceptual charts, decision tree, flow diagrams, process and procedural charts, and time and activity charts.

) *Charts and Graphs:*

The Charts and Graphs template provided ready-made shapes for graph elements and were used to create bar graphs, line graphs, pie charts, and graphs with special effects.

) *Organization Chart:*

Organizational chart was used to graphically represent relationships among people, operations, functions, and activities in organizational hierarchies.

) *Database:*

Visio also provides specific solutions for database diagrams that support the modeling technique, relational notations, object-relationship models, entity-level and schema-level diagrams, and product data models that were handy in creating the required diagrams for the documentation process.

3.4.2 Data Flow Diagram (DFD)

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system but it does not show program logic or processing steps. A data flow diagram can also be used for the visualization of data processing (structured design). It is common practice for a designer to draw a context-level DFD first, which shows the interaction between the system and outside entities. This context-level DFD is then "exploded" to show more detail of the system being modeled.

With a dataflow diagram, users are able to visualize how the system will operate, what the system will accomplish, and how the system will be implemented. Dataflow diagrams can be used to provide the end user with a physical idea of where the data they input, ultimately has an effect upon the structure of the whole system from order to dispatch to restock how any system is developed can be determined through a dataflow diagram. A data flow diagram illustrates the processes, data stores, and external entities in a business or other system and the connecting data flows. The four components of a data flow diagram (DFD) are:

-) External Entities/Terminators/Sources/Sinks (represented by a square or oval)
-) Processes (represented by a circle or rounded rectangle)
-) Data Flows (represented by an arrow)
-) Data Stores (represented by two parallel lines, sometimes connected by a vertical line)

DFD object symbols:

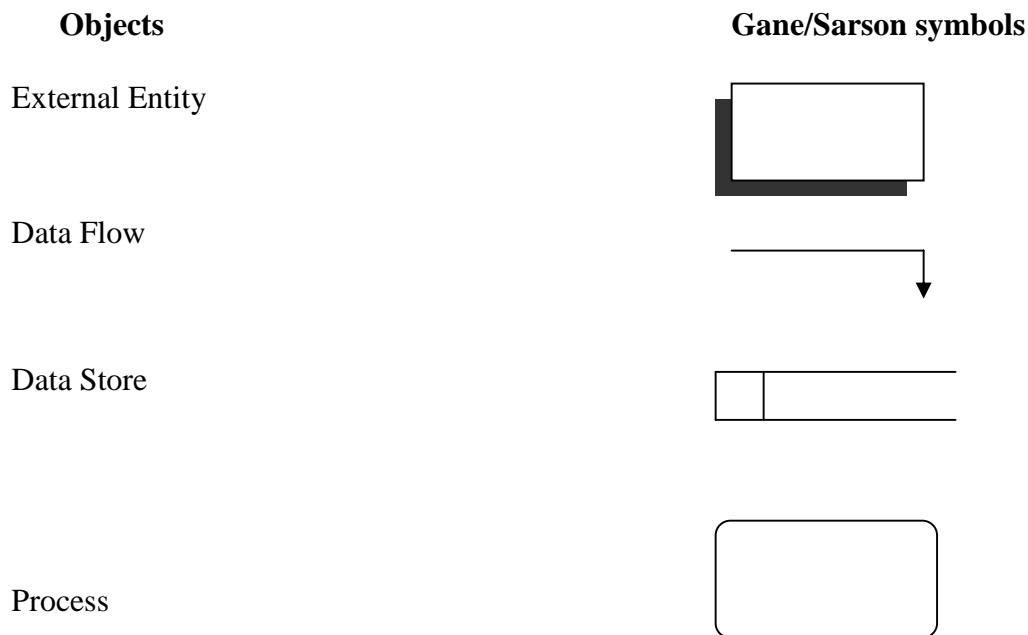


Fig: 3.3 Symbols of DFD Objects

3.4.3 Entity Relationship Diagram (ERD)

An entity-relationship (ER) diagram is a specialized graphic that illustrates the interrelationships between entities in a database. It helps the analyst understand the organizational system. ER diagrams often use symbols to represent three different types of information. Boxes are commonly used to represent entities. Diamonds are normally used to represent relationships and ovals are used to represent attributes. Both types of symbols representation are shown below:

ERD object symbols:

Table 3.3: ERD Object Symbols and Description

Objects	Description
Entity	An entity is an object or concept about which you want to store information.
Attributes	Attributes are the properties or characteristics of an entity.
Key attribute	A key attribute is the unique, distinguishing characteristic of the entity. For example, an employee's social security number might be the employee's key attribute.
Relationships	Relationships illustrate how two entities share information in the database structure.

CHAPTER-IV

PRESENTATION AND ANALYSIS

4.1 Data Presentation and Analysis

This chapter presents the data collected from various sources in an organized form and analyzes them according to the tools presented in chapter three. Since the major objective of the thesis is to know about the different developments in the field of information system and technologies globally and its use in various units of banking sectors such as computerized accounting (Voucher, Profit/Loss Account, Balance Sheet and so on), E-Banking (e-payment, debit card, credit card and so on), the data is analyzed in that fashion. This will try to analyze and present different development phases and impacts in Nepalese context.

4.2 Agenda & Issues

1, Based on detailed interviews with IS executives, charged with managing international IS outlined a global IS research agenda with four areas: (1) matching global IS strategy to global business strategy; (2) issues involving the technical platform for global IS applications; (3) issues involved in international sharing of data; and (4) issues of IS projects spanning cultures.

2, In a "key issues" study, Dean & Ricks grouped issues for GIT into the following categories: (1) managerial/strategic, (2) technological/application, (3) host country social/cultural, (4) host country economic, (5) host country technological, and (6) host country political/legal. (Deans, P.C. and Ricks D.A., The Journal of High Technology Management Research, 2, 1, 1991, 57-81)

The beginning of the new millennium marks a new era in global information technology and its management. While the eighties and the nineties witnessed global business and global IT expansion, the issues in global IT have now reached a new level of interest and maturity. The trends in global IT in the new millennium are irreversible, and it is imperative that we study them and address them in a serious and concerted manner. The Global Information Technology Management Association's (GITMA) mission is to promote the careful examination and dissemination of IT management issues in all parts of the world. The world focus is the primary and key strength of the association. While academic issues are certainly important, the association places an equal emphasis on practitioner and industry issues of information technology.

4.3 Prospects of IT-Sectors (E-Commerce in Banking) in China, 2002-2008

China's IT sector is expected to boom over the next few years in every field of commerce that may be in banking or other business due to the following factors:

- ❖ Strong economic growth which stimulated strong demand for IT products and services.
- ❖ Need for more business services to serve China's increasing diverse needs after its accession to the WTO.
- ❖ Increased globalization and opening up of China's economy which creates the necessity to compete globally.
- ❖ Emerging digital industry and commerce.

4.4 E-banking Service in China

China's central bank is drafting regulations concerning e-banking and guidelines for e-banking risk management, which are expected to be promulgated soon.

China's imminent entry into the World Trade Organization, the first impact on the banking industry will be competition from e-banking, that it is an "inevitable" task for China to speed up e-banking development and increase the competitiveness of the financial sector.

More than 200 branches and subsidiaries of some 20 banks have their own web sites and homepages, with more than 50 of them providing substantive on-line services to over 400,000 customers. In June last year, the China Financial Certification Center (CFCC), sponsored by the central bank and composed of 12 commercial banks, was established. Under the coordination of the central bank, China is speeding up national credit card integration, and the integration is expected to be completed among large and medium-sized cities by 2008. At least 2.5 million Chinese "citizens" -- about 23 percent of the country's regular Internet users - are likely to use electronic banking services, said a recent AC Nielson survey on e-banking. The survey found 23 percent of Internet users have tried some basic e-banking services, of which 30 percent have even tried more than two e-banks. About 100,000 Internet surfers use online banking services every day, 337,000 people use them once a week and over one million use them once a month.

4.5 E-Banking in the U.S., Japan and Europe

Information technology is fundamentally changing the banking industry worldwide, altering traditional definitions of product, market and customer base. Internet banking has significantly reduced barriers to entry, accelerating financial disintermediation. Competitive impacts of e-banking are more pronounced in the U.S., where non-bank financial service providers have made significant inroads into banks' traditional turf. Yet, U.S. banks are sitting on the sidelines, embracing online banking largely as a defensive strategy. Online banking in Japan has been largely confined to the domestic customer base. European banks have leveraged Internet banking for cross-border expansion,

consolidation and competition. However, e-banking in the European Union with a single currency raises regulatory and technical issues.

Businesses worldwide are being reinvented and reengineered with the advent of the World Wide Web. In particular, Internet technology is fundamentally changing the global banking industry, blurring the traditional lines that define product, market and customer base. Today, the click of the mouse empowers consumers with unprecedented freedom in choosing vendors for their financial service needs. Despite the bursting of the Nasdaq dot-com bubble, Internet banking is growing and maturing at home and abroad.

Banks perform a critical role in financial intermediation, and society benefits as banks bear risk in leveraging their liabilities, customer deposits. But the revolution in information processing has lowered entry cost, thereby increasing competition among banks, and competition between banks and other financial institutions, such as security brokers. The less efficient have been forced to merge and consolidate. In short, technology has fundamentally altered the creation, delivery, reception, and utilization of financial products, and advances in computing and telecommunication have eroded economic and regulatory barriers to competition, de facto (Greenspan 1997, Pg.26).

During the first half century of the information era, the U.S. dominated innovation and standardsetting in technology related to the Internet. However, when it comes to wireless technologies, Japanese and European companies are far ahead on the learning curve. According to Beck and Morrison (2001), penetration, use and integration of mobile phones into normal activities are much greater in Northern Europe than in the U.S. Europe leads in palm organizers and mobile web-browsers and perhaps in the innovations based on wireless information technology.

INTERNET REVOLUTION

The average consumer has accepted the Internet and e-commerce with phenomenal intensity and speed. According to Good (1998), electricity was invented in 1873, and it took 46 years for mass adoption of this technology throughout the world. It took 35 years for telephones, 22 years for radio and 16 years for PC's. For the World Wide Web, it has taken only 6 years.

As late as January 1998, only 770 banks in the U.S.-seven percent -offered online services. One year later, an estimated 4,990 banks were offering or planning to offer full service Internet banking. More significantly, over 65 percent of small- and medium- size community banks planned to introduce electronic banking to their customers (Nathan, 1999,13). Online customers account for more than 20 percent of the total, and growth is accelerating in the U.S. (Serif 2000,16).

In 1999, Internet banking sites numbered 1,845 in Germany, Belgium, Holland, Spain, United Kingdom, Italy and Ireland. Germany has the largest number of sites while France is the fastest growing market. The U.S. during this same period had only one third as many sites as these eight countries, even though the U.S. had an internet population more than twice that of all of Europe (Stewart-Allen 1999,19).

Several factors account for the fast growth in Internet banking in Europe and the U.S. First, PC and Internet banking have significantly reduced the barriers to entry in the banking industry in both continents. The accounting firm Booz, Allen and Hamilton estimates that it costs approximately \$25 to \$30 million to set up a traditional brick-and-mortar bank but only \$6 million to set up an Internet bank in the U.S. Secondly, as e-commerce is rapidly accepted by businesses and consumers, bank customers have come to expect convenience and technical innovation in the services provided by their banks. Third, while Internet banking operations are not yet profitable to most banks, the cost of attracting and maintaining customers with online banking is so low that investments in electronic and Internet banking are irresistible to banks and non-bank financial institutions. According to a survey by

Booz, Allen and Hamilton (Nathan 1999,Pg15), an estimated cost of providing the routine business of a full service branch is \$1.07 per transaction, as compared to 54 cents for telephone banking, 27 cents for ATM banking and a paltry one and one-half cents for Internet banking.([Multinational Business Review](#), [Fall 2002](#) by [Pyun, Chong Soo](#), [Scruggs, Les](#), [Nam, Kiseok](#))

4.6 Nepalese Banks' Existing System Analysis

At the initial stage of computerized banking, only data are kept in computer for easier management and findings of data. Data are collected from different fields and stored with proper management. The data collected internally or external to the organization i.e. from the environment, known as, Raw Data are to more that they are very difficult to manage. The data is collected and edited and the next step is to organize it i.e., to present it in a readily comprehensive and condensed form which will highlight the important characteristics of the data, becomes easier to compare and it is suitable for further processing and interpretation. At that time computerization mean to be the use of computer as data collection, processing and retrieving of data easily. At that time data like personnel information, accounting information, marketing information and so on are kept, which can be shown as follows:-

Marketing Department:-

Sources of Information → Storage of Information → Use of Information

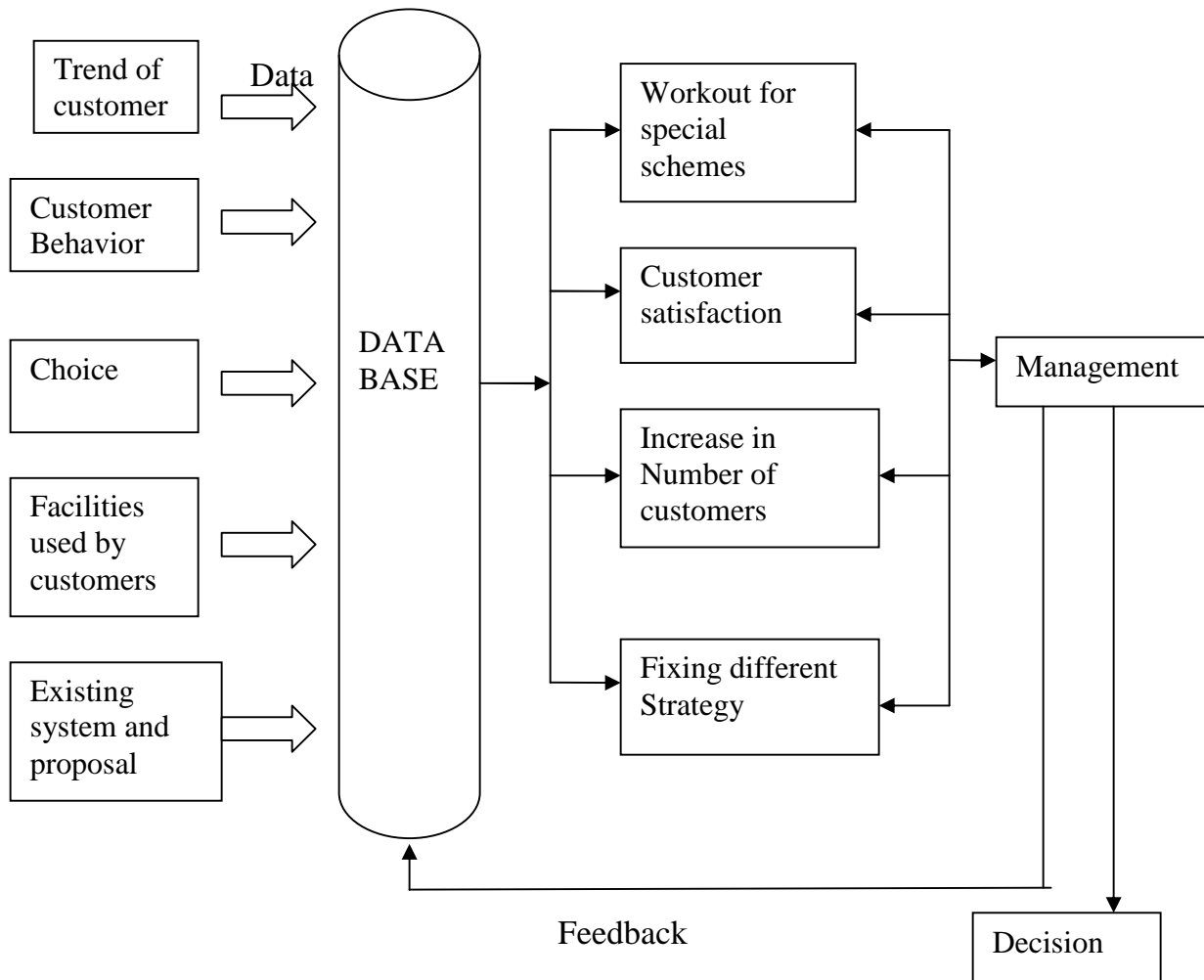


Fig: - 4.1 Flow and use of information in Marketing Department

Marketing Department is one of the important departments of an organization. In the above diagram, information is collected from different sources. Trend of the customer (Deposits and withdraw, volume and amount), customer behavior shown by the customer to the bank, choice (the different suggestions of the customers), the facilities that are being provided by the bank to the customer and existing and proposed products produce by the bank, these all are the source of information for the

bank. All the necessary information is gathered and then it is sent to the database for the storage of the information.

The management for decision purpose uses the information that is being stored. The information that is being gathered is used for working out for any special schemes, for the satisfaction of the customer, to increase the number of customer and fixing different strategies. These all information is used by the management when it is needed. Then the management takes the effective decision.

Personnel Department:

Sources of Information → Storage of Information → Use of Information

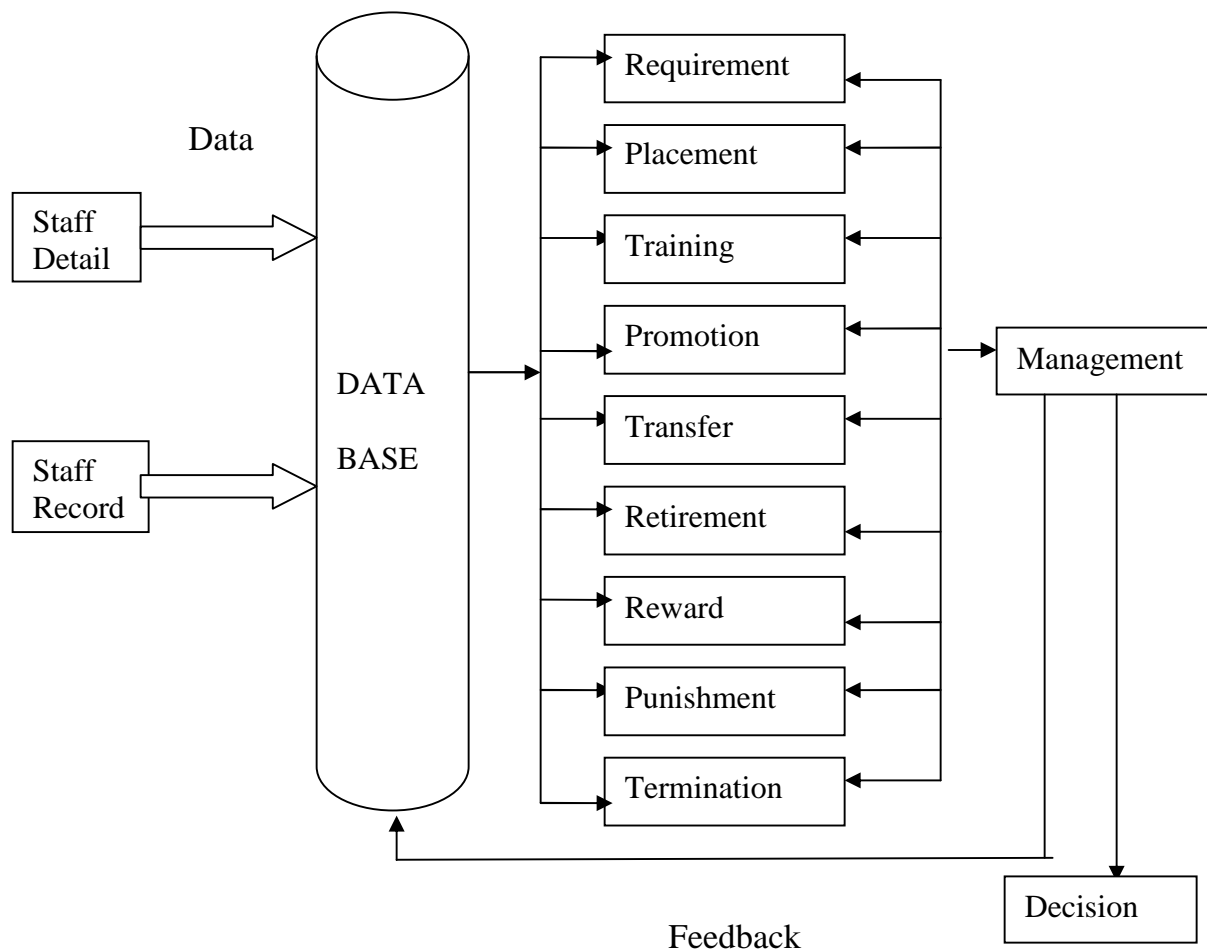


Fig: - 4.2 Flow and use of information in Personnel Department

Personnel department is one of the important departments of the organization. In the above diagram personnel department have two sources of information. One is the staff details and another one is staff record. These information are sent to database for the storage of information.

The stored data give the information about the Requirement, Placement, Training, Promotion, Transfer, Retirement, Reward, Placement and Termination. When the management needs the different information about the personnel department then it just send the query to the database and then information are gathered for taking the management decision effectively.

Legal Department:

Sources of Information → Storage of Information → Use of Information

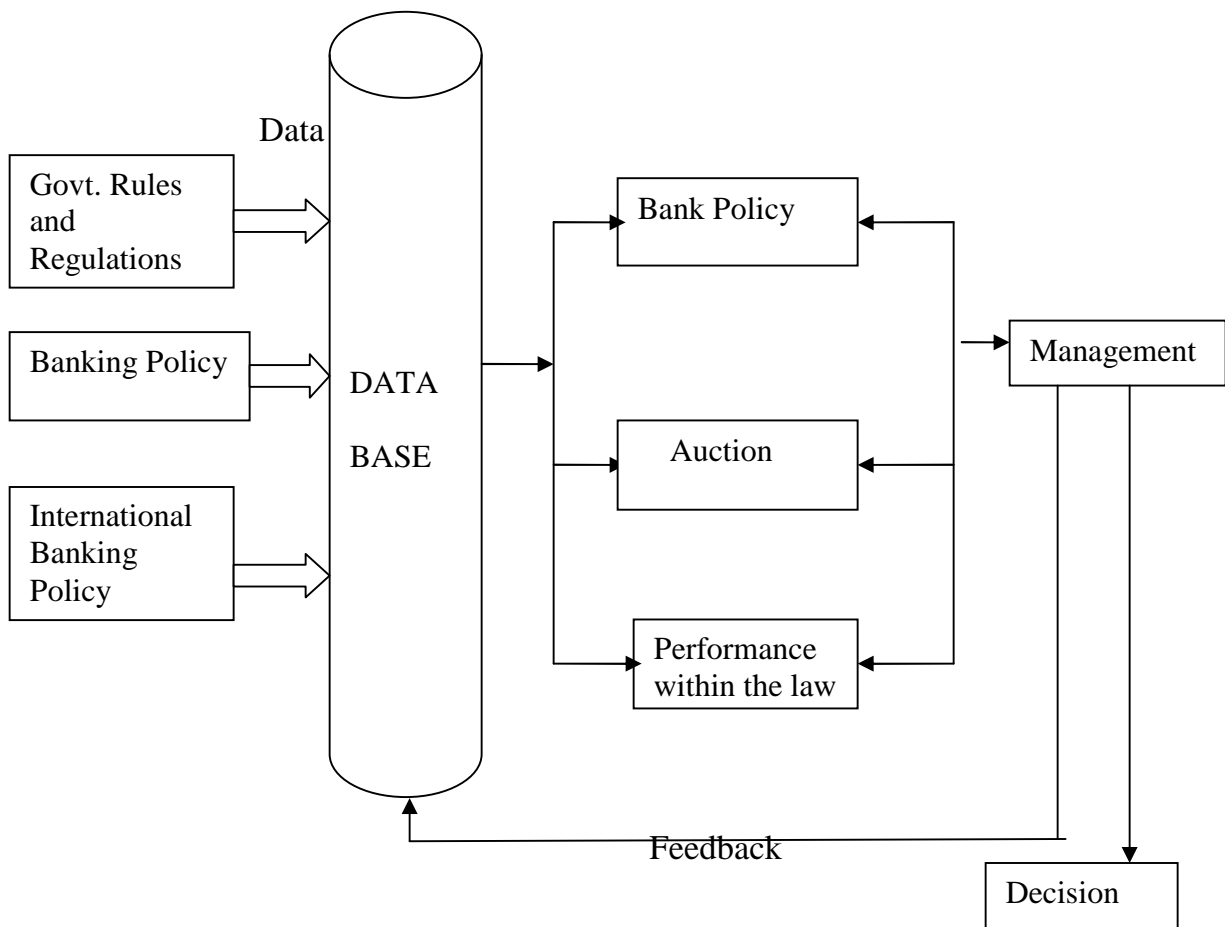


Fig: - 4.3 Flow and use of information in Legal Department

As the legal word comes, we all know that it is related with the Law. Every organization should perform the work according to the law that is provided by the country government. The source of information for the legal department is the government policy, banking policy and then international banking policy. The organization should perform its task according to the policy that is provided by the government, the policy that is being provided by the international banking and banking policy. If the bank does not perform the activities according with the policy then the bank is performing its activities against the law. The information is collect from the sources and sends to the database for the storage of information.

The information that is being stored is used in the bank policy, for the auction and to perform the bank activities within the law. The bank should perform its activities within the law. The bank should perform its activities within the law because if the bank does not perform its activities according to the law then the Central Bank takes the action with the bank and goodwill of the bank will be lose.

Planning and Research Department:

Sources of Information → Storage of Information → Use of Information

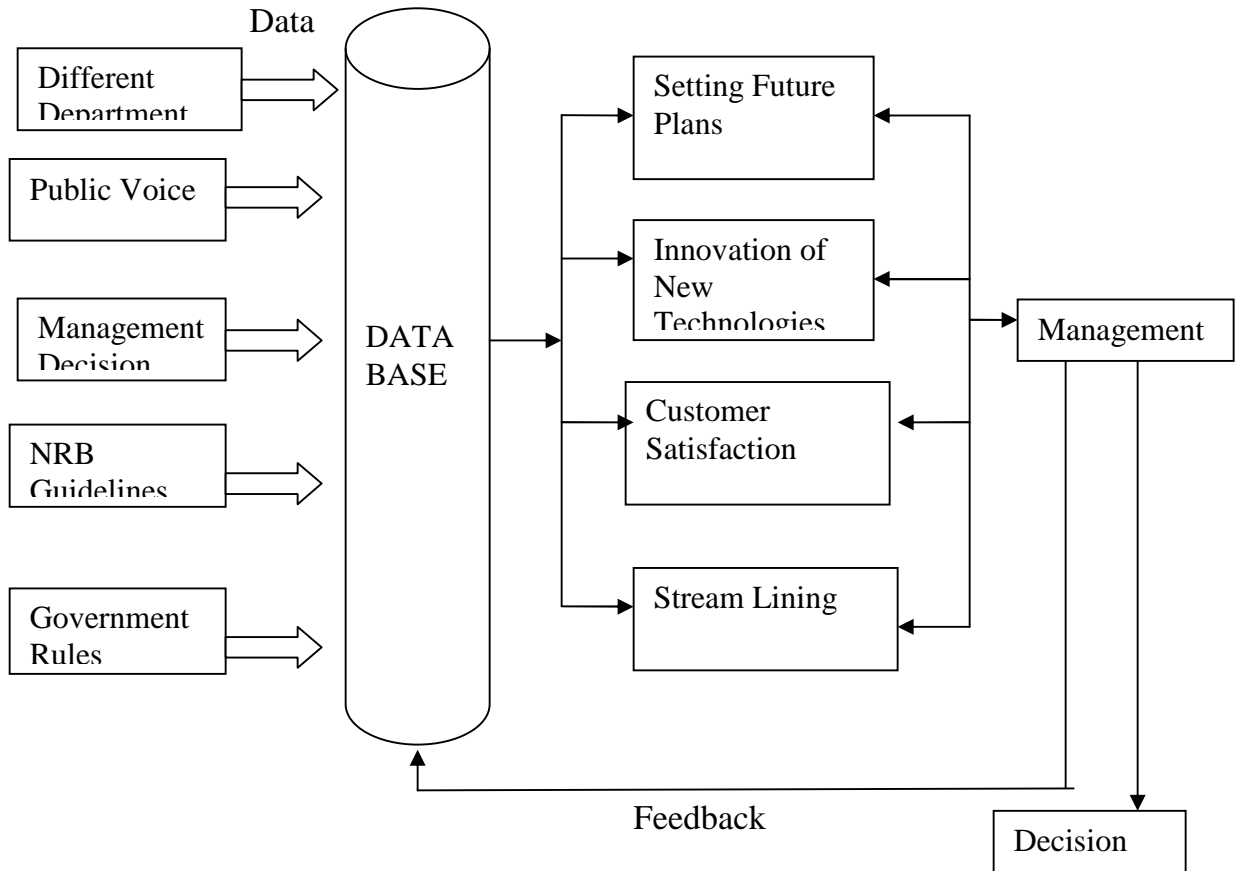


Fig: - 4.4 Flow and use of information in Planning and Research

Before doing anything we do the research and make plan so that the activities that we perform goes in the planned way without any obstacles while performing the work. In the same manner the organization also plans the activities before their performance. To make a plan different information is needed and the source of the information for the management are the information that has been provided through the different departments, the public voice, the management decision, planning are done by the help of the NRB guidelines and are within the government rules. These all information is stored in the database for the future use, when the management need then the information is taken for use.

The above activities are very much old for global banking concept but these are just applied in Nepalese banking sectors. Also it can be realized that most of the Nepalese private banks are in joint venture, most of them are using the computerized activities in their regular activities.

Mostly the banks in Nepal are using some new technologies although they have no full ideas about these technologies, which can be as follows:

Internet Banking:

Most of the banks are using or trying to use the system as the beginning approach due to which the customers are directly or indirectly facilitated in online account balance, on demand account statement, loan repayment schedule and many more.

ATM Services:

Now-a-days there can be seen ATM services in most of the banks in Nepal. The most famous network technologies using in ATM service are SCT (Smart Choice Technology), and VISA card. The ATM machine can be seen around our cities to facilitate the customers. The client can withdraw the money they want without going to bank and without queue.

SMS Banking:

Some banks are using this technology due to which the customers will be able to get some facilities as online account balance, recent account transactions, exchange rate from their home or from any place they need.

Any Branch Banking:

This product, integrated with core banking system has enabled us to make certain operations like withdrawal and deposit of cash and cheque from any branches possible. Customers maintaining an account with any of the branches of any banks can walk in to any of the branches convenient to them

for operation of the account that means they are not restricted to a particular branch for operating that account. The facility is given to the customers but not in the managed form. Now a days the banks are using highly sophisticated Global Banking System nevertheless they are unable to utilize most of the facilities due to lack of internal configurations such as inter branch cash withdrawal from ATM, signature verification, slow performance, NRB reporting, Loan reporting etc.

PROPOSED SYSTEM OVER EXISTING SYSTEM

4.7 Introduction

This system project gives the description of software design of the Core Banking Solution (CBS) as well as e-Banking Solution (EBS). It describes the various modules / sub-programs use, dependencies among them and briefly about what they do.

4.7.1 Purpose of This Research Project

This SDS intends to serve as description of the software design of this development project. It describes the data, architectural, interface design of the project. The functional features along with the interface details, design constraints and related considerations such as performance characteristics are also explained.

4.7.2 Scope of the Development Project

The project is mainly based on the idea of developing an open source banking solution which would replace the existing costlier banking solutions. All the operations that are carried out in the bank manually (like new account registration, deposit, withdrawal, cheque book issue etc.) would be performed automatically and easily by the Core Banking Solution. This would also enable the banks

to reduce their annual budget on software expenditures by a greater percentage. There would just be no need to spend hundreds of crores on the banking software any more; as the project would be developed on Open Source License based Technologies. It could also be modified by a group of experts as per requirements and at any time. The concept of centralized banking is taken into account in this solution. A well interfaced GUI would be used for connecting to the main database server for updating and retrieving the data of the customers. It would also deal with the Employees of the Bank, their registration, removal, manager allotment, etc

The e-Banking Solution deals with the customers. It would facilitate the customers to perform a wide range of functions like check blocking, fund transfer, cheque book request, viewing account statement etc over the internet. This would reduce their pains to go to the bank each for each and everything. The Customer would no more be considered as the 'Customer of the Branch' but shall be considered as 'Customer of the Bank - No Geographical Limits'.

4.7.3 Definitions, Acronyms and Abbreviation

Bank : A place where the customers deposit money for safe keeping.

Bank Employee : The employees of the bank who perform the banking operations.

Bank Customer : The people who have an account in the bank.

CBS : Core Banking Solution

EBS : E-Banking Solution

4.7.4 Overview of Documents

The purpose of this document is to write down formally the requirements considered to be necessary for building the CBS and EBS. The first section provides a brief idea about the working of the project along acronyms, definitions, abbreviations, and reference materials. Section 2 provides overview of the system, and a brief description of all the system functions. Section 3 gives a detailed description of the components.

4.8 System Architecture Description

This section is the main focus in the first version of the SDS, the high level design. This should give a good view of exact organization of the system as per the requirements.

4.8.1 Overview of Modules/ Components

The project is divided into three main modules i.e. Core Banking Solution (CBS) and e-Banking Solution (EBS), and the Central Server.

The CBS deals with the operations of the bank which are performed by the bank employees. The EBS deals with the general need of a customer.

The Central Server is the My-SQL Server and Apache Server which host the main database and customer interface respectively.

CBS MODULES / SUB-PROGRAMS:

1. LOGIN SYSTEM (CBS)
2. NEW CUSTOMER REGISTRATION
3. NEW GENERAL ACCOUNT CREATION

4. UPDATE ACCOUNT INFORMATION
5. UPDATE CUSTOMER INFORMATION
6. CLOSE GENERAL ACCOUNT
7. ACCOUNT INFORMATION
8. GENERAL TRANSACTION
9. LOAN ACCOUNT TRANSACTION
10. CHEQUE BOOK STOCK ENTRY
11. CHEQUE BOOK STATUS
12. CHEQUE BOOK ISSUE
13. CHEQUE BOOK BLOCK
14. NEW PASSBOOK ISSUE
15. ADD USER TO CBS
16. REMOVE USER FROM CBS
17. CREATE ADMINISTRATOR
18. CREATE SUPER ADMINISTRATOR
19. REMOVE ADMINISTRATOR
20. NEW EMPLOYEE REGISTRATION
21. REMOVE EMPLOYEE
22. REGISTER NEW BRANCH
23. UPDATE BRANCH INFORMATION
24. EMPLOYEE INFORMATION
25. LOGOUT SYSTEM (CBS)

EBS MODULES

1. LOGIN SYSTEM (EBS)
2. ACCOUNT SUMMARY
3. TRANSACTION SUMMARY
4. UPDATE CUSTOMER PROFILE
5. REQUEST NEW CHEQUE BOOK
6. BLOCK CHEQUE
7. CHANGE CUSTOMER LOGIN PASSWORD
8. LOGOUT SYSTEM (EBS)

CENTRAL SERVER

1. MY-SQL DATABASE (BANK)
2. APACHE SERVER (WEB)

4.8.2 Structure and Relationship

4.8.2.1 Client-Server Relationship

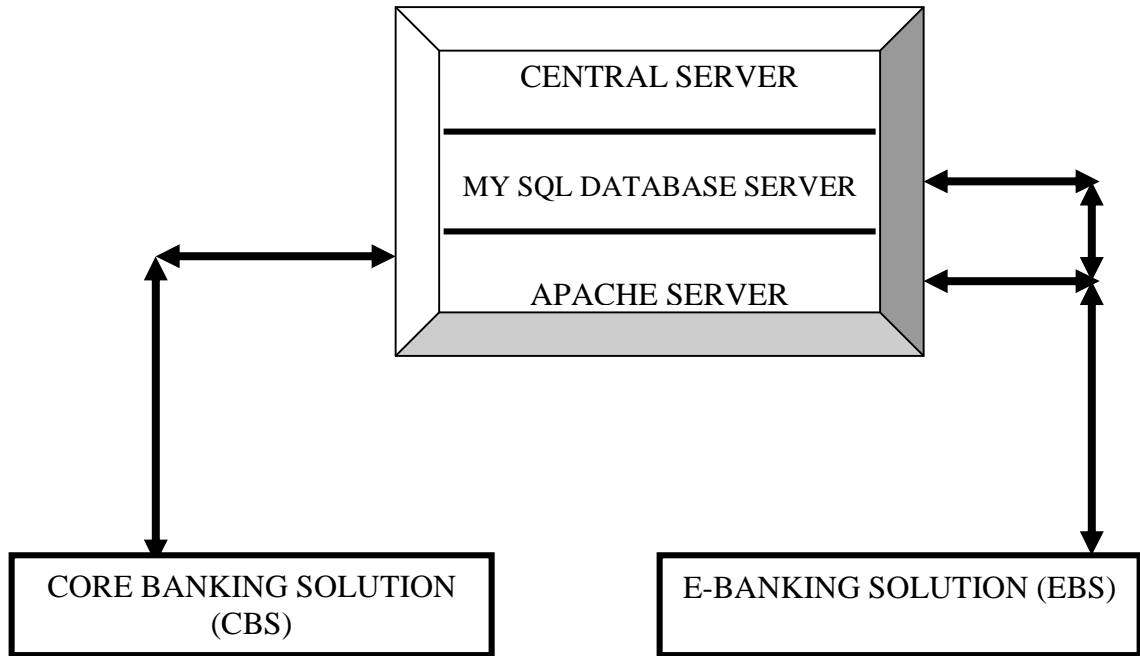


Fig: 4.5 Client Server Relationships

The CBS connects to the MYS-QL Database for performing the operations on the bank accounts data.

The EBS connects to the Apache Server for getting the user interface (web page) for the customer as well as it also connects to the MY-SQL Server for carrying out operations for the customer.

4.8.2.2 DFD OF E-BANKING SOLUTION (EBS)



Fig: 4.6 Zero Level DFD of E-Banking Solution

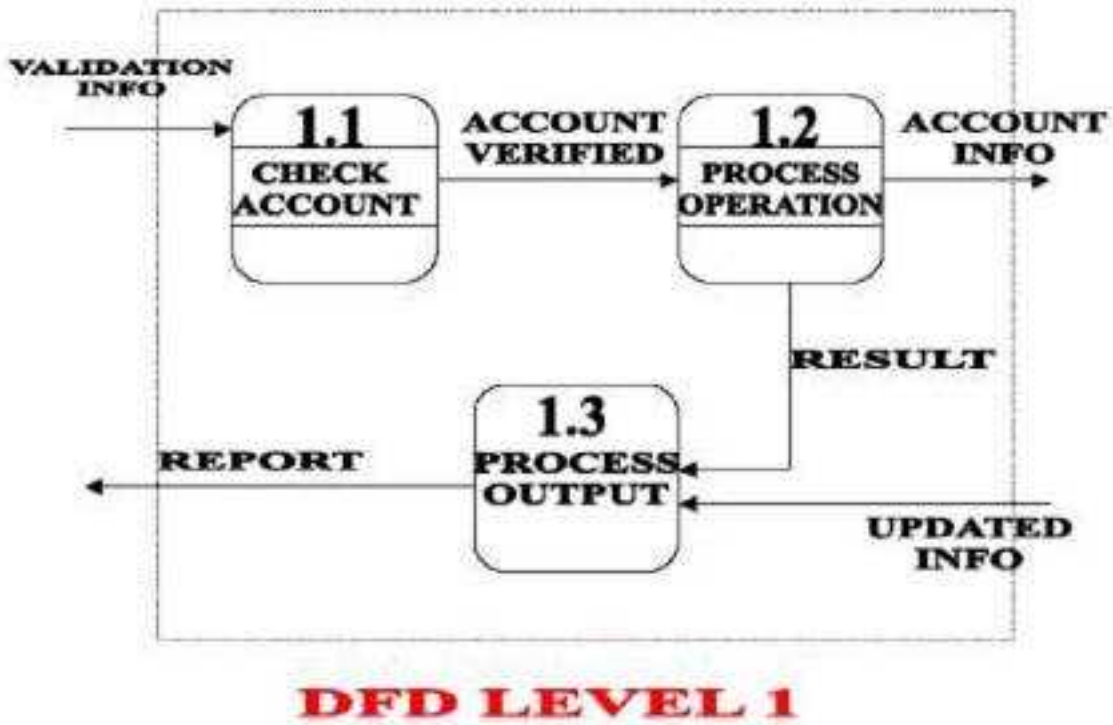


Fig: 4.7 Level-1 DFD of E-Banking Solution

4.8.2.3 DFD OF CORE BANKING SOLUTION (CBS)



Fig.4.8: Zero Level DFD of Core Banking Solution

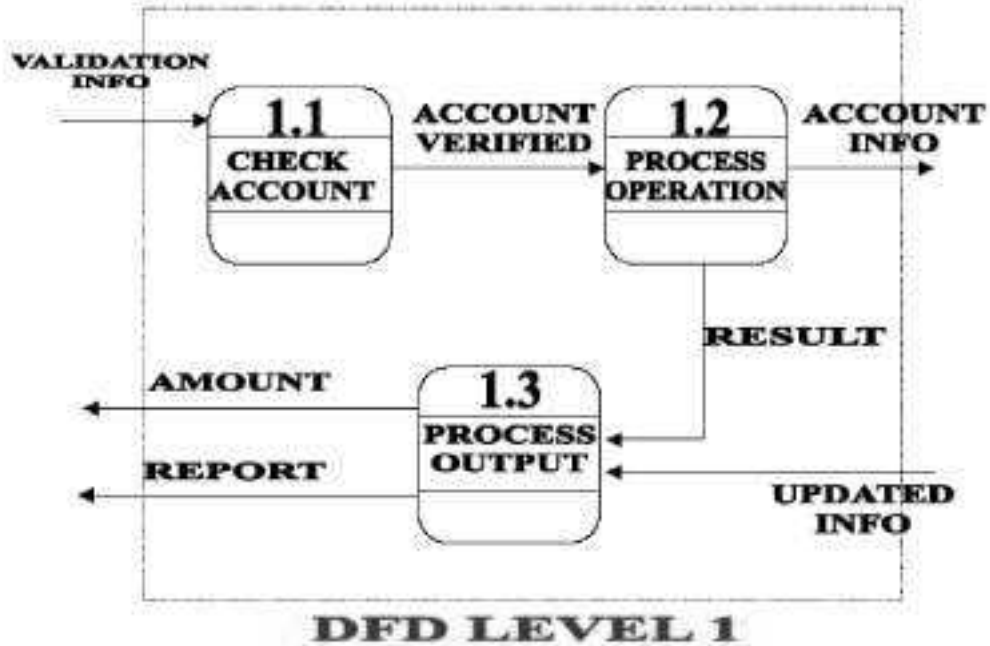


Fig: 4.9Level-1 DFD of Core-Banking Solution

4.9 User Interface Issues

The CBS has a well designed and user friendly Graphical User Interface (GUI). The user i.e. the bank employee is required to Login first by providing the user id and password. After successful validation the user is taken to the main form where he is able to perform various operations by the help of the menu-driven GUI.

In the EBS the front page is the login page where the customer would login by providing his / her password. After successful validation the customer is taken to the main account summary page. Various links are present in that page for various operations.

4.10 Detailed Descriptions of Components

4.10.1 Component Template Description

Identification: The unique name for the component and the location of the component in the system.

Type: A module, a subprogram, a data file, a control, a procedure, a class, etc

Purpose: Function and performance requirements implemented by the design component. Derived requirements are not explicitly stated in the SRS, but are implied or adjunct to formally stated SDS requirements

Function: What the component does, the transformation process, the specific inputs that are processed, the algorithms that are used, the outputs that are produced, where the data items are stored, and which data items are modified.

Subordinates: The internal structure of the component, the constituents of the component, and the functional requirements satisfied by each part.

Interfaces: Detailed descriptions of all external and internal interfaces as well as of any mechanisms for communicating through messages, parameters, or common data areas. All error messages and error codes should be identified.

Resources: A complete description of all resources (hardware or software) external to the component but required to carry out its functions. Some examples are internet connection, databases, memory, CPU requirements if any, I/O channels, printers, CD-writers, libraries, and system services etc.,

In the Component Description given below, the following assumptions are made:

USER: The person who is using the CBS or EBS and is an employee of the bank.

CUSTOMER: The person who has an account in the Bank

EMPLOYEE: The person who works in the Bank. Every USER must be an employee but not the vice - versa

ADMINISTRATOR: The USER who has the highest privileges over all other USERS in a certain branch

SUPER ADMINISTRATOR: The USER who has the highest privileges over all other USERS and ADMINISTRATORS in all the branches.

4.10.2 CORE BANKING SYSTEM (CBS)

Table: 4.1 Login Systems

Identification	LOGIN SYSTEM (CBS)
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : <ul style="list-style-type: none"> • Create a GUI for validation of user credentials • To validate a bank employee's credentials
Function	The employee gives the user id and password in the respective fields of this GUI.
Subordinates	It uses the following functions for achieving the purpose : <ul style="list-style-type: none"> • validate null- For checking the presence of empty check box • error msg. box-For displaying an error message when required • on between login quit clicked-Exits the CBS application
Interfaces	<ul style="list-style-type: none"> • It is called either during the starting of CBS or after Logout from the Main Window • If an error occurs during validation, then an error message is displayed
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table 4.2 New Customer Registrations

Identification	NEW CUSTOMER REGISTRATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : <ul style="list-style-type: none"> • Create a GUI which would be used to pass the details of a new customer to the database • A valid customer has to be created before the creation of an Account
Function	The employee fills the user data in their respective fields and then clicks on the Register Button For clearing the values already typed, the user clicks on the Reset Button For Exiting from the GUI to the Main Window, the user clicks on the Exit Button.
Subordinates	<ul style="list-style-type: none"> • Create new Customer-Regd.- Creates the GUI for entering the customer data • On new customer-regd. between register-clicked-connects to the server and creates a record with the given data in the database • On new customer regd. between reset-clicked-clears all the fields of the GUI form • on new customer regd. between exit-clicked- Exits the GUI and returns to Main window • validate null-For validating if a field is null or not • validate num-For validating the numeric format (ex-6554 and not 655j7) of a field • password compare - Compares whether two passwords are same or not • Message box-To display a message on the successful completion of an operation • Error message box- To display a message on the occurrence of an error during the operation.
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'New Customer' in the Account Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table 4.3 New General Account Creation

Identification	NEW GENERAL ACCOUNT CREATION
Type	SUB PROGRAM / MODULE
Purpose	<p>The purpose of this function is to</p> <ul style="list-style-type: none"> • Create a GUI which would be used to pass the details of a new account to the database
Function	<p>The user enters the USER-ID of the customer which has already been created earlier. Then if the USER-ID is valid the details are fetched from the server and displayed in the form. The user is then asked either to proceed or change the user id. For proceeding the user click on the PROCEED Button or on the CHANGE USER-ID Button for changing the id. The user then fills the information regarding the account. After the data are given in their respective fields, the user then clicks on the CREATE Button. For clearing the values already typed, the user clicks on the RESET Button For Exiting from the GUI to the Main Window, the user clicks on the EXIT Button.</p>

Subordinates

- **create new general acc.-** Creates the GUI of this Module
- **on new general acc between chkuserid1_clicked-** To check the validity of the FIRST USER-ID
- **On new general acc between proceed clicked-** To proceed to enter the new account details
- **On new general acc between change user-id clicked-** To change the current user-id.
- **On new general account chk-btn overdraft toggled-**Change the sensitivity of some widgets of the form as per the requirement and state of the Overdraft Check Box
- **on new general acc chk-btn joint acc toggled-**Change the sensitivity of some widgets of the form as per the requirement and state of the Joint Account Check Box
- **on_newgenacc_radbtn_user23_toggled-** Change the sensitivity of some widgets of the form as per the requirement and state of the radio button USER
- **on new general acc_radbtn_user23 toggled-** Change the sensitivity of some widgets of the form as per the requirement and state of the radio button USER2
- **on new general acc_btn_chkuserid2_clicked-** To check the validity of the FIRST JOINT USER-ID
- **on newgenacc_btn_chkuserid3_clicked-** To check the validity of the SECOND JOINT USER-ID
- **On new general acc btn. Create clicked-** To create a new account for the given user id
- **On new general acc btn. Reset clicked-** Clears all the fields of the GUI form
- **On new general acc btn. Exit clicked-** Exits the GUI and returns to Main window
- **check user-id-** Checks the validity of an USER-ID
- **get balance-** Converts the text string to Money Format i.e. "123.45" to 123.45
- **write passbook -** Creates a Passbook for the new account in the database
- **validate null-** For validating if a field is null or not
- **validate money-** For validating the money format (ex-67.54 and not 87.7.8) of a field
- **message box-** To display a message on the successful completion of an operation
- **Error message box-** To display a message on the occurrence of an error during the operation.

Interfaces	This module is called when the user clicks on the Menu Item NEW ACCOUNT in the ACCOUNT Menu.
Resources	Connection to the My SQL server via internet.

Table: 4.4 Customer Information Update

Identification	CUSTOMER INFORMATION UPDATE
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : <ul style="list-style-type: none"> • Create a GUI which would be used to update the details of a customer in the database
Function	The user enters the USERID of the customer. Then if the USERID is valid, the details are fetched from the server or an error message is displayed. The user selects a certain field from a Drop-Down List and then updates the data. The user then clicks on the UPDATE Button to update the record in the database

Subordinates	<ul style="list-style-type: none"> • create customer info update- Creates the GUI of this Module. • initialize form- To bring the form to a state exactly similar to the one during its creation i.e. the initial state of the widgets is restored again. • on customer info update between update-clicked - To update the selected field in the database with the new information provided • On customer info update combo entry self field_ changed- To change the visibility and sensitivity of some widgets as per the selected field • On customer info update between connect clicked- To validate USER-ID and retrieve the present data from the database. • On customer info update between exits clicked- Exits the GUI and returns to Main window. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554and not 655j7) of a field. • Message box- To display a message on the successful completion of an operation. • Error message box- To display a message on the occurrence of an error during the operation. • Password compare- Compares whether two passwords are same or not.
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item UPDATE CUSTOMER INFO in the ACCOUNT Menu
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.5 Account Information Update

Identification	ACCOUNT INFORMATION UPDATE
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to update the details of an account in the database
Function	The user enters the ACCOUNT NUMBER of the customer. Then if the Account Number is valid, the details are fetched from the server or an error message is displayed. The user selects a certain field from a Drop-Down List and then updates the data. The user then clicks on the UPDATE Button to update the record in the database
Subordinates	<ul style="list-style-type: none"> • create acc info update- Creates the GUI of this Module • on acc info update between update clicked- To update the details of the account • On acc. info update combo entry self field changed- To change the visibility and sensitivity of some widgets as per the selected field. • On acc info update between connect-clicked- To validate ACCOUNT NUMBER and retrieve the present data from the database. • On acc info update between exit-clicked- Exits the GUI and returns to Main window • initialize acc info update - To bring the form to a state exactly similar to the one during its creation i.e. the initial state of the widgets is restored again. • validate null- For validating if a field is null or not • validate numeric- For validating the numeric format (ex-6554 and not 655j7) of a field • get balance- Converts the text string to Money Format i.e. "123.45" to 123.45 • message box- To display a message on the successful completion of an operation • error message box- To display a message on the occurrence of an error during the operation
Interfaces	• This module is called when the user clicks on the Menu Item UPDATE ACCOUNT INFO in the ACCOUNT Menu
Resources	• Connection to the My SQL server via internet

Table: 4.6 Close General Accounts

Identification	CLOSE GENERAL ACCOUNT
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to close the account of a customer
Function	The user enters the ACCOUNT NUMBER of the customer and clicks the GETINFO Button. If the ACCOUNT NUMBER is valid the details are fetched from the server or an error message is displayed. The user then clicks on the CLOSE Button to close the record in the database.
Subordinates	<ul style="list-style-type: none"> • create close general acc- Creates the GUI of this Module • On close general acc between new-clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • on close general acc between exit-clicked- Exits the GUI and returns to Main window • on close general acc between close-clicked- Closes the account and updates it in database • on close general acc between get info-clicked- Checks the validity of the ACCOUNT NUMBER and gets the details if it is valid • validate null- For validating if a field is null or not • validate num-For validating the numeric format (ex-6554 and not 655j7) of a field • msg box- To display a message on the successful completion of an operation • error msg box- To display a message on the occurrence of an error during the operation
Interfaces	• This module is called when the user clicks on the Menu Item CLOSE ACCOUNT in the ACCOUNT Menu
Resources	• Connection to the My SQL server via internet

Table: 4.7 Account Information

Identification	ACCOUNT INFORMATION
Type	SUB PROGRAM / MODULE
Purpose	<p>The purpose of this function is to:</p> <ul style="list-style-type: none"> • Create a GUI which would be used for allowing the user to enter the account number whose info is needed. • It would then call the SUB-PROGRAM 'ACCOUNT INFORMATION 2' by passing the ACCOUNT NUMBER as a parameter.
Function	The user enters the ACCOUNT NUMBER and presses the GETINFO Button
Subordinates	<ul style="list-style-type: none"> • create acc info- Creates the GUI of this Module • on acc info between close clicked - Exits the GUI and returns to Main window • on acc info between get account clicked – Validates the account number and then calls the function create_accinfo2 • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • error msg box - To display a message on the occurrence of an error during the operation
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'ACCOUNT INFO' in the ACCOUNT MENU.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.8 General Account Transactions

Identification	GENERAL ACCOUNT TRANSACTION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used for carrying out the Transaction Operations of a General Account
Function	The user enters the ACCOUNT NUMBER. Then the type of Transaction (ex-deposit, withdrawal) Then selects the mode of transaction (ex-cheque, cash). Then the user clicks on the EXECUTE Button If the ACCOUNT NUMBER is valid the balance is fetched from the server or an error message is displayed. The user then clicks on the TRANSACT Button to perform the transaction
Subordinates	<ul style="list-style-type: none"> • create general acc transaction- Creates the GUI of this Module • On general acc transaction between new-clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On general acc trn. between exit-clicked- Exits the GUI and returns to main window • on general acc trn. between transact clicked- Performs the Transaction and updates it in database • On general acc trn between execute clicked- Checks the validity of the ACCOUNT NUMBER and gets the balance details if it is valid. • on general acc trn combo entry trn type changed- To change the sensitivity of some widgets as per the selected field • transaction num- Gets the transaction number for the current transaction from the database • fund trans num- Gets the transaction number for a MAIL TRANSFER Transaction from the database • verify cheque- Verifies the Status and Validity of a Cheque during the transaction that involves the use of Domestic (or Own Bank) cheque • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • validate money- For validating the money format (ex-67.54 and not 87.7.8) of a field • get bal - Converts the text string to Money Format i.e. "123.45" to 123.45 • message box- To display a message on the successful completion of an operation • Error message box- To display a message on the occurrence of an error during the operation.
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'GENERAL TRANSACTION' in the TRANSACTION Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.9 Loan Account Transactions

Identification	LOAN ACCOUNT TRANSACTION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used for carrying out the Transaction Operations of a General Account
Function	The user enters the ACCOUNT NUMBER. Then the type of Transaction (ex-deposit, withdrawal) Then selects the mode of transaction (ex-cheque, cash). Then the user clicks on the If the ACCOUNT NUMBER is valid the details are fetched from the server or an error message is displayed. The user then clicks on the UPDATE Button to update the record in the database
Subordinates	<ul style="list-style-type: none"> • create loan acc transaction- Creates the GUI of this Module • On loan acc transaction between new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On loan acc trans. between exit clicked- Exits the GUI and returns to Main window • on loan acc trn between transaction clicked- Performs the Transaction and updates it in the database • On loan acc trn between get info clicked- Checks the validity of the ACCOUNT NUMBER and gets the details if it is valid • payment no- Gets the Transaction ID for the process • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • validate money- For validating the money format (ex-67.54 and not 87.7.8) of a field • get balance- Converts the text string to Money Format i.e. "123.45" to 123.45 • message box- To display a message on the successful completion of an operation • error message box- To display a message on the occurrence of an error during the operation
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'GENERAL ACC TRANSACTION' in the Transaction Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.10 Cheque Book Stock Entry

Identification	CHEQUE BOOK STOCK ENTRY
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used for entering the cheque books into the bank's stock
Function	The user enters the STARTING LEAF NUMBER. The LAST LEAF NUMBER is calculated and the record is inserted into the database.
Subordinates	<ul style="list-style-type: none"> • Create chq book stock entry- Creates the GUI of this Module • On chq book stock entry btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • on chq book stock entry btn exit clicked- Exits the GUI and returns to Main window • on chq book stock entry btn add clicked- Adds the cheque book to the database • validate null -For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • error message box- To display a message on the occurrence of an error during the operation
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'CHEQUE BOOK STOCK ENTRY' in the CHEQUE BOOK Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.11 Cheque Book Issue

Identification	CHEQUE BOOK ISSUE
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used for issuing a cheque book for an account
Function	The user enters the ACCOUNT NUMBER. If there is a previous order against this account number then that is cleared here (on the availability of stock to dispense) or else a new order is placed in the database. If there are no cheque books in the bank's stock then only an order is made.
Subordinates	<ul style="list-style-type: none"> • create chq book issue- Creates the GUI of this Module • On chq book issue btn issue another clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On chq book issue btn exit clicked- Exits the GUI and returns to Main window • On chq book issue btn issue clicked- Issues a cheque book against the account number given. • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • error msg box- To display a message on the occurrence of an error during the operation
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'CHEQUE BOOK ISSUE' in the CHEQUE BOOK MENU.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.12 Cheque Statuses

Identification	CHEQUE STATUS
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used for viewing the status of a cheque leaf (i.e. ENCASHED OR UNUSED OR BLOCKED etc)
Function	The user enters the CHEQUE NUMBER and presses the Button
Subordinates	<ul style="list-style-type: none"> • create chq status- Creates the GUI of this Module • On chq status btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On chq status btn exit clicked- Exits the GUI and returns to Main window • On chq status btn get info clicked- Gets the status of a cheque. • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • error msg box- To display a message on the occurrence of an error during the operation
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'CHEQUE STATUS' in the CHEQUE BOOK MENU.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.13 Cheque Block

Identification	CHEQUE BLOCK
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to: • Create a GUI which would be used for blocking a cheque leaf.
Function	The user enters the CHEQUE NUMBER and presses the Block Button
Subordinates	<ul style="list-style-type: none"> • create block cheque- Creates the GUI of this Module • On block chq btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On block chq btn exit clicked- Exits the GUI and returns to Main window • On block chq btn status clicked -Gets the status of a cheque. • on block chq btn block clicked- Blocks the cheque • validate null- For validating if a field is null or not • Validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • Error msg box- To display a message on the occurrence of an error during the operation • msg box- To display a message on the successful completion of an operation
Interfaces	• This module is called when the user clicks on the Menu Item 'CHEQUE BLOCK' in the CHEQUE BOOK Menu.
Resources	• Connection to the My SQL server via internet

Table: 4.14 New Passbook Issue

Identification	NEW PASSBOOK ISSUE
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to: • Create a GUI which would be used for issuing a new passbook for an account.
Function	The user enters the ACCOUNT NUMBER, TYPE OF PASSBOOK and the ACCOUNT TYPE and presses the ISSUE button
Subordinates	<ul style="list-style-type: none"> • Create new pass book issue- Creates the GUI of this Module • On new passbook issue btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On new passbook issue btn exit clicked- Exits the GUI and returns to Main window • on new passbook issue btn issue clicked- Issues a Pass Book against the given Account Number • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • verify acc- Verifies if a account is closed or not • error msg box- To display a message on the occurrence of an error during the operation • msg box- To display a message on the successful completion of an operation
Interfaces	• This module is called when the user clicks on the Menu Item 'NEW PASS BOOK' in the PASS BOOK Menu.
Resources	• Connection to the My SQL server via internet

Table: 4.15 Add User to CBS

Identification	ADD USER TO CBS
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to add a certain bank employee to the CBS users list i.e. only the users in this list will be able to use the CBS.
Function	The user enters either the USERID or Employee Serial No. of the employee who is to be added to the database and presses the GETINFO Button. After verifying the information retrieved from the database, the user clicks on the ADD Button
Subordinates	<ul style="list-style-type: none"> • create add to CBS- Creates the GUI of this Module. • On add to CBS between add clicked- Adds the employee details, provided, to the CBS users list in the database. • On add to CBS between user id toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On add to CBS between new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On add to CBS between get info clicked- Retrieves the information of the EMPLOYEE and displays it on the widgets. • On add to CBS between exits clicked- Exits the GUI and returns to Main window. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • Message box- To display a message on the successful completion of an operation. • Error msg box- To display a message on the occurrence of an error during the operation.
Interfaces	• This module is called when the user clicks on the Menu Item 'ADD TO CBS' in the ADMIN Menu
Resources	• Connection to the My SQL server via internet

Table: 4.16 Remove Users from CBS

Identification	REMOVE FROM CBS
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to remove a certain bank employee from the CBS users list i.e. blocking the employee from using the CBS.
Function	The user enters either the USERID or Employee Serial No. of the employee who is to be removed from the database and presses the GETINFO Button. After verifying the information retrieved from the database, the user clicks on the REMOVE Button.
Subordinates	<ul style="list-style-type: none"> • create remove from CBS- Creates the GUI of this Module. • On remove from CBS between remove clicked- Removes the employee details, provided, from the CBS users list in the database. • On remove from CBS rad between user ids toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On remove from CBS rad between sr. no. toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On remove from CBS between new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On remove from CBS between get info clicked-Retrieves the information of the EMPLOYEE and displays it on the widgets. • on remove from CBS between exit clicked- Exits the GUI and returns to Main window • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field • Error message box- To display a message on the occurrence of an error during the operation.
Interfaces	• This module is called when the user clicks on the Menu Item 'REMOVE FROM CBS' in the ADMIN Menu
Resources	• Connection to the My SQL server via internet

Table: 4.17 Create Administrator

Identification	CREATE ADMINISTRATOR
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to add a certain bank employee as the Administrator of a branch in the CBS users list i.e. this employee would have certain privileges in the CBS over the general users..
Function	The user enters either the USERID or Employee Serial No. of the employee who is to be added to the database and presses the GETINFO Button. After verifying the information retrieved from the database, the user clicks on the ADD Button
Subordinates	<ul style="list-style-type: none"> • Create admin- Creates the GUI of this Module. • On create admin between add clicked- Adds/Updates the employee as an Administrator, to the CBS users list in the database. • On create admin between user id toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On create admin between toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On create admin between new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On create admin between get info clicked- Retrieves the information of the EMPLOYEE and displays it on the widgets. • On create admin between exits clicked- Exits the GUI and returns to Main window. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • msg box- To display a message on the successful completion of an operation. • error msg box- To display a message on the occurrence of an error during the operation
Interfaces	• This module is called when the user clicks on the Menu Item 'CREATE ADMIN' in the CREATION SUBMENU OF SUPER ADMIN MENU
Resources	• Connection to the My SQL server via internet

Table: 4.18 Remove Administrator

Identification	REMOVE ADMINISTRATOR
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to remove a certain bank employee, who has the status of an Administrator, from the CBS users list i.e. reducing or blocking all of his privileges.
Function	The user enters either the USERID or Employee Serial No. of the employee who is to be removed from the database and presses the GETINFO Button. After verifying the information retrieved from the database, the user clicks on the REMOVE Button
Subordinates	<ul style="list-style-type: none"> • create remove admin- Creates the GUI of this Module • on remove admin btn remove clicked- Removes the employee as Administrator from the CBS users list in the database. • On remove admin rad between user id toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On remove admin rad btn emp sr. no. toggled- To change the visibility and sensitivity of some widgets as per the selected field. • On remove admin btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On remove admin btn get info clicked- Retrieves the information of the EMPLOYEE and displays it on the widgets. • on remove admin btn exit clicked- Exits the GUI and returns to Main window. • validate null- For validating if a field is null or not • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • Error msg box- To display a message on the occurrence of an error during the operation.
Interfaces	• This module is called when the user clicks on the Menu Item 'REMOVE ADMIN' in the CREATION SUBMENU OF SUPER ADMIN MENU
Resources	• Connection to the My SQL server via internet

Table: 4.19 Create Super Administrator

Identification	CREATE SUPER ADMINISTRATOR
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to add a certain bank employee as the Super-Administrator of a branch in the CBS users list i.e. this employee would have highest privileges in the CBS over the general users/Administrators • There can only be one Super Administrator
Function	The user enters either the USERID or Employee Serial No. of the employee who is to be added to the database and presses the GETINFO Button. After verifying the information retrieved from the database, the user clicks on the ADD Button.
Subordinates	<ul style="list-style-type: none"> • Create creates user admin- Creates the GUI of this Module. • On creates user admin between add clicked- Adds/Updates the employee as a Super Administrator, to the CBS users list in the database. • On creates user admin btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On creates user admin btn get info clicked- Retrieves the information of the EMPLOYEE and displays it on the widgets. • On creates user admin btn exit clicked- Exits the GUI and returns to Main window. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • msg box- To display a message on the successful completion of an operation. • Error msg box- To display a message on the occurrence of an error during the operation.
Interfaces	• This module is called when the user clicks on the Menu Item 'SUPER ADMIN CREATION' in the CREATION SUB-MENU OF SUPER ADMIN MENU.
Resources	• Connection to the My SQL server via internet

Table: 4.20 New Employee Registrations

Identification	NEW EMPLOYEE REGISTRATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to pass the details of a new employee to the database
Function	The user fills the employee data in their respective fields and then clicks on the REGISTER Button
Subordinates	<p>Create new employee registration- Creates the GUI for entering the customer data on new employee registration between register clicked - Connects to the server and creates a record with the given data in the database. • On new employee reg. between reset clicked- Clears all the fields of the GUI form.</p> <p>• On new employee reg. btn exit clicked- Exits the GUI and returns to Main window.</p> <p>• validate null- For validating if a field is null or not.</p> <p>• validate num- For validating the numeric format (ex-6554 and not 655j7) of a field.</p> <p>• verify acc- Verifies if a account is closed or not.</p> <p>• Password compare- Compares whether two passwords are same or not.</p> <p>• msg box- To display a message on the successful completion of an operation.</p> <p>• error msg box- To display a message on the occurrence of an error during the operation</p>
Interfaces	• This module is called when the user clicks on the Menu Item 'NEW EMPLOYEE' in the EMPLOYEE SUBMENU OF SUPER ADMIN MENU.
Resources	• Connection to the My SQL server via internet

Table: 4.21 Remove Employees

Identification	REMOVE EMPLOYEE
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to remove an employee and mark the record of that employee as REMOVED in the database
Function	The user fills the Employee Serial Number and then clicks on the GETINFO Button Then for removing the employee, the user has to click on the REMOVE Button
Subordinates	<ul style="list-style-type: none"> • Create remove employee- Creates the GUI for entering the customer data. • On remove employee between remove clicked -Connects to the server and marks the record of the concerned Employee as REMOVED. • On remove employee btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • On remove employee btn exit clicked- Exits the GUI and returns to Main window. • On remove employee btn check clicked- Retrieves the information of the EMPLOYEE and displays it on the widgets. • Validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • msg box- To display a message on the successful completion of an operation. • Error msg box- To display a message on the occurrence of an error during the operation.
Interfaces	• This module is called when the user clicks on the Menu Item 'REMOVE EMPLOYEE' in the EMPLOYEE SUB-MENU OF SUPER ADMIN MENU.
Resources	• Connection to the My SQL server via internet

Table 4.22 Employees Information

Identification	EMPLOYEE INFORMATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to: <ul style="list-style-type: none"> • Create a GUI which would be used for allowing the user to enter the Employee Serial Number or USERID of the bank employee whose info is needed. • It would then call the SUB-PROGRAM 'EMPLOYEE INFORMATION 2' by passing the Employee Serial No. or User id as a parameter.
Function	The user enters the Employee Serial Number or USERID and presses the GETINFO Button
Subordinates	<ul style="list-style-type: none"> • create employee info- Creates the GUI of this Module • on employee info btn close clicked- Exits the GUI and returns to Main window. • On employee info btn get info clicked- Validates the account number and then Calls the function. • On employee info rad btn esrno toggled- To change the sensitivity of some widgets as per the selected field. • On employee info button user id toggled- To change the sensitivity of some widgets as per the selected field. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • Error message box- To display a message on the occurrence of an error during the operation.
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'EMPLOYEE INFORMATION' in the INFORMATION Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.23 New Branch Registrations

	NEW BRANCH REGISTRATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to: • Create a GUI which would be used for allowing the user to enter the details of a New Branch for Registration and then add that record to the database.
Function	The user enters the respective fields and presses the REGISTER Button
Subordinates	<ul style="list-style-type: none"> • Create new branch reg. - Creates the GUI of this Module. • On btn exit clicked- Exits the GUI and returns to Main window. • On new branch reg. btn register clicked- Validates all the information provided and then adds the record to the database. • On btn new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one. • validate null- For validating if a field is null or not. • validate num- For validating the numeric format (ex-6554 and not 655j7) of a field. • Error msg box- To display a message on the occurrence of an error during the operation
Interfaces	• This module is called when the user clicks on the Menu Item 'REGISTER NEW BRANCH' in the BRANCH SUB-MENU OF SUPER ADMIN MENU.
Resources	• Connection to the My SQL server via internet

Table: 4.24 Update Branch Information

Identification	UPDATE BRANCH INFORMATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to: • Create a GUI which would be used for allowing the user to view the details of a Branch.
Function	The user selects the branch id and presses the GETINFO Button.
Subordinates	<ul style="list-style-type: none"> • create branch info- Creates the GUI of this Module. • On branch info between exits clicked- Exits the GUI and returns to Main. Window. • On branch info between get info clicked- Retrieves the information of the branch and displays it on the widgets. • On branch info between new clicked- Restores the initial state of all the widgets in the form i.e. it makes the form ready for another operation after the completion of one.
Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'BRANCH INFORMATION' in the INFORMATION Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet.

Table: 4.25 New Loan Account Creation

Identification	NEW LOAN ACCOUNT CREATION
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : • Create a GUI which would be used to pass the details of a new loan account to the database
Function	The user enters the USERID of the customer which has already been created earlier. Then if the USERID is valid the details are fetched from the server and displayed in the form. The user is then asked either to proceed or change the user id. For proceeding the user click on the PROCEED Button or on the CHANGE USERID Button for changing the id. The user then fills the information regarding the account. After the data are given in their respective fields, the user then clicks on the CREATE Button For clearing the values already typed , the user clicks on the RESET Button For Exiting from the GUI to the Main Window, the user clicks on the EXIT Button
Subordinates	<ul style="list-style-type: none"> • create new loan acc- Creates the GUI of this Module. • On new loan acc between user ids clicked- To check the validity of the FIRST USER ID. • On new loan acc between proceed clicked- To proceed to enter the new account details. • On new loan acc btn change user id clicked- To change the current user id. • On new loan acc btn create clicked- To create a new account for the given user id. • On new loan acc btn reset clicked- clears all the fields of the GUI form. • On new loan acc btn exit clicked- Exits the GUI and returns to Main window. • check user id- Checks the validity of an USERID. • Get balance- Converts the text string to Money Format i.e. "123.45" to 123.45. • validate null- For validating if a field is null or not. • validate money- For validating the money format (ex-67.54 and not 87.7.8) of a field. • Message box- To display a message on the successful completion of an operation. • Error message box- To display a message on the occurrence of an error during the operation.

Interfaces	<ul style="list-style-type: none"> • This module is called when the user clicks on the Menu Item 'NEW LOAN ACCOUNT' in the LOAN ACCOUNT Menu.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.26 Logout Systems

Identification	LOGOUT SYSTEM (CBS)
Type	SUB PROGRAM / MODULE
Purpose	The purpose of this function is to : <ul style="list-style-type: none"> • To end the session of the currently Logged n User and return to the Login System of the CBS
Function	Displays the message in a small window
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • This module is called when user clicks on the 'EXIT'

4.10.3 E-BANKING SOLUTION (EBS)

Table: 4.27 Login Systems

Identification	LOGIN SYSTEM (EBS)
Type	SUB PROGRAM / MODULE
Purpose	To validate the User Credentials for Login into the EBS and on validation, create a User Session.
Function	- N . A . -
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • This is integrated into a Web-Page and is displayed to the user
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.28 Account Summaries

Identification	ACCOUNT SUMMARY (MAIN PAGE)
Type	SUB PROGRAM / MODULE
Purpose	This page becomes the HOME of the EBS after an user Logs in Successfully. It displays all the Accounts Linked with the User Id of the Logged User
Function	-N.A.-
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • After Successful Login this page is displayed
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.29 Transaction Summaries

Identification	TRANSACTION SUMMARY (MAIN PAGE)
Type	SUB PROGRAM / MODULE
Purpose	It displays all the transaction details concerned with an Account Number
Function	-N.A.-
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • When the user clicks on an Account Number Hyperlink in the Account Summary Page, this page is displayed with the details.
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

Table: 4.30 Cheque Book Order Systems

Identification	CHEQUE BOOK ORDER SYSTEM
Type	SUB PROGRAM / MODULE
Purpose	To order a cheque book for a specified Account Number linked with the current Logged In User
Function	The user clicks on the Account Number Hyperlink
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • When the User Clicks on the 'Cheque Book Order' Hyperlink, this page is displayed.

Table: 4.31 Update Personal Profiles

Identification	UPDATE PERSONAL PROFILE
Type	SUB PROGRAM / MODULE
Purpose	To update the personal details of the user Logged In
Function	The user selects the Filed to be updated, gives the new information and clicks on the Update Button
Subordinates	--N.A.--
Interfaces	<ul style="list-style-type: none"> • When the User Clicks on the 'Update Profile' Hyperlink, this page is displayed Hyperlink, this page is displayed.

Table: 4.32 Cheque Book Blocking System

Identification	CHEQUE BOOK BLOCKING SYSTEM
Type	SUB PROGRAM / MODULE
Purpose	To block a certain cheque leaf in order to prevent any misuse after it is misplaced or damaged
Function	The user selects the Account Number and gives the Cheque Number and clicks on the Block Button
Subordinates	--N.A.—
Interfaces	<ul style="list-style-type: none"> • When the User Clicks on the Cheque Block”.
Resource	<ul style="list-style-type: none"> • Connection to the My SQL server via internet.

Table: 4.33 Logout Systems

Identification	LOGOUT SYSTEM (EBS)
Type	SUB PROGRAM / MODULE
Purpose	To terminate the user session and display the Login Page
Function	-N.A.-
Subordinates	-N.A.-
Interfaces	<ul style="list-style-type: none"> • When the User Clicks on the 'Logout' Hyperlink, this page is displayed
Resources	<ul style="list-style-type: none"> • Connection to the My SQL server via internet

4.11 Reuse and Relationships to Other Products

- All the libraries and products used in this project are of the type OPEN SOURCE. So, they can be updated by their newer versions any time with certain minute changes only.
- The project is divided into modules by separating each module into different sources files. So, newer modules can be added or existing modules can be edited without any hassle.

4.12 Design Decisions and Trade-offs

The design of the CBS was done in GTK+ as it is an open source GUI Programming Toolkit which is gaining popularity day-by-day simultaneously enhancing its own capabilities. In addition to it, the Concepts of Glade 2.10.1 were used (Like Look-Up Widget, Signal Functions, Table Design etc). The Database Server used is My SQL 4.17 which is ranked among the top Database Servers in the World. The Web-Server used is Apache 2.2, which is the best Open Source Server.

As this project is an Open Source one, and the audience groups are large (which include Students and Scholars researching on GUI Development with GTK and connecting to My SQL through it), so 3 modes of My SQL Query Execution are used through out the coding session. The modes are Direct Query Execution, Multi Statement Query Execution and Query Execution using Prepared Statements. Any one of them can be used interchangeably. Due to this the code may not seem uniform but it represents the Flexibility of using GTK & GCC with My SQL.

CHAPTER-V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The last chapter of the thesis presents the summary, conclusion, and recommendations. Summary refers the short form of the entire study, conclusions draw from the analysis and recommendations suggest the improvements in the prevailing conditions of Nepalese Information Technology in banking sectors.

5.1 Summary

The case study research of Computerization and use of information system in banking sectors globally was successful in explaining the current implementation of a management information system in any organization. It evaluated the discrepancies in the existing system that led to the compromise in quality of services and periodic delay of projects. The study made an extensive study on the causes of the discrepancies and tried to relate them to the existing system. The drawback in the existing system was major reasons of a compromised service status of the organization.

Based on the study and numerous research documents based on similar researched done and bounty of literature on implementation of management information system, the study devised a new system that overcame all drawbacks in the present system and put it forth as the proposed system. The proposed system was evaluated, compared and contrasted against the existing system. An elaborate design and implementation process guidelines were put forth in support of the proposed system.

The case study research of Global issues and different fields of Nepal was successful in explaining the current implementation of a management information system in the organizations. It evaluated the discrepancies in the existing system that led to the compromise in quality of services and periodic delay of projects. The study made an extensive study on the causes of the discrepancies and tried to relate them to the existing system. The drawback in the existing system was major reasons of a compromised service status of the organization.

Management information system has been emerged as a new concept in the field of management to solve the problems generated by complex organizational structure and increased complexities of management due to industrial and technological revolution. MIS is defined as a computer-based information system, which provides information support for decision-making in the organization. MIS gives information through data analysis.

Management Information System is the backbone on which logical business decisions are made in all types of business organizations. Applying this same logic to a bank, we can safely say that a bank must have good Management Information System as a minimum to survive and prosper in this exceedingly competitive world.

While earlier attempts to bring computerization in the tasks of banking sectors came to market have failed, a new Information Technology with much more advanced facilities offering improved device capability and network capacity means that the technology is in place to provide the service.

IT in banking could play a strong role in the provision of services to the un-banked and under banked works. Given the extremely high penetration of computerization and networking globally, transaction services that are executed over networked channels could provide a significant means of extending financial services to individuals who have been geographically or demographically disconnected.

There is a general consensus that security attacks will be inevitable over networked devices in the next few years such as hacking, mishandling etc which is riskier mainly in financial institutions and also due to the ubiquitous nature of handheld devices. The most likely forms of attack will echo phishing and other forms of social engineering attacks that have plagued the online space, with the extra challenge or lack of device consistency and the opportunity for multiple vectors of attack such as e-mail, Instant Messaging.

5.2 Conclusion

At last it can be concluded that computerization and IT in banking is essential. And also the proposed system may be the good instrument in managing each and every task in the banks. The benefits of increased connectivity in areas such as better and more diverse access to information have been documented qualitatively in the literature. In large measure, they have contributed to digital literacy and fluency, as a platform for human capital growth that requires public investment. There are others, less tangible but equally crucial benefits of increased connectivity: in a wider social context, connectivity has been recognized as having a positive impact on transparency, good governance, and democracy. There are also implications of increased connectivity that are currently in the process of being defined, particularly in areas such as urban systems, lifestyles, and quality of life. For example, according to a 2006 technology needs assessment and

economic development impact study conducted in the United States for the city of Saint Paul, amidst intensifying global competition for talent, high bandwidth connectivity has the ability to enhance the city's appeal to the "creative class" of knowledge workers.

Concerning the research, limitations cannot be totally avoided. Firstly, although computerization and information technology in Banking in Nepal is not a brand new innovation, it is still in its infancy. During the collection of literature, there was a lack of relevant information. The origins of information inevitably come from other countries, like the United States and England. This may not accurately describe the phenomenon and situation in Nepal, especially with the cultural differences in between, the East and West.

) Information System and Computerization have various roles: it is a tool, the way of socializing with other people and an apparatus of various purposes, depending on the application that is ran at time. The technology is carried with in various contexts and used under unknown conditions; when being alone or in group, at home or in the bus, while moving or standing or in absolute silence, at work or when having leisure time - just to name a few. Possibly IT in banking services will be used in the future only in the few main contexts.

) Person using a new technology in banking service is at the same time a customer of a bank, a consumer of technology and a user of the designed system. It is necessary to consider customers' values towards Internet services, since meeting their expectations means satisfied customers, who will continue using those services. People, who consume technologies should perceive some value in the novel systems, otherwise new technologies will not be adapted. Person's exposure to technology, past experiences and future promises of the salesmen formulate

consumers' expectations, which – again- should be fulfilled with the service. It is healthy to take a look to the user as an individual living his/her life and to refresh designer's traditional ideas about the user as a cognitive and physical processor. What makes the products and services appealing for the customers may lie above mere usability, which should be established to the piece of design by default. Holistic approach to the users takes into account all sorts characteristics related to the physical, social, psychological and ideological aspects in the person. Totally another case is if these wider ideas of the users can be brought into the software- or service productions of the IT-business, since it is already difficult to establish usability engineering practices into the field, not to mention the vague ideas of the holistic approach without the engineering spirit.

5.3 Recommendation

The proposed new system has numerous benefits when compared to the existing system. But with every achievement, there is always a scope for improvement. There are certain recommendations for the devised system.

The study on design and adoption intentions of Internet and IT in banking services in Nepal can be extended to corporate customers. Comparison can then be made between individual customers and corporate customers in terms of the factors influencing their adoption decisions, the criteria for selecting an online banking service, and the types of products and services perceived to be useful. Studies with random sampling are suggested to offer a clearer picture of the consumer profile and to gather more representative information of the population.

As computerization in banking, use of IT in banking and Internet Banking services are still relatively new in Nepal, this study has been unable to measure the actual usage behavior of such services, which was suggested by the Theory of Planned Behavior. Future studies should incorporate this formula to measure when the number of Internet Banking customers reached a critical mass. This way, a more comprehensive investigation of Internet Banking intention and usage behavior can be conducted.

In order to examine the extent to which a model replicates in samples other than the one on which it was derived, the undertaking a cross-validation analysis is suggested.

With a sincere interest in the security implementation implanted into the system, it is recommended that the access to the system be limited and only two units, transaction processing sub-unit and management reporting unit be provided the administrative authority. But to enable the system stand useful for other divisions, operations heads and country managers should be allowed to view and record the information.

The implementation of the system should follow a bottom up approach. By the term 'bottom up', it means that the smaller modules be implemented in small scale implementation environment first. Once the system has been tested in organizational LAN, a further research on the possible security hazards if the system is launched on the web should be done. Based on the report of the research, a level of modification might be required in the proposed system. Only when the initial stage of deployment is successful and reviewed with excellence should the system be launched in the live environment.

A final suggestion for future research would be to test the proposed research model in a longitudinal study among different types of adopters according to the Innovation Diffusion Theory.

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APPENDIX-I

“INTERNET LAW”

Japanese Use of Information Technology and Internet
(Martha L. A'rias, LL.B., J.D., LL.M.)
Wednesday, June 14, 2006)

Japan's Government presented a 2005 white paper about information and communications in Japan. The paper offers some analysis on Japan's Internet and information technologies use by individuals and companies. Following, there is a brief summary on the survey's finding on the use of Internet and information technology by individuals in Japan.

Some of the important data offered by this survey shows that 79.48 millions of Japanese use Internet and the Internet penetration rate in Japan is currently 62.3%. This is an increase of 32 million of users and 25.2% penetration rate since Japan's last survey in 2000. The survey also confirms that by the end of 2004, 62% of Japanese used broadband technology; 20.4% used dial-up system; and 18.4% used the ISDN system.

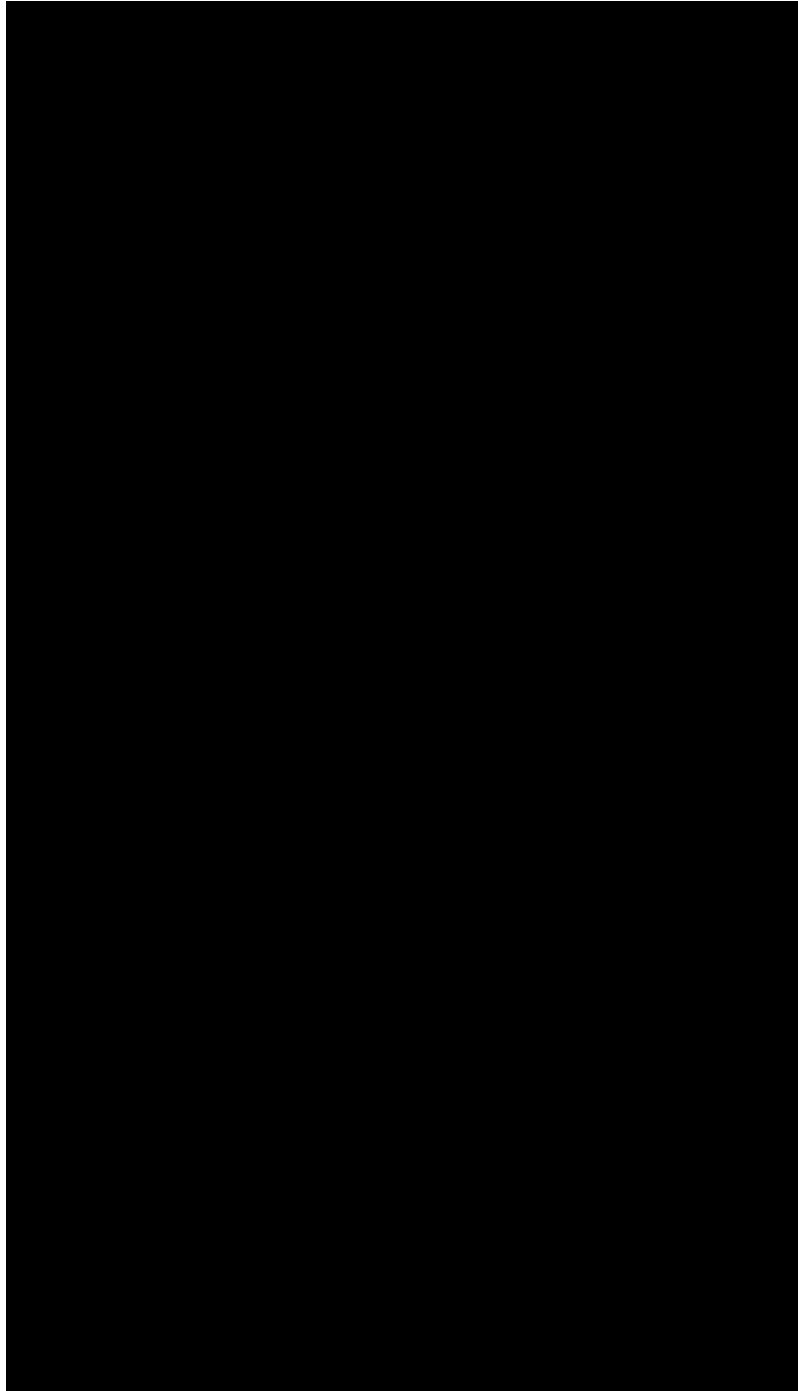
Regarding the use of PC and mobile phones in Japan, the survey reported that 65.1% of Japanese are satisfied with Japan's PC services but only 20.5% declared alike satisfaction for mobile services in Japan. Japanese considered that information gathering, shopping; communications; and financial services online have improved since 2000; whereas health services, administration, and labor services presented little progress.

Japanese search for information in the following level of preference, internet, TV, magazine/books, and newspapers according. The impact of internet in people's life in Japan is great. Japanese reported that the use of Internet decreased their time for reading books/magazines, sleeping, watching TV, and personally seeing family members. Yet, internet and phone communication with family members increased by the use of these new technologies. Japanese said they now gather more information on the Internet and buy less books, magazines, video games, and music CDs.

E-mails are widely use in the United States, 96.1% of the population use this service, and so are they in Japan, 94.2% of Japanese use this way of communication. The use of Internet for social networking, chatting, creating personal blogs, and reading other people's blogs are the least communication tools used by Japanese. Online shopping is the most used communication tool in Japan with an increase of 89.1% in online shopping from PCs and 18.1% from mobiles. The survey also reports that Japanese are very satisfied with their online shopping experience (74.6%).

APPENDIX-II

System Development Life Cycle



APPENDIX-III

Review of ICT in 10th Five Year Plan

The main focus of 10th National plan in Information and Communication Technology (ICT) is to develop the knowledge based society, to remove the barriers in ICT reach and to help reduce the poverty.

-) Emphasis will be given to education and trainings related with Information Technology.
-) National information center running under the Science and Technology ministry will be strengthened in order to implement, supervise and monitor policies related with Information Technology and to legalize e-commerce.
-) Information technology parks will be established in various parts of the country.
-) Conducive environment will be created to attract domestic and international investment in industries related with development, to encourage production and utilization of soft ware and services such as data entry, digitization, and medical transcription, call center, web content design etc.
-) International training will be encouraged to produce high and medium level manpower and to produce highly skilled manpower to compete in the international front.
-) Developing and promoting Information Technology to relay information on agriculture, education, health and other economic sectors to rural areas will be emphasized. The attempt will be made to provide Internet services to 1500 VDCs across the country.
-) Website containing information on agriculture, education and health will be launched.
-) Initiatives will be taken to incorporate computer education in the school curriculum.
-) Private sectors will be encouraged to campaign on nature, religion, culture and heritage through Internet service.
-) The participation of private sectors in Information Technology arena will be encouraged.
-) Information Technology will be used to make government activities transparent, to strengthen system that provides service and to reform financial management and administration. In this regard, e-governance will be properly handled.
-) Conducive environment will be created to increase the use of services related to Information Technology. To legalize the use of Information Technology necessary laws will be formulated.

Some main points relating to ICT in 10th plan are presented here

-) Private sectors will be encouraged to produce medium level manpower necessary for Information Technology front. Private sectors will be provided assistance to set up academic, research and development institutes.
-) Emphasis will be given to computer education from school level. Internet facilities will be provided in universities and public schools to provide better quality computer education.
-) Scholarships will be provided to bright but needy students from rural areas for higher-level education on information technology.
-) Information technology will be used for the purpose of electricity business, electronic education and distance health. Academic institutions and hospitals situated where there is facility of tele-communication and electricity will be encouraged to use the service of information technology. And where there is no electricity facility, promotion of Information Technology will be done through solar energy.