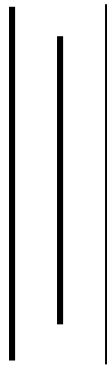


**RELIABILITY OF USING EVM IN ELECTION
(For The Underdeveloped Countries Like Nepal)**

By:
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A Thesis Submitted to:
Office of the Dean
Faculty of Management
Tribhuvan University



*In partial fulfillment of the requirement for the degree of
Master of Business Studies (MBS)*

Kathmandu, Nepal
November 2010

RECOMMENDATION

This is to certify that the Thesis

Submitted by:

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**RELIABILITY OF USING EVM IN ELECTION
(For The Underdeveloped Countries Like Nepal)**

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I hereby declare that the work reported in this thesis entitled “**Reliability of using EVM in Election (For The Underdeveloped Countries Like Nepal)**” submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the Master Degree in Business Studies (MBS) under the supervision of **Shree Bhadra Neupane** and **Er. Shankar Nath Adhikari** of Shanker Dev Campus.

.....

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Shanker Dev Campus

Campus Roll No: 3010/063

T.U. Regd. No: 49120-88

ACKNOWLEDGEMENTS

Election is backbone of democracy. The Election Commission is established for the freedom for the people and servicing to the people by taking the election. Recently, Election Commission has started using EVM in election for Constituent Assembly in area No 1 Kathmandu (2064). The successful use of EVM as shown in the statistics published by EVM inspired me to research how it can be made more effective. So, I have decided to prepare thesis report in this topic. I am not only hopeful but confident that my thesis will help in minimizing the limitations of EVM to some extent. Apart from this, my thesis will act as a guideline for others who want to study in this topic as I had faced shortage of references in this topic.

To complete it satisfactorily and suitably, invigilator is necessary to guide and correct my work. My respective thesis supervisors Shree Bhadra Neupane and Shanker Nath Adhikari have played a vital role and supported me from beginning to end of this study. I am very grateful to them for their suggestions, guidelines, help and inspiration without which this thesis objective couldn't reach the logical end.

For the successful completion of this thesis, we need help of various types of people. I want to give heartily thanks for Ram Govinda Aryal, IT manager of Election Commission, who helped me 'Research Design'. I remember Election Commission who gave me valuable data concerning EVM and election as well as Shanker Dev Campus who provided me authorized letter to provide the information.

Last but not the least, I want to pay heartfelt gratitude to all the known as well as unknown persons, who have directly and indirectly helped this thesis meet its objective.

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ABBREVIATIONS

| | | |
|------|---|--------------------------------------|
| ARR | = | Average Rate of Return |
| BEL | = | Bharat Electronics Limited |
| BS | = | Bikram Sambat |
| BU | = | Ballot unit |
| CA | = | Constitutional Assembly |
| CD | = | Compact Disk |
| CF | = | Cash Flow |
| CU | = | Control Unit |
| DD | = | Data Dictionary |
| DFD | = | Data Flow Diagram |
| DSS | = | Decision Support System |
| DVD | = | Digital Video Disk |
| EAT | = | Earning After Tax |
| EC | = | Election Commission |
| ECIL | = | Election Commission of India Limited |
| EIS | = | Executive Information System |
| ERD | = | Entity Relationship Diagram |
| Etc. | = | Etcetera |
| EVM | = | Electronic Voting Machine |
| FPTP | = | First Past the Post |
| IT | = | Information Technology |
| MIS | = | Management Information System |
| NC | = | Nepali Congress |
| OLAP | = | Online Application Program |
| PB | = | Pay Back |
| PR | = | Proportional Representation |
| RAM | = | Random Access Memory |
| ROM | = | Read only Memory |
| UML | = | United Marxist Leninist |
| UMO | = | United Maoists |

CHAPTER - I

INTRODUCTION

1.1 Background

Election is heart of democracy and it is free rights of people. The election commission of Nepal is an independent constitutional body mandate to construct supervises, direct and control the election to the constituent Assembly, any referendum and local body elections. It consists of a chief Election commissioner and four other election commissioner. It has its own secretariat and 75 district offices with 583 permanent staff. The Prime Minister shall, on the recommendation of the constitutional council, appoint the chief election commissioner and other election commissioners. Election officers are appointed by the election commission after the declaration of election. They are the most important personnel's who are given the heavy responsibility of conduction the elections. This task is completed through polling officers. Election officers appoint polling officers from among the officers of the government of Nepal. Polling officers manage polling centers, security, conduct election and may postpone it if needed, investigate and decide the complaints about the election process, and other such works.

According to the constitutional history of Nepal act 2007 B.S, the election commission is managed in 2007 B.S. and it is established on 2008 B.S. After Democracy in Nepal 2047 B.S. the free election commission is continue constant, and it is continue till now. The work existence of the election of the election commission Nepal successful completed election in Nepal on B.S. 2015, 2048, 2058 and 2065 for member of PRATINIDHI SAVA B.S. 2037, the election of system of politics, election of member of national panchayat elections B.S. 2038 and 2043.

A Nepali citizen aged 18 years and over on December 15, 2006 was eligible to vote in the CA election 2064. The total number of registered voters for the CA election was 17.6 million, consisting of 49.5 female and 50.4 male voters. Voters were categorized

as either permanent or temporary, with temporary voters only being eligible to vote in the PR race.

The interim constituting has established a special CA court, with three sitting judges from the Supreme Court. To adjudicate the complaints received after the polling results. A total of 16 cases were filed in the court, of which five cases were finalized at the end August 2008. In all of these initial five cases, the judges ruled in favours of the election commission's decision.

"The election commission on its own can do nothing for them unless the government amends the existing constitutional and legal provisions and sets a new cut-off date for compiling and updating the electoral rolls." Chief election commissioner also acknowledged the gravity of the issue and said that it would be "painful" for such a large number of citizens to be barred from enjoying their voting rights. The election commission should have taken the necessary initiative in this regard said chief of operations at the democracy and election alliance Nepal, a non governmental organization that works in the field of election observation and strengthening democracy. "Voting is a fundamental right that must be ensured by the state"

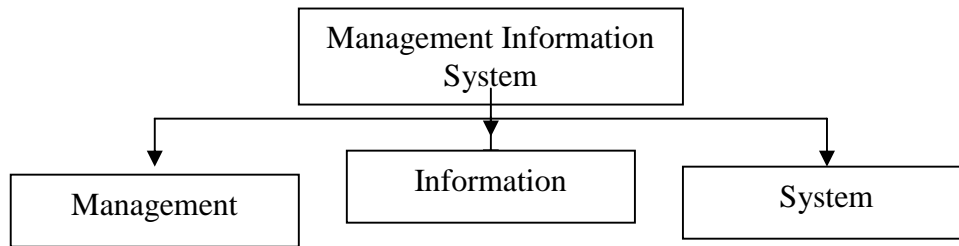
Now the election commission is used of electronic voting machine (EVM) on Kathmandu district area No. 1, on last year 2064 B.S. Chaitra 28th. first time in Nepal. The election commission Nepal planned to use the EVM for different districts in coming future election in Nepal. Accordingly in by election of 6 areas of CA, 2065 B.S. Chaitra 28, the EVM was used in election.

1.1.1 Management Information System (MIS)

As the name suggests, Management Information System (MIS) stands for the system of information which is useful for management within an organization.

Figure 1.1

Concept of Management Information System



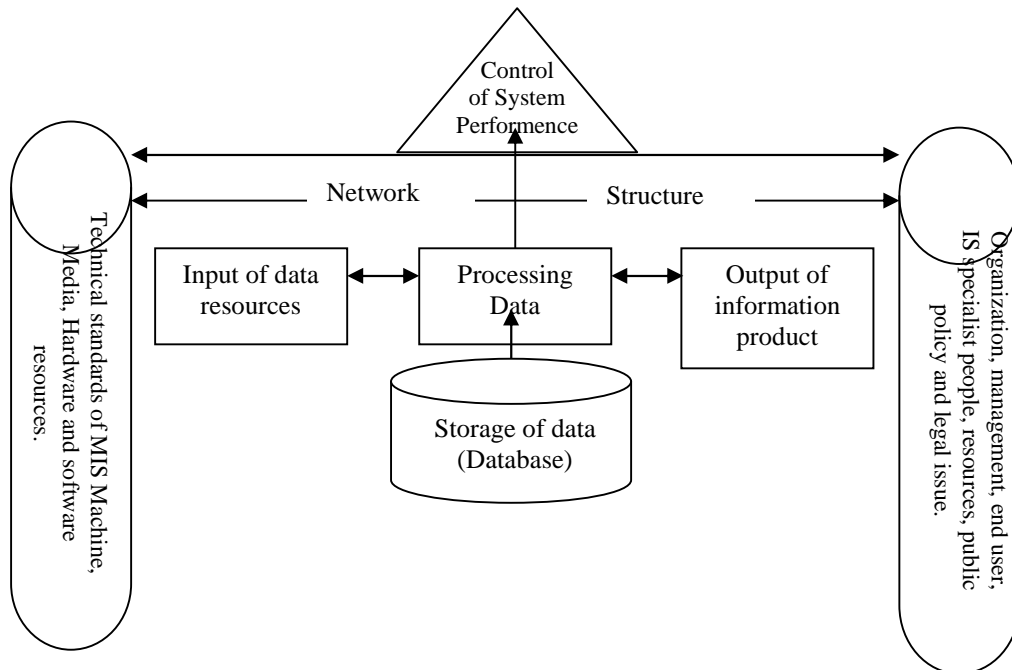
Management is the process of achieving an organization's goals and objectives by judiciously making use of resources of men, materials, machines, money, methods, managements, information and movements.

i.e. 6M + I= men, materials, machines, money, methods, managements plus information.

The initial concept of MIS was to process data from the organization and presents 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. This concept was further modified when a distinction was made between data and information. The information is a product of an analysis of data. This concept is similar to a raw material and the finished product. What are needed are information and not a mass of data. However, the data can be analyzed in a number of ways, producing different shades and specifications of the information as a product.

This concept was further modified, that the system should present information in such a form and format that it creates an impact on its user, provoking a decision, an action or an investigation. The concept was then evolved that the system should be capable of handling a need based reporting. This need may be either of an individual or a group of people.

Figure 1.2
Architectural Framework of MIS



The resources can be written as follows:

-) People resources
-) Hardware resources
 - Computer system
 - Computer peripherals
-) Software resources
 - System software
 - Application software
 - Procedure
-) Data resources
 - Data base that hold processed and organizational data
 - Knowledge base that hold knowledge in a variety of the forms such as faces, rules and case examples about successful business practices
-) Network practices
 - Communication media
 - Network support

Strategic MIS is the set of system which are considered critical to the current or future business competitiveness, and hence the survival of an organization. Strategic MIS can also supplies an organization with business intelligence. In other words, if an information system is used in creative ways to achieve goals and fulfill set organizational missions, it can be considered to be a Strategic MIS. Strategic MIS can be external or internal system External Strategic MIS are used mainly by external quantities in the business Environments. Such as customers, suppliers, distributors etc and have a value added component that gives developers sometime to reap the benefits of the system innovation. Internal Strategies MIS are used by employees within the organization and do not have value added component. The employees focus on issues such as improving the quality of products, services and also enhancing the decision making capabilities of the managers. Such system are used at all levels in the organization and they have long term implications for the firm and also for the business processes within the firm. In general, Strategic MIS can be divided into 3 categories:

-) System that focus on innovation for competitive edge
-) System that use information as a weapon.
-) System that increase productivity and lower the costs of goods and services

1.1.2 Introduction to Organization

According to interim constitution of Nepal - 2063, there shall be an election commission in Nepal consisting of a chief election commissioner and up to four other commissioner. If apart from the chief election commissioner, other election commissioner are appointed, the chief election commissioner shall act as the chair person of the election commissioner. The Prime Minister shall on the recommendation of the constitutional council appoint the chief election commissioner and election commissioners. The term of the office of the chief election commissioner and election commissioner shall be six year from the date of appoint. The election commission shall, subject to the provisions of the constitution and other laws, conduct, supervise, direct and control the election to the constituent Assembly, any referendum to be held pursuant of the constitution and the local government body elections. For these

purpose, the election commission shall prepare the voters roll. If after nominations for election to the constituent Assembly have been filed but before the election is completed, a question arises as to whether a candidate is disqualified or has ceased to possess the qualifications, a final decision thereon shall be made by the election commission. The election commission may delegate any of its functions, duties and power to the chief election commissioner, a commissioner or any employee of the government of Nepal to be exercised in compliance with the conditions specified. The other functions, duties and working procedure of the election commission shall be regulated by law. The government of Nepal shall provide necessary employees and other things, as may be required to perform the functions of the election commission in accordance with the constitution.

The interim constitution has established a special CA court with three sitting judges from the supreme court. To adjudicate the complaints received after the polling results. In CA election 2064, 28th chaitra, a total of 16 cases were filed in the court, of which five cases were finalized at the end of August 2008. In all of these initial five cases, the judges ruled in favor of election commission's decision. I have already mentioned it in Background of the study also.

The Electronic voting Machine (EVM) is a portable instrument for conducting elections to parliament, legislature, Local bodies like municipalities. The electronic voting machine is a micro Controller-based instrument designed to modernize the election process. It is simple to operate and can be installed in a short period. There is no scope for invalid votes and total secrecy of voting data is maintained. The EVM facilitates quick and accurate counting. It is possible to declare the results on the same day, at the end of the poll. The voting data stored in EVMs can be retained for years and can be extracted if necessary. The EVM simplifies the election process for the benefit of both election officials and voters. The huge expenditure involved in printing millions of ballot papers, storing and transporting them to booths etc, is obviated by the use of EVMs. In the EVM, one ballot paper per unit is used. This is fixed below the transparent acrylic sheet of the ballot unit and lists the names of the candidate and

their symbols as in the traditional ballot paper. EVMs can be reused in subsequent elections by simply pressing a button to erase votes recorded in the earlier poll and changing the ballot paper in the Ballot unit. EVM consist mainly of two units.

- a. Control Units (CU)
- b. Ballot Unit (BU) with cable for connecting it with the control unit.

A Ballot unit caters up to 16 candidates. Four ballot unit linked together catering in all to 64 candidates can be used with one control unit.

Figure 1.3
Control Unit with One Ballot Unit

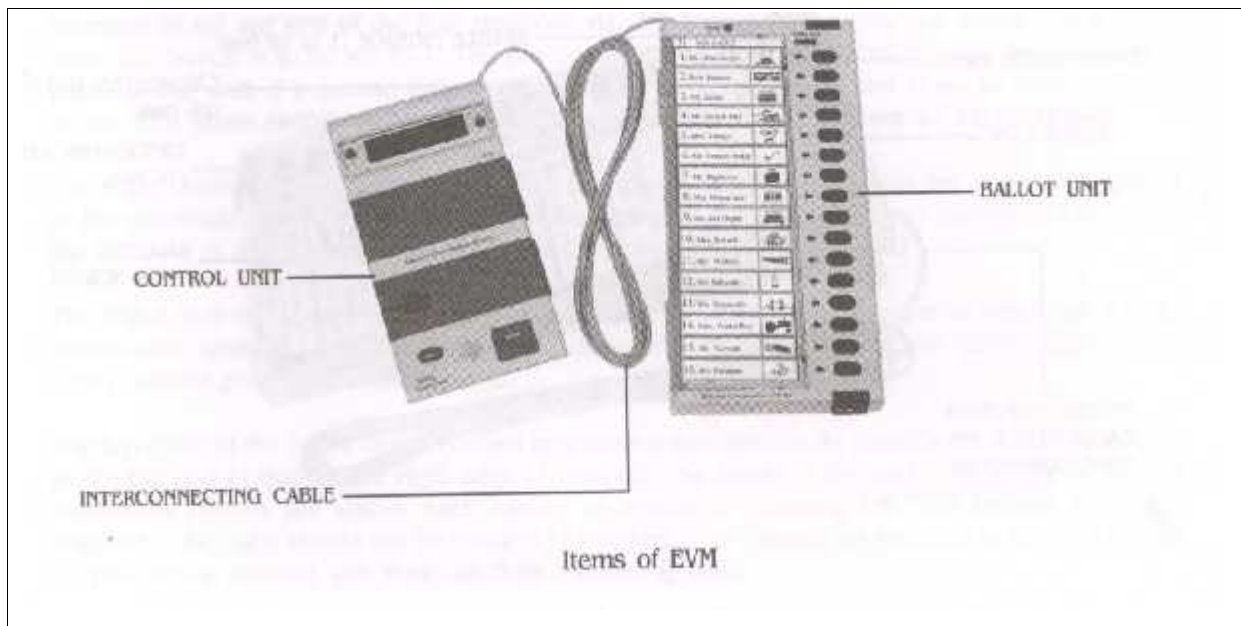
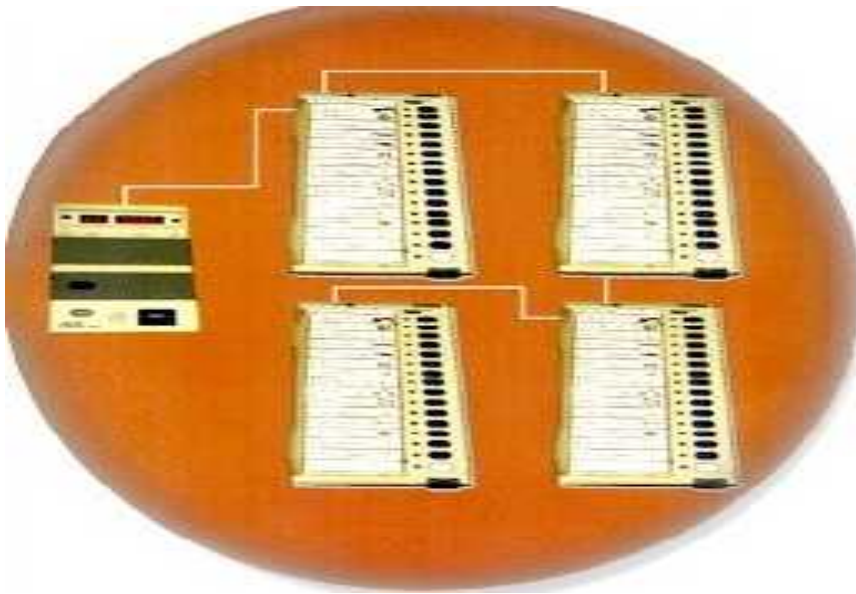


Figure 1.4
Control Unit with linking four Ballot Unit



Special features of the EVM are:

-) Unique Serial Number: Each control unit (CU) has a unique serial number, which matches it with the metal strip number and bar code on the real side of the CU.
-) Real Time Clock (RTC): The Real time clock is used to display the current time and date. The current date and time is displayed with 'Proper on' and on pressing the "Total" bottom. Any malfunction of the RTC shall be displayed by ' CLOCK ERROR' and all other functions will be working.
-) Status of Battery power: Battery power status is displayed. If change of battery is required, it also displays ' CHANGE BATTERY '.
-) Power Save Mode: The unit goes in to power save mode in idle state, thus enhancing the life of the power pack.
-) Print: The result of poll date can be printed as it required.
-) Braille: Maudling of Braille on the Ballot unit for visually challenged persons.

EVM operates on a special power pack (commonly known as Battery). It is tamper-proof, error free and easy to operate. It is easily portable. The polling information once recorded is retained in its memory even when power pack is removed. The

machine, which is according to the design approved by the authorized legal Agency. In case of Nepal, the election commission approved it and manufactured by Bhart Electronics Limited (BEL). It is the end product of considerable experience and extensive trials in Indian Elections under the guidance of the election commission of India.

The Ballot units and control units are supplied in separate carrying cases. A carrying case can be opened by pressing the latches simultaneously on both sides of the handle as shown in the following figure:

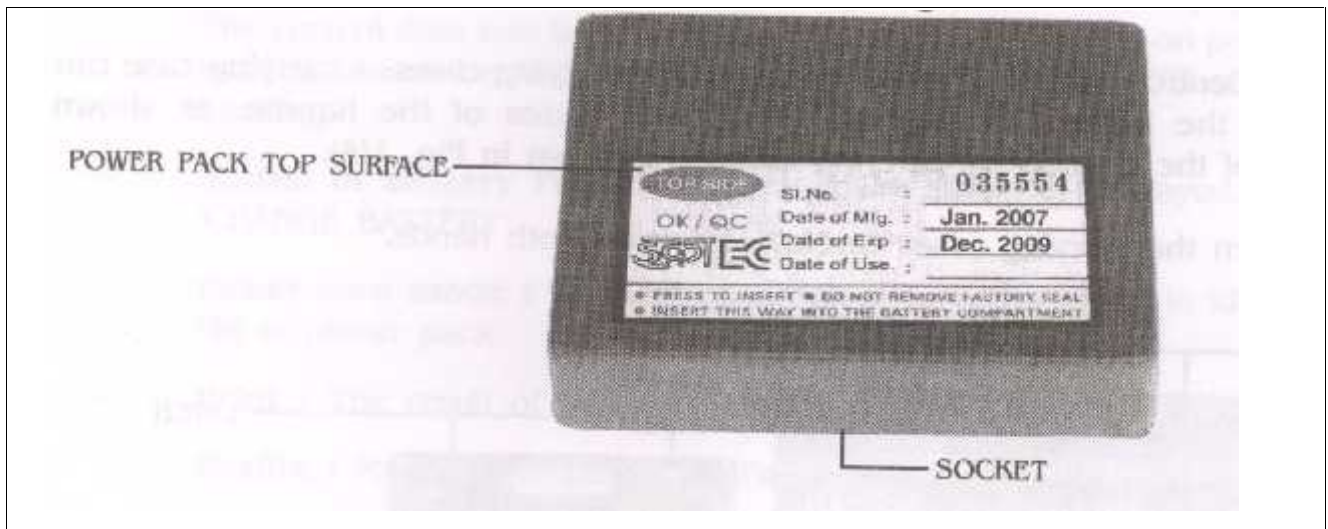
Figure 1.5
BU, CU Carrying Cases (Open Condition)



The EVMs works with the help of Battery which is called power pack. The battery is not rechargeable. The machine displays when their battery is in high, medium and low conditions. The Machine can work continuously for 48 hours with a battery. If the Battery has to be change "change Battery" displayed in the screen.

The figure of the battery is given below:

Figure 1.6
Power Pack



1.2 Focus of the Study

The main focus of the study is finding out the fact that either the EVM is Reliable or not in using election for under developed country like Nepal. There may be several variables to ensure it, but I decide only five variables to ensure it. They are:

1. Functioning system of Machine
2. Time taken for voting
3. Chances of rejecting of vote
4. Operating cost of Machine
5. Degree of education needed for voters

1.3 Statement of the Problems

"Is the EVM Reliable in election for Under developed country like Nepal"?

In other words, we can say that, "Testing reliability of using EVM in election for Underdeveloped countries like Nepal".

1.4 Objective of the Study

The objective of the study is focused in this thesis, how to use of EVM in future election on easy way to denied votes. The other Objectives is mention below:

- i. To increase of felling of people for their right choice, right candidate and freedom.
- ii. To manage friendly environment of Election by managing of thoughtful and free election.
- iii. Reform in election system and procedures.
- iv. To develop the physical structure for election commission and voting center.
- v. To develop Human Resource management for capable and attentiveness.
- vi. To manage complete accuracy of name list and identification of voters.
- vii. To motive the attention of voters.
- viii. To make improvement, capable and effectiveness of election management.

According to the summary of above description I claim that the primary objective of the study is finding out the fact that either the EVM is Reliable or not in using election for underdeveloped countries like Nepal. The secondary objective of the research is in partial fulfillment of the requirements for MIS in Master in Business Studies (MBS) in second year with 100 Marks.

1.5 Rationale of the Study

Nepal is an underdeveloped country. As like our other system and factors are in the stage of development, the election process are also are in the developing as in comparison to the past. The people may become depressed due to the materials processed during election and they use in order to minimize this drawback of our election. System and carry out the election economically. The benefits that are achieved from the use of this machine are listed below:

- i. To make the voters active during the election period.
- ii. To conduct election economically.
- iii. To make the result of election more authentic and reliable.

- iv. The purchase of EVM machine is high cost for developing countries like Nepal. So developed country help for it which automatically minimize the cost of election and increase its efficiency.
- v. The lean process of election saves the time and resource that might have been consumed.

I got a lot of information from this study. I'm well known about laws and regulation and also the objectives of Election Commission Nepal as well as the voting capacity of EVMS.

1.6 Limitation of the Study

Research work tries to clear the facts or absolute data but this is not possible due to some difficulties. We are just students not get the data at all completely and also we face some difficult technical problem also. Few limitations are mention below:-

- i. Time constraint due to student.
- ii. Economical problem also disturb to get data from different countries other than Nepal.
- iii. Hesitation to give data from authorized agency due to legal barriers.
- iv. Management Information System (MIS) is new concept which is in developing stage. Our academic knowledge since school life does not match with newly developed sophisticated concept. It is a vital limitation of the study and research.

1.7 Organization of the Study

The organization of the study is divided in five chapters which are mention as follows:-

Chapter - I: Introduction

This is the initial chapter of this research. The first chapter is the Introduction of EVM and election commission. There are seven subtopics includes Background, Introduction to MIS, Introduction to organization and thesis topics, Focus of the study, Statement of the problem, Objective of the study, Rational of the study, Limitation of the study and organization of the study.

Chapter - II: Review of Literature

After the introduction of the study, the second chapter is 'Review of the literature'. In this chapter, I study theories and practice. There are four sub topics, conceptual review, Review of articles. Review of related research studies and Research gap. Literature Review is most important part of the study of this research which gives the knowledge of EVM and election process.

Chapter - III: Research Methodology

The third chapter is Research Methodology. This chapter has shown Research Design, i.e. population and sample, Source of data i.e. primary and secondary data, Analytical tools and technology, Tables and figure.

Chapter - IV: System Analysis Design Data Presentation

The fourth chapter is System Analysis, Design and Data presentation. This chapter presents all the data available and analysis it using different analytical tools. There are thirteen subtopics like organization structure, Source of information, DFD of existing system, context level, system level. Analysis of existing technology, limitation of existing system, major finding of existing system, concept of new system and modify the system. Application modeling, DFD, DD, ERD for new system. Input database and output design, Justification of new system, Cost benefit analysis and feasibility analysis of new system.

Chapter – V: Summary, Conclusion and Recommendations

The last chapter of the study is summary conclusion and recommendation of the research study. The conclusion that the researcher found in the research analysis for the betterment of the system are included in this chapter.

CHAPTER - II

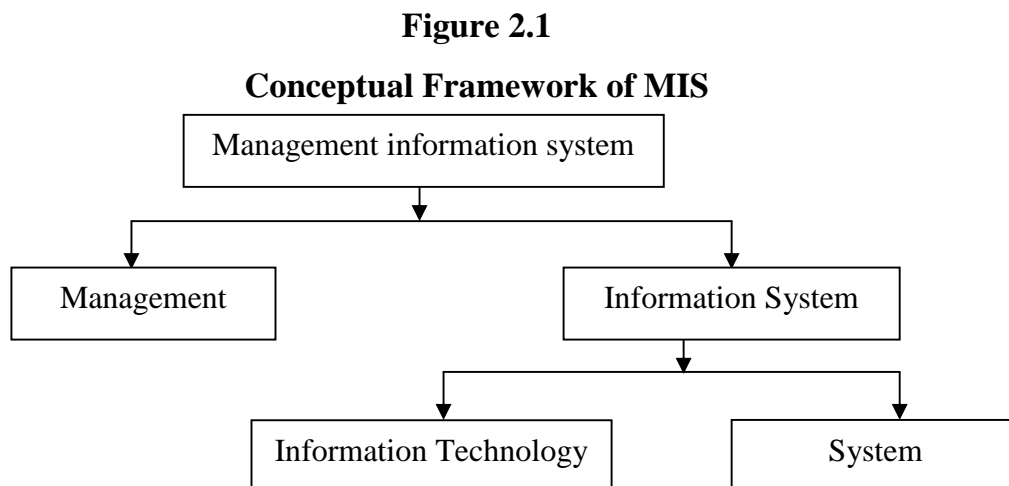
REVIEW OF LITERATURE

After the introduction, the next chapter is to review what has been written in concerning topic. The purpose of reviewing the literature is to develop some expertise in one's areas to see what new contributions, can be made and to receive some ideas for developing a research design. This chapter will examine how to choose a topic, how to review the literature and how to actually find library materials, suggestions for reading and taking notes will also be presented. The correct use of the library can save a considerable amount of time in preparing the review of the literature.

2.1 Conceptual Review

2.1.1 MIS

Management information system (MIS) stands for the system of information, which is useful for management with in an organization.



Management is the process of achieving an organizational goal and objectives by judiciously making use of resources of men, Materials, Money, Methods, Messages, information and its movements i.e. (6m+I) Which I mention in introduction chapter also.

The initial concept of MIS was to process data from the organization and presents 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 he processed data and use it for his requirements. This concept was further modified when a distinction was made between data and information. The information is a product of an analysis of data. This concept is similar to raw material and finished product. What are needed are information and not a mass of data. However, the data can be analyzed in a number of ways, producing different shades and specification of the information as a product.

This concept was further modified, that the system should present information in such a format that it creates an impact on its user, provoking a decision, an action or an investigation. The concept was then evolved that the system should be capable of handling a need based reporting. This need may be either of an individual or a group of people. This called for keeping all data together in such form that it can be accessed by any body and can be processed to suit his needs. The concept is that the data is one but different individuals can view it in different ways. This gave rise of the concept of data base, and the MIS based on the data base prove much more effective.

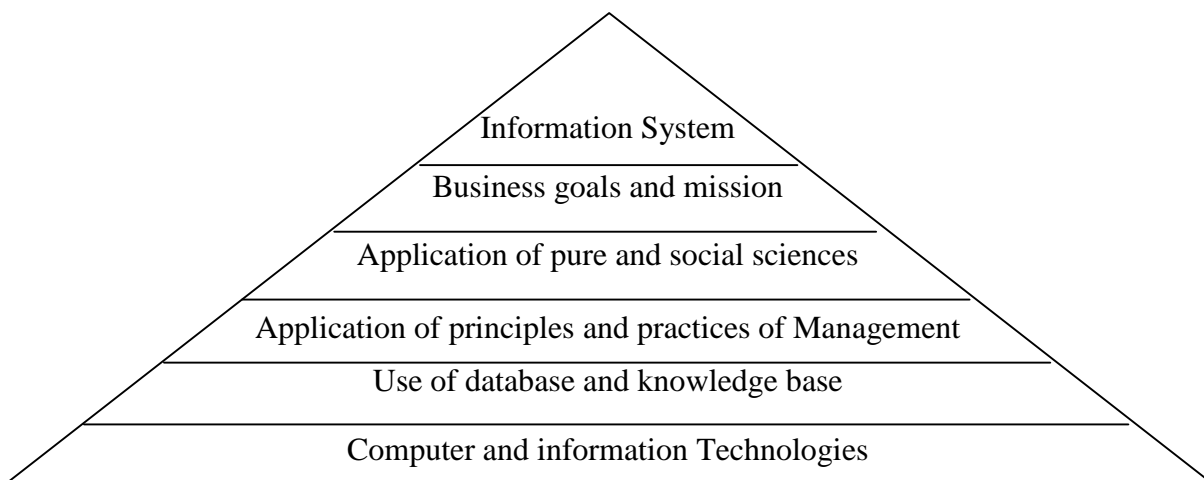
Over a period of time, when these conceptual developments were taking place, the concept of the end user computing using multiple data bases emerged. This concept brought a fundamental charge in MIS. The change was decentralization of the system and the user of the information becoming independent of computer professionals. When this becomes a reality, the concept of MIS changes to a decision making system. The job in a computer department is to manage the information resource and leave the task of information processing to the user. The concept of MIS in today's world is a system. Which handlers the databases, providers computing facilities to the end user and gives a variety of derision making tools to the user of the system. The problems with traditional MIS are as,

-) Information not timely.
-) Information not properly integrated.

-) Information lacks principles.
-) Information not available in proper format.
-) Information cost too much to produce.
-) Information produced is not relevant.

The concept, there fore, is a blend of principles, theories and practices of the management. Information and system giving rise to single product known as management information system (MIS) The conceptual view of MIS is shown as pyramid in the figure below:

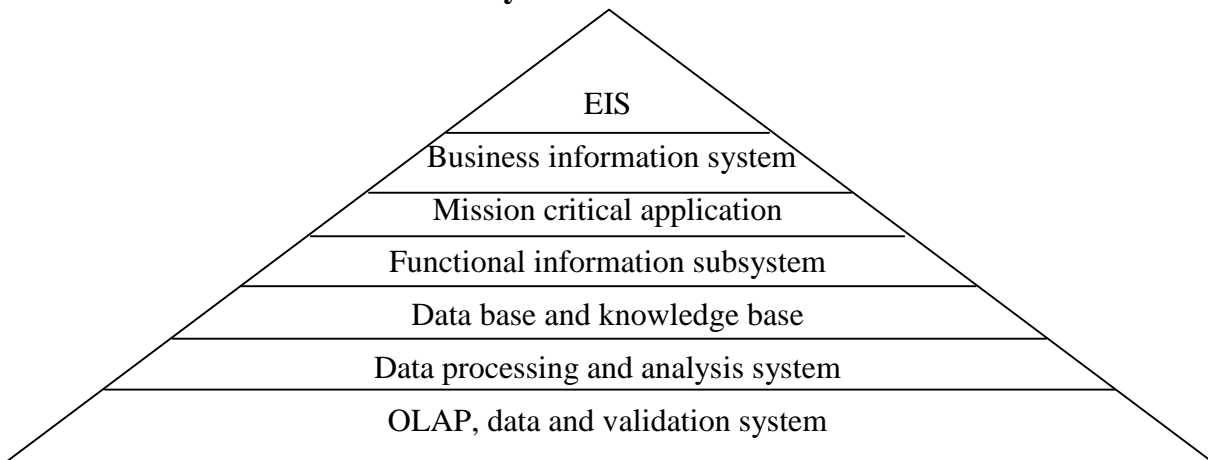
Figure 2.2
Conceptual View of MIS



The physical view of the MIS can be seen as an assembly of several subsystems based on the database in the organization. These validating, processing, analyzing, and strong the information in data bases. The sub systems could be at a functional level or a corporate level. The information is evolved through them for a functional or a departmental management and it provides the information for the management of business at the corporate level. The physical view of the MIS can be shown as in the figure below:-

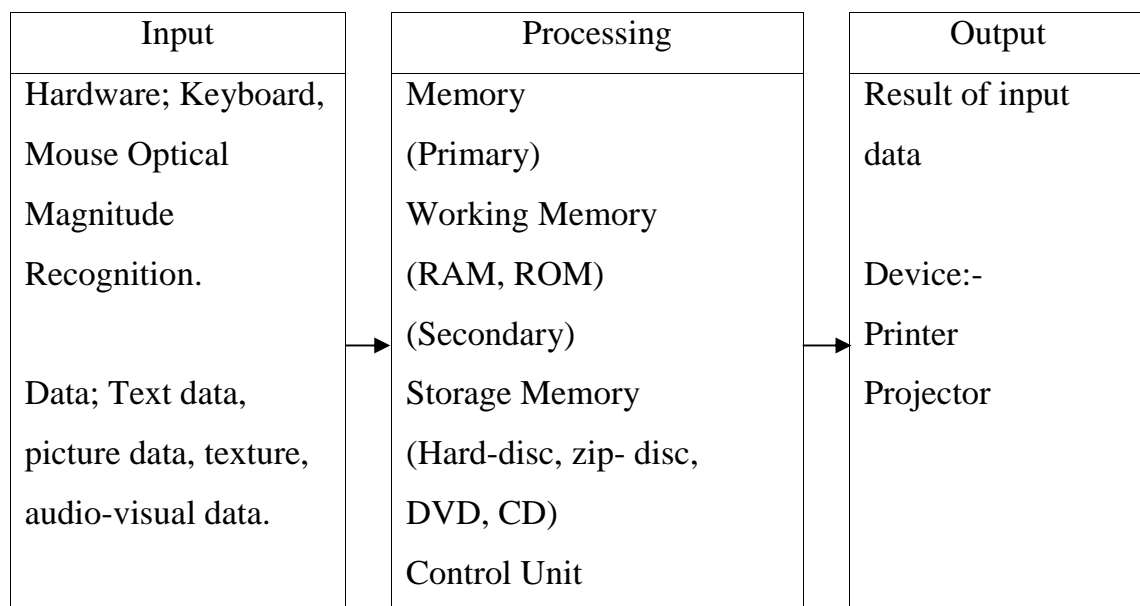
Physical Review of MIS

Figure 2.3
Physical Review of MIS



We know that a system is the combination of various subsystems functioning as a whole. In the essence of this statement I am going to explain the result deliver system as the component of computer system.

Figure 2.4
Component of Computer System



Soft ware:- Operating System of software.
) Application System Software.
) Computer Language.
) Translation.
) Enterpretatore
) Assemble

These are the system software which are used in MIS for problem solving on the basis of computer system.

2.1.3. DSS

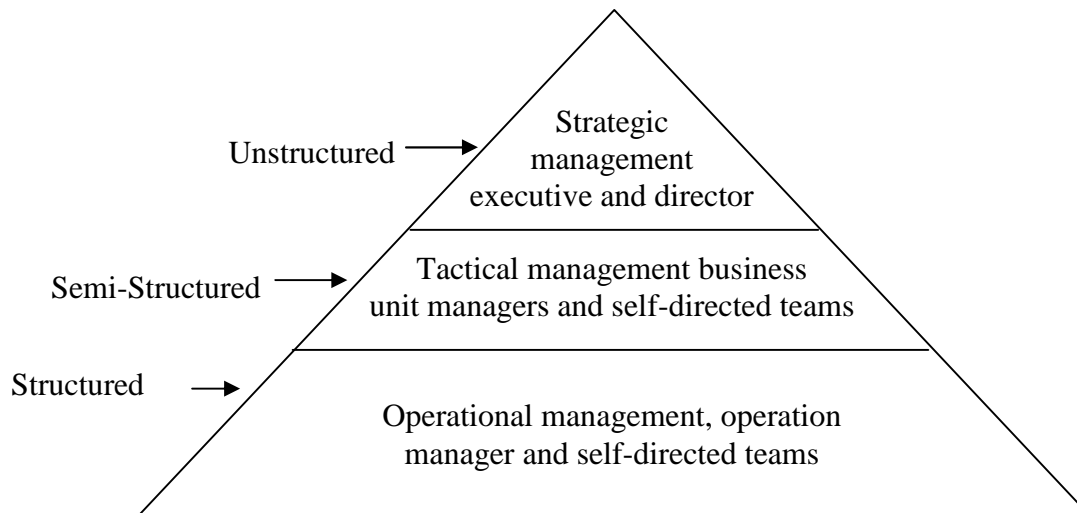
-) One important factor underlying system is that information is a corporate asset and should be recognized as such. In classical economic terms the factors of production were viewed as land, labor and capital. In the Modern Industrial age, these have become the "5 M's" Man (people) money, machine, material and management. To integrate these factors successfully, it is necessary to use information as a sixth factor of production. Although MIS tried to integrate an organization's resources together in a coherent and effective manner, there were shortcomings.
-) To allow information to be a truth sixth factor of production, decision support system has evolved to utilize information more effectively as corporate assets. On DSS information are become structured, so that they can be used as effectively as the other resources of an organization. Management needs all the pertinent information possible to support them in more effective decision making.

A definition of decision-making activity is often taken for granted and is associated with making a choice among alternatives. Decision making is the process by which the decision maker moves from a current position to the position in which she or he wants to be. So decision making process can be defined as a series of steps that start with an analysis of the information and ultimately culminate in a resolution, a

selection from the several available alternatives and verification of this selected alternative to solve the problem under study.

Figure 2.5

Level of Management



2.2 Review of Article

2.2.1 Election Officer plays a pivotal role in the election management. An Election Officer is responsible for overseeing election in one constituency may be two constituencies at the most. An Election Officer is called so because he holds the election in the constituency and returns the result.

2.2.2 There have been tremendous changes in the approach and methodology of the election management in the country over a period of time, particularly, in recent times. The elections are being more and more micro managed as an institutional responsibility to the growing complexities associated with the elections. In this chapter we may outline some of the salient features of the election management in the light of new guidelines and instructions issued by the Election Commission of Nepal.

2.2.3 Greater emphasis is being laid on the defect free electoral roll. Consequent upon introduction of Booth Level Officer system, the identification and removal of names of the dead voters and the shifted voters has become more accurate and this has helped the election machinery in ensuring enhanced fidelity of the electoral rolls. This

aspect must have been taken care of by the Electoral Registration Officer. As the Election Officer, you should also be consciously aware of the importance being given by the Election Commission of Nepal to the fidelity of roll to be used on the poll day and carry out all the instructions issued by the Commission in this regard. It is relevant to note that mere peaceful conduct of elections no way guarantees a free and fair election. In spite of election being peaceful, there could still be malpractices that can take place if the election machinery is not vigilant. Election can be called truly free and fair election only when all the stakeholders perceive and accept the election to be free and fair. As the Election Officer you have to meticulously plan a strategy so that there is no scope left for any complaint.

2.2.4 The election management should be transparent and there should not be any scope for complaint of partiality on the part of any official involved in the election management. The Commission takes very serious view about lack of neutrality on the part of any election official.

2.2.5 A visible and rigorous enforcement of Model Code of Conduct enhance the credibility of the elections and gives confidence to the voters, electoral offences, malpractices and corrupt practices such as impersonation, bribing and inducement of voters, threat and intimidation to the voters shall be prevented by all means. Introduction of photo electoral roll by the Election Commission is expected to play a crucial role in minimizing the scope for impersonation. The recent instruction that the polling agent appointed by the candidate shall be a voter in the same polling station aims at minimizing the external interference in the election process at the polling station. The threat and intimidation to the voters particularly, the voters from vulnerable sections of the society in some parts of the country has been a cause of concern. With a view to meet this challenge, the Commission has recently introduced the system of 'Vulnerability Mapping'. You should familiarize yourself with the concept of Vulnerability Mapping and implement the Commission's instruction scrupulously. A free and fair election can be conducted only in a conducive atmosphere from the law and order point of view. Hence, it becomes imperative to

keep track of the law and order situation during the run up to the election and on the poll day.

2.2.6 The Electronic Voting Machine was used in Kathmandu district No.1 2064 Chaitra 28th and by election 2065 Chaitra 28th. However, the voter awareness about the EVM cannot be taken for granted; there should be a fresh initiative to spread the awareness about the EVM among all the voters particularly, in the remote areas and among the new voters. The Commission has introduced the system of randomization of EVMs and specific responsibility has been given to the Election Officer.

2.2.7 The sector management has become an important aspect of the election management. Hence, care needs to be taken while identifying the sector officers and they need to be trained about their work in advance. You need to give lot of importance to the training of the polling personnel. If the training is not done properly you will face lot of difficulties on the poll day.

2.2.8 The Commission has introduced postal ballot reform in recent elections. The new system calls for a greater involvement on the part of Election Officer in managing postal ballot.

2.2.9 Another important pre-condition for fair election is to curb the money power which undermines the level playing field. This can be achieved by keeping a proper watch on expenditure incurred by the candidate/political parties. The Commission's instruction to keep watch on campaign vehicles and strict enforcement of Commission's instruction on "Defacement of public and private properties" as applicable.

2.2.10 Effective coordination is the essence of an efficient election management. As a Returning Officer you need to play vital co-ordinating role by constantly interacting with the District Electoral Officer, Commission's Observers and other stakeholders like political parties and the candidates and election agents. You should facilitate the

Commission's Observers to deliver their assigned duties effectively by extending your cooperation.

2.2.11 The Commission has also thinking to introduce to the system of micro observers and also for use of digital cameras at some pre-selected sensitive polling stations. The Commission's instructions in this regard should be strictly followed.

2.2.12 You should have a thorough idea about the polling station-wise deployment of security personnel including Police Forces, if any, and ensure that the approved deployment is implemented properly. You should pay enough attention to the effective management of dispatch centres from where the polling personnel are sent to the polling stations with the EVMs and also of reception centres polling parties with where the polled EVMs are received. The basic amenities for the polling personnel shall arranged be provided.

2.2.13 Transparency is the key for an effective and efficient election management for transparency adds to the credibility of the election. Hence, you should keep the political parties and candidates informed of the Commission's instructions from time to time. Your interaction with the media should be positive and you should make good use of the media to disseminate relevant information to the voters as well as to the other stakeholders.

2.2.14 To sum up, it may be said that as Election Officer you are going to play a very important role in ensuring a free and fair election in your constituency. If only you are thorough with the provisions of law and aware of the Commission's recent instruction you can lead your team to deliver a free and fair election. Hence, it would be beneficial for you to go through the Election Officers handbook and note down the important points for your guidance.

2.2.15. Role of Election Officer

2.2.15.1 Suppose that you are the Election Officer for a constituency in which voting machines are going to be used. You should, therefore, acquaint yourself fully with the up to date rules and procedures prescribed for the conduct of elections by voting machines. You should not only familiarize yourself thoroughly with each step to be taken at various stages of the election process, but also with the operation of voting machines. The smooth conduct of election right from the issue of the public notice and till the declaration of the result mainly depends on you and the electoral machinery under you. You have a well defined and a vital role to play in the electoral process. A slight mistake or lapse or wrong application of the law or rules or inadequate knowledge of various functions of the voting machines may vitiate the election.

2.2.15.2 The information and guidance, which you may need in the performance of your functions. However, it may be noted that it cannot be treated as an exhaustive compendium in all aspects or as a substitute reference for various provisions of election law during the conduct of elections. You should, wherever necessary, refer to those legal provisions, which are contained in the Manual of Election Law. You should provide yourself with a copy of the latest edition of the Manual of Election Law brought up-to-date. You must also keep a mind for Presiding Officers, and compendium of instructions, which are being issued by the Election Commission. You should make yourself thoroughly familiar with the manual.

2.2.15.3 You should also study the various Forms, statutory and non-statutory, which have to be used for an election and make sure that they are the latest Forms in force at the time of the election. These should be stocked in adequate numbers. You should know well the territorial extent of the constituency for which you are the Election Officer. The extents of Parliamentary and Assembly Constituencies. As your constituency may be one of them, you may check this from the Delimitation Commission's Orders, which are likely to be published shortly in a consolidated both called the Delimitation of Parliamentary and Assembly Constituencies.

2.16. Brief Introduction to Voting Machines

2.2.16.1 It is, therefore, necessary for you to be thoroughly conversant with the operation of the voting machine. A voting machine consists of two units, namely, Control Unit and Ballot Unit. These two units are interconnected, when the voting machine is put to operation, by means of a cable, one end of which is permanently attached to the ballot unit. The free end is to be plugged into the control unit when you want to use the machine.

2.2.16.2 A Necessary changes were made in the Conduct of Elections Rules, for using the voting machines in the elections.

2.2.16.3 One ballot unit caters up to a maximum of sixteen candidates. There is provision for display, on the ballot unit, of the ballot paper containing the particulars of the election, serial numbers and names of contesting candidates and the symbols respectively allotted to them. Against the name of each candidate, there is a button by pressing which the voter can record his vote for him. Alongside the said button, there is also a lamp for each candidate, which will glow, red when the vote is recorded for him by pressing the said button.

2.2.16.4 Four ballot units linked together catering up to sixty-four candidates can be used with one control unit. On the top most portion of the control unit, there is provision for displaying the various information and data recorded in the machine, like the number of contesting candidates, total number of votes polled, votes polled by each candidate, etc. This portion is called, for easy reference, Display Section of the Control Unit. Below the Display Section, there is a compartment for fixing the battery on which the machine runs. By the side of this compartment, there is another compartment in which there is a button for setting the machine for the number of candidates contesting the particular election. This button is called the 'Cand Set' button and the whole section of the control unit consisting of these two compartments is called the 'Cand Set Section'. Below the Cand Set Section is the 'Result Section' of the control unit. This Section contains 'Close' button used for closing the poll, two

‘Result’ buttons for ascertaining the result of two different polls and ‘Clear’ button for clearing the data recorded in the machine, when not required. In the bottom portion of the control unit, there are two buttons – one marked - ‘Ballot’ by pressing which the ballot unit becomes ready to record vote and the other marked ‘Total’ by pressing which total number of votes recorded upto that stage can be ascertained. Please note that the display indicates only the total votes and not candidate-wise tally. This section is known as the ‘Ballot Section’ of the control unit.

2.2.16.5 The machine uses a modern microcomputer and other integration chips. It operates on a battery and can be used anywhere and under any conditions. It is tamper-proof, error free and easy to operate. Both the Units of the machine are supplied in two separate carrying cases, which are easily portable. The polling information once recorded in the machine is retained in its memory even when the battery is removed.

2.2.16.6 The machine, especially ballot unit, is so designed as to keep intact all essential features of the present voting system and the only change is that the voter is required to press the button provided opposite the name and symbol of the candidate of his choice as against the use of arrow cross mark rubber stamp which is put on the ballot paper on or near the symbol of his choice. All the safeguards taken under the present system against the tampering of the ballot boxes and violation of secrecy of vote are fully maintained in the voting machine. The process of voting in the voting machine is very simple and quick and even illiterate voters have no difficulty in using the voting machine to record their votes. The polling personnel will also not find any difficulty in operating the machine, as its mechanism and operation are quite simple. The pace of polling is far quicker and the time taken for the entire operation of voter exercising his vote is comparatively much less. The counting of votes and declaration of results by using the voting machines will be an absolutely simple affair as there will be no doubts and disputes with regard to the validity or otherwise of any vote, and the result of poll taken at a polling station will be available on the mere pressing of a button on the control unit.

2.2.16.7 The Electronics Corporation of India, Limited and the Bharat Electronics, Limited who have produced these machines have published separate Manuals explaining in full the details of operation of the machines produced by them. The Commission has classified the machines based on the year of production and these are as follows: -

- i. ECIL (New) Machines made in 1999 to 2005
- ii. ECIL (New improved) Machines made in 2007 and later
- iii. BEL (New) Machines made in 1999 to 2009
- iv. BEL (New improved)

Machines made in 2007 and later You should find out as to which of the machines, that is to say, whether produced by Electronics Corporation of India Limited or Bharat Electronics Limited, are going to be used in your constituency. You should study very carefully the Manual of operation relevant to the machines being used in your constituency.

2.2.17 Broad Outlines of Duties

2.2.17.1 You, as the Chief Election Commissioner/Election Commissioners/ Election Officer, are primarily responsible for the conduct of election from your constituency. The main items of your work in that regard are briefly mentioned as below: -

Preparation for the Poll

1. Drawing up, well in advance, a District Election Plan specifying different tasks, deadline and strategy and planning to meet it; (2) Do Vulnerability mapping of your Constituency (Prepare updated lists of Absentee, Shifted (with or without family linkage) and dead electors in respect of each polling station.
2. Procurement of voting machines and all election materials in sufficient unity;
3. Issue of public notice of election.

Processing of Nomination Paper and Allotment of Symbol

1. Reception of nomination papers, security deposits, etc.;
2. Administering oath or affirmation to candidates after they have filed their nomination papers;
3. Dissemination of information contained in the affidavits filed by the candidates;
4. Scrutiny of nomination paper; (9) Recording of reasons in brief for rejecting any nomination paper;
5. Receipt of notices for withdrawal of candidatures;
6. Checking whether any party has been granted concession by the Commission.
7. Allotment of symbols to contesting candidates;
8. Preparation and publication of notice of nominations, list of validly nominated candidates and list of contesting candidates;
9. Checking which of the political parties have communicated their list of leaders.

Ballot Paper- Printing and Distribution

1. Assessing the requirements of (i) ballot papers for use in the ballot units of the voting machines; (ii) postal ballot papers for service voters and voters on election duty, etc., and (iii) tendered ballot papers and arranging the printing and supply thereof;
2. Preparing the lists of classified service voters who have appointed proxy voters;

Confidence Building Measures

1. Establishing contact with the contesting candidates and political parties to ensure free, fair and smooth election;
2. Convening of meeting of the Constituency Committee to discuss common problems relating to conduct of election, review of law order situation, enforcement of code of conduct for political parties, etc.;
3. Preparation and commissioning of voting machines about one week in advance before the date of poll;

Dispatch of polling parties and election materials

1. Transport arrangements for the polling parties, voting machines and election materials;
2. Dispatch of polling parties for the conduct of poll and supply of voting machines, tendered ballot papers and other election materials to them;
3. Effective supervision of the poll;
4. Appointment of counting staff;
5. Transport and storage of voting machines after and poll, under strict security arrangements and proper arrangement at “Reception Centre” to received polling parties after poll.
6. Fixing of date, time and place of counting and actual counting of votes;
7. Declaration of result;
8. Transmission of all voting machines, election papers and election materials after declaration of result, to the District Election Officer for safe custody;
9. Overall supervision of election work

2.2.17.2 Some of the important arrangements for the conduct of election are also made by the District Election Officer

1. Selection (and, at the appropriate time, setting up) of polling stations, with the previous approval of the Election Commission;
2. Formation of polling parties and appointment of Presiding Officer and Polling Officers for each polling station;
3. Imparting intensive training to the polling personnel.
4. Building awareness about the use and working of Electronic Voting Machine among the general public, political parties, candidates, and media;
5. Printing of postal ballot papers for service voters and their dispatch to the service voters;]
6. Scrutiny of accounts of elections expenses of contesting candidates and submission of returns to the Commission;
7. Safe custody of all voting machines, election papers and election materials after the completion of election and during the period specified for the purpose.

2.2.17.3 In some cases, you yourself may be the District Election Officer. You have to look after the above arrangements in such a case. Wherever there is a different officer functioning as District Election Officer, you have to work in close liaison and coordination with him in respect of the above arrangements.]

2.2.18 Advance Planning for the Poll

You should draw up well in advance a programme and plan of detailed arrangements for the poll. A good deal of forethought and advance planning are necessary if the election is to be carried through efficiently and to your credit.

Training of Staff in the Use of Voting Machines and Polling Rehearsals

2.2.18.1 It is essential that thorough and intensive training is imparted to the election machinery in the use and operation of voting machines. The success of the voting machines would depend on the degree and intensity of training given to them and thoroughness on their part in operating those machines at the polling stations. You should hold polling rehearsals as often as possible where the use and operation of the voting machines should be explained and practically demonstrated. You should see that every Presiding Officer and senior polling officer (who is designated to act as Presiding Officer if the latter is unavoidably absent on the day of poll) attends at least two or three such rehearsals and is given an opportunity to have “hands-on” training on the machine.

2.2.18.2 Before you arrange such polling rehearsals, it is essential that you should have yourself attended training classes/polling rehearsals organized by the Election Commission and/or the Chief Electoral Officer, so that you are yourself well versed in the use and operation of voting machines and about the correct procedure to be followed for the conduct of poll and the counting of votes by means of the voting machines.

2.2.18.3 At the polling rehearsals arranged by you, provide to each Presiding Officer and Polling Officer present, a copy of the Handbook for Presiding Officers separately

published by the Commission explaining the detailed procedure to be followed at the polling stations where the voting machines are to be used. Also provide them with a copy of the Electronic Voting Machine Manual published by the company, which has manufactured the voting machines, to be used in your constituency, which explains with the help of graphic illustrations the operation of the voting machines. Also instruct all Presiding Officers and Polling Officers present to operate these machines themselves at the training classes, so that they become fully familiar with their functions and operations.

2.2.18.4 It would be advisable to allocate a room permanently in your office in which a voting machine may be kept, so that if any Presiding Officer or Polling Officer feels that he requires more practical training he may do so there, till he is satisfied and confident of handling the machine at the polling station independently on the day of poll.

2.2.18.5 While conducting the polling rehearsals, the Presiding Officers and Polling Officers present should first be given an introduction of the machine and its general functions and then they may be taken through various operations on the machine, stage by stage, with proper demonstration.

2.2.18.6 At the polling rehearsals, the following aspects should be stressed specifically: -

1. All must handle the voting machines with utmost care at all times.
2. When the voting machine is not in use, the control unit and ballot unit should be kept in their respective carrying cases.
3. The battery in the control unit should be switched off to avoid unnecessary drainage of the battery.
4. When the machine is put to use, the control unit and ballot unit are inter-linked by means of a connecting cable. One end of this cable is permanently attached to the ballot unit and no one should attempt to detach the cable from the ballot unit. Further, the connector provided at the other end of the cable fits into the control

unit in a particular manner and can be detached afterwards only after releasing the latch in a particular manner which is explained in the EVM Manual published by the manufacturing company. Every presiding officer and polling officer should be specifically taught the correct manner of fixing the connector in the control unit and detaching it there from afterwards, so that no damage is caused to the machine in the process of such fixing or detaching.

5. All buttons both on the control unit and the ballot unit operates by mere application of light pressure and use of unnecessary force should be avoided as that may damage the machine.
6. There is a provision for fixing green paper seal(s) on the inner door of the compartment containing 'Result' and 'Clear' buttons on the Control Unit. (One green paper seal is used in the machines produced by Electronics Corporation of India, Limited and two such seals are used in the machines produced by the Bharat Electronics, Limited) manufactured before 2007. Explain the proper method of fixing these seals to each Presiding Officer and Polling Officer. This seal is vital and so long as it is intact it guarantees that the machine has not been tampered with, after the commencement of the poll and till the result is ascertained at the time of counting of votes. The Commission has also introduced (i) sealing of the 'Result section' with a 'Special Tag' and (ii) use of an 'Outer Paper Strip Seal' as added security features.
7. At the end of the poll, the Presiding Officer is required to prepare an account of votes recorded at the polling station and an account of green paper seals used for sealing the voting machine. The said accounts shall be prepared by the Presiding Officer and an attested copy thereof shall be furnished by them to every polling agent present at the polling station. The Presiding Officers should, therefore, be properly instructed to prepare the said accounts committed by hem in filling up the various entries in that Form. For that purpose, sample Forms may be filled by you in the rehearsal classes and the Presiding Officers asked to prepare such accounts in the prescribed form themselves as an exercise.
8. Before as well as, after the conclusion of poll, the Presiding Officer is required to seal the ballot unit and the control unit and their respective carrying cases. He

should also permit the polling agents to affix their seals on these units. At the Polling rehearsals, the Presiding Officers should be properly informed and instructed of the manner in which such seals are to be affixed on the machines and their carrying cases. Whenever any seal is put on the machine, it must be ensured that the direct flame does not come into contact with the machine and the molten wax does not fall on it. Sealing is to be done in switch off mode only.

2.2.18.7 Political parties and candidates may also be invited to polling rehearsals. While inviting representatives of the political parties, both recognized and registered-unrecognized parties, to the polling rehearsals, contesting candidates may also be invited to such rehearsals, if such rehearsals are held after the last date for withdrawal of candidatures. Explain and demonstrate to all of them the operation of the voting machine and the safeguards provided therein for ensuring the secrecy of vote, interoperability of the machines and the safe preservation of memory of the votes recorded by the machines. The better these procedures and safeguards are known and appreciated by them, the less would be the volume of uninformed criticism and suspicion.

2.2.18.8 Compulsory Training for the police officers from the level of Superintendent of Police to Sub-Inspector shall also be conducted as per Orders of the Commission.]

2.2.19 Contact With Political Parties

You should also meet the representatives of the recognized political parties and contesting candidates together as often as you can. Hold also the meetings of the Constituency Committee as often as necessary. Many of their doubts and misapprehensions can be cleared up by mutual discussions. In the absence of such personal contacts and clarifications, some parties may be apt to imagine all kinds of irregularities and violation of law. It has often been experienced that they themselves labour under an ignorance or misapprehension of the provisions of the law and of Commission's directions and instructions and that their doubts and misapprehensions usually arise out of this.

2.2.20 Commission's Special Instructions

The Commission has directed that –

- i. At the time of presentation of the nomination paper of a candidate, such candidate or his proposer should be –
 - a. Handed over a letter requiring the candidate to furnish, before 5.00 p.m. on the last date of filing nominations, the affidavits containing the information relating to criminal antecedents, assets, liabilities, educational qualifications, if the same is not filed with the nomination;
 - b. Given the notice about the time, date and place of scrutiny of nominations and allotment of symbols.
 - c. Supplied with copies of such instructions and guidelines issued by the Commission as may be directed by it from time to time, including those on the maintenance and lodging of Account of Election Expenses and the Register prescribed for the purpose;
- ii. All contesting candidates should be issued with a notice inviting their attention to the provisions of law relating to corrupt practices and electoral offences. The Commission has directed that the Standing Committees at the District and Constituency levels should be set up to ensure the observance of the Model Code of Conduct devised by the Commission for the guidance of political parties and candidates. The model code of conduct comes into operation from the date of announcement of election by the Commission.

2.2.21 Observers

2.2.21.1 The Observers are appointed by the Election Commission. They are officers of the Commission working under the superintendence, control and discipline of the Commission for period of elections.

2.2.21.2 The duties of the Observers can be broadly classified as below:

- i. They will observe the preparedness for conducting a fair, free and peaceful election and whether, in compliance with the guidelines of the Election Commission, the local authorities have identified sensitive areas and polling stations from the point of view

of protection of weaker sections and women. They will also take stock whether election materials like voting machine, paper for printing ballot papers, symbol blocks, indelible ink phials, green paper seals, etc. are physically available in adequate quantity. They should inspect the electoral rolls at random with a view to ensuring their completeness and correctness and that there are no complaints of unauthenticated addition or deletion of names. They should make a random check of polling stations with particular reference to their location, spaciousness and suitability and especially with reference to the casting of votes by SC/ST, women and other weaker sections of the society. They should however not recommend for creation of a new polling station when election process is already going on. The observers should also attend some of the training rehearsals arranged for the Presiding Officers and Polling Officers to study the quality of training being imparted.

ii. They should locally discuss with the Election Officer, the law and order enforcement authorities and other election related Officials, defects and shortcomings in the election arrangements, which are locally remediable.

iii. They will closely observe and assess the expenditure incurred by a candidate himself, or by a political party or any other persons on his election so as to ensure a check on the flow of unaccounted financial resources.

iv. This is so because situations vary from constituency to constituency. But there are certain common points of concern, viz:

-) That the conduct of the election machinery in the field is free from bias, is impartial and uninfluenced by any local or other prejudices;
-) That the complaints received from the candidates and their agents are being suitably, and with due and deliberate speed, disposed of by the election machinery;
-) That the location of polling stations, the composition of the polling parties, the deployment of the Central and State police forces, the preventive action of the local law and order machinery to curb poll violence and intimidation and

counting of votes, are being carried out in a manner which minimizes chances of vitiation of the process to conduct peaceful, fair and free elections;

J) That the local election machinery is taking all practicable steps to ensure the observance of the Model Code of Conduct.

2.2.21.3 The Observers are expected to visit the constituencies allotted to them at least twice or so often as may be directed by the Commission. Where there is a time lag between the date of poll and counting, the visits will be even more. The Commission will brief the observers suitably before each election/bye-election.

2.2.21.4 Observers shall not under any circumstances share the contents of their reports or any information therein with any one except the Election Commission.

2.2.21.5 Under no circumstances are the observers expected to address the press.

2.2.21.6 The observers do not have to call meetings of the political parties independently. They should attend the meetings of political parties called by the Election Officers. However, if an Observer feels the need of meeting the political parties/candidates to explain omission's stand on issues like the model code of conduct etc or removing any misgiving about the conduct of election machinery, then the Election Officer will arrange for such meeting with the political parties/candidates immediately where he himself will also be present

2.2.21.7 The observers have the powers to direct the Election Officers to stop the counting of votes at any time before the declaration of result or not to declare the result, if in their opinion booth-capturing has taken place at large number of polling stations or at the counting place or the ballot papers or voting machine are unlawfully taken out of the custody of the Election Officer or are accidentally or intentionally destroyed or lost or damaged or tampered with. The counting proceedings in such cases shall proceed further in accordance with such directions of the Commission only

as it may issue on the reports of the Observers and after taking all material circumstances into account.

2.2.21.8 The District Election Officers shall ensure that the place of stay, the phone number, the dates of visit of the observers are duly publicized in the constituencies. The observers shall double-check this. They have to make themselves easily accessible to whomever wants to meet them with election related complaints or information.

2.2.21.9 The Commission has recently started appointing Micro-Observers in some specific constituencies in the recent elections to help the General Observer where the constituency allotted to him is spread over a large area and the number of sensitive and hypersensitive polling stations is comparatively more. The Micro-Observer will be an officer of Govt. who will be stationed at a particular polling station and report directly to the General Observer of the constituency concerned.

2.2.22 Safe Preservation of Voting Machines

2.2.22.1 The voting machines should be stored in go down when the machines are not in use before an election. Likewise, proper arrangements should be made for their safe custody and preservation in the district treasuries after the completion of the election and during the period for which they are required to be so preserved under relevant directions of the Commission.

2.2.22.2 For the safe and proper storage of voting machines in the election go down, follow meticulously the instructions given by the manufacturing Companies, which have been communicated, separately to the Chief Electoral Officer of your district.

2.3 Review of the Related Research Studies

In order to know, if any research has been undertaken about the electronic voting machine (EVM), I had gone to Research library of Shanker Dev Campus and then the central library of Tribhuvan University but in vain. I did not find any researches made about this topic. So I conclude that it was a new topic to research. I have taken my project work of MIS "VOTER EDUCATION MANAGEMENT INFORMATION SYSTEM FOR EVM" as reference for my research as needed. Besides it, I am confident that it is only research conducted on EVM.

2.4 Research Gap

I have already said that there has been taken five variables like functioning system of machine, time taken for voting, chance of rejecting of vote, operating cost of machine, degree of education needed for voters are the main determinant of reliability of EVM. But in reality, there may be hundred of such variables which help to determine the reliability of EVM. So I do not claim that hundred percent reliability represented, but it is only a satisfactory level of representation. In other words, this research is only the fast track of big chapter election and EVM. In the future, other researchers can take a valuable reference for his/her destination.

This research is slightly different in another way i.e. using different types of tools like DFD and ERD which help to determine the reliability of EVM when it is used for election programmes. All other remaining parts of research are some except some particular tools mentioned above.

CHAPTER - III

RESEARCH METHODOLOGY

This chapter discusses some of the concepts of research. Although these concepts are theoretical, the use of them in the one's research should clarify them. First, independent and dependent variables are explained. In our concern, 'Reliability' is dependent variable and other five variables be independent variable. In other words, Reliability depends upon the system time, rejection, cost, education and so many other variables.

3.1 Research Design

Research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implications to the final analysis of data. The structure of the research is more specific. It is the outline, the scheme, paradigm of the operation of the variables.

Basically, the research design has two purpose. The first purpose is to answer the research question to test the research hypothesis. Second purpose of research design is to control variance.

After the research study has been formulated, the next logical step is to construct the research design which refers to the entire process of planning and carrying out a research study. The research design asks, what approach to the problem should be taken? What methods will be used? What strategies most be effective? Identification, selection and formulation of a research problem may be considered as the planning of a research. The remaining activities refer to the designs, operation and completion of the research study.

I am now at the second stage and the main task here is select the most suitable design for a study. Several types have been suggested for classifying a wide variety of

research designs used in social science research. Five models of different types of research design have been suggested.

-) Controlled Experiment
-) Study
-) Survey
-) Investigation
-) Action Research

Selltiz and others suggest three broad categories of research design:

-) Formulative or exploratory studies.
-) Descriptive studies.
-) Studies, testing casual hypothesis.

I designed the research by the help of Ram Govinda Aryal who is the IT Manager of Election Commission of Nepal. Other more information I collected from District Election Commission, Kathmandu, Nepal along with Department of Election Commission of Nepal.

3.1.2. Population and Sample

Collection data is the connection link to the world of reality for the researcher. The data collection activity consists of taking ordered information from reality and transferring it into some recording system so that it can later be examined and analyzed for patterns. It is from these patterns that social behavior can be understood and predicted. Research as a media can be interpreted as having a content of data and a process of methodology. Without the data, methodology can not be utilized to bring us to the conclusion which the hypothesis suggest.

One of the critical aspects of empirical research is to decide the sample. Following the decision of the statement of hypothesis, the design of the sampling procedure must be decided upon. The term 'Population' and 'Universe' for research means all the members of any well-defined class of people, events or objects. For example, we

might say that we will study the valid vote of EVM in election of Nepal. Each EVM using in election related to research population. It is important from the beginning of a research study to understand and state who is being studied. A population is defined by listing all the EVMS using in election purpose at that period of time. In such case, the researcher would have a well defined population as well as the address of each of the members of the study of the population.

A population in most studies usually consist of a large group of people. Because of its large size, it is fairly difficult to collect detail information from each member of population. Rather than collection information from each member, a sub-group is chosen which is believed to be representative of the population. This sub-group is called a sample and the method of choosing this sub-group is done by sampling. The sample allows the researcher more time to make an intensive study of a research problem. Good sampling techniques or methods can save the researcher much time and money.

Basically there are three important sampling problems:

-) The definition of the population
-) The size of the sample
-) The representation of the sample

3.2 Source of Data

According to the source, we can classified primary source of data and secondary source of data. Accuracy of gathered information is main ingredient of success in historical research. I have already said that there are two main sources from where past evidences can be found. One is the primary source, where the researcher was a direct observer of the recorded event and the other is the secondary source where he/she reporting the observation of other. In most cases the researcher has to depend upon the data observed by others rather than by himself. At the same time, he must also be aware that inappropriate and biased information results in faulty conclusions and findings. I am very conscious about this factor.

3.2.1 Primary Data

The term primary data refers to statistical material which the investigator originates for the purpose of the inquiry in hand. Thus if it is desired to conduct an inquiry in to the cost of living of the workers in a certain mill, and if the facts pertaining to this inquiry are collected by the investigator or his representatives from the workers themselves, such data would be termed as primary data.

For primary methods of data collection, an investigator may adopt any one of the following methods:

-) Personal Interviews.
-) Mailed Questionnaires.
-) Observations, etc.

In my research concern, because of the nature of the research, there is no primary data collection.

3.2.3 Secondary Data

The advancement of mankind has been attributed, to man's ability to build on what others have done before. Scientists become well acquainted with the past work which led them to their present research. Secondary data are actually the results and data collected by previous investigators. It provides the researcher with a considerable amount of useful information. Secondary studies take existing collected information and examine relations among variables. In other cases, a researcher will collect empirical data on one variable and then sees if it can be related to variables from secondary data. The most distinguishing aspect of secondary data collection is that an instrument does not need to be developed; only a uniform data collection form is required. The following discussion is divided in to two sections. First the sources of secondary data explained. Then approaches to collecting secondary data from office records are given.

Frequently, this type of research is called ' ex post facto ' which means the data are collected after the fact. In ex post facto studies, the researcher takes one dependent variable and traces it back in time seeking independent variables which correlate with it.

An administrative office usually requires and collects a large amount of information on all aspects of its operations. This information is already recorded on bureaucratic, forms and is stored in office files. The office can supply the researcher with an inexhaustible amount of data. The researcher should have a good idea of exactly what information he needs. Shifting through the files without a design looking for information is a waste of time and most offices probably would not allow it. Obtaining data from office records requires preparation before entering an office. First, the desired information should be outlined. From the outline a list of variables can be made. A few of the basic variables could be: sex employees, age, education level, religion or caste, as well as variables directly related to the hypothesis. There will be at least three basic types of data collected.

-) Data for general information on the sample.
-) Data for the independent variables.
-) Data for the dependent variable.

After deciding upon the desired information, some form for recording the information needs to be developed. The form should have a separate page either for each individual or for each variable. The source for obtaining the information should be included on each data collecting form. Following is an example of a possible way to organize data summary sheet for the variables.

Result Sheet of an Election

Table 3.1

Result sheet of 'By Election 2065, Chaitra 28

| S. N. | District election Area No. | Total Voters | Vote on election | Required vote for election | Related party |
|-------|----------------------------|--------------|------------------|----------------------------|-----------------------------------|
| 1. | Morang-5 | 67,397 | 38,913 | 13,811 | Madhisi Jana Adhikar forum, Nepal |

| | | | | | |
|----|--------------|--------|--------|--------|-----------------------------|
| 2. | Dhanusa-5 | 62,947 | 37,715 | 13,222 | Nepal Communist Party (UML) |
| 3. | Kanchanpur-4 | 67,589 | 30,680 | 10,782 | Nepal Communist Party (UMO) |
| 4. | Morang-7 | 71,993 | 41,121 | 12,071 | Nepali Congress |
| 5. | Kaski-1 | 92,528 | 41,390 | 12,257 | Nepal Communist Party (UML) |
| 6. | Rolpa-2 | 81,899 | 35,765 | | Nepal Communist Party (UMO) |

Source: Election Commission of Nepal - By Election 2065, Chaitra 28

3.3 Analytical Tools and Technology

Out of so many tools and technology some appropriated tools and technology I used in this research which I presented below with diagrams and names. Data are collected by using different tools and technique like flow chart, Data flow, Entity relationship etc. For the programme presentation we can use some tools which are mention below.

1. Algorithm
2. Pseudo code/ structured English
3. Flow chart
4. Data flow diagram

Algorithm

Manually use tools is algorithm. Step – by – step method of programe is called algorithm.

Pseudo Code

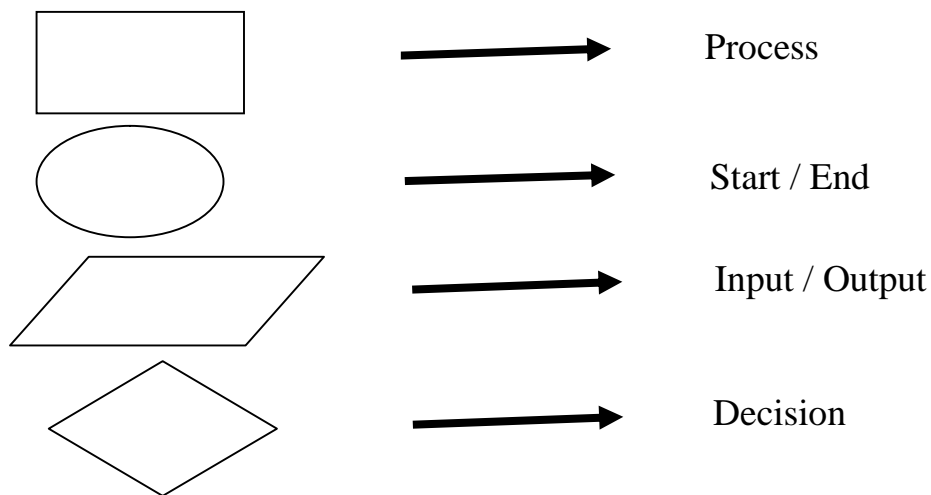
To represent the program by using English with some logical expression like the programs. For an example; If condition, loop streeck, etc.

Flow Chart

Program are reported in diagrammatically by using standard symbols is called flow chart. This provides the skeleton of the programmers. The rectangular box represent the process of the flow chart or the system. Circular shape or oval shape represent the Start or end the process or the system of flow chart. Parallelogram type symbol represent the input or output of data. Similarly the kite symbols represent the

Decision. On this way the flow chart is planned by the information manager or IT manager or engineer. The symbols of Flow charts is presented below:

The symbols of Flow Charts



Data Flow Diagram (DFD)

Diagram that represent the flow of information from external entity to the system and vice-versa.

- i. Context level DFD
 - ii. DFD systematic flow level
-) 0 level DFD
) 1 level DFD

Context Level DFD

This is one of the most important technique or tools for data collection methods While preparing this Thesis or models, I use interviews, questionnaires, and other techniques to gather facts about the system, and they learned how the various people, department, data, and processes fit together to support their operations.

The first step is constructing a set of DFDs is to draw a context diagram. A context diagram is a top-level view of an information system that shows the system's boundaries and scope. To draw a context diagram, I start by placing a single process symbol in the center of the page. The symbol represents the entire information system,

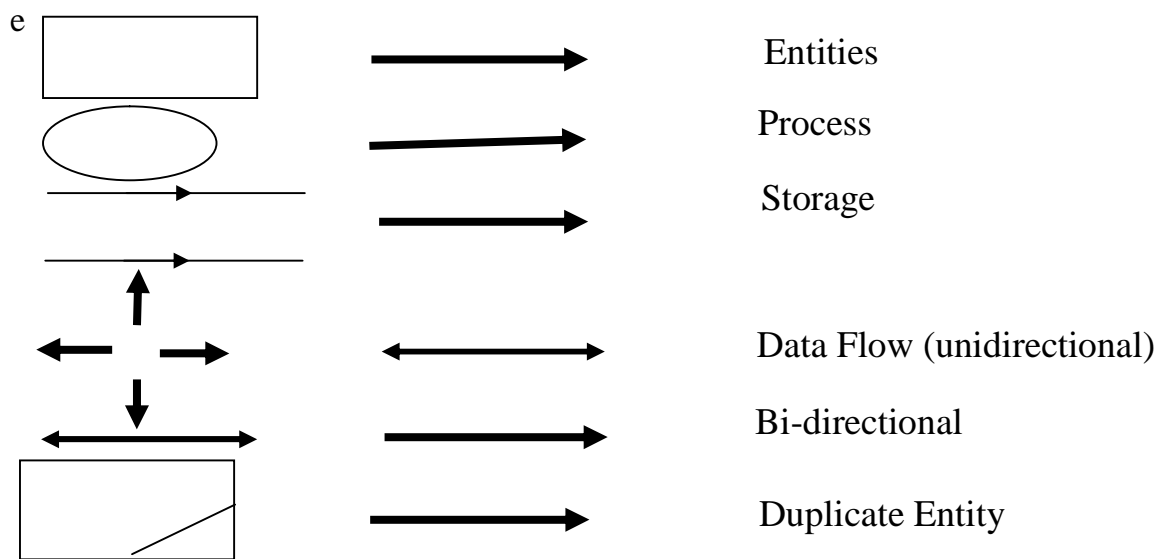
and you identify it as process 0. Then I place the internal entities around the perimeter of the page and use data flows to connect the entities to central process. I do not show any data stores in a context diagram because data stores are the internal system. How do I know what internal entities and data flow to place in the context diagram? I begin by reviewing the system requirements to identify all internal data source and destination. During that process, I record the name of the entities the name and the context of the data flows, and the direction of the data flow. If I do that carefully, and I do the good job of fact-finding in the previous stage.

Zero Level Data Flow Diagram

A context diagram provides the most general view of an information system and contain a single process symbol, which is like a black box. To show the detail inside the black box, I create DFD diagram 0. Diagram 0(the digit 0, and not the letter 0) zoom in on a context diagram and show major processes, data flow, and data stores. Diagram 0 also represents the external entities and data flow that appear in the context diagram.

Process Symbol

A process receives input data and produce output that has a different content, form, or both. For instance, the process for calculating pay users two inputs (pay rate and hours worked) to produce one output (total pay). Processes can be very simple or quite complex. In a typical company, processes might include calculating sales trends, filing online insurance claims, ordering Inventory from a supplier's system, or verifying e-mail address for web costumers. Processes contain the business logic, also called business rules that transform the data and produce the required results. The process name identifies a specifies function and consists of a verb (and an adjective, if necessary) followed by a singular noun.

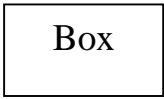

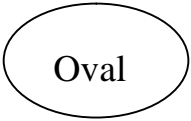
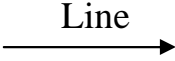


Entity Relationship Diagram (ERD)

Diagram that represents entity set at single entity. Diagram that perform the object modeling. (Entity = Objective). In the given table below represents the name of entity and comments .This in one most important technique for data collection which is use in widely in Management Information System. To understand the relationships concepts, we have to understand the terms used in explaining the same. They are: entity, attributes, values, key attributes and records.

To provide the control and work with multiple fields certain relationship are generated and present with a diagram called the entity relationship diagram.

Symbols

| S.No. | Symbols | Comments |
|-------|---|---|
| 1. |  | It is used for entity representation. It contains objects used in relational database. |
| 2. |  | Diamond represents relationship . |
| 3. |  | The oval or ellipse is used to represent attributes of entities. |
| 4. |  | It is used to link attributes to entity sets and entity set to relationship. |

There are three types of relationships between entities. They can be shown in an entity-relation diagram. Also known as E-R diagram.

-) One – To – One
-) One – To – Many
-) Many – To – Many

CHAPTER - IV

SYSTEM ANALYSIS DESIGN DATA PRESENTATION

4.1 Organizational Structure

The Election Commission of Nepal is an independent constitutional body mandated to conduct, supervise, direct and control the election to the constituent Assembly, any referendum and local body elections. It consists of a Chief Election Commissioner and four other Election Commissioners. It has its own secretariat and 75 district offices with 583 permanent staff.

Constitutionally the CA has 601 members, of whom 240 are elected from single – member constituencies based on the FPTP system, 335 through the Pr system with the county being a single constituency, and 26 nominated by the cabinet. To make the CA inclusive as well as representative of all communities and groups, such quotas were set for the closed list of candidates in the PR race.

Election Staff

A total of 240,000 electioneering staff were employed, including 108,000 Polling centre volunteers. In addition, over 150,000 security personnel were deployed by the government to manage the security of polling locations across the country.

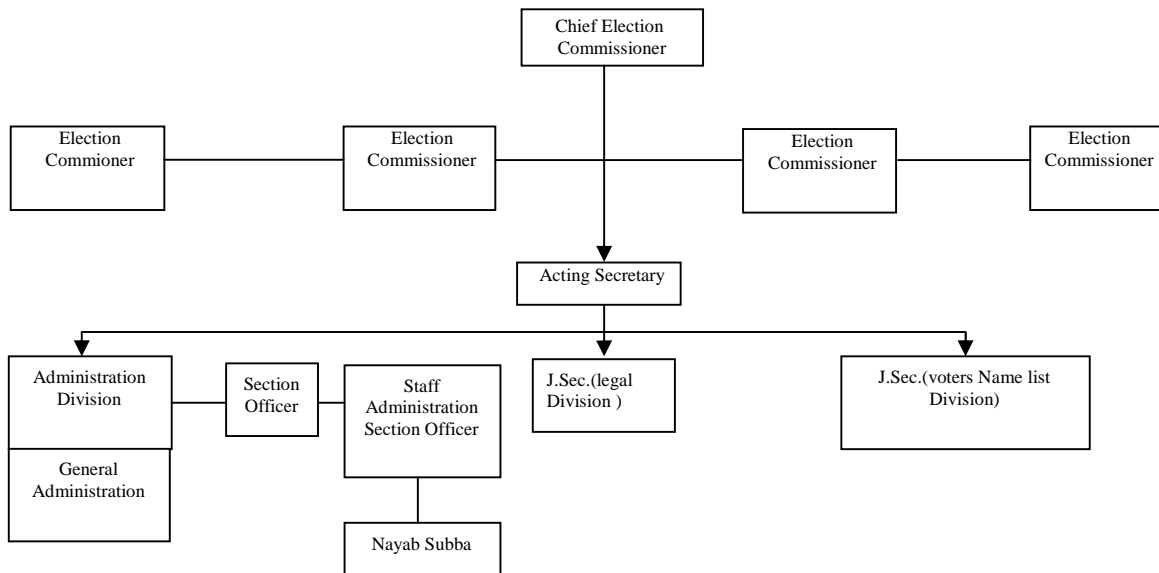
Between the period of voters registration and implementation of the election, over 275,000 election officials were trained in nine different programme conducted at various levels through cascading methods.

Assembly Court

The interim constitution has established a special CA court, with three sitting judges from the Supreme court, to adjudicate the complaints received after the polling results. A total of 16 cases were filed in the court, of which five cases were finalized at the end of August 2008. In all of these initial five cases, the judges ruled in favor of the election commission's decision.

Election Commission Organizational Chart

Figure 4.1
Organization Chart of Election Commission



Level of Management

Corporate organizational structure has changed in recent years. As part of downsizing and business process re-engineering many offices reduced the number of management levels and delegated responsibility to operational personnel. Although the organization chart tends to be somewhat flatter a traditional hierarchy still exists in most offices.

Top Level Management

Top management develop long-range plans called strategic plans that define the offices' overall mission and goals To carry out that task, top managers ask questions such as 'How much should the offices invest in information technology,' or How much will internet sales grow in the next five years,' or should the office build new ideas about voters list collection.

Strategic planning focuses on issues that affect the office's future survival and growth long-term IT plans. Top managers focus on the entire business enterprise and use information systems to set the office's course and direction. To develop a strategic plan, top managers also need information from outside the office such as population

forecasts technology trends competitive threats governmental issues and stakeholder concerns.

Middle Level Management

Middle managers focus their goals on a shorter time frame, usually ranging from one month to one year. They develop plans to achieve business objectives in a process called tactical planning. Middle managers delegate authority and responsibility to team leaders or supervisors and then provide direction, necessary resources, and feedback on performance as tasks are completed.

Middle managers need more detailed information than top managers, but somewhat less information than team leaders and supervisors. For example, a middle manager might review a voter list for a geographic region, whereas a other team leader would need a daily report on customer activity. Middle managers also use business support systems, knowledge management systems, and user productivity systems to perform their jobs.

Lower Level Management

Supervisors and team leaders oversee operational employees and carry out day – to – day operational plans. They coordinate operational tasks, make necessary decisions, and ensure that the right tools, materials, and training are available. Like other managers, this group often needs decision support information, consults knowledge management systems, and relies on user productivity systems to carry out their day – to - day responsibilities.

Operational Level Management

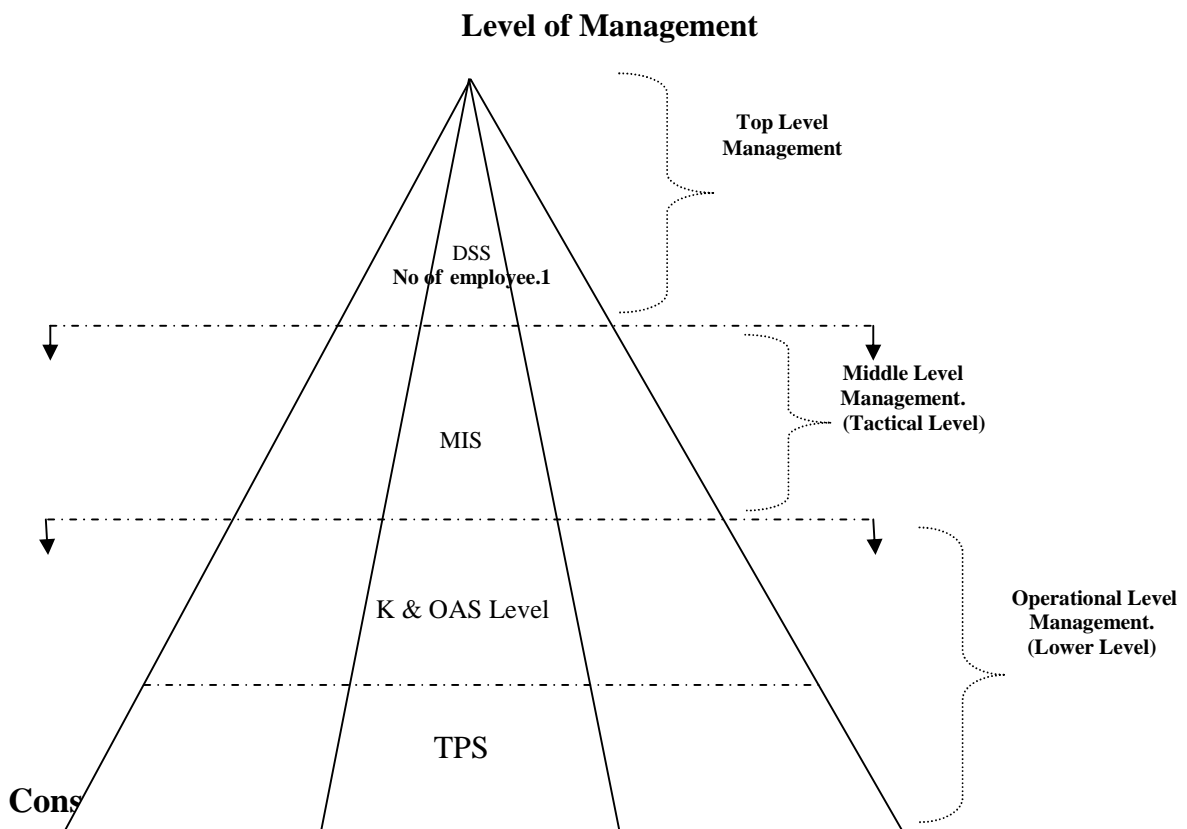
Operational employees primarily use TP systems to enter and receive data they need to performs their jobs. In many companies, operational employees also need information to handle tasks and make decisions that were assigned previously to supervisors. This trend, called empowerment, gives employees more responsibility and acceptability. Many companies fiend that empowerment leads to better employee motivation and increased customer satisfaction.

Figure 4.2
Number of staff on the basis of Level of Management



On the basis of Decision making Level of management under MIS

Figure 4.3



) Composition of the CA

Constitutionally the CA has 601 members, of whom 240 are elected from single – member constituencies based on the FPTP system, 335 through the PR system with

the county being a single constituency, and 26 nominated by the cabinet. To make the CA inclusive as well as representative of all communities and groups, the following quotas were set for the closed list of candidates in the PR race.

Table for the closed list of candidates in the PR race

Table 4.1

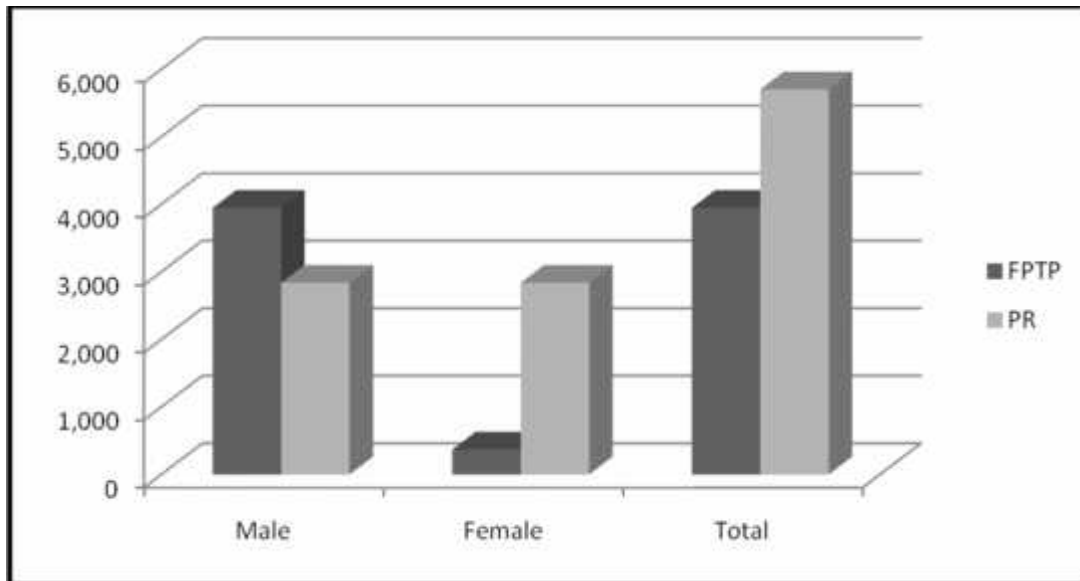
Composition of Candidates, Election 2064, Chaitra 28

| Groups | Representation % |) Every group must include 50% women.) An overlap within some groups has made the total more than 100% |
|-----------------|------------------|--|
| Madhesi | 31.2 | |
| Janajati | 37.8 | |
| Dalit | 13.0 | |
| Backward Region | 4.0 | |
| Others | 30.2 | |

) **Candidacy**

A total of 9,647 candidates participated in the CA election, of which 3,946 candidates, including 368 women, contested the FPTP race. For the PR race, a closed list of 5,701 candidates which included 2,837 female candidates, was submitted by 54 political parties. The bar chart below depicts the number of male / female candidates in both the FPTP and PR races.

Figure 4.4
Candidates in the FPTP & PR Races



Election Results

Of the 54 political parties who contested the election, only 25 eventually won seats in the CA. Nine parties succeeded in securing seats from both the FPTP and PR race and 16 parties won seats in the PR race only . The following tables summaries the election results.

A representation of 33% women in the CA and its inclusive representation of specified groups is one of the major achievements of this election

Table 4.2

Vote Secured by Various Political Parties on Different Seats

| Political Party | Vote Secured | FPTP Seats | | | Vote Secured | PR Seats | | | FPTP&PR Total | | | Total member |
|-----------------|--------------|------------|--------|-------|--------------|----------|--------|-------|---------------|--------|-----------|--------------|
| | | Male | Female | Total | | Male | Female | Total | Male | Female | M/F Ratio | |
| CPN(Maoist) | 3145519 | 96 | 24 | 120 | 3144204 | 50 | 50 | 100 | 146 | 74 | 1.97 | 220 |
| NC | 2348890 | 35 | 2 | 37 | 2269883 | 37 | 36 | 73 | 72 | 38 | 1.89 | 110 |
| CPN(UML) | 2229064 | 32 | 1 | 33 | 2183370 | 35 | 35 | 70 | 67 | 36 | 1.86 | 103 |
| MPRF | 534154 | 28 | 2 | 30 | 678327 | 11 | 11 | 22 | 39 | 13 | 3 | 52 |
| TMDP | 345587 | 8 | 1 | 9 | 338930 | 6 | 5 | 11 | 14 | 6 | 2.33 | 20 |
| SP | 174086 | 4 | 0 | 4 | 167517 | 3 | 2 | 5 | 7 | 2 | 3.5 | 9 |
| PFN | 136846 | 2 | 0 | 2 | 164381 | 3 | 2 | 5 | 5 | 2 | 2.5 | 7 |
| NWPP | 55908 | 2 | 0 | 2 | 74089 | 1 | 1 | 2 | 3 | 1 | 3 | 4 |
| NPF | 93578 | 1 | 0 | 1 | 106224 | 2 | 1 | 3 | 3 | 1 | 3 | 4 |
| Others | 1132488 | 2 | 0 | 2 | 1612153 | 26 | 18 | 44 | 28 | 18 | 1.56 | 46 |
| Total | 10196120 | 210 | 30 | 240 | 10739078 | 174 | 161 | 335 | 384 | 191 | 2.01 | 575 |

Figure 4.5

Secured by Various Political Parties on FPTP Seats

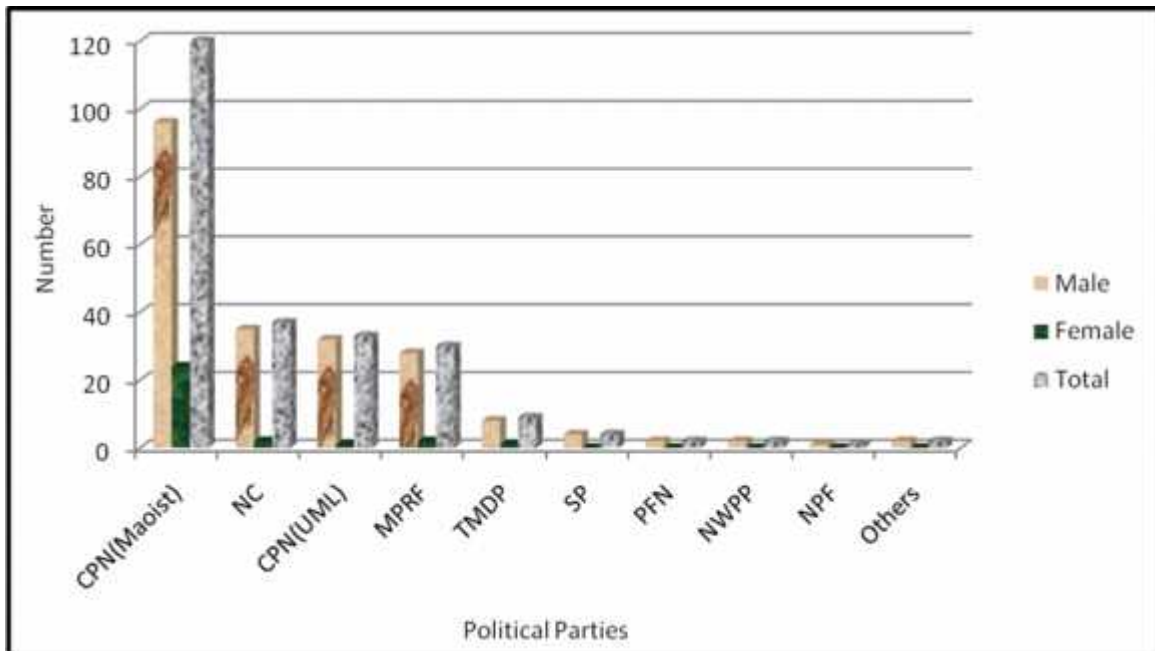
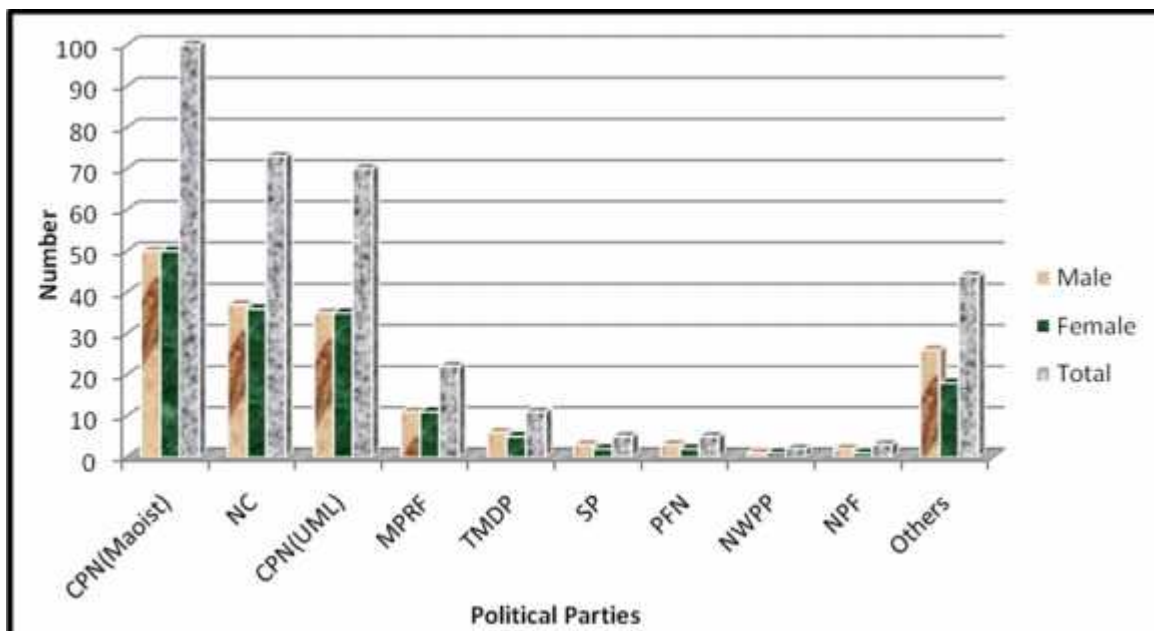


Figure 4.6

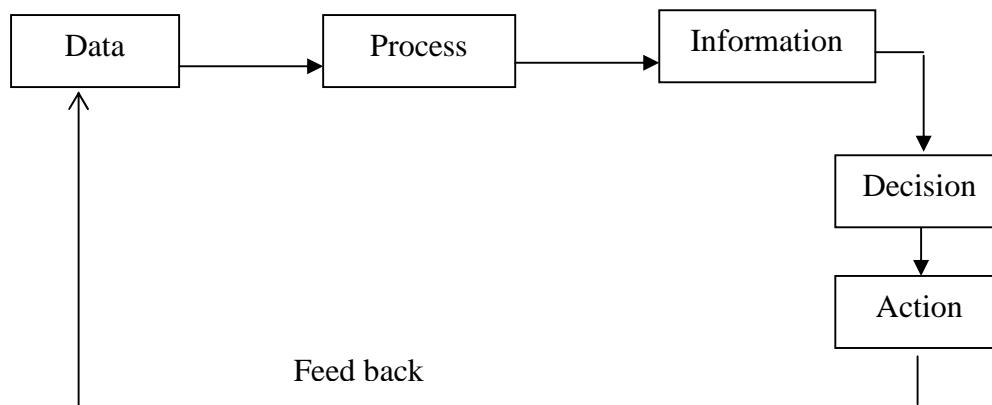
Secured by Various Political Parties on PR Seats



4.2 Source of Information

Information can be defined as the data, which can be organized and presented of that the decision maker may take the necessary action. In other word, information is the result of processing data. The conversion process of data in to decision is shown in the figure below:

Figure 4.7
Data Processing System



From the above figure, it is clear that information consists of data that has been retrieved, processed or otherwise used, reduces uncertainty and triggers of action. The main sources of information are primary information and secondary information.

4.3 Data Flow Diagram of Existing System

I already mention about the Data Flow Diagram (DFD) in previous chapter collected information about Electronic Voting Machine which is newly introduced in Nepal for vote.

Electronic voting took place successfully for the first time in Nepal in Constituency 1 of Kathmandu District on 2064 Chatra 28, various positive feedback on the use of electronic voting machine in this district, the Election Commission has expanded the use of electronic voting to the six constituencies whereby – elations took place.

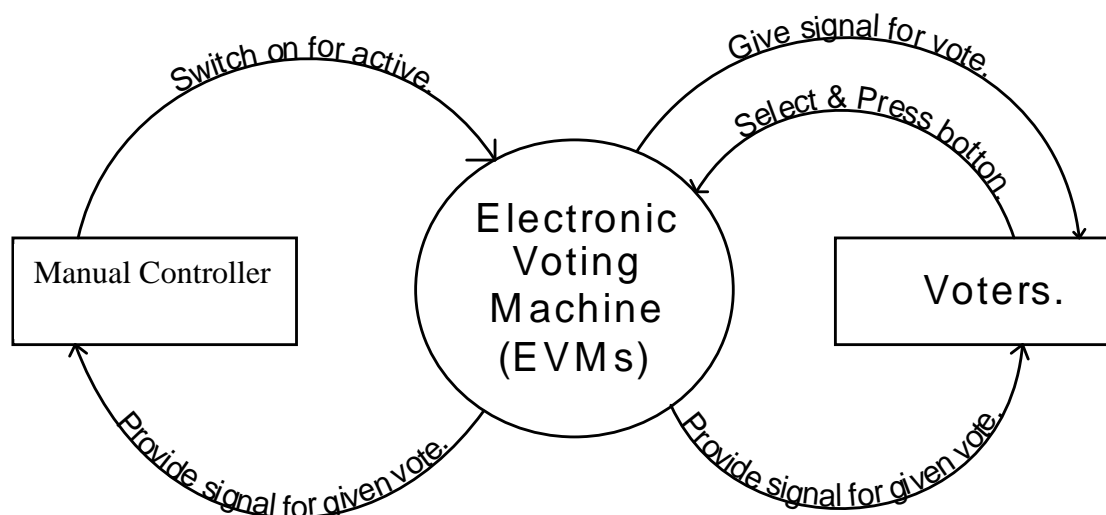
4.3.1 Context Level Data Flow Diagram of Electronic Voting Machine

While preparing this thesis or models, I use secondary data collection methods and other techniques to gather facts about the system, and they learned how the various people, department, data, and processes fit together to support these business operations.

The first step is constructing a set of DFDs is to draw a context diagram. A context diagram is a top-level view of an information system that shows the system's boundaries and scope. To draw a context diagram, I start by placing a single process symbol in the center of the page. The symbol represents the entire information system, and you identify it as process 0. Then I place the internal entities around the perimeter of the page and use data flows to connect the entities to central process. I do not show any data stores in a context diagram because data stores are the internal system. How do I know what internal entities and data flow to place in the context diagram? I begin by reviewing the system requirements to identify all internal data source and destination. During that process, I record the name of the entities the name and the context of the data flows, and the direction of the data flow. If I do that carefully, and I do the good job of fact-finding in the previous stage.

Figure 4.8
Context Level DFD of EVMs

Electronic Voting Machine.



First of all manual controller activates the Electronic Voting Machine. A voters gets the information by blue color burning lamp and he is ready for press selected button and press. Rapidly the Electronic Voting Machine provide information of press button by showing red color lamp and rapidly it is inactive.

No one can put vote more then once for selected candidate. The record of this type of voting is kept by ballot unit which is connected by 5 meters wire in secret Room.

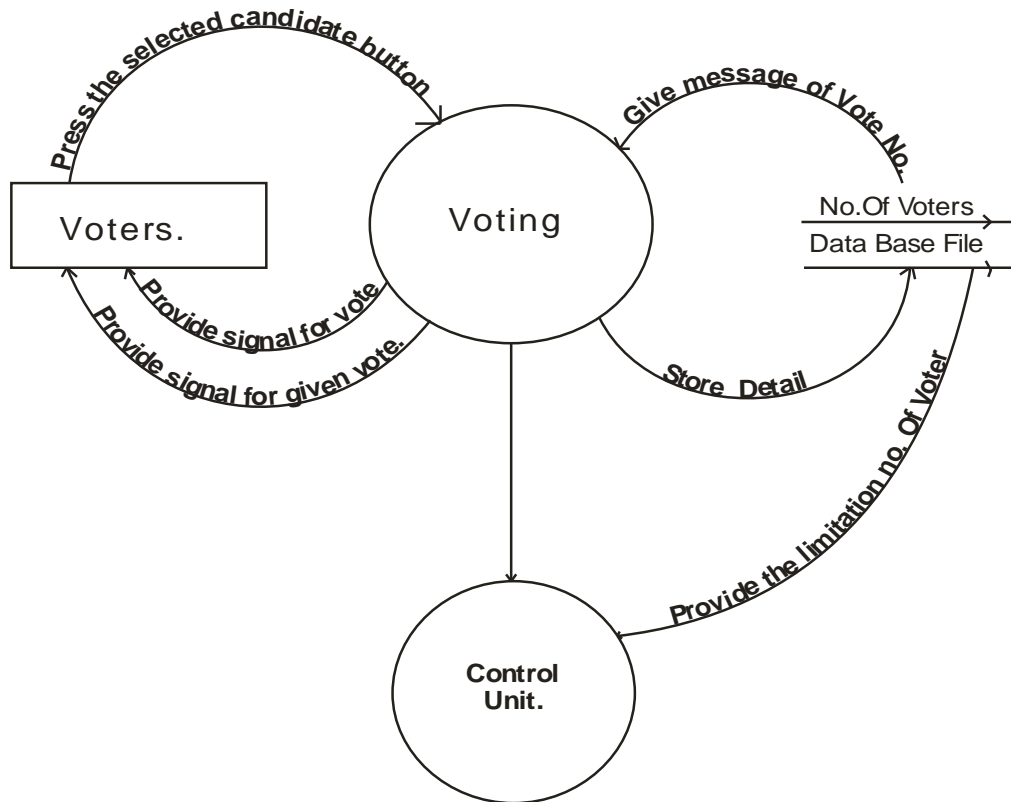
By this way I design the context level Data Flow Diagram of Electronic Voting Machine. Voters and Manual controller are external entity of Electronic Voting Machines.

4.3.2 Zero Level Data Flow Diagram of EVMs

A context diagram provides the most generals view of an information system and contain a single process symbol, which is like a black box. To show the detail inside the black box, I create DFD diagram 0. Diagram 0(the digit 0, and not the letter0) zoom in on an context diagram and show major processes, data flow, and data stores.

Diagram 0 also represent the external entities and data flow that appear in the context diagram.

Figure 4.9
Zero Level DFD of EVMs



In zero Level Data Flow Diagram only Voters is the external entity and two process one is voting and another is control Unit. No. of Voters data base file link with the control unit and if the limit of EVMs is finished then it provide information to the control unit.

4.5 Analysis of Existing Technology

Two units are present in EVM for the purpose of election namely Ballot Unit (B.U.) and control unit (C.U.). When Ballot Unit is inserted in Control Unit EVM starts working. Four Ballot Units can be inserted in a control unit. Control unit displays all the necessary topics needed for election. In this way, the electronic technology for election works which I have explained in a detailed way in the second chapter.

4.5 Limitation of Existing System

As already discussed, four ballot units can only be connected in a control unit and sixteen names of candidates can only be placed in a ballot unit. So, maximum sixty-four candidates can only be accumulated by a control unit. If any place has more than sixty-four candidates, this system doesn't work.

Also, the machine control technology is used instead of manual control technology which has decreased efficiency, reliability, and dependability of existing system.

4.6 Major Findings of This System

Electronic voting system is paper-free system as it has minimized the use of ballot paper. Consequently, time, cost and environment all get saved. There is almost no chance of rejection of votes. Illiterates can also get benefited from this system. These are major findings of this system.

4.7 Concept of New System of modify the System

In the existing system, election officer works as manual controller. If machine controller is used instead of manual controller, the human errors in controlling can be minimized. Apart from it, modification should be made in control unit so that it can accommodate more than four ballot units.

4.8 Comparison between New and Existing System

The new and existing system can be compared as below.

| S. No. | Bases of Comparison | Existing System | New System |
|--------|----------------------------|---|--|
| 1 | Controller | Control by election officer as manual controller. | Invention of machine control technology. |
| 2 | Ballot units | CU can accommodate four BUs which is suitable to area having small number of candidates | CU can accommodate more than four BUs as desired which is suitable to every places. |
| 3 | Efficiency and Reliability | It is comparatively less efficient and reliable due to manual controller. | It is efficient, reliable and dependable due to the invention of machine control technology. |
| 4 | Technology | The use of technology is comparatively weak. | The use of machine control technology and modified control unit has made EVM technologically advanced. |
| 5 | Defects | There is possibility of manual errors in controlling. | It is scientific and advanced with zero defect. |

4.9 Application Modeling

To estimate the value of election expenditure trend line can be used in terms of mathematics form i.e.,

Where;

Y = unknown election expenditure

a & b = constant

b = trend line

a = intercept of y

x = Known time variable.

We can use least square method in equation

$$y = na + b x \dots\dots\dots(i)$$

$$xy = a x + b x^2 \dots\dots\dots(ii)$$

As $x = 0$,

$$a = \frac{\Sigma y}{n}$$

$$b = \frac{\Sigma xy}{\Sigma x^2}$$

On this way we can determine the value of a and b and substitute the value of a and b in to the $y = a + bx$ equation and we can forecast the value of required time period.

I represent here a mathematical model related to this trend line projection or time line, which is belongs to the total expenditure of election in different time periods. The model forecast the election expenditure till 2089 B.S.

Table 4.3
Forecasting Model of Election Expenditure in 2089 B.S.
Nepal Election Commission
Election Expenditure (2036-2064)

(*Rs. In million)

| Years | Election expenditure*(Y) | X= X-2047 | X ² | XY | Expected expenditure*(y _c) |
|--------------|--------------------------|--------------|--------------------------------|-----------------------|--|
| 2036 | 2225 | -11 | 49 | -24475 | -3426 |
| 2037 | 2275 | -10 | 100 | -22750 | -3017 |
| 2042 | 2555 | -5 | 25 | -12775 | -972 |
| 2047 | 3315 | 0 | 0 | 0 | 1073 |
| 2056 | 8815 | 9 | 81 | 79335 | 4754 |
| 2064 | 11936 | 17 | 289 | 202912 | 8026 |
| Total | Y=31121 | x=0 | x² = 544 | xy = 22247 | |

(Source: Secondary Data Collection from E.C.)

Let the trend time be 2047

$$Y = a + bx \dots \dots \dots (i)$$

As $x = 0$.

$$a = \frac{\sum y}{n} = 31121/29 = 1073.13 = 1073 \text{ (approx)}$$

$$b = \frac{\sum xy}{\sum x^2} = 222247/544 = 408.54 = 409 \text{ (approx)}$$

From the trend line $Y = a + bx$

$$\begin{aligned} Y &= 1073 + 409(-11) = -3426 \\ &= 1073 + 409(-10) = -3017 \\ &= 1073 + 409(-5) = -972 \end{aligned}$$

$$= 1073 + 409(0) = 1073$$

$$= 1073 + 409(9) = 4754$$

$$= 1073 + 409(17) = 8026$$

Now, For the year 2069 B.S. $Y = 1073 + 409(2069 - 2047) = 10071$

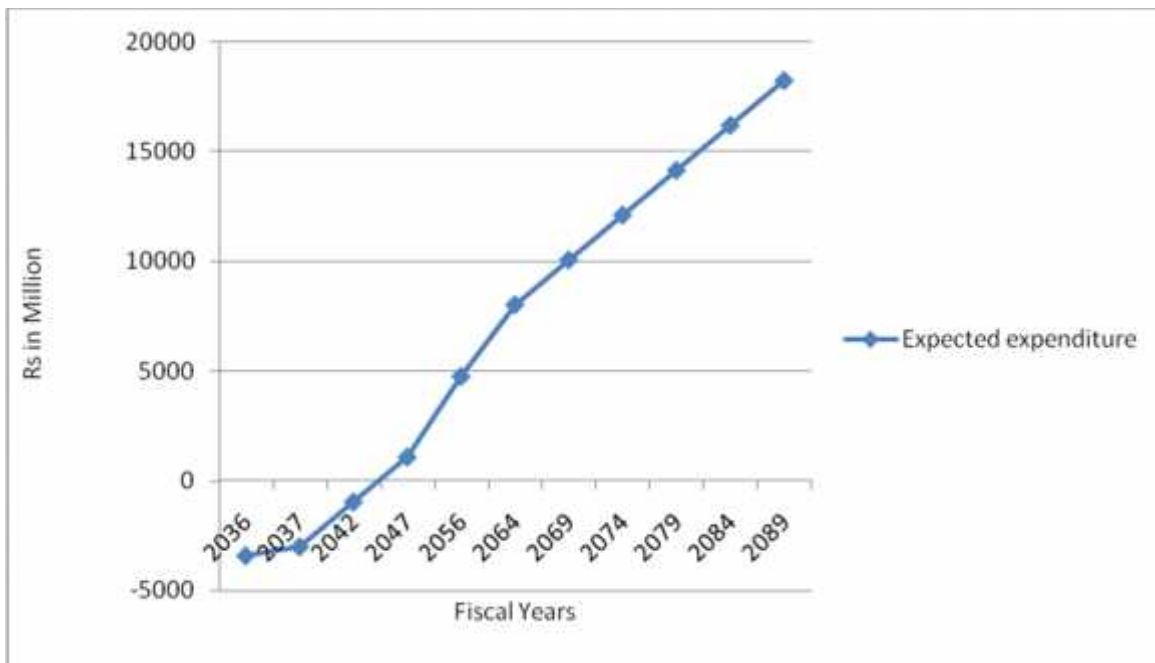
For the year 2074 B.S. $Y = 1073 + 409(2074 - 2047) = 12116$

For the year 2079 B.S. $Y = 1073 + 409(2079 - 2047) = 14161$

For the year 2084 B.S. $Y = 1073 + 409(2084 - 2047) = 16206$

For the year 2089 B.S. $Y = 1073 + 409(2089 - 2047) = 18251$

Trend line Projection of Election Expenditure in Nepal upto 2089 B.S.



4.10 DFD, DD & ERD of New system

The DFD of new system is presented below in both context level and system level diagram.

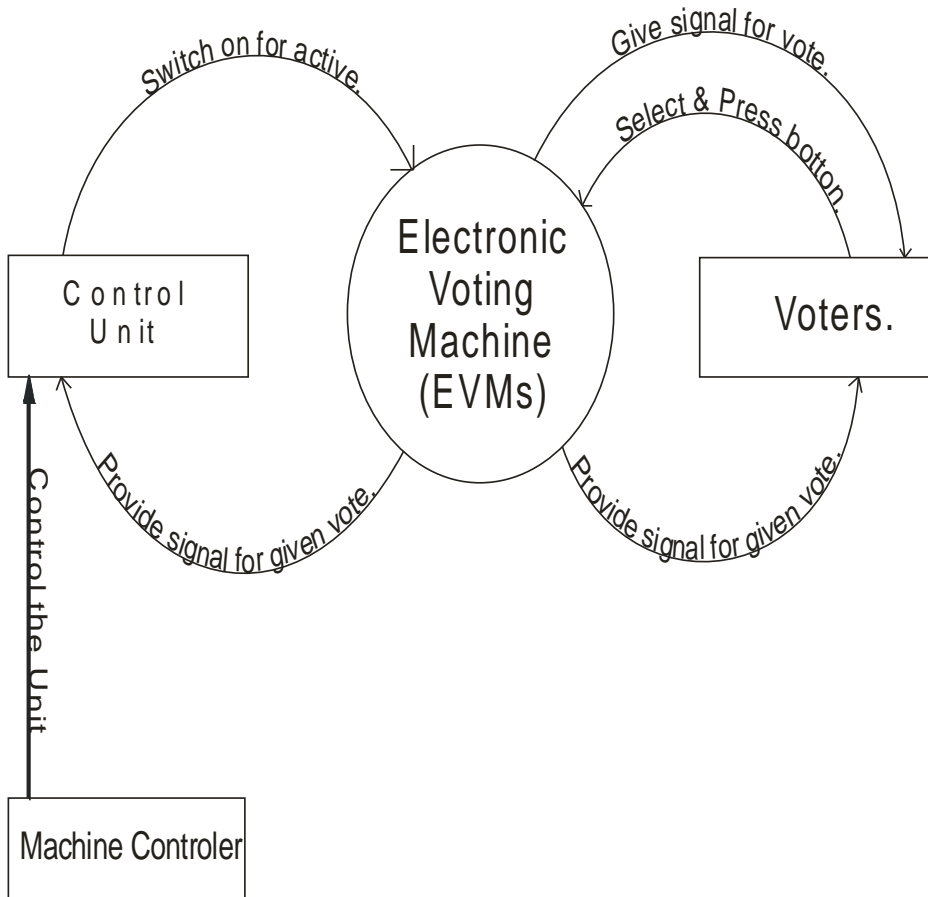
Context Level DFD of New System

Machine controller controls the control unit when switched on for active along with providing the signal for giving vote.

Figure 4.10

Context Level DFD of New System

New Electronic Voting Machine.

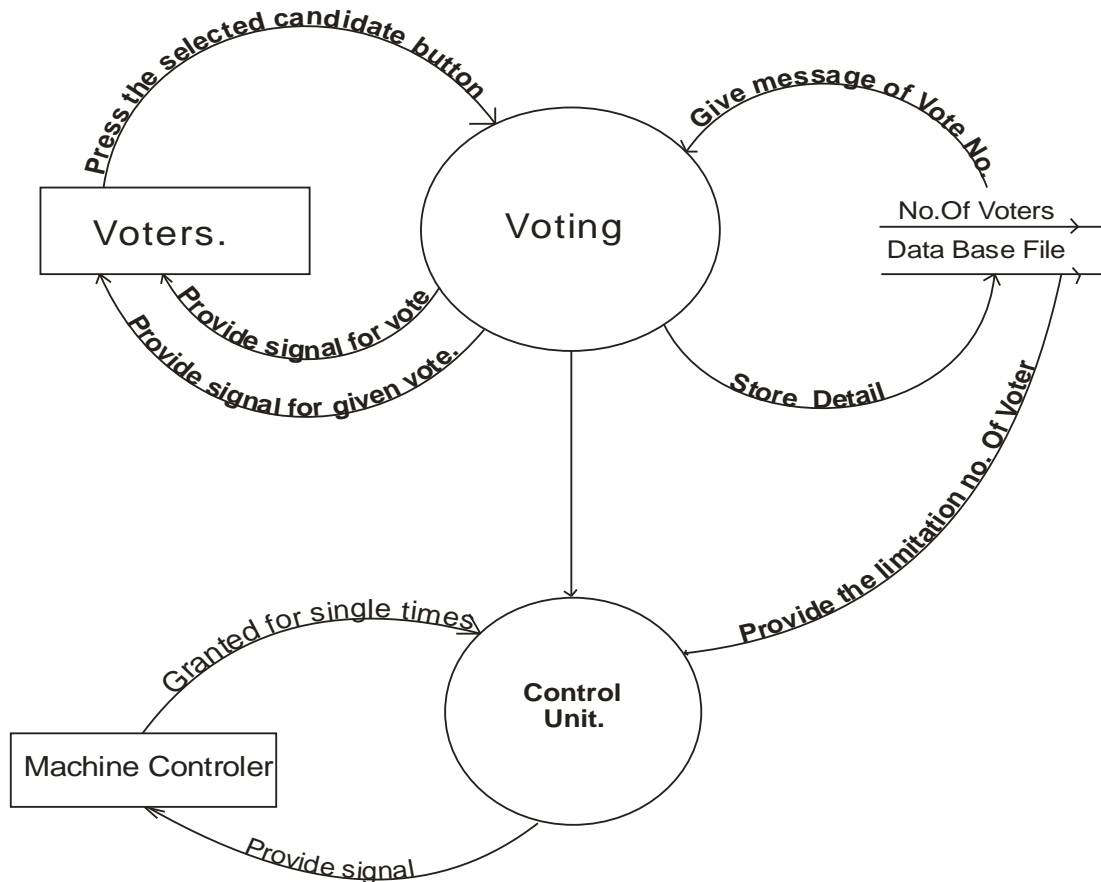


System Level DFD of New System

The system level DFD is same as the existing system except machine controller granted for signal for single time. Machine controller provides the signal for control unit and voter can give the vote only once. The update database system in EVM record the vote in the storage box. In this way, the new system keeps authentic record of votes.

Figure 4.11

Zero level DFD of EVM in new system



Data Dictionary

The data dictionary can be recalled as the centre storehouse of documentation for an information system. Along with the description of each data element dataflow, data store, record, external entity and process, the data dictionary documents the relationship among these components. Various reports can be obtained from data dictionary including the following:

- i. A report by voter list department of data elements that must be updated by each department
- ii. A report of all data flows and data stores that use a particular data element.
- iii. Detailed reports showing all characteristics of data elements, records, data flows, processes, or any other selected item stored in the data dictionary.

Some attributes use and their variable are given below.

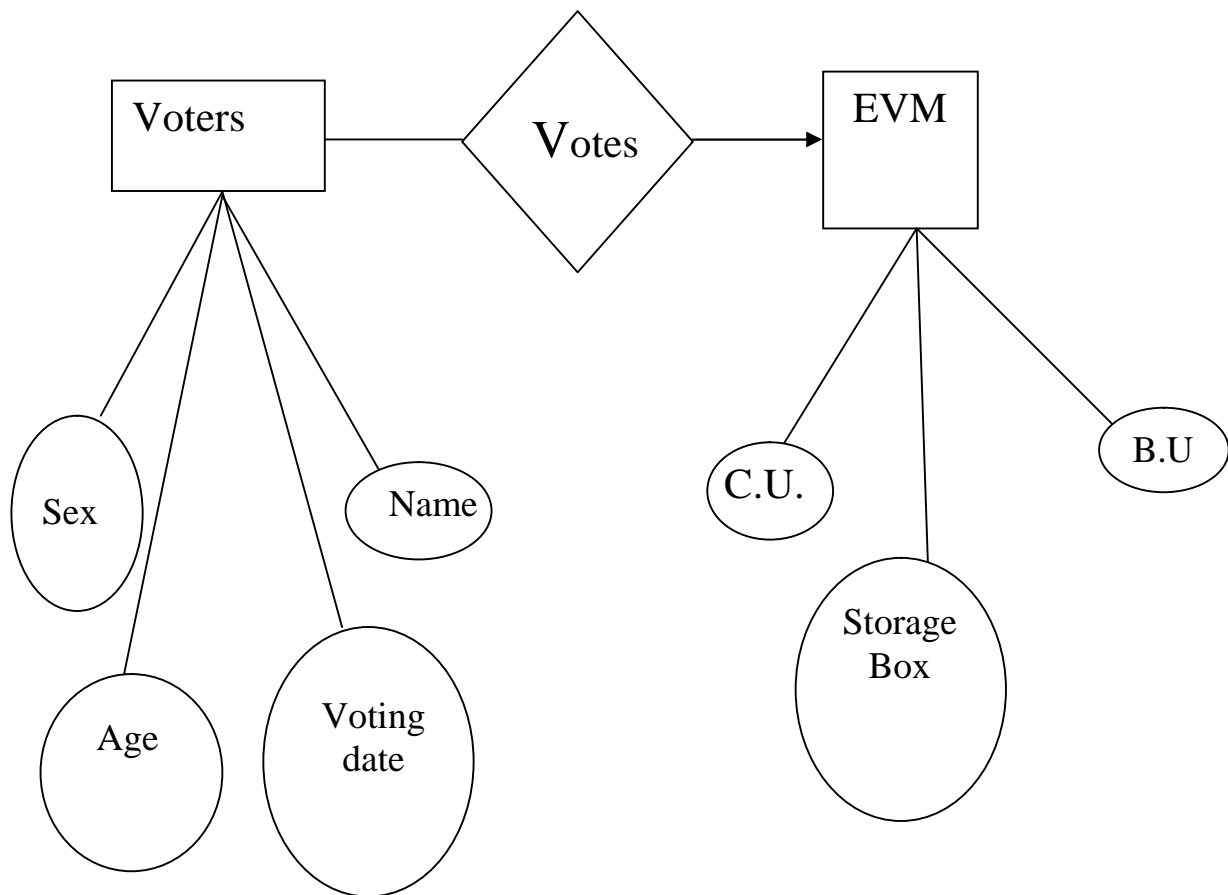
Table 4.4
Data Dictionary

| Attributes | Variables |
|-----------------|------------------------|
| Name | Character(50) |
| Address | Character(50) |
| Voter list date | Character(10) / Num.10 |

ERD for the EVM Voting

ERD shows the relation between two different entities. The two entities are voters and voting machine. The voter gives the vote with the help of EVM machine. The relationship among these two entities is given below:

Figure 4.12
ERD for EVM Voting

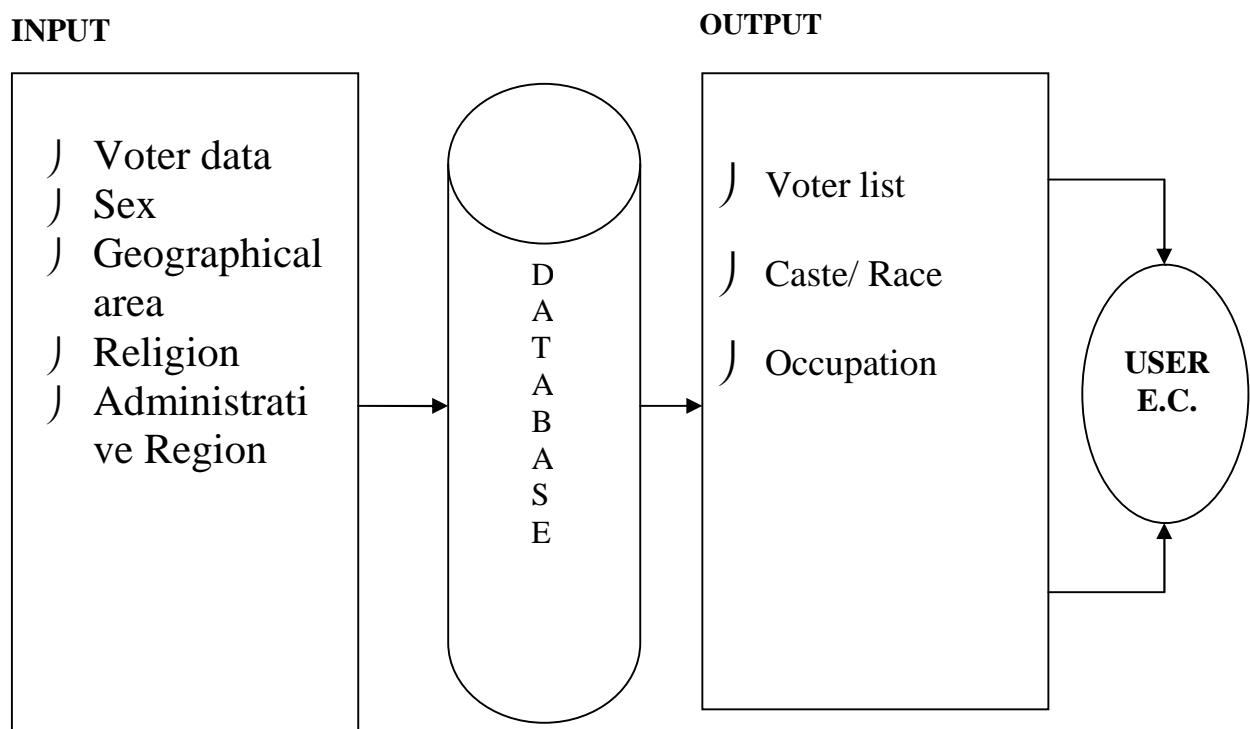


4.11 Input, Database and Output Design

The objective of statistical process controls to closely monitor voter lists at various stages of the voting process, identifying potential problems before they result in defects and adjusting the voting process accordingly through observations. Another promising role for the computer in quality controls is in the area of vision inspection systems, whiter robotics eyes replace humans in the quality control inspection process.

Figure 4.13

Input Database and Output



4.12 Justification of the New System

What about an overall strategy for developing a set of DFD's ? .A set of DFD's is a graphical, top-down model, so most analysts first create the context diagram, then diagram 0, then all the child diagrams for diagram0, and so on.

Other analysts, however, follow an alternative bottom – up strategy. With a bottom – up strategy, we first identify all functional primitives, data stores, external entities, and data flows. Then we group processes with others related symbols to develop the lowest – level diagrams. Next, we group those diagrams in a logical way to form the next higher level. You continue to work our way up until we reach diagram 0.

Regardless of which strategy we use, we should apply the suggestions and guidelines. The main objective is to ensure that our model is accurate and easy to understand. Reviewing data and process models with users allows us to obtain their feedback and approval for the logical design of the systems.

This new system works on the basis of the above description and can predict the actual voter and up and down of it.

4.13 Cost benefits analysis and feasibility analysis of New System

Cost-benefits analysis is the process of comparing the anticipated costs of an information system to the anticipated benefits. Cost-benefit analysis is performed throughout the SDLC to determine the economic feasibility of an information system project and to compare alternative solutions. Many cost-benefit analysis techniques exist. This section covers discussion of only the three most common methods:

1. Payback analysis.
2. Return on investment analysis.
3. Present value analysis.

Each of the approaches analyses cost-benefits figures differently, but the objective is the same: to provide reliable information for making decisions.

Payback Analysis

This is the traditional but important method of screening the projects. Normally, an investor thinks that when it will receive its investment and compares the period required receiving the investment with project life. Sometime, an investor itself sets the period within which it had to recover the investment. In the case of debt financing, an investor may consider the maturity period of debt as the period within which has to recover the investment. Thus, the payback period is the expected number of years required to recover the investment of the project.

$$PB = \frac{I}{CFA}$$

Where,

I = investment cash outlay

CF_A = annual cash flow

PB = payback period

Return on Investment

Return on investment is book rate of return on investment. It is based on the average accounting profit and average investment and it is calculated by dividing the average accounting profit by average investment. It is calculated as:

$$ARR = \frac{\overline{EAT}}{\bar{I}}$$

Where,

$$\overline{EAT} = \frac{\sum_{t=1}^n EAT_t}{n}$$

$$\bar{I} = \frac{I_0 + I_n}{2}$$

\overline{EAT} = average income

\bar{I} = average investment

n = project life

EAT_t = earning after tax for t number of years.

I₀ = book value of the investment at the beginning

I_n = book value of the investment at the end of n number of years.

Net Present Value

This is widely used discounted cash flow technique of capital budgeting. The previously discussed methods – payback period and accounting rate of return – do not take the time value of money into consideration. But this technique does. While evaluating the capital projects, in this technique, benefits of the project measured in terms of cash flow are discounted, and the cost of the project measured in terms of cash outflow is deducted. The remaining value is known as net present value. More precisely, net present value of the project is the difference between present value of cash inflow and outflow. Mathematically, it is given by:

$$NPV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \dots + \frac{CF_n}{(1+k)^n} - CF_0$$

Where,

NPV = Net present value

CF_1 , CF_2 , CF_3 are expected cash flows in first years, second years and third years respectively

K = cost of capital

n = project life

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.2 Summary

The Electronic Voting Machine (EVM) is a microcontroller-based instrument designed to modernize the election process. It is simple to operate and can be installed in a short period. There is no scope for invalid votes and total secrecy of voting data is maintained. The EVM facilitates quick and accurate counting. It is possible to declare the results in the same day, at the end of the poll. The voting data stored in EVMs can be retained for years and can be extracted if necessary.

The Electronic voting machine simplifies the election process for the benefit of both Election Officials and voters. The huge expenditure involved in printing millions of ballot paper, storing and transporting them to booths etc. is obviated by the use of EVMs. In the EVM, one ballot paper per units is used. This is fixed below the transparent acrylic sheet of Ballot unit and lists the names of the candidates and their symbols as in the traditional ballot paper. EVMs can be reused in subsequent elections by simply pressing a button to erase the votes recorded in the earlier poll and changing the ballot paper in the ballot unit. The EVM is truly designed for single post and single vote.

Two units are present in EVM for the purpose of election namely Ballot Unit (B.U.) and control unit (C.U.). When Ballot Unit is inserted in Control Unit EVM starts working. Four Ballot Units can be inserted in a control unit. Control unit displays all the necessary topics needed for election. In this way, the electronic technology for election works with the use of EVM.

Election is the heart of people and is the free rights of people. The government has responsibility in enhancing quality in providing rights to the people. As EVM simplifies the election process, it is consistent for the election system of Nepal which

has to be modernized by the government for coping with the need of change as in the minds of the Nepalese people.

5.2 Conclusion

EVM is a portable instrument for conducting elections to Parliament, legislature, and local bodies like municipalities. It is micro-controller based instrument designed to modernize the Election process. It is simple to operate and can be installed in a short period.

In the existing system of EVM, due to manual controller, it has decreased efficiency, reliability, and dependability of existing system of EVM.

This is the twenty-first century and the age of science and technology. The government has planned to use modern technology in every sector. So, by the modification of control unit and the use of machine controller EVM can be made technologically advanced.

With the help of feasibility study, cost analysis, viabilities, acceptance and suitability, I refer Election Commission (EC), to modify control unit and use the machine controller technology as soon as possible. The modality, format, workflow are very feasible and user-friendly system as indicated above, so voters can easily use this system. It facilitates less use of paper, faster time and greater efficiency.

5.3 Recommendation

In Physics, according to the Heisenberg Theory of Uncertainty – “A work done with an objective may also give un-imaginable result. X-Ray was also invented in this way. Similarly, a year before when I was preparing the proposal for my MBS thesis, I had thought to do 5 variable tests on the topic “The reliability of EVM in election for the underdeveloped countries like Nepal” in the view that those five variables were self-proved variable which needn’t to be tested. I have covered it in the chapter “Major Findings of this System.”

According to my subject 'Management Information System (MIS)' where DFD, DD and ERD had to be prepared, I have explained in the gap between the existing system and new system of EVM. Overcoming the two major shortcomings of the existing system I have given logical end to my thesis. I have recommended major three subjects as listed below:

1. Use EVM in Election in Nepal

My objective of the research was to find whether EVM is reliable for Nepal or not. According to my research, I have come to know that EVM is necessity of modern election system not only in Nepal but for other countries also.

2. Use machine Controller Technology

Machine controller is one of the finding of the new system. Use of machine controller oils the election engine of Nepal reducing the frictions of Election Control Systems. So, machine controller technology is recommended.

3. Modification of Control Unit

In the existing system, a control unit can hold four Ballot Units which means only sixty-four candidates can only be accommodated by a control unit. Although, being technical term, I have recommended modification of control unit where more than four control units can be accommodated. This may not be required for present context but may become essence of future.

BIBLIOGRAPHY

- Adhikary, S.N. (2004). *Management Information System*. Kathmandu: Buddha Academic Publishers and Distributers Pvt. Ltd.
- Agrawal, G.R. (2001). *Marketing Management in Nepal*. Kathmandu: M.K. Publishers and Distributers.
- Bharat Electronics Ltd. “*Electronic Voting Machine MK IV Instruction Manual*”
Jalahalli P.O. Bangalore-560013, India.
- Jawadekar, W.S. (1997). *Management Information System*. New York: Tata McGraw Hill.
- Johnson, G. & Scholes, K. (1978). *Exploring Corporate Strategy*. New York: Pearson Prentice Hall.
- Kanter, J. (1977). *Management-Oriented Management Information System*. Englewood Cliffs, N.J.: Prentice-Hall, Inc.
- Sthapit, A.B. et.al. (1996). *Production and Operation Management*. Kathmandu: Asmita Books, Publishers and Distributions.
- Thierauf, R.J. (1982). *Decision Support System for Effective Planning and Control: A Case Study Approach*. Englewood Cliffs: Prentice- Hall, N.J.
- Turban, E. & Aronson, J.E. (2001). *Decision Support Systems and Intelligent Systems. (6th edition)*. Upper Saddle River, NJ: Prentice Hall.
- संविधान सभा सदस्य निर्वाचन (२०६४) निर्वाचन परिणाम, निर्वाचन आयोग
- संविधान सभा सदस्य उप निर्वाचन (२०६५) निर्वाचन परिणाम निर्वाचन आयोग

Web References

- <http://www.bel.co.in> (2010/04/12)
- <http://www.eci.gov.in> (2010/04/12)
- <http://www.election.gov.np> (2010/05/10)
- <http://www.wikipedia.com> (2010/05/10)