# CHAPTER I

# INTRODUCTION

## 1.1. BACKGROUND

As the globe moves into the 21st Century, information technology is an important aspect of everyday life conduct for every individual person, small business, private organizations, big multi Million companies and big government organizations. However managing and keeping data up to date with information technology require commitment and skilled knowledge personals. Computer based information System are a very important asset in many organizations or companies all over the world which effectively contribute to effective decision making for the betterment of those organizations.

The very common areas where information Technology contributes to decision making and effective running of an organization are Microsoft, every banking system all around the world, which includes all the ATM system in place everywhere for the general public. In addition accounting information system for big accounting firms, accounting systems assist very much in decision making of the big accounting firms, further more payroll system used now a day in the information technology world by almost all organizations which cuts down time and cost effectively.

Information is the outcome or processed data which can be read and understood using common language, while Data are raw material which has not been processed for people to see. A System is a Set of Interrelated components, with clearly defined boundary, working together to achieve common set of objectives. Every system is delineated by its spatial and temporal boundaries, surrounded and influenced by its environment, described by its structure and purpose and expressed in its functioning. An information system (IS) is typically considered to be a set of interrelated elements or components that collect (input), manipulate (processes), and disseminate (output) data and information and provide a feedback mechanism to meet an objective. In addition an Information System is an organized combination of people, hardware, software, communication networks and the data resources that collects, transforms and disseminates information in an organization. And information system have five (5) main components, they are hardware, software, data, network and people. All this components work cooperatively to produce an effective information system.

Developing of Systems takes a long time of planning and analysis before it is literally developed. Development of an effective system is done through carefully following the regulations set by Major Software development organizations like Institute of Electrical and Electronic Engineers (IEEE) software.

Papua New Guinea is a developing country and most system are all run manually; one of such system is the voting system of Papua New Guinea.

Papua New Guinea is located near the Equator Just above Australia. Papua New Guinea got Independence straight after world war two in 1975 from the Australian Government. Originally it was under the colonization of the Great Britain but when Britain when back to Britain, the Australian Government Took care of it till the independence. Papua New Guinea was under the Colonization of Great Britain therefore everything concerning the nature of how the country should behave as an independence Nation were all inherited from British, one of those thing that the Nation of Papua New Guinea inherited is the Complete Political System of Great Britain. Since then, Papua New Guinea Uses the Same Political System as Great Britain and Australia. Elections of New Members to the House of Assembly or Parliament are conducted every 5 years interval. The government organization that looks after all election affairs of Papua New Guinea is Known as **Papua New Guinea Electoral Commission (PNGEC)**, the organization is then broken down into smaller division according to the number of Province's in Papua New Guinea, Papua New Guinea has 22 different provinces so Papua New Guinea Electoral Commission is than Broken Down into 22 different division to handle each provincial electoral affairs separately. This research paper will focus on the development of Electronic Voting System (E-Voting) for National Capital District; it is the Central Province where the nation's capital city (Port Moresby) is located.

In this 21 century, most system are taken over by technology, technology is seen to have contributed effectively to most sectors of life, technology is used

mostly now a days to manage data effectively and technology also help organizations to reach their goals and visions effectively with effective decision making.

Papua New Guinea currently has two voting system, this research will base on the voting system known as first past the post, this voting system gives every voters only one choice to choose their candidate of choice. Most of the system processes are manually carried out. The candidate who receives the most votes with the highest percentage of the population is declared the winner. The current system of voting does not have an accurate database for all citizens of the Nation to effectively assist for correct conduction of election. There are ballot boxes with ballot paper distributed all over the country during elections for the citizens to mark their votes literally with Pencil on their choice of interest. After completely marking for District and Regional Candidate the ballot papers are collected back into the respective ballot box for them to be escorted back to the district headquarters to be counted to declare the winner. The government must have more security in place for this system of election because it is possible for hijacking of ballot papers by candidate's supporters to be marked for that certain candidate and returned. There can be casualties during voting because supporters of different candidates can disagree concerning how the election is conducted during the polling day which can leave many casualties. Those are some common issues that are so fresh in the current voting system of Papua New Guinea.

The proposed new E-Voting System is precise and simple which can assist the government in many areas in terms of costing and the overall running of the national election for NCD. During the national Census, it will be an E-Census or E-Registration for every citizens of Papua New Guinea above the age of 18 years old who are eligible to vote. Every registered citizen will be given a special ID which will enable them to use the E-Voting System for NCD to vote during polling. There will be an E-From for Candidates to fill in and register as an intending candidate, every candidate will be given a special ID number which will also be their box number for voters to choose and vote. During polling the government will send only a few securities out with the system to the polling areas for voters to vote and all the voting data will be collected into the database respectively. This system will be so effective that no ballot box or ballot papers will be printed; everything will be taken care of by the system electronically.

As mentioned above in the current voting system, there are many related problems that comes with it, the problems associated with the current system are, it is way too expensive to run the national election, there is no proper database for citizens of NCD for en effective and efficient election , there is no honesty in the current voting system, most candidates play around with the system through corruption and win elections, risky to transport ballot box to and from the polling site, there can be casualties as a result of supporters of two candidates having an arguments during polling, Most times ballot box are hijacked by candidate supporters and filled and sent back for

counting with the escort being threatened or bribed not to say anything, the counting room can be affected with corrupt dealing where the wrong candidate can be declared as the winning candidate. In addition the total population of voters is always less compared to the marked ballot box because there is not strict security in place to control that.

The E-Voting system for NCD is seen to bring more good into the voting system though it will have disadvantage, everything has two sides to it, good and bad but it is believe that the E-Voting system of NCD will bring down or solve most of the problems in the existing voting system. The E-Voting System of NCD will have a complete E-Census/ citizen registration before voting, candidates and polling officials to prove check correctly who deserve to be declared because all records will be effectively monitored by the system, the government will not need to produce ballot box and ballot papers because ballot box will be replaced by voting database in the system and ballot papers will be replaced by E-Ballot papers in the system, the E-Voting system will not need more vehicle and security to transport, just an handful will do just fine to escort the officials to the pooling site and back to the district headquarters. Labor cost from the government will definitely be reduced. There will not be so much corrupting because everything will be handled by the E-voting system for NCD and feedback will be recorded. Counting and declaring of the winner cannot be affected by external factors because it will all be done inside the secured E-voting system.

## 1.2. Problem Identification Statement and Problem Formulation

The identifying of problem statement and problem formulation of the topic are;

### i. Identify the problem

2. No clear Database for citizens of National Capital District to hold data for every citizen to have a clear fair voting.
3. Most phase of the current First Past the Post voting system is manual where corruption is eminent.
4. Way too expensive for the government to conduct the National Election with the current system in place.
5. Most times supporters for candidates hijack ballot box with unmarked papers and take them off mark them and bring them back for voting leaving the escorts threatened or bribed.
6. Counting and declaration of the winning candidate is often associated with corruption and it's not right.
7. Normally there are arguments with the supports of two different candidates leaving casualties during polling.

### 1.2.1. Problem Formulation

The problems relating to the existing voting system of NCD can be formulated in relation to the above as follows;

1. How does the problem of improper database of the citizens of NCD be addressed using the new proposed system, it is addressed

through developing a new database with will hold every citizen of NCD above the age of 18 who are eligible to vote.

2. How can corruption in the system be reduced while using the new proposed system? The new voting system will mostly be managed electronically where most corrupting associated issues with the Manuel voting system will be done away with.

3. How does the new system minimize the cost of running a National Election? The new system will not need more security like the old system, in addition the new E-voting system will not use ballot box and ballot papers instead they will use E-Ballot papers and boxes which will result in cost being reduced.

4. How does it stop hijacking of ballot box with papers inside? They can hijack an hardware with the E-Voting system installed but to get to using it the password will come from different people so they can rely hijack.

5. How does it stop corruption in declaring winner during election? The proposed system will all by electronic and every vote will have the records of origin so they cannot be any effect on the system by external factors.

6. How does it stop clash between the supporters of two different candidates? the E-Voting system will take care of all voting so they supports will not know how every citizens voted so there will not be any form of arguments.

7. The total population of a certain province is always less than the total number of ballot papers marked during voting because often the extra ballot papers are marked by one or two person in favor of the candidate they support or they are marked in relation to corrupt dealings.

## 1.3. Research Objectives

The research objectives of this research are;

### 1.3.1. Research Purpose

The purpose of this research is to figure out the problems present in the current voting system of National Capital System and reduce them through the development of a new E-voting system of National Capital District.

### 1.3.2. The purpose of this study

The purposes of this whole study are follows;

1. Design a citizen Database for all citizens of NCD over the age of 18 who are eligible to vote.
2. Create a system which is secured and safe to be used by NCDC for the national Election without any errors.
3. Design and create E-Ballot papers and E-Ballot Box in terms of Database to collect number of voters and keep records of all the citizens of NCDC.
4. Phase out outdated paper ballot, punched cards and other mechanical voting systems with paperless electronic voting systems.

## 1.4. Usability Research

This research is useful in many areas, the usefulness of this research are as follows;

### 1.4.1. Practical Use

The research carried out has limited usefulness for certain parties, as stated;

1. Citizen of NCD side

   Assists citizens of NCD that they votes are secured and they must expect and effective outcome from voting.

2. Electoral commission of NCD side

   Keeps the NCD Electoral commission up to date with the eligible citizen over the age of $18^{th}$ to vote for the next election through the citizenship database.

3. Candidates side

   Facilitates candidates by putting them in a positive state of mind where there will not be any form of corrupting that will affect the outcome of the election.

### 1.4.2. Academic Use

The academic uses of the research are;

1. Development and promotion of Computer Science

   This research academically promotes Computer Science and it surely encourages others to do more research on the field of computer science.

2. Other Researchers

   Give insight to others researchers to do more research on the topic and make it more perfect.

3. Insight knowledge to student in this field of study

   This Research can give more insight knowledge to those students in this field of study to research more on other related topics.

4. For Author

   The Author or researcher of this topic can build on more knowledge academically while researching on this topic and he can contribute more into the academic societies throughout the globe.

## 1.5. Limitations

The limitations are more focused on achieving the objective of the research and its main benefits, therefore the limitations of the research are;

1. The E-Voting System of NCD is designed to assist Citizens of NCD to do E-Voting which will erase corrupt dealings that are in cooperated into elections.
2. Design a Database which will register all the citizens of NCD over the age of 18 so that they are prepared for voting. The database will also have tables of Candidates who will contest for regional Seat and District seat.
3. The database will have tables which will accommodate the total votes for each candidate.

4. The system will focus on registration of citizens until voting, in addition counting will be done electronically by the system as each individual votes, the results will be printed out for confirmation of the winning candidate.

## 1.6. Location and Time of Research

The location and time of the research for the research are as follows;

### 1.6.1. Location of Research

The Research was carried out in Indonesia Java barat Bandung:

Name of Country: Indonesia

Province: Java Barat (west Java)

City: Bandung

Name of Campus: Indonesian Computer University

Address: Jl. Dipatiukur No. 112-114-116

Tel: Tel. [022] 2504119, 2508412, 2506637, 2506634, 2503054, 2506553

Fax: (022) 2533754.

### 1.6.2. Time of Research

The research was conducted in Indonesia West Java Bandung at the University of Computer. International Program Student, the estimated times of research are as shown below:

**Table 1.1** Time research

| SCHEDULE | MONTH | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FEB 2015 | | | | MAR 2015 | | | | APR 2015 | | | | MAY 2015 | | | | JUN 2015 | | | |
| **1.Identification of needs** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** |
| a. Observing | | | | | | | | | | | | | | | | | | | | |
| b. Interview | | | | | | | | | | | | | | | | | | | | |
| c. Data collect | | | | | | | | | | | | | | | | | | | | |
| d. Document analysis | | | | | | | | | | | | | | | | | | | | |
| **2.Creating and fixing prototype** | | | | | | | | | | | | | | | | | | | | |
| a. The design process | | | | | | | | | | | | | | | | | | | | |
| b. Design database | | | | | | | | | | | | | | | | | | | | |
| c. Make program | | | | | | | | | | | | | | | | | | | | |
| **3.Testing the prototype** | | | | | | | | | | | | | | | | | | | | |
| a. Black box testing | | | | | | | | | | | | | | | | | | | | |

### 1.7. Schema Of Chapters

**CHAPTER 2: Literature Review**

Chapter 2 state in detail what Papua New Guinea Electoral Commission is, it will also define in detail what National Capital District is with relation E-Voting system. Moreover it will clearly highlight what frame work or theoretical approach will be taken to build and design the E-voting system of National capital District. The Methods and Tools used for the development of E-Voting system will be defined. The most common life cycle

of system development will be clearly elaborated in this chapter too, the system development life cycle (SDLC).

**CHAPTER 3: Object, Materials and Methodology**

Chapter 3 will basically state the procedures on how the research was done, the method used to collect data and procedures on how data was evaluated and analyzed. In addition the materials used for the research will be stated clearly here with definition of their function in the research, also the research methodology will be stated clearly. The Organizational Structure and the existing system will be clearly defined in this chapter.

**CHAPTER 4**: **RESULTS AND DISCUSSIONS AND RECOMANDATIONS**

Chapter 4 is the chapter where all data collected through research as illustrated in chapter 3 will all be evaluate and discussed on, every end results obtained may be posted as graphs, tables, drawing or designs. All the drawings will be clearly discussed completely, in addition the weakness and strength found in the research of E-voting system development of NCD will be clearly stated and further discussion will be stated on how improvement will be done to those areas that are weak and there will be further compliments on how to maintain those areas of National Capital District E-voting system that have strength to continue and be more productive.

There will be a clear distinction between the old and the new proposed system in this chapter and more discussion will be stated for more improvements.

## **Chapter 5**: **Conclusion for The Entire Thesis**

Before concluding the Thesis, basing on the discussion in chapter 4, there should be strong recommendation stated, the recommendation will cover all aspect of National Capital District E-voting system. In the recommendation there will be a recommendation on NCDEC to use Electronic Voting System and the application will be shown as user interface.

The conclusion will basically conclude the whole Thesis from chapter one to chapter 4 and state some common benefits achieved through the research and state ways on how this thesis will help develop National Capital District Election.