**Chapter 1**

**INTRODUCTION**

* 1. **Background of the Study**

University Student Leaders are the leaders for the university students and the university administration. These student leaders are elected democratically to represent the interests, needs, and problems of the university. It always an expectation of every student in the university to held the election fairly, secured, and the results are computed in accurately.

In the past few years of elections, there are some challenges to the voters face on the voting day. However, in the voting day they were expected to queue and cast their votes in the ballots as per their various sections/course. The current system does not verify and register all the students before voting day, causing them to have a long line and delay during the voting day. This brings some holes to even some students who is not in the session can line up and vote as long as he/she has a Student ID of the university. The current system does not state the expected number of voters dependent on the University student population, but also does not show the status of votes per candidate. This is the main challenge to the voters/students and the officials of the election.

However, students who run as a candidate for the respective positions are expected to reach the voters through campaigns, posters, and debates which has been a challenge for them. Many students cannot attend the campaigns and debates because of their schedules and also its hard for the candidates to express their respective platform and ways on how to improve the university for the sake of the students and administrations. In the counting day, a lot of teachers and students are consumed following the population of voters. In Human nature, not everyone is very diligent; many shortcomings are found that could potentially cause chaos during the counting of votes.

Facing with these challenges, we saw that it is good to come up with the new system, which can provide a concrete, free, fair, and real-time voting results. When a system is based on ballot papers and pen is used at a large population of the university, the results can be arguable and it question the clarity of the system already used. Manual counting of votes it time consuming especially at a turnout of many votes and many positions being voted for. In a case of disabled or duty-bound voters, they struggle to cast their votes; the system makes it easy for them since they can vote at their convenience with the help of their smartphones/laptops anytime of the voting day. This system also controls the chances of manipulation of results from influential authorities and thus generate transparency at the highest level.

* 1. **Overview of the Current State of Technology**

For several years, the current system is manual where everything is done by using papers/ballots and pen. The beloved and aspiring candidates apply through their various departments for the various post of interest. Therefore, they are guided and reviewed by teachers and election staff for their various positions. Afterwards, candidates are given a duration of campaign where they have to express and share their respective ideas, thoughts, policies, and their platforms to the voters. These campaigns are done through posters, debates and room-to-room visit for each of the candidates where they are literally asking for votes, and defending/promoting themselves from their fellow students. The debates were organized concurrently in elections are always ineffective because the provoke conflicts and chaos from opposite teams.

Voting is done manually using pen and ballot papers where every student is supposed to tick or shade the chosen candidate. Many times, this leads to many spoilt votes due to ignorance or violation of rules of the students who are excited to cast their votes quickly. In the voting day students are expected from long queues to cast their votes, as voting is done up to five students at a time. Votes counting is done handily together with the candidates and faculty witnessing the process. The candidate with the majority of votes is declared as the winner and sometimes once the candidate with major votes is notice, the counting process is stopped. How will other candidates know that they have lost some votes? This is the reason why we proposed this kind of system to give an accurate election with the exact results. The system is so slow and lot of holes, some essence of manipulating the results from higher authorities in favor of their preferred candidates who may not be elected by the students.

* 1. **Statement of the Problem**

Internet has led to discussion of e-democracy and online voting. Many people think that the internet could replace representative democracy, enabling everyone to vote everything and anything by online voting.

The current system of election does not take or verify the students before the election, hence gives chance to any person to vote as long as they have the School ID. Some students may not be eligible for the process since they may not be in the university system on different reason. Interaction between students and candidates has been minimal since they only interact once and may not enough for all students to know who the candidates are and what the candidates have for them. In other situations, some persons or senior authorities may exploit and try to manipulate the votes in favor of their preferred candidates, which tempers with the expected reliable and fair elections. The current system consumes a lot of time since the students have to queue in order to vote and also in counting day may take lot of manpower.

The proposed system will provide online registration for students within the university few days before the election will students will register and be allowing them to login and can see the candidate’s platforms or profiles. Each registered student will have a username and password to login. The proposed system will provide an interactive feature that will vanish all the reasons for not able to vote, and also this system makes the students and the candidates to interact perform their campaigns. The system will also perform some sort of tallying where results and number of students who did not vote and students who voted already. The system will allow preliminary voting and the results will graphically real-time and represented in numbers. The system will also allow the voters to view the candidate’s profiles together with their platforms and basic information’s provided by the candidates. The system will automatically compute and give election results for all the whole election process.

* 1. **Research Objectives**

To address the problem observer by the researcher some general and specific objectives are identified.

**1.4.1 General Objectives**

The Team of researchers will design a centralize system web-app with an android application which will handle the election process, registered students, and results of the election.

**1.4.1 Specific Objectives**

This project research goal is to implement the Online Voting System in Western Mindanao State University – External Studies Unit Aurora where all issues, possibility of manipulation during election will be filed and addressed accordingly by the grievance committee, the guidance and the department of student affairs also the faculty and staff.

This project study includes the following functionality as specific objectives.

* To develop a system that will capture candidates and voters information’s
* To develop a system that will facilitate online voting
* To develop a system that will generates a real-time result
* To develop a system that voters can interact to candidates and vice-versa
* To develop a system that will give number of registered voters
  1. **Scope and Limitations of the Research**

This project study is conducted and intended to operate in Western Mindanao State University – External Studies Unit Aurora to offer the students and faculty of elections a centralize online voting system for their convenience and needs. The centralize system is capable for registering, logging in, counting number of voters, it has an ability to interact both voters and candidates (vice-versa), give a real-time result, and an android based application to facilitate during voting day.

This system will work on any kind of Operating System that support HTML5 and JavaScript, it will also work on Smartphones running with Android version 4+.

* 1. **Significance of the Research**

This project will be valuable to some administrative officers/faculty of elections in Western Mindanao State University – External Studies Unit Aurora and this is beneficial to someone:

School*,* this will help the school and its management in terms of elections to make it easy and reliable. This will also improve the accessibility for disabled voters and also to minimize the voting manipulation during voting day.

Researchers*,* this will prepare the students of Western Mindanao Stare University – Aurora External Studies Unit to become more reliable researcher or inventor or IT related topics. This will enhance their skills in doing scientific works, like addressing problems with solution applied using the new technology available.

Employees*.* For the administrative staff of Western Mindanao State University – Aurora External Studies Unit, this system makes them capable handling any kind of elections.

*Other Researchers.*  In the future, this study will serve as a reference to the other researchers when they decide to do similar studies in other environments and will help a new way of creating a brand new and unique Online Voting System.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE**

* 1. **Foreign Related Literature**

In 2001, Wand and colleagues published a paper titled “The Butterfly Did It” (see Wand, et al. 2001, cited under Voting System Neutrality) in which they argue that Palm Beach County’s butterfly ballot caused enough errors to decide the 2000 election for George W. Bush. The butterfly ballot also helped launch significant new research initiatives into voting systems and prompted new federal legislation through the Help America Vote Act of 2002, which served to modernize American voting systems. Along with Internet voting, these developments account for most contemporary research on electronic voting systems. Research on electronic voting systems is now at a crossroads. Much of the research following the 2000 election evaluated technology including lever and punch-card machines that are now largely obsolete (Stewart 2011, cited under History and Development of Voting Systems). Current and future research is moving in the direction of issues of security, Internet voting, ballot design, usability, efficiency, and cost of electronic voting systems. All voting systems in the United States today are electronic to a degree. Ansolabehere and Persily 2010 (cited under Empirical and Legal Evaluation of Voting Systems) identifies three discrete parts to voting systems: voter authentication, vote preparation, and vote management. Electronic voting technology can facilitate any of these steps. The term “electronic voting” is polysemous. Electronic voting (or e-voting) variously describes direct-recording electronic voting, electronic vote tabulation, or Internet voting among others. This document defines electronic voting as any voting system that uses electronic technology at any step in the voting process. Fully electronic voting systems use DREs (direct-recording electronic machines), in which ballots are electronically generated, prepared, and counted. Hybrid types of electronic voting are optically scanned ballots (precinct or centrally counted) or ballot mark devices (BMDs), which the voter completes manually and submits but is electronically counted. Electronic voting systems can also include Internet voting in which voters receive, prepare, and submit ballots online. The 2000 presidential election precipitated the most sweeping changes to voting systems, and we continue to see officials adopt new voting systems and Internet voting pilot programs, such as those in Estonia, Canada, Brazil, and Switzerland. Voting systems, particularly Internet voting, are a source of controversy in the United States and abroad. Debates over security and ease of use involve complex technologies and core democratic principles about the rights and responsibilities of citizens. Elections are also, at least in a narrow sense and especially in the United States, zero-sum.

**CHAPTER III**

**DESCRIPTION OF THE SYSTEM**

1. **System Overview**

Online Voting System can have a major impact on an organization or even in universities. However, choosing a voting system is not a trivial task. Although many social-choice aggregation procedures have been proposed, none have been theoretically or empirically demonstrated to result in the “best” election outcome. Indeed, determining the best outcome has been shown to be impossible in many cases involving choices among three or more alternatives. In addition to choosing methods for aggregating voter preferences, organizations must also select methods for registering and authenticating voters, collecting ballots, and physically tallying the votes. By using the Android Application or the Web-Based to collect data and votes from the students.

The student and the candidate’s data process by using the simplified way of storing information in database using MongoDB together with Nodejs. The system has a special feature that every users and candidates can interact to each other, they can send a message to their co-students and candidates; drop a comment to their co-students, and receiving a notification without refreshing the page. The system uses a WebSocket technology to deliver real-time voting results, messages, status of the server, notifications, and even data.

According to Wikipedia, WebSocket is a computer communication protocol, providing full-duplex communication channels over a single TCP connection.

**3.2 System Objectives**

To provide real-time and trusted election, and to help the students to cast their votes easily with no hassle and easy to use application that facilitate in any kind of situation.

**3.2.1 System General Objectives**

To produce an election results that has value to the voters. Whatever the nature of the result (goods or information), it must be in line with the expectations of the intended voters.

**3.2.2 System Specific Objectives**

This System created for Western Mindanao State University – External Studies Unit, Aurora to manage and handle the election safely and secure to prevent data manipulation.

**3.3 System Scope and Limitation**

**3.3.1 System Scope**

For the purpose of coming up with an online voting system, a case study of Western Mindanao State University – External Studies Unit, Aurora University Student Leaders was used. The Study assumes that voter registration can be completed and the students can have login credentials to log in, interact to co-students and candidates, view voters’ profile, comment, and also message to other voters

**3.3.2 System Limitation**

This system will only work on any Operating System that have a Browser that supports HTML5 and JavaScript Enabled and the Android Application can work only on Android Version 4+.