# Literature Review

This chapter documents the available relevant literature of the problem domain. The implication was that the researcher devoted sufficient time to reviewing research already undertaken on related problems. This event was done to learn what data and other materials are already available from earlier research, and identify gaps that the present research may fill.

Theoretic Framework

The Stima Sacco voting app will allow members to log in or create an account generated once one becomes a member of the Sacco. After logging in, they will then select their leader of choice in various positions and vote. After voting, they will log out and they will later be notified on elections' outcome via the same app after the votes have been counted.

The main purpose of this research is to increase election integrity. The app will be accessible by a member of the Sacco across the globe only when there’s an election happening or some by-laws that need to be passed.

**Election**

An election gives people the right to select candidates to represent them in a democratic pattern. Election deals with the democracy and free will of citizens, then, the voting process is considered to be a very critical and sensitive process, therefore election implementation must serve many requirements in order to deliver a trustworthy election. These requirements can be defined as user convention's requirements and delivery of secure voting process requirements.

The world is going toward the use and implementation of technology in every aspect of our life including e-governments due to the fast development of network technologies. Online voting is one of technologies. Online voting refers to the use of hardware and software to establish an electronic system, useful in the voting process, by generating an electronic ballot replacing the paper ballot. Online voting was introduced by governments especially in Europe so as to serve voting convention by

Providing a remote system so to allow the voters can cast their votes whenever and wherever he/she can. These systems will increase the voter's participation and will speed up the votes counting. Introducing remote voting technique over the internet will serve the voter's convention. The main idea of this technology is to speed up the ballot counting and increase voters' participation by providing remote voting processes and social interaction platform

**Types of Voting**

Voting is a process at the heart of a democratic society. There is a wide variety of different voting systems that are based on traditional paper ballots, mechanical devices, or electronic ballots.

In recent years, voting equipment's which were widely adopted in many countries may be divided into five types

**Paper-based voting**: The voters get a blank ballot and use a pen or a marker to indicate who he wants to vote for which candidate. Hand-counted ballots is a time and labor consuming process, but it is easy to manufacture paper ballots and the ballots can be retained for verifying, this type is still the most common way to vote.

**Lever voting machine:** Lever machine is peculiar equipment, and each lever is assigned for a corresponding candidate. The voter pulls the lever to poll for his favorite candidate. This kind of voting machine can count up the ballots automatically. Because its interface is not user-friendly enough, giving some training to voters is necessary.

**Direct recording electronic voting machine:** This type, which is abbreviated to DRE, integrates with a keyboard; touch screen or buttons for the voter press to poll. Some of them lay in voting records and counting the votes is very quickly. But the other DRE without keep voting records are doubted about its accuracy.

Punch card: The voter uses metallic hole-punch to punch a hole on the blank ballot. It can count votes automatically, but if the voter’s perforation is incomplete, the result is probably determined wrongfully.

**Optical voting machine:** After each voter fills a circle corresponds to their favorite candidate on the blank ballot, this machine selects the darkest mark on each ballot for the vote then computes the total result. This kind of machine counts up ballots rapidly. However, if the voter fills over the circle, it will lead to the error result of the optical-scan.

**Electronic voting:** is a voting system where the recording, casting, and counting of votes involves information and communication technology. The main principle of the e-voting system is the replica of the regular voting system as much as possible. It is compliant with the election legislation and principles and be at least secure as the regular voting. In a nutshell, e-voting strives to be uniform and secret, only eligible persons are to be allowed to e-vote and a voter should only cast one vote

**Online Voting:** this is just like electronic voting but only that it is a web-based system. In this paper, a new easy to use, secure and transparent online voting system is proposed. The new scheme can be easily used by colleges and universities worldwide. The new scheme most notable allows voters to interact, participate in campaigns and political rallies virtually by use of a web-based system.

**Critique of Existing Methods**

Low voters turn out this is resulted by fixed voting day and some members willing to the voter are maybe held by unavoidable circumstances or the cost of coming to voting stations.

Election rigging this is resulted by few individuals who would prefer a certain person in power for their own personal gain.

Cost the current system is expensive to hold. This is resulted by the large labor force needed to man the election and the cost printing ballot papers.

**Identified Research Gaps**

Lack of transparency in the election systems

Lack of robust and error-free systems for the election process.

**Data collection techniques**

**Interviews**

Interviews allowed verbal responses and also gave the respondent room to give out any suggestions and expectations. The advantages of this is that the researcher was able to get firsthand information that was not biased in any way and also was able to interact with the stakeholders and record their day to day experience with the current system

Direct Observation

Direct observation helped to get real time scenario of what was happening on the ground based on the experimental outcomes. This approach is in the primary data collection where observation in the case on the ground keenly from past elections.

Questionnaires

Here, formulated questions which both were open ended and close ended and were issued to the stakeholders (organization managers and technical staff) who complied by giving their responses. This tool helped in the collection of data on the daily activities that were being carried out.

Advantages

Was easy to analyze data since the questions that was asked were straight forward.

Reduced Bias in that most of the questions were in closed format and had answers and therefore answers were straight forward.

It was relatively quick to collect information since most of the people that were required to answer the questions were available when needed.

**Data analysis**

### Analysis of the findings

Below are the individuals who were involved during the data collection phase.

|  |  |
| --- | --- |
| People Involved in Data Collection Process | Number of People Involved |
| Senior Managers | 5 |
| Stima staff | 10 |
| Shareholders | 20 |
| Technical staff | 5 |
| Total | 30 |

**Feasibility study**

Depending on the results of the initial investigation the survey is now expanded to a more detailed feasibility study. Feasibility study is a test of system proposal according to its workability, impact of the organization, ability to meet needs and effective use of the resources. Some of the feasibility study carried during the research include:

**Technical feasibility**

A study of resource availability that may affect the ability to achieve an acceptable system. This evaluation determines whether the technology and the technical support needed for the proposed system is available or not.

Can the work for the project be done with current equipment existing software technology & available personal?

Can the system be upgraded if developed?

If new technology is needed then what can be developed?

This is concerned with specifying equipment and software that will successfully satisfy the user requirement.

**Economic feasibility**

This study looked at the financial assessment of the project in terms of cost-benefit analysis and it basically ensures that the system will be affordable by the Sacco and its shareholders when implemented. Economic justification is generally the “Bottom Line” consideration for most systems. Economic justification includes a broad range of concerns that includes cost benefit analysis. In this we weight the cost and the benefits associated with the candidate system and if it suits the basic purpose of the organization i.e. profit making, the project is making to the analysis and design phase.

According to the analysis done, the organization will incur some cost in hiring the technical staff and also the shareholders will also need to purchase an android phone (platform the system will run) so as to vote. However, despite these costs the organization and the shareholders are able and willing to invest in this project since the major problems they face will be minimized thus this project will be economically feasible.

**Operational Feasibility**

Operational feasibility refers to the proportion of taking care of issues with the assistance of another proposed framework. It helps in exploiting the chances and satisfies the prerequisites as recognized during the improvement of the task. It takes care that the administration and the clients bolster the venture. It is mainly related to human organizations and political aspects. Some of the things to consider are:

* What changes will be brought with the system?
* What organization structures are disturbed?
* What new skills will be required? Do the existing staff members have these

Skills? If not, can they be trained in due course of time?

The system is operationally feasible as it very easy for the End users to operate because they only needs basic information about using an android smartphone and they will be good to go.

**Schedule feasibility**

Time evaluation is the most important consideration in the development of project. The time schedule required for the developed of this project is very important since more development time effect machine time, cost and cause delay in the development of other systems.

A reliable voting app can be developed in the considerable amount of time. It can take up to a maximum of 2 months moths to develop. This will include voters’ registration and education.

**Social feasibility.**

Social feasibility is one of the feasibility study where the acceptance of the people is considered regarding the product to be launched.

It describes the effect on users from the introduction of the new system considering whether there will be a need for retraining the workforce.

It describes how you propose to ensure user co-operation before changes are introduced.

**FUNCTIONAL REQUIREMENTS**

Functional requirements try to explain the basic functions of the system intended. The system will do the following:

Recognize and Authenticate users’ credentials.

Display search results

Registration of the voter is done by the Sacco once one is declared a shareholder.

Voter is given a unique ID and PASSWORD.

Voter can give vote after login and entering the ID and PASSWORD.

In the DATABASE information of every voter is stored.

**NON-FUNCTIONAL REQUIREMENTS:**

The non -functional requirements are as follows:

**Maintainability**

The experts should have the ease of maintaining the system by, correcting errors, preventing breakdown, perfecting the system and ensuring that it adapts to the changing technology and needs of the user.

**Usability**

The system will be friendly to all users with or without much knowledge due to simple user interfaces and proper documentation of the system.

**Economy**

The system will be affordable and within the budget specified.

**Physical design**

The physical design is concerned with how the physical architecture of the entire system interacted to achieve its objectives. It modelled the user interfaces, the server architecture and the database models.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Top of Form  **WELCOME PLEASE LOG IN HERE BY ENTERING YOUR USERNAME AND CORRECT PASSWORD**     |  |  | | --- | --- | | **USERNAME:** | ***\**** | | **PASSWORD** | **\*** | |  |  |   Fields marked by \* must be filled correctly.  Bottom of Form |

This is where a new user/voter starts; the individual is required to provide a username and password. When this is provided the system validates the user if the entered information tallies with what is in the database. He/she is then logged in otherwise the voter/user isn’t logged in.

**Login**

It is the login session for the voter to proceed with the voting

**Username**

Each voter has unique username that will be generated by the admin

**Logical design**

Logical design characteristically looked at the intended system from a logical perspective without considering physical requirement. The project needed a logical design that modelled the flow of data and information through the system from input to output. Logical design also modelled the security checks that the system will be using as well as the formats for all data items in the system.

**Database design**

This is the process of producing a detailed data model of the database. This data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language which can then be used to create database. This is also carried out in order to reduce redundancy of information. The Stima Sacco voting app will use a database comprising of two tables as illustrated below;

**Registration details table-**the table holds records of registered users/voters with their respective preferred usernames and passwords. It also has the contacts {phone numbers, and email address} of voters/users.

## Table structure for table registration details

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Null** | **Default** |
| ***ID No*** | int(10) | No |  |
|  | varchar(15) | No |  |
| Othername | varchar(15) | No |  |
| PhoneNo | varchar(15) | No |  |
| Email | varchar(50) | No |  |
| Username | varchar(15) | No |  |
| Password | varchar(20) | No |  |
| User | varchar(40) | No | Voter |

This same table is used by the user to get the username and password for logging in

**Vote table-**That holds records of the candidate, and the voter who casts a vote in favor of the candidate. Its primary key is the *id* field which is also necessary during vote counting. The database is queried to find out how many voters’ casts their votes for a given contestant.

## Table structure for table vote

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Type** | **Null** | **Default** |
| candidate | varchar(25) | No |  |
| Voter | varchar(15) | No |  |
| ***Id*** | int(8) | No |  |

Admin table

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data type** | **Null** |
| Admin\_Id | Int (10) | No |
| Username | Varchar(20) | No |
| Password | Varchar (20) | No |
| Phone | Int(20) | No |

**Sample Questionnaire**

**I'm Nderitu Samwel from Jomo Kenyatta University of Agriculture and Technology. If it's not too much trouble take a couple of minutes to express your conclusions on the underneath inquiries. Your answers are essential to the accomplishment of this examination. Please answer with 'YES or NO' where required. This is the poll is aimed at improving and getting better services provided during AGM voting meeting.**

1. What’s your gender? Male [ ] Female [ ]
2. Are you going to vote in the coming elections? YES [ ] NO [ ] NOT SURE [ ]

|  |
| --- |
| If not, why aren’t you going to participate? |
|  |
|  |

1. Are you conversant with online voting? YES [ ] NO [ ], if online voting was an option would you choose to use it? YES [ ] NO [ ]. If yes, why would you use online voting?

|  |
| --- |
|  |
|  |

If not, why not?

|  |
| --- |
|  |
|  |

1. Do you think online voting would significantly increase voter’s turnout?

YES [ ] NO [ ] NOT SURE [ ]

1. How long does it take to vote manually?

|  |
| --- |
|  |
|  |

1. Challenges faced when carrying out voting?

|  |
| --- |
|  |
|  |

1. Do you find the current system effective? YES [ ] NO [ ] NOT SURE [ ]

If NO, what recommendations would you give?

|  |
| --- |
|  |
|  |

Thank you for agreeing to take part in this survey. All of the answers you provide in this survey will be kept confidential. No identifying information will be provided to the public. The survey data will be reported in a summary fashion only and will not identify any individual person.