KNKFSP: Treasury Management System and Predicting Future Income Using Classification for Unbound Foundation Antipolo East Cluster

A Thesis Presented

to the Faculty of the College of Arts and Sciences

Eulogio "Amang" Rodriguez

Institute of Science and Technology

Nagtahan, Sampaloc, Manila

In Partial Fulfillment

of the Requirements for the Subject Capstone 1 Project and Research 1

Leading to the Degree of

Bachelor of Science in Information Technology

By:

Alimoot, Jerrecho T.

Del Pilar, Rovic S.

Panotes, Miguelle E.

Puno, Mark Wilson N.

Tulalian John, Roland P.

June 2022

APPROVAL SHEET

Republic of the Philippines
EULOGIO "AMANG" RODRIGUEZ
INSTITUTE OF SCIENCE AND TECHNOLOGY
Nagtahan Manila, Philippines

College of Arts and Sciences

May 19, 2022

Raygie Sabalbarino
OIC / SEDO

Dear Mr. Sabalbarino,

Good day!

We, the 3ʳᵈ Year students from Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST) in support of the College of Arts and Science Department (CAS), currently enrolled in the subject entitled "Capstone 1 Project and Research 1" would like to ask for permission to conduct a research study in Unbound Foundation: St Vincent Foundation for Children and Aging Incorporated.

The permit will allow the researchers to perform an interview and gather information for further knowledge and understanding of the **Organization's** operations on data gathering and other related processes that are considered useful for the completion of the project especially in the design and development of database applications to meet research goals.

We rest assured that all the data gathered will be treated with the utmost confidentiality and for academic purposes only.

Thank you very much for your cooperation with us, it was a pleasure to serve you with our credibility and integrity.

Respectfully yours:

Alimoot Jerrecho T.

Del Pilar, Rovic S.

Panotes, Miguelle E.

Puno, Mark Wilson N.

Tulalian, John Roland P.

Noted by:

Mrs. Hazel Anuncio
Subject Professor

Approved by:

Mr. Raygie Sabalbarino
OIC / SEDO

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CHAPTER 1:

THE PROBLEM AND ITS BACKGROUND

Introduction

In today's generation, computers and technology play a big role in everyone's life. Computers have a huge impact on work, especially on people working in the office. Having a computer that is connected to the internet, makes our lives easier and also it is useful in terms of studying. As years go by, the evolution of technology is very fast, It can perform a certain task that is almost impossible, more efficient, and convenient. Today's generation is living in a technology where access to useful resources and information is easier. Online transactions like handling money and paying bills are more convenient with the help of the computer and technology. Most organization uses a computer and the internet to record all of the transaction that they doing.

Most Scholarship organization uses a treasury management system because they are handling a huge amount of money. Having a treasury management system can automate the organization's daily, monthly, and yearly cash transactions, and also having that system can easily identify if the liquidation and the transparency of the money can easily to track.

Treasury management is related to the finances of one's organization and it involves the management of money and financial risk of the organization or business it also ensures the manages financial risk successfully. The treasurer is the head of the treasury. It's a process of management and participation of financial assets work. The main goal is to optimize the company's Liquidity, make appropriate financial decisions for the future, and handle financial risk wisely, It is simply called cash management.

Treasury Management System (TMS) is a kind of software application that allows one company or organization to automate the process that is required to manage its cash flow. Organizations can gain benefits from having a treasury management system, it can reduce error, Auditing can become more accurate, and Transparency reports can easy to identify lastly, it can save time in recording the transaction that has been done

Background of the Study

Unbound Foundation was initially started in the state of Missouri, Kansas City country of United States. It all began with a group of mothers in Hyderabad India called Self Help Mothers Group in the year 1981. They built the organization to help people with their financial needs for their studies. The reason behind the foundation is they witnessed the devastating effect of poverty in Latin America while they are working. Initially, the unbound foundation is the former Christian Foundation for Children and became Christian Foundation for Children and Aging but in 2014 it officially became Unbound. Over the past years, the organization has served more than 800, 000 children, students, and aging adults, and now they are currently working with more than 300, 000 people and supported by 260, 000 sponsors. In the Philippines, Unbound Foundation is registered in the Department of Social Welfare and Development as Non-Government Organization as St. Vincent Foundation for Children and Aging Incorporated. Unbound foundation is widely spread in the Philippines one of its branches is located at Antipolo, Rizal.

The main objective of the foundation is to teach how to save money. Saving money is important because it helps protect you in the event of a financial emergency. In addition, saving money can help an individual pay for large purchases, avoid debt, reduce financial stress, leave a financial legacy, and provide a greater sense of financial freedom. In the unbound Manila Project, Kaban Ng Kaunlaran Family Savings Program, or KNKFSP, is a savings program that is

implemented for more than 10 years. This is one of their tools in achieving the goals of Hope for a Family focusing on its three major characteristics namely, economic self-sufficiency, capability building, and sustainability.

In addition to the kaban program of the said organization, they also have a lending program that aims to respond to the immediate needs of the members for individual, family, and or group livelihood projects. Furthermore, the goal is to help sustain the short and long-term goals of the operation through the individual members of the sponsored members to Unbound born cooperatives. The total amount that they can lend from the organization is 75% for livelihoods like paying bills such as water, electricity bills, house rents, and 50% for education, hospitalization, and burial of the total amount they contributed.

The researchers chose the Unbound Manila Foundation as their beneficiary mainly to help the organization have an automated treasury management system to make the cash flow much easier. The Unbound Foundation is currently using a manual way of processing the kaban of the foundation. Kaban is the term for the funds from the members of the organization and from the sponsors that are called matching grants. The matching grant is the monthly contribution of the members and the help of the organization. The matching grants every month are 100 pesos, 50 from the sponsors and 50 from the foundation.

The manual way process of monitoring and encoding the kaban might have inaccurate results such as the total amount of accumulated money, list of loanees, and release funds. in their manual way they are struggling to identify who are the members who need to pay the monthly contribution and the payment for their monthly interest on their loan.

Researchers want to develop a system where they can easily monitor the savings of the foundation including the lending program. The system will have a feature where the coordinator of every chapter has access to the system and they can easily encode all of the transactions such as the total money that they collected from their members. The system will also have a report where they can monitor the kaban per area. Transparency of the liquidation is also important to avoid suspicion in terms of cash flow. The system will also notify the members who need to pay for their monthly matching grant and monthly interest for their loan. it can also predict which month has the fewest and most funds collected and also which month has the most released fund.

Project Context

The present process of the Unbound Foundation or the St. Vincent Foundation for Children and Aging Incorporated is done manually. Since the organization started in the Philippines in the year 2010, a manual way has been used. The treasurer of every area needs to go to the main office of the organization to encode and report all of the accumulated money from the members of the organization. Pen and paper are the instruments for their manual process that is used in encoding and reporting. Since they are using the manual process, the transparency of the fund is not visible. Every month the leader needs to provide the Kaban Ng Kaunlaran Family Savings Program Form or KNKFSP Form as proof of their collection. Reminding their members to regard their monthly interest for their loan is not easy and time-consuming given the number of members that the organization has.
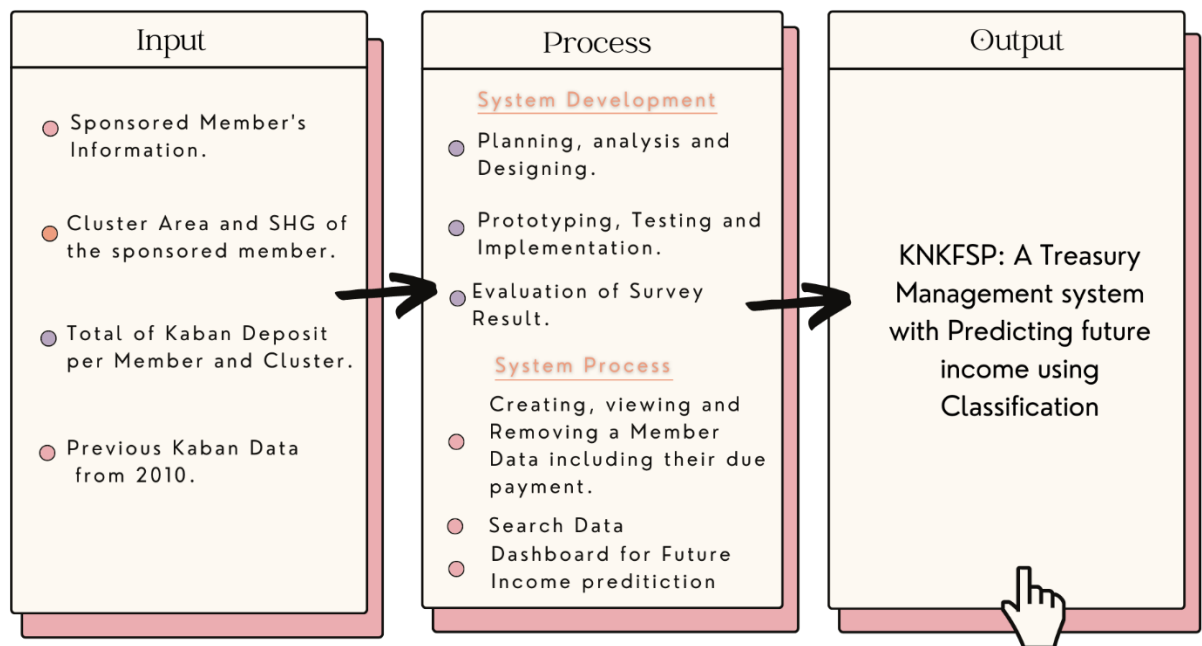
Purpose and Description

The main purpose of this thesis project is to create a secure and accurate automated treasury management system. Researchers designed an automated treasury management system for Unbound Foundation's former St. Vincent Foundation for Children and Aging Incorporated: Antipolo Cluster an important project for the organization.

The Proposed system will replace the manual process of managing the "Kaban" fund by providing an automated treasury management system for the Unbound Foundation and to help them to predict their future income. The system will also provide security to have a security system that will keep their data protected. The system offers the beneficiary to have an automated way to record or liquidate the income of the Kaban Program. This system will have a form field that will let the employee insert the data into the system. It also comes with Machine Learning that is used for predicting future incomes through Classification Technique. They will monitor these transactions, pieces of information, and activities with the Dashboard Section. With these features, the organization will easily read and access the data without any hassle/s. Another is that the proponents have prepared the security of this website by using a Secure Socket Layer or SSL Certificate to maintain a secured online connection between the user's computer into the system. This will also prevent thieves from viewing and

changing any information transferred, including potential personal details. The proponents will also add a Captcha Security where all the users will have to take a small puzzle before logging in or doing a specific task in the system. This will avoid intruders from spamming and password decrypting. Another feature is the account filter, where the information will only display, based on their handle member. But, The Head of the organization will be able to see the full system data without any filters. The researcher will use the firebase for their database. Lastly, to provide security in the system data, The proponents will add Data backups where the users can store and keep their data personally in case of an emergency such as System crashing and Database failure.

Conceptual Framework

Input	Process	Output
○ Sponsored Member's Information.	**System Development** ○ Planning, analysis and Designing. ○ Prototyping, Testing and Implementation. ○ Evaluation of Survey Result.	KNKFSP: A Treasury Management system with Predicting future income using Classification
○ Cluster Area and SHG of the sponsored member.	**System Process** ○ Creating, viewing and Removing a Member Data including their due payment.	
○ Total of Kaban Deposit per Member and Cluster.	○ Search Data Dashboard for Future Income predition	
○ Previous Kaban Data from 2010.		

Figure 1: Conceptual Framework of the Study

A conceptual framework is a textual or visual presentation of a variable's intended connection. Variables are the traits or features that you want to evaluate. In general, the conceptual framework is constructed based on a survey of previous studies and theories on the issue. The researchers added a conceptual framework on how the system will develop so that the reader will easy to understand it.

Objectives

The main objective of the study is to provide an automated treasury management system in Kaban ng Kaunlaran Family Savings Program in Unbound foundation and to replace the manual processing of cash flow management. It also aims to have a more accurate result with daily, monthly, and yearly transactions.

The project is designed to develop the system to achieve the following objectives:

- To have an automated treasury management system on the chosen beneficiary.
- To give more accurate reports on the cash flow.
- To notify the members if they have a pending payment regards to their monthly matching grant and monthly interest on their loan.
- To replace their manual way of encoding and monitoring their balances.
- To predict the future income in the succeeding years.
- To test the system if it is functional, to meet the requirement of the system.
- To meet the International Standard Organization (ISO) 25010:2011) requirement and to test the functionality of the system using ISO25010:2011

Significance of the study

The target beneficiary of this project:

1. **Head Area** This study will assist the head in managing the real-time monitoring of the members' funds. Only he has access to the entire organization's records.

2. **Socio-Economic Development Officer** every time the leaders report to them, they will administer and use the system. They will be in charge of encoding all data submitted by their cluster.

3. **OAF/Leaders** will collect and record the savings from their members and then pass them on to the workers.

4. **Future Researchers -** this study could be used as a reference for their treasury management system.

Scope and Delimitation

The study is to focus on the development of the treasury management of the "KNKFSP" to replace the paper-based manual process. This is to manage the liquidation and their savings and cash loan records. The system includes the main processes; the system will notify users when members are needed to pay. Also, to ensure the transparency of their monthly Kaban records to avoid irregularities within their organization. The system will also predict the future income of the organization.

The project research is delimited to the use of workers and members of St. Vincent Foundation for Children and Aging, Inc., Antipolo-East Cluster.

Participants in this study shall be limited to the St. Vincent Foundation for Children and Aging Inc. personnel and sponsor members, including the treasurer and head chairman those assigned to manage the system, and sponsor members. The location of the study where data will be collected is the Antipolo-East cluster.

Definition of Terms:

1. **Accumulated** - gather together or acquire an increasing number or quantity

2. **Automate** - convert (a process or facility) to largely automatic operation.

3. **Cash Flow** - is the amount of cash that comes in and goes out of a company.

4. **Cluster -** group of similar things or people positioned or occurring closely together.

5. **Convenient -** fitting in well with a person's needs, activities, and plans.

6. **Cooperative business** - A cooperative business, also known as a co-op, is a type of organization that is both owned and controlled by its members, who also happen to use the services and products of the cooperative.

7. **Deposit –** a sum of money placed or kept in a bank account, usually to gain interest.

8. **Economic Self-Sufficiency** - Economic self-sufficiency is the ability of individuals and families to maintain sufficient income to consistently meet their basic needs – including food, housing, utilities, health care, transportation, taxes, dependent care, and clothing – with no or minimal financial assistance or subsidies from private or public organizations.

9. **Efficient -** (especially of a system or machine) achieving maximum productivity with minimum wasted effort or expense.

10. **Lending –** the action of allowing a person or organization the use of a sum of money under an agreement to pay it back after the corresponding timeline.

11. **Liquidation -** the conversion of assets into cash (i.e., by selling them). the clearing of debt.

12. **Loanees** - Borrower; someone who is loaned something.

13. **Loans –** a thing that is borrowed, especially a sum of money that is expected to be paid back with fixed or zero interest.

14. **Savings**

    - **Force –** Cooperative and Rotating funds or "paluwagan"

    - **Voluntary –** Commercial banks

    - **Voluntary with match –** Unbound SHGs initiative

15. **St. Vincent Foundation for Children and Aging, Inc. –** It is the organization's name that is registered in the DSWD.

16. **Transparency** – the condition of being transparent

17. **Treasury management** - (or **treasury operations**) includes <u>management</u> of an enterprise's holdings, with the ultimate goal of managing the firm's liquidity and mitigating its operational, financial and reputational risk.

18. **Treasury Management System** - A treasury management system (TMS) is enterprise software that helps automate repetitive, often manual treasury processes.

19.Unbound – The agency that funded the organization.

CHAPTER 2

REVIEW OF RELATED WORKS

This chapter contains the relevant literature and studies. The literature and research in this chapter address the multiple ideas, concepts, generalizations, findings, and historical developments related to the topic. This will also function as a guide for the researcher while they do the research. Furthermore, the material in this chapter assists in familiarizing oneself with aspects that are important and connected to the current situation.

Related Studies

According to Donepudi, Banu, Bangladesh et al., (2020), As your business grows, financial management becomes more complex. Companies need better financial management to make progress. One of the Treasury's main functions is cash management, which requires cash forecasting. This requires artificial intelligence and machine learning. These are to help businesses predict cash flow. Centralized financial management helps provide accurate data for machine learning models for learning purposes. This paper demonstrates the importance of artificial intelligence and machine learning for financial management. Describes various machine learning predictive models that help companies predict cash flow.

Another Study that has Develop and implement many activities and other related means in this computerized financial management system to reduce the

stress faced by most of the bank's treasures. I've been walking. By overriding careful research analysis and design to create an executable system, we have achieved our goal of automation. It focuses on open source and programming tools, providing low cost, easy implementation, easy management and efficient currency exchange. This system provides an integrated, user-friendly electronic environment for recording. Samphina Academy (2017)

As Stated by Chen, Cho, Dou, Et al., (2022), They Use machine learning techniques and high-dimensional, detailed financial data to predict the direction of revenue change over the next year. Their model shows significant predictive power outside the sample. The area below the receiver operating characteristic curve (AUC) ranges from 67.52 to 68.66 percent, which is significantly higher than the random estimate of 50 percent. The annual rate of return on the hedge portfolio formed on the basis of the model's forecasts ranges from 5.02 to 9.74 percent. Our model is superior to two traditional models that use logistic regression and a small set of accounting variables, and professional analyst predictions. Analysis shows that outperformance, when compared to traditional models, is due to both the non-linear predictor interactions overlooked by regression and the use of more detailed financial data by machine learning

According to Dr. Tamilarasi & Mrs. Renula (2015) There are seven Advantages when using the Treasury Management System:

Time Efficiency

The financial management system streamlines the payment process and minimizes the time it takes to approve and initiate payments. An optimized and distributed approval process further minimizes the time required and eliminates organizational bottlenecks

Economical

The clear and complete information provided by the treasury management system allows you to see the cost of high interbank transactions.

Reduce Errors

By mapping business processes and digitizing workflow processes, you can reduce random and random tasks and directly minimize the potential for human error. Having multiple authentication points helps automate routing rules.

Accurate Audit Control

Digitizing, implementing, and logging the approval process creates a complete, detailed, and accurate audit trail within a single system. There is always a complete registration of all actions related to a particular payment.

Detailed and Executable Insights

This system acts as an aggregated and integrated analytics and reporting platform. Therefore, it provides practical insights for discovering inefficiencies and optimization opportunities.

Bank Provider Flexibility

It serves as a single point of contact for numerous banks and accounts. This, together with the advent of worldwide Financial Messaging Standards, provides the flexibility of switching bank providers without disrupting everyday productivity or workflow.

Compliance and System Standardization

Standardize procedures and systems by implementing a Treasury Management System. The crew can be taught in a single system, which means faster onboarding.

Related Literature

According to Clarck, Austin (2018) Cash forecasts are an important part of our financial operations. No company can afford to lose track of its cash or liquidity position, regardless of size or industry, but in an increasingly complex economic environment.

In Addition, one of the main advantages of financial management systems is the ability to manage ANOVA, especially given the comp x and global nature of

financial functions. Treasury personnel can spend a great deal of time trying to figure out the cause of forecast errors and examine bank statements and accounting entries to determine the timing and classification of income and expenses. This is a very difficult task in the spreadsheet model.

(Cloud Firestore: An In-Depth Look, Written by Yifat Perry, Product Marketing Lead | Nov 2, 2020 1:49:52 PM)

Flexible data model—allows for the creation of flexible hierarchical data structures. Allows you to save data in documents, which can then be organized into collections and sub-collections. Complex nested objects can be supported by documents.

Complex queries—as long as the query parameters are met—allow you to obtain a particular single document or every document in a collection. You can also combine filtering and sorting, as well as incorporate a number of filters in a single query.

Data syncing— updates data on all linked devices automatically. Simple one-time requests can be effectively processed by the sync operation.

Caching— stores application data, enabling offline data writing, reading, monitoring, and querying for your application. Once the system is operational again, this technique syncs local modifications with Cloud Firestore.

Synthesis

The following papers and materials for the development of the proposed software can be related to the specific study.

The above-mentioned concept of the study of the treasury management system and predicting future income is relevant to the current project and it will serve as a guide for the development of a treasury management system and predicting future income that will allow the organization to encode and record their accumulated funds in an efficient way.

A Treasury Management System will perform better than manual processing. Having a Database is much essential for keeping the organization's records as well as the sponsored members of the foundation. Based on the studies mentioned above, predicting the future income of one business or organization is helpful because it will provide accurate and trusted data.

As mention on the reviews, Having a big organizations will have a difficulty in managing a financial plan. Furthermore, One of the benefits of using the treasury management system is the cash management. With this system, It will help us to

forecast the cash flow of the organization using the Artificial Intelligence or Machine Learning.

Another benefits of having a Treasury Management will be less the human work. TMS can reduce stress to a person whose managing the treasury.

Lastly, The cash forecast or prediction of future income is very essintial to one's company. This will help to improve or be notified early before the problem. According to Clark Austin (2018), No company can afford to lose track of its cash or liquidity position, regardless of size or industry

CHAPTER 3: METHODOLOGY AND DESIGN

This chapter will discuss the method to be able to complete the study. This chapter also discusses how the system will be completely developed by the researchers.

Methodology

The researcher will adopt the descriptive study method, with the help of a questionnaire serving as their primary data collecting method, supplemented with relevant private information acquired from interviews and observations. This technique was chosen because it is a status survey that would reveal the conditions and connections among the numerous processes and persons involved in the development of the system. Researchers will also use the Agile method of System Development Life Cycle (SDLC) when developing the proposed system.

Technical Background

The encoding of the accumulated money and loan reports of Unbound Foundation formers St. Vincent Foundation for Children and Aging Incorporated is done manually. The organization. The organization lacks critical tools for a quick and efficient encoding of the funds and also in updating and reminding their members regarding loans and monthly matching grants.

To implement the proposed system, the organization is required to purchase computer units, a printer, an internet connection as well firebase for the database. A backup is much needed if the primary server will fail.

A software firewall is needed to be able to protect the main server and computer unit from the malware. The agile method will use by the researcher to develop the proposed system.

Requirement Analysis

The proposed System entitled "KNKFSP: Treasury Management System and Predicting Future Income using Classification" is A web-based system that allows authorized personnel to encode the accumulated money from the members of the organization. Users will also have the privilege to show the transparency of the kaban with the help of the dashboard. Users will also

For software design and development to be finished, the following goals and objectives of the system should be met:

- To provide more accurate reports on cash flow.

- To encode all the accumulated money as simply as possible for the leader-in-charge.

- Creating a database for the members of the organization such as the total savings that they have, money that they need to pay, and also the loan interest.

- To provide a web-based treasury management system for the chosen beneficiary.

Population, Sample Size, and Sampling Techniques

This study's respondents included Unbound Foundation former St. Vincent Foundation for Children and Aging Incorporated – Antipolo East Cluster. Members from the Antipolo Cluster include a total of 523 sponsors member and 5 employees.

Description of Respondents

The proposed study of the researcher will conduct at Unbound Foundation former St. Vincent Foundation for Children and Aging Incorporated- Antipolo East Cluster and is located at Bagong Nayon, Antipolo, Rizal.

Research Instrument

One of the most significant parts of the study's implementation is data collecting. The data of the respondent was used to determine the current system as well as how it was designed and evaluated. International Standard Organization (ISO) 25010: 2011) will be used to assess the system's quality and if the system will solve the addressed problem of the existing system they are using

Data Gathering Procedures

This chapter will describe the researcher's method and technique for performing the study, as well as the system development procedure, findings, and analysis.

The researcher will use different types of analytical tools to collect data and also to justify the implementation of the study. Using the data collection method, researchers found the challenges of the current system in the foundation. An analytical tool such as interviews and brainstorming will use and the collected data will be analyzed and examined to use as a foundation for the development of the system.

. The interview is a structured conversation between two people which is the interviewee and interviewer. Conducting a study interview is very essential

because it is the way to gather data that the researcher will use to identify the problem and it is also necessary to solve the specific problem.

Brainstorming is a sharing of ideas done by a group and it is also a technique to gather ideas as many as possible. Using brainstorming, a solution for the problem will identify and address.

Statistical Treatment of Data

Statistical Formulas

Percentage/Proportion

The researchers used proportion to describe the demographic profile of respondents.

Formula 1 Percentage/Proportion

$$P = \frac{f}{n} \times 100\%$$

Where:

$P = Percetage/Proportion$

$= Frequency \ or \ the \ number \ of \ observations \ in \ each \ class$

$n = sample \ size \ or \ the \ total \ number \ of \ observations \ involved \ in \ the \ study.$

Weighted Mean

The researchers used weighted mean to assess the perception of evaluators about the proposed system

Formula 2 The formula for weighted mean is

$$W.M. = \frac{\sum wx}{n}$$

Where:

w - number of respondents who answered specific scale/item

$x =$ values of likert scale

$n =$ sample size

System Requirements

Hardware

The Unbound foundation's savings record management process is manual and uses pen and paper. They will effortlessly manage the records using the automated system. Administrators can use any desktop with an i3 processor or above capable of internet browsing and light work performance.

Software

The system will be built using Python, HTML, CSS, and Bootstrap. The Firebase Database will also use to implement the functionality. Authentication will also be required for every user to protect confidential data and also to be more secure.

People Ware

Admin: The system admin is the foundation's head. He or she will be able to monitor and view all of the system's records. This includes each member's monthly savings status.

Workers: They have access to the system as well, but are generally responsible for maintaining such records of their covered area. They encoded the records collected from the members.

Network

"KAKASA: Treasury Management System and Predicting future income" is an automated system that will monitor the members' savings, matching grants, including cash loans.

Data ware

The data is saved in the Real-time Firebase. Members' data will be recorded in the Database after workers submit it into the system.