

# ZENT EMPLOYEE SOCIAL SECURITY SYSTEM



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By

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## **ABSTRACT**

This research study aims at producing a proposed ZENT Employee Social Security System that delivers an automated employee access to social security credit. The development of this system was driven by the incompetence processing of the long serving social security access system. More so, the proposed ZENT social security system was developed using the modern technology adopted from the object oriented language classes. The benefits of developing such as a statement proved to outstand the related costs. The study advanced to outline the system user manual and document the data mining methods used to develop the proposed system.

## DECLARATION

I, **ROBERT MARINGE (R151265Q)** hereby do declare that I am the dissertation's sole author. I also authorize the **Midlands State University** to give the dissertation to other people or institutions for scholarly research purposes.

Signature \_\_\_\_\_ Date \_\_\_\_\_

## **APPROVAL**

The ZENT social security system dissertation written by **ROBERT MARINGE (R151265Q)** meets the **Midlands State University's BSC HONOURS INFORMATION SYSTEMS DEGREE** regulations governing the degree's award and it is permitted for its contribution to knowledge and literal presentation.

Supervisor\_\_\_\_\_ Date\_\_\_\_\_

## **ACKNOWLEDGEMENT**

Appreciations to my mother and the whole family for their guidance, emotional support and financial support throughout the project. Gratitude also goes to my dissertation supervisor Dr T. Tsokota and the Information Systems Faculty at large for their support and assistance in the dissertation completion and success. Lastly, I give thanks to the almighty God for the spiritual guidance and strength to accomplish the project.

## **DEDICATION**

I dedicate this dissertation to my mother and take this time to ask God to continue blessing her.

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## **LIST OF ACRONYMS**

**ZESA** - Zimbabwe electricity distribution and transmission company

**ZENT** - ZESA enterprises

**ZPC** - Zimbabwe power company

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# **CHAPTER 1: INTRODUCTION**

## **1.1 Introduction**

This chapter aims to present ZENT employee social security system alongside its motive for development. The chapter explains ZENT organization background, evolution, mission and its visions. Driven by a system digitization force behind the development of ZENT employee social security system, the chapter is largely dominated by new ideas and projected proposed system objectives. Resources used to build the proposed system are explained as the system document unfolds. A system development justification plan concludes this chapter.

## **1.2 Background of the study**

The interest of this study is centred on the transformation of the ZENT current traditional social security management and operations into a modern automated system. However, the proposed ZENT employee social security system also caters for the ZENT ordinary employees living standards. This is archived through the regular social security funds funding.

### **1.2.1 Background of an Organization**

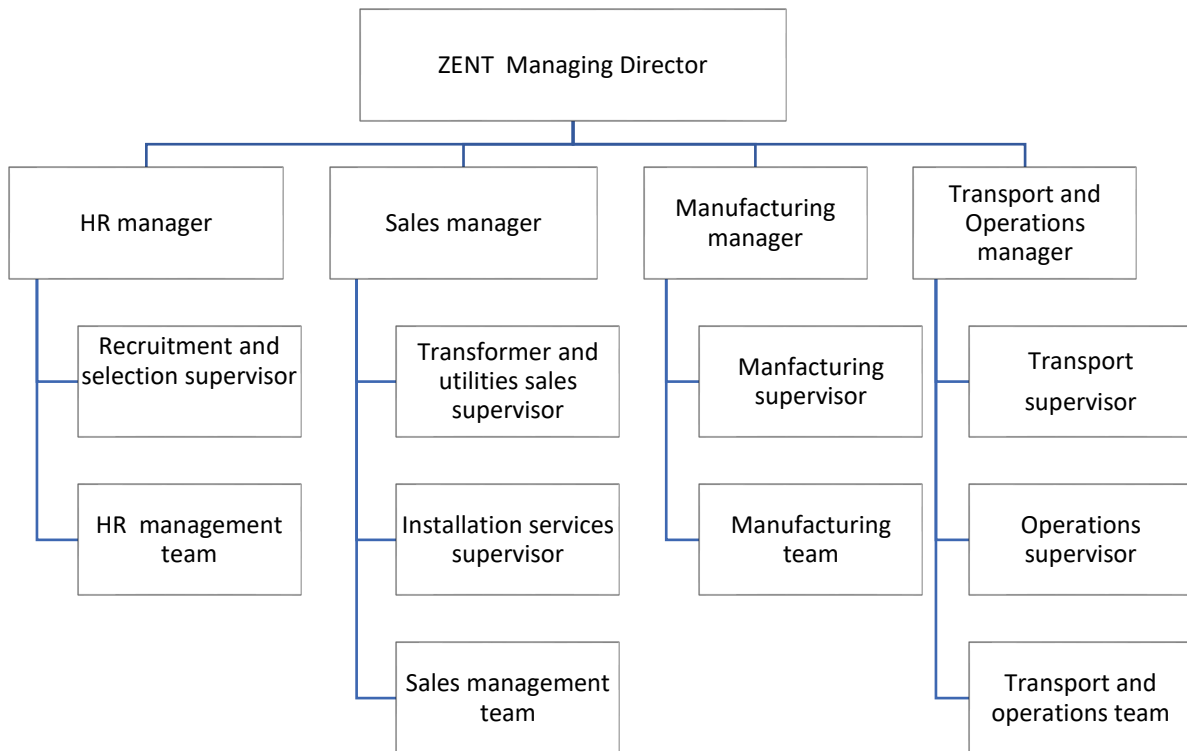
The introduction of the Electricity Act (Chapter 13:19) and the Rural Electrification Fund Act (Chapter 13:20) brought about the existence of ZESA Holdings company in 1996. ZESA Holdings was later sub divided into subsidiaries namely the Zimbabwe Power Company, Zimbabwe Electricity Transmission and Distribution Company and ZESA Enterprises.

Electricity distribution falls under the merger of Zimbabwe electricity transmission company and Zimbabwe electricity distribution company abbreviated as (ZETDC), the production, logistics and transport services is managed by ZESA enterprises ZENT. Zimbabwe Power Company is responsible for electricity generation.



### 1.2.2 Organizational Structure

ZESA organizational structure typically imitates a standardized and structured system of specialists in order to bring together a sound team of management to achieve any administrative objectives. Zimbabwean energy sector is led by an appointed minister of energy who occupies the top sit of any Zimbabwean energy company organogram. Fig 1.1 show the ZENT organogram.



**Figure 1.1 Organizational Structure**

ZENT organogram is head by the Managing director support by different functional managers whose task is manage their respective departments. The information system sector of the organization is supplies by their chief organization ZESA holdings.

### **1.2.3 Vision Statement**

ZENT visualize being among the leading and superior dynamic electrical power service providers.

### **1.2.4 Mission Statement**

Produce reliable and quality electricity, engineering and telecommunication services to its stake holders in and around its region at affordable prices.

## **1.3 Problem definition**

ZENT current existing social security system is characterized by huge errors. This is caused by its manner of conducting the day to day operations in a traditional approach, a paper pen based approach. Due to the high number of security funds access request issued daily, the movement of the paper work from one office to the other takes forever. Not only would this lead to employees getting exhausted and giving up the process, it also demotivates the ZENT employees and compromise their labour efficiency rate since channelling the social security funds paper work is time consuming. This alone denotes that the social security fund system record keeping is largely prepared manually as very little electronic assistants is made of use. Employee records are kept in traditional files which might be destroyed or accessed by unauthorized personnel. As supported by the company policy, ZENT employees are the first preference bidders on any company staged auction. However, this benefit if not fully yield by the employees since they cannot use their social security funds to participate in the biding exercise, hence most of the assets on auction are bought by external bidders which leaves ZENT employees with very few or nothing to benefit from the auction. The current system has poor data calculation and management, moreover it is out of reach of users in distant areas thus only employees near the company can access the social security funds easily. A study on the cause of the poor functionality of the current social security fund system was carried out and reported to have been caused by the use of the incompetent current social security system. Therefore, the major problem with the current system is that it does not allow employees to access their social security fund electronically. More so, it does not enable employees to participate in the organization unwanted asset auction using their social security funds online.

## **1.4 Aim of the research study**

This research study aims at producing a proposed ZENT Employee Social Security System that delivers an automated employee access to social security credit. This system stands to compete in today's technology and rekindle the ZENT holdings employee dying moral and worker efficiency rate. ZENT proposed system goes on to improve the of ZENT employees living standards at large through the establishment of a dedicated social security funds access channel. The proposed system will introduce the "ZENT live auction" a platform that facilitates online auction on unwanted company asset in real time. This floor will allow the employees to participate in the online auction using their social security funds at the comfort of their homes.

## **1.5 Objectives of the research**

Objectives are outcomes that are expected or the result expected from a study as according to Dari (2008). ZENT EMPLOYEE SOCIAL SECURITY SYSTEM objectives are outlined below.

- To develop a system that generates an aggregated and detailed employee financial declaration for a period.
- To develop a live bidder dashboard that transparently show highest bidder in relation to the current bid prices in real time.
- To develop a system that compute employee usable social security funds basing on employee account data.
- To develop a system that allows employees to access regulated social security credit for their personal benefit.
- To develop a system that incorporate absentee bidding for social security account holders.

## **1.6 Instruments and methods**

This section explains the fact finding technics that were used to data mine the information about the functionality of the current social security fund system. Record sampling and questionnaires were used to gather date on the current system.

## **Questionnaires**

This fact finding technic is probably the oldest and most used data gathering method. Questioner documents is posed with questions with free space provided to fill in the relative response to each question. This data collection method enables one to collect data from a large some of people with the least time possible. Its ability to keep the group or individuals who attempt to answer the question anonymous makes its responses more effective since one can answer the questions freely and safely.

After using the questionnaires and data gathering method the writer faced challenges when evaluating the returned questioners since they did not tally with the number of questions distributed. This is due to individuals who were saved with questionnaires but did not bother to return the questionnaires or attempt to answer them at all.

## **Record Sampling / Inspection**

Record sampling initiates information to be extracted from various sources that include work related documents, day to day procedure manuals, company logistics journals and any other related content. A close study on the company documents enables one to obtain vital in-depth knowledge on the company history and current statutes on any company married systems and procedures. A carefully crafted data mine strategy on the existing social security credit arrangement provides one with adequate information to understand and develop electronic functions that will improve the system.

## **Hypothesis**

### **JavaScript (JS)**

Initially developed by Brendan Eich as LiveScript, the JIT-compiled programming language was renamed to JavaScript in 1995. JavaScript is an interpreted client-side scripting language for both web and non-browser environment that enables the developer or designer to insert code into their interactive pages. JavaScript is a multi-paradigm, dynamic language, supporting object-oriented environment. Lovely

## PHP

Fully known as Personal Home Page is a Hypertext Pre-processor language developed by Rasmus Lerdorf. Unlike the Javascript that works on the client side PHP respond to the back end request. It is a sever based language that has modules saved in the user request server, this are responsible for attending and computing the users request with the help of the PHP pre-processor that generate HTML output used to initiate display on the users' browser as supported by Dixit (2007).

## MySQL database

Thompson (2009) is for the idea that this is a database system that is heavy manipulated by SQL commands when editing, accessing and managing content its contents. It is an open source, free and quick processing relational database management systems. The software works best with apache web servers and PHP as the object oriented scripting language. This database backend system allows easy integration of varies data base it also enables importing, exporting and sharing of database content.

## Apache web server

Developed and supported by apache software foundation is the Apache webservice. According to Rouse (2013) this is software provides web based facilities through the use of client and server model. Apache can easily be customized to suit the user's different environments. Among the popular examples of programs that uses this open source sever are word press developed system.

## **1.7 Justification for the study**

Among the alternative solutions available to address problems being faced by ZENT is developing an automated bespoke software. This system will be dedicated to improve the social security fund access facilities unlike a generic software whose aim is to solve generalized problems through its standardized structure. Development of a new proposed system that conveys real time access to employee social security funds online office that will speed up the social security funds request transactions time is inexorable. The proposed system is equipped with foreign functions among which is the “live auction” online service which helps one to use the respective funds to bid for products on ZENT internal auctions. More so it aims to smoothen the social security credit access channel and minimize the transaction waiting time by digitizing the social security access process.

## **1.8 Conclusion**

A close study of the existing ZENT social security fund system puts to light why it's totally inevitable to consider the development of an automated employee social security system. This system is deemed to eliminate the continuous faults and minimize the long credit access transactions time being experienced by the current security fund system arrangement.

## **CHAPTER 2: PLANNING PHASE**

### **2.1 Introduction**

This phase of the ZENT social security system documentation aims to explain the feasibility of the proposed system. The chapter clarifies any action to be done on the proposed system before it is actually carried out. Thus the red flags associated with the project are identified and risk mitigation plans are put in motion. System stakeholder's analysis and project work plan dominates the conclusion sector of this chapter.

### **2.2 Business value**

These define the ongoing benefits the business creates for its stakeholders. This section discusses the business value of the social security system to ZENT stakeholders, namely the managerial value and shareholder value.

#### **2.2.1 Managerial Value**

These are unstructured beliefs that stand as governing principles to any area of the ZENT management board. ZENT management have their major core concern on the social security system, among their system expectations is the connivance and ease of use of the social security system to the employees and management at large. Making the system available to all employees regardless of their location at any given time of the day is a significant move in achieving the managerial system expectations. The management goes further to expect a quality, digitalized and error free social security system that accurately aggregates daily transactions effectively.

### **2.2.2 Shareholder value.**

Shareholders are a regulated number of individuals or companies with a valid membership, shares or any beneficiary right to ZENT organization. Amongst zesa enterprises shareholders is the Zimbabwe electricity supply authority board members, these members expect a system that regulates the amount of social security funds that are usable by each employee at a given time so as to safeguard the organization from going bankrupt due to employees assessing a large sum of money at one goal.

## **2.3 Analyze Feasibility.**

Feasibility study is the in-depth analysis of the viability of a project. The given project is assessed on its technical, economic, social and operational feasibility. A project is said to be viable if it can be developed and supported by the available funds budgeted towards the project. ZENT social security system is declared feasible if its projected cash inflow surpasses the risk and expenses that are directly associated with the project. This study is widely used to decide if it is rational to proceed with a project or an idea.

### **2.3.1 Technical Feasibility.**

At this point the technical requirements of social security system are revised and closely assessed for their viability. This technical feasibility analysis reflects the ability of the ZENT project fund team to support the required technical resources and skills necessary to sustain the proposed system project expenses. Social security system technical resources include the actual hardware, software and networking expert skills essential for the success of the project.



**Table 2.1 Client machine specifications**

<b>Item</b>	<b>Specification</b>
Dell latitude family pro	Laptop
Processor	Dual core 4 <sup>th</sup> edition minimum
Memory	2 gigabytes
Static disk drive	1 terabyte

**Table 2.2 Server machine specification**

<b>Item</b>	<b>Specification</b>
Processor	Intel XEON family
Number of processors	4-8 logical processors
Memory	4 gigabytes maximum 64
Static disk drive	2 terabyte minimum

**Table 2.3 Networking system specifications**

<b>Item</b>	<b>Specification</b>
Intelligent hub	16 port
Ethernet cables	UTP CAT 6/5a 300mbs
Uninterrupted power supply	backup power generator 300va

**Table 2.4 Software specifications**

<b>Item</b>
Windows 10
Sublime text
MySQL local server
Free google chrome browsers, Mozilla browser
Xampp web server

**2.3.2 Economic Feasibility**

It is generally the process of justifying the viability of a project economically, an act of assessing the viability of a project on its revenue against its operational cost. Given the conclusion of the assessment reflecting surplus profit over total project related cost, the design and development stage of the project are proceeded. Below is the cost benefit analysis of this project.

**Cost Benefit Analysis**

Cost benefit analysis table compares the proposed system benefits against its related costs. The table is made up of four sub headings which are explained as follows:

- **DEVELOPMENT AND RESEARCH COSTS:** these are capital cost, cost incurred at the software project development stage.
- **OPERATIONAL COSTS:** these are the project ongoing costs, these costs are incurred during, before and after the project implementation phase.
- **DIRECT BENEFITS:** these are the paybacks that come with the implementation and adoption of the system.
- **PROFIT** these are surplus benefits less total costs associated with the project.

**Table 2.5 Cost benefit analysis**

ITEM		Values estimated for the next three(03) years (in US\$)		
		(2019)	(2020)	(2021)
<u>DEVELOPMENT AND RESEARCH COSTS</u>				
Stationery		30.00	0.00	0.00
Printing and photocopying		60.00	0.00	0.00
Additional Networking Hardware	Network Card(10/100 LAN) * (03)	90.00	0.00	0.00
Consumables		60.00	0.00	0.00
Support and Maintenance		100.00	80.00	50.00
Personnel training		40.00	20.00	20.00
<u>OPERATIONAL COSTS</u>				
Stationary		295.00	145.00	82.00
Printing and photocopying		520.00	170.00	40.00
Physical auction staging cost		640.00	350.00	140.00
Administration cost		2 550.00	1 080.00	900.00
<b>TOTAL COST</b>		<b>4 355.00</b>	<b>1 845.00</b>	<b>1 232.00</b>
<u>DIRECT BENEFITS</u>				

Reduction in stationery costs	295.00	150.00	218.00
Reduction printing and photocopying	520.00	350.00	480.00
Reduction physical auction staging cost	460.00	290.00	500.00
Reduction administration cost	2 550.00	1 470.00	1 650.00
<b>TOTAL BENEFITS</b>	<b>3 825.00</b>	<b>2 260.00</b>	<b>2 848.00</b>
<b>PROFIT</b>	<b><u>(530.00)</u></b>	<b><u>+415.00</u></b>	<b><u>+1 616.00</u></b>

**Return on investment (ROI)**

Return on investments is a project evolution plane that expresses the profit generated by the investment as a percentage of the total project cost as suggested by Tang (2003). This is a project performance measure on project profitability in direct comparison with the proposed project total cost.

Return on investment formula

$$R.O.I = \frac{\text{Total Benefits} - \text{Total Cost}}{\text{Total cost}} * 100 \%$$

Total cost

Year 2020

$$R.O.I = \frac{(2\,260 - 1\,845)}{1\,845} * 100\%$$

1 845

$$= 22.4\%$$

22.4% is the investment rate of return on social security system

### **Payback period**

This is the time taken to return the amount invested in a project.

**Table 2.6 Payback period**

<b>Year</b>	<b>Annual cash in flow</b>	<b>Cumulative cash in flow</b>
2016(0)	(530)	(530)
2017(1)	415	(115)
2018(2)	1 616	1 501

1 501 cumulative cash in flow

12 number of months in a year

$$1\ 501 / 12 = 125$$

Therefore, the payback period is 23 months

### **2.3.3 Operational feasibility**

System operational feasibility is the assessment of the system ease of use and its perceived usefulness as according. It is the measure of how effectively and efficiently the proposed system will solve the challenges currently being faced by the existing arrangement. This feasibility study tries to align the system functionality to the company's mission and objectives.

### **Overview of Feasibility Study**

The social security system will be valued on its ability to achieve the required objectives against the old traditional security funds access system. This evaluation is done in line with the system

design and technical requirement so as to correctly measure the level of competence required for one to understand and adopt the proposed system. A positive evolution of the study fuels the contention of the system development.

## **2.4 Risk Analysis**

This is the process of quantifying and qualifying the projected software risks. It tries to measure the impact of risk financially. At this stage of the system development, the software development and existing risks are identified and addressed respectively. This process goes further to explore possible alternatives and ways of avoiding and passing over the risk to try and minimize the risk impact.

### **2.4.1 Technology Risk**

Technological risk is the risk that arises as a result of incompatible and failure of the modern resources to be used during the system development and later in its day to day operations. Yardley (2006) suggest that technology risk is the potential losses or failure due to the unanticipated technology changes or behavior. This type of risk is usually uncertain hence no probability can be assigned to its possibility. Social security system faces this potential risk internally if any software project development materials are changed during the development stage. This risk can also result externally when the web server host hardware and software require additional changes or updates that are not compatible with the hypothesis tools that were used to develop the system initially.

### **2.4.2 Resource Risk**

The risk is usually as a result of under estimating the resources needed to complete and support a project. The resources needed to keep the project going include the financial resources and human

skill as a resource. A good example of lack of human resources would arise when they are complicated system designs required and the developing team does not have a designer with HTML and CSS skills to manipulate the design. Social security system is vulnerable to financial resources risk due to the changes in price of related hardware since the project is funded on a static budget. The project risk plan is categorized as follows.

### **Risk Avoidance**

Risk avoidance is an ongoing process that comes after the risk has been identified. It evaluates the alternatives to every decision and aims to come up with a strategy that has the least probability of facing a risk. Various system functionality testing's will be carried out at different system development levels so as to assess the system behaviour in different scenarios and avoid risk potential areas.

### **Risk transfer**

Risk transfer is the process of moving potential risk from one part to the other. They are varying ways to transfer potential social security system risk of failure through purchasing genuine hardware tools that comes with long term guarantees. This would enable the management to return the products if they are faulty. Thus the management will not suffer the loss of purchasing faulty products.

## **2.5 Stakeholder Analysis**

This analysis takes a close study on the different project interested parties and how they are affected by each turn taken by the proposed system. Stakeholders range from an individual to

organizations that pose direct or indirect interest on the proposed system. These different groups of stakeholders have their expectations on social security system that must be achieved.

Among the various ZENT social security system stakeholders are its sister companies namely ZETDC, ZPC and PowerTel communications. Their major interest is to analyse the viability of the system so as to inherit the system if it proves to surpass their existing social security funds access arrangements. Individual system stakeholders include the ZENT finance manager, Loans manger and the social security management team. These stakeholders interest is heavily centered on the creation of the system that enables automation of the social security fund access processes.

## 2.6 Work plan

A project work plan is a time measurement document that is used to time a project. It strives to align the time schedule for each activity in the project development and implementing process against its budgeted time. It is often necessary to tally the projected activities with the project time line so as to produce a project in the expected time frame. A project time schedule is outlined in table 2.11.

**Table 2.7 Project timing**

<b>Task</b>	<b>Start date</b>	<b>Completion</b>	<b>Duration</b>
Project proposal	01/08/18	08/08/18	1 week
Planning phase	09/08/18	16/08/18	1 week
Analysis	23/08/18	30/08/18	1 week
Design	31/09/18	21/09/18	3week
Implementation	22 /09/18	06/10/18	2 week
Maintenance	07/10/18	21/10/18	2 weeks
Documentation	01/08/18	21/10/18	10 weeks



### 2.6.1 GANTT CHART

A Gantt chart is a graphical time measurement tool used to display all project activities against their projected budgeted time as argued by Dixit (2007). This tool keeps the management and development time on track on the progress check of the project. The chart has the time in weeks on its x-axis and project activity title on its y-axis. Social security system Gantt chart is presented in figure 2.1.

Week	1	2	3	4	5	6	7	8	9	10
Proposal	█									
Planning		█								
Analysis			█							
Design				█	█	█				
Implementation							█	█		
Maintenance									█	█
Documentation	█	█	█	█	█	█	█	█	█	█

**Figure 2.1 Gantt chart**

### 2.7 CONCLUSION

One can safely summaries the project planning phase by highlighting the major analysis carried out in the chapter. The feasibility study produced fruitful and favourable results that give a greenlight to the development of the proposed project. It also explained how the project potential risks will be avoided.

## **CHAPTER 3: ANALYSIS PHASE**

### **3.1 Introduction**

Project analysis study clarifies the activities that the current ZENT social security fund access system is practicing. This phase defines how the current system was built and the setbacks that are to be addressed by the proposed system. The chapter highlights the application of each of the information gathering methodology used to collect different content in relation to the current social security fund access arrangement from the ZESA employees. A data analysis is carried out later in the chapter with the system context diagram and data flow diagram as the chapter major area of interest.

### **3.2 Information gathering methodologies**

These are the different approaches one takes when collecting information from a group of people. They are a number of methods a system analyst can adopt when collecting information about any system of interest. Collecting the correct information on how the current social security system works is very essential to the system developing team. This is because it is used as the baseline for the changes that will be implemented by the proposed system. Interviews and questionnaires are the information gathering methodologies used to collect the system information from the ZESA employees.

#### **3.2.1 Interviews**

An interview is facilitated by the exchange of questions and answers between the interviewer and the interviewee. They are normally two parties in an interview setup, namely the interviewer and the interviewee. The interviewer is the end that holds the series of questions, while the interviewee is on the receiving side. The interviewee is expected to answer the questions being asked by the interviewer to the best of their knowledge.

Monday the 6<sup>th</sup> of November 2017 the writer had an interview with different ZESA social security members and authorities at ZESA head office premises. Among the social security members interviewed was the IT networking and security supervisor, he emphasized on the need of a real time system that would address the funds access process time. The majority of the members interviewed were compliant which made the process a success.

Using Interviews as a data gathering method gave the writer the advantage of requesting clarification on any response given by the interviewee since it is done on a face to face bases. The process presented the writer with a chance to rephrase topic questions where ever necessary, however the process was time consuming since only an individual could be interviewed at a time.

### **3.2.2 Questionnaires**

These are goal centered list of questions drafted strategically for a selected group of people. Questionnaires have different forms depending on their structure, they can either be open, closed or a combination of both. A questionnaire is designed in a way that promotes the responded to provide answers as required.

Questionnaires made it comfortable for employees to express their view on the current social security system since these are anonymous. It also has the advantage of allowing the responded to provide a detailed answer at their own time. Through the use of questionnaires varied data is mined, however this documented set of question have their disadvantages. Misinterpretation of the questions on the questionnaire is common, this lead to poor and non-productive responses.

### **3.3 Analysis of existing system**

This analysis takes a close study on the data mined from the social security members. The analysis of the existing system aims to describe how the current system works. It stands as the base line for the development of the proposed system. The weaknesses of the current system are exposed at this stage. More so the analysis triggers counter solution development in the newly system.

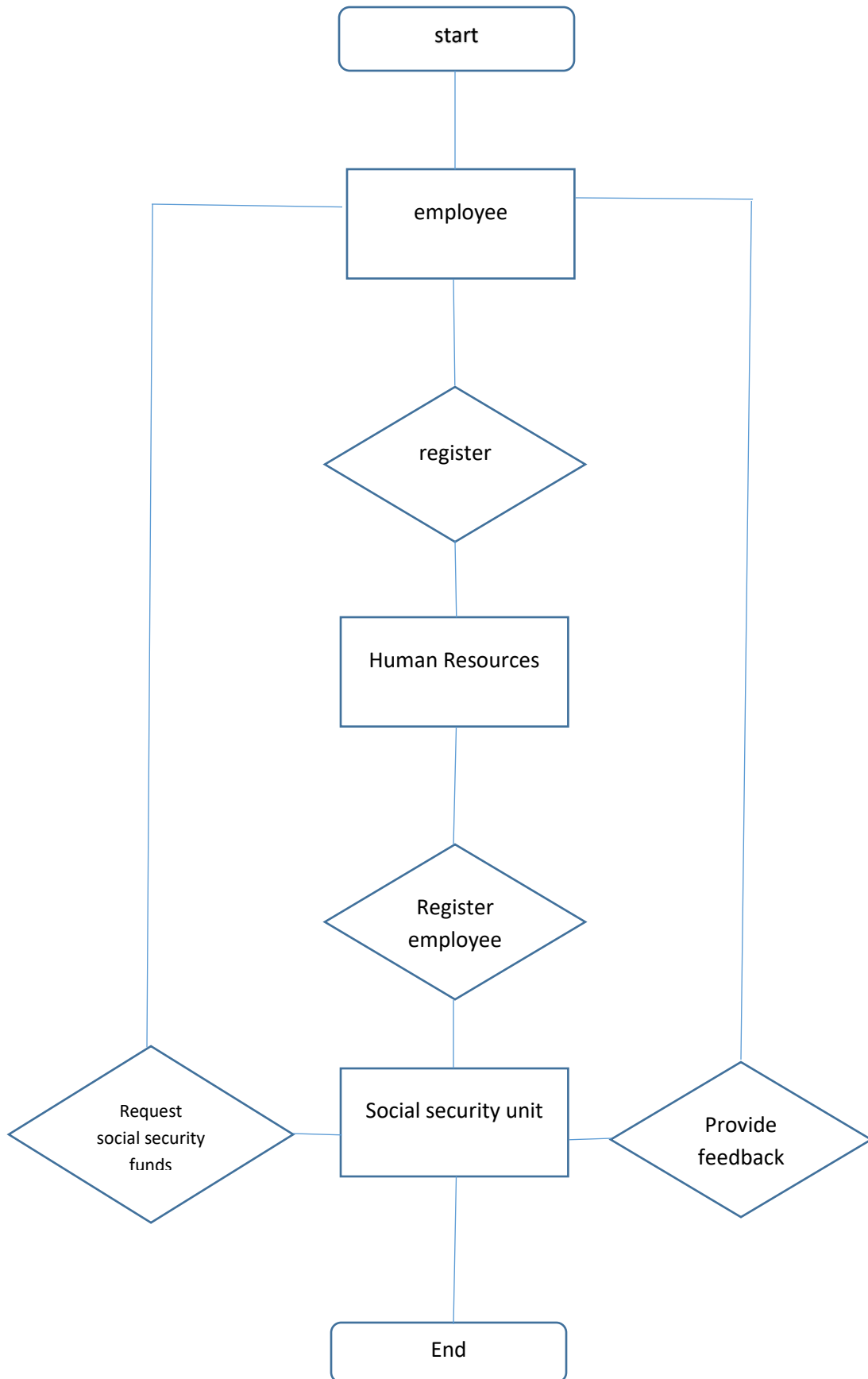
### **3.3.1 Description of the current system**

The results generated from the fact gathering techniques proved that most of the current social security process are done manually and the rest partially automated. The employee is registered with the social security funds unit through the paper pen and the electronic processing. The employee reports to the human resources department of the respective subsidiary, the department then processes and sends the details of the employee to the social security unit. The unit uses details presented by the human resources to register the employee.

After the employee is provided with registration details, the registration is officially completed. Registered employees will then have to go to the social security offices whenever they need to access their funds. At this stage the member is introduced to the fund access paper work process.

### **3.4 Process analysis**

This is the in-depth study of the current system activities that make up the activity diagram. Process analysis allows one to learn all the activities that inter link all the entities in the system of interest. This process aims to fish out the weaknesses of the current system. The results of this analysis are presented graphically in the activity flow chart. Current social security system flow chart diagram is presented in figure 3.1.



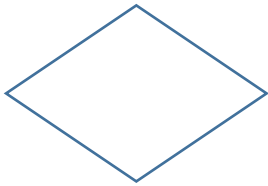
## Key



**System entities**



**Start/ End node**



**Decision**

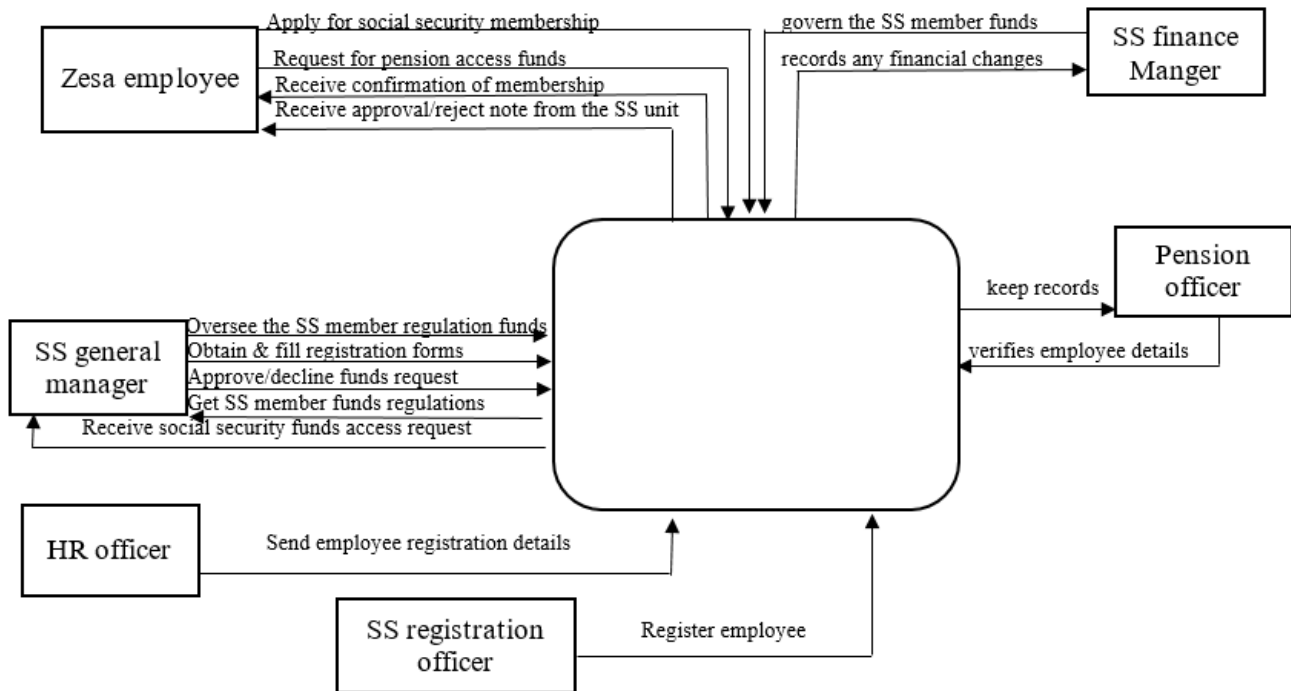
**Figure 3.1 Current activity diagraphme**

## 3.5 Data Analysis

Blinder (2008) supports the idea that data analysis is the process of taking a close study on the data structure and data movement in a system. This process aims to analysis how the current system data flows from one entity to the other. The visualization of the study is done through the use of a context diagram and the data flow diagram.

### 3.5.1 Context diagram

The context diagram is a single high level process diagram that graphically shows the sequence of data in a system as put forward by Daniel (2009). This diagram brings out the relation between the different system entities and their respective roles in the system cycle. However, the context diagram does not show the time variance of the system processes activities and their number of occurrence. The main aim of the diagram is to produce a summarized picture of how data flows in the system environment. Figure 3.2 displays the current system context diagram.



**KEY:**



Represents a process



Represents an entity or source

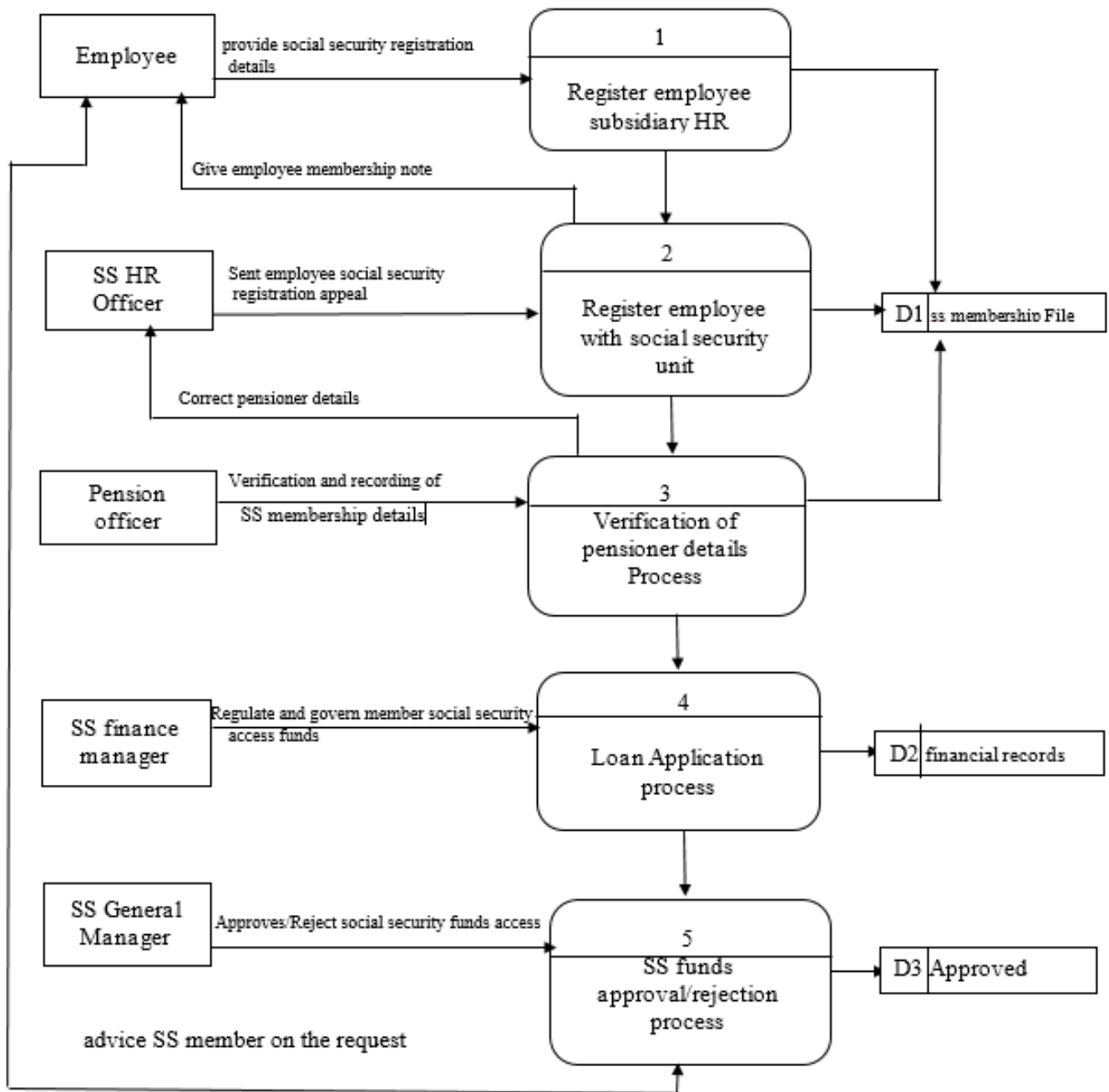


Represents the direction of flow of data

**Figure 3.2 Context diagram**

**3.4.2 Data flow diagram**

A Data flow diagram is a tool used to model and simulate the movement of data in a system in detail as supported by Britney (2001). Unlike the single process context diagram that shows limited data traffic, the data flow diagram presents a detailed data movement from one entity to the other. This diagram makes use of data information sets and data flow arrows to show the direct movement of data in the system environment.






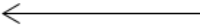


Art	Description
	Entity
	Dataflow direction
	Data storage
	Process

Figure 3.3 Data flow diagram

### 3.6 Weaknesses of current system

The weaknesses of a system are its setbacks on either its technical or non-technical operations, these are said to be the red flags to the system operations. All system operations should constantly be revised to try and locate any potential weaknesses. ZENT current social security system weaknesses are listed as follows.

- The current system traditional file keeping arrangement makes it very difficult and time consuming to retrieve a specific required record.
- The system is characterized by too many entities thus the social security fund access request transaction takes forever to be fully processed.
- The current system suffers from lack of integrated processing which stops it from hosting two different transactions on one platform.
- The system is only easily accessible to those near the social security offices, members in distant ZESA substations will have to travel every time they are to request for any funds.

## **3.7 Evaluate Alternatives**

Davies (2013) argues that an alternative is the second choice option that delivers the required results. Evaluating alternatives is the process of assessing the best possible way of obtaining the proposed social security system. They are three possible ways of obtaining this system namely, system outsourcing, improving the old system or developing a new system in-house.

### **3.7.1 Outsource**

Accruing a software from an external expert or software vender defines system outsourcing as supported by Burd (2015). This is known to be a risk avoidance plan through risk passing. The process is usually initiated when the organization do not have experienced man power to develop the system in- house. Outsourcing involves contracting external service providers that are presented with the problem at hand so that they develop the required system at an agreed payment. The current prevailing standard development cost of such a system is valued at USD \$4 300.00.

#### **The drawbacks of outsourcing include:**

- Outsourcing risk user specifications compromising.
- It requires a more resources than any of the alternatives available.
- Higher operational and maintenance cost in the long run since external expert aid is required every time a change is to be committed.
- The organizational information system might be compromised through handing over information to the external hand.

### **3.7.2 Improvement**

Improving the current system is the process of modifying the functionality of the current funds access system. The introduction of an electronic and automated processing is inevitable in coming up with the competent system, thus the system must totally be modernized and computerized. Improving the current system will only result in increasing the current system problems, more paper work and complications which is in contrary with the system development objectives. Some of the disadvantages of improving the current system are as follows.

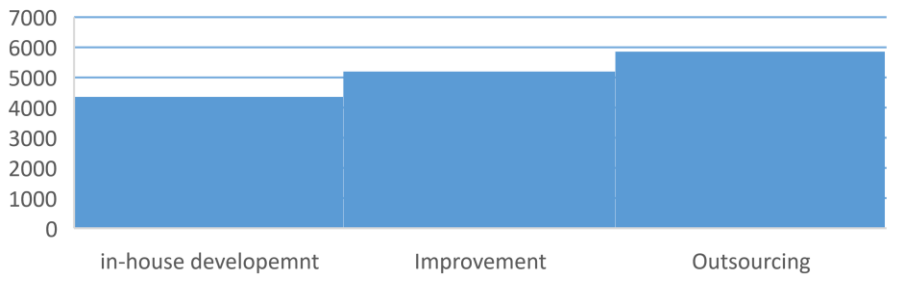
- Prolonging problem inheritance – improving the existing social security access funds system will only perpetuate the already known system problems since this cannot be solved without the introduction of a fully computerized system.
- Due to the continues technological change improving the current traditional oriented system will result in a system that is not compatible with any other system whenever a future system integration is required.
- It is very difficult to audit an outdated system hence they will no longer be quality check on the system in the near future.

### **3.7.3 In-house development**

In-house system development is an act of developing a system within the organization argues Wieringa (2014). This process depends on the system development skills of the internal IT personals. The process guaranties that the right and correct system is developed to solve the identified current system setbacks. In-house system development involves developing the complete system internally. Merits that come up with in-house system development are explained as follows.

- The company information system secrecy is kept secured since no foreign part will be involved in the system development.
- The company will automatically own the complete rights of the system.
- Low operations cost in the long run since the system maintenance skill are readily available in-house.

Chart Title



developed.  
standing since some of tools needed for  
ent.

### 3.7.3 Development

The feasibility study carried out earlier in the document valued system in house development at \$ 4 355.00, while out sourcing is valued at \$5 860.00 in today’s market. With the improvement of the system costing a little less than the out sourcing. One can simply note why in-house system development is the best alternative for the system development. Figure 3.4 shows the evaluation of the system development alternatives graphically.

**Figure 3.4 System development expenses**

### 3.7.4 Recommended alternative

In- house system development is a better alternative plan to system outsourcing or improving the current system. This is because in- house system development allows the system users who are directly affected by the system to take part in developing the solution to the problems they are currently facing with the old system operations.

## 3.8 Requirements Analysis

System requirements analysis is the process taking a close look at the essential features to be included in the proposed system. System requirements are divided into two, namely the functional and non-functional requirements.

### **3.8.1 Functional requirements**

System functional requirements define the system and its respective components as explained by Fine (2002). These are the basic functions expected from the proposed system. The social security system is required to offer the services and functions as follows.

- An ease of use system (user friendly).
- A speedy query response system.
- An effective and accurate system.
- A system with minimum user input.
- An end to end secured system.

### **3.8.2 Non-Functional requirements**

Hives (2010) views non-functional requirements as the nature of the system, this class of requirements are fundamental for the system attributes and its operations. The system non-functional requirements are listed as follows

- Expandability - a system compatible with any integrations for future extensions.
- Paperless system.
- Minimum system entities.
- Worldwide accessible system.

## **3.8 Conclusion**

This chapter presented a detailed analysis of the current fund access system. It has projected the quality planning of the in-house development of the proposed system as shown by the system alternative analysis stage. The forecasting plan to eliminate the current system setbacks has been mapped out and budgeted for as one of the preparations for the design phase in the next chapter.

## **CHAPTER 4: DESIGN PHASE**

### **4.1 Introduction**

This is the phase that transforms the proposed system ideas into a computer based system logical ideas. Design phase features the system architectural and physical design before the database structure is put forward. More so, it explains the proposed system graphical design since it is an essential user interaction environment. The proposed system pseudo code is defined half-way through the phase.

### **4.2 System Design**

A well-designed system is a system that securely compute the required processes effectively and efficiently with minimum resources usage. ZENT proposed social security system is a compressed and smaller system as compared to the current system since it phased out most of the unnecessary entities in the old system.

#### **Inputs**

The proposed system inputs are classified as the registration input on the admin side or the member inputs on the user side. User side is characterized by the click and go inputs facilities, this enable the member to request for social security funds with minimum effort. Consequently, user side is graphically designed in a way that allows the members to view the real-time bid process and enable them to input counter bid offer as the process progresses.

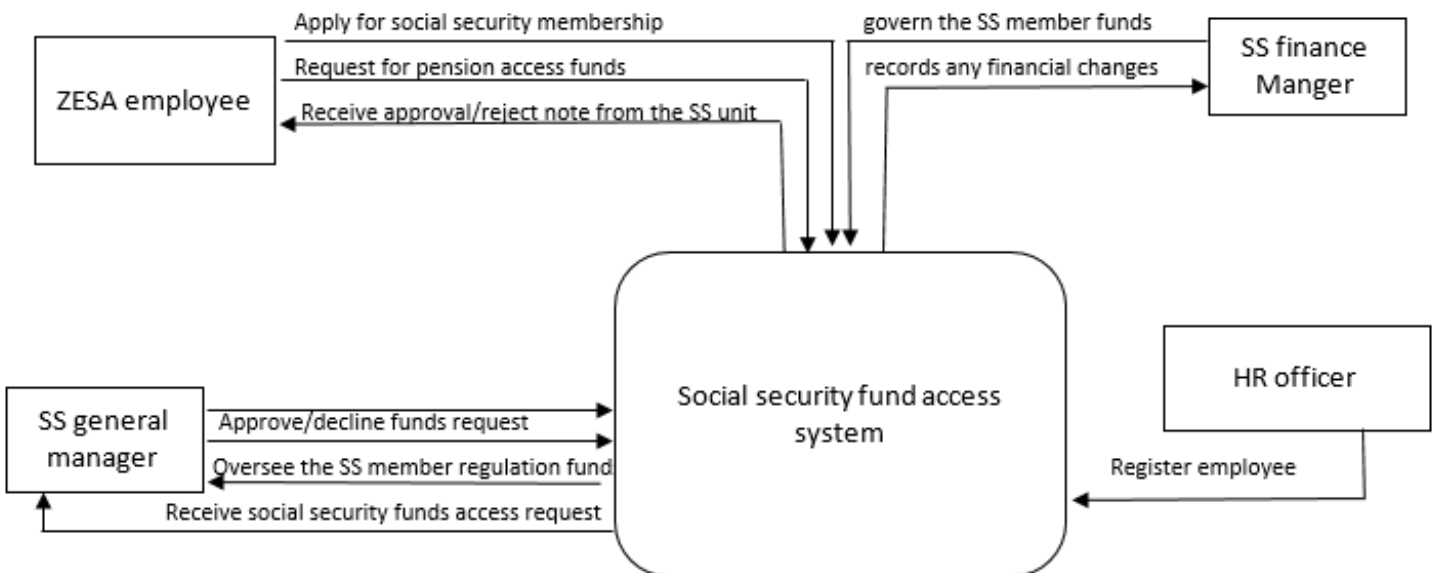
## Processes

System processes are the step by step compilation sequence of instructions or queries as per user request as according to Sommerville (2015). The proposed system features speedy processing abilities that enables the admin to query and alter member details instantly. There for, it enables the members to get real-time feedback of the highest bid price and online feedback on any social security funds request.

## Outputs

System output is the software means of communicating with the user, through system output the system provide a feedback to the user. Unlike the current fund access arrangement, the proposed system is featured with high graphic user interface that allows user to understand all the system processes quickly. ZENT proposed system will be able to generate reports at every required interval, these can be in form of software or hardware copies of the system records and its time variant process sequences.

### 4.2.1 Context Diagram and DFD of the proposed System



**KEY:**



Represents a process



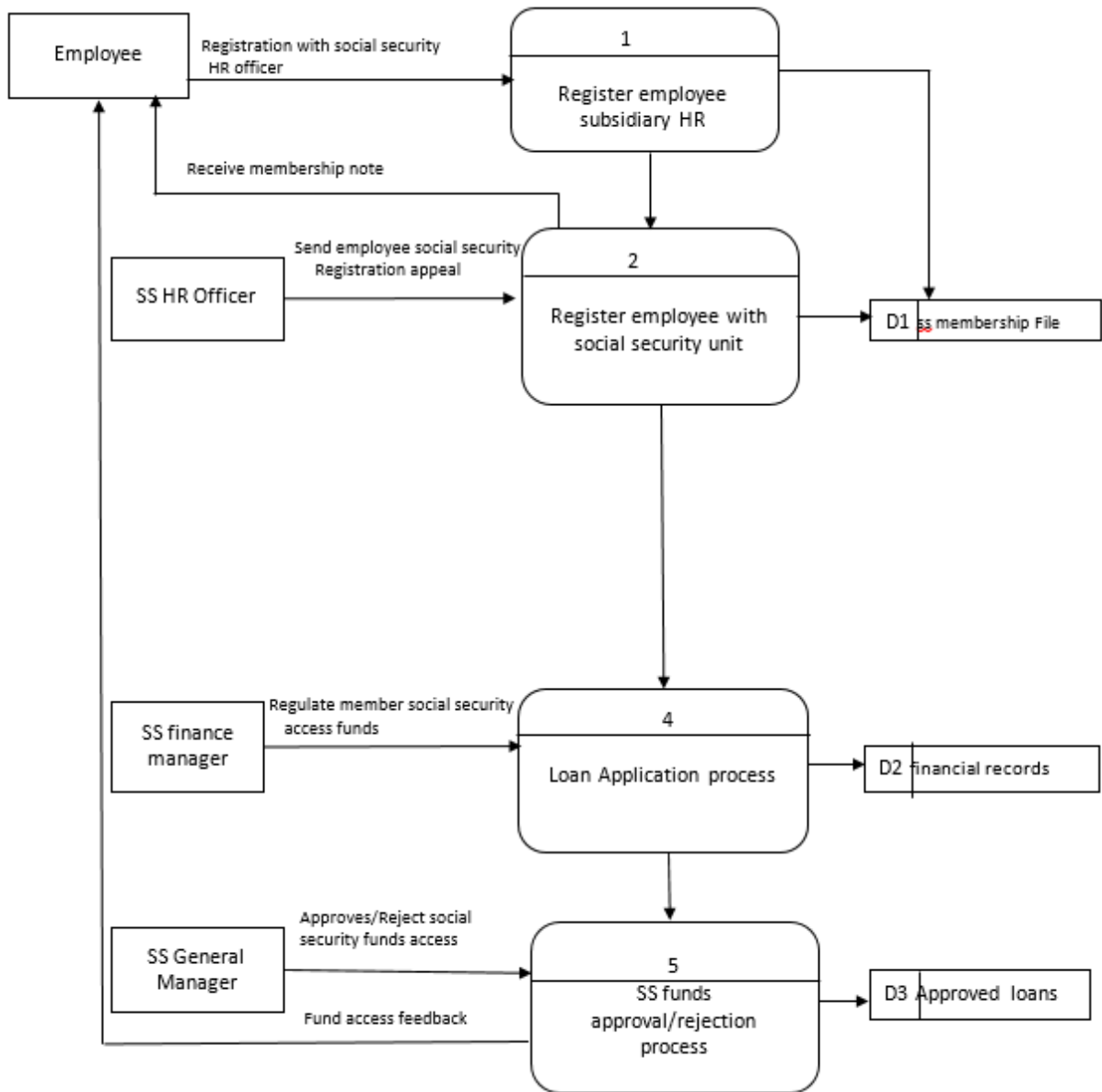
Represents an entity or source

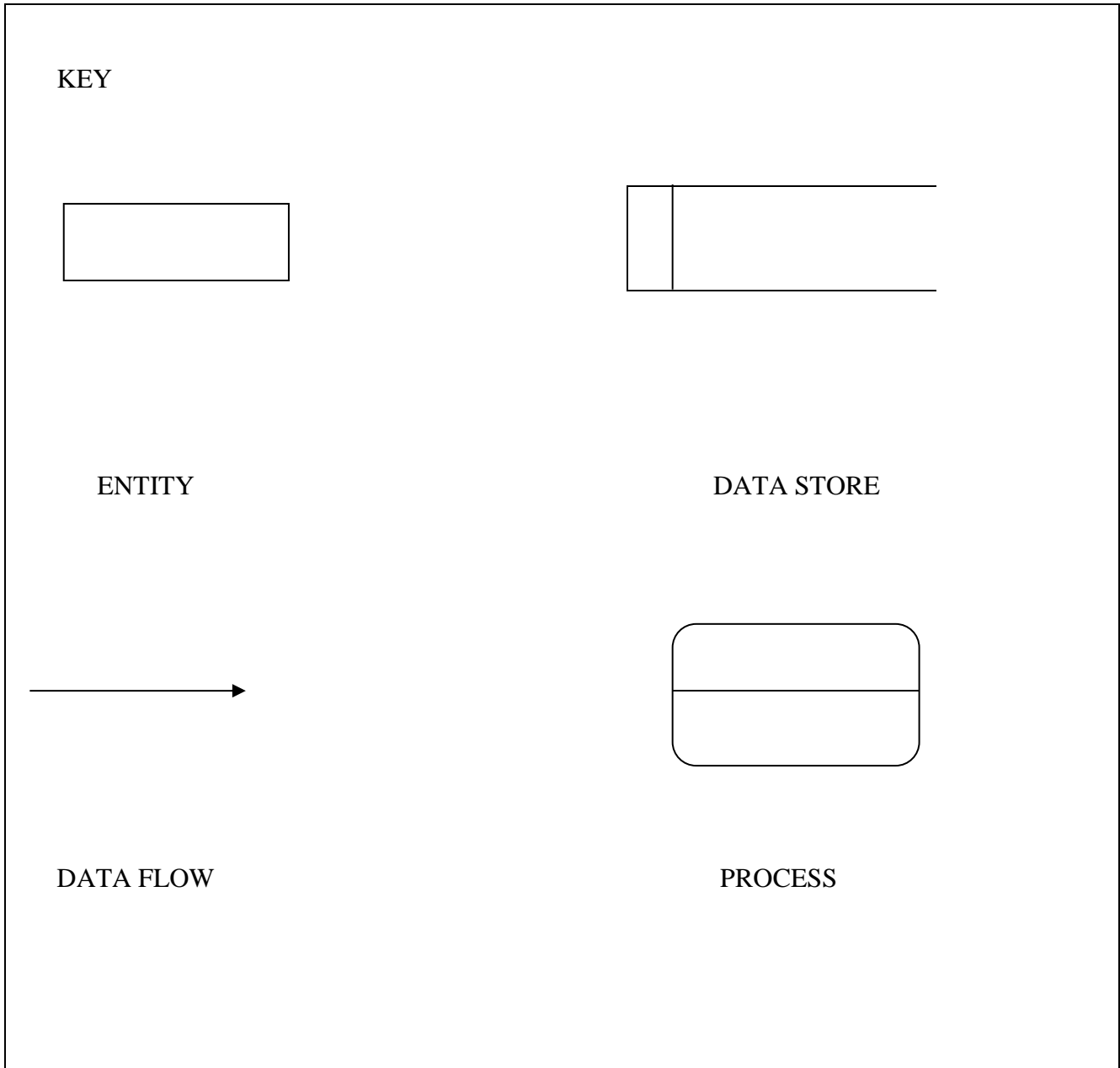


Represents the direction of flow of data

**Figure 4.1 Context Diagram**







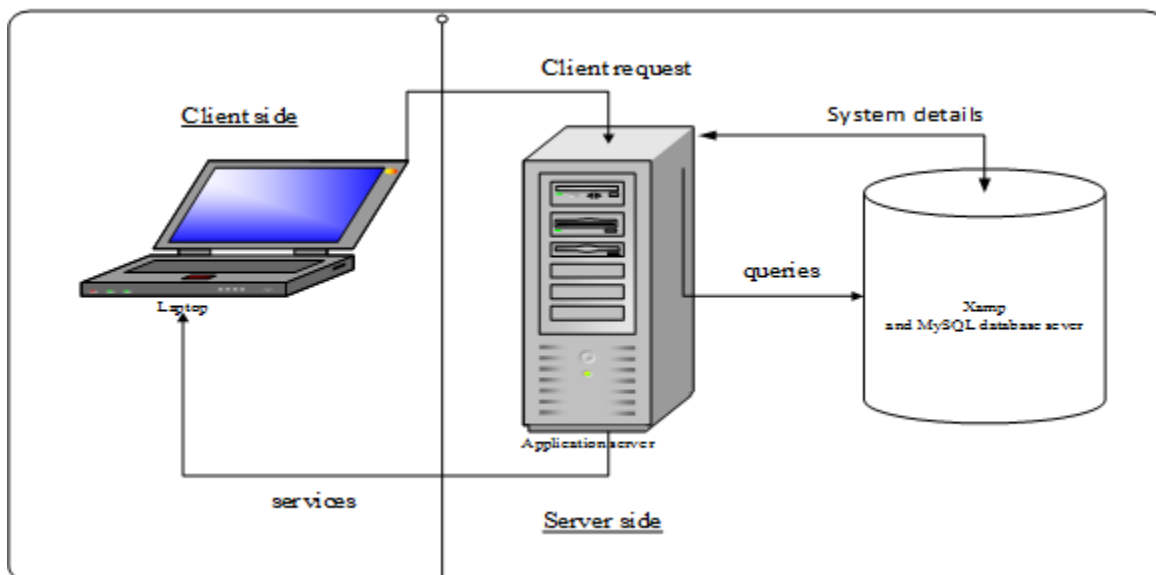
**Figure 4.2 Data flow diagram**

### 4.3 Architectural design

As according to Bentley (2007) architectural system design is the technological arrangement of computer components in a system cycle. This design goes further to explain the information sequence and interaction of the different hardware components in the social security system. Components that make up the proposed social security system are categorized as either sever side or client side oriented.

The system client side is the major user interaction dashboard that allows the social security members to interact and navigate the system. It provides system users with the platform to access the services offered by the system. More so, the graphical view of the system client side is a combination of CSS and bootstrap tools to produce an interactive webpage.

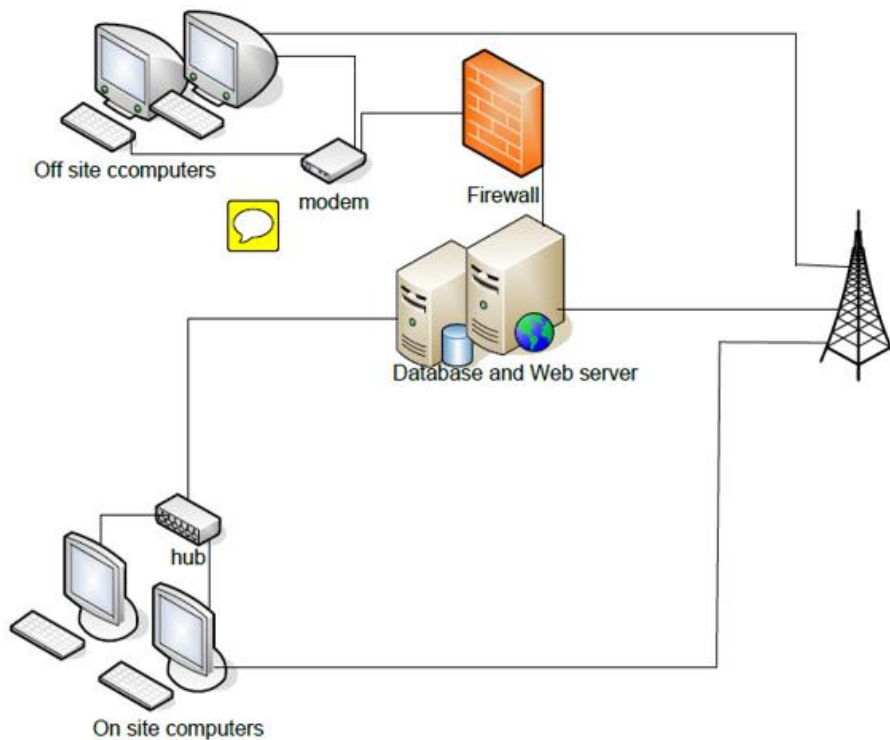
The system server side is made up of the sever machine and its respective database, it is also known as the backend. Bruce (2006) puts forward the idea that the back end of the system is the powerhouse of all the operations that a system does on the background. The system server side is responsible for the logical system calculations and the interaction of the system and the database. Figure 4.3 is the social security system architectural design.



**Figure 4.3 Architectural design of the proposed system**

## 4.4 Physical Design

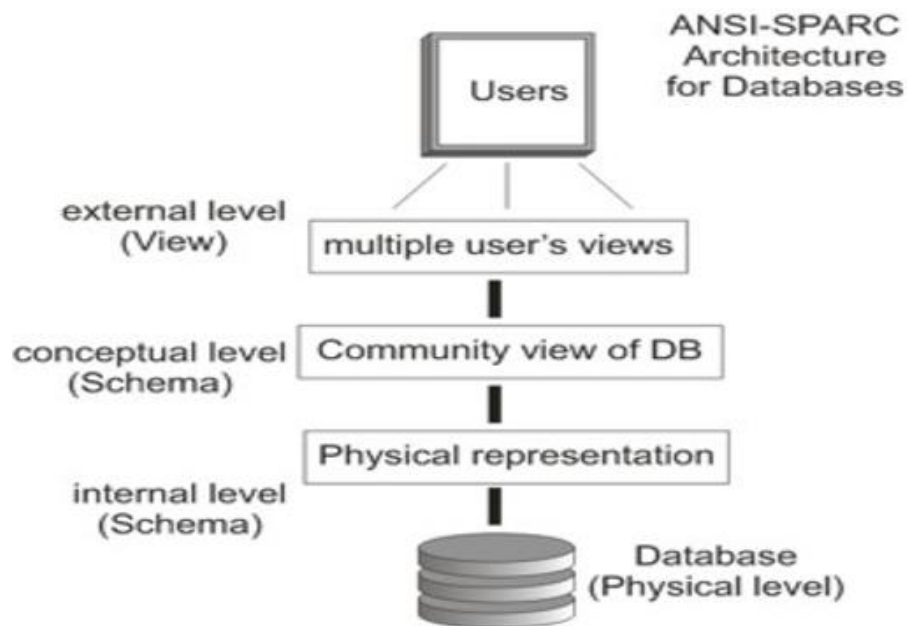
This is the actual architecture and structure of the system. It aims at representing the physical arrangement of the system components, hardware and software technologies. The structure displays a detailed data traffic movement from one respective process to the other in the system operations sequence. In addition, this sector is featured with the operations of the actual system input and related output process. Social security proposed system physical design is logically divided into three segments namely, interface, process and data design.



**Figure 4.3 System physical design**

## 4.5 Database Design.

Database design is the definition and structure of a database as according to Gnesi (2014). The proposed social security database is divided into three data base layers, namely physical, application and conceptual layer. These three data schemas work hand in hand to successfully store, retrieve and compute any query presented to the database. The diagrammatic structure of the proposed social security diagram is shown in figure 4.4.



**Figure 4.4 Database Architecture**

### External View Level

Also known as the external schema, external view level is the final interactive stage between the users and the system database. The schema presents data in a relational way that is understood by any novel to expect users. This view is tallied differently from one user type to the other, it also acts as a shield to block visualisation of data in the database from unauthorised users. The schema

is succeeded by the conceptual schema. The proposed system external view insures that the following are observed.

- A social security member should not access or view another members account content.
- Social security member should not be able to accept or decline another members fund request
- Administrator should not request social security funds for a group member.

### **Conceptual Level**

Conceptual data defines the data in the database, it is the data of the data in the data base. Data in the database is stored in relational tables for easy querying. All the data that describes the relation of this tuples and attributes is stored in the conceptual level. This schema is also responsible for defining the data types of the data in the database, this include their data format and their respective sizes.

### **Physical Level**

Database physical schema occupies the most bottom level of the database design architecture. At this level of the database, a detailed description of the arrangement of data in the database is defined. The schema is made up of the low level and complicated data structures. Data design, data encryption and mass compression of data for security and storage saving respectively is emphasizes at the database physical level. ZENT proposed social security system makes use of the MYSQL database software.

## 4.5.2 Data tables

Also known as the relational tables are the data tables, these are a combination of interrelated rows and column that hold data of the same subject on the same counter. A database is made up of interlinked relational tables, these tables contain different rules that ensures there contains integrity. The database tables make use of primary keys, foreign keys and data types to link data from different data tables successfully.

**Table 4.1 User registration**

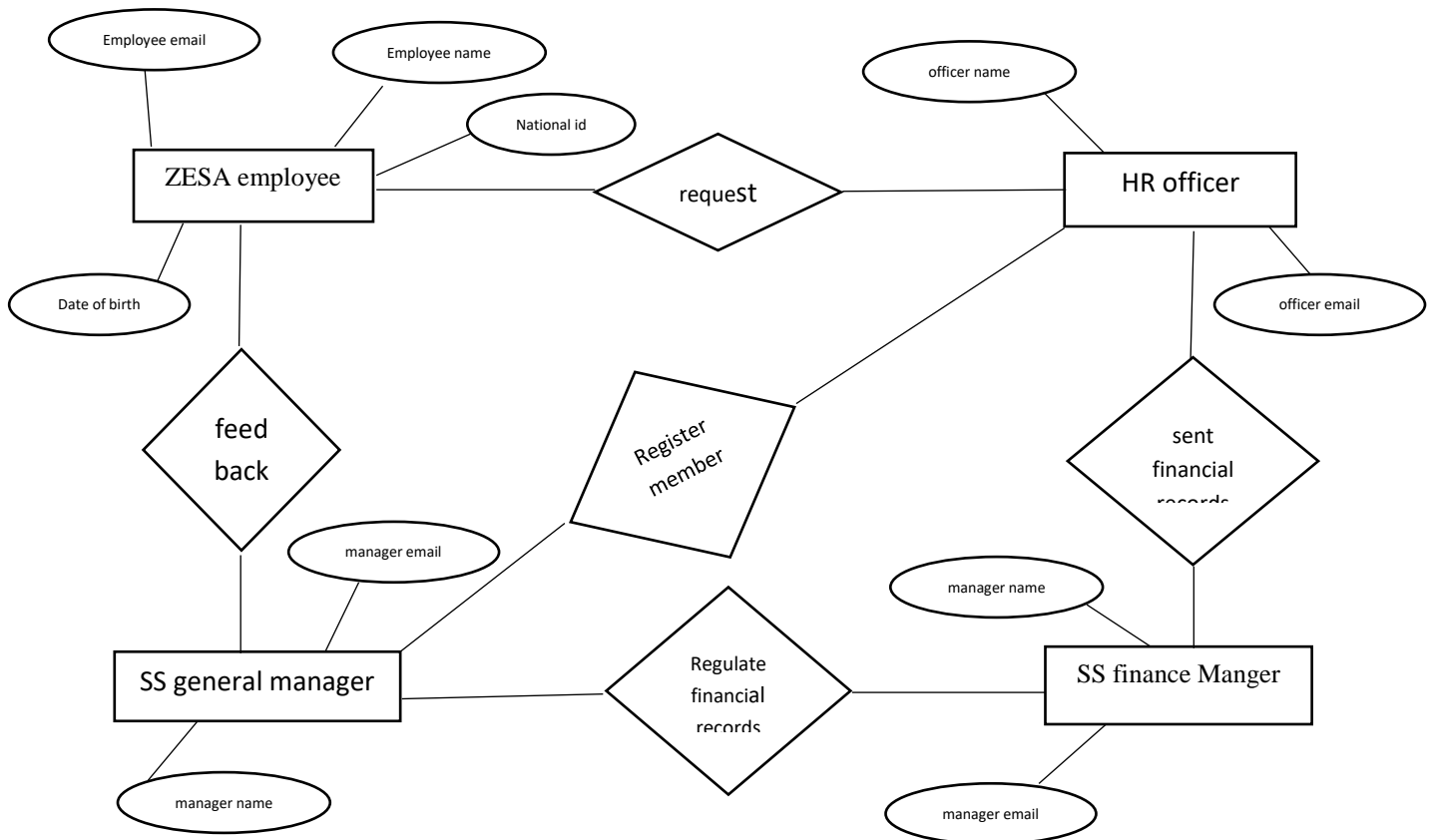
<b>Field</b>	<b>Type</b>	<b>Description</b>
User email	Varchar(20)	Primary key
User Name	Varchar(20)	User first name
User national ID	Varchar(20)	User national ID
Date of birth	Varchar (10)	User date of birth
Security fund	Int (8)	User funds
Password	Varchar (40)	User login password

**Table 4.2 Fund request**

<b>Field</b>	<b>Type</b>	<b>Description</b>
Fund Amount	Int (6)	Fund request amount
Fund Purpose	Varchar(40)	Fund request purpose
Request ID	Varchar(40)	Primary key
Date of request	Varchar (40)	Fund date of request

**Table 4.3 Update employee details**

Field	Type	Description
User email	Varchar(20)	Primary key
User Name	Varchar(40)	User first name
User ID	Varchar(40)	User national ID
Date of birth	Varchar (40)	User date of birth
Security fund	Int (8)	User funds
Password	Varchar (40)	User login password

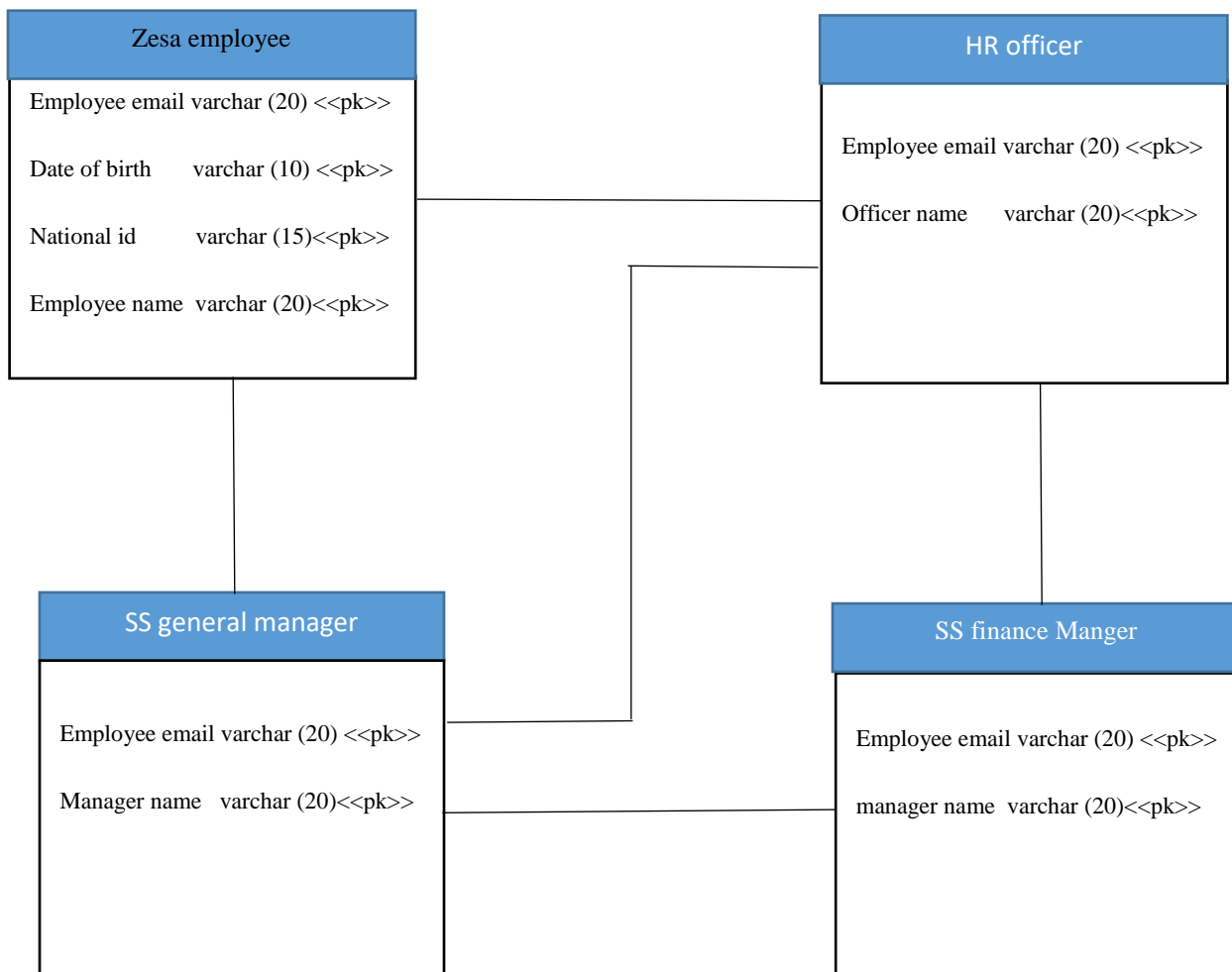


**Figure 4.5 Entity relationship diagram**



## 4.6 Program design (Class diagram)

A class diagram defines the permanent system members in their class objects and structure as supported by Maciazek (2005). This diagram depicts the systematic relationship between the system object classes. The class diagram shows the system entities' methods and data attributes for every object. The diagram is prepared for analysis of the system package process and overall view of the system process. Figure 4.6 is the proposed class diagram.



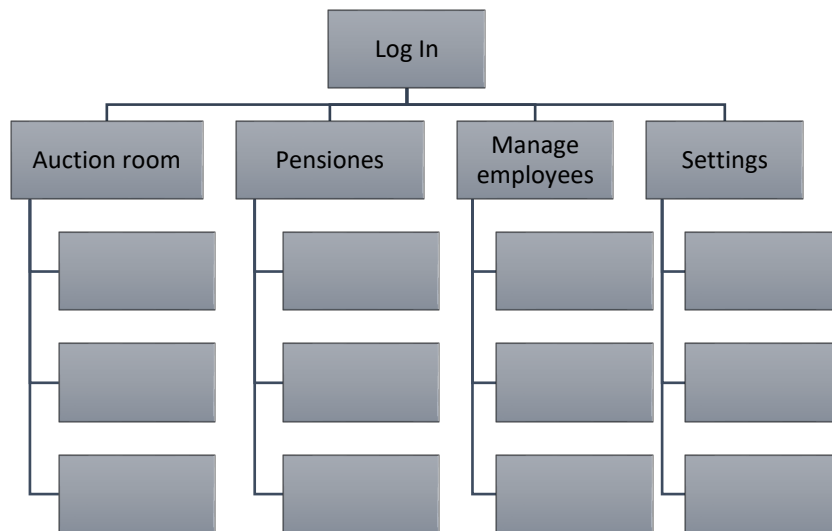
**Figure 4.6 Class diagram**

## 4.7 Interface design

The system interface is the interactive platform for communication between the system user and the system its self as according to Foster (2014). These are visual controllers that prompt user manipulation to fuel any user desired process or request. The proposed system uses a GUI interface with windows, menus, icons and pointers to facilitate the interaction process between the users and the system. This graphic user interface is a friendly interface and makes it easy for novel users to learn and master.

### 4.7.1 Menu design

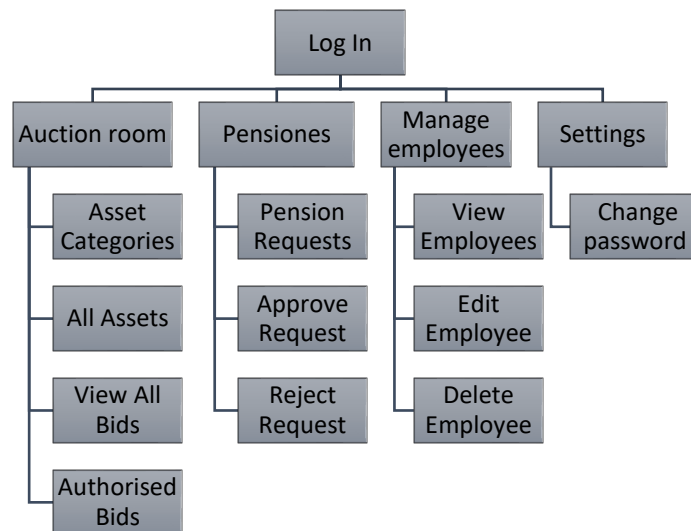
The system main menu is the back born of the system navigation, it is a page that has the main avenues to all the system sub functional modules. More so, the main menu contains the path to the different system sub menus, among the sub system gateways is the auction room, security requests, announcements. This project aims to display the main menu in a way which allows users to easily study and operate the proposed system. Figure 4.7 is a diagrammatic view of the system main menu.



**Figure 4.7 Log in structure for the proposed system**

## Sub-menus

System sub-menus are the child links in form of tables and templates that are generated from the mother tab on the main menu. The sub menus are created to save the user to specify the class of request he or she wants to perform.



**Figure 4.8 system sub-menu**

## Input design

System input design is the structured interface that permits users to enter information prompted by the system in the spaces provided respectively. The proposed social security system is featured with user input windows forms that allows system users to enter all the required data for system process. This input forms are validated to insure that only the correct format and type of data are entered into the system. It is important for the forms to be clearly labelled to make it easy for users to identify the data required.

### **System Log-in form**

The system log in window page is responsible for authenticating the system user. The page prompts the user to enter their unique email address and their respective passwords, these are then verified and validated accordingly. This page allows access to the system to all the registered users. Figure 4.9 displays the proposed system login form.

**ZENT SOCIAL  
SECURITY SYSTEM**

Email address

Password

**Login**

**Figure 4.9 System Log-in form**

### **Add social security member**

This form is used to capture and register the new member details and provide them with an initial password for the first time use.

Add member

Member email address

Display name

Phone number

Total social security funds

Member password

Confirm password

Save member picture

Add member

**Figure 4.10 Add social security member**

**Request social security funds**

This page acts as the portal for communication between the social security member and the social security team. It prompts the member to enter the total amount of the social security funds and its purpose. The social security access portal is shown on figure 4.11.

Request funds

Request amount

Request purpose

Browse fund request transcript

Save request

**Figure 4.11 Request social**

### 4.7.3 Output design

Output design is the product of the system process. Gary (2012) supports that output is a way a computer system communicates back to the user. The design is the graphical appearance of the system output page. Also known as system report forms, system output design forms are used for auditing purposes other than managerial purposes.

<b>id</b>	<b>User Email</b>	<b>Full Name</b>	<b>Phone Number</b>
*****	*****	*****	*****
*****	*****	*****	*****
*****	*****	*****	*****

**Figure 4.12 social security membership details**

View members request

Search member

<b>id</b>	<b>Request title</b>	<b>Amount</b>	<b>Date requested</b>	<b>Request status</b>
*****	*****	*****	*****	*****
*****	*****	*****	*****	*****
*****	*****	*****	*****	*****

**Figure 4.13 View members report**

View Bids

Search Bid

<b>id</b>	<b>Asset</b>	<b>Did date</b>	<b>Amount</b>	<b>Bidder</b>	<b>Status</b>
*****	*****	*****	*****	*****	*****
*****	*****	*****	*****	*****	*****
*****	*****	*****	*****	*****	*****

**Figure 4.13 view bids report**

## 4.8 Pseudo Code

A pseudo code is the idea of presenting a computer programme in a way that can be understood by a non- technical human as suggested by Gary (2012). This process makes use of reverse engineering technology, which is the process of writing computer procedural code in layman language. This is done to help the ordinary user understand the system compilation processes. The proposed system pseudo code is divided into different parts to define different system modules as illustrated by their heading.

### System database communication

```
Check if connection has been made
Start system operations
    Test database connectivity
        IF database connected
            System run
        ELSE
            Present message box "no database connection"
            Process end
    End
```

### User system login

```
Start
User prompt to enter member email address and password
System validate member email address
User authentication process starts
    IF email address is valid
        IF email matches the password THEN
```



Access granted

Enter main menu

ELSE IF email address not valid

Present message box “enter valid email address”

ELSE

Access denied, you may try again

ENDIF

**End**

### **Member request fund**

**Start**

User Login

User prompt to enter request amount, purpose and load related quotation

Member request social security funds

IF fund request is less or equal member usable funds THEN

Request send

ELSE

Present message box “fund request is more than usable funds”

Request declined

ENDIF

**End**

## **4.9 Security design**

System security design is the line of defence structure that protect the system from any threats as according to Harrison (2006). The system possible threats are initially declared by the developing team to enable the right counter defence plan. More so, the complete system security design is composed of the hardware physical security design and the logical software security design. The proposed system is web based hence it faces high risk of online transmitted virus and malware. These can cause serious harm to system hence the system should inherit maximum protection architecture design to stay protected.

### **4.9.1 Physical security**

Physical security is a means of system protection barrier that protect the proposed system from corporal damage. This involves protecting the system from system hardware resources damage or access to unauthorised users. ZENT proposed system need to be protected from natural disasters like floods. However, this will not be a problem since the proposed system is part of the IT department resources, hence it is saved its portion in the already secured sever space among the other organizational system in the IT data centre. This automatically secures the system since the IT data centre is kept secured and physically locked at all times.

### **4.9.3 Operational security**

This is a process of safeguarding the system day to day processes. The system is made safe from system operation interference threats by educating the social security members of how the system operate, clearly outlining them with their boundaries of action. The proposed system secures its operation sensitive information as one of the measures to protecting the system from operational threats.

## **4.10 Conclusion**

The proposed system design phase prepared the system for the system implementation phase. This chapter clearly explained the data movement path through the data flow and context diagrams. More so, the proposed system design phase included the physical, database and logical design of the system.

## **CHAPTER 5: IMPLEMENTATION PHASE**

### **5.1 Introduction**

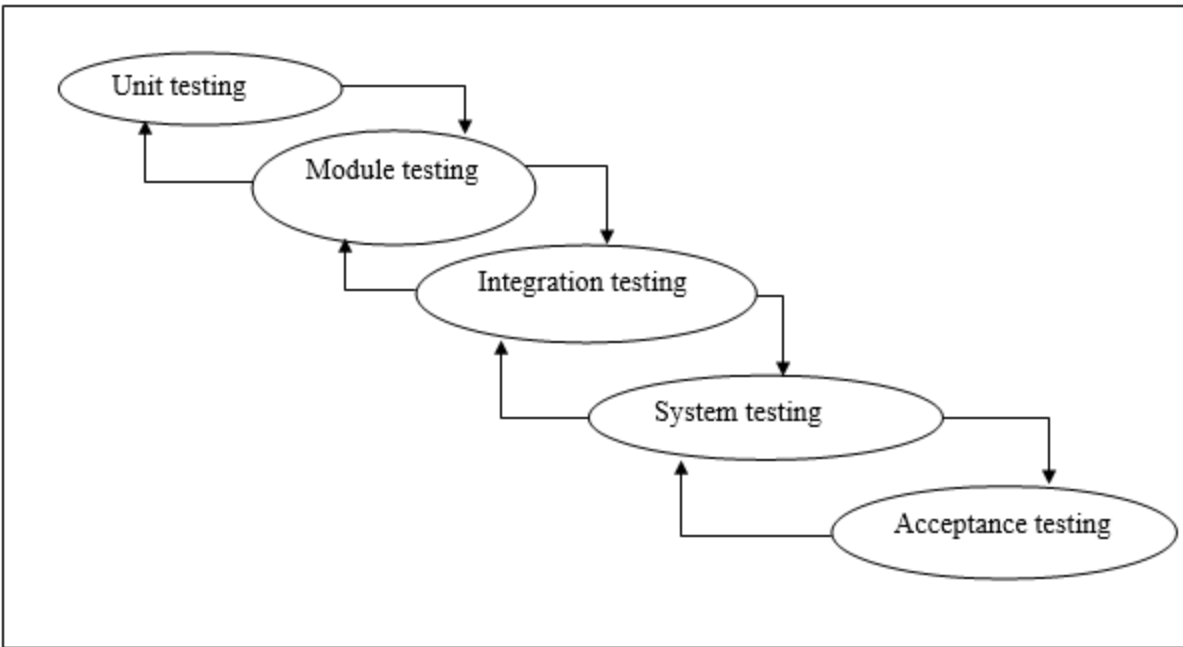
The system implementation stage is the final stage of the system development cycle. During this stage the transformation of the system logical ideas into reality is done. More so, the chapter explains the system coding and testing processes. These processes are featured with the system error finding and correction procedures. ZENT proposed system implementation stage oversees the adoption of the proposed system parallel to the current system to avoid major disasters in event the system fails. A system maintenance plan is an ongoing process that is explained later in this chapter.

### **5.2 Coding**

According to Hoffer (2002) coding is the process of transforming the desired system requirements, designs and specifications into digital instructions that make-up a computer program. Different tools are used to perform the transformation successfully, the proposed social security system used tools from different open source software's and text editors. Among these are PHP programming language, HTML, CSS, bootstrap and java scripts. PHP was used as the main functional language, this language is responsible for manipulating data in the database and executing user requirements. HTML and CSS are responsible for the output design layout of the system.

### **5.3 Testing**

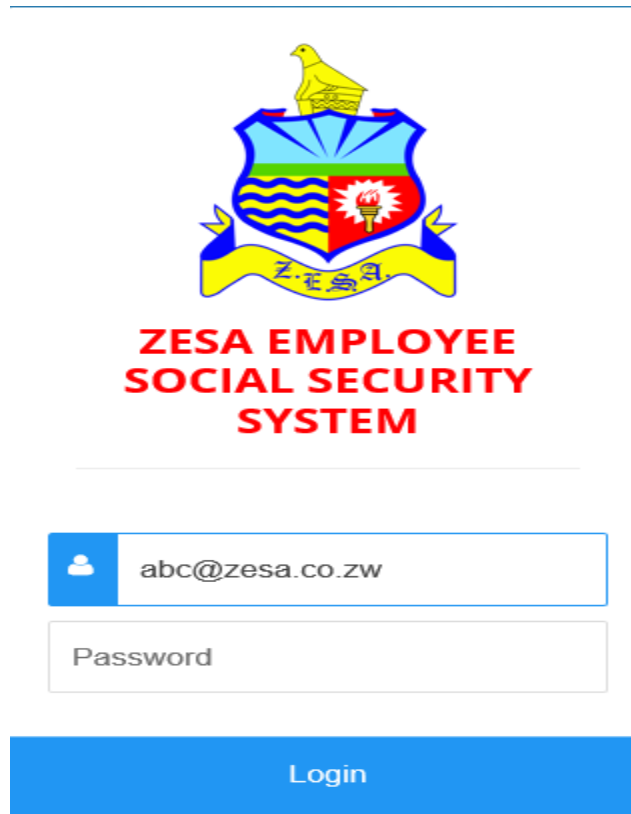
Software testing enables one to measure the validity and correctness of a system. The proposed system is tested at different sub system units, modules and later on the integrated system model. This exercise is done to determine if the system is performing as expected. ZENT proposed system testing cycle is graphically explained in figure 5.1.



**Figure 5.1 Phases in testing**

### **Unit testing**

Unit testing is a systematic software testing technique that allows one to test the system smallest working module. This process is important since it is used to segment a problem or system failure to a specific module. Consequently, it identifies system errors at their premature stage because it is done before the modules are totally integrated to form a complete system. Unit testing can be carried out in two ways, namely black and white box testing.



**Figure 5.2 A unity testing on the user login page**

### **Black Box Testing**

Black box testing is testing the system functionality without actually looking at the logical structure of the code. This process aims to correct any interface, function or performance related errors. Black box testing is sometimes known as the blind testing since the personnel testing is not provided with the detailed system code. The proposed system black box testing sample is shown in figure 5.2

The image shows a web form titled "Request A Fund". It contains several input fields: a text box with the placeholder "Amount eg \$500.00", a dropdown menu labeled "Select Purpose For Fund", and an upload area labeled "Upload Image / Document of Quotation" with a "Browse..." button. A large blue "SAVE" button is at the bottom. Red rectangular boxes highlight the "Amount" text box, the "Browse..." button, and the entire upload area.

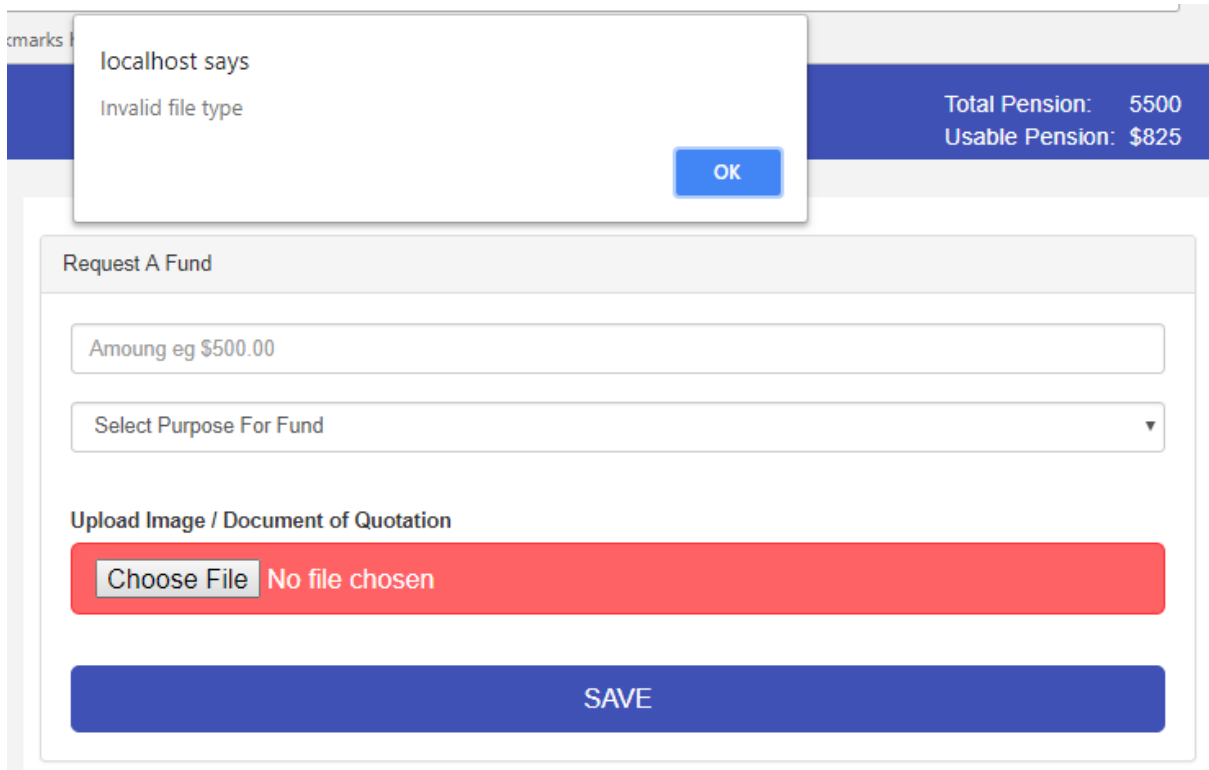
**Figure 5.2 Black box testing**

### **White Box Testing**

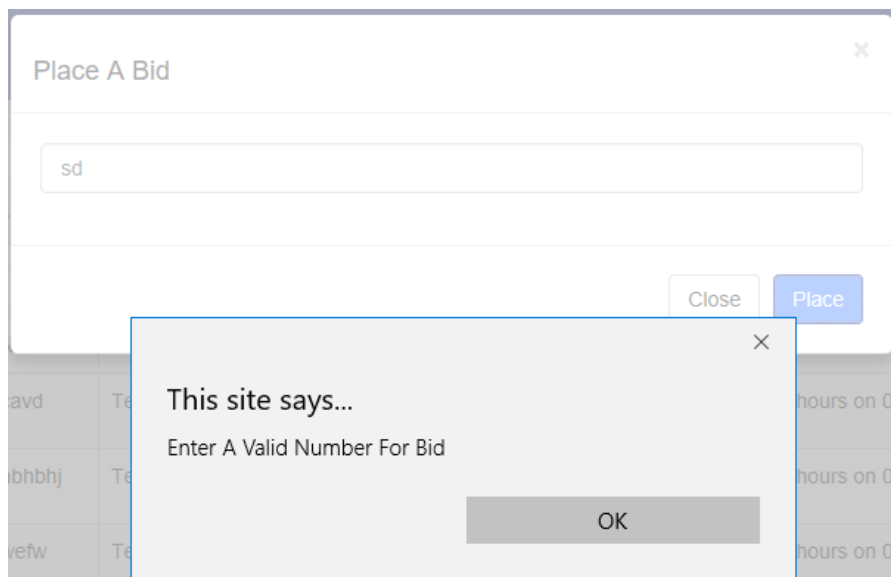
White box testing is the process of testing the system in light of the actual code. This testing is done by a computer programming skilled personnel. The testing technique aims to analyse the degree of accuracy and correctness of the computer code.

### **Validation**

Validation is a process of verifying if the correct system was built, the process aims to compare the system performance to what it is expected to do. This process is important since it is at this stage the system is tested on different data types and class. This exercise ensures that the system users are pri-governed on the type and class of data they must input in the system. A carefully validated system results in a competent process execution plan and less processing errors since only the expected data is entered in the system.



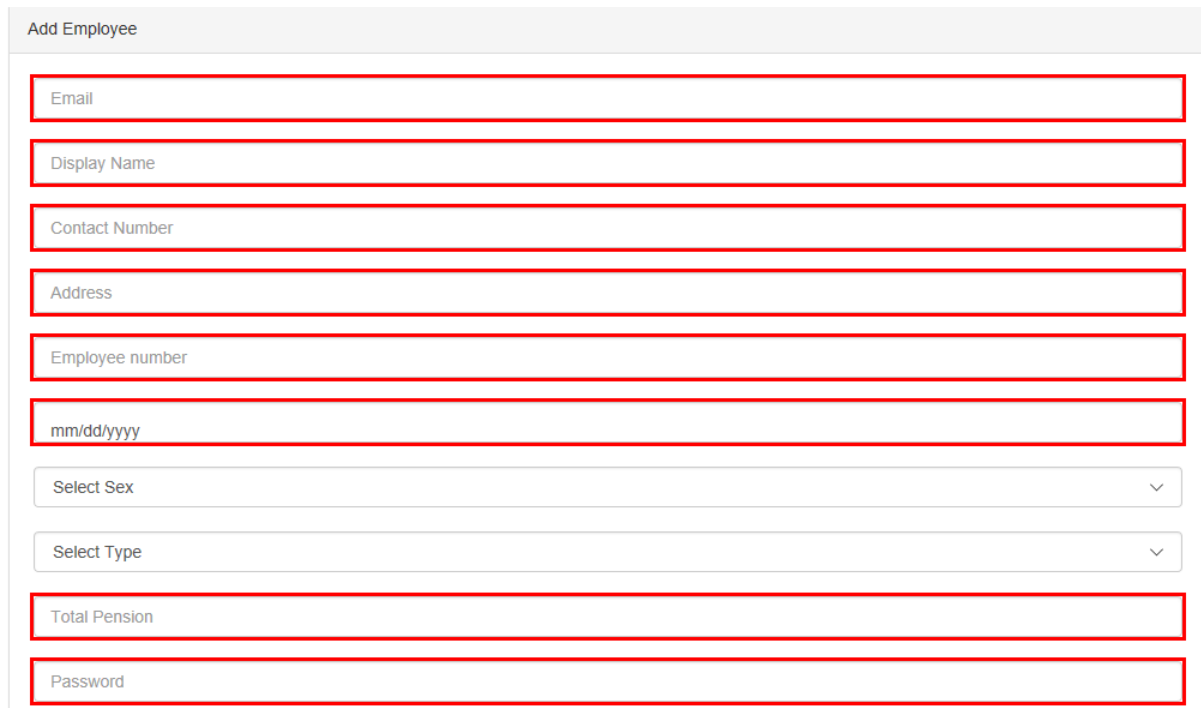
**Figure 5.3 File format validation**



**Figure 5.4 Bid value validation**



When one tries to submit a new member form with blank details the system will validate the empty fields and display an error as displayed by figure 5.5.

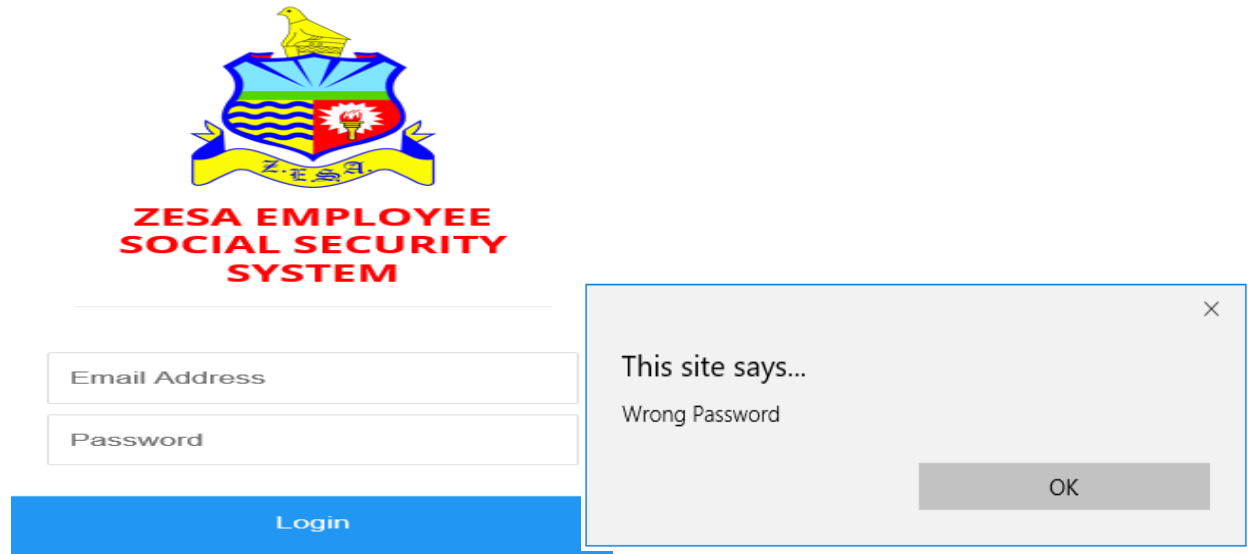


The image shows a web form titled "Add Employee". The form contains several input fields, each highlighted with a red border to indicate they are empty. The fields are: Email, Display Name, Contact Number, Address, Employee number, mm/dd/yyyy (date format), Select Sex (dropdown menu), Select Type (dropdown menu), Total Pension, and Password.

**Figure 5.5 Add new member validation**

### **Invalid username and password**

When wrong user login credentials are submitted the system will display an error message which means that the details are not matching the corresponding data in the database. Figure 5.6 graphically explains invalid password.

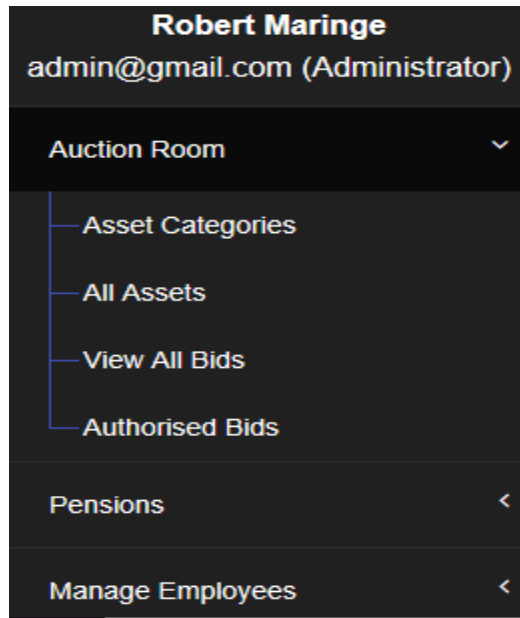


**Figure 5.6 Invalid Username and Password**

### **Sub-System Testing**

This system testing method enables one to test two or more system modules working together to ensure that they are performing according to user specifications. It ensures that the job streams are correct and requires the analyst to test the integration of interfaces in different parts of the system.

Figure 5.7 displays the sub system menu.



**Figure 5.7 Sub system menus**

### **System Testing**

The complete system was converted into an executable file and tested to see if the system performed the required functions. ZENT proposed system was able to retrieve information from the database, add information to the database, display all interfaces, deliver reports and execute queries.

### **Acceptance Testing**

This is when the system is tested for its acceptability. Acceptance testing was the final testing process before the system was adopted for operational use. The system was tested with the data supplied by the users rather than simulated test data. Errors and omissions in the system were discovered and were rectified. This process continued until there was an agreement between the management and the developer.

## **5.4 Installation**

System installation is a process of implementing the new system into its working environment. The process covers the system change over strategies and the training of the social security members on how to use the new system. The proposed system will have its database installed on the servers of the host company. Consequently, the system will automatically display a link on desktop computers of all the machines on ZENT domain. This will provide a channel for uses to access the system services through the link.

### **5.4.1 Changeover strategies**

These are techniques of phasing out an old system making way for a new system as supported by Martin (2014). After a successful new system user training, the system is slowly implemented to take over processes from the current working system or arrangement. The chief goal of the process is to introduce the new system without disrupting the day to day business proceedings. They are four changeover strategies to be considered for the proposed system namely, pilot, phased, direct and parallel changeover strategies.

### **5.4.2 Pilot changeover**

This system conversion strategy targets a small group of users to try out the system before it is introduced to the inter-organization. The system will only be accessible to a limited number of users so as it can further be tested for acceptance testing. ZENT proposed system is then slowly adopted by more users. This changeover strategy tries to minimize the risk of system failure since only a few uses will be affected if the system fails as its primary phase.

### **5.4.3 Phased changeover**

The system phased changeover strategy divides the system to be implemented into different phases. These are then implemented one after the other separately. A working module is implemented and tested for acceptance at a time, if it is successfully adopted another phase is introduced until the full installation of the system. This system changeover method targets to minimize the loss in the event the new system fails since only the implemented phases are affected.

### **5.4.4 Direct changeover**

This is a complete elimination of the current system creating a way for the proposed system instantly. The operation of the current system is suspended in all the company departments as the new system takes over the operations. This method poses a high risk of data loss if the new system fails to perform as expected.

### **5.4.5 Parallel changeover (recommended)**

This changeover strategy ensures that the current system works alongside the new system, side by side. The results of the old system will be compared with the results of the proposed system to try and check if the system is performing as required accurately. This process is labor costly, however it totally eliminates any form of disaster if the new system fails at its early stage of installation, since one is able to go back to the old system records if the system fails. This method provides more time for the system user to familiarize with the system.

## **5.5 Maintenance**

As put forward by Martin (2014) system maintenance is a process of revisiting the system functionality and try to modify any parts necessary. A computer system is maintained to try and correct any emerging errors and new functionality integration or system enlargement. This process is important since it helps the system to stay up to date with the ever changing technology. The varies method to be used to maintain the social security system include perfective, corrective preventive maintenance.

### **5.5.1 Corrective maintenance**

This system maintenance technique aims to correct the system errors that arise in the long run, usually these errors would have been overlooked during the system tasting stages. The procedure involves an alteration of the system code in the error relevant system modules. When these errors are fixed a complete system test if performed to make sure that all the other modules are not affected by the new alterations.

### **5.5.2 Perfective maintenance**

Perfective system maintenance aims to add more functionality and validation to the current exiting system. This is done to intensify the proposed system integrity and enhance the system functionality so as to get maximum benefit from the system usage effectively. However, this system maintenance procedure is not user oriented. It is done as a result of the system developer discovering better and modern system processing strategies and tools that can be added to improve the system.

### **5.5.3 Preventive maintenance**

This system maintenance method bases its procedures on the forecasted system threats plan. The proposed system is maintained in light of the possible future threats. More so, this system maintenance method is an ongoing maintenance process since new system threats are discovered nearly every day as the world technology continually change.

## **5.6 Recommendations for further developments**

Provision of the system integration with a mobile application should not be ruled out. The integration will be very vital since it will increase the system user convenience as they will be able to place bits and request their social security funds over a mobile cell phone application. This integration will go further to easy communication between the social security team with the social security members since they will be able to have a direct interaction and communication over the cell phone. System regression testing should be added onto the already existing system testing methodologies.

## **5.7 Conclusion**

The chapter has successfully converted the logical social security system into a practical and working system. ZENT new system was successfully tested in all its different modules and proved to be robust, competent, and acceptable to the social security management. Regression system maintenance was found to be the most recommended system maintenance strategy to archive a system that can easily adopt to the ever changing technologies.

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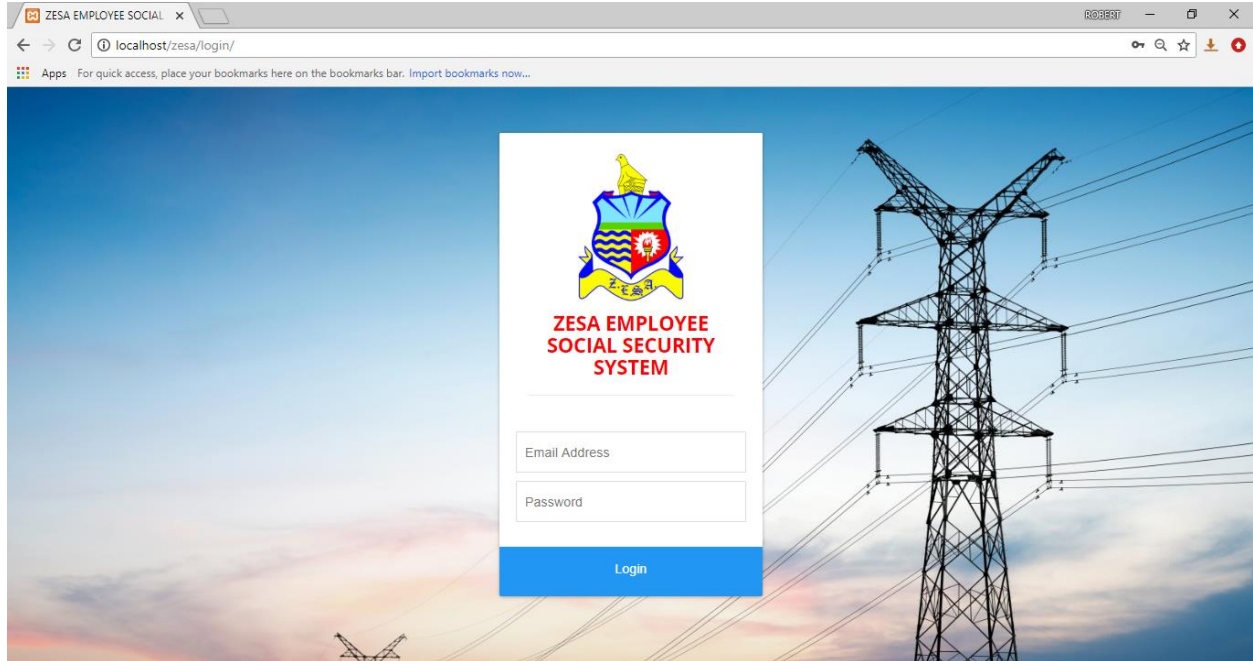
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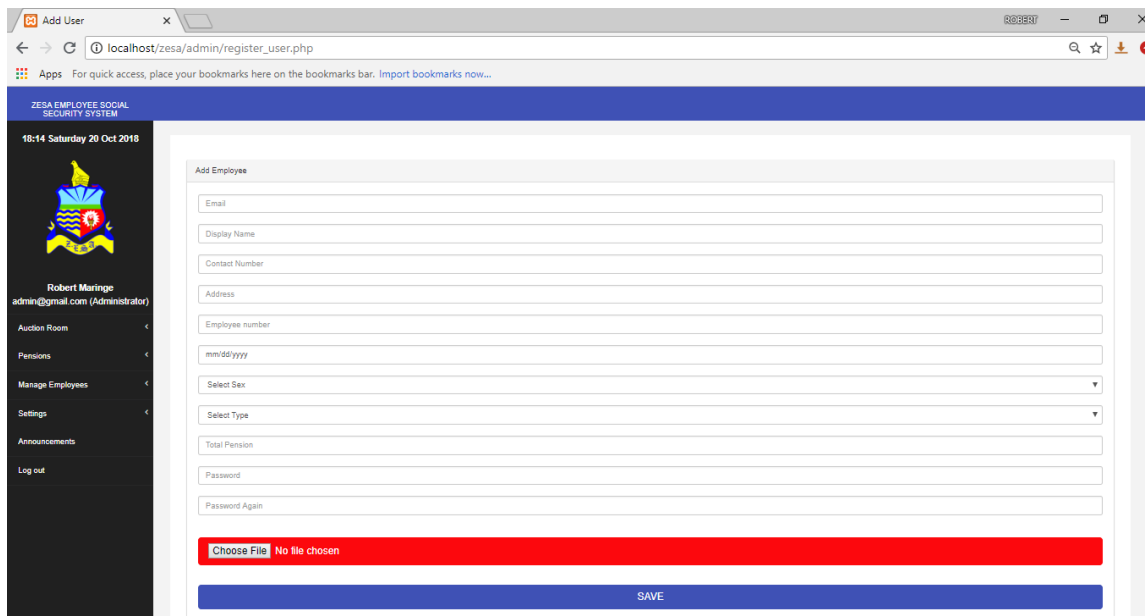
# Appendix A: User Manual

## How to login to the system



This is the login panel, one fills in required details to access the system.

## Registration of the new member



System Admin fills in the new members credentials in spaces provided.

## Administrator's' functions

Administrations functions are available on the left nav of the system admin side.

18:34 Saturday 20 Oct 2018

Robert Maringe  
admin@gmail.com (Administrator)

- Auction Room
- Pensions
- Manage Employees
- Settings
- Announcements
- Log out

5 Employees

10 records per page Search:

ID	Username	Full name	Contact Number	Usable Pension	Options
1	admin@gmail.com	Robert Maringe	0773418009	6.45	Options -
2	user@gmail.com	Honest Guy	0777222879	825	Options -
3	wale@gmail.com	Walter	991	300	Options -
4	bla@gm.com	Thabo	12345	3.45	Options -
5	rozay@gmail.com	rozay	0777222879	298.05	Options -

Showing 1 to 5 of 5 entries

Previous 1 Next

The admin leaves the system from logout tab

All Assets (27) T-Gonzi Zvenyu

18:38 Saturday 20 Oct 2018

Robert Maringe  
admin@gmail.com (Administrator)

- Auction Room
- Pensions
- Manage Employees
- Settings
- Announcements
- Log out

ZESA EMPLOYEE SOCIAL SECURITY SYSTEM Add New Asset

2 Bids

10 records per page Search:

ID	Asset	Date Bid	Amount	Bidder	Status	Options
1	cavd	22:31 hours on 09 Feb 2018	5555	Administrator	Approved	Options -
8	pipe	14:13 hours on 15 Oct 2018	40	Honest Guy	Pending	Options -

Showing 1 to 2 of 2 entries

Previous 1 Next

## Members Functions

When a member logs on to the system he or she is automatically presented with a user function main menu. The member then goes to the user dashboard where one selects a function depending on the action requested.

The screenshot shows a web browser window displaying the ZESA Employee Social Security System dashboard. The page title is "ZESA EMPLOYEE SOCIAL SECURITY SYSTEM". The user is logged in as "Honest Guy" (user@gmail.com). The dashboard shows a sidebar menu with options: Auction Room, Request A Fund, Announcements, Settings, and Log out. The main content area displays "4 Assets On Auction" with a table of 4 entries. The table has columns for ID, Name, Category, View Picture, State Condition, Date Created, and Options. The assets are:

ID	Name	Category	View Picture	State Condition	Date Created	Options
21	cavd	Testing	<a href="#">Open Image</a>	555	16:36 hours on 09 Feb 2018	<a href="#">Options -</a>
22	hbhbhj	Testing	<a href="#">Open Image</a>	bkjkbjbnj	16:51 hours on 09 Feb 2018	<a href="#">Options -</a>
23	wefw	Testing	<a href="#">Open Image</a>	dwvd	20:40 hours on 09 Feb 2018	<a href="#">Options -</a>
24	pipe	Testing	<a href="#">Open Image</a>	old	17:51 hours on 13 Oct 2018	<a href="#">Options -</a>

The dashboard also shows the total pension as 5500 and the usable pension as \$825. The time is 18:46 hours on 20 Oct 2018.

Members logout and password changing is available at the tabs on the top bar

This screenshot is identical to the one above, but with a blue arrow pointing to the "Change Password" option in the sidebar menu. The sidebar menu options are: Auction Room, Request A Fund, Announcements, Settings, Change Password, and Log out. The main content area displays "4 Assets On Auction" with a table of 4 entries. The table has columns for ID, Name, Category, View Picture, State Condition, Date Created, and Options. The assets are:

ID	Name	Category	View Picture	State Condition	Date Created	Options
21	cavd	Testing	<a href="#">Open Image</a>	555	16:36 hours on 09 Feb 2018	<a href="#">Options -</a>
22	hbhbhj	Testing	<a href="#">Open Image</a>	bkjkbjbnj	16:51 hours on 09 Feb 2018	<a href="#">Options -</a>
23	wefw	Testing	<a href="#">Open Image</a>	dwvd	20:40 hours on 09 Feb 2018	<a href="#">Options -</a>
24	pipe	Testing	<a href="#">Open Image</a>	old	17:51 hours on 13 Oct 2018	<a href="#">Options -</a>

The dashboard also shows the total pension as 5500 and the usable pension as \$825. The time is 18:46 hours on 20 Oct 2018.

## Appendix B: Interview Checklist

### Interview Questions

Interviewee Name: \_\_\_\_\_

1. The current system performance and functionality?

Poor  Fair  Good

2. Are you an active member of ZENT social security?

Yes  No

**If yes, please proceed to question 3 if not interview terminated**

3. Have you ever faced any electronic processing challenges while using the social security system? How was it solved?

.....  
.....  
.....

4. Do you support the development and implementation of the new automated ZENT social security system?

Yes  No

Give reason to the above answer

.....

5. How often does the current system fail?

All times  Very often  sometimes

6. What are the current problems being faced by the traditional social security system.

.....  
.....  
.....

7. What additions features do you expect on the newly proposed social security system?

.....  
.....  
.....

**Current system write review results**

**Review date** \_\_\_\_\_

**Review time** \_\_\_\_\_

**Document reviewed** \_\_\_\_\_

**Review Results:**

-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----  
-----

**Conclusion**-----

-----  
-----  
-----

**RESEARCH QUESTIONNAIRE**

**Please answer all questions on the spaces provided.**

1. Which part of the ZENT social security system are u familiar with?

**Manual**       **Computerised**

2. What are the processes involved in the funds request?

.....  
.....  
.....

3. What are the details required to request a fund?

.....  
.....  
.....

4. How is data in use and backup currently stored?

.....  
.....  
.....

5. How are members notified of their request upon approval?

.....  
.....

6. How reliable is the current system?

.....  
.....  
.....



7. Do you wish the system to change. if yes how?

.....

.....

.....

## Appendix C: Code Snippet

```
<?php

require "Utilities/REQUIRE_SETTINGS.php";
require "Utilities/URL_MANAGER.php";

require "Utilities/Areas/Area.php";
require "Utilities/Media/Media.php";
require "Utilities/Media/MediaExt.php";

require REQUIRE_DATE;
if(!isLoggedIn())
{
    open_login();
    return;
}
?>

<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <title><?php echo "All Assets" ?></title>
    <!-- BOOTSTRAP STYLES-->
    <link href="assets/css/bootstrap.css" rel="stylesheet" />
    <!-- FONTAWESOME STYLES-->
    <link href="assets/css/font-awesome.css" rel="stylesheet" />
```

```

<!-- MORRIS CHART STYLES-->
<link href="assets/js/morris/morris-0.4.3.min.css" rel="stylesheet" />
<!-- CUSTOM STYLES-->
<link href="assets/css/custom.css" rel="stylesheet" />
<!-- GOOGLE FONTS-->
</head>
<body>
<div id="wrapper" ">
<nav class="navbar navbar-default navbar-cls-top " role="navigation" style="margin-bottom:
0;background: #3F51B5;">
  <div class="navbar-header">
    <button type="button" class="navbar-toggle" data-toggle="collapse" data-target=".sidebar-
collapse">
      <span class="sr-only">Toggle navigation</span>
      <span class="icon-bar"></span>
      <span class="icon-bar"></span>
      <span class="icon-bar"></span>
    </button>
    <a class="navbar-brand" style="background: #3F51B5;color: #fff" href="index.php"><h5><?php
echo SYSTEM_NAME ?></h5></a>
  </div>
  <div style="color: white;
padding: 15px 50px 5px 50px;
float: right;
font-size: 16px;"> </div>
  <div style="color: white;
padding: 15px 50px 5px 50px;

```

float: right;

font-size: 16px;"></p>

```
<table style="width: 120%; padding: 20px;">
```

```
<tr>
```

```
<td> Total Pension:</td>
```

```
<td> &nbsp;&nbsp;&nbsp;<?php echo $_SESSION[SESSION_PENSION]?></td>
```

```
</tr>
```

```
<tr>
```

```
<td>
```

```
<?php
```

```
$sum=$_SESSION[SESSION_PENSION];
```

```
$usable =15*($sum)/100;
```

```
?>
```

```
Usable Pension:
```

```
</td>
```

```
<td>
```

```
&nbsp;&nbsp;&nbsp;<?php echo($usable); ?>
```

```
</td>
```

```
</tr>
```

```
</table>
```

```
<br/>
```

```
</div>

</nav>

<!-- NAV SIDE -->

<?php

require('nav_side.php');

?>

<!-- END NABV SIDE -->

<div id="page-wrapper" >
  <div id="page-inner">

    <!-- /. ROW -->

    <div class="row" style="padding: 2%;">

      <?php

$username=$_SESSION[SESSION_DISPLAY_NAME];

      $ids = getAllMediaIds();

      $number_of_ids = 0;

      foreach ($ids as $id)
```

```
$number_of_ids++;
```

```
echo "<div class=\"panel panel-default\">
```

```
<div class=\"panel-heading\">
```

```
    $number_of_ids Assets On Auction
```

```
</div>
```

```
<div class=\"panel-body\">
```

```
<div class=\"table-responsive\">
```

```
<table class=\"table table-striped table-bordered table-hover\" id=\"dataTables-example\">
```

```
<thead>
```

```
<tr>
```

```
<th>ID</th>
```

```
<th>Name</th>
```

```
<th>Category</th>
```

```
<th>View Picture</th>
```

```
<th>State Condition</th>
```

```
<th>Date Created</th>
```

```
<th>Options</th>
```

```
</tr>
```

```
</thead>
```

```
<tbody>
```

```
";
```

```

foreach ($sids as $sid)
{
    $media = new Media();
    if(!$media->create_from_id($sid))
        continue;

    $area_name = "Unknown Category";

    $area_id = new Area();
    if($area_id->create_from_id($media->area_id))
    {
        $area_name = $area_id->name;
    }

    $date_created = getDateSummary($media->date_created);

    echo "          <tr class=\"odd gradeX\">
          <td>$media->ID</td>
          <td>$media->name</td>
          <td>$area_name</td>
          <td><a href='$media->url'>Open Image</a></td>
          <td>$media->condition</td>
          <td>$date_created</td>
          <td> <div class=\"btn-group\">

```

```

toggle="dropdown" class="btn btn-success dropdown-toggle">Options <span
class="caret"></span></button>                                <button data-

class="dropdown-menu">                                        <ul

href=$media->url'>View Asset</a></li>;                          <li><a

    if($media->startbid == 0 && $media->endbid == 0){
        echo "<li><a href='#' onclick='absentee_bid($media->ID)'>Absentee
Bid</a></li>";
    }else if($media->startbid == 1 && $media->endbid == 0){
        echo "<li><a href='#' onclick='place_bid($media->ID)'>Place a Bid</a></li>";
    }
    echo"                                                    <li

class="divider"></li>

                                                    </ul>
                                                    </div>
                                                    </td>

                                                    </tr>

";

}

echo " </tbody>

</table>

</div>

```



```
</div>
```

```
</div>
```

```
<!--End Advanced Tables -->;
```

```
?>
```

```
</div>
```

```
</div>
```

```
<div id="temp"></div>
```

```
</div>
```

```
<script src="assets/js/jquery-1.10.2.js"></script>
```

```
<!-- BOOTSTRAP SCRIPTS -->
```

```
<script src="assets/js/bootstrap.min.js"></script>
```

```
<!-- METISMENU SCRIPTS -->
```

```
<script src="assets/js/jquery.metisMenu.js"></script>
```

```
<!-- DATA TABLE SCRIPTS -->
```

```
<script src="assets/js/dataTables/jquery.dataTables.js"></script>
```

```
<script src="assets/js/dataTables/dataTables.bootstrap.js"></script>
```

```
<script>
```

```
$(document).ready(function () {
```

```
    $('#dataTables-example').dataTable();
```

```
});
```

```
</script>
```

```
<!-- CUSTOM SCRIPTS -->
```

```
<script src="assets/js/custom.js"></script>

<?php
echo"
<script>

function place_bid(id) {
    var user ='$manager';
    var table = 'bids';
    var date='$date';
    var usable='$usable';

    $.post('Utilities/FileManager/bids.php',{ t: table, i:id,u:user,d:date,us:usable},function (output) {
        $('#temp').html(output);
    });
}

function absentee_bid(id) {
    var user ='$manager';
    var table = 'bids';
    var date='$date';
    var usable='$usable';

    $.post('Utilities/FileManager/bids.php',{ t: table, i:id,u:user,d:date,us:usable},function (output) {
        $('#temp').html(output);
    });
}

</script>"?>
```

```
<script>
```

```
function PrintElem(elem)
```

```
{
```

```
    var mywindow = window.open("", 'PRINT');
```

```
    window.print();
```

```
}
```

```
</script>
```

```
</body>
```

```
</html>
```