

## **ABSTRACT**

This is an original documentation of the system entitled Harare city council interdepartmental office automation system. The system has been designed under the software development life cycle standards and has been development from the current problems currently encountered within this organisation. The Harare city council is relatively a very large organisation and operates under a number of departments and divisions. The offices a distributed around Harare and inter departmental collaboration is a great challenge in the organisation since its offices are scattered around. The Harare city council interdepartmental office automation have however designed as a solution to this problems and allows employees to work remotely from their office without traveling to and fro one office. All members who will be working in different offices are going to be allocated accounts and the user will view and edit information according to their access levels. The system is going to allow registered members in the management level to create a budget, make requisition, archive their important documents and share information according to the their area of specialisation

## **DECLARATION**

**I, MUKAMO SHEPHERD**, hereby declare that I am the sole author of this dissertation. I authorize the University of Midlands to lend this dissertation to other institutions or individuals for the purpose of scholarly research.

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

**APPROVAL**

This dissertation entitled “HARARE CITY COUNCIL INTERDEPARTMENT OFFICE AUTOMATION SYSTEM” by MUKAMO SHEPHERD meets the regulations governing the award of the degree of BSC HONOURS INFORMATION SYSTEM of the Midlands State University, and is approved for its contribution to knowledge and literal presentation.

Supervisor .....

Date .....

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## **DEDICATION**

This project is dedicated to my parents Mr. and Mrs. P Mukamo who have never failed to offer financial support up to the end of this program, Mr. and Mrs. N Chitambo would never be forgotten for their kindly love in every category where help was needed, Mr. and Mrs. F Chiunya, Mr. and Mrs. J Mukamo and all family members at large who never failed to give their hand whenever a need arises

## TABLE OF CONTENTS

ABSTRACT.....	i
DECLARATION .....	ii
APPROVAL .....	iii
ACKNOWLEDGEMENT .....	iv
DEDICATION.....	v
CHAPTER 1: INTRODUCTION .....	1
1.1 INTRODUCTION .....	1
1.2 Background of the organization.....	1
1.2.1 Vision.....	2
1.2.2 The Corporate Mission Statement .....	2
1.2.3 Organisational structure for Harare city council.....	2
1.3 Problem definition .....	3
1.4 Aims of the research study.....	5
1.5 Objectives of the research.....	5
1.5.1 Limitations of the study .....	5
1.6 Hypothesis.....	6
1.7 Justification .....	6
1.8 Conclusion .....	6
CHAPTER 2 PLANNING PHASE .....	7
2.1 Introduction.....	7
2.2 Why build the system.....	7
2.3 Business value.....	7
2.3.1 Tangible benefits.....	8
2.3.2 Intangible benefits.....	8
2.4 Feasibility analysis.....	9
2.4.1 Technical Feasibility .....	9
2.4.2 Economic Feasibility .....	11
2.4.3 Social Feasibility.....	14
2.4.4 Operational Feasibility.....	14
2.5 Work plan.....	14
2.5.1 Gantt chart.....	15
2.6 Conclusion .....	16
CHAPTER 3 ANALYSIS .....	17
3.1 Introduction.....	17
3.2 Information gathering methodologies.....	17
3.2.1 Interviews.....	17

3.2.2 Observations .....	18
3.2.3 Questionnaires.....	19
3.3 Analysis of the current system .....	20
3.4 Process Analysis .....	21
3.4.1 Activity Diagram .....	21
3.5.1 Context diagram of current system .....	23
3.5.2 Data flow diagram of the current system .....	24
3.6 Weakness of the current system.....	25
3.7 Evaluation of alternative of selection software packages .....	25
3.7.1 Outsourcing .....	25
3.7.2 In-House Development .....	26
3.7.3 Improvement of the current system .....	27
3.7.4 Recommendation .....	27
3.8 Requirements Analysis .....	27
3.8.1 Functional requirements.....	28
3.8.2 Case Diagram.....	29
3.8.3 Non-functional requirements .....	29
3.9 Conclusion .....	30
CHAPTER 4: DESIGN PHASE.....	31
4.1 Introduction.....	31
4.2 System Design .....	31
4.2.1 Context diagram of the proposed system.....	32
.....	33
4.2.2 Data flow diagram of the proposed system.....	33
4.3 Architectural design .....	36
4.3.1 Network Architectural Design .....	36
4.4 Physical design.....	38
4.5 Database Design.....	39
4.5.1 Enhanced Entity Relationship Diagram.....	41
4.5.2 Databases .....	44
4.6 Program design .....	46
4.6.1 Activity diagram .....	46
4.6.2 Package diagram .....	48
4.6.3 Sequence diagram .....	48
4.6.4 Class diagram.....	50
4.7 Interface design .....	50
4.8 Conclusion .....	55

CHAPTER 5 EMPLEMENTATION PHASE.....	56
5.1 Introduction.....	56
5.2 Coding (Pseudo Code) .....	56
5.2.1 Connecting to the database .....	57
5.2.2 Logging On .....	57
5.2.3 Contact us.....	57
5.2.4 Requisition of assets .....	57
5.2.5 Record business letters.....	58
5.2.6 TRACKING BUSINRSS LETTERS.....	58
5.3 Testing.....	58
5.3.1 Unit testing.....	59
5.3.2 Module Testing .....	60
5.3.3 System Testing.....	60
5.3.4 Acceptance Testing .....	60
5.3.5 Validation and Verification.....	61
5.4 Installation.....	62
5.4.1 User Training .....	62
5.4.2 Conversion .....	63
5.5 Maintenance .....	65
5.5.1 Adaptive Maintenance .....	66
5.5.2 Corrective maintenance .....	66
5.5.3 Perfective maintenance .....	66
5.6 Conclusion .....	67
BIBLIOGRAPHY .....	68



## **LIST OF ACRONOMYS**

COH	CITY OF HARARE
HCCIDOAS AUTOMATION SYSTEM	HARARE CIY COUNCIL INTERDEPARTMENTAL OFFICE N
SQL	STRUCTURED QUERY LANGUAGE
UML	UNIFIED MODELING LANGUAGE
DFD	DATA FLOW DIAGRAM
EER	ENHANCED ENTITY RELATIONSHIP DIAGRAM
DB	DATABASE
ROI	RETURN ON INVESTMENTS
NPV	NET PRESENT VALUE

## LIST OF FIGURES

Figure 1.1 Organisational structure.....	3
Figure 2.1 The Gantt chart .....	15
Fig 3.1 activity diagram .....	22
Figure 3. 1 Context Diagram .....	23
Fig 3.3 Data Flow Diagram .....	24
Figure 3.4 Use Case Diagrams.....	29
Figure 4.1 Context diagram of proposed system .....	33
Figure 4.3 Network Architectural design.....	37
Figure 4.4 The ANSI SPARK model.....	41
Figure 4.5 entity relationship diagrams .....	43
Fig 4.4 activity diagram .....	47
Figure 4.7 Package diagram.....	48
Figure 4.10 Login page .....	51
Figure 4.11 User home page .....	52
Figure 4.13 Requisition form.....	52
Figure 4.14 Electronic in and out tray page.....	53
Figure 4.15 project information .....	53
Figure 4.16 Archive .....	53
Figure 4.10 Business letter report .....	55
Figure 5.1 Testing phases .....	60
Figure 5.2 database inserting validation form.....	61
Figure 5.3 user account creation.....	61

## LIST OF TABLES

Table 2.1 Software development process requirements .....	10
Table 2.3 Cost Benefit Analysis .....	13
Table 2.4 Timing.....	15
Table 3.1 Input, Process and Output.....	21
Table 3.5 non-functional possible metrics table .....	30
Table 4.1 hardware and software requirements proposed system .....	39
Table 4.2 Entities and Attributes .....	42
Table 4.3 User details .....	44
Table 4.4 User account .....	44
Table 4.5 Budget.....	45
Table 4.6 Requisition.....	45
Table 4.7 Business letters .....	45
Table 4.8 Projects.....	46
Table 4.9 Budget.....	54
Table 4.10 Requisition .....	54

**LIST OF APPENDIX**

APPENDIX A: INTERVIEW.....xiv  
APPENDIX B: QUESTIONNAIRES.....xvi  
APPENDIX C: OBSERVATION..... xviii  
APPENDIX D: USERMANUAL.....xix  
APPENDIX E: CODE SNIPPET.....xxvi

## **CHAPTER 1: INTRODUCTION**

### **1.1 INTRODUCTION**

Harare city council is a long term serving organization which has a history of more than 100 years in service. It operates under a number of departments and each department is headed by a director. Under each department are a number of divisions which are headed by a manager. Communication though important for the success of each organization is a great hindrance in Harare city council. Each member reports to a superior over him or her.

### **1.2 Background of the organization**

Harare city council is an organisation which is aimed at providing service to its residents, the surrounding growing cities such as Norton and Chitungwiza, business people and many other stakeholders. Harare is located in Mashonaland central province and is the capital city of Zimbabwe. It was founded in 1890 when Cecil John Rhodes much into Zimbabwe from South Africa with his organized military forces. It was later give the status of a fort and it was by that time named 'Fort Salisbury'.

After sometime, the place was known only as 'Salisbury'. In 1935, Salisbury was declared as a city. In 1897, Salisbury was then declared as a municipality. After the second liberation war when Zimbabwe gained independence, Salisbury was changed to Harare and this was on April 18 1982. The name Harare was taken from the first Shona tribe to stay in the marshy flats near the Kopje.

### **Population**

After a 2012 census ZIMSTAT reflected that Harare urban population increased to 1.5 million. City of Harare is also surrounded by two growing towns' areas namely Chitungwiza and Epworth. The two rural areas have however recorded a 2.1 million population overriding that of the city centre. The 2.1 million is a result of 1million males and 1.1 million females.

### **City Management**

City of Harare management team comprises of an elected Non-executive Mayor, his deputy and 46 councillors elected by residents in their designated wards and 12 specially appointed by the minister of local government and rural development. Internally the city council comprises of 10 departments, each headed by a director and all report to the town clerk.

Currently the city is governed under the mayor deputed by doctor. Under the deputy mayor there is the town clerk Mr Mahachi

### **1.2.1 Vision**

The city of Harare has a vision to achieve a world class standard city status by the year 2025.

### **1.2.2 The Corporate Mission Statement**

The city of Harare mission is to ensure its services are improved to world class standard services providing a favourable environment for investment. It seeks to achieve this through involving stakeholder in policy making and promoting team work spirit.

#### **Core Business**

The Harare city council's core value is to ensure provision housing, health and sanitation to the residents and the surrounding cities.

#### **Corporate Values**

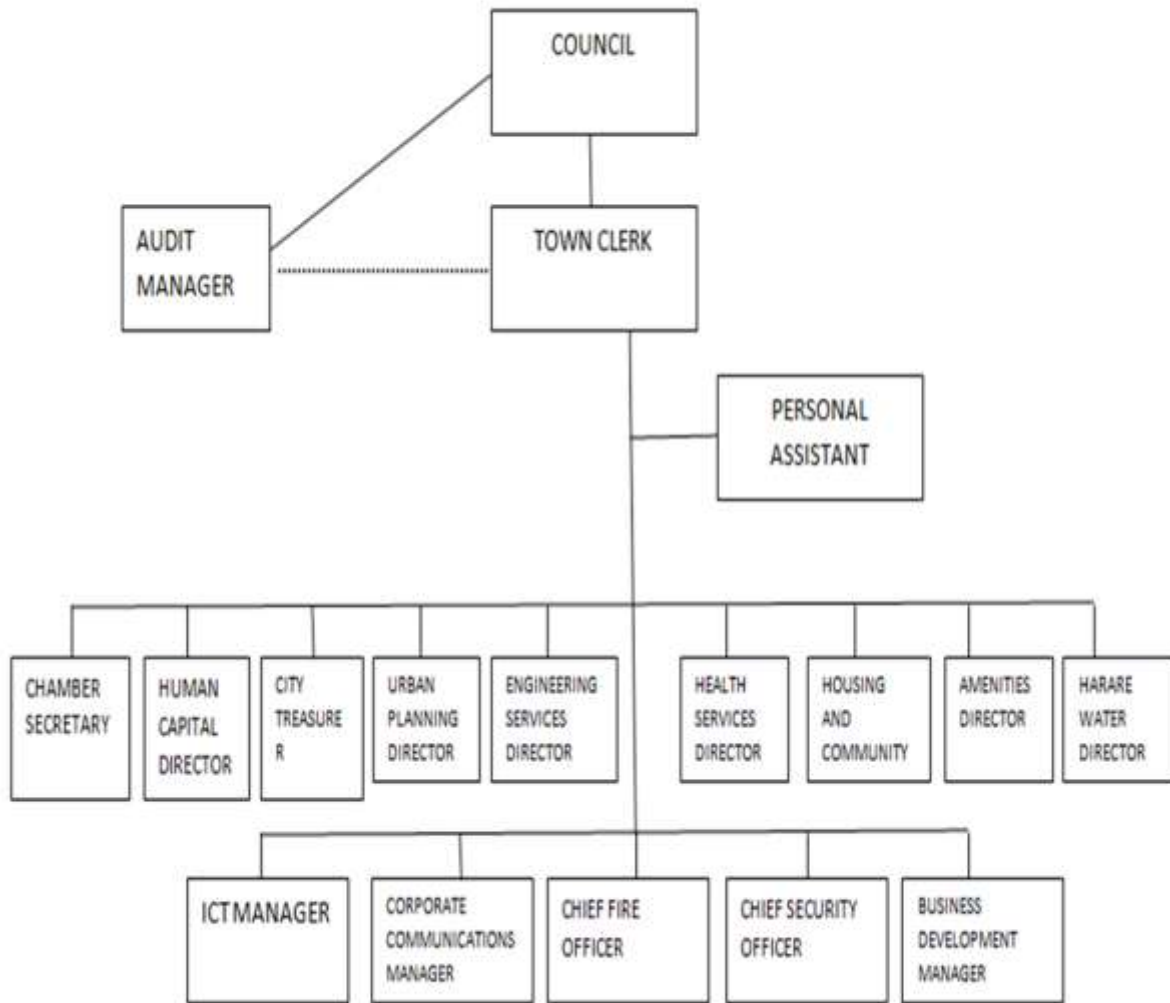
The Harare city council corporate values are:

- Commitment
- Truthfulness
- Integrity
- Trust
- Authenticity

### **1.2.3 Organisational structure for Harare city council**

An organisational structure according to Montana and Charnoy (1998) is a framework for organizing formal relationships in an organization. They stated that its main aim is to clarify and communicate the lines of responsibility, authority and accountability.

**TOWN CLERK'S OFFICE: STRUCTURE**



**Figure 1.1 Organisational structure**

**1.3 Problem definition**

Harare city council is a very large organization which employs more than one thousand personnel. It has its offices in different parts of Harare and these include Rowan Martin building, Cleve rant building, Town house, Mbare, central stores, Trafalgar building and other district offices. Inter departmental interaction have been a great challenge to members in the organization. Some have failed to attend meeting in time and even failing to be present. Top management may need to know different activities being held by the organization as a whole, department and division and their current state that is completed pending and failed.

Some user even carry with themselves C.P.U when they just want some documents in it that is maybe they will not have flash drives. The current system used does not support some data formats to be transmitted within the organization. Many activities will be slowed down since members have to move to and fro on tasks which can be done remotely. No calendar to show activities which may result in some activities not done in time. That is there is a lack of effective communication

Sometimes paper work is used where it is not necessary which will result in slowing down business operation and consuming up stationary. Taking for example when a user need a new email address account he have to write a requisition letter, print it and send to the I.T department. The letter will be sent to the I.T manager's secretary and to the manager for approval. If the manager is overloaded with work to do and or is not available the letter is left pending and slows business process.

Since Harare city council is a large organization paper work is also large. The current system does not support storage of other document formats such as word and pdf documents and archives have to be piled with important and non-important document that will make it difficult to track a certain document when needed. More so, after holding a meeting there are usually files given to the members who would have attended for future reference. However where the user may have lost the flat file no other sources will be available for reference.

Many users have also requested for their lost important documents after their machines have come for repair to the I.T workshop. Users are not able to back up their very important files and may results in the organization losing important information.

Stake holders who would be requesting service from the council would write business letters such as applying for shop license, which will have to pass through different offices within the council. Many incidents of letters being lost have been recorded and also tracing the current state of the letter have been a great challenge especially to external stakeholders and the stakeholder have to reapply which will become comp some

Requisition of items is mainly based on hard copies and if lost no prove will be provided for it. Taking for example a user is requesting a printer. He obtained different quotations, evaluate them and come up with a reliable one it if processed and there is need to keep a scanned copy of the quotation and the requisition forms for future reference



#### **1.4 Aims of the research study**

To design and development an interdepartmental office automation system which improves employee effectiveness and efficiency in offices activities and allows interaction and sharing of information and knowledge among departments and divisions

#### **1.5 Objectives of the research**

The proposed system seeks to achieve the following objectives:

- To design an electronic in-tray and out-tray that allocates identification number to each business letter for easy tracking.
- To design an electronic archive module where users upload and save their important documents which they would access from any office.
- To provide a project management platform where users responsible for a particular project under process may share information and see the current status.
- To allow each division produce its yearly budget of stationery it wishes to purchase and be able to make requisition when need arises.
- To provide a platform where users may share information according to area of specialization.

##### **1.5.1 Limitations of the study**

Mobilizing financial resources to support the project is one of the greatest challenge the project is likely to encounter. The project requires a lot of funding since the developer will not be based in Harare and hence travelling cost are likely to increase

Some of the Harare city council employees are not technologically advanced and hence the system may face some forms of resistance.

Harare city council has nine departments with over forty division. Its division has its own function independent from the other and this entails the size of the system and the time for its delivery is very short given the developer will be doing other task which are not linked to it.

The time needed to the delivery of the system is too short as the developer will be entitled to other activities outside the project. More so power cuts, no network services whilst the developer is home are also going to slow down the development process.

## **1.6 Hypothesis**

The following software have been chosen to be used in the development of the COH interdepartmental office automation system:

- The development will be done on Microsoft Windows 7 operating system.
- The Apache web server, this is because it is a stable and good server software and not complex to maintain.
- PHP is going to be used as a platform for generating scripts for the website.
- MySQL is the database manipulation software that this researcher is going to use to maintain the system database. It provides all the queries this researcher would require in developing and maintaining the system database.
- JavaScript language is going to be used to improve the system user interfaces.
- Cascading Style Sheets (CSS) for creating a well-structured website.
- Adobe Dreamweaver CS8 is also going to be used
- Mozilla Firefox as a browser for testing the system on the local server due to its compatibility

## **1.7 Justification**

Available technology is capable of supporting the system. There is also effective metropolitan network connection enhance the effective communication The systems is challenging and involve a lot of functions and hence will enhance the developers' studying carrier in I.T. The employees of Harare city council are located in offices in different buildings and more so, some employees from the same division can be located in different buildings. The system will however be an office automation which will bring employees together regardless of distance and different location of offices. The system benefits employees and improves on services delivery to all stakeholders of the organization

## **1.8 Conclusion**

The ability to identify a problem is the key input to a successful project. This chapter reviews the developers' intention on what made him want to design this system. That is ability to identify the problem affecting Harare city council on his time of attachment had made the developer design objective solution to them. The designer also highlighted his justification of the system being completed.

## CHAPTER 2 PLANNING PHASE

### 2.1 Introduction

This chapter involves a detailed plan of how the system is going to be developed. Planning according to Larson and Gray (2011) is developed to determine what a project will entail, its schedule the quality levels to be maintained and the budget which need to be met to achieve the system. There are a number of things to be discussed which include why there is need to build the system, the business value of the system, feasibility study and the time needed to complete the project, that is the work plan. It is an important section of the project as it shows whether it is worthwhile to start the project with the available resources and its business value to the entire organization.

### 2.2 Why build the system

Harare city council is a very large organization operating under 10 departments and 41 divisions. It also employs more than 1000 employees and the offices are scattered within the town. The development of the interdepartmental office automation system will however solve many of the problems the organization is facing. That is it will bring all the employees to a common view point working as if from the same office desk. The following are some of the reasons for the system to be developed.

- Improvement of employee efficiency in carrying out their designated duties.
- Provide a fast information delivery to all staff members of the municipality.
- Improvement of project management and ensuring each member in a particular project contributes greatly regardless of different locations.

The main aim of the system is to however improve employee efficiency in carrying out their duties regardless of location. That is activities where an employee may have to move from one office to another can be done remotely reducing time and hence improved performance and customer satisfaction.

### 2.3 Business value

Business value according to Schwabes (2006) is the success of an enterprise or organization derived from the usefulness of its information to achieve its strategic objectives. Therefore the Harare city council is an software system that is aim at regulating the information systems of an organization to improve its value by acquiring relative information reliable for decision making.

The developer suggests that the system when developed is going to improve many operations of the organization. The users who are expected to benefit from this system as proposed by the developer are first the employees of Harare city council whose efficiency at work is going to be improved and the residents and business people of the city of Harare whose waiting time for a service is going to be reduced. The business values however vary with some measurable known as tangible benefits and those which cannot be measured known as intangible benefits. That is the monetary value of the system has to be recorded so that it will be easy to compare it to its prospective expenses. The system's business value is center on the current operation of the present system as a key to the new system development.

The following are therefore the proposed benefits to be accrued in their category:

### **2.3.1 Tangible benefits**

These are benefits that an organization or individual enjoys from the use of the system and can be expressed in monetary terms Hughes and Cottrell (1999). The Harare city inter-departmental office automation system as proposed by the developer and management will be expected to effect the following changes to the income of the organization.

- Reduced stationery expenses by 15%
- Travelling expenses are also expected to be reduces by 10%
- Loss of important information is also expected to be reduced the system is going to provide an archive system to important user documents.

### **2.3.2 Intangible benefits**

Larson and Gray (2011) have stated that intangible benefits are benefits that will be enjoyed by the organization and cannot be expressed into monetary values. These may include job satisfaction, improved efficiency and reduced waiting time by the organizational clients

- Client response time is expected to be reduced. That is a client may have no need to move from one office to another.
- Employee job satisfaction is also expected to increase since employees will now be able to share resource and knowledge without necessarily moving to and fro their offices.
- Communication is the key input to members of any organisation work towards their set goals. Therefore the interdepartmental office automation system is going to come as a solution to this to ensure every one works towards the 2025 mission of Harare to

become a world-class city.

## **2.4 Feasibility analysis**

Feasibility study involves evaluation and analysis of the potential of as proposed system Woods and Sangster (2005). That is the analysis involves determining whether the system is worth doing or not. Though the system may have shown many benefits to the organization, it is not a guarantee that the system should be developed. Analysis still need to be done that will improve confidence in the developer in designing the system. Non-monetary factors are the most difficulty in determining whether the system should be developed. Feasibility study has been carried out to identify first what new equipment are needed for the system to be completed within stated time frame.

The feasibility of the Harare city council inter-departmental office automation system have been explored in economic, technical, social and operational feasibility analysis. That is determination of what is needed to develop the system, when and at what cost. The system requirements have been jotted down for cost benefit analysis. Feasibility will help to identify whether the system is worth undertaking according to the organizational budget.

### **2.4.1 Technical Feasibility**

According to Larson and Gray (2011) technical feasibility involves analysis of technical expertise, software and hardware required in the development process. That is whether the required technologies software or hardware is available. If there is any need to purchase new resources it is revealed here. Evaluation and analysis of the above helps the developer identify if there is any resources which can be needed in the future and not stated. More so helps in budgeting process and how to acquire the software to be used.

#### **Technical Expertise**

Human capital is a major resource in the development of the Harare city council interdepartmental automation system. Technical expertise involves the available personnel with related skills of need in the development of the project (Larson, and Gray, 2011). That is determining whether human resource is available or not. Basically the Harare city council will have three options to choose in determining personnel is available for the development processes which are:

- I. Looking up for an independent designer or development organization to do the development for them.
- II. Sending one employee for a specialized training process so that he can acquire

knowledge to carry out the development process

- III. Employing a new I.T specialist with the knowledge in the language to be used to oversee the development process.

One option will have to be chosen however which proved to be cheaper to the organization but providing a maximum quality output. The Harare city council having an I.T division with skilled personnel will rather send one for training to upgrade his knowledge in php programming language. This will also be cheaper in system supporting rather than employing a new employee who does not know organization culture or consulting a specialist who can withhold certain knowledge so that he can continually provide support to the organization. The users who are going to be on the querying point of the system are the Harare city council employees and hence having an internal employee develop the system will enhance fast response to user queries an customer service .

#### 2.4.1.1 Hardware and Software Requirements

These are application programs (software) and physical components (hardware) that are needed in the development of a software system (Tom 1988). The applications and hardware however vary with the type of application to be developed and its accessibility. The software and hardware needed for the development of Harare city inter-departmental office automation system have been listed below by the developer and their version

##### Software development process requirements

Software requirements		Hardware requirements	
Application	version	component	Model
Wamp server	2.0	Laptop	Hp 635
Macromedia Dreamweaver	8	USB flash	2GB
Mozilla Firefox	29.0	External hard drive	50GB
Windows 7 OS			
Microsoft office word 2013	15.0		
Artsier	4.1		

**Table 2.1 Software development process requirements**

### 2.4.1.2 Software installation requirements

These are mainly hardware specifications which are needed for the system to run effectively and efficiently. The requirements will vary with whether the machine will act as a server or client machine. The requirements to a client machine are generally low as compared to those of a server. This is because the server will have multiple accesses as compared to client server which will only be for use to its user. Below is a list of installation requirements needed for the proposed system

Server machine			Client machine		
Item	Minimum requirement	Recommended requirement	Item	Minimum requirement	Recommended requirement
Processor	1.65GHz		Processor	00MHz	1GHz
Operating System	Windows 7		Operating System	Windows 7	
Hard Disk Drive	500gb	1 tera byte	Hard disk drive	10GB	20GB
Memory	1GB	4GB	memory	500MB	2GB

**Table 2.2 software installation requirements**

The above analysis has shown that most of the required technologies are available.

### 2.4.2 Economic Feasibility

Economic feasibility involves evaluating the potential benefits to be accrued through the use of the system over its cost in monetary terms Luicey (1996). For any system if the expected benefits equal or exceed the expected costs, the system can be judged to be economically feasible (woods and Sangster 2005) . This analysis helps the designer whether the potential benefits outweigh estimated expenses. Different expected expenses and incomes over the three years have been prepared by the developer for the system. More so, analysis has been made to these figures to provide full assurance whether the system will benefit the Harare city financially.

### 2.4.5 Cost benefit analysis

It is often necessary to decide if the proposed project is the best of several options, even if the estimated benefits exceed the estimated costs. Cost benefit analysis is an evaluation of

identifying all of the costs and benefits of carrying out the project and operating the delivered application and expressing these costs and benefits in common units (Hughes and Cottrell, 1999). Table 2.3 shows the cost benefit analysis projected by the developer.

Item	Estimated cash flows to be generated through using the system		
	(2014)USD	(2015) USD	(2016) USD
<b>1. Development and Research Costs</b>			
Stationery	\$50.00	0	0
Printing and Photocopying	\$35.00	0	0
Consumables	\$40.00	0	0
Communications	\$50.00	0	0
Additional Software	\$70.00	0	0
Travel	\$50.00	0	0
Development labour	\$500.00	0	0
Further research	\$35.00	\$200.00	\$100.00
<b>2. Operational Costs</b>			
New Hardware	\$300.00	\$150.00	\$100.00
Personnel Training	\$1500.00	\$700.00	\$200.00
Maintenance	\$2500.00	\$900.00	\$500.00
Backup	\$250.00	\$250.00	\$200.00
<b>Total Cost</b>	<b>\$5430.00</b>	<b>\$2200.00</b>	<b>\$1100.00</b>
<b>3. Direct Benefits</b>			
Reduction in Stationery	\$1000.00	\$1400.00	\$2000.00
Reduced Telephone Costs	\$350.00	\$300.00	\$500.00
Reduction in manual labour	\$2000.00	\$2000.00	\$2300.00
<b>Total Benefits</b>	<b>\$3350.00</b>	<b>\$3700.00</b>	<b>\$4800.00</b>



<b>Profit(+) or Loss(-)</b>	<b>-\$2080.00</b>	<b>+\$1400.00</b>	<b>+\$3700.00</b>
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**Table 2.3 Cost Benefit Analysis**

### **Net Profit**

According to Randall (1996) Net profit is calculated by finding the difference between total income and the total cost. It takes all income for the life span of the system. He goes on to say that if the outcome is positive (total income outweighs total cost) the value is known as net profit and when totals cost outweighs total income it is net loss. It is calculated as follows:

#### **Net profit = Total Benefits – Total Costs**

$$= \$(3350+3700+4800) - \$(5430+2200+1100) = \mathbf{\$3120}$$

After the net incomes for the three years have been added together and subtract from the summation of their respective costs and showed that a positive net income will be enjoyed. This shows that the operation of the system is expected to generate income to the organization and hence prove to be economically feasible.

### **Payback Period**

According to Woods and Sangster (2005) Payback involves the selection of a capital expenditure appraisal technique that repays the initial investment of a project in a short period of time. That is the time taken by the system future inflows to recover the initial outlay of the development project. The initial outlay is the total cost which an organization would have used in developing the system. The less the time taken by a system in paying its initial outlay the most favorable it is. It is calculated as follows:

Where: X = number of years before final payback year (1 year).

Y = Total Amount needed to pay the remaining. (\$ 2200)

Z = the amount of money received in the year of payback. (3700)

#### **Payback period = X+(Y/Z)\*12 months**

$$= 1 + (2080 / 3700)*12$$

**= 1 year 6 months 21 days.**

The results showed that the payback period is expected to be approximately 1 year 7month which proves a short period of time and hence from the payback rule the project is worth under taking and has low risk.

### **Return on Investment (R.O.I)**

Return on investment measures an efficiency of an investment (Randall 1996). It is calculated by dividing the net inflow (total cash inflow – investment) by the initial outlay. The outcome

produces is the expressed as a percentage. The main aim is to find the contribution of each dollar invested to the profit of the system. Its formula is as follows:

**Return on Investment = (Average Annual Profit \* 100)/ Average Total investment**

$$\begin{aligned} &= \frac{\$(-2080+1400+3700)/3 * 100}{\$(5430+2200+1100)/3} \\ &= (2393.3/8730) * 100 = \underline{\underline{27.41\%}} \end{aligned}$$

The return on investment as shown in the analysis above it shows that after 3 operating years the system is expected to have a return of 0.27 cents return per each dollar invested. This from the ROI rule is favorable and hence the project economically feasible.

### **2.4.3 Social Feasibility**

As indicated by Larson and Gray (2011), Social feasibility seeks to evaluate how the community welcomes the new development that is how the employees view the proposed system. The society can view the system as life changing or as a threat. If it is viewed as a benefit than it is likely going to gain more acceptance than when it viewed as a threat.

### **2.4.4 Operational Feasibility**

This phase involves determining whether the system will be used by the intended users or not (Hughes and Cottrell 1999). It also evaluates the possibility of the system facing some form of resistance or not. There are several questions which can be raised at this stage mainly focusing on whether the management will support the system, users are satisfied with current system or have been involved in the planning of the proposed system and whether the organisation will benefit from the system. That is if the system answers the above questions positively then it is likely to gain acceptance.

## **2.5 Work plan**

A work plan is a series of a task broken down into a series of activities with time that shows how a task is going to be carried out. Time is a manager's scarcest resource Larson and Gray (2011). They also stated that Project managers should wisely budget their time and give room for necessary adjustments if needed.

## Timing

activity	Activity Start date	Activity End date	Total weeks
proposal	04/08/2014	18/07/2014	2 week
planning	18/08/2014	29/08/2014	2 weeks
analysis	29/08/2014	12/09/2014	2 weeks
design	12/09/2014	03/10/2014	3weeks
Implementation	03/10/2014	17/10/2014	2 weeks
documentation	21/07/2014	17/10/2014	11 weeks

**Table 2.4 Timing**

### 2.5.1 Gantt chart

Gantt diagrammatical representation shown horizontally of the actual and projected amounts of time involved in completing a particular task or reaching specific levels of production according to Student Encarta dictionary (2008). Its main aim is to guide the developer to work much harder in order to meet set dates. It reviews the progress of the system and is also used evaluation of the development process. The Harare city council inter-departmental office automation system is expected to be completed within three months and the time frame for each stage has been set as below.

Week	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.
Proposal											
Planning											
Analysis											
Design											
Implementation											
Documentation											

**Figure 2.1 The Gantt chart**

## **2.6 Conclusion**

From the above analysis the Harare city council interdepartmental office automation system is expected to bring more income and gained acceptance to the society. More so, employee efficiency is expected to increase and that's improving operational efficiency bringing more income to the organization and increase employee job satisfaction

## CHAPTER 3 ANALYSIS

### 3.1 Introduction

This phase involves analyses the performance of the current system. It acts as a base for the development of the new system. Proper analysis of the current system will give more insight to the developer on problems that may have over looked by the developer. From Hassainien (1989) view analysis focuses mainly on the evaluating how the current system works. The developer has had plenty of time to look at the functions of the current system for the period of one year during his attachment. Every day he was able to observe user response in terms of efficiency and effectiveness. More so, many comments were received from the users as the developer gives support on users encountering problems with the current system. Therefore this chapter reflects the current working system in detail.

### 3.2 Information gathering methodologies

Data collection is an essential part of any project to be successful. Potter (2003) described information gathering methodologies as a set of techniques used in acquiring data related to a certain area of study by the project manager. There are a number of data collection techniques the developer is going to take to ensure the information obtained is relevant and reliable. The research is going to be based on the Harare city council different level employees per division to come up with a full functional system. The techniques which are going to be used include

1. Interviews
2. Observations
3. Questionnaires

Each of the above produce different outcomes however all will aid value to the system. That is the other technique will be able to review other problems not reflected by the other.

#### 3.2.1 Interviews

An interview is a conversation between two or more people where questions are asked by the interviewer to elicit facts or statements from the interviewee (Potter, 2003). He goes on to say that Interviews are a useful qualitative data collection method that is used for a variety of purposes. That is they include needs for assessment, program refinement, issue identification, and strategic planning. The interview to Harare city council was carried out on September 15, 2014. It was successfully done and the information gathered had been so useful in the development of the proposed. The interview was carried out in three department in which the developer was concentrating on the development if this system. The departments include the human capital department, the city treasury department and the town clerk department

### **Advantages of the interviews**

The advantages of interviews are that firsthand information is obtained. The results obtained are more instant and are recorded down for future use. More so, the interviewer is able to observe none verbal communication such as facial appearance to evaluate their need and acceptance of the new system unlike questioners. User requirements were clearly defined as they freely express challenges they were encountering through using the system. The response was immediate and different user view was obtained.

### **Disadvantages**

Some members were however reluctant in providing information especially junior workers since they fear to violet organizational values. Some users were not approached and only a sample was taken which may not have revealed all the problems of the current system. The users were limit top responding to the questionnaires and hence may have withdrawn some important information. Interviews are also time consuming and more resources will be consumed during the process.

### **3.2.2 Observations**

According to Patton (1990) observation is a data collection method by which one watch out events, behavior, or noting physical characteristic in their natural operations. It stated that observation can be categorized into overt (where the person under observation knows they are under evaluation) and covert (where one does not know he or she is under observation). Covert observation however has been viewed as being of great impact since people are likely to behave naturally. Both covert and overt observation have been used by the developer in coming up with reliable results.

Taylor-Powell and Steele (1996) reviewed that observation need to be recorded for them to be useful. They goes on to say that the observation may choose to do the recording on sport and at other times after the observation have been done. However they recommended doing the recording whilst on the scene of observation and the description should be short

Observations about the current system were done during the time the developer was directly linked to the systems of Harare city council. That is from February 2013 to December 2013. The observation time was plentiful and much data was collected. More so, since the developer was directly link to the systems of the council, he was able to interact with the system and able to see how user friendly the current system is.

### **Advantages of observations**

Through covert observation the developer was able to obtain the real behavior of the working system. Since the developer was directly linked to the organization observation have provided firsthand information which is more reliable. More so the data obtained was taken on event occurring and hence more relevant.

### **Disadvantages of Observations**

Though firsthand information was obtained, the results were somehow biased where overt observation was used. The process was time consuming and since Harare city council have many office distributed in different locations, the developer was not able to acquire all information that could be required to state the problem domain of the current system and hence the process is ongoing.

### **3.2.3 Questionnaires**

According to Taylor and Steele (1996) questionnaires are written set of questions which will be distribute to the intended individual to obtain information and opinions from them. The questionnaire document was distributed to the various individual with an influence in the topic under examination. The intended personnel are then expected to respond to the questions. It is expected that the question should not take much time to respond and the response should normally be yes or no, a tick to agree and a short comment

Questionnaires were sent to Harare city council three departments on 21 September 2014 and were collected on 25 September 2014. The questionnaires were distributed to the three departments Town clerk, human capital and city treasury which are the major departments under study. Different user levels in each division were given questions to respond based on how they expect the proposed system should address given the available problems. Information obtained from different user respond has been a great input in the designing of the proposed system and its functionality.

Questionnaires are a set of written questions for obtaining information from individuals.

### **Advantages of questionnaires**

Questionnaires have played a major role in coming up thin a vibrant proposed system aim. One of the major advantages was that it provided information for future reference. That is the data obtained can be stored for future use.

### **Disadvantages of questionnaires**

Not all members responded to the questionnaires since they say they have a lot of business task to do. More so, the users were only fixed to the questions asked. That means more important information was lost on questions which the developer may have not asked but important to the development of the proposed system

### **3.3 Analysis of the current system**

There is currently no a working computerized web based system which regulate interdepartmental operation of Harare city council. The available working system is developed in Visual Basic 6 (BIQ system) and has great limitation if interdepartmental operations. More so, the BIQ system is used in selective departments such as ICT department which does the installation, configure and maintaining of the system, the central accounts department, housing, human capital.

An employee's personal details are recorded in to the system on entering the organization. The employee from his respective division is given an authorization letter printed in hard copy that seeks to authorize a given user to access the system. After authorization by the ICT management a user account is created. The system is then installed and configured on the user machine to allow the user to first use it. The system does not offer a self-supporting system where the user will may query to get answers on problems encountered during operation. The ICT management team is centered at Rowarn martin Building and hence if a district office encounters a problem it will be solved after Two to three weeks when the ICT team will be moving around the Offices helping users.

The current system does not allow file sharing of documents in e.g. PDF and word document format. Project review and progress is obtained in the meetings which will be carried out. No member updating is done in between meeting dates. The outcomes of the meeting if needed by each member will be printed into flat files and handed to each. No back up reference is put in place if a member may need the document whilst he or she may lost the hard copy solving a problem that requires specialization in a given field is always done over the phone. If the person with the available knowledge is not available process are slowed down. The current BIQ system does not support file transfer of other documents format which may result in people moving to and for one office to another



### Strengths of the existing system

1. It is less vulnerable to unauthorized access since it has to be installed and configured to a user's personal computer.
2. Any password resetting's left for the ICT employees.
3. There are low training costs for the current system.
4. It requires a low initial outlay. The setup is relatively cheap. It does not need any complicated equipment to keep it running.

### 3.4 Process Analysis

According to Andersen (1999) a process is a logical series of related transactions that converts input to output. It involves studying the existing processes so as to come up with an abstract that captures all the key characteristics. According to University of Pennsylvania (1999) process is defined as a "black box" that transforms inputs (raw materials) into outputs (finished goods, served customers). the university of Pennsylvania stated that after different processes have been identified the next step will be carrying out the process analysis of which is aimed at Finding the process which is limiting the rate at which the process generates Output, Find the maximum rate at which the process can generate output (capacity) and Compute the time it takes for a flow unit to go through the process. That is processing time and waiting time. It also stated that process analysis is important in computing the time it takes to fulfill an order of a given size.

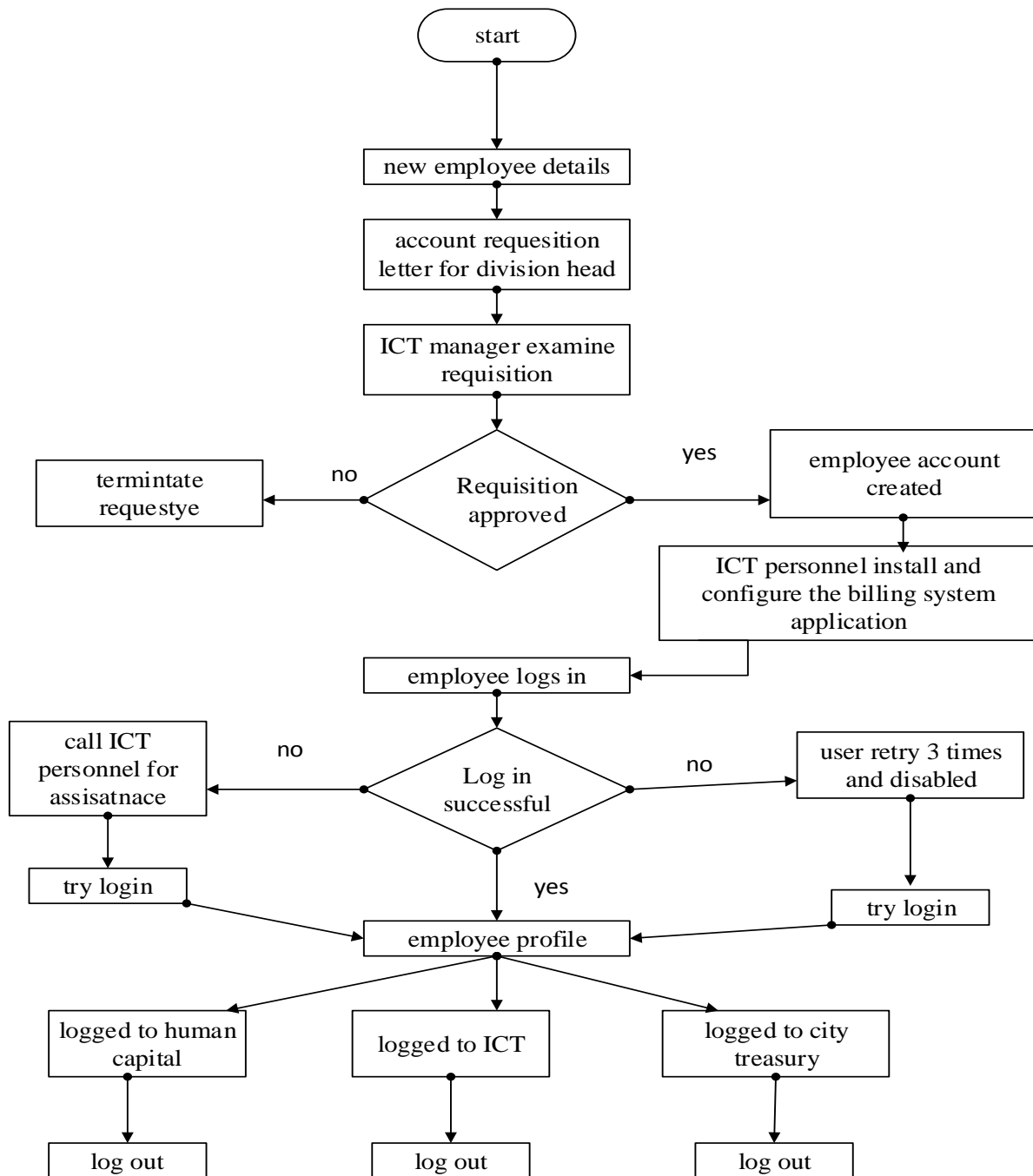
inputs	process	Outputs
Employee details	Recording employee details And creating user account	Report on business letter location
Account details	Analyzing business transaction	User account details
Business transactions	Report generation	Employees details
	Extracting data from BIQ	Executive business analysis of combined transactions

**Table 3.1 Input, Process and Output**

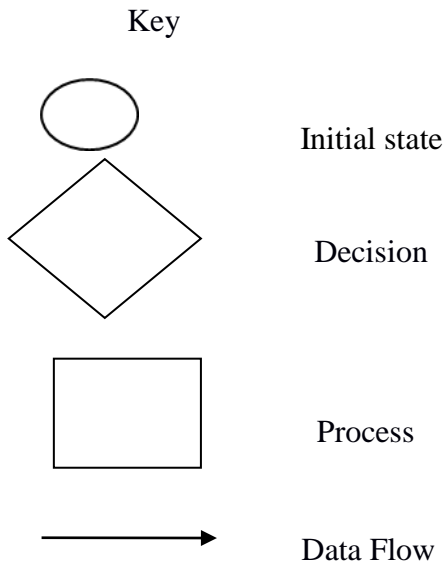
#### 3.4.1 Activity Diagram

An activity diagram models information flow and control flow of a process (Schreiber, 2000). Fowler (2000) also stated that an activity diagram describes the workflow behavior of a system. He goes on to say that it the state of activities is reviewed in activity sequence and

the diagram will be showing activities that are conditional or parallel. The current system activity diagram is shown in fig below



**Fig 3.1 activity diagram**



### 3.5 Data Analysis

Data analysis is cleaning, transforming, process inspection, support decision making and modeling data with the goal of highlighting useful information (Schwables, 2006). It encompasses diverse techniques and includes the following.

#### 3.5.1 Context diagram of current system

A context diagram is a top level data flow diagram which only shows one major process node that generalizes the functionality of the entire system according to Mall (2009). It is a summarized data flow diagram. It is a summarized dataflow diagram.

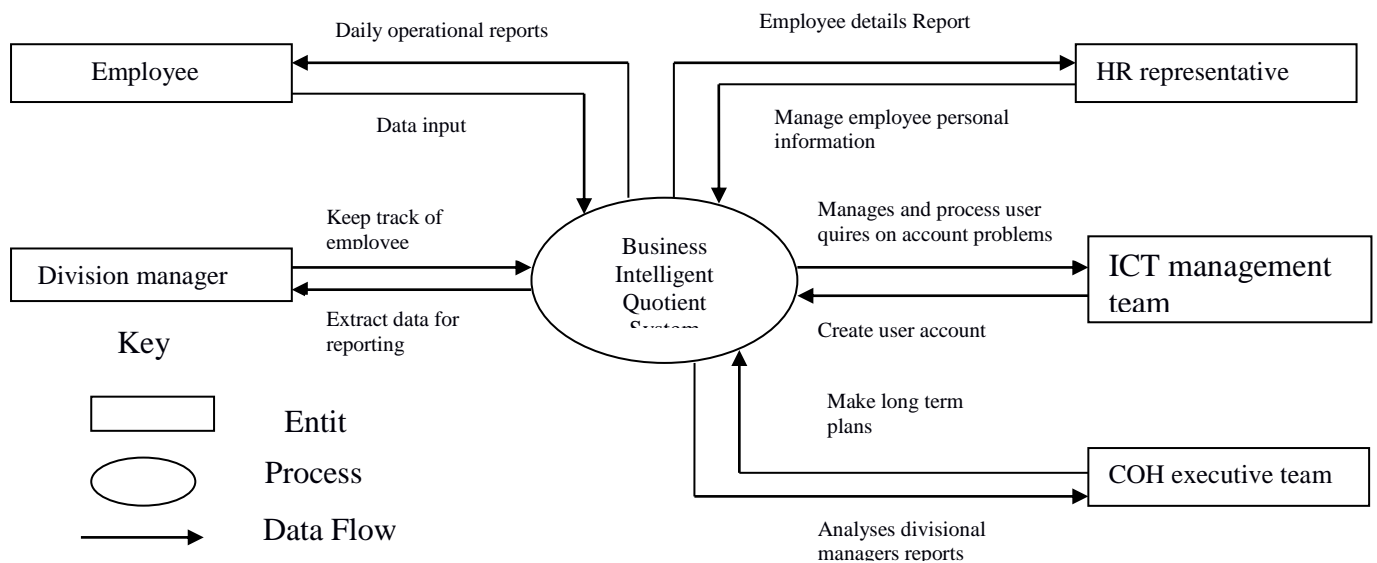


Figure 3.1 Context Diagram

### 3.5.2 Data flow diagram of the current system

Data flow diagram (DFDs) of the current system is a diagrammatical representation of the relationships among and between various components in a system according to Mall (2009). They play a vital role in modeling high-level detail and shows how input data is transformed into output through a series of functional transformations. The major components of a DFD include entities, data flows, process and data stores which are logically linked to produce a logical view of the whole

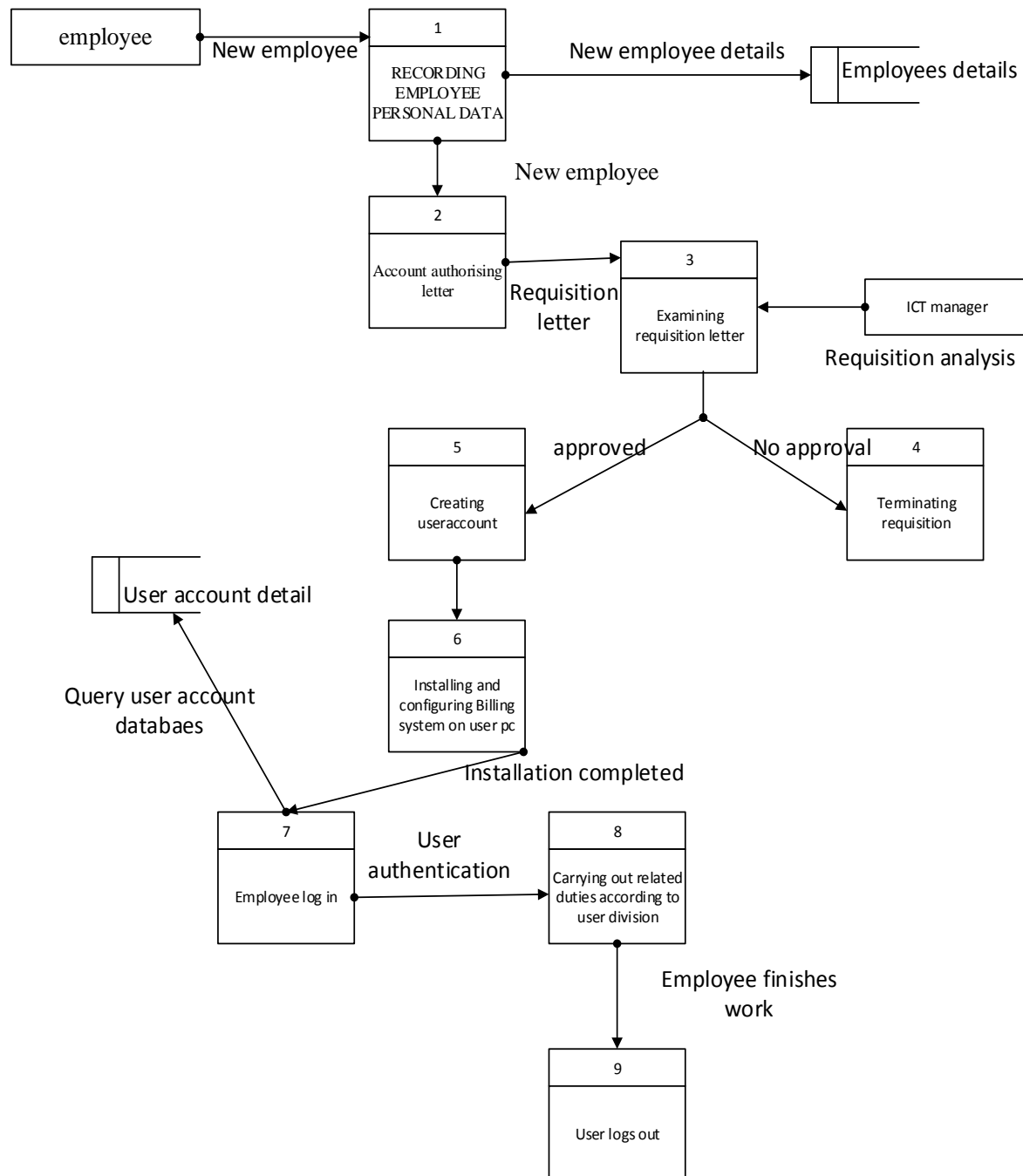
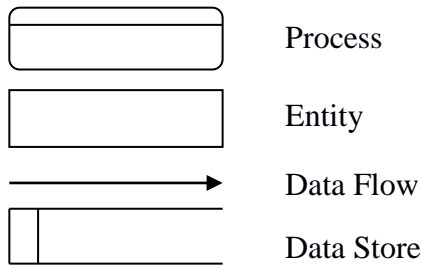


Fig 3.3 Data Flow Diagram

### Key



### 3.6 Weakness of the current system

The current system is a mixture of manual and computerized system. It is used by limited users that are other employees don't have accounts. The system is not web based and does not support other file transfers. Also Operations which are interdepartmental are not fully supported and information dissemination is limited with the limited users and the language used to design the current BIQ system. The system has to be installed and configured in each user personal computer using the system. It is time consuming and sometimes the desktop icon can corrupt and the IT personnel have to go and reconfigure the system. More so updates on meetings and research tasked to the members are obtained on the date of the next meeting. After a workshop by the human capital department, the outcomes are typed, printed and distributed as flat files to the participants.

### 3.7 Evaluation of alternative of selection software packages

This process evaluates different software development methodology which is available for the development of this Harare interdepartmental office automation system. The developer have evaluated each and set a recommendation of the best development methodology which best suits the Organization.

#### 3.7.1 Outsourcing

Software outsourcing is a process of an organisation contracting out the development of its software to another organisation or individual David and Siddons (1997). The contracted partner will carry out all development process consulting the contracting company at each stage for progress purposes. That is the organisation will have to pay the agreed amount to the contracted partner for their effort

### **Advantages of outsourcing**

Contracting an independent organization or individual will benefit the Harare city council on a number of ways. Installation time is likely to be reduced. Also the ICT personnel will have time to concentrate on the core business of the organization that is maybe user support. Updates of the outsourced software are likely to be received freely

### **Why not outsourcing**

Though the organization may seem to be benefiting it is also costly to contract an independent developer. The developer will not be directly linked to the users and the functionality of the system may be violated. The contracted organization will also have access to the organization confidential information which becomes a risk to the organization. That is if the organization will not be trust worth. Though it will save time but outsourcing will reduce competitive advantage of Harare city council since the contracted organization may sale the same application to its rivals

### **3.7.2 In-House Development**

This is when organisation have their own development department responsible for producing software for interior use Ishenko (2005) that is to say In-house development is designing an application from scratch from within the organization. That is the available employees of Harare city council will be contracted to design the system

#### **The advantages of in-house development are**

In-house development will be of great advantage to the organization if implemented. Firstly the development team will be directly linked to the users of the system and any change to user requirements will be directly responded to. Confidential information of the organization will be secured and the software will be customized for competitive advantage. System update and maintenance will be easy.

#### **Why not in-house development**

Though an organization will benefit from an in-house development it tend to have a number of draw backs. It will take much time of the ICT personnel and their core business of the will be overlooked. If the new system requires new programming language which the available employees are not used in training will need to be contacted and hence it can be costly. New development technologies if needed will have to be acquired which may be only used during the development time.

### **3.7.3 Improvement of the current system**

This is an alternative development technique which seeks to upgrade the available working system. That is identification of weakness in the available process and finding ways to improve them.

#### **Advantages of improving the current system**

The improved process is likely to work on the available technology and hence there may be no need to acquire new software and technology. Less time is likely to be taken since the people are used to the system. More so, improvements made are likely to face resistance since the users are used to the system

#### **Disadvantages**

The available programming language might not be able to solve the problems available and hence a direct changeover will be expected. If there is any need to increase the personnel the salaries will also have to increase since work load may have increase on its ICT employees

### **3.7.4 Recommendation**

The developer after evaluating a number of development alternatives, have chosen the technique which he thinks will best suit the available problem. In-house developments have been chosen due to its advantages and to the problem definition. The software need to be customized and need to be web based which is not support in the available language used to develop the BIQ system. Available of the skilled ICT personnel knowledgeable in the language also have contributed to the system being developed from within the organization

## **3.8 Requirements Analysis**

According to Bochman (2010) it is the process of studying and analyzing user and client problems and arrives at problem domain. He stated that the main objective of requirement analysis are to find the boundaries of the current system ,detect and find solution to user requirements, priorities and triage requirements and evaluate requirements for desirable qualities.

Having evaluated the current system different user requirements have been identified which will map the development of the proposed system. User requirement is classified into functional and non-functional requirements.

### **3.8.1 Functional requirements**

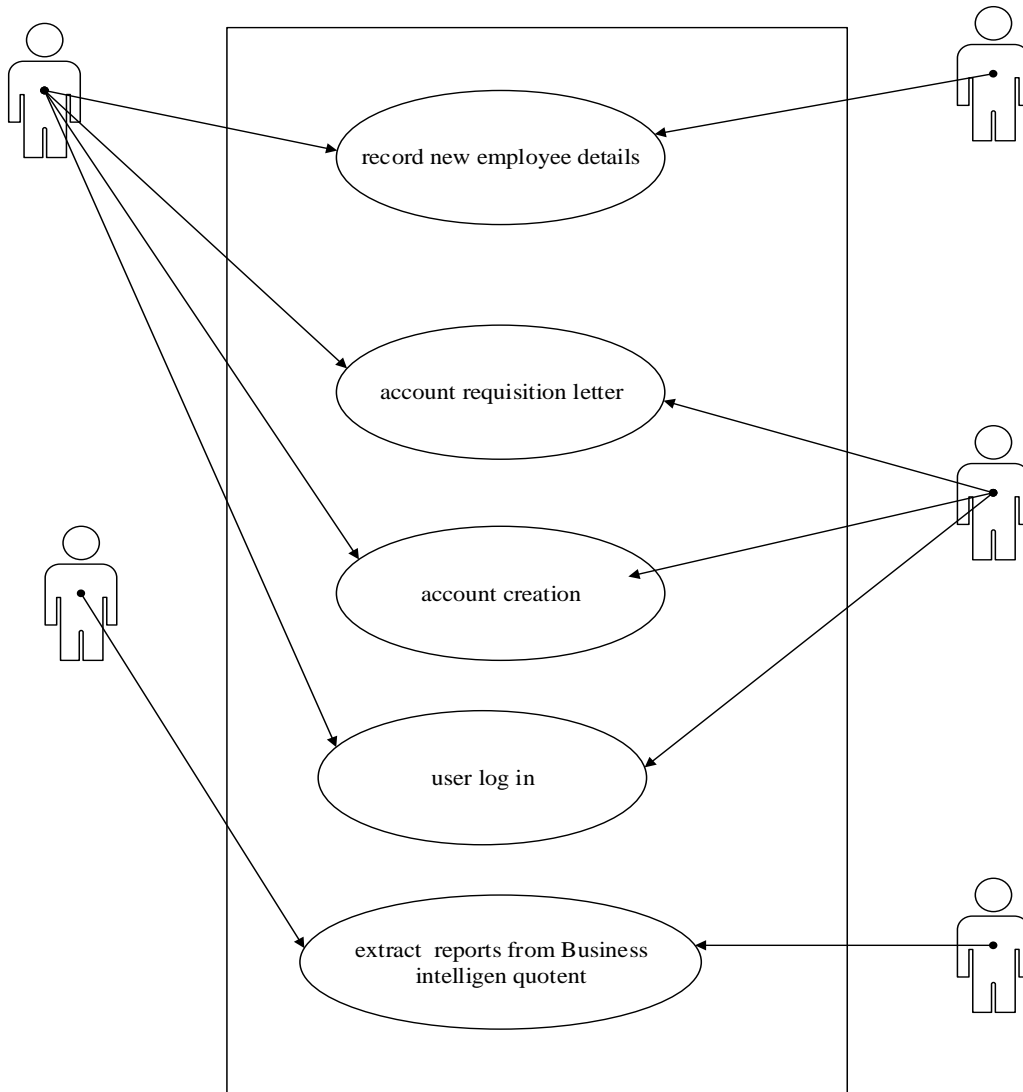
According to Hughes and Cottrell (1999) functional requirements are defined as the deliverables of the end system or what the final system should perform. They stated that system analysis and design methodologies such as SADT and information engineering are structured that the functional requirements process is done earlier in the project. Douglas (1997) also stated that functional requirements depend on the type of software, expected users and the type of system where the software will be used. He goes on to say functional requirements should define the system services in detail.

In summary it is data need to be inputted, processes involved and the output of the system. That is it describes the basic functionality of the system. The functional requirements identified include

1. Record employee personal information and create his or her own account according to their access levels.
2. Design a web based employee collaboration system where users will login, perform their various activities and share information.
3. Develop a system which allows users record the details of business letters in circulation and allows easy tracking of the current position and status of each letter.
4. Designing an electronic archive system where user uploads their important documents and access them from any office
5. Managing projects undertaken by Harare city council and recording any information related to them.
6. Provide a employee chatting platform where users share information according to area of specialization
7. Facilitate a budget creation process by each division and enable requisition of stationery to be done according to budgeted amount

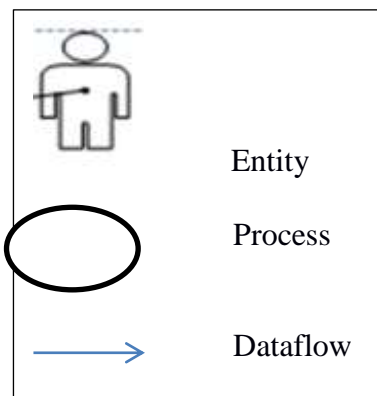


### 3.8.2 Case Diagram



**Figure 3.4 Use Case Diagrams**

Key



### 3.8.3 Non-functional requirements

According to Lee (2012) non-functional requirements are different user needs placed on various attributes of system functions. These are mainly functionality which every developed system is expected to deliver. These may include user friendly interface, compatibility with different operating system platforms, providing maximum security through user authentication, produce reports in different visual aids, self-error handling and providing a backup for the system

<b>Property</b>	<b>Measure</b>
speed	Processed transaction per second, user/event response time screen refreshment time
size	K Bytes Number of ram chips
Ease of use	Training time Number of help frames
Robustness	Time to restart after failure Percentage of events causing failure Probability of data corruption on failure
portability	Percentage of target dependent statements Number of target system

**Table 3.5 non-functional possible metrics table**

### **3.9 Conclusion**

Analysis phase is a very important chapter in a system development life cycle. It is the key to the problem definition and development of the new system functionality. Analyses of the current system have been successfully carried out and the system design phase is expected to be an easier one since user requirements have been defined clearly in this chapter.

## CHAPTER 4: DESIGN PHASE

### 4.1 Introduction

This chapter introduces the developer to the more practical phase. Having thoroughly set a plan and analyzed the operations of the current system the developer is now on this phase going to put his aim of study into practical action. That is the design of the actual proposed system. This will involve database creation, interface development and writing of the actual code. The developed system should show the difference between the current systems analyzed in chapter 3. The functional requirements should be a primary requisite in designing the proposed system. This chapter is going to allow the reader to this document visualize the system without actually being in contact with it and be able to determine how it works.

### 4.2 System Design

This system design phase will concentrate on the functionality of the Harare city council inter-departmental office automation system (HCCIDOAS). That is it will concentrate on how the system will run. Generally the HCCIDOAS will allow recording of personal information of a new employee and creation of his or her account according to his access level by ICT personnel. The new employee according to his access level will be able to carry out the duties assigned to him which include creation of budget and making requisition by the management personnel of each division, recording and tracking of business letters and archiving of important documents. The standard users will be able to mainly view queries from the database such as requisition details and will not have privilege to input confidential information into the system. Below is a breakdown of the department the developer have chosen to work with according to area of his study.

#### **Human resource department**

The human resources is known as a department which is responsible for the recruitment process and regulation of employee relations in an organization. The proposed system will allow this HR department to record and maintain new employee's details. It also have a mandate to maintain and update employee personal data, activities of the department and upload organizational culture documents which employees may download at any time when need arise. One of the main division include the capability development and employee relations.

### **Town clerk department**

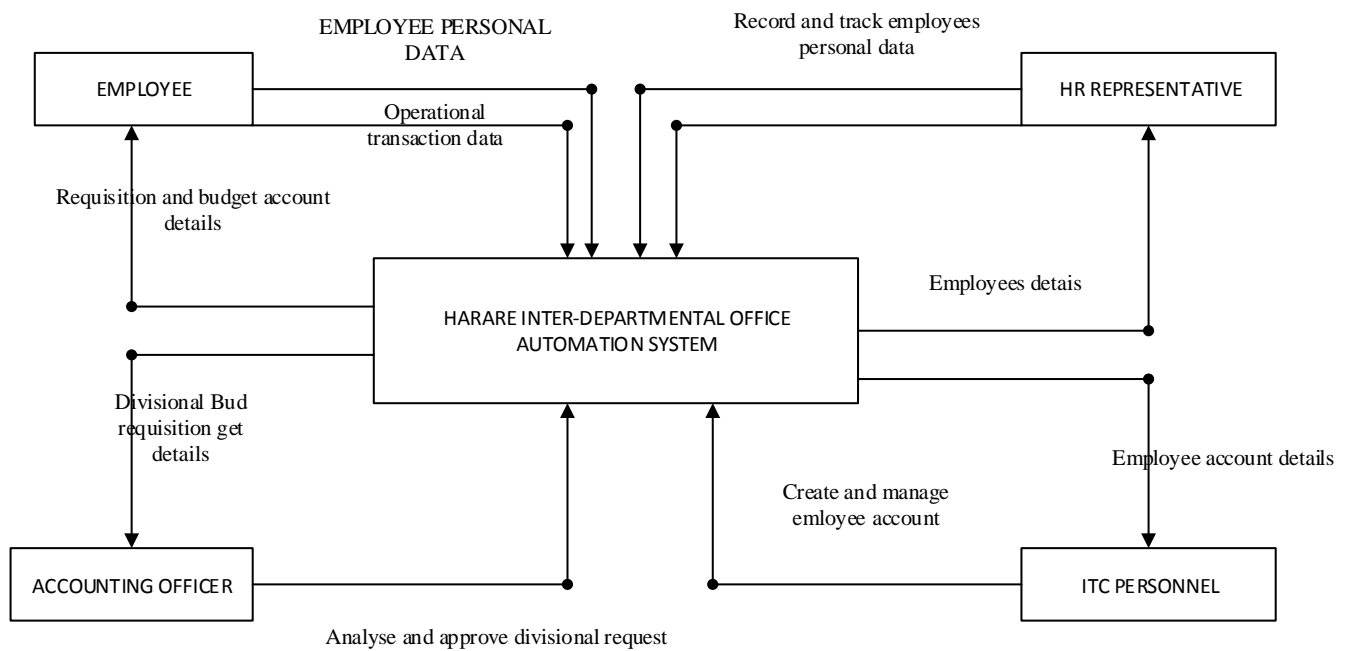
This department has a number of divisions under which falls ICT. The ICT division is responsible for creating and managing user accounts to the Harare city council inter-departmental office automation system. The division is also responsible for maintaining and protecting the organizational digital data and ensures users access what is intended for them. That is managing who is access is what information and at what time. It handle all ICT related solutions and support

### **The city treasury department**

This is one of the major department in the Harare city structure. It has also many divisions which operates under it. These include the central accounts and the stores division. The central accounts will on this proposed system evaluates divisional budgets and requisition. That is making an approval or rejection to divisional stationery request. The stores division will take approved requisition and make necessary purchase and finally update necessary division for collecting there requisition stationery.

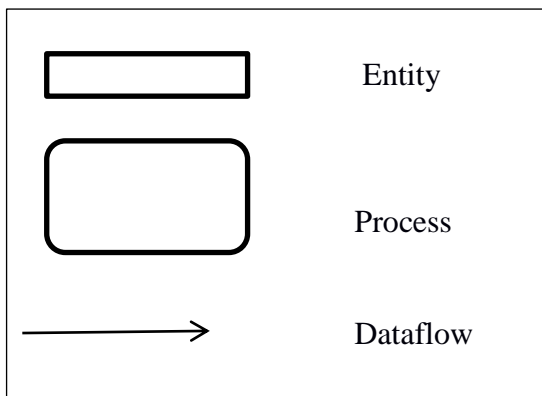
#### **4.2.1 Context diagram of the proposed system**

A context diagram is a diagrammatic representation of major entities and establishment of system endpoints (boundaries) (Donald, 2000). Systems are never exhausted and therefore a context diagram will state boundaries to the developers' area of study. This is useful mainly in analyzing system deliverables and majors processes to be included in the system. Context diagram represented the proposed system in a logical way. The Harare city council inter-departmental office automation is expected to have four major entities. That is the new employee, the human capital representative, the ICT personnel, and the accounting officers according to the developer's area of study. On figure 4.1 is a context diagram of the proposed system



**Figure 4.1 Context diagram of proposed system**

**Key**



**4.2.2 Data flow diagram of the proposed system**

A data flow diagram is a logical representation of the project or system in a diagrammatical manner according to Greg (1998). It shows how information flows within the system. That is from one entity to another and from process to process until the developers objectives are fulfilled. The proposed system is expected to have four entities operating within in major processes and four data stores. The major entity according to the developer is a new employee of which all other entities lie. The processes include recording new employee

information and creating account, preparing divisional budgets, recording and tracking business letters, making stationery requisitions and querying to check on approval of budgets and requisitions

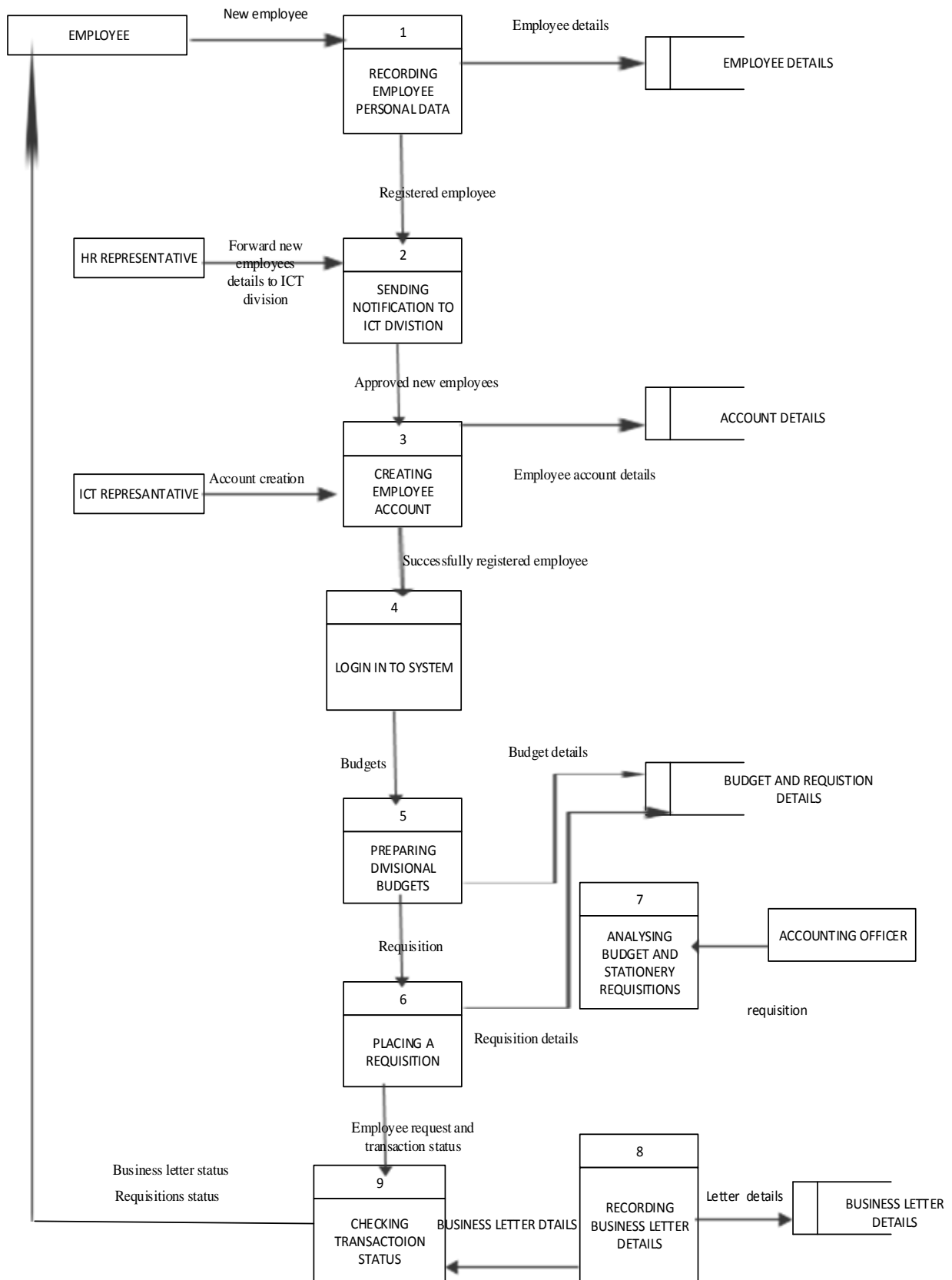
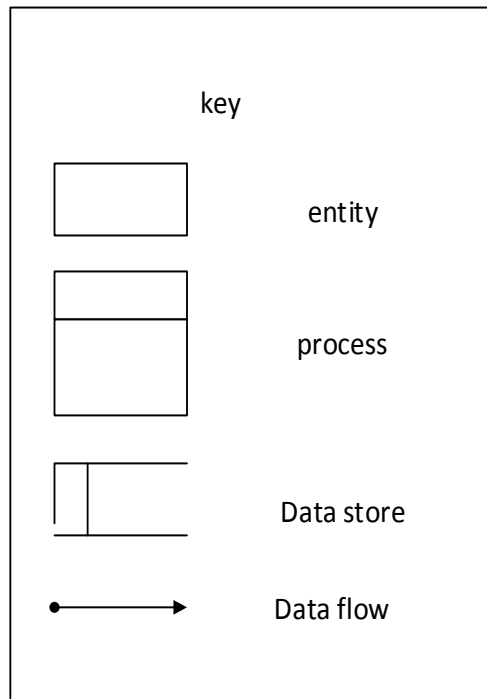


Figure 4.2 Data flow diagram of the proposed system



### 4.3 Architectural design

Software requirements should be expressed in to an architecture that describes a software structure and determining its components according to (Pressman 2000) words. The main aim of architectural design is to come up with an abstraction level where the designer will specify the functionality and performance of the system and evaluating all top level designs. It also provide a guide line to enhance the system by describing those modifiable features of the system affecting the system integrity. Architectural design also help in coming up with the preliminary versions of the documentation

#### 4.3.1 Network Architectural Design

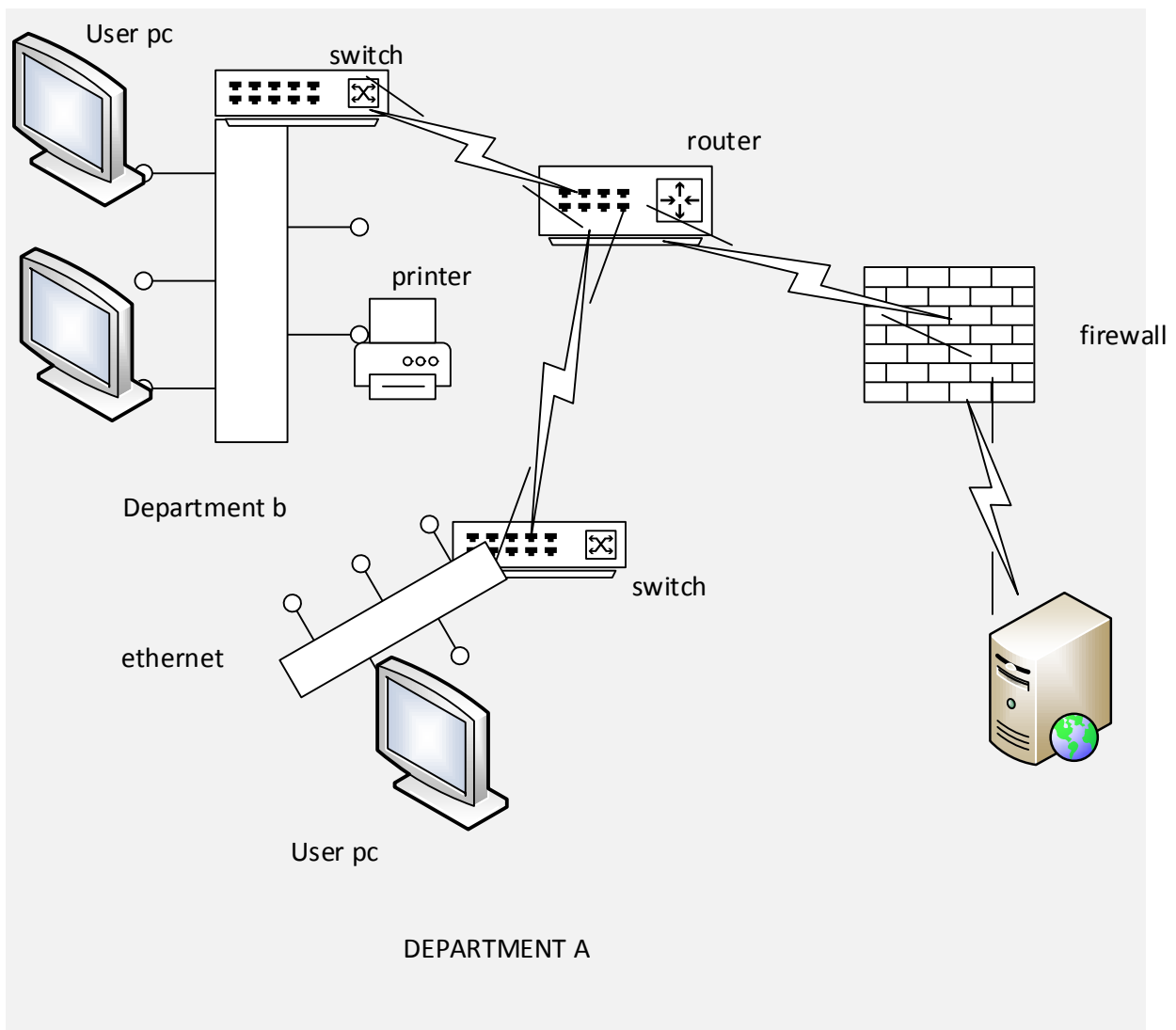
Network architectural design is a phase that seeks to describe the network environment in which the proposed system will be operating (Chen and Roughgarden 2009). The network architectural design mainly how users are going to access the main server. It looks at the physical location and connections of users in a network. That is who will be able to access it. Taking for example if only employees should access it the system will require most preferably local network and a world wide network structure if it is to be accessed by every one.

The harare city council interdepartmental system is going to be running under a local network. That is the system will not be accessible to any one outside the council offices.



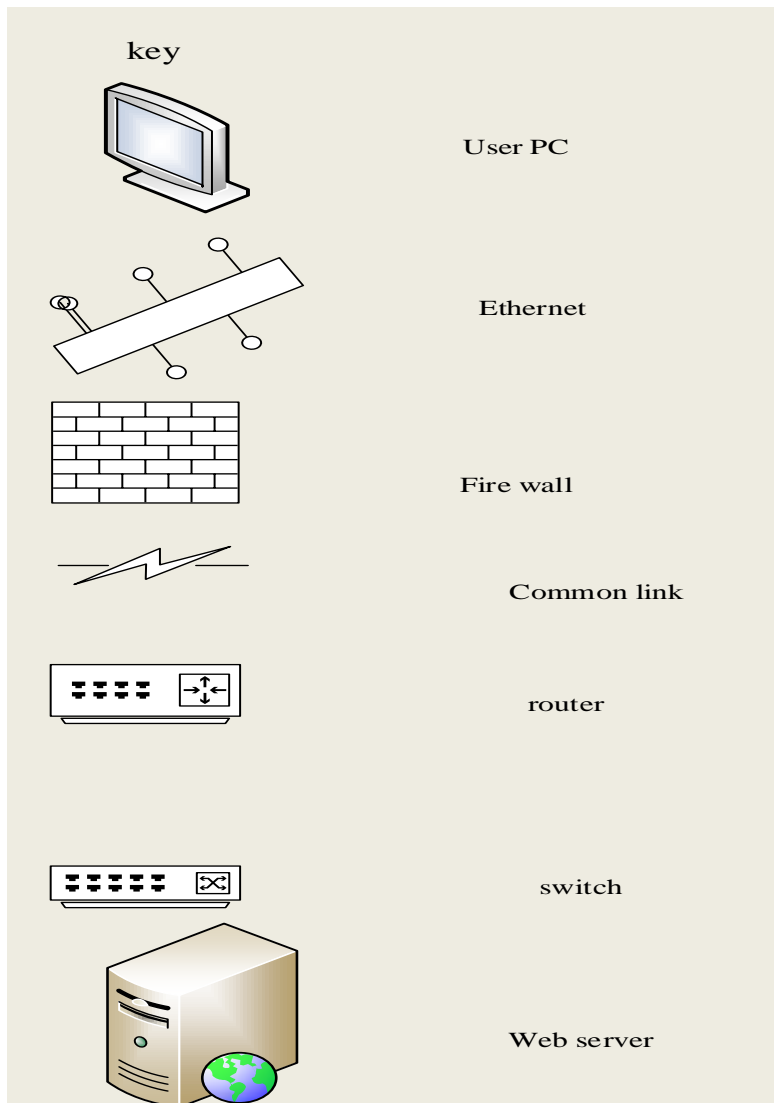
network will connect different users from different offices and buildings. The network structure is expected to be a metropolitan network

The network architectural design is going to be set up that it is going to connect each user PC to the server machine. The users will then access the information through a web based platform. A group of users from say the same department will be connected to a switch and 24 port switch are going to be used. Routers are going to be used to link users located in different buildings.



**Figure 4.3 Network Architectural design**

KEY



#### 4.4 Physical design

This involves the translation of the abstract model into the specific technical design. Physical design is hardware and software requirements of the proposed system (Garlan and Shaw 1994). The hardware for the client and server machine will vary and will be specified together with the network and software required. The system is going to be a web based and hence client machine need not have sophisticated specification since all process will be carried out by the server. The server is going to be processing multiple user request in a single second and hence its specifications should allow very high processing speed to reduce waiting time. For the Harare inter-departmental office automation system, the developer has

proposed the following client and server machine requirements for maximum efficiency. The proposed system is also expected to operate under different platform. That is different operating system.

<b>Server machine</b>	<b>Software\server</b>	<b>Other hardware requirements</b>
8GB Ram	Software's	24 Port Switch
2.8GHz processor	Windows 7 ultimate	Patch panel
1 Tera byte hard drive	Mozilla Firefox, internet explorer,	router
	MySQL server	
	Macromedia Dreamweaver	
<b>Client machine</b>	<b>Software\server</b>	
1GB Ram	Software's	
1.65 GHz processor	Windows 7 ultimate	
80 GB hard drive	Mozilla Firefox, internet explorer,	

**Table 4.1 hardware and software requirements proposed system**

#### **4.5 Database Design**

Database is an organization of data in a specified format which will make it easier to manage, and retrieve in the future (Ramakrishnan and Gehrke 2003). A database should be able to return user request fast and accurately. It should also be able to handle errors. They also stated that a database should allow data sharing, maintain data in its original format, and allow multiple access in a single time.

MYSQL database have been chosen by the developer for the proposed system. One of the greater advantage of the chosen database is that is open source and it does not require too much processing power.

Designing a standard database system of either a new system or improvement of an existing system is beneficiary for future grow. That is a database designed in a standardized form will be also easier to maintain and upgrade.

The developer has chosen to maintain the ANSI SPARK database standard proposed in 1975 in developing the system. The standard seeks to filter access to the data of user at different level. That is the data in the database will be stored in a specific feasible format and will be available to different users in different formats as they desire. The user levels include external view, conceptual view and internal view

### **External view**

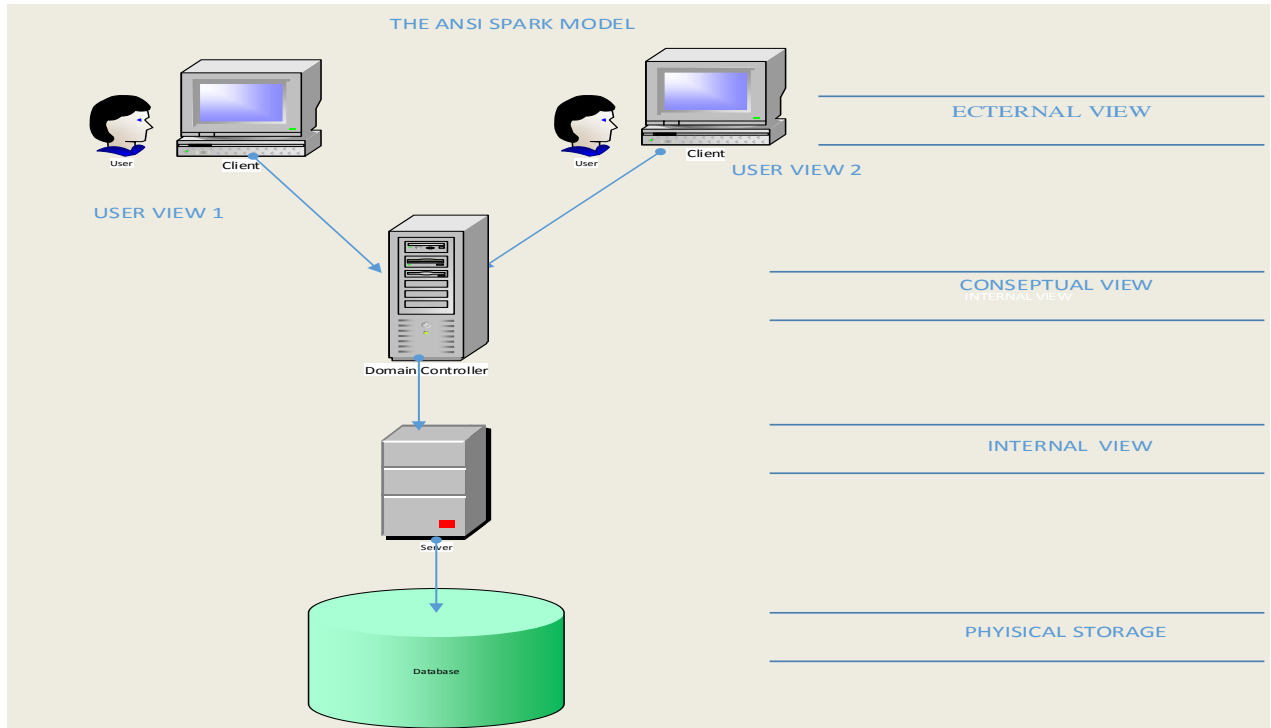
This is the user view level of the database. It consist of a user who will be having limited view rights to the one who will be accessing the whole database. Each user will be viewing the same information but in different formats as he or she desires. Therefore the developer is going to differentiate user view with respect to the department, division or individual needs.

### **Conceptual view**

This is usually known as community view of the database. It is the level of the database which contains rules and information about the structure and type of data. Conceptual view shows all entities, attributes and relationships of data in the database of an organization.

### **Internal view**

This is data definition level. It state what data is stored in the database and usually is for access by the database administrator. It is the lowest level and the data definition is normally presented in a language understandable to the knowledgeable personnel only such a the database administrator



**Figure 4.4 The ANSI SPARK model.**

#### **4.5.1 Enhanced Entity Relationship Diagram**

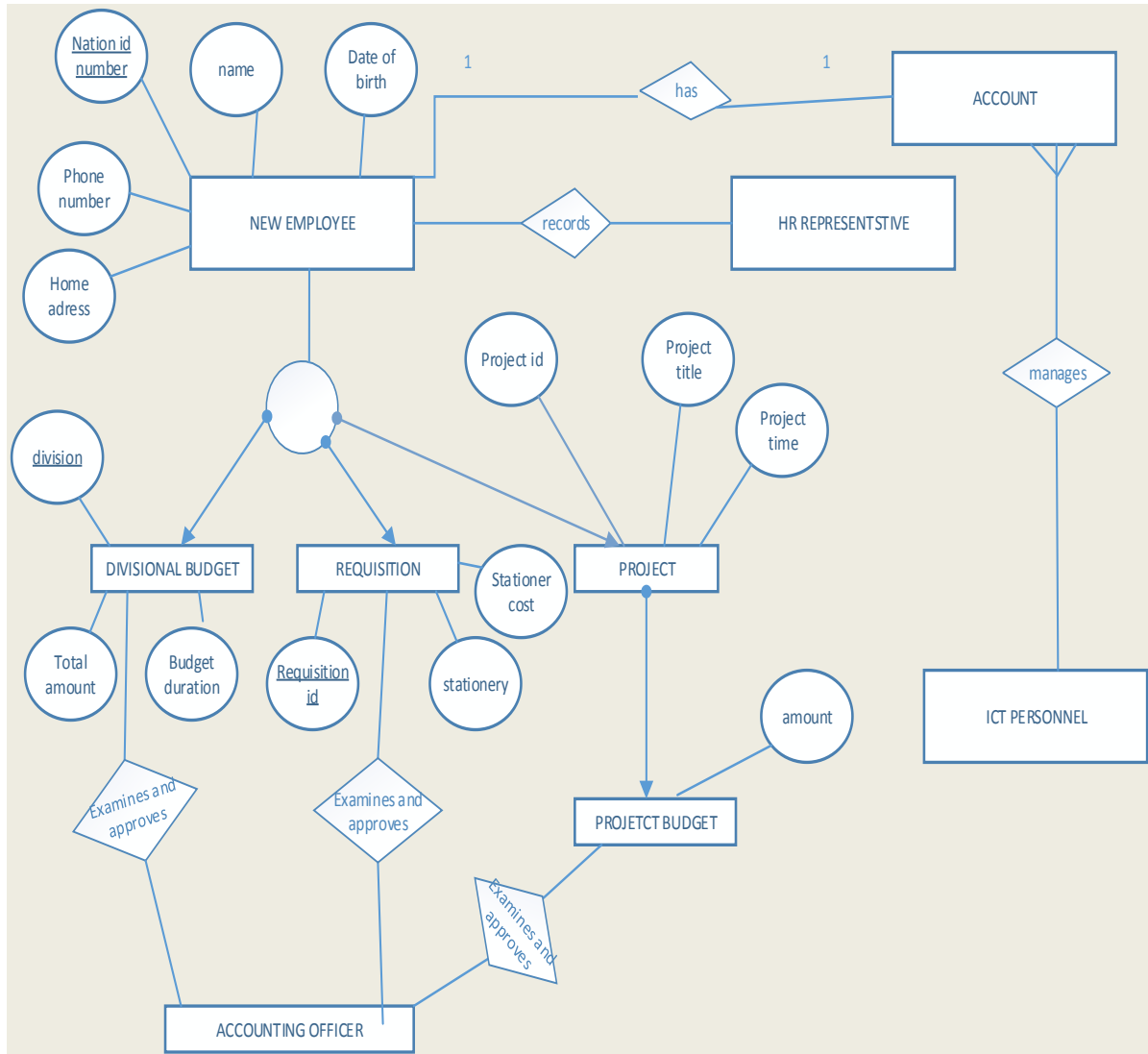
Entity relation diagram is a high level data modeling technique that is used by system developer to understand the system requirements (Larson and Gray 2011). That is they provide a visual and graphical aid. Once the developer is satisfied with the ER diagram together with the user, the diagram will provide specification of what need to be accomplished.

The Harare city council inter-departmental office automation system has a number of entities which have been described in the table below. The table represents an entity with its corresponding attribute

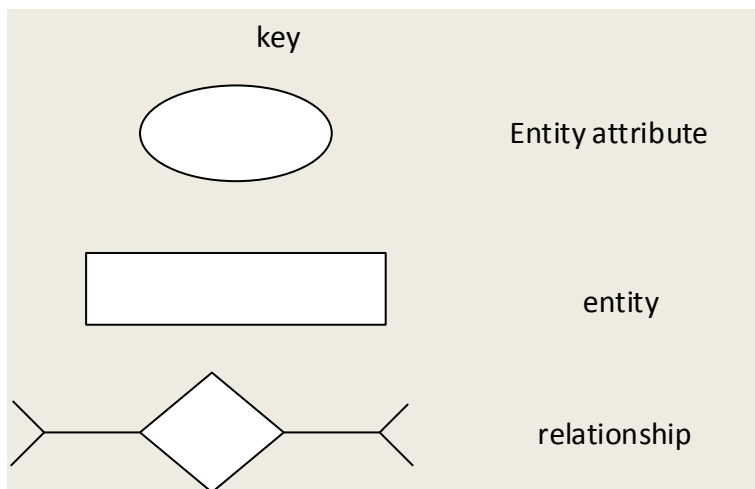
<b>Entity</b>	<b>Attributes</b>
Employee	<ul style="list-style-type: none"><li>i. Full Name</li><li>ii. department</li><li>iii. Contact Details</li><li>iv. Access level</li></ul>
Business letter	<ul style="list-style-type: none"><li>i. Letter ID</li><li>ii. type</li><li>iii. status</li></ul>
Project	<ul style="list-style-type: none"><li>i. project name</li><li>ii. project ID</li><li>iii. status</li></ul>
Budget	<ul style="list-style-type: none"><li>i. division</li><li>ii. budget term</li><li>iii. status</li></ul>
Requisition	<ul style="list-style-type: none"><li>i. Requisition ID</li><li>ii. Division</li><li>iii. status</li></ul>

**Table 4.2 Entities and Attributes**

Enhanced Entity relationship diagrams reviews the logical relationship among various entities. It helps in the database and interface design of the system. At this level the developer is able to identify primary keys for each entity and establishing what relationship exist among these entities. Different relationships will include one to one relationship (one entity have a single relationship with another), one to many (on entity have many relationship with entities) and many to many relationship (many entity have many relationship with another).



**Figure 4.5** entity relationship diagrams



#### 4.5.2 Databases

<b>Employee database</b>		
Field name	Data type	description
name	Varchar(20)	Name of the employee
surname	Varchar(20)	The surname of an employee
National id	Varchar(12)	National identity number of employee
Home address	Varchar(50)	Home address of employee
Phone number	Int (15)	Employee phone number
gender	Varchar(10)	Employee sex(male or female)
department	Varchar(50)	Department where employee will be working
Division	Varchar (50)	Division where employee will be working
Office number	Int (5)	Office number where the employee will be working
Phone extension	Int (6)	Work phone extension of the employee
Building	Varchar(80)	Building where the employee will be working from
email	Varchar (20)	Work employee email.

**Table 4.3 User details**

<b>Employee account table</b>		
Field name	Data type	description
Employee id	Varchar(6)	Employee registration id
username	Varchar(20)	Employee username for logging into the system
password	Varchar(20)	Employee password for logging into the system
date	Date()	Registration date

**Table 4.4 User account**



<b>Divisional budget</b>		
<b>Field name</b>	<b>Data type</b>	<b>description</b>
division	Varchar(40)	Division where the employee works from
department	Varchar(40)	department where the employee works from
Stationery item name	Varchar(40)	Stationery item name budgeted
quantity		Quantity budgeted for
Unit amount		Price per unity budgeted
Total amount		Product of quantity and unity price

**Table 4.5 Budget**

<b>Stationery requisition</b>		
<b>Field name</b>	<b>Data type</b>	<b>description</b>
division	Varchar(40)	Division where the employee works from
department	Varchar(40)	department where the employee works from
Stationery item name	Varchar(40)	Stationery item name budgeted
quantity	Int (3)	Quantity budgeted for
Unit amount	Float(4)	Price per unity budgeted
Total amount	Float(4)	Product of quantity and unity price
status	Varchar (15)	The status of a requesting

**Table 4.6 Requisition**

<b>Business letter in circulation</b>		
<b>Field name</b>	<b>Data type</b>	<b>description</b>
Letter id	Varchar(8)	Primary key
Owner name	Varchar(50)	The owner of the letter
Subject	Varchar(50)	Letter agenda
Office number	Int(6)	Office where the letter was received
building	Varchar(40)	Building where the letter was received
Date in	date	Date when the letter was received
status	Varchar(8)	Approval status

**Table 4.7 Business letters**

<b>Project description</b>		
<b>Field</b>	<b>data type</b>	<b>description</b>
Project id	Int (10)	Primary key
Project name	Varchar(8)	The name of the project
Start date	Varchar(8)	Project start date
End data	Varchar(8)	Project start date
Project documentation	Varchar(1000)	Project Manual documentation
status	Varchar(10)	Current status of the project eg pending

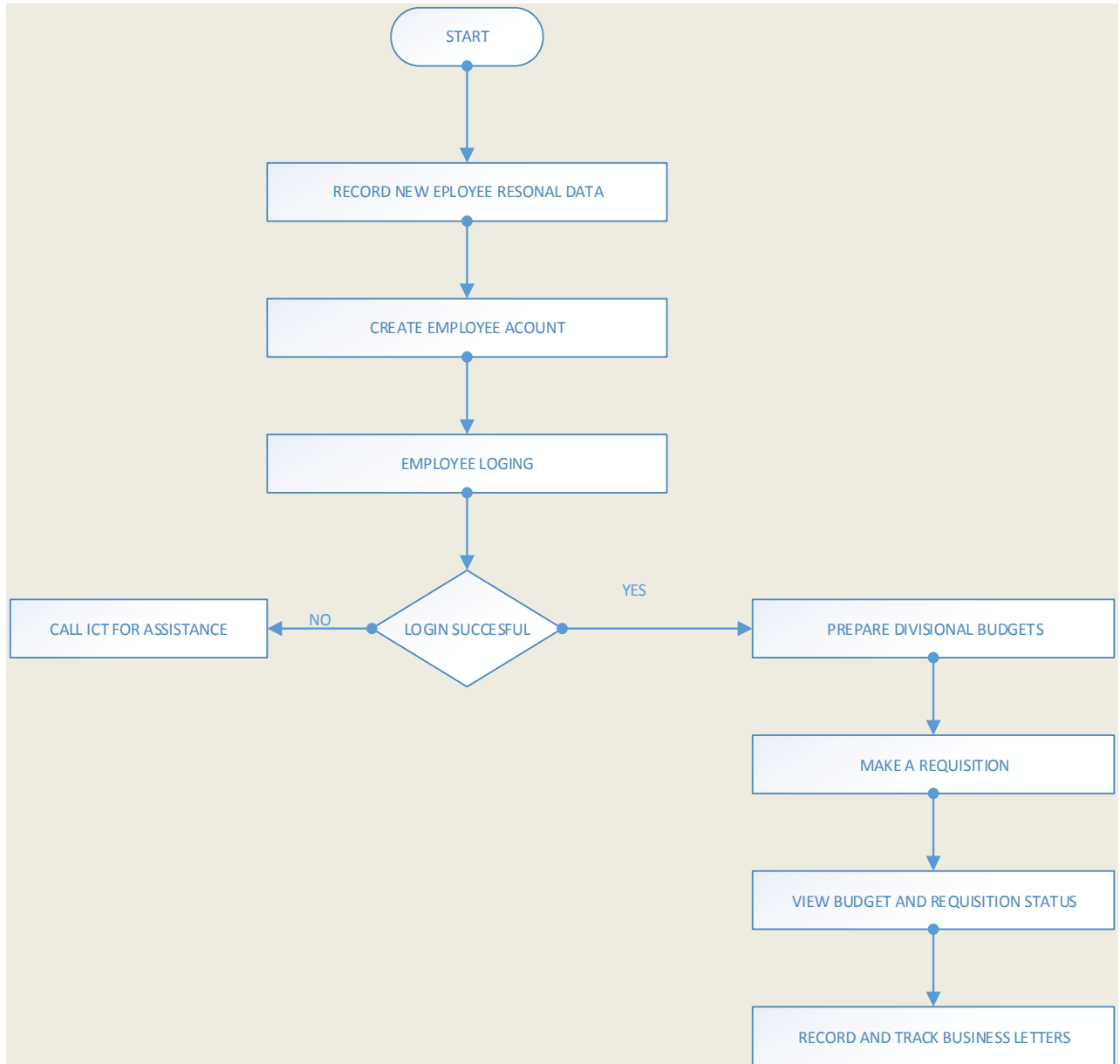
**Table 4.8 Projects**

## **4.6 Program design**

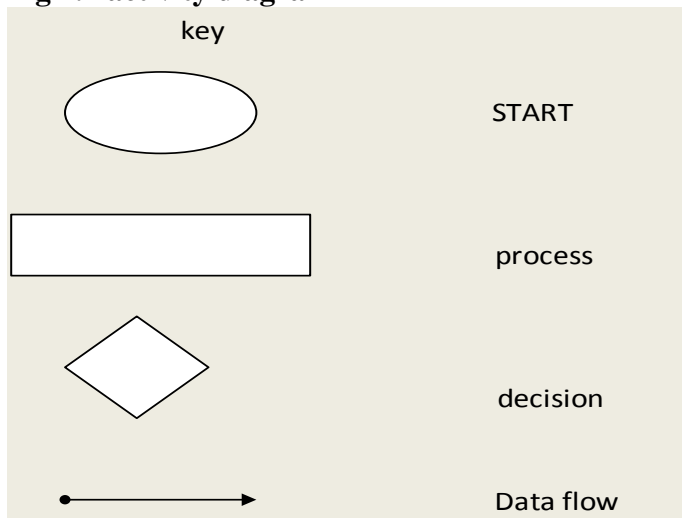
This models the various processes that are performed by the system (Fowler, 2008). He also stated that it provides the steps to be taken by the programmers before commencing coding in a specific language. The designing of system modules and determination of how they interact with each other is also done under program design. This is done using UML diagrams which includes class and package diagrams. The proper documentation of the program will make it much easy to carry out system maintenance. Program design will be shown on the class and sequence diagrams

### **4.6.1 Activity diagram**

Fowler and Scott (2000) wrote that and activity diagram is a diagrammatical representation of activities and flows of data or decision between activities. Felici (2009) view an activity diagram as how activities are coordinated to provide a service. He goes on to say that activity diagrams are good for describing synchronization and concurrency between activities.



**Fig 4.4 activity diagram**



#### 4.6.2 Package diagram

According to an article by UML Tutorial for C++ Windows Platform (2000) a packaged diagram is like class diagrams that shows how classes can be divided into several applications (modules) and the relationship between packages. R Development Core Team (2008) stated that package diagrams are mostly used strictly for logical modulation, when the system may maybe too large and also stated that it is used at design stage of a project.

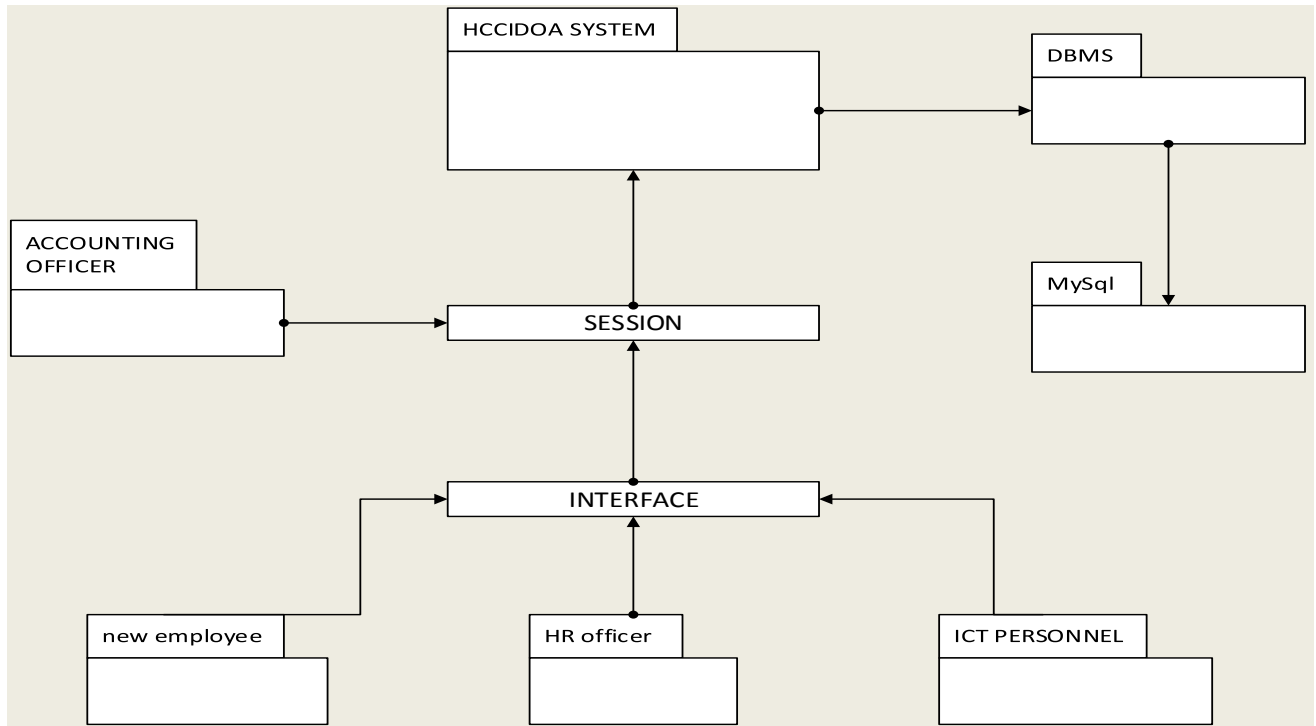
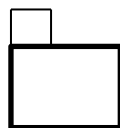


Figure 4.7 Package diagram

#### Key

Entity



#### 4.6.3 Sequence diagram

According to Felici (2011) Sequence Diagrams are interaction diagrams that detail how operations are under taken. Fowler (2008) described sequence diagram as a model describing groups of objects collaborate in some behaviour over time. He goes on to sa that the diagram describe the flow of message, events, actions between objects, show current process and

activations and typically used during analysis and project design to document and understand the logical flow of the system

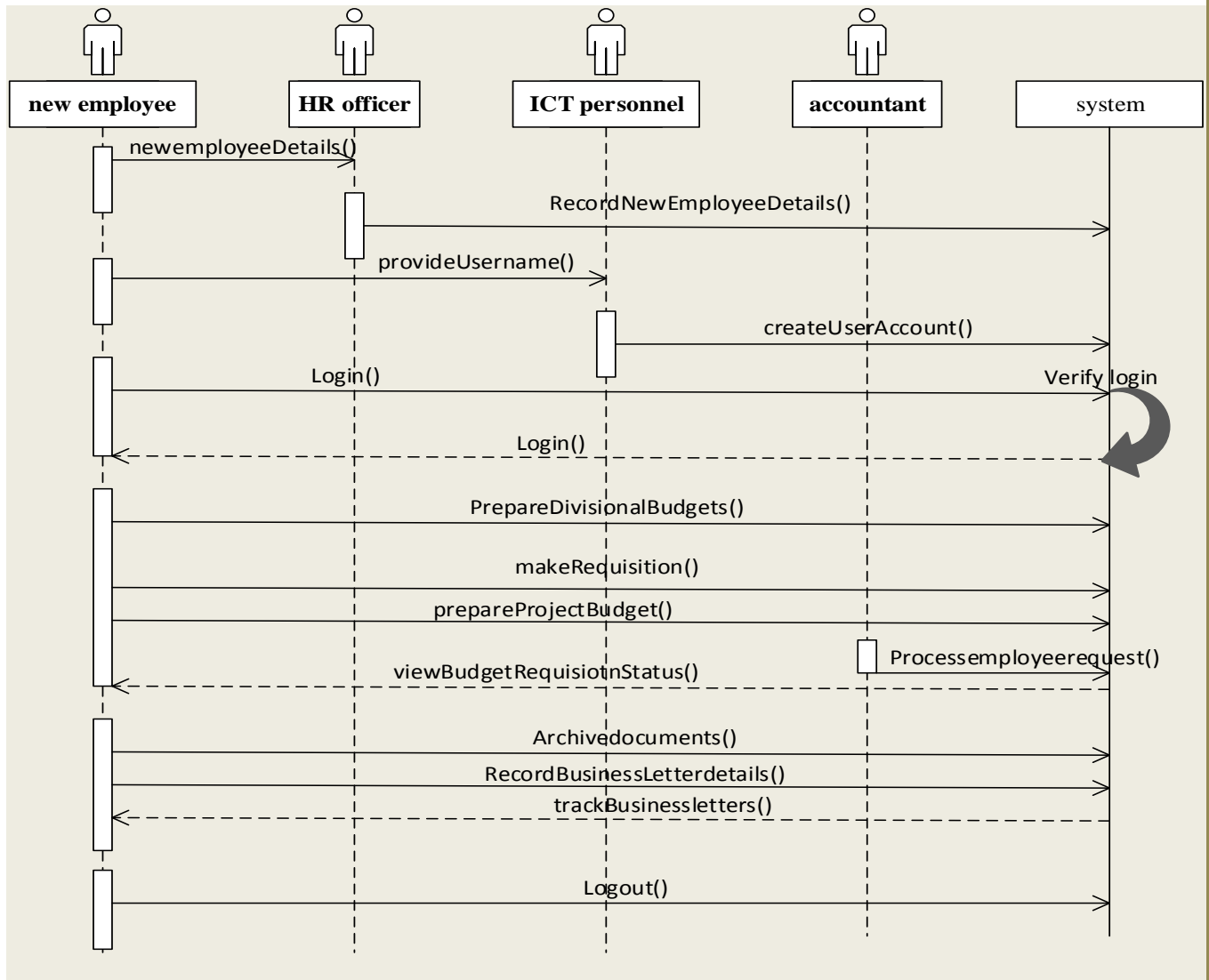


Figure 4.8 Sequence diagram

key

Symbol	Description
	Entity
	Activation
	Sending message
	Returning message

#### 4.6.4 Class diagram

Bell (2004) mentioned that the purpose of the class diagram is to show the types being modelled within a system. Martins (1997) also commented that the purpose of a class diagram is to depict the classes within a model. He goes on to say in object oriented applications class have name, attributes (variables) and operations (member functions). Bell (2004) stated that when drawing a class diagram, the class name is shown at the top compartment, the attributes at the middle and finally the operators at the lower compartment.

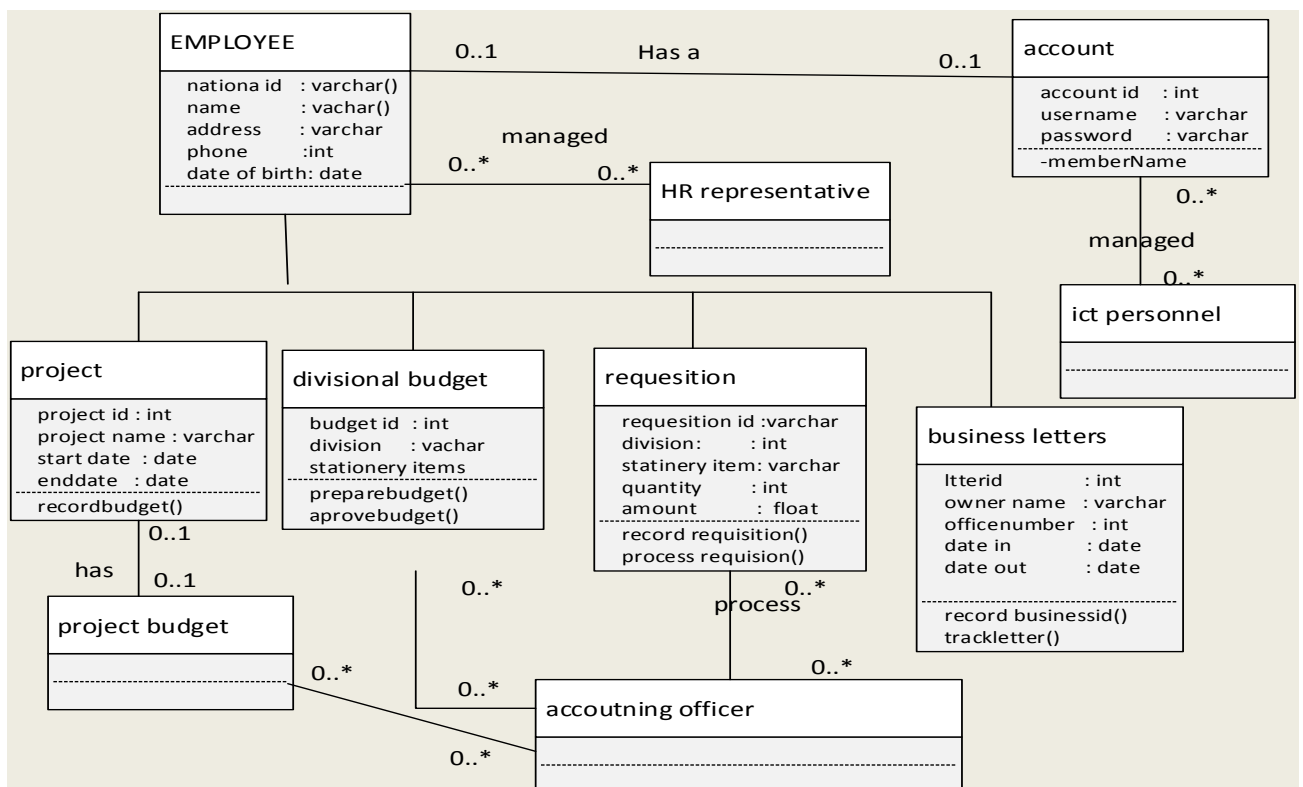
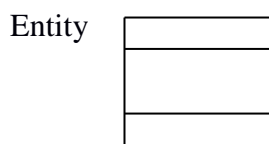


Figure 4.9 Class diagram

#### Key



#### 4.7 Interface design


According to Wiley & Sons (1997) a good user interface design allows easy, natural and interaction between a user and a system, and it allows users to carry out their required tasks

Summerville (2004) proposed that a good s interfaces should be designed to match the skills, experience and expectations of its anticipated users he goes on to say that users often judge a system by its Interface rather than its functionality. According to him again a poorly designed interface can cause a user to make catastrophic errors and finally stated that poor designed user interface software are normally never used.

(Ben. 1992) believed that before a software is designed, the user should be in the same boat (same belief) with the system. He believes that every designed software comes with its beliefs which are in built.

### Login






Users are going to be prompted to log in first before they could do or view. Every user is directed to the same login page but will be directed to different home pages according to their access levels

HARARE CITY COUNCIL		
USERNAME	<input type="text"/>	
PASSWORD	<input type="password"/>	
		

**Figure 4.10 Login page**

### Home page

When a user has successfully logged in he or she is directed to his respective home page. That is if you work in ICT division you will be directed to that respective page which shows your acces

HARARE CITY COUNCIL				
				

**Figure 4.11 User home page**

**Budget preparation**

Employees in each and every division in the management level are prompted to prepare a divisional budget at the beginning of every trading period. A budget identity number is issued to each division each year as a budget ID. Users are expected to know their budget id for them to add new item to their budget.

Harare city council			
Budget ID	<input type="text"/>		
Stationary name	<input type="text"/>		
quantity	<input type="text"/>		
unit	<input type="text"/>		
Total	<input type="text"/>		
<div style="background-color: #4a86e8; color: white; padding: 5px; display: inline-block; border-radius: 10px;">Prepare budget</div>			

**Figure 4.12 New employees detail page**

**Make requisition**

Harare city council			
Stationery item	<input type="text"/>		
quantity	<input type="text"/>		
Unit price	<input type="text"/>		
Total price	<input type="text"/>		
division	<input type="text"/>		
department	<input type="text"/>		
<div style="background-color: #4a86e8; color: white; padding: 5px; display: inline-block; border-radius: 10px;">Place requisition</div>			

**Figure 4.13 Requisition form**

**Business letters**

An electronic in tray out tray is going to be designed which is going to allow each letter in circulation recorded and make it easier the current office it is located.



Harare city council		
Letterid	<input type="text"/>	
title	<input type="text"/>	
status	<input type="text"/>	
Owner name	<input type="text"/>	
Owner address	<input type="text"/>	
date	<input type="text"/>	
office	<input type="text"/>	
<input type="button" value="Requisition detail"/>		

**Figure 4.14 Electronic in and out tray page  
Project management**

This function directs the user to where he/she should update information to a project being under taken. The user will first need to get a project identity number created by the ICT manager. Update or insert new information one need to have a project ID.

Harare city council		
<b>Project id</b>	<input type="text"/>	
<b>Project name</b>	<input type="text"/>	
<b>Start date</b>	<input type="text"/>	
<b>End date</b>	<input type="text"/>	
<b>Project documentation</b>	<input type="button" value="Load document"/>	
<b>username</b>	<input type="text"/>	
<input type="button" value="Project magt"/>		

**Figure 4.15 project information**

### Archive system

The proposed system is also going to allow users to save their important documents such monthly and yearly reports.

Harare city council		
subject	<input type="text"/>	
file	<input type="button" value="Upload file"/>	<input type="button" value="Record archive"/>

**Figure 4.16 Archive**

## Reports

The system is designed in a way that it will generate reports for the user transaction for analysis and decision making process.

Budget for TOWN CLERK – ICT DIVISION			
BUDGET FOR 6 MONTHS		FROM 01/07/2014	
ITEM NAME	QUANTITY	UNIT PRICE(USD)	TOTAL (USD)
PRINTER	2	300	600
A4 BOND PAPER	20	4	80
<b>TOTAL</b>	<b>32</b>	<b>-</b>	<b>730</b>

**Table 4.9 Budget**

### REQUISITION FOR TOWN-CLERKC ICT DIVISION

<u>DATE</u>	<u>NAME</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u> <u>(USD)</u>	<u>TOTAL</u>	<u>STATUS</u>	<u>COMMEND</u>
<u>15/08/14</u>	<u>A4 BOND</u>	<u>5</u>	<u>4.00</u>	<u>20.00</u>	<u>APPROVED</u>	<u>BUDGETED</u>
<u>02/09/14</u>	<u>PRINTER</u>	<u>1</u>	<u>500.00</u>	<u>500.00</u>	<u>REJECTED</u>	<u>EXCEED</u> <u>BUDGET</u>

**Table 4.10 Requisition**

### Electronic in-tray out tray report

After the users have been allowed to enter information pertaining each letter in circulation the system will also allow a search or track of the current status and location of the letter from any office on the client may request it. The search will allow two searches, that is search by owner's name search by letterid

<u>ENTER LETTER ID</u>		001	<input type="button" value="SEARCH"/>			
<u>OFFICE #</u>	<u>OWNER</u>	<u>DATE IN</u>	<u>DATE OUT</u>	<u>DESCRIPTION</u>	<u>STATUS</u>	
209	SHEPHERD	08/08/2014	11/08/2014	APPLYING FOR A SHOP STAND	PENDING	
56	SHEPHERD	11/08/2014	15/08/2014	APPLYING FOR A SHOP STAND	PENDING	
258	SHEPHERD	18/08/2014	20/08/2014	APPLYING FOR A SHOP STAND	NEED JUSTIFICATION	

**Figure 4.10 Business letter report**

#### 4.8 Conclusion

The design phase has been the busiest of all the previous stages since it involve both documentation and actual system development. The stage has however revealed the actual system to the user logically and it acts as a user manual. Inputs, processing and output forms have been shown which reveals how the system will be actually operating. The system have been designed in an interface which the developer believes is highly user friendly starting from the colors used to the layout of the user functions

## CHAPTER 5 EMPLEMENTATION PHASE

### 5.1 Introduction

System implementation is one of the last stages that is encountered in the development life cycle of a software project though there will be continuous maintenance stage. System implementation can also be summed up as the system introduction phase. That is the system is the system will be made ready for use to the users. Deploying or implementation of the new system involves educating the users on the use of the new system, installing the system into production, confirming that all data required to make the system start functioning is available and making sure that validation and verification have been correctly put in place.

Implementation also involve caring out several tests to the system functions to ensure they meet the stated goals from the user point of view. The users will also be allowed to be in contact with the system before it is completely installed. Different installation techniques will also be discussed in this phase and the recommended strategy the designer have proposed based on the nature of the system

### 5.2 Coding (Pseudo Code)

Pseudo coding is a logical representation of specific functions to execute in the system. The complete system is a combination of several modules designed to meet different functions. Stated that it is a halfway language between English and computer language. He goes on to say that it enables one to address important parts of a program without having to worry about the less relevant parts getting in your way.

Synergy Learning & Gentleware (2006) defined a pseudo code as a tool that is used to develop English-like statements for solving logical problems in an understandable language. He also give an exploded explanation of the word pseudo code revealing that pseudo primarily means false and hence a pseudo code is a false code. Finally state that it provides sense to the action to the computer programming language statements The developer have however designed a number of pseudo codes to different modules of the system. This will make those users not highly familiarised in computer programing language can also understand the logical operation of the system

### 5.2.1 Connecting to the database

Connect to the database

Check if connection has been made

If not yet set then

Error message shown for no connection;

Else

Connect

### 5.2.2 Logging On

Enter username and password

Check the username and password match one of the combination in the database

If no match found

Pop up message shown informing on invalid login details

Else

Login is successful

User directed to their respective home pages.

### 5.2.3 Contact us

Enter new employees Details

Checks all information needed have been entered

Validate new employee's details

If checking and validation is true

Insert the details into the database

Else

Validation is not true

Return to employee's details page;

### 5.2.4 Requisition of assets

Enter the details of stationery item you wish to purchase

Check whether the total amount is still below budgeted amount;

If checking is true

Record is successfully recorded;

Else

If budgeted amount is less than the total requisition amount

Terminate the entry and go to employee's home page

### 5.2.5 Record business letters

Enter business letter details

Check validation of the details entered

    If details validation is true

        Insert into database

Else

Details validation is false

Re-enter the details

### 5.2.6 TRACKING BUSINRSS LETTERS

Enter business letter ID

Check if the ID matches one from the database

    If the letter id matches one it the database

        Select all from the databases with such an ID

Else

ID doesn't match any letter in the database

Return to the track business letter page

## 5.3 Testing

Testing is a technique of making sure the functions of a system met the stated objective. According to Chillarege (1999) the center of software testing is to ensure the system meets user requirements. Zielczynski (2006) defined it as a practical method used to detect the presence of errors in a computer program. He goes on to say that testing helps to identify the difference between the functions of the newly develop system and the proposed functionality. That is identifying defects, errors and bugs. Some testing principles have been put in place which include testing the system during development (aimed at identifying the bug earlier), once a unit is ready and design test cases systematically

It is a tool that is used to measure the extent at which the developer was able to design the system functionality as per user requests. These needs to be carried out before the system have been installed to see whether there are changes to be made. It will be costly to identify that the system still have some errors after the installation process have been completed. Testing is carried out to see also whether there is possibility of runtime errors occurring whilst the system will be on operation

The Harare city council interdepartmental office automation system (HCCIDOAS) testing process have been carried out from a very preliminary stage in the development process to

ensure quality and reduce rework. The following testing techniques have been employed by the developer.

- 1 Unit testing
- 2 Module testing
- 3 System testing
- 4 Acceptance testing

### **5.3.1 Unit testing**

A unit has been defined by (IEEE, 1990) as a component that cannot be split up in to another component. It therefore defined unit testing as testing of individual software or hardware units or groups of related unit.

Unit testing is the initial testing technique of program. The test can be focused just on a function or small module. Taking for example testing the function to record employee personal details. The developer need to test whether the details are inserted in their intended fields in the database and are of the correct data type. According to Beizer (1990) evaluation of software testing 65% of all bugs are found when carrying out unit testing. This technique includes two special tests the black box and white box testing technique.

#### **5.3.1.1 Black box testing**

In black box testing the developer records the relative output from input testing variables without looking at the system's internal operations. (Beizer, 1995). Williams (2006) revealed that as for black box testing the developer needs to think diabolically about any alteration a user might be expected to do to the program. That is looking at the code and drawing up possible ways the user can break it.

#### **5.3.1.2 White box testing**

The testing technique where the developer or software engineer examines the code of a system to verify whether it works as expected (Williams, 2006). IEEE (1990) defined it as a software testing technique that focuses on the internal functionality of a system and thus the code structure. It is also known as structural testing, clear box Testing, and glass box testing (Beizer, 1995). Williams (2006) also pointed out on white box testing that a code must be run with the inputs which have already known output results and check to make sure that output is certain.

### 5.3.2 Module Testing

According to Williams (2006) this testing technique involves integrating different units of a program to a module and see whether it achieves the user requirements. Its main aim is to check whether units tested individually will work properly when put together.

### 5.3.3 System Testing

Modules are then combined to make up the whole system of the computer project. Therefore system testing is aimed at ensuring the system can cope with real data, monitor system performance and self-handling of errors and data recovery techniques according to Zielczynski (2006). System testing does not only look at the functions of the new system but also compatibility of the system to the already installed hardware is tested. This is because the function may relatively achieve what the user required but the platform where the system will be operating affects also the expected results

### 5.3.4 Acceptance Testing

It is a user point of view testing technique. The tests on this technique are written by the users and their main aim is to identify whether the developers have designed the right system (Kaner and Falk, 1999). The whole system is tested and when the user has been satisfied with the system the coding process is terminated. Real data is used during this testing and

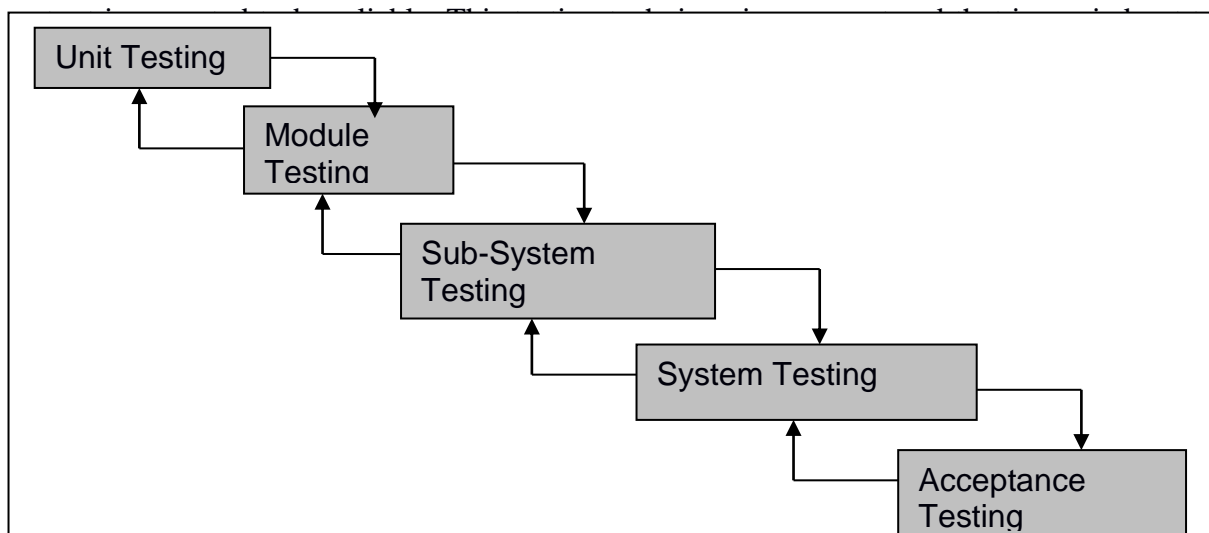


Figure 5.1 Testing phases

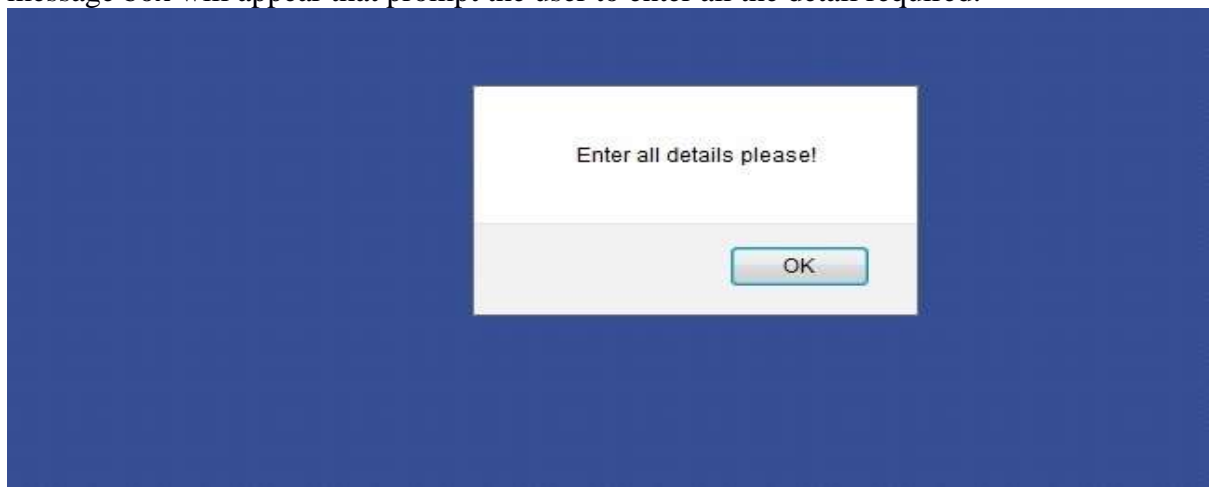


### 5.3.5 Validation and Verification

Validation is a software development technique that is aimed at ensuring that data entering the system is of the required type and format. Verification is a technique that is used to measure the extent at which a products its specifications. Validation is method used to ensure that a software product meets its desired functionality as proposed by the developer. One of the aim of validation and verification is to ensure data consistence is maintained.**Error!**  
**Bookmark not defined.**

#### Sample Validation

If a user tries to update the database without completing the details required on each form the message box will appear that prompt the user to enter all the detail required.



**Figure 5.2 database inserting validation form**

#### User registration

After a user details have been created the user goes to the I.T division for account creation whilst the human capital officer sends a confirmation on user acceptance and the role to be carried out. If the user details registration was not successful, account creation will reflect a pop up message



**Figure 5.3 user account creation.**

## 5.4 Installation

Installation is a process of putting to operation the system which have been developed. The users will have been satisfied with all the functions of the system and now could not wait to use the system. The Harare city council inter departmental office automation system is a web based system and hence it is going to be hosted on a web server. For the system to start running the user personal computer only requires a web browser installed on it and all other programs will have to be installed on the server machine. This is one of the advantages of a web based system as compared to application program where installations of the system have to be done on each and every user machine

The following software will be installed for the system to start operating

1. Install WAMP SERVER on a server machine
  - a. Install Apache Server software on the web server.
  - b. Install MySQL Manager on the server as well for database management.
2. Install Macromedia Dreamweaver 8 on the server machine
3. Install a web browser on each and every user machine including the server.
4. To start the system the user will need to type `http://localhost/hararecity/login.php`  
Alternatively the browser will be set to this home page default and each time a user will run the browser login page will be shown.

### 5.4.1 User Training

User training as proposed by the developer is going to be relatively easy. The Harare city council staff according to the developer is used to a web based system since the system was design in in a website form just similar to its main site.

The developer has also proposed to hold min workshops with managers form different departments and division to explore system functionality. The managers are then expected to also disseminate the information to their respective subordinates

More so, a user manual guide will have been designed that is going to help the user on how to operate the system. User training is going to be carried out with the system developer and a sample of users wish to be taken from all levels of system users. That is from the standard user to the executive. This is because direct interaction offers effective training techniques and non-verbal expression from the users may also be identified.

The system is going to be web based and it was developed with current website standards. This makes it relatively easy for the users which are the customers who are going to access it

over the internet. The system is relatively easy to use and thus the basic skills of computing and internet surfing are necessary for the users to use.

### **5.4.2 Conversion**

System conversion is an implementation strategy that is chosen to make to install the newly developed system to operation. Different conversion methodologies have been proposed which include direct, phased, parallel adoption and pilot conversion or a combination of those four. (Turban, 2002)

According to ( Rooijmans, 2003). It is a technical change over method of replacing the software system already in operation in an organization. The main aim of this study is to find out a suitable conversion method to make the system gain support and acceptance from the users. Kaner and Falk, et al. (1999) pointed out that many software fail not only that they did not good functionality and attractive interface design. They stated that the conversion method implemented by the developer will also have a great impact on system acceptance.

#### **5.4.2.1 Pilot Conversion:**

This is the system implementation method where the new system will be configured only for a small group of users and the rest still use the old system (Pressman ,2001)The system is set as a testing technique to see how the system will operate if it will be installed for the entire organization. After several evaluation of a pilot system it is then installed for all the users. This technique is normally used in retail shops where the new system is installed in one shop. And the others continues using the old one. The success or failure of the pilot system will determine whether to continue using the old system or implement the new one. The advantages with this system is that it is less costly when a defect his identified while still running the pilot system unlike where the defect is identified while the system was installed for all users.

#### **5.4.2.2 Direct Conversion:**

Hughes and Cottrell. (1999) defined direct conversion this is a system implementation technique where there is a direct change over or switch off from the current system. The new system is implemented in full and all the operations of the old system a terminated.

Direct changeover will be mostly recommended where the new system function are almost similar to those of the old system. That is user training will relatively be easy. More so, it is most suitable where there is high risk of fraud. That is if the two system are left to run in parallel there will be likely to be recorded fraud activities from users.

Its disadvantage is that the user training time is relatively short for users to cope up with the new system. If the new system may not produce expected results then high risk will be expected in the organisation losing is customers and recording continuous losses. Data conversion from the old system to the new one will be so intense that there is also risk with this method of losing lots of organisational data.

Kaner, and Falk, et al. (1999) reviewed that the danger with businesses implementing direct system conversion is that benefits obtained from it are relatively lower than the risk likely risk likely to be encountered

#### **5.4.2.3 Phased Conversion:**

This is the software installation technique where the full system is implemented in different versions until the whole systems have been successfully implemented and the old system is no more. (Turban, 2002). The new system will be introduced in versions and it is less risky as compared to other methods such as direct change over. Its advantage is that there is room to make adjustments on modules which will not be operating as expected and at relatively lower cost. If the new system fails to produce the required results the organization may still switch back to the previous system.

Its disadvantage is that the time to the complete switch of may be longer than expected as time may be spent on correcting installed modules of the system. More so it is likely to be

costly on installation since the implementation is divided in parts unlike when the whole system is installed at once.

#### **5.4.2.4 Parallel Conversion:**

In this conversion method the two systems ( old and new) will be operating together for a given period of time and the old system will then be completely switch off as proposed by Pressman, R. (2001). That is when the management will be satisfied on the performance of the new system the old one is completely terminated and the new system will be on operation.

The advantage with this implementation methodology is that there may exist some functions in the old system that may have been overlooked by the developer in the new system and hence it give room to correct any error whilst the organization still operates normally. User training is given time and hence the system is expected to gain more acceptance as compared to other methods. There is relatively low risk to organizational data being lost with thins methodology.

Its disadvantage is that there is likely to be data redundant that is data being recorded in both systems. It is also labor intensive as users are expected to perform the same operation in both systems if the current system is paper based there is likely to be errors in transferring the date into the new system and hence organizational information may be biased

#### **5.4.2.4 Recommendation Parallel Conversion:**

The developer has chosen among the rest the parallel conversion method. This is according to this developed software the most favorable one since it does not currently take into account other operation of the current system such as billing process. Allowing the system to run in parallel will allow the developer to identify other function that may have been overlooked during the development process and identify the need for designing a letter version of the new system

### **5.5 Maintenance**

Maintenance is a continuous process businesses under take to make user installed system continue to meet changing user requirements. Today' business environment is dynamic and

for a business to be continuously operate is has to maintain its system. Maintains of software systems are usually done by a specialized personnel group in an organization and not by the developer himself. Several maintenance techniques have been employed by much organization which include adaptive, corrective, perfective maintenance. The other reasons for maintenance is to ensure ant error occurring whilst running it and ensure organizational changes are catered for

### **5.5.1 Adaptive Maintenance**

According to French (1997) adaptive maintenance allows an organization to change system functionality for other modules. That is adding new or improving current system functions. This is mainly due to changes in user or organizational requirements. For example security changes, creating new tables in database and designing new forms and data inputs to the system. More so adaptive maintenance is also common where a new hardware or operating system is to be employed. This form of maintenance is normally as a result of external influence or strategic changes within the company

### **5.5.2 Corrective maintenance**

This is a corrective measures employed by an organization as a solution to the defects currently encountered in using the system. French (1997) stated that corrective maintenance responsive measure where an organization modifies the system after delivery of correct noticed faults. This maintenance needs to be identified quickly since operating without seeing defects of the system may affect integrity of the organizational information system. Corrective maintenance major aim is to respond and remove defects from the operating system without adding any functionality.

### **5.5.3 Perfective maintenance**

Though the system may be operating well without showing any error during operation there will be still need to perfect it in order to improve its operations (IEEE, 1990).. The example reorganizing data sets within data base and tweak code to make it more responsive. This helps to maintain or improve user satisfaction to continuously use the system.

System perfection is also a continuous process which is done by the system support team to make sure the new system improves its deliverables in such respond time and processing speed. Kaner, and Falk, et al. (1999) reviewed that any unidentified errors and bugs during development, installation and use should be recognized during this phase. The perfections

that can be employed may include a better date input screen, improving help system. This process ensures that the newly implemented system meets the system development objectives established for it.

## **5.6 Conclusion**

When the user requirements have all been met then the project comes to an end. The project has been a resounding success since user has been satisfied with the system functionality. However the system requires continuous upgrading and maintenance as explained the last chapter to continuously cope up with changing user requirements

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## APPENDIX A: INTERVIEW

### INTERVIEW CHECKLIST

#### Section 1: Interview Details

1. Name of interviewer .....
2. Interviewee's position .....
3. Employee's department .....

#### Section 2: INTERVIEW QUESTIONS

1. What is the name of the system currently operating the organization?

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

2. How does the system operate?

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

3. Was the system outsourced or in-house developed and why?

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

4. Are all departmental functions incorporated in to the system?

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

5. What weakness have you witnessed in the current operating system?

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

6. How do you think the organization can overcome the weakness?

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

7. Do you think developing a web based system may solve some of these problems

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

8. Who are currently in control of the working system?

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

9. What is your recommendation on a development of a web based inter-departmental operation system?

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

**Date:** ..... **Time** .....

**Signature:** .....

**Thank you for your cooperation**



## APPENDIX B: QUESTIONNAIRES

### QUESTIONNAIRES

I am Shepherd Mukamo a student at the Midlands State University. I am pursuing a Degree in Information Systems. This questionnaire is designed to find out information about the current operating system, its weakness and your recommendation on a web based system proposed. The proposed system seeks to integrate activities which are inter-departmental to allow all members of the organisation to work toward the common goal. I kindly request you to assist me with the required information in this questionnaire. I promise to keep all the given information confidential. Thank you for your cooperation.

You are recommended to tick in a box to show your response and write short notes where applicable.

1. What is the name of the current operating system? .....

2. Is the system computerised or not?

Manual  Partially Computerized  Computerized

3. Are you satisfied with the current system      Yes      No      partially  
           

4. How do you rate the current system?

Poor       Good       Average

5. What programming language was used to design the current operating system

.....

6. What are the processes involved in the current system?

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

7. Does the organisation have a system which regulates interdepartmental activities?

Yes

No

8. Do you well come a new idea of developing a web based inter-departmental system that

regulates activities of all departments    yes     no

If **No** to the above question explain why and if **yes** give a detail recommendation of what you think the system should incorporate.

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

9. Are there any other contributions?

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

After completing this form you are recommended to fill in the details below

Name

.....

Signature..... Date .....

**Thank you for your Cooperation. God bless you.**



**APPENDIX C: OBSERVATION**

**OBSERVATION SCORE SHEET**

Observation guide schedule.

<b>Date.....</b>	<b>Observer.....</b>
<b>Time.....</b>	
<b>Department.....</b>	
<b>Observation</b>	
.....	
.....	
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.....	
<b>Conclusion</b>	
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.....	
.....	
.....	
.....	
.....	
<b>Signed by Observer</b> .....	<b>Date</b> .....

## APPENDIX D: USERMANUAL

### Login

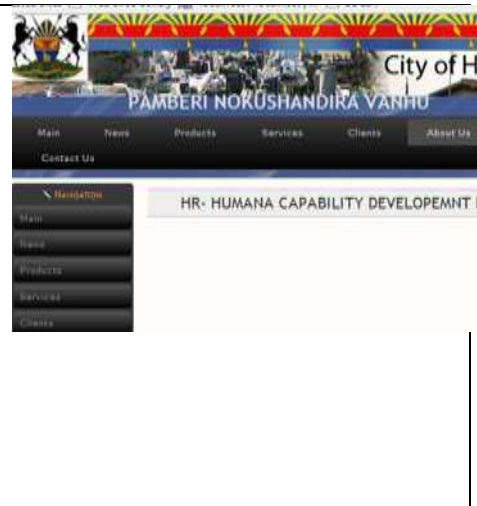
Users are going to be prompted to provide their authentication details that are username and password to be able to access the system. All users' standard or administrators are going to be using the same log in platform as shown in the figure below



### Home page

When a user has successfully logged in he or she is directed to his respective home page. That is users will be directed to a home page specifically for their division. More so the functions will differ also with the employee level. Such as executive and standard users.

#### Central account standard user home page



### New employee

When a new employee enters the organization his/her personal details are recorded under the human capital functions. Then his working details will be recorded next, of which some are



department, division to be worked building where the employee will be working to mention a few.

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Main LOGOUT Monitor Employee data

EMPLOYEE DETAILS  
Main  
Employee details  
Logout  
INFORMATION ABOUT THE SYSTEM

NEW EMPLOYEE

status	select	No. of employees	Division	select profession
Title	Mr			
Name		School		
second name		Profession	select profession	
certificate		certificate	Diploma	
national id		status	fulltime	
D.O.B		Division	capacity development	
address		Department	City treasury	
phone		Office Number		
nationality		Building	DOWARN HARTIN	
Gender	select gender			
Employee type				
Date	2014-09-30	Employee type	select	
		Department	0	

Submit

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Fig 4.6 New employees detail page

### Account creation

When new employee detail has been created the employee goes to the ICT department to complete the registration process. The IC personnel then creates the user account

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Main LOGOUT

NAVIGATION  
LOGOUT

CREATE USER ACCOUNT

national id	
username	
password	
Confirm password	
access level	

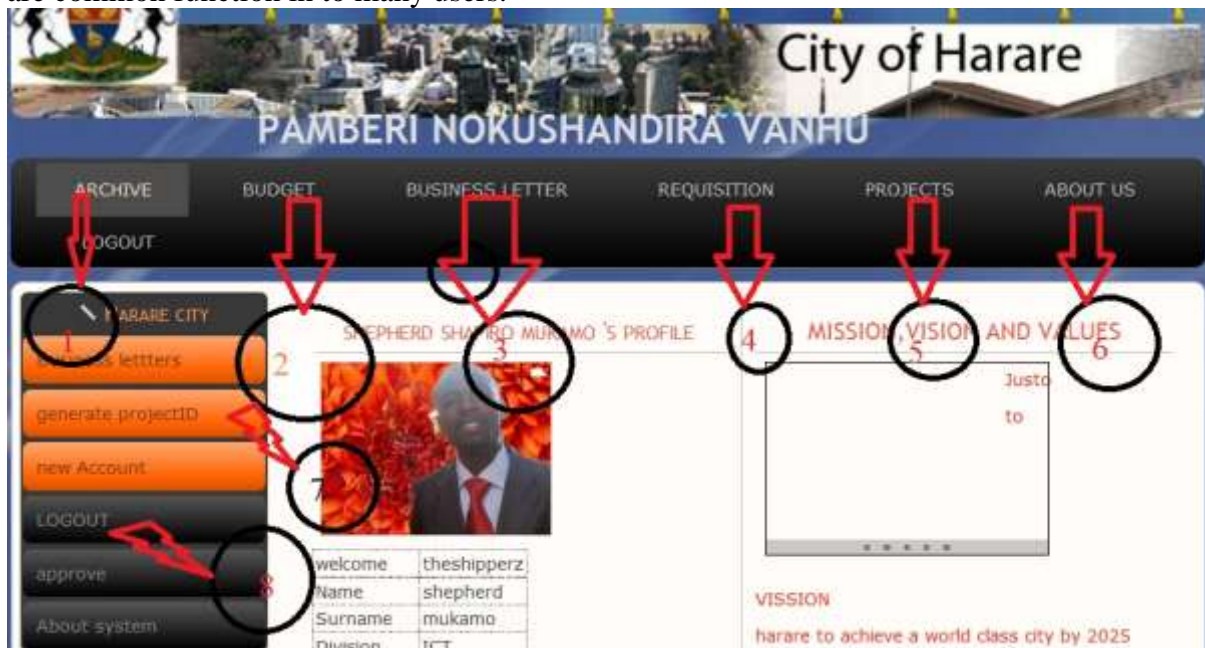
Submit

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After the process has been completed the user can now login into the system. The user access level are determined by the human capital and the ICT implements by allocating the.

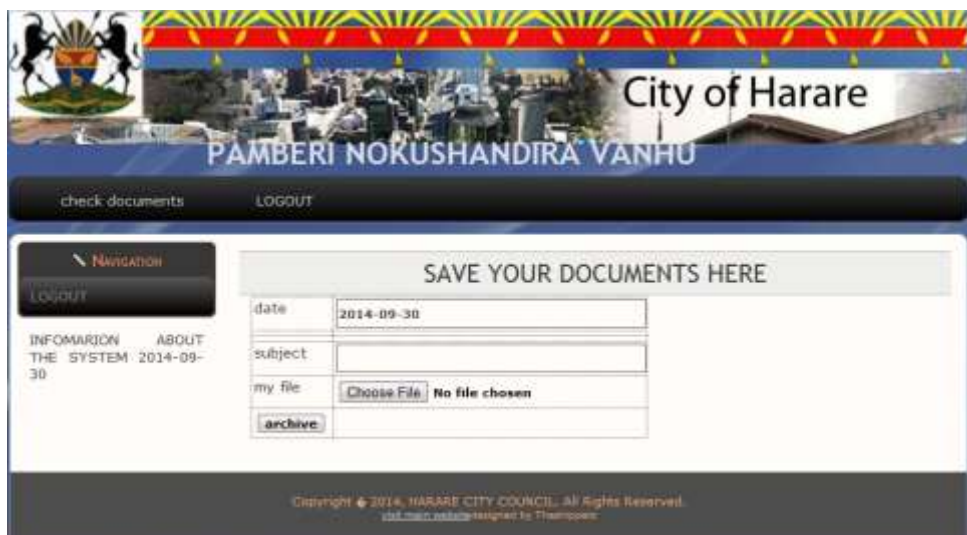
### Logged in user

When a user is logged in he is directed to his respective home page of which the following are common function in to many users.



### Function 1 archive

The archive function allows the user to save an view his previously archived documents. The user will be able to retrieve his documents from where ever logged within the Harare city premises.. below is the form to upload the user document to be archived.



To check the detail the user will click on check documents finction on the archive form and his documents will be displayed.

## Function 2. Budget

The budget function allows the user to prepare budgets for their respective divisions. The city treasury accounting officer will issue budget IDs each year for each division as a unique identifier. The user having obtained the budget ID will then add new budget stationery items that it proposed to buy in the trading period.



The screenshot shows the 'PREPARE BUDGET' interface. At the top, there is a header with the City of Harare logo and the motto 'PAMBERI NOKUSHANDIRA VANHU'. Below the header, there are navigation links for 'BUDGET', 'BUDGET ID', and 'LOGOUT'. The main content area is titled 'PREPARE BUDGET' and contains a form with the following fields:

Budget	PR147H
Item name	
Quantity	
Unit price	
Total amount	
Department	Town_clerk
Division	ICT
Date	2014-10-03
modifier	theshipperz
<input type="button" value="Submit"/>	

On the left side of the form, there is a 'BUDGETS' menu with a 'LOGOUT' button and a list of budget IDs, including '01-10-2014'. At the bottom of the page, there is a copyright notice: 'Copyright © 2014, HARARE CITY COUNCIL. All Rights Reserved.'

## Function 3 business letters

The business letter function allows the town council employees to record all business letters in circulation in the organisation. It acts as an electronic in-tray out-tray system and allows tracking of current position and status of letters easier and faster. This is because business letters move from different offices and hence tracking without a system can be time consuming. Each letter is allocated an ID for easier tracking

### Tracking the letter

owner	title	status	comment	modifier	date	Building
simon	applying for a shop liceny			theshipperz	2014-09-30	ROWARN MARTIN
simon	applying for a shop liceny	Approved	the shop liceny aplication have been processed you can now collect it forn rowan martin building. o	theshipperz	30-09-2014	

### Function 4 requisition

Employee after they have prepared their budget they may also make requisition if the product is now in need. However the total requisition should not exceed total budgeted. The details of the organization to supply the materials or stationery will also be recorded. The employee can also track to check the requisition status. The requisition and budgets are approved by the accountant



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REQUISITION REQUISITION STATUS LOGOUT

NAVIGATION  
LOGOUT

INFORMATION ABOUT THE SYSTEM

STATIONERY REQUISITION

quantity	
Unit price	
Cost	
Tendered organization	
tender phone	
tender email	
tender address	
Department	Town_clerk
Division	ICT
Building	ICT
stationery due date	
Modifier	theshipperz
Date	2014-10-01

Submit

#### Function 4 project management

This function allows users to record project information, management details, update project details and minutes which are interdepartmental. The ICT manager creates the project ID for each project and to update information one need to have this project id.

City of Harare  
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LOGOUT

GENERATE PROJECT IDENTITY

PROJECT ID PRJ001

date 2014-10-01

username theshipperz

Submit record id

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192.228.190.10000 10/10/2014

Below are functions to be executed in each running project.

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PROJECT INFOR BUDGET requisition MANAGEMENT UPDATE MINUTES

LOGOUT

#### Function 6 about us

This function provides information about the system and how to use it. It also contains guide lines to how the system should be used.

### **Stationery item purchasing**

This function will be available to the users at the central stores division. All approved requisition will be revealed to the central stores ready for purchase.

<b>PURCHASE ORDER</b>	
ITEM NAME	hp printire 255
UNIT PRICE	.2
TOTAL	300
DEPARTMENT	Town clerk
DIVISION	ICT
TENDERED ORGANISATION	first computers
TENDERED ORG EMAIL	smukamo@yahoo.com
TENDERED ORG PNONE	773354286
TENDERED ORG ADDRESS	456 robert mugabe harare
<hr/>	
Approved BY	pee
DATE APPROVED	28-09-2014
	01-10-2014

### **Function 8 logout**

The user after completing all his tasks logs out of the system.

## APPENDIX E: CODE SNIPPET

### LOGIN

```
?php
session_start();
include"dbconcoh.php";
?>
<?php
@$user=$_POST['username'];
@$pass=$_POST['password'];
if(isset($_POST['log']))
{ if(!$user || !$pass){
?>
<script language="javascript">
alert("no details entered");
window.location="pinda2.php";
</script>
<?php
    }
$query=mysql_query("select * from persons where username='$user' and password='$pass'
and status='1'") or die(mysql_error());
    $count=mysql_num_rows($query);
    if($count==0)
        {
            ?>
            <script language="javascript">
alert(" invalid login details");
window.location="pinda2.php";
</script>
<?php }
        $qr=mysql_query("select * from persons where username='$user' and
password='$pass'") or die(mysql_error());
        $fetch=mysql_fetch_array($qr);
        $level=$fetch['level'];
        $_SESSION['username']=$_POST['username'];
        $_SESSION['password']=$pass;
        $_SESSION['userid']=$fetch['userid'];
        $_SESSION['firstname'] = $fetch['firstname'];
        $_SESSION['surname'] = $fetch['surname'];
        $_SESSION['secondname']=$fetch['secondname'];
        $_SESSION['department'] = $fetch['department'];
        $_SESSION['division'] = $fetch['division'];
        $_SESSION['entrylevel'] = $fetch['type'];
        $_SESSION['access'] = $fetch['access'];
        $_SESSION['office'] = $fetch['office'];
        $_SESSION['biulding'] = $fetch['biulding'];
        $_SESSION['logged']=$level;
        $_SESSION['log'] =true;
        switch($level)
        {
        case'admin':
```

```
        header('location:index.php');
        break;
        case'TCA1':
        header('location:ict.php');
        break;
        case'HRA1':
        header('location:hr.php');
        break;
        case'HRA2':
        header('location:hr2.php');
            break;
        case'CTA1':
        header('location:city.php');
        break;
        case'CTA2':
        header('location:city1.php');
        break;

        default:
        alert("Either your username or password is incorrect!");
            break;
    } }
?>
```

## **PREPARE DIVISIONAL BUDGET**

```
<?php
include("dbconcoh.php");

if(isset($_POST['Submit'])){
$item = $_POST['item'];
$quantity = $_POST['quantity'];
$price=$_POST['price'];
$total=$_POST['total'];
$division=$_POST['division'];
$department=$_POST['department'];
$modifire = $_POST['modifire'];
$date=$_POST['date'];
$budgetid = $_POST['budgetid'];

if(!$item!=$quantity)
{
die('<script language=javascript>alert("Enter all details please!");</script>');
}
$query_availability=mysql_query("SELECT * FROM projects WHERE
budgetid='$budgetid' and division ='$division'") or die(mysql_error());
$count_rows=mysql_num_rows($query_availability);
if($count_rows==0)
{
die('<script language=javascript>alert("Wrong budgei id entered, Try again!");</script>');
exit();
}
```



```
}  
  
else  
$query_insert="INSERT INTO  
budget(budgetid,item,quantity,unitprice,total,department,division,modifier,status,todaydate)  
  
VALUES('$budgetid','$item','$quantity','$price','$total','$department','$division','$modifier','b  
udger','$date)";  
$add=mysql_query($query_insert) or die(mysql_error());  
die('<script language=javascript>alert("Budget item succesfully recorded. Thank  
You!");</script>');  
}  
?>  
  
<script language="javascript">  
alert("enter another item");  
window.location="budget.php";  
</script>
```

### **Record archive details**

```
<?php  
include("dbconcoh.php");  
?>  
<?php  
if(isset($_POST['enter'])){  
$user = $_POST['username'];  
$password = $_POST['password'];  
$subject=$_POST['subject'];  
$file=$_FILES['file'];  
$date =$_POST['date'];  
if(!$user ||!$password ||!$subject ||!$date)  
{  
?>  
    <script language="javascript">  
alert("no details entered");  
window.location="archivedetails.php";  
</script>  
<?php  
}  
else  
$query_insert="INSERT INTO archive(username,password,subject,file,date)  
VALUES('$user','$password','$subject','$file','$date)";  
$add=mysql_query($query_insert) or die(mysql_error());  
{  
?>  
  
    <script language="javascript">  
alert(" archive created")  
window. location = "archivedetails.php";  
</script>  
<?php  
}}}
```

?>

## MAKE A REQUISITION

```
<?php
include("dbconcoh.php");
?>
<?php
    if(isset($_POST['cal'])){
        $quantity=$_POST['quantity'];
        $price=$_POST['price'];
        $product=$quantity*$price;
    }

if(isset($_POST['Submit'])){
    $item=$_POST['item'];
    $quantity=$_POST['quantity'];
    $price=$_POST['price'];
    $total=$_POST['cost'];
    $organ=$_POST['organ'];
    $phone=$_POST['phone'];
    $email=$_POST['email'];
    $address=$_POST['address'];
    $division=$_POST['division'];
    $department=$_POST['department'];
    $building=$_POST['building'];
    $modifier=$_POST['modifier'];
    $date=$_POST['date'];
    $tdate=$_POST['tdate'];
    if(!$item!=$quantity)
    {
        die('<script language=javascript>alert("Enter all details please!");</script>');
    }
    else
    $query_insert="INSERT INTO
budget(item,quantity,unitprice,total,torganisation,tphone,temail,taddress,department,division,
building,modifier,status,date,todaydate)

VALUES('$item','$quantity','$price','$total','$organ','$phone','$email','$address','$department',
'$division','$building','$modifier','Requisition','$date','$tdate')";
    $add=mysql_query($query_insert) or die(mysql_error());
    {
?>
<script language="javascript">
alert("your requisition was succesful. track to check approval status thank you");
window.location="requisition.php";
</script>
<?php
}}

```

?>

## REQUISITION REPORT

```
<?php
session_start();
include"dbconcoh.php";
```

```
$id=$_GET['id'];
$office=$_GET['office'];
?>
```

```
<?php $qry=mysql_query("select * from budget where id='$id'");
$rw=mysql_fetch_array($qry);
?>
```

```
<table bgcolor="#FFFF00"width="504" align="center"border="0">
  <tr class="style10">
```

```
    <tr>
      <td colspan="2"><div align="center" class="style20
style12"><em><strong>PURCHASE ORDER </strong></em></div></td>
    </tr>
```

```
      <tr>
        <td width="219" class="style10"><span class="style10 style21"><strong>
ITEM NAME </strong></span></td>
        <td width="275"><label><?php echo $rw['item']; ?></label></td>
      </tr>
```

```
      <tr>
        <td class="style10">UNIT PRICE </td>
        <td><?php echo $rw['unitprice']; ?></td>
      </tr>
```

```
      <tr>
        <td width="219" class="style10"><strong>TOTAL</strong></td>
        <td width="275"><label><?php echo $rw['total']; ?></label></td>
      </tr>
```

```
      <tr>
        <td class="style11">DEPARTMENT</td>
        <td><label><?php echo $rw['department']; ?></label></td>
      </tr>
```

```
      <tr>
        <td class="style11">DIVISION</td>
        <td><?php echo $rw['division']; ?></td>
      </tr>
```

```
      <tr>
        <td class="style11">TENDERED ORGANISATION </td>
        <td><?php echo $rw['torganisation']; ?></td>
      </tr>
```

```
    <tr>
```

```
<td class="style11">TENDERED ORG EMAIL </td>
<td><?php echo $rw['temail']; ?></td>
</tr>
<tr>
<td class="style11">TENDERED ORG PNONE </td>
<td><?php echo $rw['tphone']; ?></td>
</tr>
<tr>
<td class="style11">TENDERED ORG ADDRESS </td>
<td><?php echo $rw['taddress']; ?></td>
</tr>
<tr bgcolor="#0000FF">
<td class="style10">&nbsp;</td>
<td>&nbsp;</td>
</tr>
<tr>
<td class="style10"><span class="style11"><span class="style10
style21"><strong>Approved BY </strong></span></span></td>
<td><label><?php echo $rw['user']; ?></label></td>
</tr>
<tr>
<td class="style11">DATE APPROVED </td>
<td><label><?php echo $rw['pdate']; ?></label></td>
</tr>
<tr>
<td class="style11"><input type="label" name="date" value="<?php echo
date('d-m-Y'); ?>" readonly="readonly" /></td>
<td></td>
</tr>
</table>
```

## TRACKING BUSINESS LETTERS

```
<?php
session_start();
include("dbconcoh.php");
?>

<?php
if(isset($_POST['cmdview']))
{
$letterid=$_POST['letterid'];
if(!$letterid)
{echo "<script type='text/javascript'>alert('letterid is required')</script>";
}
else
{

$rs=mysql_query("select * from bsnletters where letterid='$letterid' ") or
die(mysql_error());
?>
```

```
<table width="93%" border="1" bgcolor="skyblue">
  <tr>
    <td> letter id</td>
    <td colspan="2">owner </td>
    <td width="27%">title </td>
    <td width="15%">status </td>
    <td width="11%">comment</td>
    <td width="5%"> modifier</td>
    <td width="11%">date</td>
    <td>Building</td>
  </tr>
  <?php
  while($row=mysql_fetch_array($rs))
  {
  ?>
  <tr>
    <td><?php echo $row["letterid"]; ?></td>
    <td colspan="2"><?php echo $row["owner"]; ?></td>
    <td><?php echo $row["title"]; ?>
    <td><?php echo $row["status"]; ?>
    <td><?php echo $row["comment"]; ?>
    <td><?php echo $row["user"]; ?>
    <td><?php echo $row["date"]; ?>

    <td><?php echo $row["building"]; ?> </tr><?php
    }}
  ?>

  </td>
</tr>
</table>
<p>
<?php
```

## TRACK ARCHIVED DOCUMENTS

```
<?php
Include ( "dbconcoh.php");
  $qry=mysql_query("select * from archive where username = '$_SESSION[username]'
and password = '$_SESSION[password]'" ) or die(mysql_error());
  while($row=mysql_fetch_array($qry))
  {
  ?>
  <tr bgcolor="#999999">
  <td><?php echo $row['subject']; ?></td>
  <td><a href="<?php echo $row['file']; ?>"> <?php echo $row['file']; ?></a></td>
  <td><?php echo $row['date']; ?></td>

  </tr>
  <?php } ?>
```

