ZRP CADET RECRUITMENT SYSTEM

XAVIOUR MUGARI (R111014B)

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BY

XAVIOUR MUGARI

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Supervisor: Mr T. Mzikamwi

ABSTRACT

The main aim of this project was to develop a computerised online Zimbabwe Republic Police (ZRP) Recruitment System that will store information of every applicant and be able to process, evaluate and produce feedback to the applicants efficiently and manipulation of information. Officer recruitment at ZRP was facing problems with the manual filing system that they were using to store information, and hence processing of applications and evaluation was now a tedious and unfair process. So the purpose of the project was to develop computerized system that would cater for these needs. Information on the requirements of the recruiting staff was gathered through various Information Gathering Methodologies such as interviews, questionnaires and observations. It was noted that the system allowed too much access to confidential documents and that the recruiting staff were working under hectic schedules. Also it took time for the applicant to receive feedback about his/her application after application processing was done. After the requirements were gathered, the proposed system was designed. A range of Microsoft tools most notably Visual Studio 2012 which comprises of Visual Basics.Net were used to develop the system. Also a MySQL server database managed by Windows Server 2008R2 operating system was used to store the large volumes of information and redundancies were kept under control while information security was upgraded. Testing and final installation of the hardware and software at the implementation phase made sure that the developed system was fully functional and operational as well as those activities associated with turning over control of the new system to the end users. The finished system was implemented under a pilot run change over on recommendation by the Developer. It was successful and faced little problems. Users were trained to use the system effectively and the system was fully operational. Regular maintenance was chosen for the system but other maintenance methods such a adaptive were recommended so as to keep the system up to date with its environment. In conclusion the research study was a success. The developer made recommendations on future studies and on improving the study he made. Upon completion of the project, there was improved process efficiency, quality of service, convenience to management and applicants at ZRP.

DECLARATION

I, **Mugari Xaviour,** hereby declare that I am the sole owner and author of this dissertation. I authorise the Midlands State University to lend this dissertation to other institutions or individuals for the purpose of scholarly and academic research.

Signature _____ Date _____

APPROVAL

This dissertation entitled **Zimbabwe Republic Police Online Recruitment System** by Xaviour Mugari meets the regulations governing the award of the degree of **BSc Computer Science Honours Degree** of the Midlands State University, and is approved for its contribution to the knowledge and literal presentation.

Supervisor …….

Date …….

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DEDICATION

I dedicate this project to my parents for the financial support they rendered me during the course of my academic life and have never failed to give me financial and moral support and who through their unwavering support continued to stand beside me in all the hard and tiresome moments in the development of this system and helped in teaching me that even the largest task can be accomplished if it is done one step at a time.

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LIST OF ACRONYMS

SQL	**Sequential Query Language**
UML	**Unified Modeling Language**
DFD	**Data flow Diagram**
EER	**Enhanced Entity relationship Diagram**
DBMS	**Database Management system**
DDL	**Data Definition Language**
DML	**Data Manipulation Language**
DB	**Database**
GUI	**Graphical User Interface**
CBA	**Cost Benefit Analysis**
ROI	**Return on investments**
AAR	**Annual Rate of Return**
NPV	**Net Present Value**
IDE	**Integrated Development environment**
HR	**Human Resources**
IT	**Information Technology**
ZRP	**Zimbabwe Republic Police**

CHAPTER 1: INTRODUCTION

1.1 Introduction

The recruiting system seeks to provide procedures and controls to regulate the creation, processing, usage, storage, retrieval, manipulation, retention /disposal and archiving of recruitment records. It will give support to the records management strategy which views information as a core organizational resource, on a parallel footing with other organizational resources such as finance and human resources, and underpinning all Z.R.P functions and activities. This chapter serves as an eye opener on the effectiveness of the recruiting system that is being developed for the Zimbabwe Republic Police (Z.R.P). The chapter looks at the organizational background, problem definition and purposes of study, objectives and how they will be achieved. It will also highlight the benefits to the organization of adopting such a system.

1.2 Background of Organization

Upon the gaining of the country's independence in 1980 The Zimbabwe Republic Police was born. It was formed following the union of different forces, the ZANLA (Zimbabwe African National Liberation Army), the former British South Africa Police (B.S.A.P) and the Zimbabwe People's Revolutionary Army (ZIPRA) cadres. The Police Force is composed of a Regular Force, a Police Constabulary and ancillary members. The Ministry of Home Affairs is where the Zimbabwe Republic Police lies as a government department.

It has its headquarters situated in Harare, the capital city of Zimbabwe corner 7th street and Chinamano Avenue. The Zimbabwe Republic Police has since decentralized its operations and is made up of thirteen (13) provinces namely, Police General Headquarters (PGHQ), Support Unit, Police Protection Unit (PPU), Harare, Bulawayo, Masvingo, Gweru, Manicaland, Matabeleland North, Matebeleland South, Mashonaland Central, Mashonaland West and Mashonaland East. The provinces are further divided into districts and districts to stations. Most of the police stations have bases and posts under their policing areas. There is also what is termed Provincial sections in every province where supporting staff comprising of technicians in various fields like medical, transport, finance, Information Communication Technology (ICT) and construction are located.

The Zimbabwe Republic Police is a Force and it employs an autocratic way of handling business, that is, a Top-down leadership style. It has policies and strategies in place and all actions and/or activities are done in line with the policy. Any deviation without written authority from top management will result in disciplinary action towards the deviant. Its top management comprises of the Commissioner General, deputized by four (4) Deputy Commissioner Generals and five (5) Commissioners (who make up a team known as the National Support Group) respectively. The management team has its supporting staff whose ranks range from Senior Assistant Commissioner to constable in every department/ section. Its leadership is uniform in all provinces and manpower is received from three training depots, that is, Morris Training Depot, Ntabazinduna Training Depot and Chikurubi Training Depot.

All the depots receive recruits from the Recruiting department which gathers its resources from the various provinces. Cadets are trained and at the completion of their initial training, they are then posted to provinces and further released to stations on attachment. Its recruiting policy has aligned itself with the call of gender equality hence it has taken into consideration the inclusion of women in the organization as they apply the quota system. This system has seen an increase in the number of women police officers forming part of the manpower base in the organization.

Having launched the records management strategy, the organization is steadily moving away from manual systems by computerizing its activities of which progress is being hampered by lack of resources. The records management strategy recognizes the problems that are being faced in the handling and management of manual records and information and crystallizes the role of records and information in police work, so as to ensure that records are available timely, in the right place, and in the good format and quantity, for those who need them.

1.2.1 Organizational Structure

An organogram is an organizational structure in the form of a chart that represents different relationships, jobs, people at all levels in an organization. According to Oscar Guzman (2008) an organizational structure is a system of duties and hierarchy. It outlines the responsibilities of each position and the relationships between. In an organizational structure developed there are a few factors which need to be considered these include distribution of authority, determination of the span of control, organizational height, line of stuff structure and the creation of departments. Zimbabwe Republic Police (ZRP) comprises of the Commissioner General at the top of the hierarchy, followed by the Deputy Commissioner General then Chiefs of Staff for various departments within the ZRP and so on. The rest of the hierarchy of posts can be shown on the diagram below.

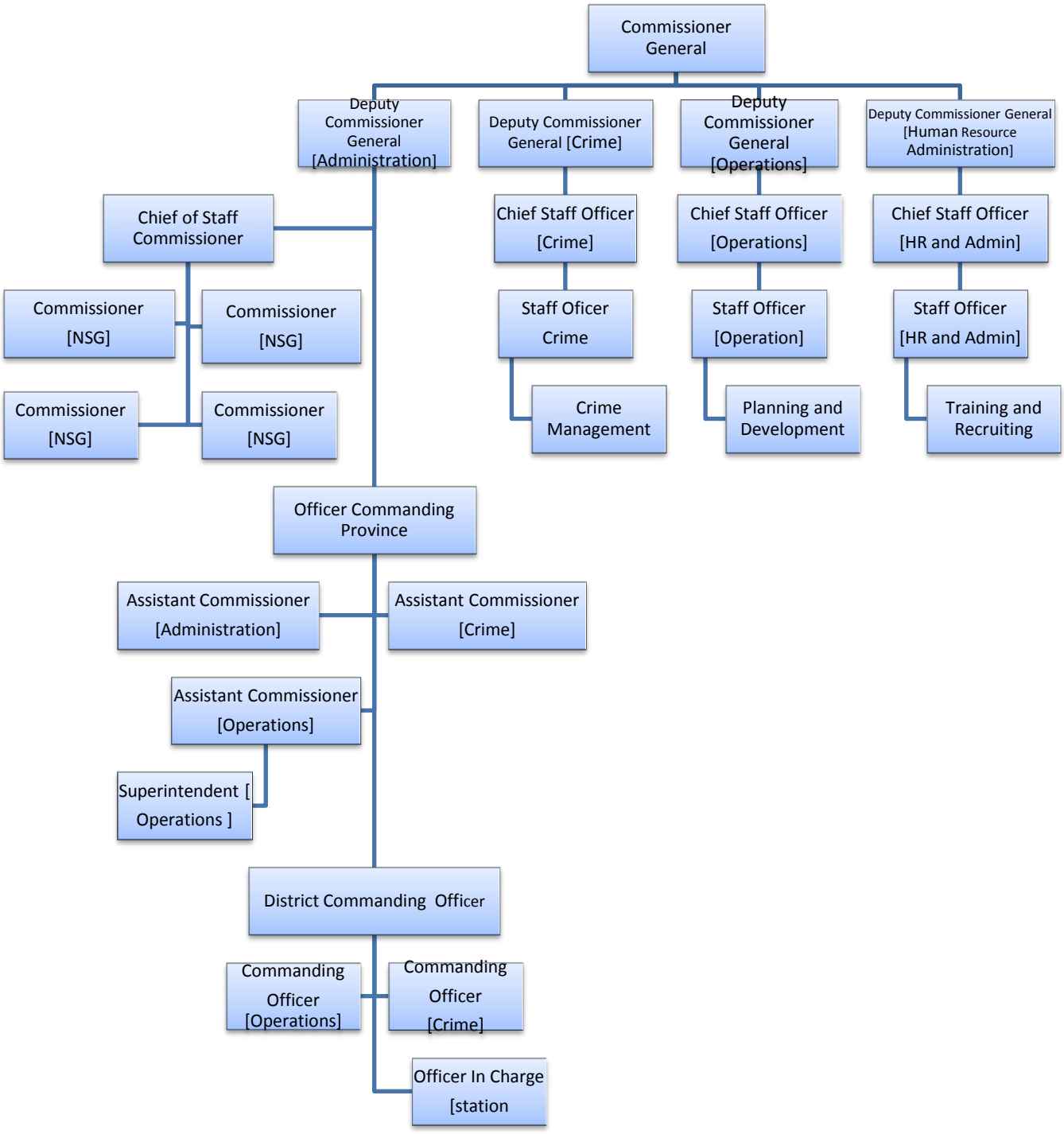


Fig 1.1 *Zimbabwe Republic Police Organogram*

1.2.2 Vision

Being the leading law enforcement provider on the globe by the year 2022.

1.2.3 Mission Statement

With accordance to the mandate of the Constitution, the mission statement of the organization is:

Providing an efficient and effective law enforcement service to the nation thereby maintaining peace and stability and create a social and economic environment that is conducive to development of the nation.

1.3 Research Problem

The recruiting process for aspiring officers takes long before an applicant gets feedback owing to the cumbersome movement of the records by mail bags and couriers, which may sometimes force an incumbent applicant to think otherwise. There is little liaison between the Human Resource (HR) and other line manager who set the pool/database of potential recruits. There is no established efficient online communication channel recruiter and candidate between which will help in establishing a relationship between the recruiter and the candidate. Manual processing of mass records are prone to natural human errors of omission, or intentional alterations. It creates a platform for mal-practices like nepotism and corruption which at times does not produce a pool of quality manpower. Security is compromised with respect to applicants' records due to unlimited access to such records. Limited resources are wasted on stationery where a record has to be produced in quadruplicate. The backup system is not convenient and reliable since it is a manual process which requires much effort and is tedious as duplications are produced. Due to misplacement of papers some applicants who are potentially good officers are unnecessarily delayed and may decide to join other ministries, hence loss of preferred cadets. The system provides a poor data storage and retrieval system, which causes inconveniences in cases where queries emerges and need to be verified. One has to go through files to locate a record if at all it has been filed correctly. Process takes long before an applicant gets feedback owing to the cumbersome movement of the records by mail bags and couriers, which may sometimes force an incumbent applicant to think otherwise. Also there is no centralized database to provide ad-hoc queries that may arise from the applicants, staff and management.

1.4 Aim of the Study

Develop a system that processes an application and gives feedback to the applicant advising of the next step to take. It will provide a more organized and systematic way of processing applications by prospective cadets.

1.5 Objectives of the Research

The proposed system seeks to achieve the following objectives:

- To allow the hiring personnel to screen out unqualified candidates in an automated way, which will save a significant percentage of the hiring time.
- To generate a pool of quality manpower enrolled for training by affording a strict vetting system.
- To offer real time updates on the progress that the candidate is making in various stages of the recruitment process and help in making informed decisions with regards to training as and when cadets are accepted.
- To establish efficient communication channel between recruiter and applicant which will help in establishing a relationship between the recruiter and the applicant and facilitate fast responses to problem that arise in the application and recruitment process.
- To allow passive applicants (job seekers) to submit their resumes into the database of the organization for consideration in future, as and when the vacancies become available.

1.6 Instruments

In computerization of the Zimbabwe Republic Police Recruitment System, a number of software and programming languages will be used.

- Visual Basic.Net
- MS SQL 2014 database
- Crystal reports 2013

1.6.1 Visual Basic.Net

An easy to learn Beginners All Purpose Symbolic Instruction Code (BASIC) that is full-fledged object oriented programming language for building applications in the .net framework.

1.6.2 MySQL database

A dynamic database programming software that is robust and scalable, used to build databases in user friendly Structured Query Language (SQL) commands

1.6.3 Crystal reports

Crystal reporting service is a de facto standard in reporting, a standalone application that is very flexible and promotes fast and easy report development.

1.7 Justification and Rationale of the Study

The system is a very vital improvement for the Zimbabwe Republic Police, which not only provides a convenient service but a reputable and professional way of handling business.

It will improve the image of the organization in respect of transparency and efficiency, which are some of its core values. It will also assist in the enrolment of appropriate trainees which will result in improved service delivery. A constant supply of trainees to training depots due to improved decision making will be afforded as they will be a consistent monitoring of the database. Offices being used for record storage will be used for other purposes other than storage since the manual file system will become a thing of the past whilst the database management system will come into use. Distance barrier will be expunged since networked machines will be used and rural based folks will have an equal opportunity to be considered for recruitment in a more convenient and effective way.

1.8 Conclusion

Introduction of the enrollment system for Zimbabwe Republic Police is a sound proposition that would see the organization achieving various targets set by the organisation which could not be achieved due to various limitations of the manual system. The proposed system seeks to provide viable solutions to deal with the limitations. The proposed system will deliver a better level of satisfaction to both the end user and the client to whom services will be offered with much convenience. The system carries a level of quality and professionalism for the Zimbabwe Republic Police to its clients and this will improve operations by offering efficient and reliable service.

CHAPTER 2: PLANNING PHASE

2.1 Introduction

This phase of planning is defined as the sketch of the work that is to be carried out in developing the proposed system, (Gill, 2002). Here there is prioritization of the undertaking, the funding and plan are outlined and also the resources are outlined which will be needed to come up with the project. The accumulating inefficiency and ineffectiveness of the current system has capacitated the need for the development of an online system in the Zimbabwe Republic Police. The system is expected to deliver the organisation from the current problems being experienced. It will provide quality, reliability, efficiency, security and reduced risks of security compromise which have been active parties within the existing current manual recruiting system. The project development in progress will reduce costs and offer extra benefits due to advancement in information technology to the organisation.

2.2 Why Build the System

In a bid to achieve the organisation's mandate as stated in their vision and mission statements, there is need to develop such a system that will offer a platform to achieve some of the set goals. The system will offer a number of benefits which include:

- **Reduced costs**

The new system seeks to eliminate data redundancy which causes usage of a lot of stationary for example paper, pens and files. The system eliminates the expense of unnecessary man-hours spend in manual upkeep of records done by employees and continued visits done as messages are being transmitted from the recruiting office to the prospective applicant, which resulted from lack of readily available updates. Also high telephone bills are eliminated which result from communications done as these applications are being processed.

- **Storage**

The system includes a powerful database application which implements MySQL as the record keeping system. It offers easy access, that is, storage and retrieval of organised or ordered data, which is consistent and less redundant.

- **Security**

The system offers secured application packages that are used to access, manage and manipulate the data records within the database. The relational scheme is very reliable and offers security enforcement policies. It offers different levels of access rights to different users of the system thus enforcing strict security measures.

- **Convenient**

The system offers a convenient record system together with an efficient access application which allows for quick, efficient, fast and accurate access of records and details when emergency queries arise. Accurate and reliable reports can be drawn, hence quick informed business decisions can also made. Waiting time in respect of applicants is also reduced, therefore a better service and improved reputation is achieved.

- **Backup**

The system offers readily available backup of records.

- **Effective and efficient**

The system offers an effective and efficient well-updated recruiting system which reflects all transactions.

- **Employee motivation**

The introduction of the system will reduce manual work for the employees. The introduction and use of modern technologies causes a moral boost among the employees as a feel of moving with time and quality being employed is experienced.

2.3 Business Value

Nayima (2009) describes the business value of a firm as the prosperity and wellbeing of that firm over the long period of time or haul. In this section there will be reflection of the benefits /value that the proposed system will bring to Zimbabwe Republic Police as an organization. The system will in turn deliver benefits to the organisation in different ways by eliminating the existing problems if the proposed objectives are successfully met. These benefits can be categorized as tangible and intangible benefits. The benefits/value will improve the image of the organisation in respect of transparency and efficiency, which are some of its core values. It will also assist in the enrolment of appropriate trainees which will result in improved service delivery as promised to the nation in the Service Charter.

2.3.1 Benefits of Tangible Nature

These are benefits that have a value that is touchable or easily felt by the organisation, (Hyde and Wilson, 2004).This would be seen by the reduction of the manual labour in the recruitment process. The system will give support to the record management strategy which views information as a core organisational resource. This will aid in the provision of accurate and current recruitment information.

- Managerial Value - Information availability for the management will be improved which aids the processes of decision-making and control of resources of the organisation.

- Security Value - The system will improve records security and reduce the risk of activities that are fraudulent in nature. Security of data enhancement will be achievable through the implementation of the recruiting system. Up-to-date and accurate information availability will be improved by the system.

2.3.2 Intangible Benefits

These benefits are defined as value that is not touchable or can't be felt. The proposed system provides s number of intangible benefits, (Hyde and Wilson, 2004). Notable improvements will be noticed in the in quality of the recruitment process as well as in the public relations department. Also customers' value is improved. The internal customers, that is, the recruiting department staff will be assured of efficient and reliable system or service. Applications will be dealt with expeditiously. Accessibility of data and its integration will be improved which allows movement of data between departments as a result it is accessed all authorized end users.

For instance the Training department can have access to information they want from the Recruiting department. Also the recruitment transactions will be made in a more effective and efficient manner.

2.4 Feasibility Study

According to Fyffe (2001) feasibility analysis is described as investigating and assessing the capability and capacity of the system to be developed which will facilitate decision making procedure. The investigations are done so as to come up with the feasibility on the introduction of the proposed system as well as to investigate the project to come up with the justification as to whether the project development can be continued or not. There four main categories of feasibility study which are social, technical, operational and economic in nature

2.4.1 Technical Feasibility

Wiley (1998) described technical feasibility as a tactical and logistical plan of with regards to the firm's plan for producing, delivering, storing and tracking of its service or product. Here the technical capacity of the Zimbabwe Republic Police is evaluated in terms of the resources to develop or purchase and operate the system, whether the system has the required technology, hardware, software and technical expertise to meet the requirements. Basically, this investigation will determine whether the system can be rolled out given the constraints of resources and time amongst many others.

The system will require the following resources for development and implementation:

- **Hardware**

  It has been found to the advantage of the system that there must be hardware, which includes one server located at the recruiting head office and Pentium 4 desktops at each workstation for the system to perform efficiently. To include printers, preferably line or page printers, as well as Networking cables and network adapters. There are a considerable number of Pentium IV processors and line printers, flash drives and network devices namely a hub, router and a switch are readily available.

Hardware to add includes:

Server (Main)

Processor (3GHz speed)

1 TB HDD

2 Network adapters (Ethernet cards)

52 x speed DVD ROM

Tape Drive

Scroll mouse

128MB VGA Card

Uninterrupted Power Supply

Network Switch

Workstations: (for use by the employees)

A Hard Disk Drive with at least 100GB

128MB VGA Card

Mouse and Keyboard

An Ethernet network adapter card

A minimum of 256 MB RAM

A DVD combo (writer)

500GB external hard drive

Uninterrupted Power Supply

Laser Printer

- **Software**

Software requirements include Microsoft Windows 7 operating system, MySQL Server, interpreters and compilers for high-level language that is Microsoft Visual Basic .NET and PHP a server-side scripting language. These tools are also readily available. Also SAP crystal reports are needed for the reports production

- **Technical Expertise**

The organisation has the already the needed personnel for the development, maintenance and supporting of the proposed system. There is an IT department in the organization and the systems administration section fall under it. There are qualified administrators and some have gone under in-house training. They are found in each province. The system will be documented comprehensively and training will be carried out for the end users as a result this makes maintaining and supporting of the proposed system to easily carried out with no problems. The end users will be trained so that they understand fully the structure of the new/ proposed system and its functionality.

Resource of software and hardware in nature for proposed system development and operation and also technical expertise are available readily in the market. The management is also to willingly purchase the resources and see to the staff training therefore the project is deemed to be feasible technically.

2.4.2 Economic Feasibility

The area focuses on the evaluation of the development costs weighed against the income or benefit derived from the solution. There is an establishment to see if successful project completion can be achieved with respect to the set budget. If future benefits of the proposed system are more than system development costs then the project is deemed to be feasible economically.

- An ideal acceptable system must possess the attribute of a positive economic results and demands.
- An economically feasible system is expected to provide benefits valued above estimated costs involved in developing, installing, operating and maintaining the system.
- The costs accumulated must be justifiable by the benefits.

Applying the costs benefit analysis is the best way to value the system economically, where we compare the anticipated costs to anticipated benefits.

2.4.2.1 Costs of Development and maintenance

The Zimbabwe Republic Police is to face some costs in the development of the system, as also is the case with cost of maintenance in the life cycle of the system. Costs of development are those incurred costs during system development and these can include:

- Costs of communication
- Costs of salaries, research and traveling for the team developing the system
- Costs of stationery

Cost of maintenance covers the system upkeep, since it is not in-house development. The cost of maintenance is to include system upgrades and any other changes that will be performed on the system. These costs also take into consideration the costs of support, which is going to be done through use of telephones, or visits to sites. Some of the hardware needed, say Pentium 4 computers are already there at the organization.

Description	**Quantity**	**Price(US$)**
Server	3	1600
Installations		300
Laser color Printer	3	500
Uninterrupted Power Supply	2	300
PHP Full set	4	400
Total cost		**2100**

Table 2.1 *Costs of development*

Cost of maintenance is the cost to be accrued during the operation/running of the system as a result of equipment that is needed for the system to run smoothly. The Table 2.2 below depicts the costs to accrue as a result of the operation of the proposed system.

Description	**Cost (US$)**
Costs of maintenance	400
Labor Costs	600
Stationery Costs	300
Costs for User Training	400
Other expenses incurred	300
Total cost	**2000**

Table 2.2 *Costs of running/operation*

2.4.2.2 Tangible, Intangible Benefits and Operational Costs

- **Tangible Benefits**

Description	**Cost (in U.S.A dollars)**
Labour Reduction	2300
Stationery Reduction	1600
Expenses estimated to be saved	600
Total costs	4500

Table 2.3 *Tangible benefits*

- **Intangible benefits**

Intangible benefits to be derived from the proposed system include the following:

- Data quality improvement.
- Goodwill improvement for the recruiting process

- Efficiency improvement as morale for the worker is increased.
- Improved efficiency in information dissemination -5400
- Increased satisfaction for the client

➢ **Operational costs**

These are the costs the company faces and has to deal with in the running of the system. They may incorporate consumptions for staffing, training, hardware and software maintenance, rental and security (Jaffe, 1997). They include costs of stationery, say for printing policy schedules, and also other consumables for example cartridges for printers. Also

- On the job training costs
- Software upgrades and hardware upgrades
- System maintenance

2.4.2.3 Analysis of the cost benefit of the project

This analysis is described as the project impact financially, highlighting if a firm or organisation is making any profit or loss, (Othman, 2005). This stage was used to identify the project feasibility in terms of the costs and benefits realized. It is an in-depth research about the costs of developing a computerized system as compared with the costs incurred by rejecting the computerization proposal. This is where proposed system benefits are compared with the costs of running the system and this can be shown in the form of Table 2.4 below:

	Yr. 2015 (US$)	Yr. 2015 (US$)
Benefits		
Tangible		4500
Intangible		(2000)
Total benefits		***6500***
Costs		
Development	2100	
Running	2000	
Total costs		**4100**
Net benefit		**3300**

Table 2.4 *Analysis of the Cost Benefits*

As the obtained results shows, the benefits outweigh the costs so consideration can be done to proceed with the project.

2.4.2.4 Return of Investment, (ROI)

This is described as the speculator value/profit which results from some investment in a particular resource, (Chachage and Ngulube, 2006). It provides a method of calculating capital invested return measure. Birch and McEvoy (1999) notes that return on investment can also be called ARR (Annual Rate of Return), which can used for comparing between overall profits against the needed investment.

$$R.O.I = \frac{Total\_Benefits - Total\_Costs}{total\_Costs} x\,100$$

Total Benefits expected: $6500

Total Costs: $4100

Therefore $ROI = \frac{6500 - 4100}{4100} x\,100$ **= <u>58%</u>**

The ROI provides a method of calculating capital invested return measure. As is the case a **58%** is the moderate percentage even if it does not take account to the timing of flows of cash, so the project can be continued since return on investments percentage is high.

2.4.2.5 Net Present Value

This is described as the difference between the present estimation of money inflows and the present estimation of money outpourings (Dexter, 2011). NPV is utilized as a part of capital planning to investigate the benefit of a speculation or undertaking. It attempts to ascertain the true value of money and comparing it with current bank rates through changing future costs thus it is much interested in the value of money considering and uses a percentage to discount cash flows . The percentage used is called the discount factor of which a rate of 10% will be used for the purpose of this research.

NPV = Value in t years * Discount,

OR

$$\mathbf{NPV} = \frac{\textbf{Value in year T}}{(1+R)^{T}}$$

R is Discount rate as a decimal, T represents years the cash flows have occurred.

Considering years from 1 up to year 3 we have:

Year 0: 1/ (1+0.1)0 = 1

Year 1: $1/(1+0.1)^{1} = 0.909091$

Year 2: $1/(1+0.1)^{2} = 0.826446$

Year 3: $1/(1+0.1)^{3} = 0.751314$

Present values can be shown as in the Table 2.5 below:

Year	Cash flow(USD$)	Discount (10%)	PV
0	-6200	1	-6200
1	4500	0,909091	4091
2	4050	0.826446	3347
3	3750	0.751314	2817

Table 2.5 *Present values*

NPV = Sum of all Present Values to date

= - (6200) + 4091 + 3347 + 2817

= <u>$4055</u>

The calculations review that a profit of **USD$4055** will be gained, thus pursuing this project will be a benefit to the organization.

2.4.3 Social Feasibility

A nitty gritty study on how the system will connect with all the peoples in an organization or association, (Hofstrand, 2006). Thus influence of the proposed system to the social environment it is operating is best analyzed using social feasibility, It tries to address the impact that may come with the implementation of the ZRP Online Officer Recruitment system, this include more than just human issues, for instance, there could be some costs to the organisation culture, to the environment, and to the society at large. Implementation of this system may have some negative impacts on the employees and consequently to their families who feel they may lose their responsibilities or occupations or to those who may suffer retrenchment. To ensure social compatibility, the developer's responsibility is to incorporate community values and concerns into the ZRP Online Officer Recruitment System and work through the operational, engineering and technical aspects of the system at the same time exercising leadership roles by highlighting

areas that need technical expertise and through arguing that administrative independence is part of delegation authority. Employees will enjoy fast processing of transactions and also reduction in errors. Almost all the data storage and transactions will be handled electronically thereby reducing paperwork and garbage to environment.

2.4.4 Operational Feasibility

Justis and Kreigsmann (1999) define operational feasibility as how the proposed system will deal with issues that might arise and exploit the recognized opportunities in between the definition of the scope and how it is going to fulfill the identified prerequisites in the analysis of the requirements. This entirely depends on the human resources available for the project and involves projecting whether the system will operate and be used once it is installed.

It deals with the impact the system has on the stakeholders in the organisation and also if the development of the system is going to be a scenario welcomed by management. In other words it is ascertaining the level of acceptance of the expected beneficiaries which are the users of the system especially the management and the recruiting team. The proposed system emerges as a major relief to both the organisation and recruiting staff of Zimbabwe Republic Police as it provides the organisation a platform to improve as a service provider.

It offers staff assistance rather than staff elimination and staff moral boosting by avoiding chances of stress to staff members from busy and tiresome working days, conflicts between management and workers over inaccurate reports, answerability, applicant inconvenience, excessive manual work, extra hours and many other problems. For management, they achieve reliable and accurate decision making assistance and expenditure reduction.

2.4.5 Risk analysis

According to Roebuck (2011) Risk analysis concerns hazard dissection, distinguishing all the obstructions that may influence or reason a negative impact for the fruitful of undertaking the project. It requires the researcher to recognize the conceivable dangers that maybe involved amid the execution of the project, identification of serious risks, assessing these risks, estimating their likelihood of occurring, monitoring circumstances that may lead to such risks and finding ways to avert them are some of the tasks involved. A proper risk management has to be carried out if

project completion time is to be maintained unchanged and this helps to keep the project costs at minimum otherwise the project may suffer abandonment.

2.4.5.1 Technical Risks

One of the major technical risks that will be faced on implementation is the high levels of computer illiteracy within the organisation. To counter this, User training sessions will be conducted to ensure that users familiarize with the system. The system will have user friendly interfaces to help users follow the stages involved in the system during operation.

2.4.5.2 Stakeholders Risks

Stakeholders will welcome this transformation since it promotes quality, improvements and professionalism at the Zimbabwe Republic Police.

2.4.5.3 Users

Although some users might resist the change as it will come as a threat to their jobs, others will be motivated by this computerization process as it will come with much benefits compared to the current system in terms of work load, response times and easy access to information

2.4.5.1 Economic Risks

Since the economic risks are largely associated with cost of the project, thus if Zimbabwe Republic Police needs the project then a budget should be set forth before commencement of the development process. The materials in need and resources should be well available at the developers' disposal first and on time.

2. 5 Work Plan

Georgakellos and Marcis (2009) describe the work plan as a document depicting the project, outlining targets of the system and its objectives and also specify a plan which the project team plans to complete the whole project in compliance with the budget and specified time. The entire project that is to be embarked on has been modularised into the following phases or stages that are crucial for the achievement of the goals and of objectives of the entire computerisation program for the organisation. Project Proposal, Planning Phase, System Analysis, Design, Implementation and Maintenance. Periods have been scheduled and budgeted in Table 2.5 as follows:

Phases	Start Date	End Date	Period (days)
Project Proposal	01/02/2015	08/02/2015	7
Project Planning	09/02/2015	23/02/2015	14
Project Analysis	24/02/2015	10/03/2015	14
System Design	11/03/2015	25/03/2015	14
System Implementation	26/03/2015	02/04/2015	7
System Maintenance	03/04/2015	17/04/2015	14

Table 2.5 *Schedule of the Project*

2.5.1 Gantt Chart

This is the graphical representation of the project schedule at a more understandable glance. Gantt shows a series of activities and their durations, giving the development team an overall graphical view of how well on target they are before completion of a certain task. This is very important to the development team as it give them a pointer on the areas that may need more resources if they are behind schedule to be able to strike a deadline. It is illustrated below:

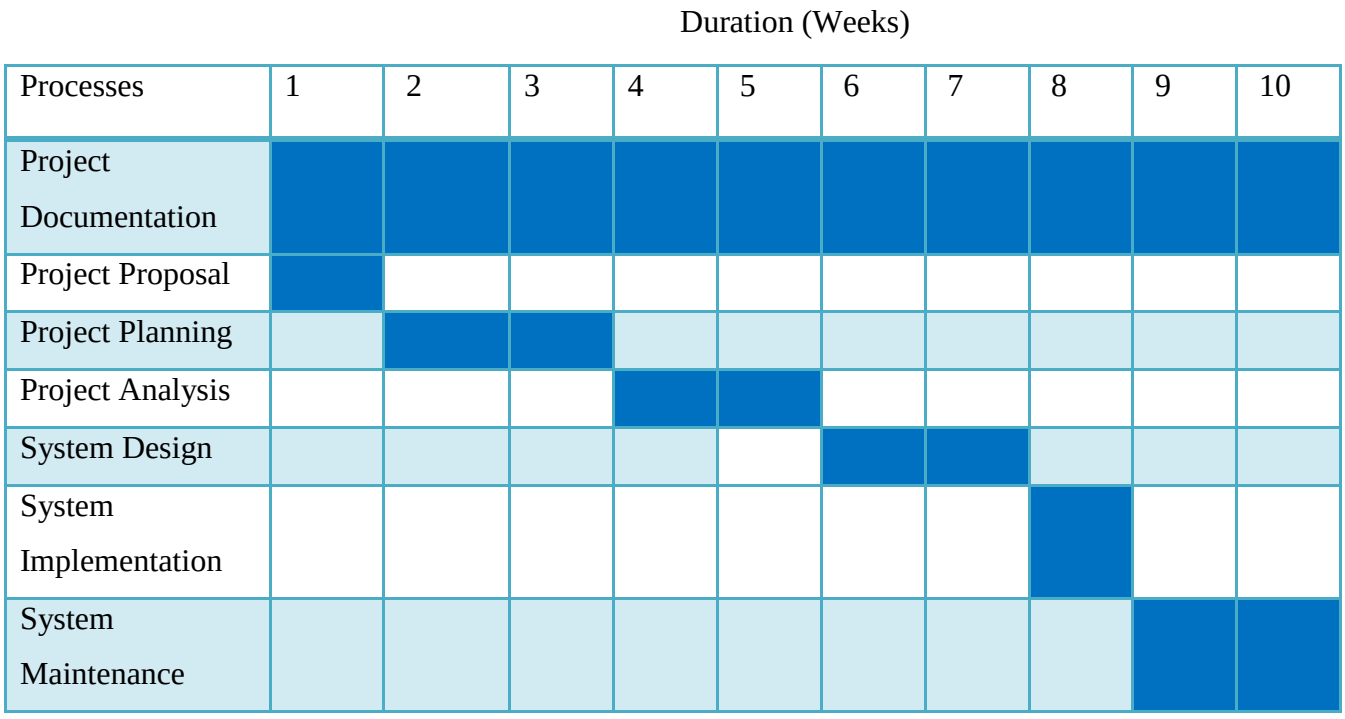


Fig 2.1 *Gantt chart*

2.6 Conclusion

After all the activities performed in this chapter the project developer will be able to proceed with the development of the project. Since the approval of the project has been done, feasibility tests passed and the tasks to be performed are outlined, project work plan and schedule established, the project developer proceeds on to carrying out of the current system analysis as well as other in between activities.

CHAPTER 3: ANALYSIS PHASE

3.1 Introduction

According to Laudon (2006), this stage is almost the same to the strategy of thinking critically, it partitions the system into sections so that the end goal is to mull over how the part parts cooperate and work well to finish their motivation. With enough acquired capacity from the proposal and planning phases the commencement of this analysis phase was now feasible to acquire thorough understanding of the existing system to the specifications of the new system. Here the procedures and documents used, the activities and the information generated within the system and a clear picture of the strengths and weaknesses of the existing system are determined.

3.2 Information Gathering Techniques

"Information gathering methodologies is the procedure of coming up with the new system's requirements by observing the existing system and talking to the users" Marsic (1997). Gathering of information is required and a necessity so there is a fool-proof knowledge about the system currently being used as this will lead to the determination of the requirements. In carrying out the information gathering exercise the analyst used three techniques. The purpose for this was to eliminate the arising of drawbacks as a result of using of one technique only. Incorporating more than one technique is advantageous as one technique can solve the shortcomings of the other. For contracting the current system's in-depth view the analyst decided to implement the three information gathering techniques below.

- Interviews
- Observations
- Questionnaires

Interviews

Interviews are one of the instruments for research which are flexible, they comprise of a number of questions used for acquiring both quantitative and qualitative information from respondents, (Alison, 2014). The questions for the interview have to be clearly phrased and careful evaluation of responses is needed in order to avoid misunderstanding. The recruiting staff was interviewed so as to find out the way they work when carrying out their respective duties and also problems being experienced with the current system as well as to highlight improvements to be done, if

any. According to Kvale (1996) an interview is a dialogue involving two individuals (the interviewer and the interviewee) where issues are discussed to get hold of information regarding a definite subject matter.

Applicants were also interviewed in order to find out their views in regard to quality of service being offered by the current system. When carrying out the interviews the analyst used interviews that were structured. Interview procedure was conducted in the office, each interview had set a maximum of 10-15 minutes the people interviewed were, the operations officer, Officer Commanding and the recruitment officers. The researcher managed to cover topics of how the current system operates the effectiveness of the current also. Questions asked were concerning the current system, also the challenges and the weakness of the current system, how they staff feel about having a new system which would help in the recruitment process and the statistics of the organization.

Advantages of Interviews

Interviews gave the researcher the chance to clarify some questions that were not clear since he had direct conversations with the respondents. This method gave an immediate data collection as the facts were noted just after the respondent gave an answer. The researcher could also took advantage of the social cues like facial expressions and body language as they also conveyed important messages that could not be verbally expressed. Direct conversation allowed the interviewer to motivate the interviewee to be open and free and enabled for probing to certain answers. Interviews were directed to different persons having different occupations and different departments, thus they allowed the interviewer to customize the questions in relation to their respective departments and positions.

Disadvantages of Interviews

This method of information gathering gave a high probability of biased responses since there are chances that the interviewer may have influenced the respondent in answering questions. Measured in terms of monetary terms and resources, interviews generally are expensive and maybe time consuming resulting in only a few individuals being interviewed. The researcher may not completely relay on the interviews conducted because they maybe as a result of only one interviewee. Good interview questions are difficult to formulate therefore they may not be the best information gathering technique.

Questionnaires

Questionnaires are short phrased, documented and direct questions directed to the management, working staff and customers, (Foddy, 1994). A questionnaire was designed for the personnel who are stakeholders in the current system. The questionnaires were dominated by a variety of user-friendly and brief questions. (Bentley and Whitten, 2003) denotes questionnaires as a unique document which is given to clients so as to collect information and what people think about a specific aspect. Questionnaires can be structured or unstructured.

The researcher designed a set of questions which are relevant and which enabled the respondents to answer as quickly as possible but effectively and efficiently. Some designed questions were based on a simple yes or no answer, also to enable to get better information questions were designed in such a way that allowed the concerned part to answer in a brief and short manner without shifting far from the question. . Questionnaires were distributed randomly at the Gweru Headquarters within the force from Sergeants, Assistant Inspectors to Chief Superintendents. Also these questionnaires were distributed to a selected group of the general public such as aspiring applicants so as to know how they also feel about the current system as it affects them greatly. The questions covered the topic of the challenges being faced by the current system and how they feel about having a new system in place so as to eradicate the challenges.

Advantages of Questionnaires

This technique yielded imperative fair-minded data because of its high trustworthiness level since the researcher has no impact to the topic. Contrasted with Interviews, these were not difficult to arrange, monitor and conduct. Respondents had all the time to ponder the inquiries before they fill in the survey permitting them to give thorough data. Large amounts of secrecy were kept up to improve real reactions; following there was no space for intimidation from different representatives or senior staff members. Questionnaires permitted information to be assembled in an institutionalized organization.

Disadvantages of Questionnaires

Considering the questionnaires contacted there were no immediate responses as with interviews and no means to clarify where there maybe misunderstanding of the question. The questionnaires were time consuming as the researcher had to wait until the questions were answered after two or three days. There was no room for close monitoring and this resulted in respondents giving poor

responses and some even left the spaces uncompleted making it difficult to draw conclusions based on this method of information gathering.

Observations

Observation are a technique which permits the researcher to study information or tasks flow and control and results in the provision information missed or misinterpreted by the other techniques, (Kosso and Peter, 2011). (Oates, 2004) denotes observing as a technique used for fact discovery where the researcher is interested with behaviour and not views of the users. Here the researcher would be interested mostly in the physical environment and behaviour as to the perceptions of the users. Using the observations made it possible for the researcher to actually analyse how the manual system is being used by the workers and how operations of the business are being conducted. When the observations were carried out, the researcher made visits to both the station and provincial recruiting offices. Observation of the current system was done, taking note of the main events and processes as highlighted within the interviews by each individual. Also taking special note of the comments and response of the clients and individuals with respect to what is actually taking place to clarify the data collected to avoid sabotage or intentional negative information as a result of personal differences or views. This process was crucial as it provided valuable insight and a better understanding of the operational progress and activities within the current system.

Advantages of Observation

This method involved the researcher directly into how the current system operates and thus providing firsthand information. The method also gave the researcher a personal view and understanding of how the current system operates as well as to give a qualitative view of how information fits into work progress. The method does not involve the workers of the organization as it only involve the researcher himself thus there is no interruption of work on those observed. The researcher through observation interpreted the researched information correctly and accurately.

Disadvantages of observation

The main disadvantages to this method lies on the fact that not all activities were observable, thus not every aspect of the tasks performed could be observed and provided needed information. There is always a risk in this method when the observed personnel became aware that they are

being observed, they may change their normal way of doing business resulting in wrong and biased data.

3.3 Current System Analysis

The existing Zimbabwe Republic Police Recruiting System is manual and it employs on-paper transaction. Its record keeping system employs a manual tracking system of the data and records through use of applicant surnames and dates. Each month has its own new file drawer set aside to place all the applicant records that are received during that month. Records may be picked out at random when an interview date is set and if the number required for interviews is limited, then some applicants will be disadvantaged.

Successful applicants will have their records produced in quadruplicate and posted to the recruiting head office for further processing. Feedback is given to those shortlisted only via the same communication channel, this time in a reverse manner. Production of reports is done through manual compilation and processing of information from station to provincial recruiting office and from province to national headquarters.

3.4 Analysis of the Processes

The analysis of processes is defined as the way for representing formally flow of processes within an organisation, (Jerz, 2011). In this case this is the flow of the application process within the Zimbabwe Republic Police. Its actions which are stepwise support for concurrency, iteration and choice. Displaying of data is done in various stages from the moment the Application is made to the organisation until it is processed and response/feedback given to the applicant. The processes included in the Recruitment Process are shown in Fig 3.1.

3.4.1 Activity Diagram of the Existing System

(Palvia, 1999) notes that it is a graphical illustration of activity flow portraying stepwise events and workflow with support for repetition, choice, concurrency and repetition. It envisions the procedure flows within the on-going system. Fig 3.1 below is a diagram which will help demonstrating the procedure flows.

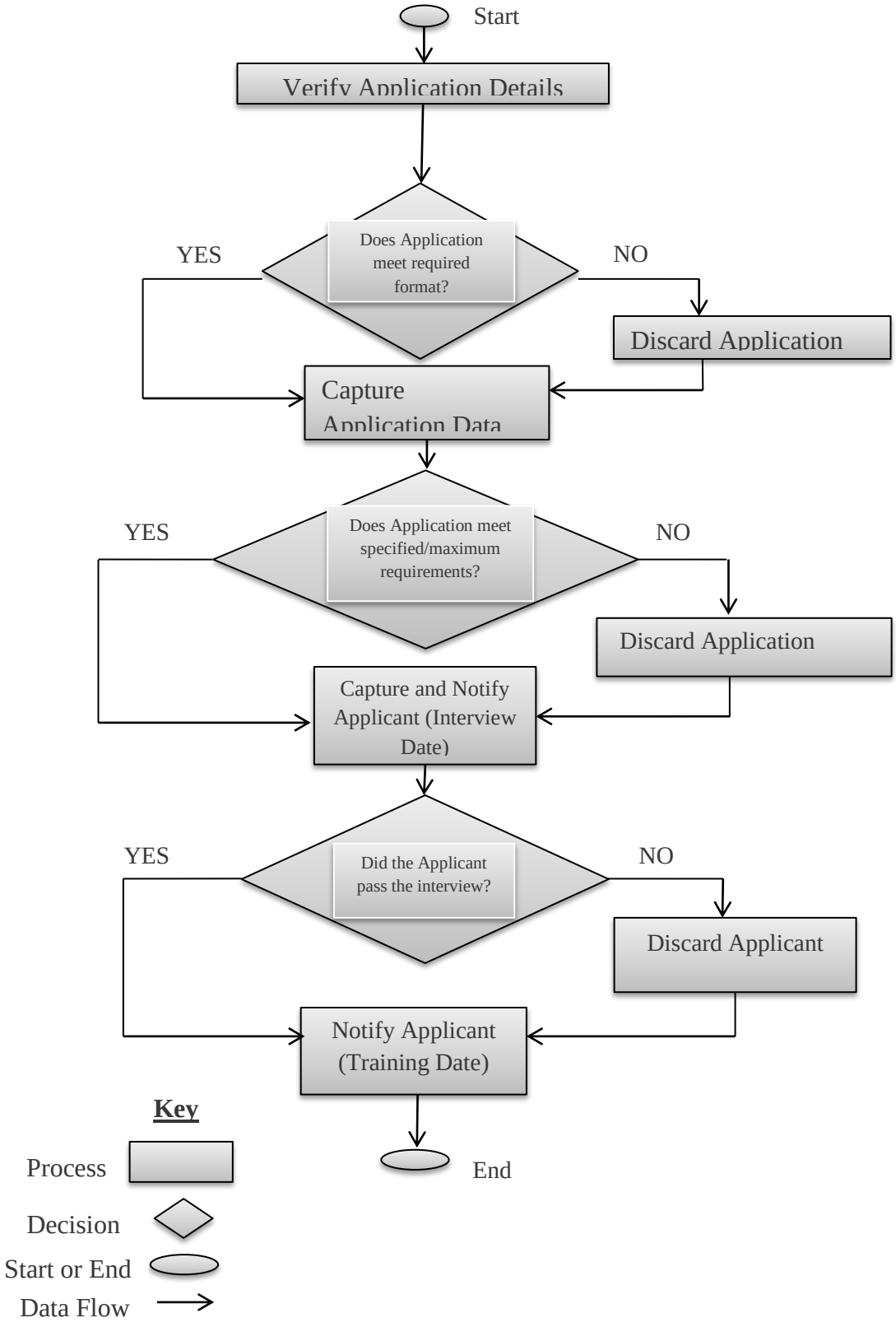


Fig 3.1 *Existing system activity diagram*

3.5 Analysis of Data

Wixon (1997), states that data analysis is the process or an activity that is done to shows how information moves around. According Shamoo (1999) data analysis is described as a route efficiently used to portray legitimate and factual systems for information assessment. As a further elucidation on the operation of the system, two techniques were utilised by the researcher, namely the data flow diagram and context diagram. The two diagrams illustrate existing relationship of the system in question and the substances it interacts with which are outside.

3.5.1 Context Diagram of Existing System

This is a diagrammatic representation for catching and conveying cooperation and information stream in the middle of action courses and doesn't give data about the timing, synchronization or sequencing of methods , (Wiener, 1998). Primary objective of context diagram is centring the attention on exterior procedures and aspects that must be deliberated while building a complete set of the requirements for the system and limits (Pomberger, 2001).

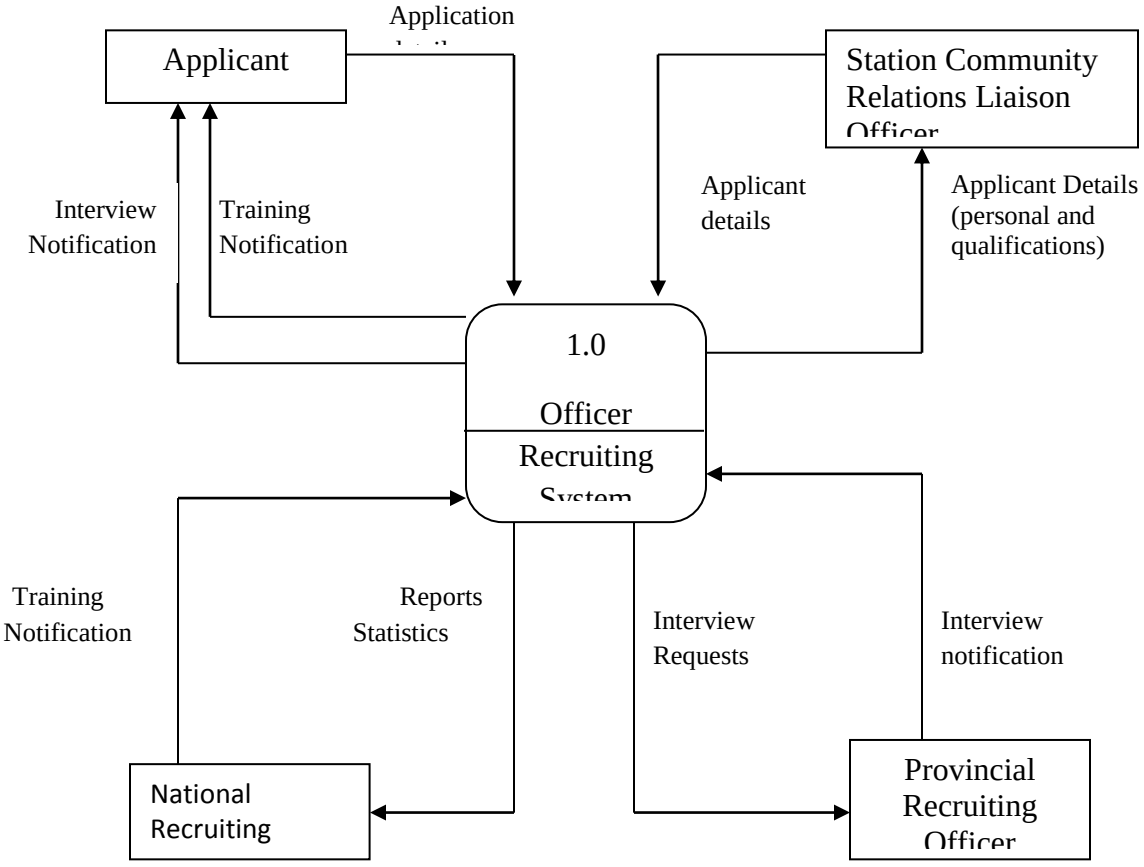
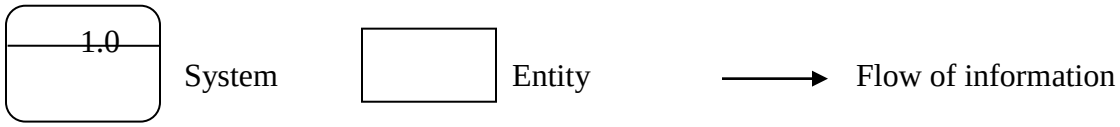


***Fig* 3.2** *Existing System Context Diagram*

KEY:



3.5.2 Existing System Data Flow Diagram

Data flow diagram (DFD) is a tool for modelling data which displays instruments that give a reasonable diagrammatic representation of any firm/business capacity, (Ambler, 2014). (Yeates.D and Wakefield, 2004) notes that this is one of the most used diagrams in capturing the procedures of the existing and proposed system. A data flow is in image format which shows how information flows in and within the system. This is represented below in Fig 3.2 by the current system data flow diagram.

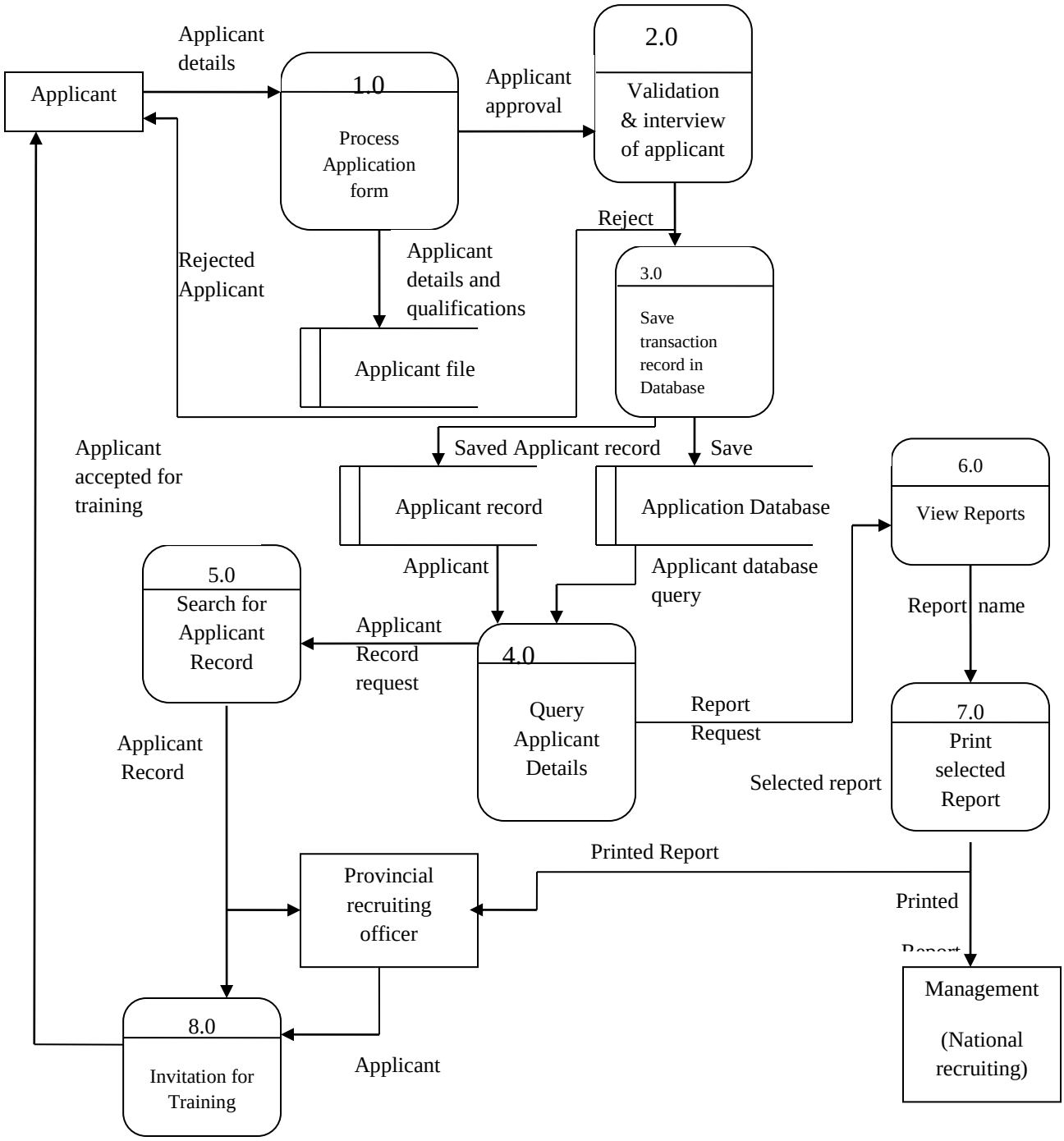
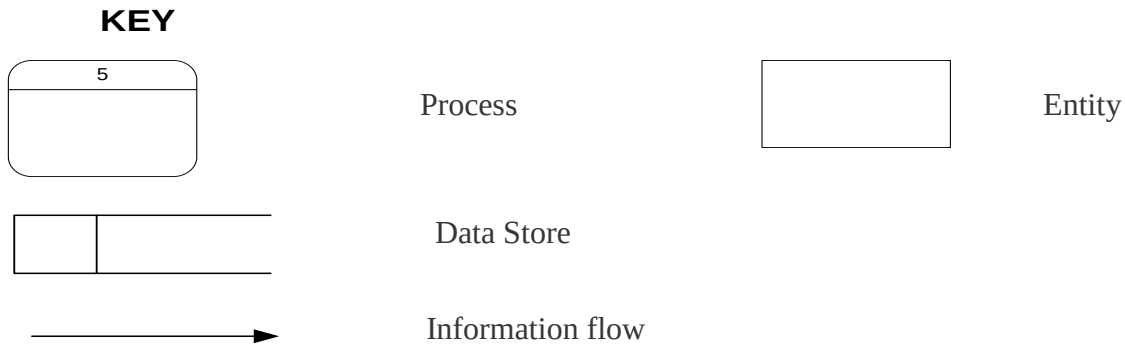


Fig 3.3 *Existing System Data Flow Diagram*



3.6 Current System Weaknesses

The following weaknesses are associated with the current system. Transaction processing is inefficient because of a poorly designed manual system. Also data is inconsistent and not always up to date. If modifications are made at one stage in the process, they may not be effected in the other duplicates of the same record located at other stages of the process. These variations may cause unnecessary delays or improper decisions. There is also need for a well-structured database that offers excellent security measures. The manual system is more of a store of information but with limited capabilities for manipulating of data. The information provided is of little value to management in terms of planning. Mechanisms for control and accounting provided by the current systems are inadequate; ultimately this resulted in an inconsistent intake of recruits and abuse of office, that is, corruption and nepotism. Poor quality reports, which are also not timely for decision-making, are produced. Manual compilation and processing of system data increases the risk of errors and fraudulent activities by employees. Confidentiality and security to information is a challenge since there are no restrictions on access to information. The current system is not user friendly or flexible. This has increased the need for a new system that will deal with problems being caused by the current system.

3.7 Evaluation of Alternatives

After the user requirements have been clearly laid out, it is time to deal with the discrepancies current system. A number of alternatives are outlined and a decision has to be made by the researcher on how the replacement of the existing system is going to be carried out. The alternatives in place are existing system improvement, development of the system in-house and outsourcing

3.7.1 Existing System Improvement

This means modifying of the manual procedures which currently exist will be done. This alternative seeks to deal with improving the manual problems stated in the problem definition in order to make the current system much more effective and efficient than it already is at the moment.

Advantages

Documentation for the current system is available. It shows the procedures to be undertaken when recruiting new candidates (officers). No new hardware and software costs are encountered No training is required and there is little inconvenience resulting from misuse of any new structures or implementations.

Disadvantages

This does not eliminate other existing problems like back up, uncontrolled access to records and redundancy, which causes an expense of stationary and security compromise. Improvement the system is time consuming at times, resulting in the development of a short term solution. Manual and a partially computerised system and likely to be produced which will only frustrate the users in the end.

3.7.2 In-House Development

a route efficiently used to portray legitimate and factual systems for information assessment. As a further elucidation on the operation of the system, two techniques were utilised by the researcher, namely the data flow diagram and context diagram. The two diagrams illustrate existing relationship of the system in question and the substances it interacts with which are outside, (Krugman P, 2009)**.**

Merits of in-house development

Personnel in the organisation's I.T section are familiar with Visual Basic and PHP. Here the development costs are significantly reduced. Also in-house development increases the likelihood of developing a system meeting all requirements of the end users. Maintaining the system will be simple since the system would be the product developed by the organisation's I.T Department

The end users will be full-part participants in the design of the system such that the system is meant to meet their needs. Training sessions for the staff members can be carried along with the

development of the system such that at implementation the end users would quite understand the system they helped to design.

Disadvantages of in-house development

In-house development is time consuming compared to buying of an already made software package. Knowledge of the programmers is what the system will be limited to. Also some users might find learning the new system difficult

3.7.3 Outsourcing

This is a technique which permits the researcher to study information or tasks flow and control and results in the provision information missed or misinterpreted by the other techniques, (Griffiths, 2001). As a further elucidation on the operation of the system, two techniques were utilised by the researcher, namely the data flow diagram and context diagram.

Merits

This technique requires less time during system changing and implementation since it is a readymade product. Improvements to the system done when users require it because of the license and maintenance fees being paid to the entity provide the software. Outsourcing provides a more convenient service system to both the clients who are the applicants and staff involved in the recruiting program.

Demerits

There is a smaller amount of administrative control with this technique. Outsourcing company can go out of business causing unwanted interruptions if the system needs upgrading. Outsourcing is unlikely to satisfy fully the company's principles. There is also a chance of exposal of confidential information in case of disagreements with the developing company.

Alternative Selection

By the comparing of the three solutions, developing the system in-house was chosen because it proved to have more positive notions on its case than the other alternatives. These will benefit the organisation in the long run.

3.8 Requirements Analysis

In this case this is the flow of the application process within the Zimbabwe Republic Police. Its actions which are stepwise support for concurrency, iteration and choice. Displaying of data is done in various stages from the moment the Application is made to the organisation until it is processed, (Rouse 2007). The two requirements include:

- Functional requirements
- Non-functional requirements

3.8.1 Functional Requirements

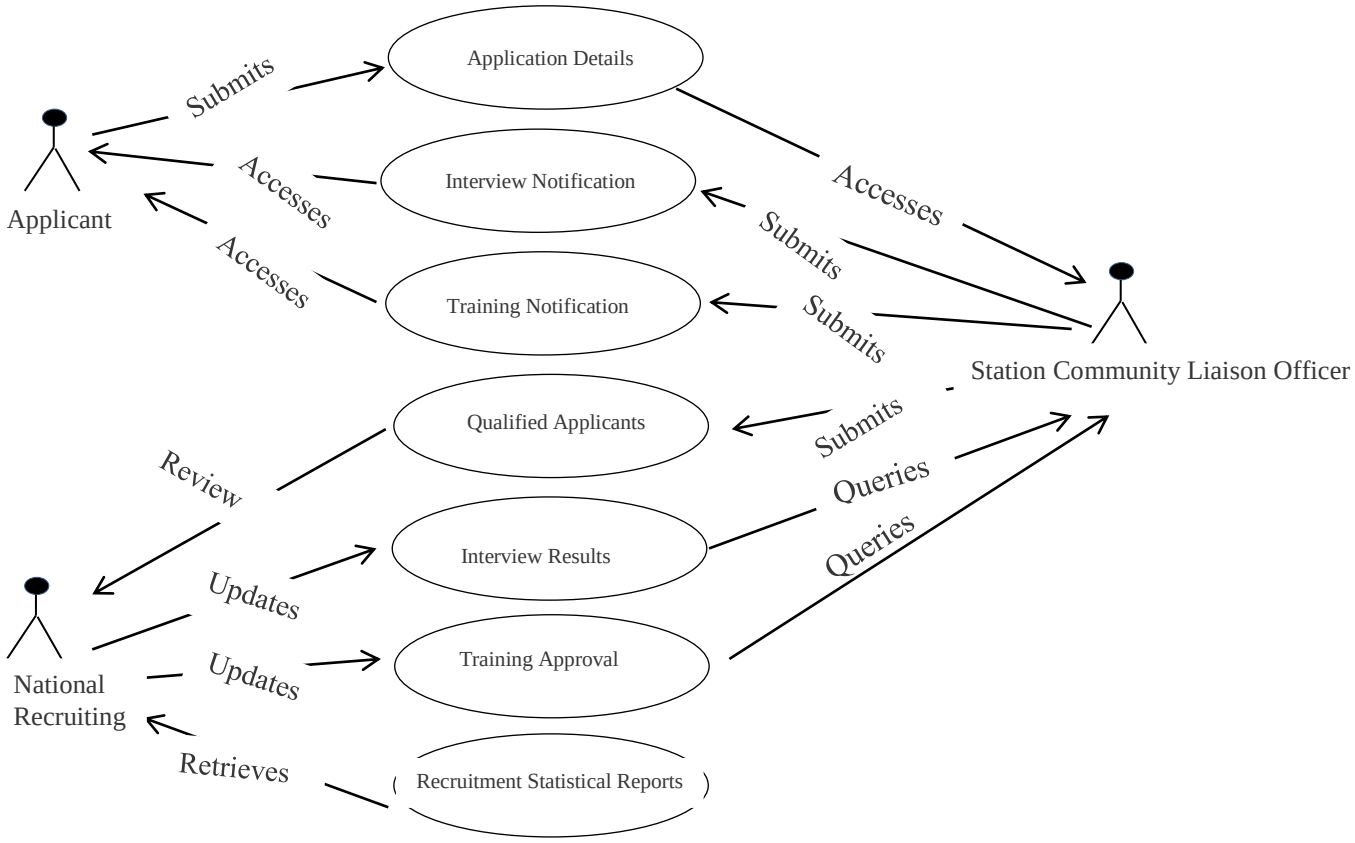
Malan (2012) is of the opinion that these are the requirements defining the services, which the system should provide mainly in the operational field of dimension. These are the requirements defining the services, which the system should provide mainly in the operational field of dimension. The requirements highlighted by users are outlined below.

The users have highlighted the need of a recruiting or client serving facility that is fast and accurate. Management requires an accurate and fast report producing system that can provide reliable up-to-date reports on applicants, those whose applications are being processed and those awaiting training at any time when required to help in fast and accurate decision making processes. Management also requires a more secure record keeping system to which ultimate access is only limited to certain individuals or an individual given the overall right as administrator to centralize responsibilities maximizing the security of the system.

Users require a facility that offers readily available and easy access to client or applicant records and details by senior supervisors in case of applicant queries. This is also what the applicants suggested as a major improvement and an area of concern. There is a need of a well updated, easy, less laborious and accurate reserve accounting and management system that keeps track of the levels of applicants available for training and every activity performed on the reserve. The users need a system that limits manual work and increase convenience to applicants, which is a good base for a good name and reputation. Also the system has to be user friendly system that is easy to adopt, that is not a threat to any part of the staff but should offer improved service to clients without adding manpower. It should offer high performance and efficiency. User friendly interface should be employed.

Use Case diagram for the current system

This is a diagrammatic representation for catching and conveying cooperation and information stream in the middle of action courses and doesn't give data about the timing, synchronization or sequencing of methods, (Cashman and Rosenblatt, 2009).



Key

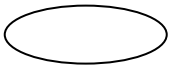
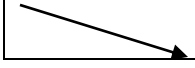
Symbol	Description
	Actor
	Use Case
	Communicator

Fig 3.4 *Case Diagram for the current system*

3.8.2 Non-Functional Requirements

These are defined as requirements which the system should provide mainly in the operational field of dimension. These are the requirements defining the services, which the system should provide mainly in the operational field of dimension, (Jacobson, 1999). These include limited manpower for concentrating on the various modules of the system. Also a lot of time and money is required. Resistance to change may occur if proper training is not conducted. Expertise is required to develop and maintain the system.

3.9 Conclusion

After careful analysis of the current existing system, a firm and acceptable conclusion can be reached which certainly gives a good starting ground for the implementation of the project to develop a new system. The data and document that has been developed from this analysis is of great significance as it will definitely directly influence the actual design of the system. As at this point, the problems can be clearly understood to a better extend from direct data and not only assumptions. The next phase is the designing of the proposed system.

CHAPTER 4: DESIGN PHASE

4.1 Introduction

This phase of system development is an important stage, mainly concerned with the designing of the proposed system. All the logical vital information acquired in the previous stage of detailed analysis is now transformed into a real logical model presenting all the relationships between processes, that is, how the system will work, how software and hardware interact and those tasks that focus on the specification of a detailed computer solution will be looked at. The development of the logical model of the proposed system includes logical design, architectural design, physical design, interface design and database design are covered in this section of the development life cycle. The system is designed for implementation using several approaches that include Data Flow Diagrams and Entity Relationship Diagrams.

4.2 System Design

According to Waldo (2006) system design is defined as the ultimate components, modules, architecture, data and product development to meet the specified requirements. System design is a meaningful engineering representation of something to be built. Eppinger (2000) notes that this is the method of describing the components, data, interfaces and structural design of the proposed systems so at to archive the stated objectives. This describes the desired features and operations in detail, including screen layouts, business rules, process diagrams and other documentation of the proposed system.

The design of the Zimbabwe Republic Police Online Officer Recruitment system will be centred on the following design phases.

- Architectural design
- Physical design
- Database design
- Program design
- Interface design

The Zimbabwe Republic Police Online Officer Recruitment will perform the following processes:

Inputs

The major inputs to the system will be the users' registration details. All the users who use the system should get registered and will access the system using their authorised username and password. Some of the details captured include the first name, surname, middle name, user group, access level, password and username. The personnel responsible for account creation are the system administrators. Verification and validation will be enhanced at every data entry point in the system so that only valid user input is processed and data is saved in a standard format.

Processes

Applicants apply for the vacancy and submit their application to the system database where each application is assigned an applicant ID which will be used by the recruiting staff to identify an applicant. All users are issued their accounts and privileges depending on their work descriptions. Recruiting staff can access the system with restricted privileges, being able to process the application details and updating the applicant on progress. Applications are processed by the National Recruiting staff and decisions are made on whether an applicant qualifies or not. and feedback is given to the recruiting staff who then notify the applicants.

Outputs

The recruiting staff gets feedback from the national recruiting about the application status and then provide feedback to the applicants about their application, i.e. whether accepted or not. Applicants can track their application progress status. Reports about the application process can be produced for decision making by higher management and to provide managers with precise information about the current state of the application process, well structured-reports are the main output of the system and other relevant information. The data produced here will be meaningful if the processes above have been done accurately.

How the Zimbabwe Republic Police Online Officer Recruitment system will work.

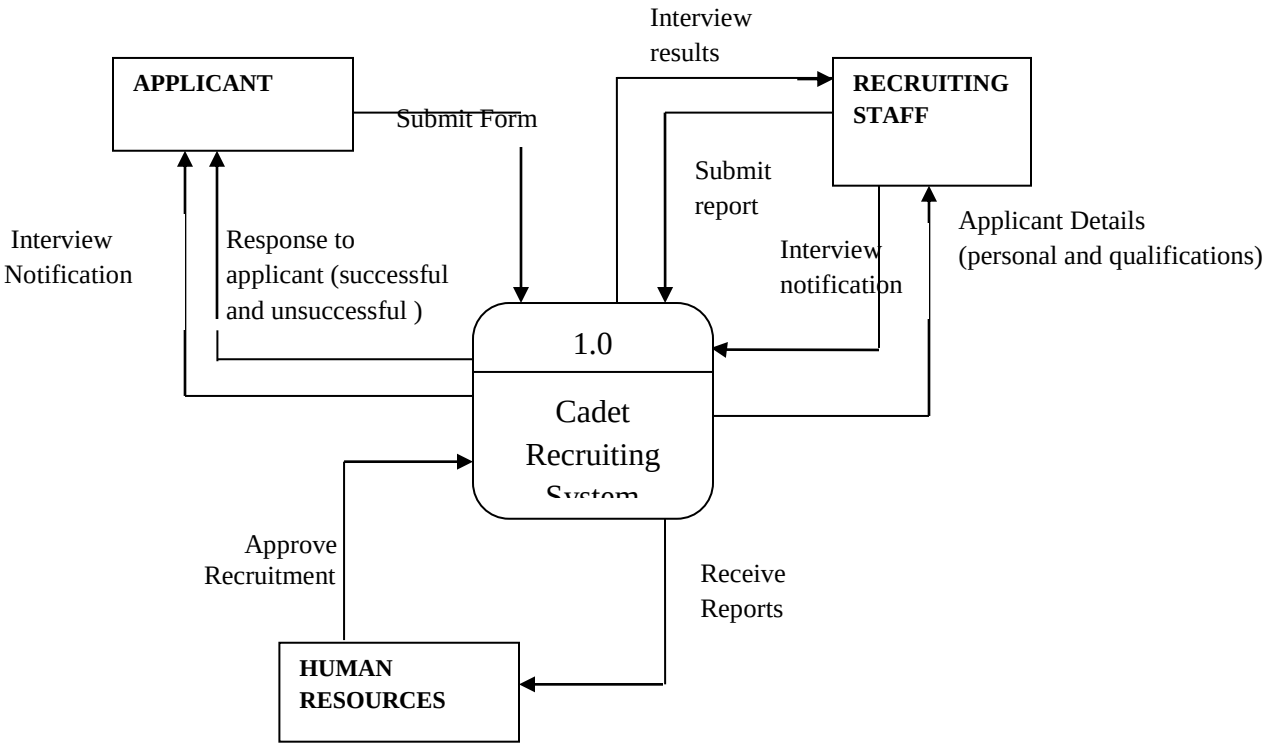
The system shall allow applicants to apply for vacancies available. It will also capture every applicant's personal details, upload and view the application form. The proposed system will allow users to log in using their user name and password, that is, encouraging security, accountability and confidentiality. Also it will allow the recruiting staff to download and view applicant's forms, allow the Recruiting officers to reply the applicants using the applicant's ID as

identifier through emails and sms which will allow the applicant to view the response quickly and also allow applicants to view their responses pertaining to their vacancy applications by use of their applicant ID number. The system will allow the organization to keep records of every recruitment process that takes place and also be able to generate reports which can be viewed from the system or printed. It will also be able to offer a user friendly system due to the presence of simple and understandable user interfaces.

4.2.1 Context Diagram of the proposed system

The Context Diagram shows the system under consideration as a single high-level process and the relationship that the system has with other external entities (systems, organisational groups, external data stores, etc.).

Context Diagram for Proposed System



***F*ig 4.1** [*Context Diagram for Proposed System]*

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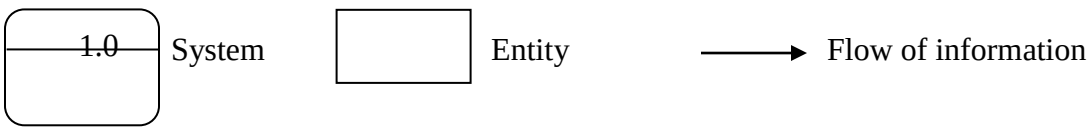


4.2.2 Data Flow Diagram of the Proposed System

This is a two-dimensional diagram that explains how data is processed and transferred in a system. It involves identifying external inputs and outputs, determining how these inputs and outputs relate to each other. It illustrates how these connections relate and what they result in. This type of diagram helps business development and design teams visualise how data is processed and identify or improve certain aspects.

Data Flow Diagram for Proposed System

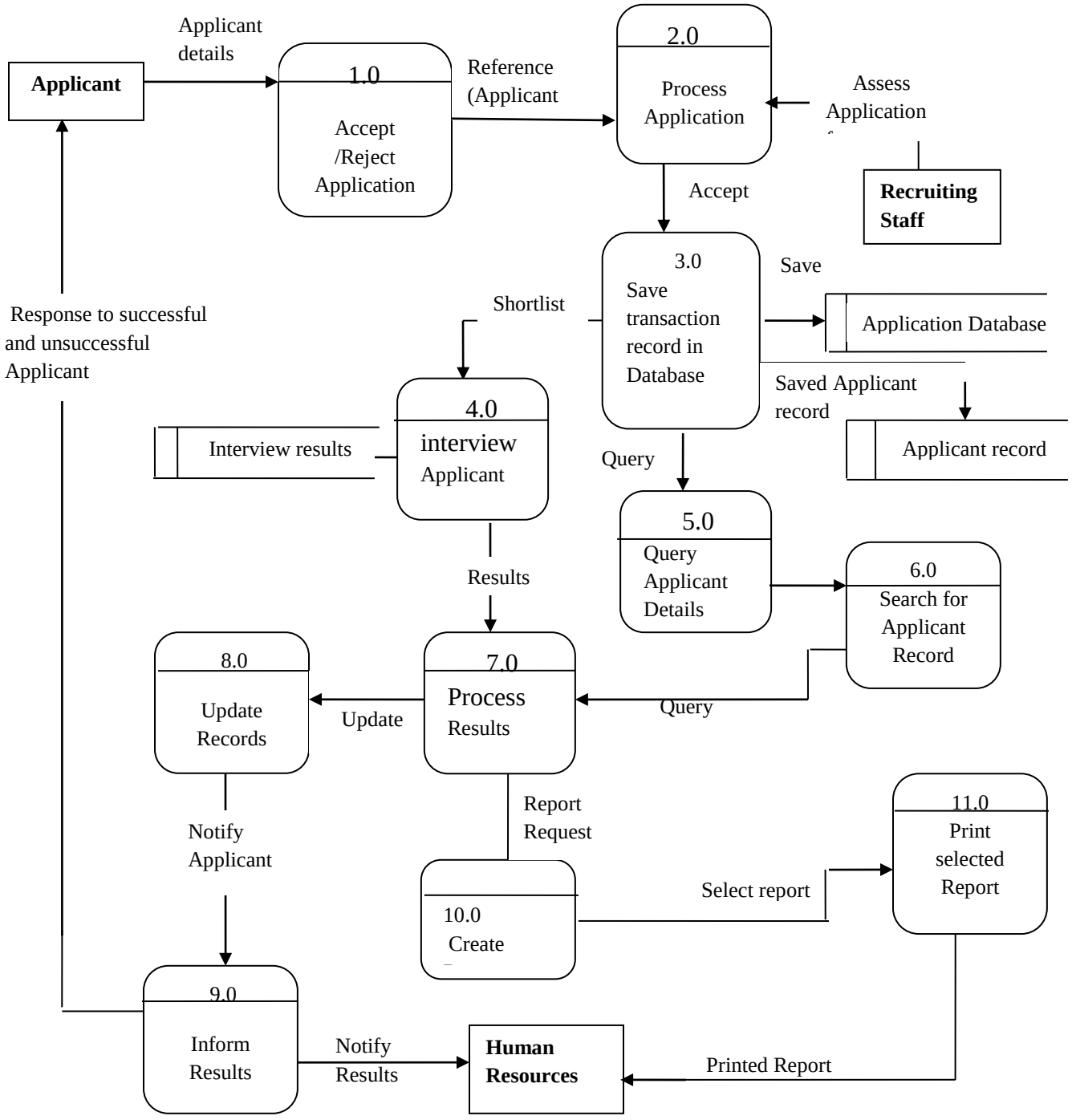
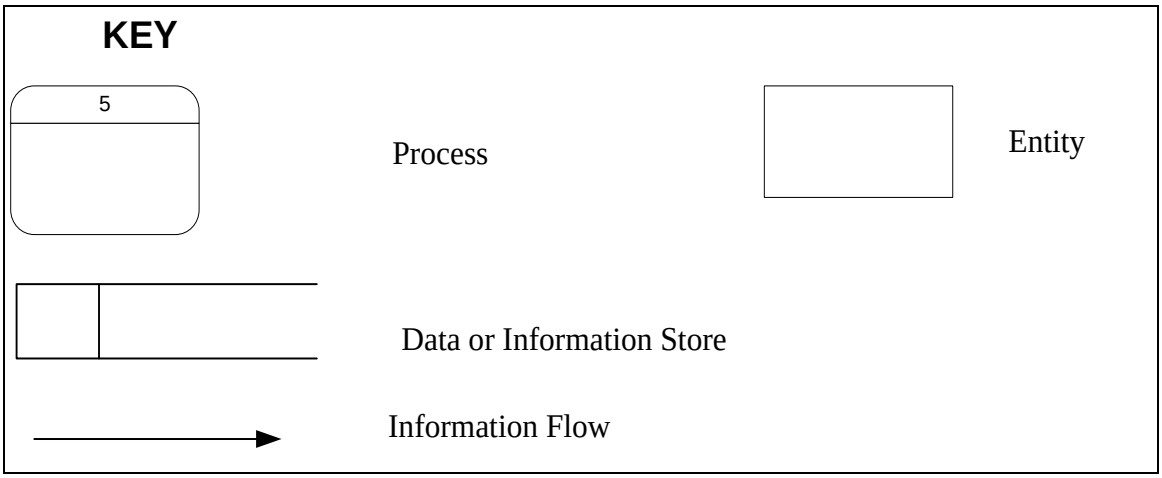


Fig 4.2: *[Data Flow Diagram for Proposed System]*



4.3 Architectural Design

Architecture design displays the infrastructure on which the system will be created on and methods that support the system needs. It also refers to the arrangement of data in a database in the form of layers known as schemas. Ackley (2010) is of the opinion that without a unifying architectural design and vision system qualities such as security, modifiability, and performance cannot be archived. The objective of architecture design is to minimize bottlenecks in the system caused by hardware, software and architectural factors.

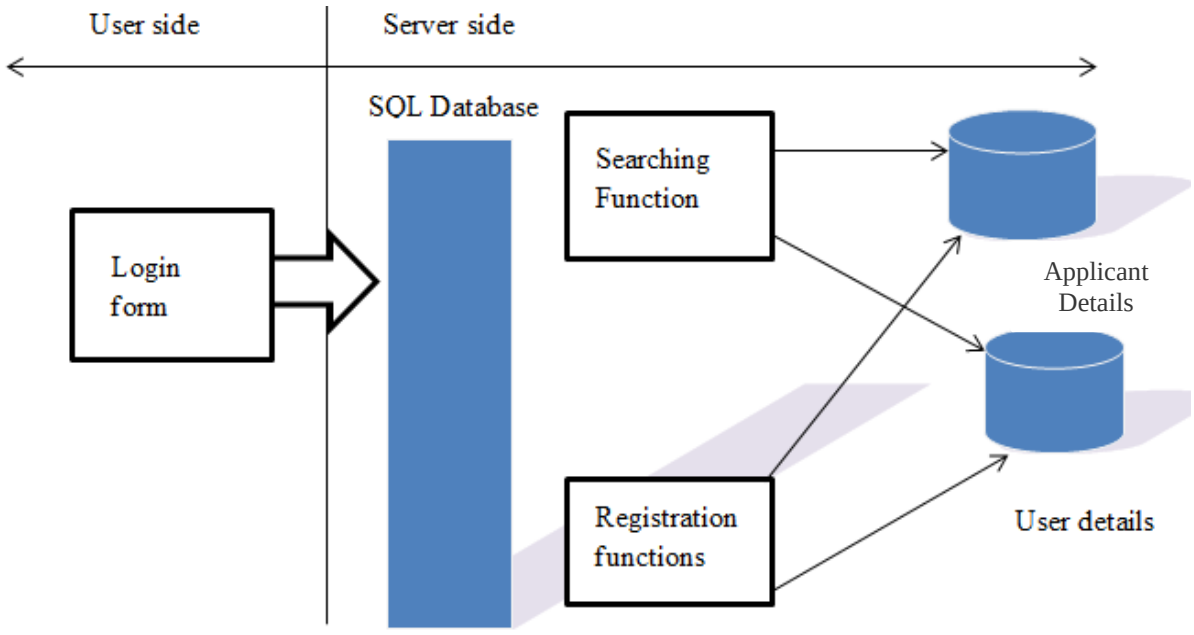


Fig 4.3 *Architectural Design of the proposed system*

The system should run on a reliable hardware platform and information should be backed up regularly in case the system is corrupted. The system will use the star network topology, which allows accessibility in all directions, which would include the Applicant, Database Server and several workstations. A star network consists of one central network hub or computer, which acts as a conduit to transmit messages. This consists of a central node, to which all other nodes are connected. The central node provides a common connection point for all nodes through a hub. The hub and leaf nodes, and the transmission lines between them, form a graph with the topology of a star. The layout of the system is illustrated as below.

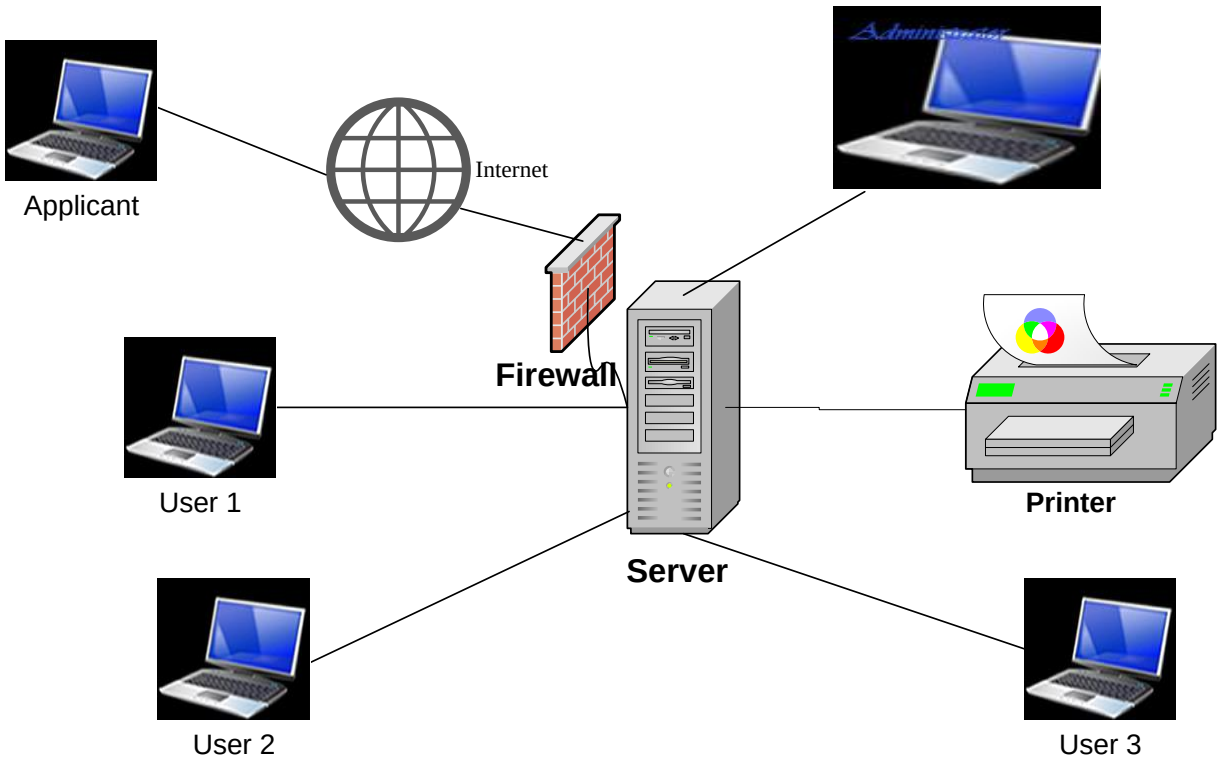


Fig 4.4 *Star network topology of the proposed system*

Benefits of this type of architectural design

Better performance - Star topology prevents the passing of data packets through an excessive number of nodes. At most, 3 devices and 2 links are involved in any communication between any two devices. Although this topology places a huge overhead on the central hub, with adequate capacity, the hub can handle very high utilisation by one device without affecting others.

Isolation of devices - Each device is inherently isolated by the link that connects it to the hub. This makes the isolation of individual devices straightforward and amounts to disconnecting each device from the others. This isolation also prevents any non-centralised failure from affecting the network.

Benefits from centralisation - As the central hub is the bottleneck, increasing its capacity, or connecting additional devices to it, increases the size of the network very easily. Centralisation also allows the inspection of traffic through the network. This facilitates analysis of the traffic and detection of suspicious behaviour.

Drawbacks of this type of architectural design

Failure of the central computer disenables the functioning of the entire network and database access. This technique requires more cable length as compared to linear bus topology.

4.4 Physical Design

David (2006) defines a physical design as a transformation of the abstract logical model into a meaningful and specific technical design and thus involves a closer look on the software and hardware design the new system is going to operate on. On the other hand, Naveed (2013) suggested that a physical design will constitute the entire network infrastructure for the whole System. This entails the translation of the abstract logical model into the specific technical design. It is the design of the hardware and software that the proposed system is going to operate on. As mentioned earlier on in feasibility study some of the hardware equipment is already available.

The recruitment system will have a centralised server which acts as a storage for the organisation's database and is secured by firewall sessions and cookies enabled so as to enhance security of the whole system thereby protecting data from hackers or being copied when system is in transit. As part of the proposed system, there exist the physical components of the system. The system will be using an MySQL database on a windows server 2008 operating system.

Users in each section or department will access the server on a LAN network, although some extra cabling maybe necessary in extending the LAN network to a wide area network (WAN) for distant sections or divisions of the organisations.

Some of the major components consist of the following hardware elements:

- Server computer
- Host computers
- Printer

These components are to be linked through networking cables to allow for integrated data sharing and communication, as well as sharing of other peripherals at some point in time like the printer. This networking will also cater for integrated monitoring of data and any access into the system. Upgrading of security for the entire network can be done centrally. The central element of the system will be a computer to be used as the sever computer and has its own characteristics and properties upgraded above the others. This is the centre of the network in the star network architecture proposed, and it is responsible for traffic monitoring on the database of the department. All other computers termed as client or host computers access the data from it according to their access levels as defined by the software. Fig 4.4 below shows the physical design of the Zimbabwe Republic Police Online Officer Recruitment system.

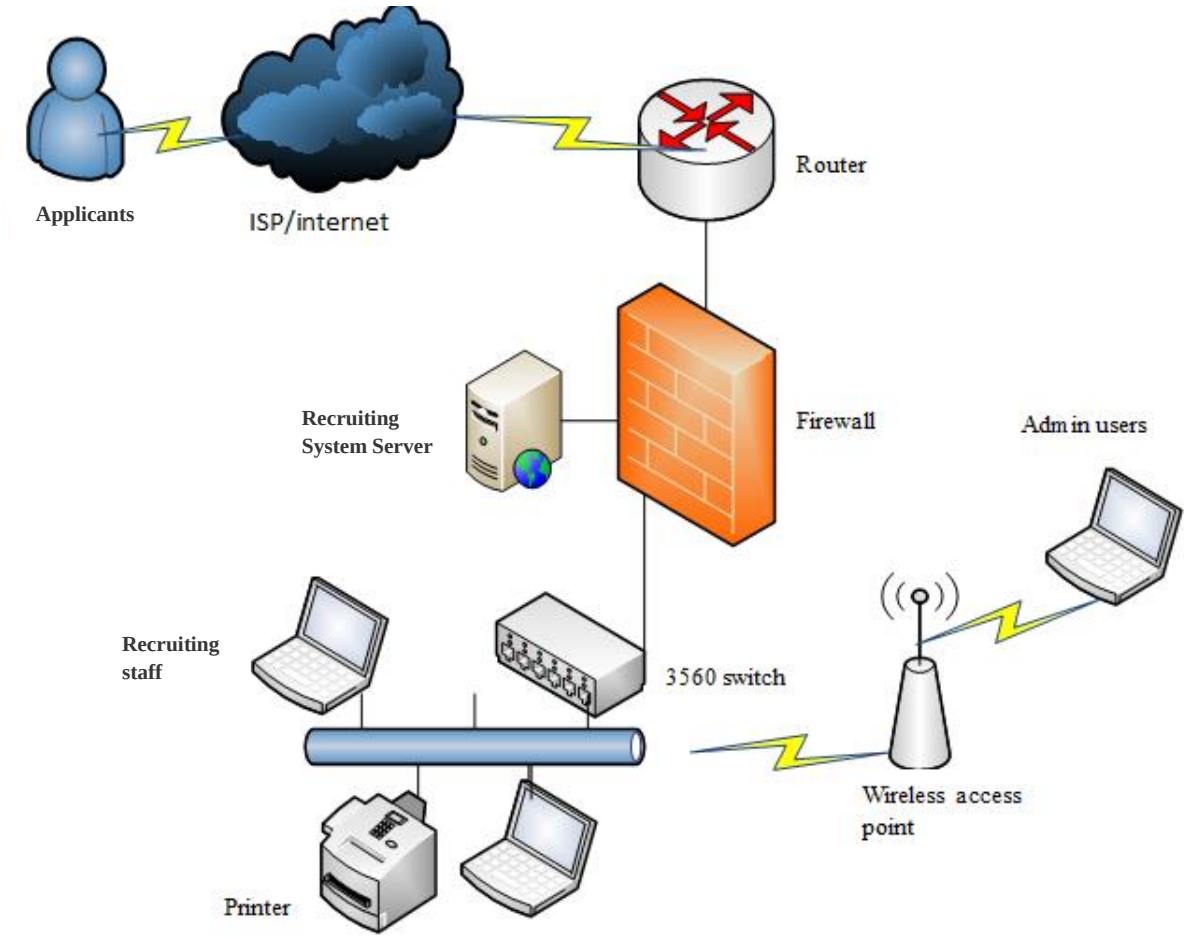


Fig 4.5 *Physical Design of the Proposed System*

4.5 Database Design

Owen (1997) defines database design as an art of data modeling which focuses on various kinds of data to be stored in the database. In the case of relational databases, Edgar (1998) said it is data organized in relations with well-defined relationships that make it easy and effective in retrieving the needed information wherever necessary. An efficient, secure and reliable record storage service is to be part of the new computerised system and is to replace the manual file system. The database system is expected to reduce data redundancy and enforce data integrity. In addition, it will afford a secure and reliable back-up system.

The Database is a MySQL database that consists of several tables of records. The relational database model was used in designing the database. This process will define the data that is to be stored in the database as well as its type. Data is entered and stored via the designed forms.

The data is held in such a way that changes to the structure of the database do not affect any of the programs that access the data. Since each data item is held only once, there is no danger of one item being updated on one system and not on another. With database systems, users have access to information that was previously stored in separate files in other departments. The database is designed from three different viewpoints known as schemas.

Possible relationships between tables in the given database are: -

- One to one
- One to many
- Many to many

Reasons of using relational databases are:

They are very convenient and easy to use with the application being developed using Microsoft Visual Basic .NET. They also support diverse data needs and are good in handling data. They effectively support database manipulation, that is, operations such as updating, retrieving, and deleting stored data. There is an improved concurrence access as different users can access the same table in the database simultaneously. They enhance data consistency through the use of database management system. There is input validation as well. Database management system provides backup and recovery services in case of eventualities. Costs are reduced since the database management system integrates data into one central repository. They also describe data elements and the relationships between them in a simple way.

Security

Enforcement of security is both physically and electronically employed.

Physical control

Unauthorised or unknown people are denied access to the use of the system without permission. The supervisor is also there to monitor use of computers on the network.

Non-physical control

Accounts are created with at least two accounts appearing on the computer, one for the administrator and another for other users. The database is to be locked by the use of a password so that only authorised people can directly access the database. Access to certain parts of the software program, is controlled through the use of access level, where users login into the system using passwords and accounts. For instance the client server cannot alter applicant record from another district's database.

Database Architecture Design

The database consists of three schemas which are the conceptual layer, physical layer and application layer. The schema is a description of the database specified during database design and the instance is the data that is stored in the database at a given time. The database architecture design of the proposed system is shown below:

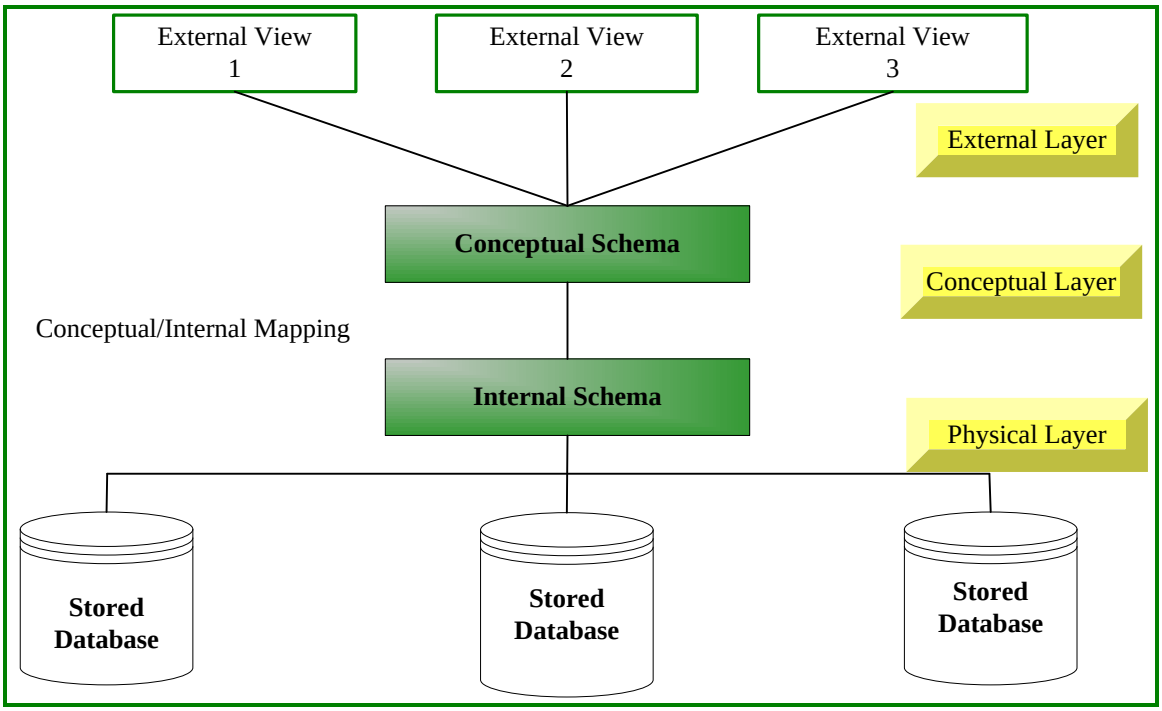


Fig 4.6 *[Database Architecture: Three Level Schemas]*

Physical Layer

The internal level involves how the database is physically represented on the computer system. It describes how the data is actually stored in the database and on the computer hardware. It is a

low level representation of the entire database that describes how data is stored and the database access paths. Smith and Barnes (1995) add that it is concerned about the storage details that are not part of the database and just below this level is a physical level managed by the operating system under the control of the database management system (DBMS).

Conceptual Layer

It is also known as the logical schema. Elmaseri and Navathe (1994) describe the conceptual view as representing a logical structure of the database as seen by the database administrator, concentrating on relationships, constraints and entities and hiding physical storage details. It describes the stored data in terms of the data model of the Database Management System. In a relational Database Management System, the conceptual schema describes all relations that are stored in the database.

External Layer

The user's view of the database describes a part of the database that is relevant to a particular user. It excludes irrelevant data as well as data which the user is not authorised to access. This level shows the highest level of abstraction. Its main aim is to simplify the user's interaction with the database by provision of interface that the user can simply manipulate. Benyon (1997) describes it as a level that describes which parts of the database are relevant to one particular user. The most common interfacing tools in this level are the data manipulation (DML) and data definition languages (DDL).

4.5.1 Logical Database Design

Entity Relationship Diagram

An Entity Relationship (ER) diagram is a specialised graphic that illustrates the interrelationships between entities in a database. Entity Relationship diagrams often use symbols to represent three different types of information. Boxes are commonly used to represent entities. Diamonds are used to represent relationships and ovals represent attributes. Illustrated below is the entity diagram for the proposed system.

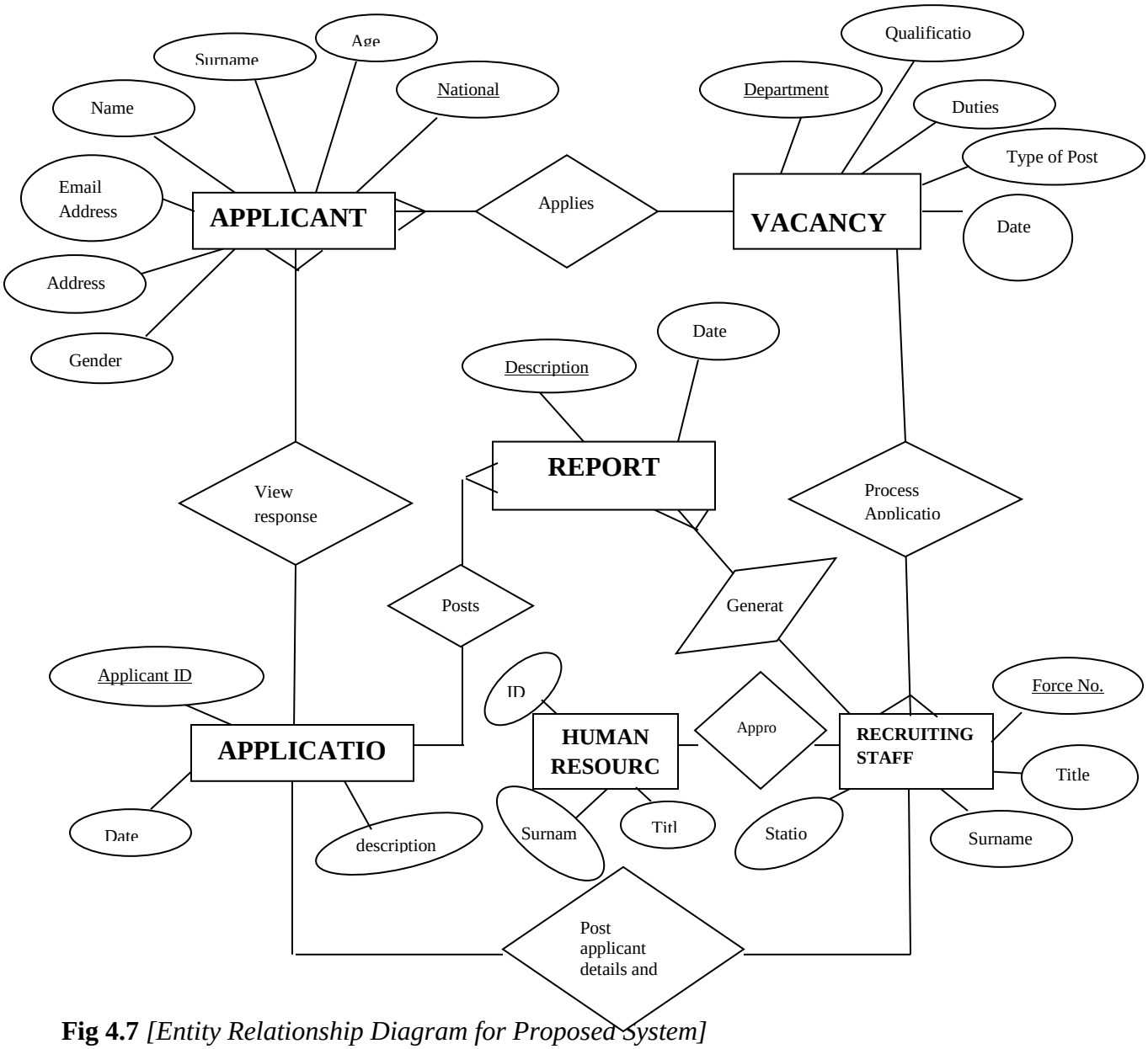
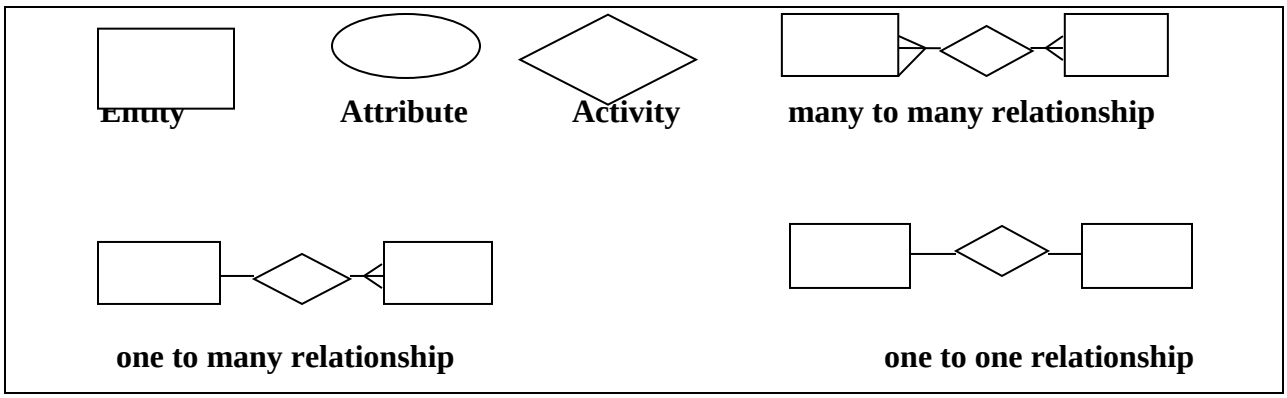


Fig 4.7 *[Entity Relationship Diagram for Proposed System]*

KEY:



Enhanced Entity Relationship Diagram

Thelheim (2011) defined an Enhanced Entity-Relationship diagram as an extension of the entity relationship diagram that deals with more complex relations within data providing easy ways of representing it. It is the best graphical solution for any Database Management System design. The figure below is an illustration of the Zimbabwe Republic Police Officer Recruitment System.

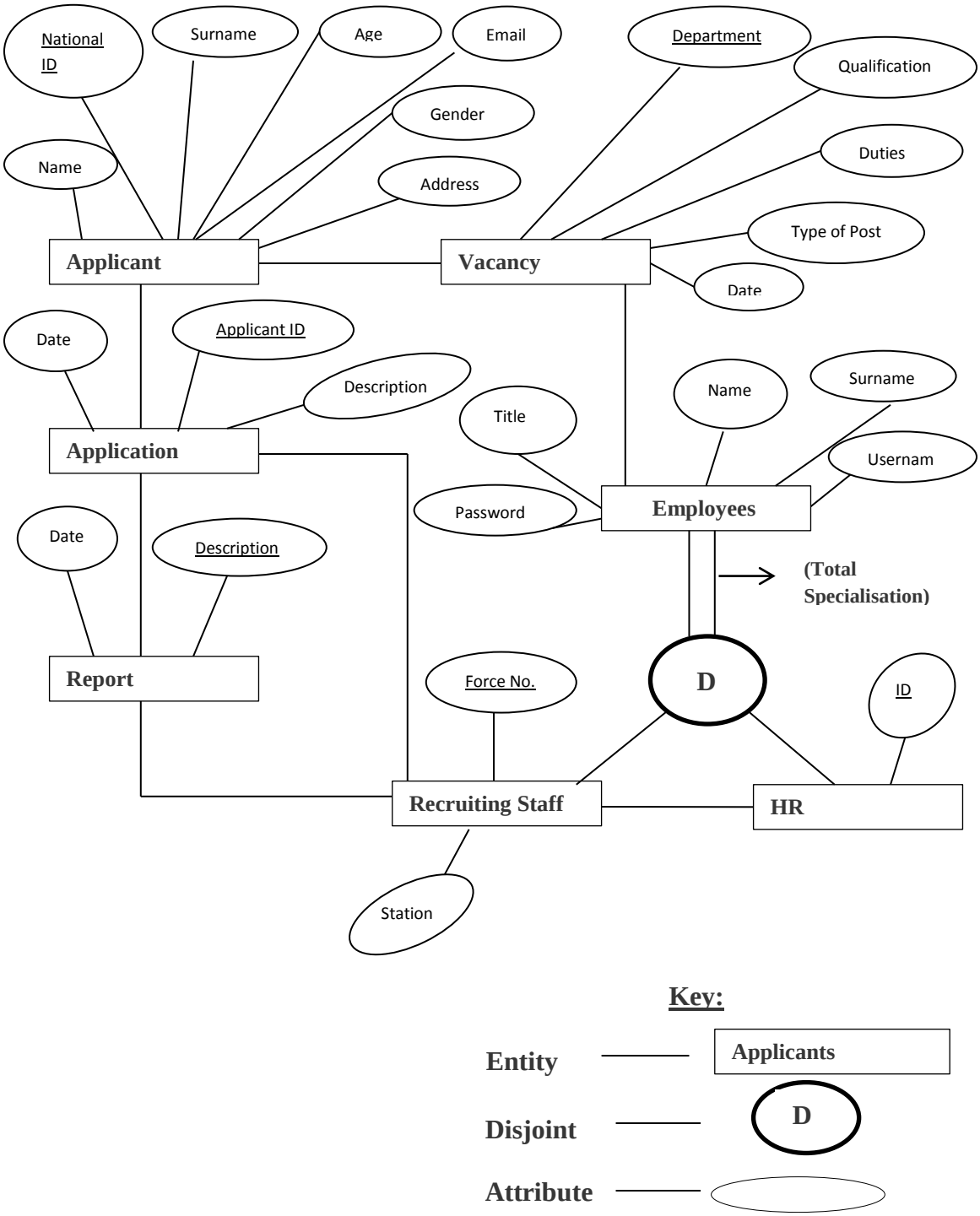


Fig 4.8 *Enhanced Entity Relationship diagram for the proposed system*

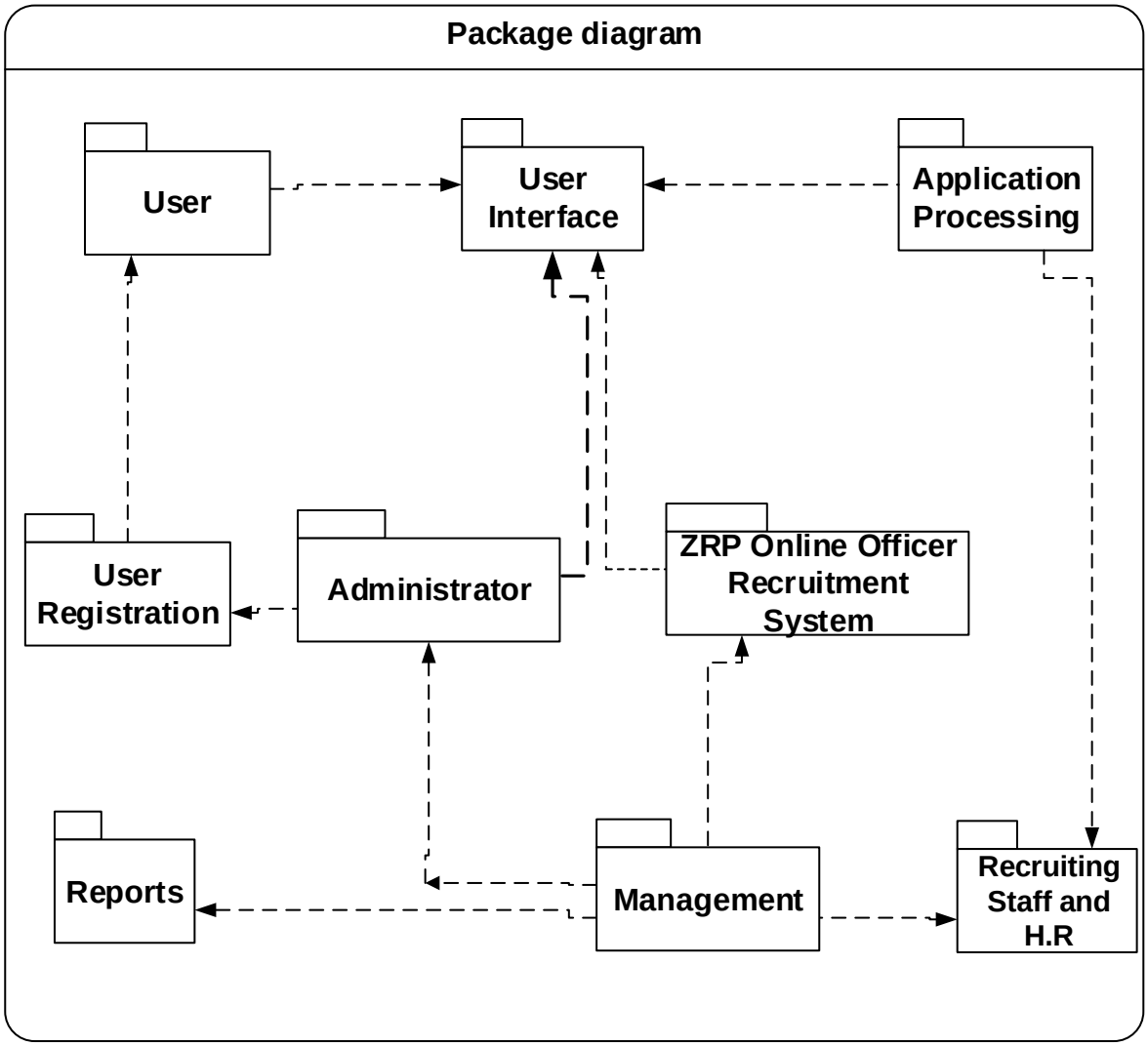
4.6 Program Design

Rennekamp and Jacobs (2003) are of the idea that before embarking on coding a certain program in a certain language, a programmer needs to follow some steps. These well-documented steps make up a complete program design that will make it easy to maintain and can be used by any programmer in the same language in future. Akin (2001) agrees with the same idea and adds on that in order to come up with a sounding program design, the programmer must pay special attention to the rules and syntaxes of that particular language.

The stage will look at the basic functionalities of the proposed system as it models the processes in the system under construction. Thus package diagrams, sequence diagrams and class diagrams for the proposed system will be considered

4.6.1 Package diagram

It is a diagram which depicts make of the system and the functionality of that system. Dubuis and Fachhoschule (2008) defined a package diagram as a model that tries to depict organisational elements into packages and dependencies within these packages. Booch (1993) extends the same idea as he defined the package diagram as a model that visualises per module, the structure of the system and module interaction. The diagram below shows the package diagram for the proposed system



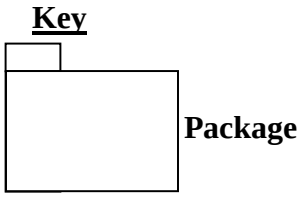


Fig 4.9 *Package Diagram for the proposed system*

4.6.2 The Class diagram

According to Clark (2004), a class diagram is an excellent tool used to articulate relationships, operations and attributes in an application. It helps to describe in a logical way the classes and objects inside the system and how they relate to each other. As the name suggest a class diagrams represents a system's overview elaborating the classes of that system (attributes, functions, objects) and the existing interrelatedness of the classes. The bellow diagram is a class diagram for the Zimbabwe Republic Police Online Officer Recruitment system.

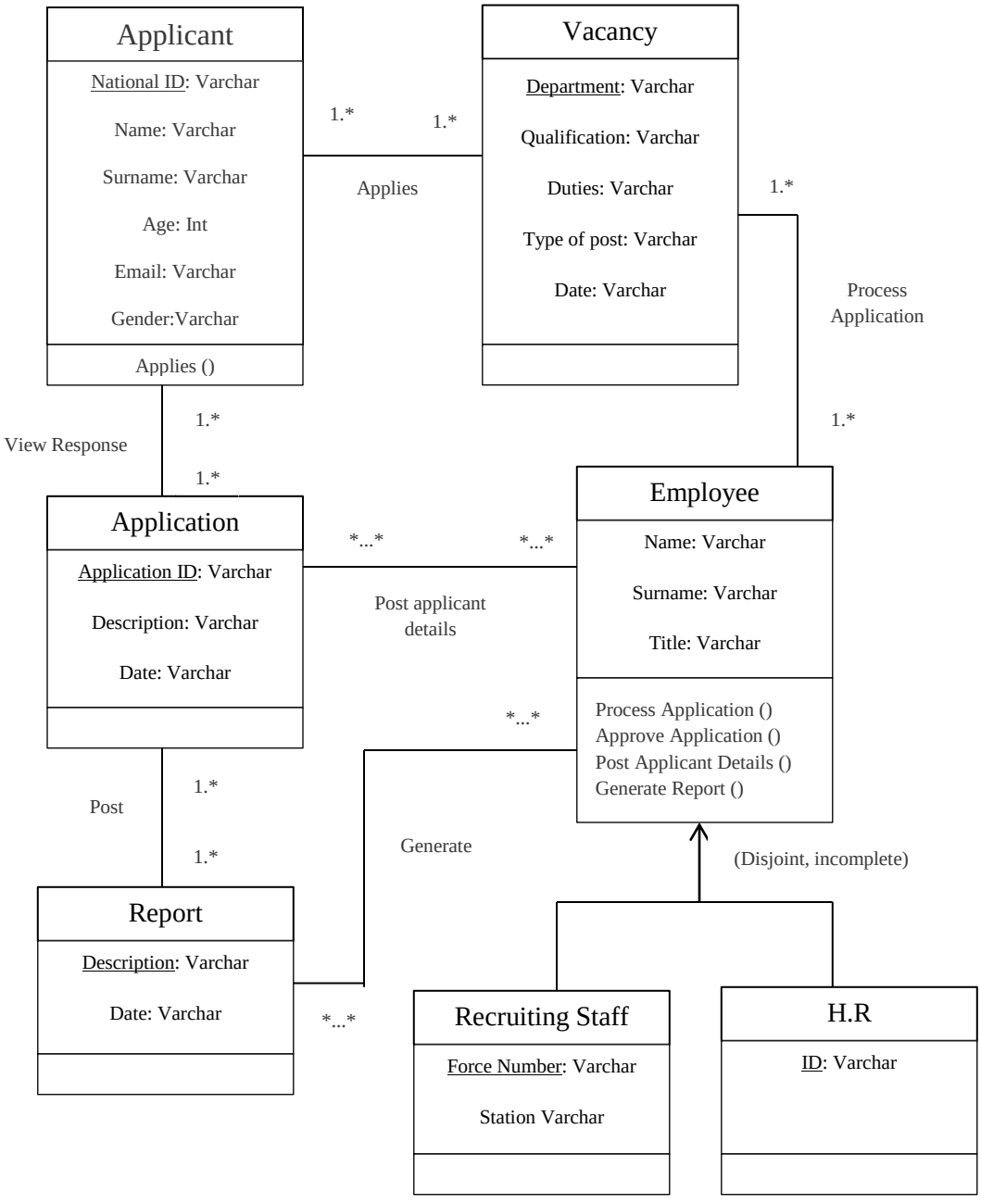


Fig 4.10 *Class diagram for the proposed system*

4.6.3 Sequence Diagram for the proposed system

Displays activities of objects in a use case by illumination the messages distributed and the objects. (Meziro, 2008) states that it displays objects relation arranged in time series. Ambler (2011) defined a sequence diagram as model diagram that represents a sequential nature of logic in a system usually used for the analysis and design purposes. Its main focus is on the objects and classes and the sequence exchanged between these to carry system functionalities.

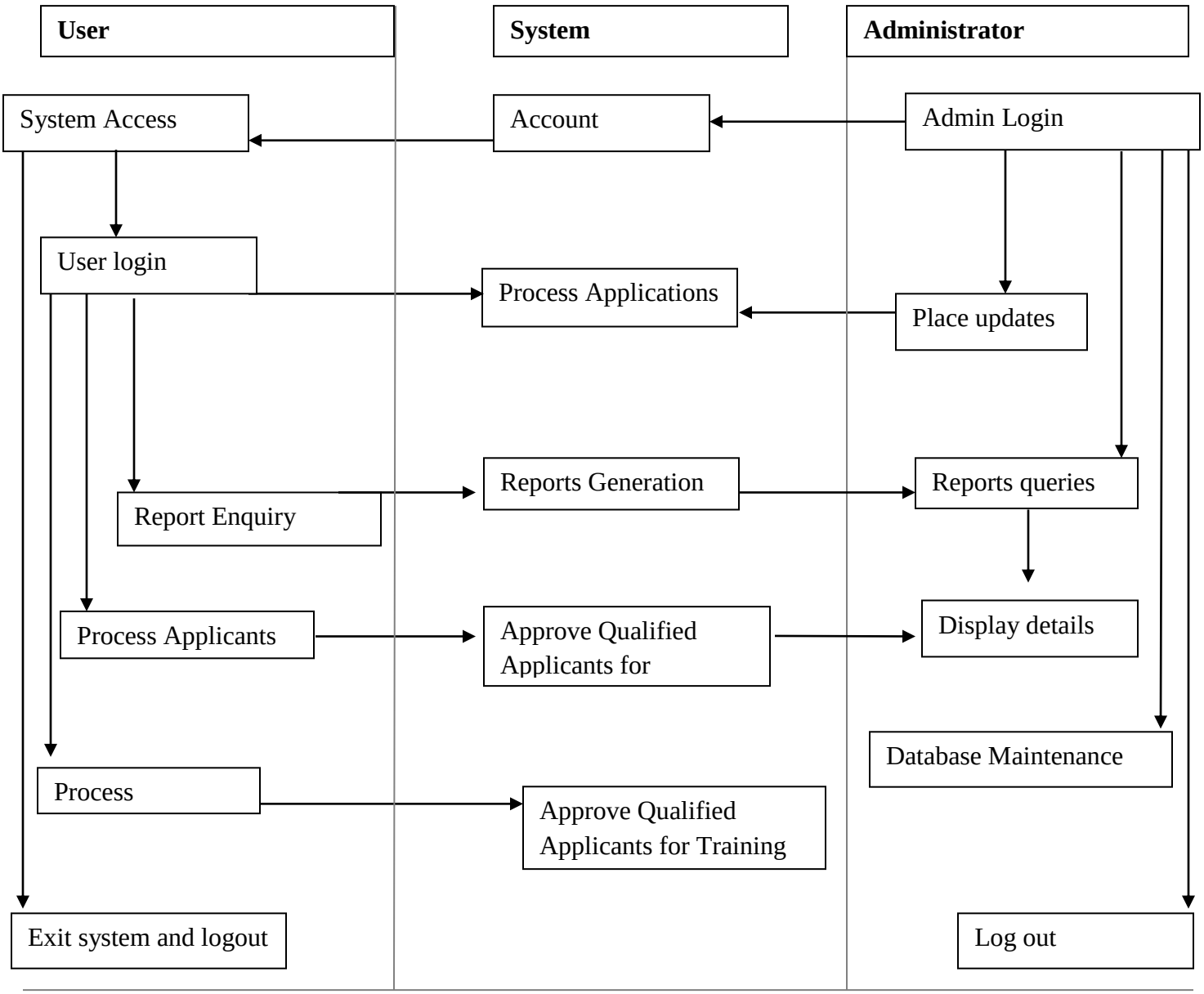


Fig 4.11 *Sequence diagram for the proposed system*

4.7 Interface Design

Garrett. J (2009) is of the opinion that an interface design is a representation of the interaction of the system components with the external entities. It gives therefore an understanding of how the users will interact with the system and the inputs that are going to be accepted by the system. According to Morville and Rosenfeld (2010) a good interface design encourages a user to work, forgetting that he or she is using a computer system and get on with whatever job being done and not concerned with the internal system processes. Interface design illustrates the Graphical User Interface (GUI) that interacts with the users each time they use the system, this will be designed in a way that will allow easy navigation of the entire system.

This is a major area of consideration when designing the user interface for the Ziimbabwe Republic Police Online Officer Recruitment System as it has a direct impact with the users. The interface in this case is meant to be user friendly. The users should find it easy to learn and use its components. The interface should be very informative and attractive to the user. Irritating colour contrasts should be avoided. The interface includes input windows and viewing windows of records and message boxes to show messages that are important to the user at certain points. The report interface is designed to be as informative as possible and as required.

4.7.1 Login structure for the proposed system

The figure below shows a login structure for the proposed system. There is a single login screen for all the users that leads to a main form after proper user authentication. Depending on the user type and user access level, some controls in the main form will be deactivated if the current user does not have proper access rights to access.

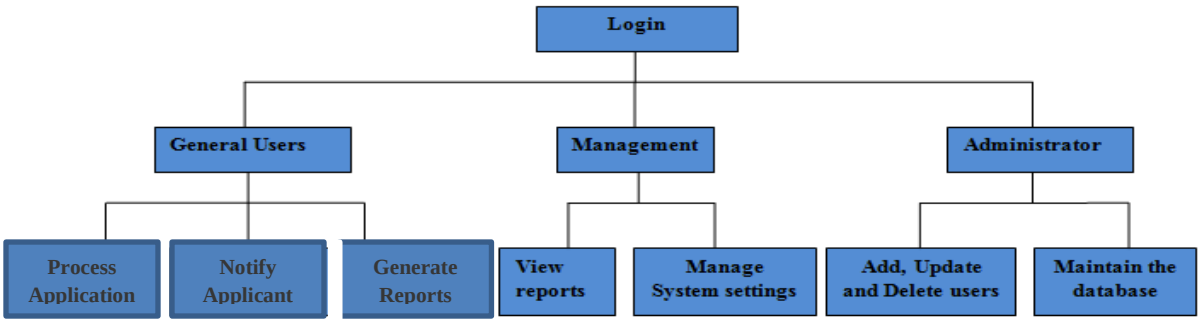


Fig 4.12 *Login Structure for the proposed system*

4.7.2 Login form

This form serves as the entry point into the system. It will accept username and password then validate them against what is in the database**.** If input is valid the user is granted access and if input mismatches information in the database then access is denied. When access is granted the user is directed to the main form.

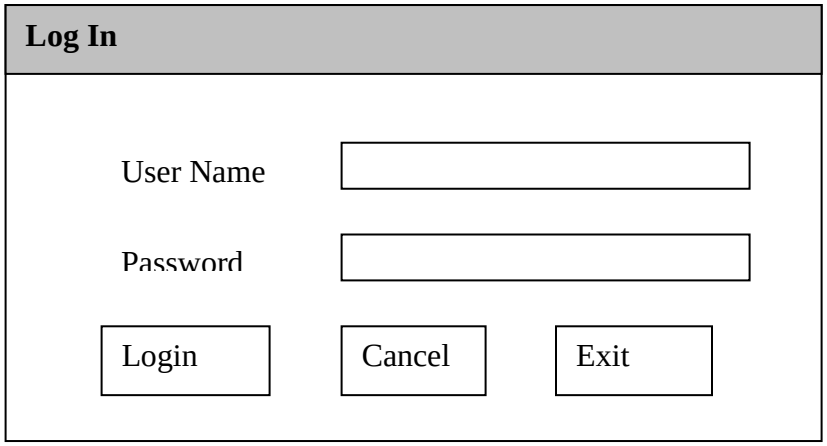


Fig 4.13 *[Login Form]*

4.7.3 New and Existing users screen

All the system users are authenticated on the below screen, where a user is created, given appropriate access rights and a default password that can be changed first time as soon as the user enters the system. Existing users can also be edited and deleted using the same screen where the update, save, and delete buttons will alternate activating and deactivating depending on the calling operation to be performed as well as guiding the user to make the right operation.

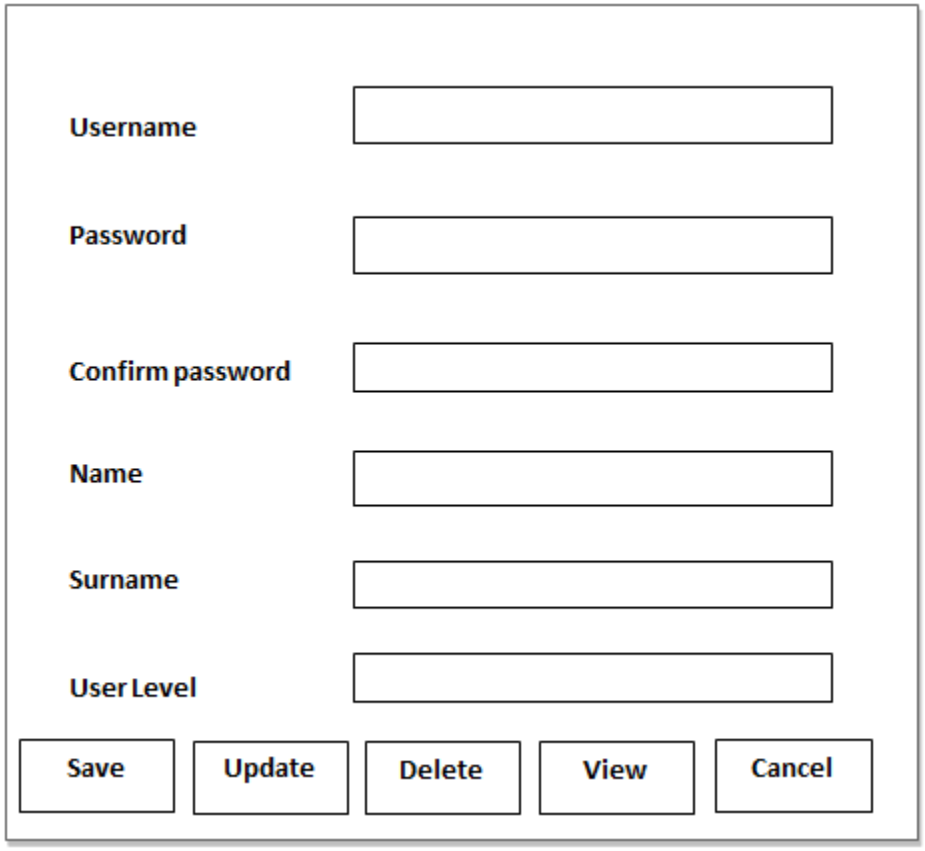


Fig 4.14 *User Registration diagram for the proposed*

4.7.4 Change Password screen

All users are created with a default password, upon successful login the user is prompted to change his or her password. This was done to avoid users coming to system administrators with account creation and password problems as the process can be achieved online while everyone is seated to his or her desk.

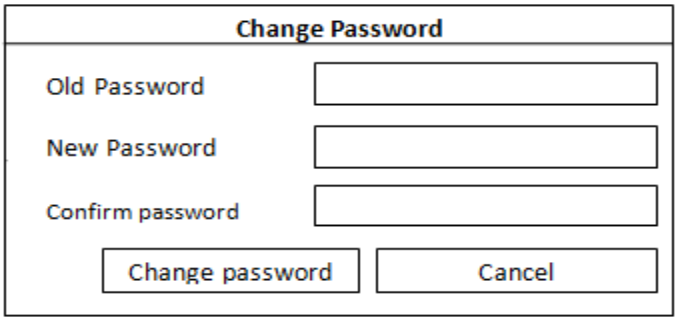


Fig 4.15 *Change Password screen*

4.7.5 Main Menu Form

After successful login the user is directed to this form. From this menu the several forms can be accessed to carry out the several processes of the system. According to user access level the enabled menu items vary as shown by the main form during the login process.

Examples of the forms to be accessed from the main form are:

- Application form
- Login
- Main form
- Response

Main Form

Implemented is a drop down menu. Related options will be categorised together for the convenience of the user. Navigation around the system will be done via the menu.

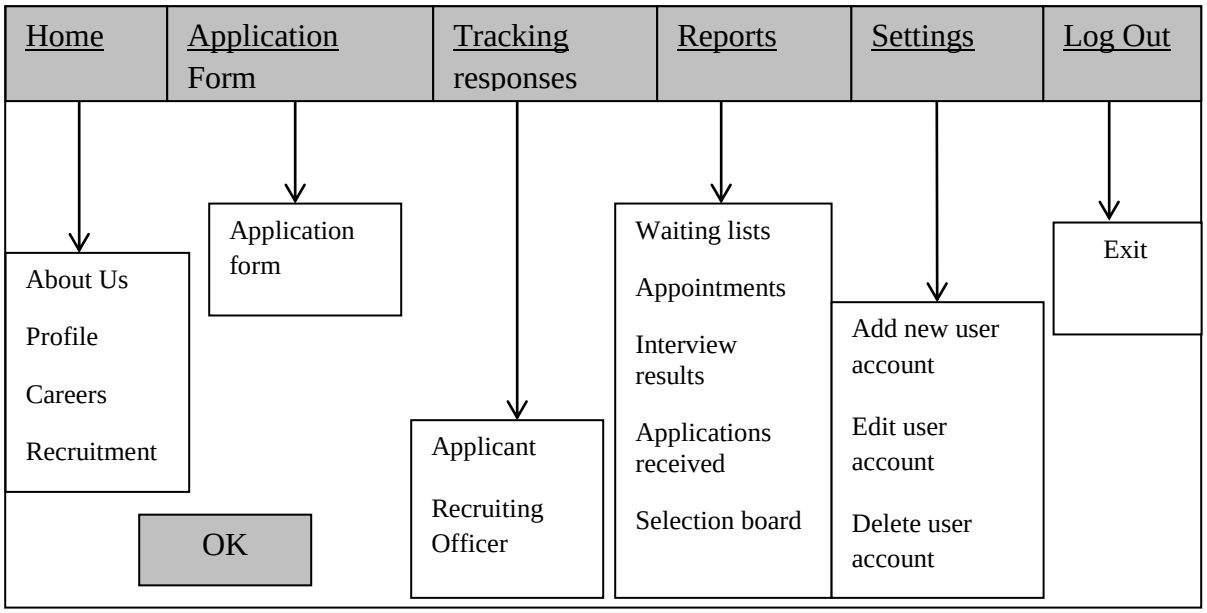


Fig 4.16 *[Main Form]*

4.7.6 Vacancy Application Form

This form provides the main interface for the applicants to enter their details and submit it for processing.

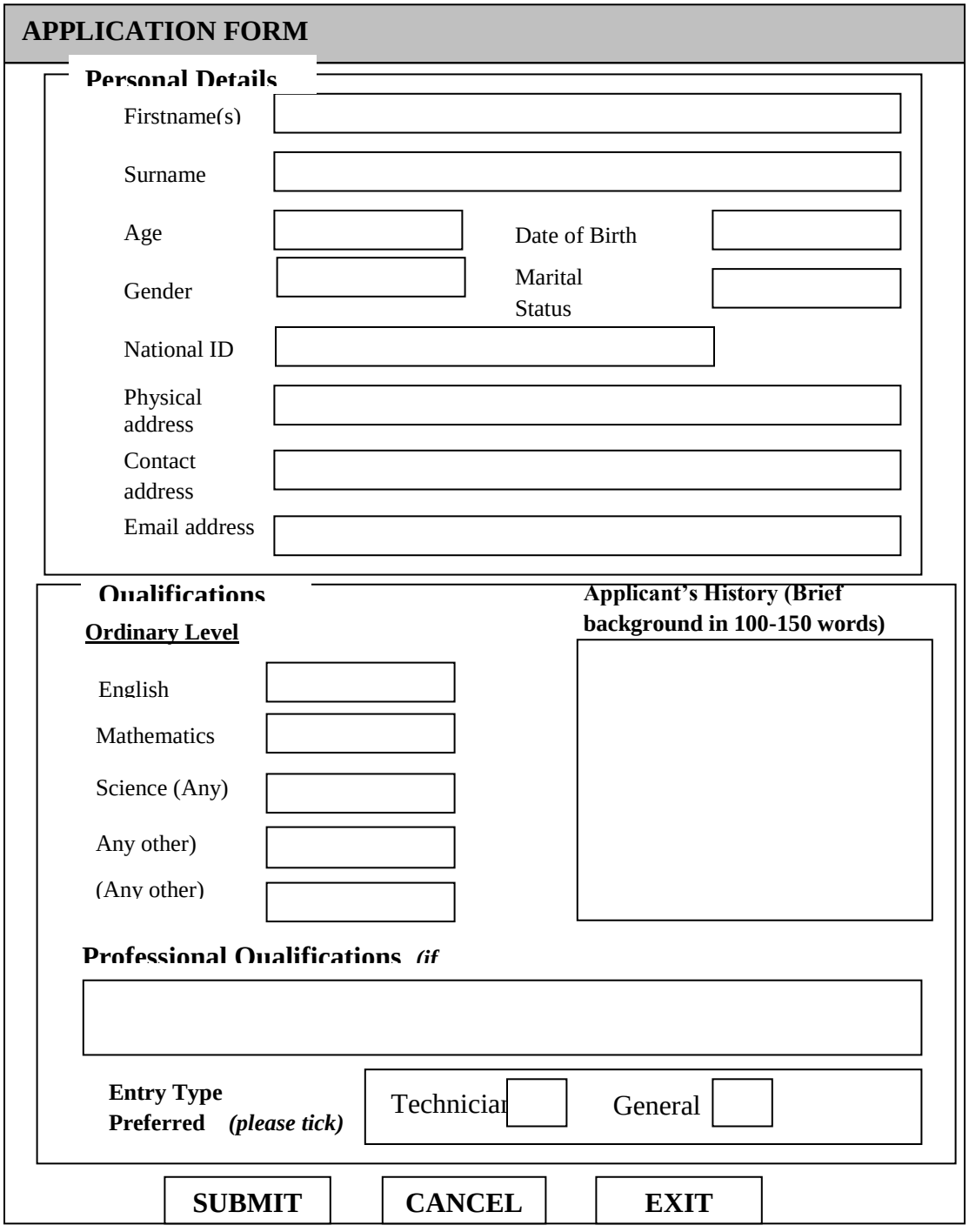


Fig 4.17 *[Application Form]*

4.7.7 Application Tracking Form

This input form will be used to retrieve or request for a response in respect of the application made, that is, request for a feedback by the applicant.

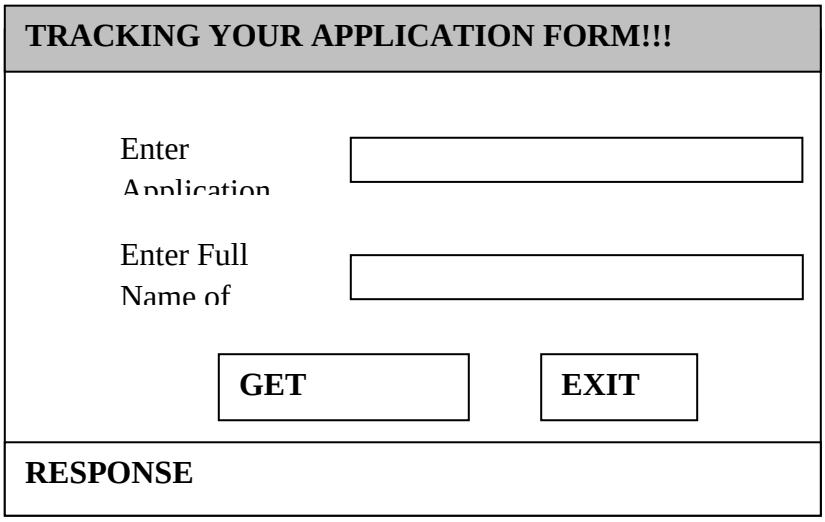


Fig 4.18 *[Application Tracking Form]*

4.7.8 Processing of application form

This form provides the interface for the administrator or recruiting staff to post response to applicants who would have applied for the job vacancy. If the applicant is successful he/she is notified about the interview dates and regret messages are posted to unsuccessful applicants. Applicant will in turn respond, accepting or rejecting the offer.

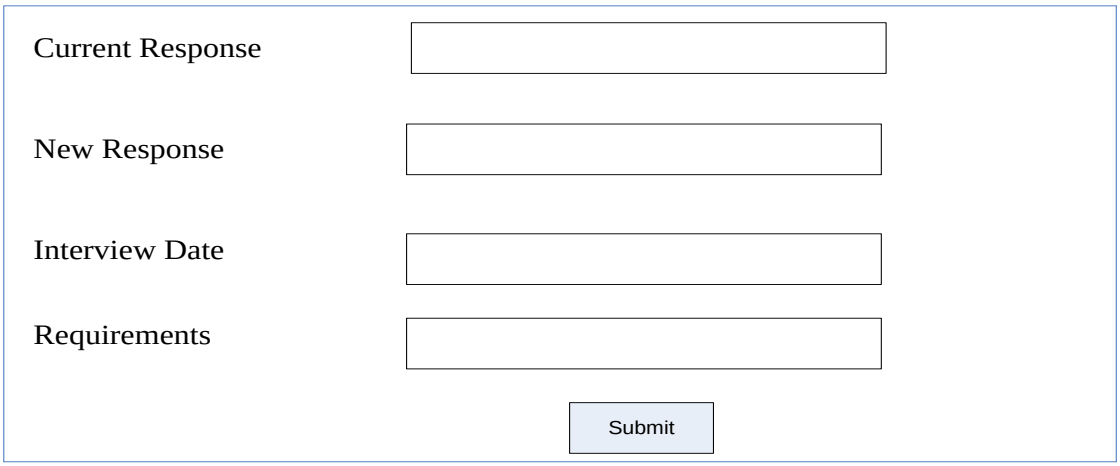


Fig 4.19 *[Response Form- Recruiting Officer]*

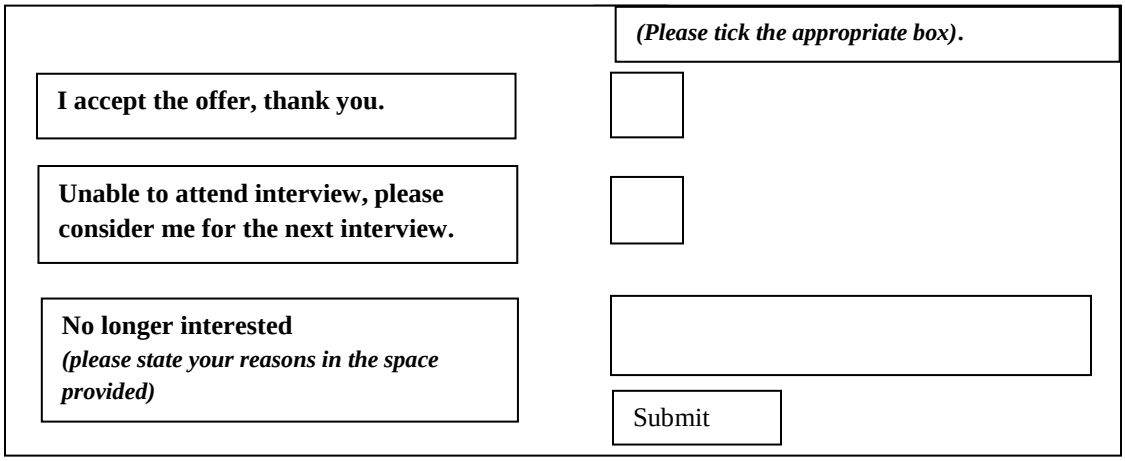


Fig 4.18 *[Response Form- Applicant]*

4.7.9 Output Design

Output design deals with the conceptual design of output forms and reports for the proposed system. The outputs are in a form of electronic reports which can be printed out. Below is a list of reports and forms that will be used for output.

Reports:

Firstname	Surname	ID Number	Address	Phone Number	Email	Date Applied	Type of vacancy	Qualifications	Response

Table 4.1 *[Departmental Report for applications received]*

Applicant number	Spelling	F.I.T	C.S.A.T	Oral	Age	Height	Overall fitness	Qualifications confirmed	Overall result Pass/Fail	Processing Officer

Table 4.2 *[Report on all applicant's interview results]*

Applicant Number	Date of interview	Place of interview	Result	Appointment (position)	Board President

Table 4.3 *[Officer Recruiting Selection Board]*

Invitation for Appointment

Enter Applicant ID _____ National ID _____

Full Name of Applicant _____

Congratulations, you have been shortlisted for initial training. You are required to report at our National Recruiting Offices for appointment on the last day of this month at 0900 hours.

You are required to bring with you the items listed below;

1. Enough toiletries and clothing to change
2. Money for personal use
3. Two (2) Blankets
4. Original certificates (Birth, National ID, Educational and Professional)

If you accept our offer, please click **ACCEPT**, otherwise click **REJECT.**

ACCEP **REJEC**

Fig 4.21 *[Invitation Form]*

4.8 Conclusion

The design phase enabled the developer to have a view of the proposed system. All the necessary designing was carried out in this phase, that is, inputs, processes and outputs of the new system were designed. The system is designed in a manner that is expected to accomplish the user requirements which constitute the objectives that where pointed out in the proposal. It considered the weaknesses that where reflected on the current manual system during the analysis phase. The flow of activities of the proposed system as well as physical setup of the application, which will assist in the coding and construction paved way for the implementation phase. This phase entails the actual system construction, system testing, security, validation, verification, installation and user training. The capacity to move on to implement the required system is now visible.

CHAPTER 5: IMPLEMENTATION PHASE

5.1 Introduction

The implementation phase emphasises on implementing the developed system and finding out whether it meets the objectives as stated in the project proposal. According to Weiss and Wysocki (1996), implementation phase involves delivering a working system to its users where by the proposed system is installed, User manuals delivered and a review meeting held after the system implementation. The phase also includes the coding stage, where the designed system is converted into a machine-readable form using one of the different programming languages. The main emphasis of the phase is on system construction, system testing, fields' validation, verification, system installation and user training (Krugman, 2009). In this project the programming language being used is Visual Basic .NET. The system is made to perform its work giving the analyst an opportunity to eliminate errors, if any. After this process the system is then installed for use.

5.2 Pseudo Code

This is a process which involves converting program logic into specific instructions that are executable by the computer system. Lundgaard (1999) defined pseudo code as intermediate instructions that are logically similar to the actual codes but are not the actual programing codes and implemented using a specific programing language. As highlighted earlier in the development process, the project developer used Visual Basic for coding as well as the construction of interface and MySql as the database. All the elements in the data dictionary conceptualized during the database design were mapped into the relevant tables and its assigned attributes were aligned into the appropriate field.

The system functionality was developed as modules. The modules were finally integrated into one working system. Bailey (1997) had an opinion that pseudo can provide a clear coverage of the problem being addressed, giving a clear conscience about the modular techniques, program testing and programming logic. The project developer considered the effective use of primary keys, foreign keys and indexes as identified, setting their properties appropriately. The developer also constructed queries to perform the required functionalities and operations on the database.

These operations generally included data retrieval operations, that is, **Select** and data manipulation operations (**Insert, Update**, and **Delete**).

Having built the database, efforts were turned towards the construction of the Graphical User Interface (GUI) using Visual Basic .NET. This environment is event driven hence simplifies the construction of the interface. The modules together with the interface and database were integrated into a working system to fulfil the functional requirements identified in the analysis phase. Thus pseudo code will show the processes involved from input up to the output of the system to produce necessary information for proper decision support reports.

5.1.1 Open database connection string module

This is required to access the database and its tables. Once the function to connect is constructed a call to it will be made whenever we connect to the database. The connection string also constitutes the database username and a password

```
Public function connectionString
{
    If Correct database username and password are entered
    Accept
    Open database connection
    Else
    Display message login error
    Exit application
    End if
}// close function
```

5.1.2 Login module

This is the point of entry to all users and a primary authentication level for everyone who uses the system. Only users with a correct combination of username and password are allowed access to the system.

Public function Login

{

Call function connectionString()

Enter username and password that matches those in the users table

If match is found Then

Give user access privileges as defined in the database

Log the user into the system

Else

Display login error message warning the user of the number of times left before the account is automatically locked

End if

Close database connection

}// close function

5.1.3 User registration module

A module that offers user registration and defines access rights to each user registered into the system. It also defines User profiles and departments they work in.

Function Validate details

{

If input is not in a correct format Then

Prompt user to enter correct formatted input

End if

}// close function

Public function register User

{

Enter user information

Call function Validates details ( )

If Details are in correct validated format Then

Call function connectionString()

Save User Details

// Display message of successful Registration save

Else

Prompt user to enter data in correct format

End if

Close database connection

}// close function

5.1.4 User Maintenance module

This a module that caters for editing or updating and deleting of the system users. If a user is deleted his or her account cannot be used again but the audit history information is kept for security reasons.

Public function Edit User

{

Call function connectionString( )

Pull a user from the database

Verify if it is the user due for update

Change fields that need to be changed

Call function Validates details ( )

Update details

Close database connection

// Display message of successful Update save

}// close function

Public function Delete User

{

Call function connectionString( )

Pull a user from the database

Verify if it is the user due for Deletion

Delete user

Close database connection

// Display message of successful user deletion

}// close function

5.1.5 Applicant applying for a job and application processing

This module caters for the applicants when applying for the vacancy. Applicants select the application form ad fill in their respective details and then submit the application if all required fields are field. It also cater for the recruiting staff who download/view the application form from the database for consideration and then give respective responds to applicants as to whether they short listed or not.

Select form

Enter required details

Select type of entry

Check for required fields

If correct then

Post application

Else

Go back to main form

End if

Application processing

Select application form

Download application form

If form is shortlisted then

Reply applicant with interview date

Else

If application form is not shortlisted then

Inform the applicant regretting

Else

If application is unavailable then

Go back to main form

End if

5.1.6 Applicant response view module

This module provides the applicant with the chance to track/ view response pertaining to the application made. The applicant logs in and uses his/her applicant ID to track/view the respective response.

Log in

Select Track application

Enter applicant ID

If applicant is shortlisted then

Applicant receive invitation for an interview

Else

Receive an unsuccessful message

End if

5.1.7 Report Production

Here the recruiting staff and management can produce reports pertaining to the recruitment process. The staffs choose/enter the query they want to perform to the system and receive response on the screen i.e. the report for the respective query.

Invoke a database query

If query is valid then

Refresh report data

View report on screen

Set report to be printable

Else

Generate informative message to user

End if

5.3 Testing

Fowler (2008) defined System testing as involving ascertaining whether the developed system meets the stated objectives it was built to meet before it is fully in use. The system was tested at all levels, that is, from the lower levels to the conceptual level of the system. The developer started from unit testing, individual module testing, sub-system testing and integrating the sub-systems in order to conduct system testing. Testing is done to validate the system. According to Ammann and Offutt (2003) system testing is any action intended to evaluate the features and or capability of a system, also verifying and validating if it's satisfying the stated objectives.

This process is aimed at ascertaining whether the system is able to meet the initial objectives of the project, that is, the requirements outlined by users. An important part of testing is the reviewing of prototype displays, reports and other output. This iterative process is done on every unit before and after the units gets integrated to become a whole system. End users of the proposed system should review prototypes for possible errors. The system testing process is illustrated by the diagram below:

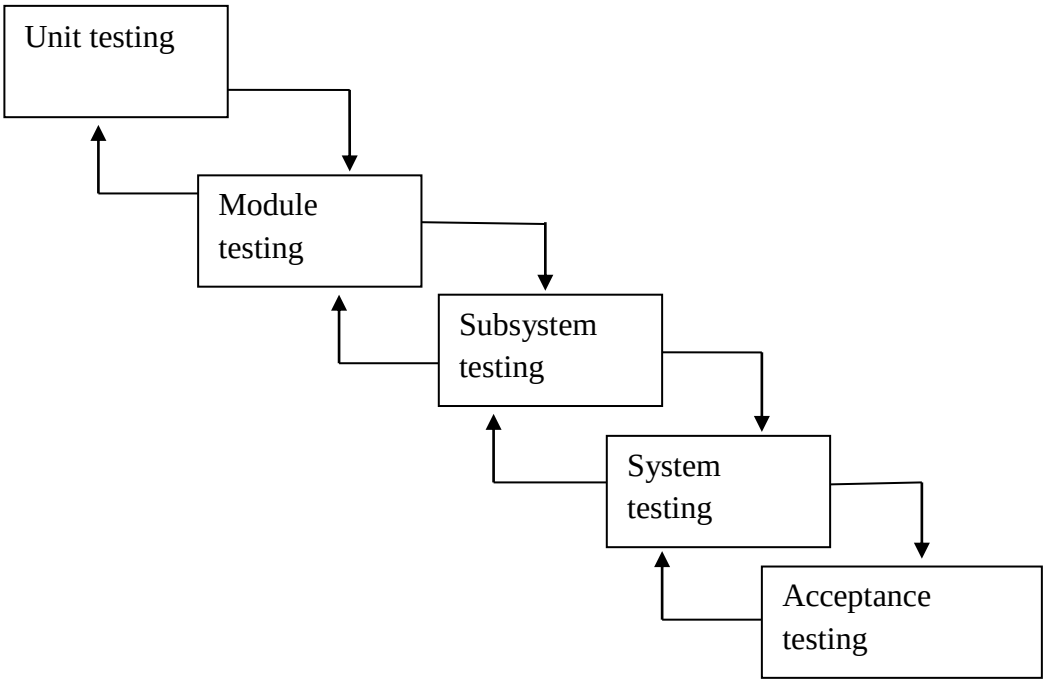


Fig 5.1 [*Testing Process]*

5.3.1 Unit Testing

This focused on the small units of programs or one unit of the software, a module or function in the system. Osherove (2009) defined unit testing as involving testing of one module or program to see if components are functioning as required, thus each unit should have to perform its intended task. This is done to check whether each unit performs its intended task as specified. The system was tested modularly as per test specification. The unit test was done in two scenarios:

Black Box test

Myers (2004) indicated that black box testing is a strategy also known as behavioral test that does not need any knowledge of the internal operations of the item being tested. It is usually focused on the inputs and outputs of a unit. This is a testing strategy, which does not need any knowledge of internal design or code. The user or analyst manipulates inputs and observes outputs. This type of testing does not take into consideration the internal structure of the system but rather focuses completely on the results or the outputs that are produced by the system in relation to the inputs (Williams, 2006). In this case it focused on the testing for requirements and functionality of the software application of the system and not the implementation of the software.

White Box test

Nidhra (1995) is of the idea that white box testing is a technique also known as structural testing used to test the internal operations of the item or unit. This focused on the internal test for functionality of the code. It tests for internal errors in unit codes which is not obviously evident in black-box testing. It is also known as glass box testing. Bevan (1998) noted that it is the kind of testing which takes into consideration the internal mechanism of a component or system. It is a security testing method that was used to validate whether the code implementation followed the intended design. It looks at the internal structure of the system. White box testing include analysing data flow, control flow, information flow, coding practices, and exception and error handling within the system; this is done to test the intended and unintended software behaviour.

5.3.2 Module Testing

This method of testing combines dependant components and test them together. A collection of procedures and functions are also tested together. Abbott (2007) defined module testing as involving combining all the tested units into more complex groupings and then tested as a whole. Modules are made up of a number of functions; one needs to test their cooperation when they are combined into a module. According to Miller (2007) component or unit testing selects the smallest part of software and tests that. Module testing is done using set objectives. Objectives measure the reliability and functionality of modules. Application reports are tested for their dependency on the applicant module. The main idea of this test is to find if the separate modules can perform their specific functions when integrated with other modules and also as a whole system, e.g. if the system is updating the accounts before the applicant logged out.

5.3.3 Subsystem Testing

The subsystem testing involves testing a collection of modules integrated into subsystem. It ensures that job streams are correct. According to Cartwright (2004), collections of units are validated for general performance without taking into consideration the complete actions of the different units in each module. The above sub modules will have been placed into one full system. There is detection of interface mismatches and rigorous exercise of the interface between programs. The applicant module is tested in accordance to application reports module. Application module was tried in understanding to application processing module.

At the point when a new application is submitted, the system takes a gander for appropriate data input before it save the record and this is always the case even on updating the records.

5.3.4 System Testing

System testing involved testing the entire information system and it included all processing situations. The sub modules tested were integrated into one system. Weinberg (2008) is of the opinion that system testing includes testing the whole data framework and incorporates all preparing circumstances. The system was tested to find out if there were any errors, which would hinder the performance of the system as a whole and if it met its objectives. According to Roger (1993), it is the testing of the whole information system and including all processes. The developing team used the recruitment data for verification and it was proven beyond doubt that the system was working properly.

5.3.5 Acceptance Testing

Naik and Tripathy (2011) are of the point that the aim of acceptance testing is to determine the degree to which the system will be accepted by its end users and stakeholders and thus defining the success or failure of the system. This was done by the users and stakeholders of the system as well as by other colleagues that is other programmers. Its main purpose was to test the acceptance of the system by the end users. This testing determined the success or failure of the system. It was made up of beta and alpha testing.

Beta testing

Fine (2002) defines beta testing as a testing strategy that uses actual data provided by the users of the system and continues until the organisation approves the use of the system in all its areas it was made for. The system was tested using actual data supplied by the recruiting officers who are the users of the system. Errors and omissions were discovered and corrected. This process continued until the organisation accepted that the delivered system was ready for usage.

Alpha testing

Jenkins (2008) suggested that alpha testing is a stage in in system testing when the system is given to the organisation so that stakeholders can have a feel of their system and further testing it to further identify errors and defects before it can be returned to the development team for further purification. The system was delivered to the organisation to use it and report any errors and defects they may discovered. The errors and defects discovered were corrected and the system returned to the organisation for another trial. It was eventually accepted.

5.4 Testing strategies

Performance and objective evaluation

Test strategies are utilized as a part of guaranteeing the right usefulness of the projects and the overall systems. The system was also tested against the entire project objectives. This was done to ensure that the project was actually able to meet the initial objectives set out in the system proposal document. This would lie as proof that the project has been able to satisfactorily solve the problems facing the organisation. The system was tested for system security, accuracy in form processing and generation of reports.

5.4.1 Verification

Sorensen & Reed (1995) defined verification as testing of non-functional functional needs to confirm that the system meets its specifications. Verification checks if the right product was produced, thus the system was verified whether it was keeping track of all the organizational assets as this is one of the council's main determinations and prerequisites as to why the system could be constructed at the first place.

5.4.2 Validation

According to Whitten (2002) this is a way of evaluating the system or application through or at the near end phases of the development of the system to clarify if meets the user requirements and specifications. This is checking the system for the rightful functionalities. For instance fields that only accept numbers should be validated to allow only the numbers and disallow any other user input. Thus validation is of important aspect if the system is to be delivered without errors

The Security module

Every user who uses the system should have his or her account created by the Systems administrator. Thus the security module was tested for validation, password strength and primary keys violation. The below screen shoots are as a result of entering a password which does not tally with the organizational password policy.

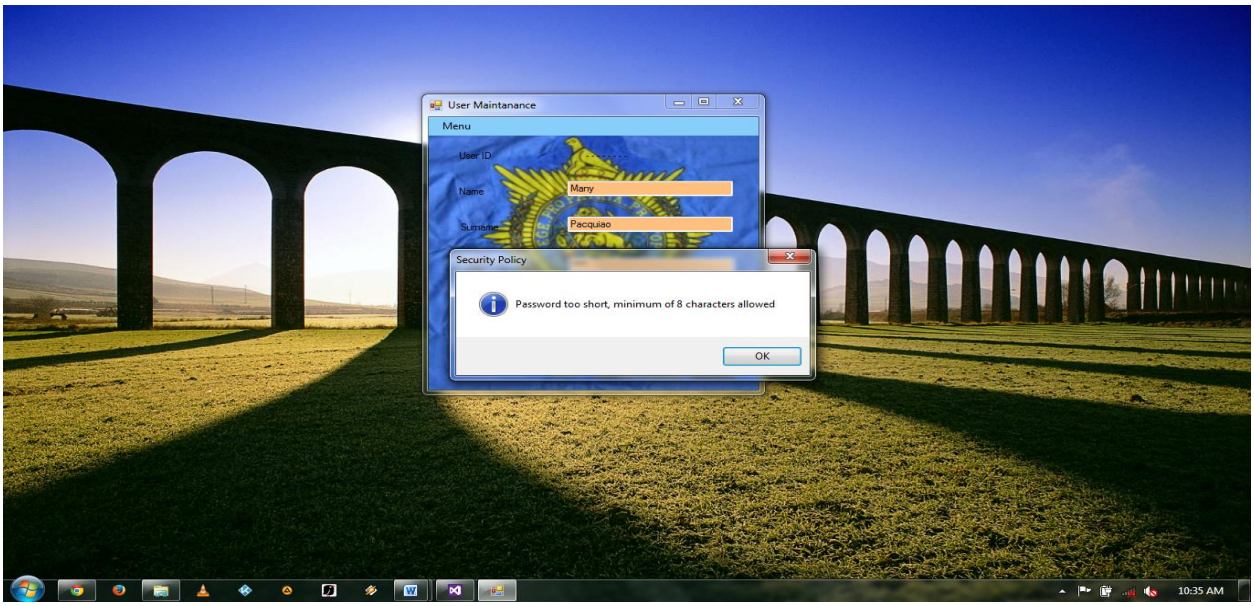


Fig 5.2 *User maintenance – Password should have at least eight characters*

Fig 5.3 below shows another security policy on password field validation to contain at least one special character, thus the message box is raised when the user enters a password that does not have a special character.

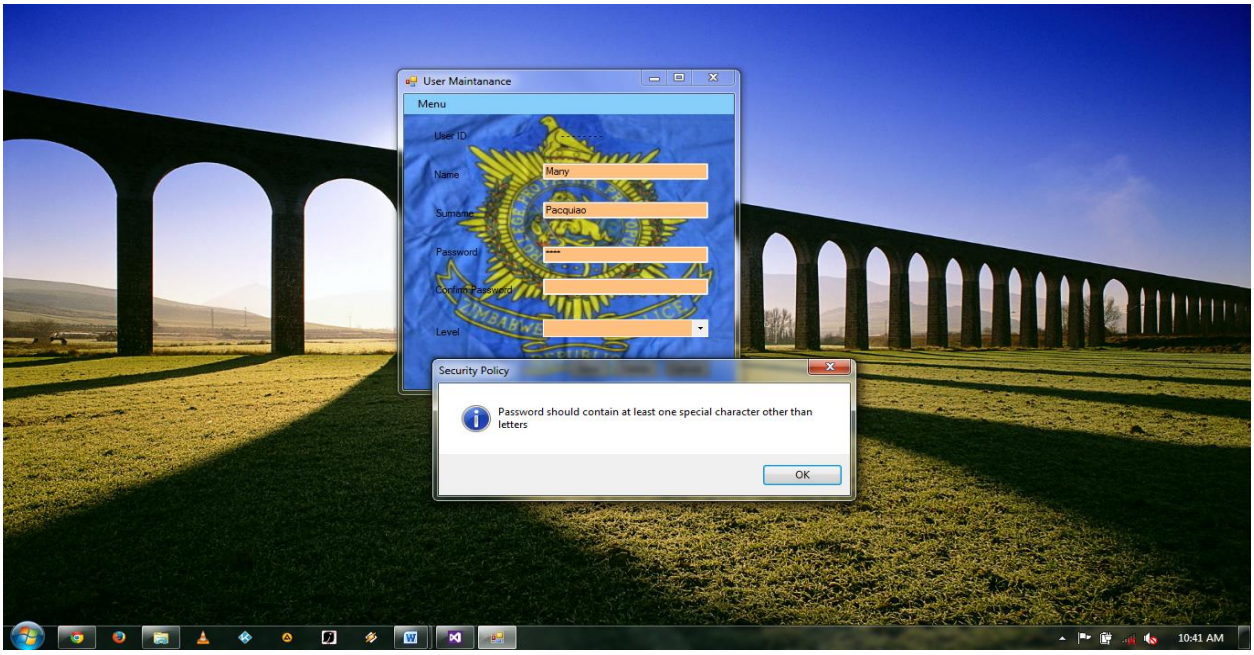


Fig 5.3 *User maintenance – Password should have at least one special character*

Other fields that were tested included the user type and the access level fields. On successful account creation the user name and password created were then tested to see if the created account could login into the system and the below validations in Fig 5.4 were noticed on the user login screen.

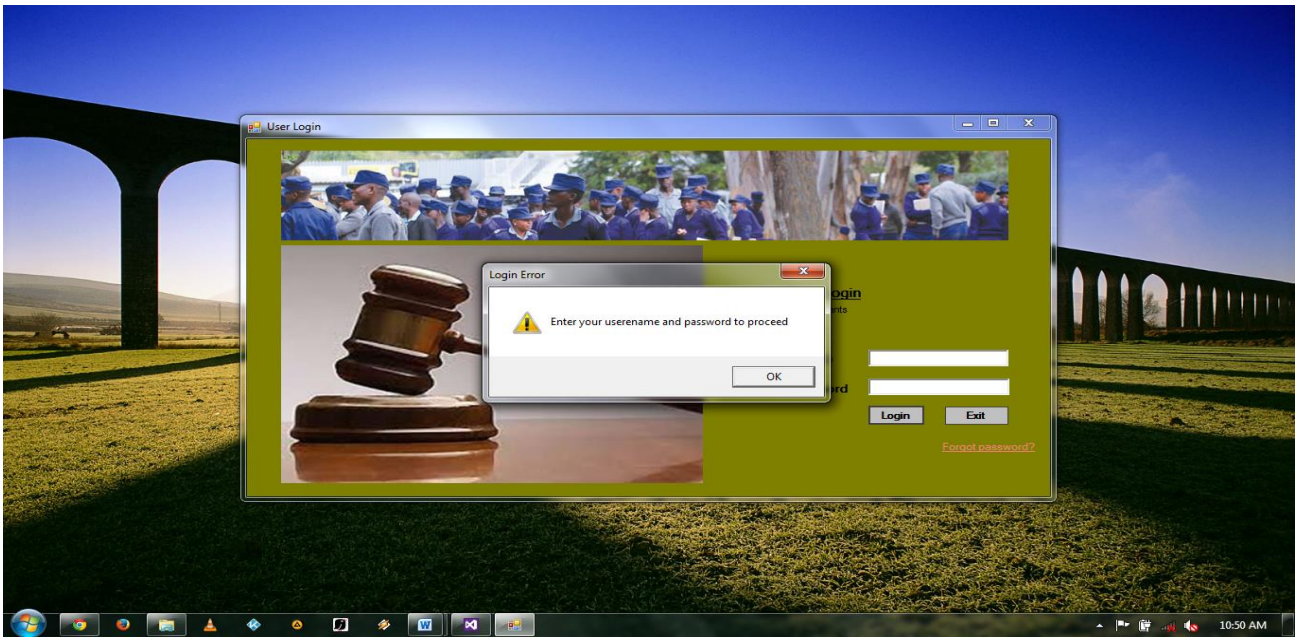


Fig 5.4 *Login screen – Password field left blank*

When the user enters an incorrect password, a login error message box appears as in Fig 5.5 indicating also that the account will be deactivated after he or she enters a wrong password after three times of trying

Fig 5.5 *Login screen – Wrong Password*

5.5 Installation

According to Grady (2008) is the procedure of placing the designed system in practice, when users move from the old way of doing things or system to the new and improved system. It is putting the developed system in use. Users are changing from using the old system to using the new system. In this phase the required software is installed on the appropriate hardware converting from the present system to the proposed system. A number of activities such as training, file conversion and system changeover methodologies are carried out during this stage. Installation will include software and hardware configurations for the Z.R.P. Installation is rendered incomplete if it is not complemented with sufficient user training.

5.5.1 The process of installation

The software is going to be installed from the CD Rom and a copy for backup is left with organisation and the other with the development team.

Steps in the installation of the application software

Insert the Installation Disk CD. Determine the installation path and then install system that path, (it is recommended that the system be installed to the program files folder). After verify that the system is installed properly, that is all folders are installed. When verified, add the system data source and finally connect data source to the database on the main server housing the system database.

5.5.2 User training

According to Gupta (2008), user training is a methodology by which all the prospective stakeholders of the created system get acquainted with the new system and are made to be completely familiar with the system. The user groups listed below will be trained on their relative use of the system. Stackpole (2008) is of the opinion that proper education for novel users on a system is important for Information Technology departments who want to increase information security, observe principles and increase the return on their software investment. A user training module was needed for the related entities to acquaint them with the new developed system and enable successful system implementation. Outlined below are the generalised areas where they will be trained.

Information Technology (IT) Administrators: Their training will include how to perform system backup and how to troubleshoot certain errors that may come up in the system. They will also be trained on how to create reports.

Recruiting officials: They will be trained mainly on how to use the system when carrying out operations such as adding applicants to their database, viewing and responding to vacancy applications and queries from applicants and Human Resources department.

Human Resources Officer: They will be oriented on how to generate reports as most of their decision-making relies on analysis of reports.

Training Plan

Training is going to be in-house and is split into two sessions. It will be done in each Province and Information Technology (IT) support officers in each province will attend all the sessions since they should have an overview of the whole system for trouble shooting purposes and further development.

Session 1

Venue	Provincial Updating Centre
User Group	Recruiting Officers and their Desk Officers, IT administrators
Training Scope	System Trouble shooting, Handling errors, Documenting changes, viewing and responding to vacancy applications
Requirements	Five computers and an overhead projector
Trainer	System Developer and colleagues

Table 5.1 *Session 1 for Training*

Venue	Police General Headquarters – Human Resources
User Group	IT administrators , HR Officer
Training Scope	Systems functionality overview and Report generation and retrieval
Requirements	Three computers, overhead projector.
Trainer	System Developer and colleagues

Table 5.2 *Session 2 for Training*

5.6 File Conversion and System Changeover

This is a technical process whereby the new system replaces the old system and will take effect after the establishment of the operational environment and training has been established. Shelly (2005) denotes that conversion is a procedural technique whereby a developed system replaces the old and current system and begins functioning when the environment is fully set. The aim here is to gain user acceptance of the information system with minimum disruption. Caution, anticipation and attention to detail are therefore imperative. This means that new data may have to be gathered old data re-analysed and reformatted, the repercussions of which can be formidable. There are several methods that can used to install the new system and these include the following changeover strategies namely Pilot Conversion, Direct Conversion, Phased Conversion, Parallel Conversion.

5.6.1 Direct conversion

According to Maynard (1998), it means that the developed system completely takes over from the old system right from the beginning. This entails the new system replacing the old one in its entirety in one go. The old system is rendered obsolete and all the departments that were using it will now start carrying out there daily activities under the new system. The cost incurred is relatively low because one system is in operation. However risk is high for there is no backup option. Some inconveniences also come with this type of conversion for instance the deployed software package may not be totally the right choice and the fact that it is hard to make the system operational after slips are later discovered after changeover, (Culley, 2001).

5.6.2 Phased conversion

The developed system is implemented into the organization through phases, thus also removing or eliminating the old system again through phases, this being done so that the users familiarize themselves with the system gradually (Kitchenham, 1994). The new system is installed in phases allowing the users to become accustomed to its use as well as to slowly phase out the old system. Cost is relatively moderate because the system is implemented in stages. Risk is also relatively moderate because the risk is limited to the module being implemented.

5.6.3 Parallel conversion

According to Rawlings M. (2000) this is a technique that runs both the old and new system at the same time. Simultaneous running of the systems gives the organization better chances of back-up

in case the new system flops totally. This involves running the two systems together at the same time. This gives the users a solid platform on which to fall back on if they discover that the new system is not functioning as expected. Cost is relatively high as both systems are in operation for the changeover period. Risk is relatively low due to the existence of backup options. Errors will be identified and corrected without disrupting daily operations of the business. This method facilitates the solving of operational problems before the old system is abandoned. A parallel run is done to ensure that all users get used to the system and that data is safely moved to the new system. The organization need a trade of between risk and cost so they in-turn use the parallel method; this is the most expensive method of conversion, (Anderson, Hanson, 2003).

5.6.4 Pilot conversion

This conversion includes setting up the new system meantime but in a solitary unit site when the rest piece of the association keeps interfacing with the current system (Godfrey, 1999). The system is installed and used by a selected group of users who will further assess its acceptability and functionality. This is choosing some parts of the organization where the system will be installed and run there, whilst another part of the organization is still using the old system (Lehman & Belady, 1995). Cost is relatively moderate since only a small section runs both systems. Risk is also relatively moderate because risk of failure is reduced to the pilot component.

5.6.5 Recommendations

After a thorough scrutiny it has been decided to use the pilot conversion because an organization like the Zimbabwe Republic Police is highly decentralized so by using the pilot conversion it means that out of five stations under each DHQ one station will be used for running the system, thus giving other stations to learn the new system and errors which will be dictated will easily be sorted out.

Steps of pilot conversion

The system is installed on station in question to all terminals. The users are trained to use the system. After that data is caputured into the new system. The new system is used is used in that one station while all the other stations continue to use the old system, so that the two operate concurrently. The performance of the new system is monitored and results are evaluated against

those of the old system. If it is a success, implementation is done on a larger scale otherwise the new system is rejected and returned to developer for modifications.

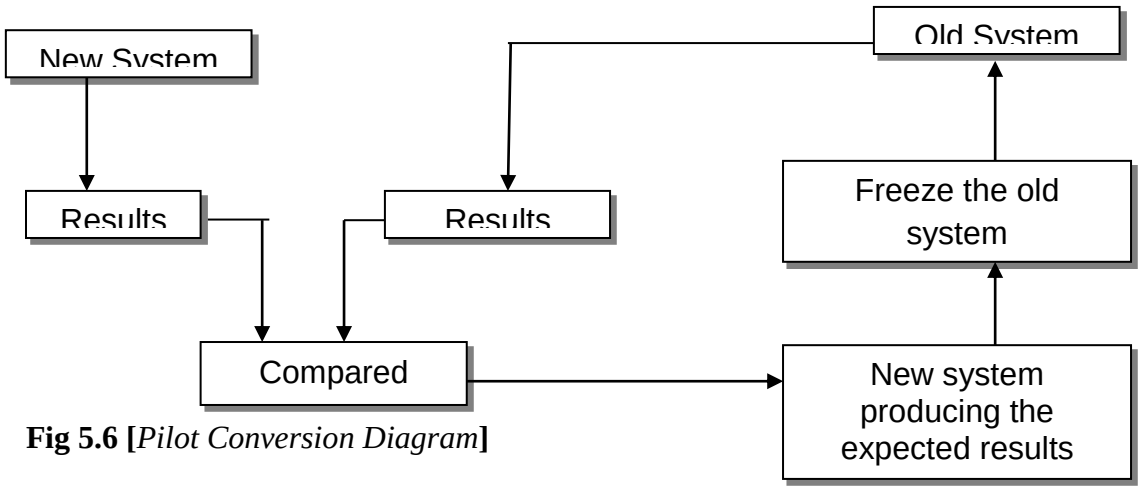


Fig 5.6 [*Pilot Conversion Diagram***]**

5.7 System Maintenance

According to Whiten (2008), this is an endless process of elevating the system as time progresses. Also Sommervile (2004) notes that it is a process which is done on a regular basis so as to ensure that the implemented system does not drift from it stated objectives and aims. The main objectives of system maintenance are to provide maintenance and improvements for the new system as well as to support users and help them to obtain optimum value from the new system. It will also entail upgrading, adjusting and modifying the system to keep abreast with the goals of the organisation .Changes may be simple, changes to correct coding errors, more extensive design errors, new requirements or enhancements. Maintenance for the Zimbabwe Republic Police Recruitment system is going to be broken down into four main phases, which are corrective, perfective, adaptive maintenance and Disaster Recovery.

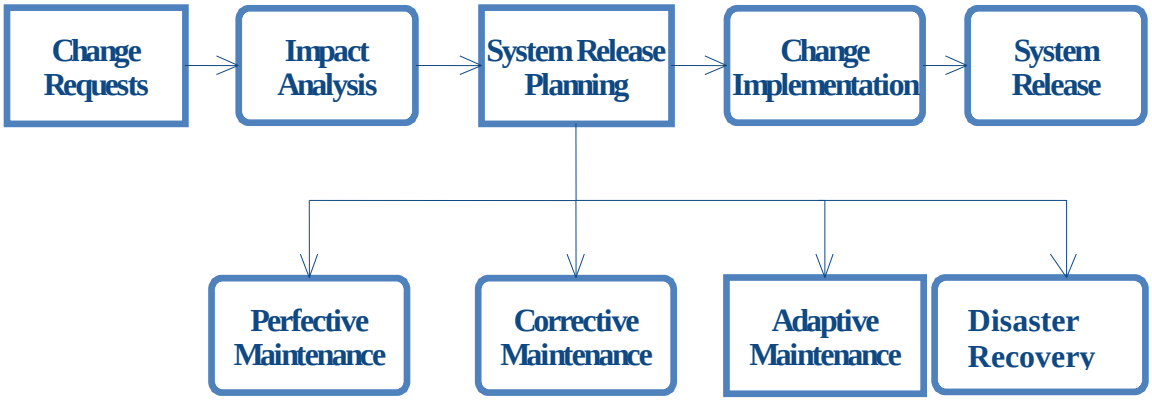


Fig 5.3 [*Maintenance Diagram***]**

5.7.1 Corrective Maintenance

Perry (2000) notes that this involves amending revealed and reported errors, when an error has been found and reported, examinations on the system are carried out so as to determine the causes and the root of the error. This entails correcting discovered and reported errors of the Zimbabwe Republic Police recruitment system. Errors range from wrong implementation to completely not performing. Once an error is reported, investigations will be launched to establish the root and cause of the errors. Once established, a design is mapped out for how to effectively correct the errors, followed by the correction, that is, implementing the corrective design. Weekly reviews or follow ups would be made to make sure that the system is functioning well and that no new bugs were introduced during the fixing.

All the correction activities from the investigations to the implementation are documented. This is carried out after a failure has occurred so as to restore the system to its intended functioning position or state. It is done to rectify and to correct faults (Alqueres, 2009).

Diagnosis of the issue

The developer requires significant efforts to spot the fizzled parts or modules or generally evaluates the reason for the system failure.

Repair or substitute parts

This is done after the reason for the system failure has been dead set and constitutes steps that should be taken to deal with the actual problem. That can be achieved through supplanting or repairing the segments that brought about the system fizzle.

Verification of the repair activity

This is done after the modules being referred to has been repaired or supplanted and constitutes verifying if the modules that had given errors are working effectively again after repair

5.7.2 Adaptive Maintenance

This will be done whenever some new environment has to be used. It involves modification of the present code so as to meet changing environment as well as changing certain functionalities (Haydock, 2011). The software has to be changed sometimes when a different hardware platform or operating system has to be used. This will occur in the Zimbabwe Republic Police recruitment system as it will constantly be updated to meet user requirements and also to provide the best of

quality services. As we operate in a dynamic environment user requirements evolve, when this occurs there will be need for the system to meet the new user requirements. It is recommended that the System administrator be conversant with Visual Basic and other web driven programming languages.

5.7.3 Perfective Maintenance

This is carried out when there is need to change the whole system to make it more efficient. This involves adding features that were initially not there so as to improve performance and increase the speed of the system as well as maintainability, (Han, 2013). Implementation of new functional or non-functional system requirements generated by users as their organization or business changes is also catered for in this section.

This process ensures that the newly implemented recruitment system meets the system development objectives established for it. Errors in development or use of the recruitment system must be corrected by this maintenance process.

5.7.4 Back up plan

A backup plan is set up in place in case the system goes down and a quick reinforcement will make utilization of another external server that keeps the most last saved backup. In the event that the system pulverizes, it may be reinstalled and begins and the operations will be rectified again.

	Time	Storage Venue
Application Setup Files Back Up	At least twice quarterly	Provincial Systems Admin storage room
Database Back Up Plan	Twice Daily First-[0800Hrs] Second-[1600Hrs]	Provincial Systems Admin storage room

Table 5.3 *[Back-up Plan]*

5.7.5 Disaster Recovery

To be properly maintained, the Recruitment System should be complemented with a congruent disaster recovery plan. Backup of all system files is going to be done weekly to guard against uncertainty and the media that are going to be used are tapes and external drives. There is going to be an offsite back up store.

5.8 Recommendations to system users

To have the framework working legitimately, there is need to stay in close contact with the developer, since he is the one having a full reasonable comprehension of the system better than anyone and can tackle problems much quicker and sparing the highly required goals. To guarantee a smooth running of the system, maintenance methodologies should be stuck by the respectable parts of Information Systems department.

There is need for constant use of the user manual to refer back and seek help should be done regularly so as to increase the experience. Any changes to the system should be noted down especially when the main developer is not around. User passwords are not supposed to be exposed to any unapproved faculty or let anybody temper around with the system. Security policies ought to be continuously re-examined.

5.9 Conclusion

The project has been a success in relation to the fulfilment of the desired objectives. The project has also been well planned and budgeted for as referenced by the few problems encountered during the project development. The developer has immensely benefited from the project. The organisation will now stand a better chance of employing skilled manpower, and the move will assist them in their endeavour to achieve organisational vision and mission, which are, “To be the best Police Service provider in the world” and “To provide an effective and efficient policing service to the public in order to maintain peace and stability and create an environment conducive to social and economic development”, respectively. Although it has been overwhelmingly passed as a success, the developer will also consider looking ahead and expect to continuously work on improving the system.

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APPENDIX A: USER MANUAL

The Zimbabwe Republic Police Online Officer Recruitment System offers good user friendly interfaces that allow users to effectively navigate through the system. To help users use the system with minimum support a user manual has been prepared; this offers step by step assistance to various functionalities of the system.

User creation

A screen that is only accessed by the administrator, and is necessary for authenticating legitimate users of the system, i.e. every user who accesses the system should have his or her account created by the administrator. The screen is also used to change or updating user information like, access levels, user profiles and any user related registration information

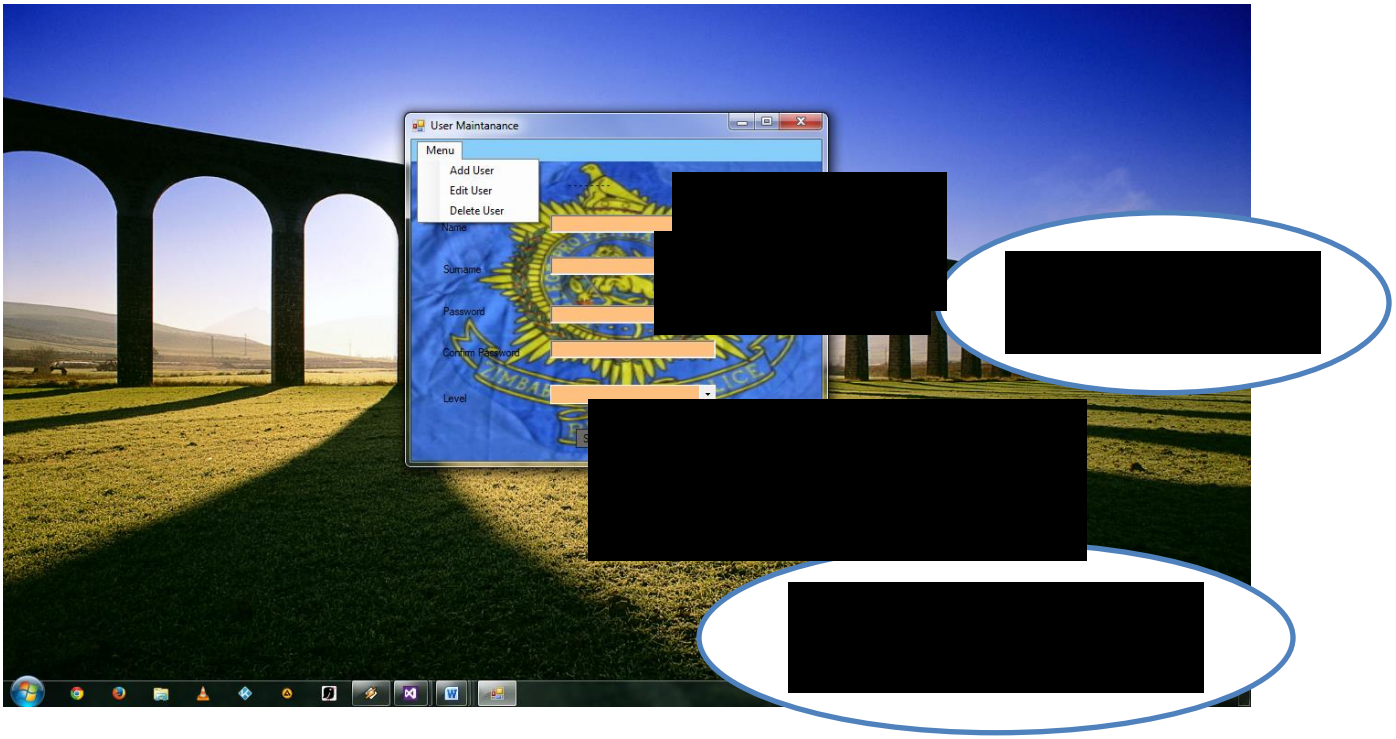

Fig 6.1– User registration form

To update any user information, choose edit user from the drop down menu option and enter the user's id and press enter or click the search button and then fill in all the information relating to that user. Respective details can then be changed after which an update button will commence the changes back to the database.

Attention is to be given most to the password field which requires a password length of more than 6 characters, at least one special character, at least one capital letter, at least one digit and at least one small letter. Saving or updating of any user information should have conformed to the password policy otherwise the below messages can be expected.

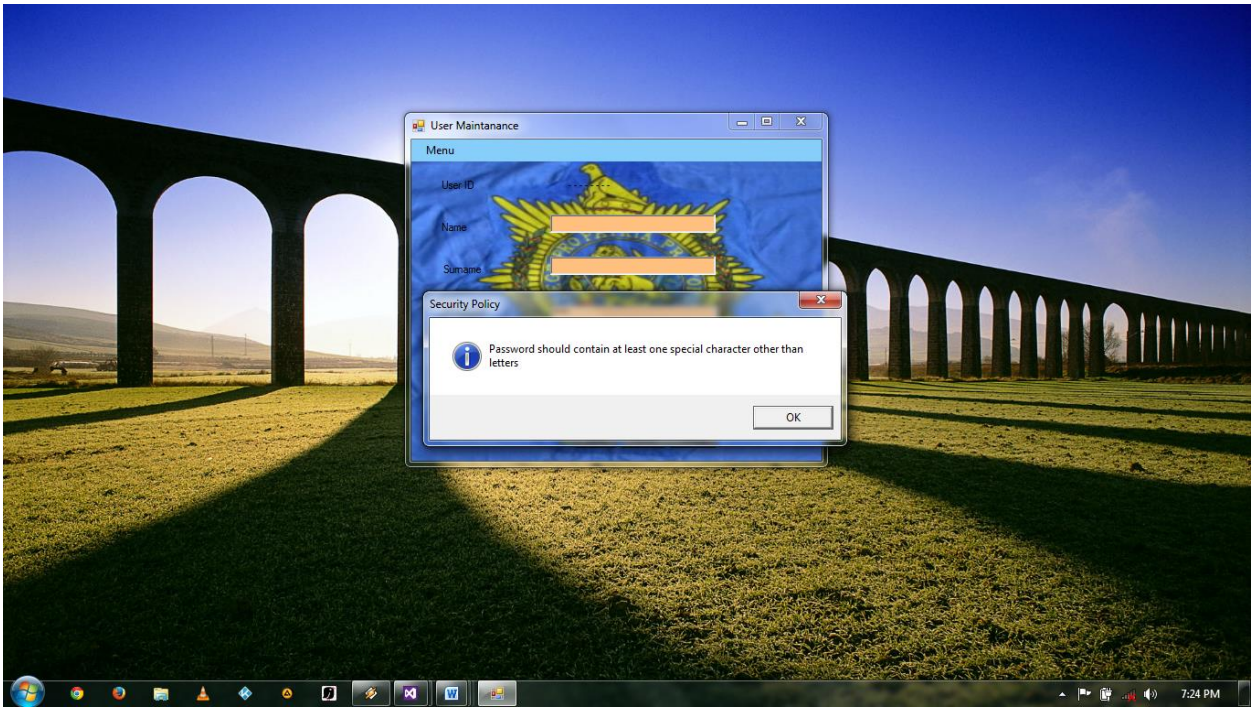

Fig 6.2 Error in password- *at least one special character required*

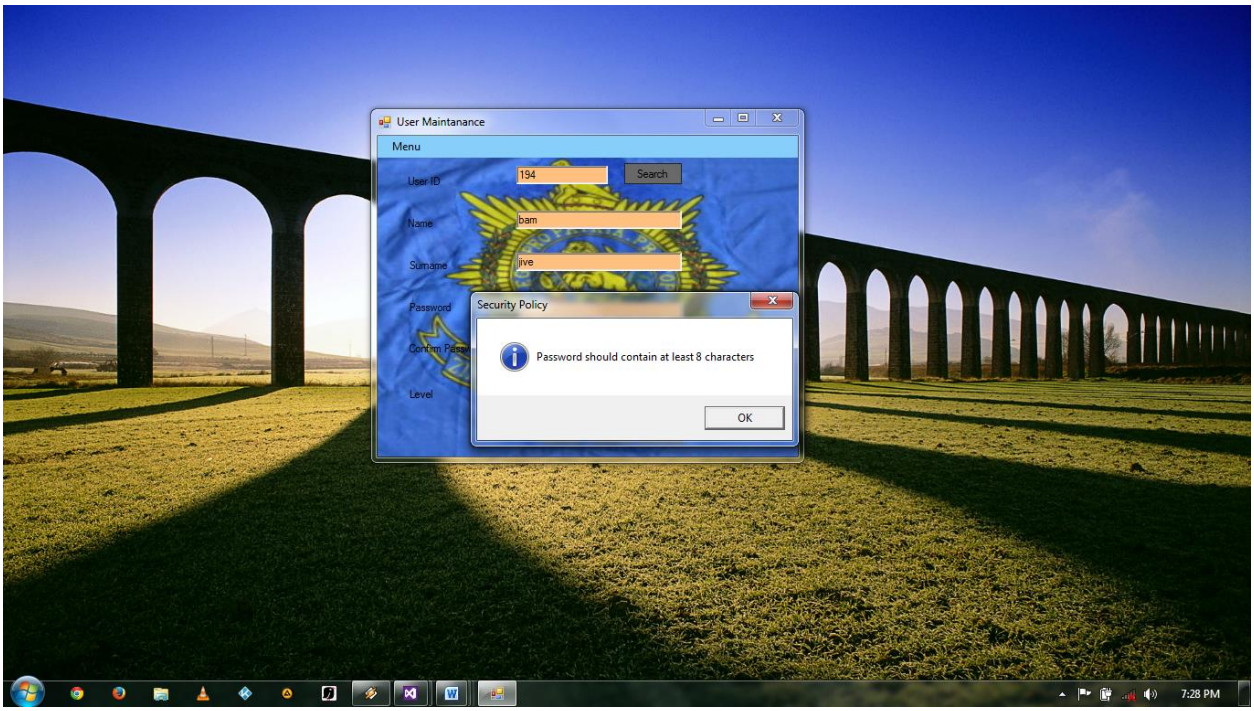

Fig 6.3 Error in password- *At least 8 characters required* ***characters***

Login screen

When a user is successfully authenticated the next stage is to test if it can login using the created username and password combination. The system is also validated for empty fields, reminding the user of some skipped information.

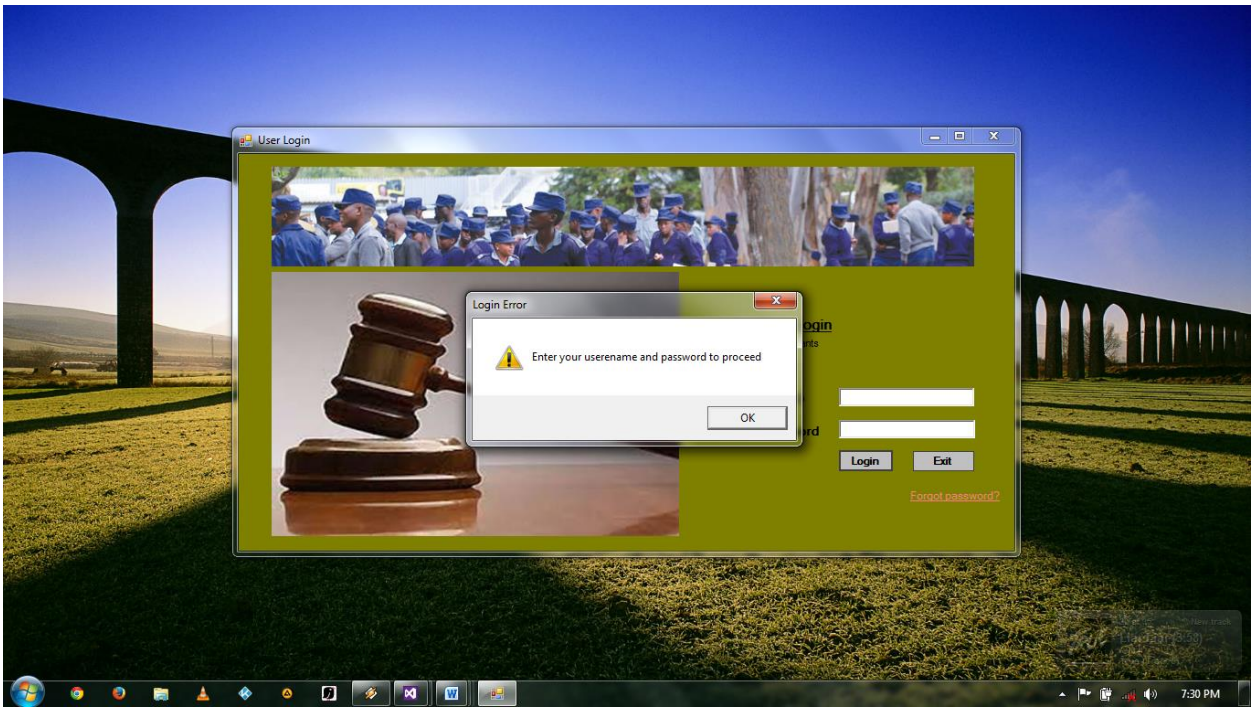

Fig 6.4 Empty password validation

Main form

The main form will be displayed upon successful authorization of the password and username combination. The main form constitutes **tool strip**, centered **picture buttons** and **drop down menus** to allow easy navigation of the system modules for different functionalities

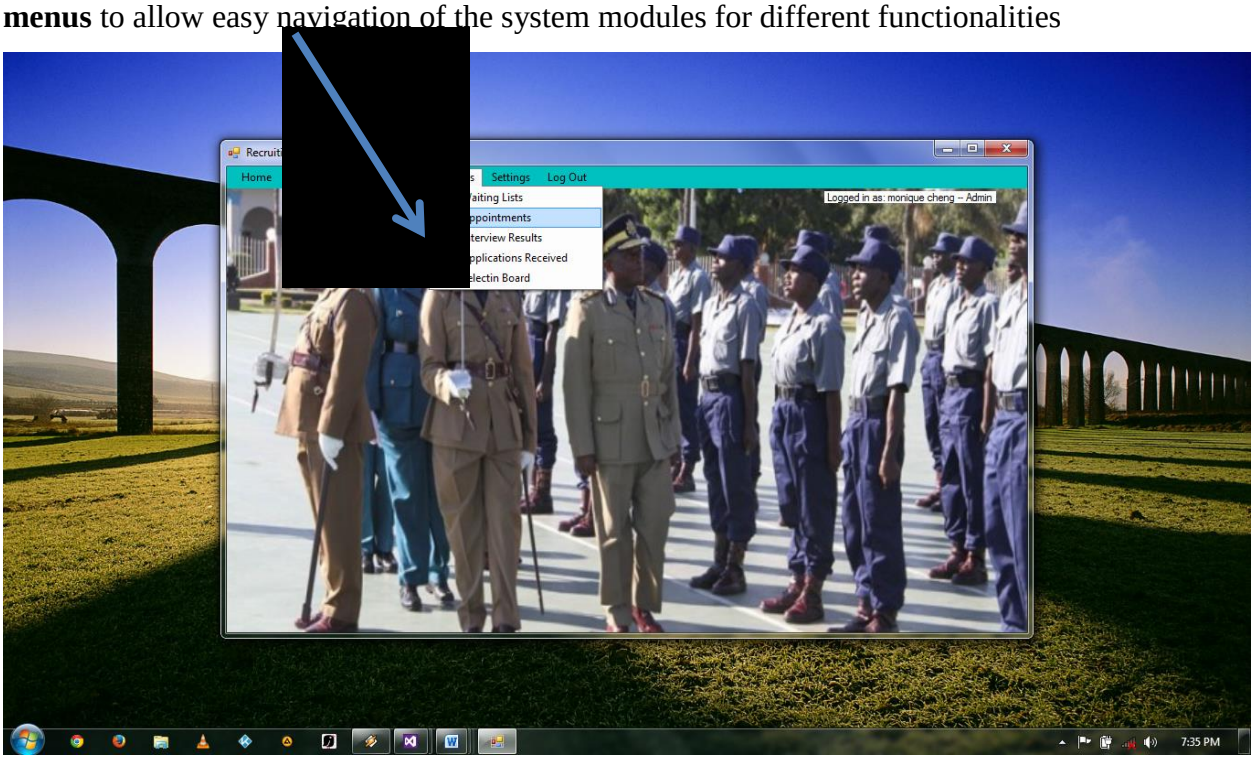

Fig 6.5 Main form

Application Submission

This is a screen by which all applicants apply and submit their application in the adtabase are All the functionalities for the applicants are based on the system are based on this screen since not even a single process can be done before an application is made. This screen is accessed after the applicants log in and the main form below is shown:

Fig 6.7 Applicants Main Form

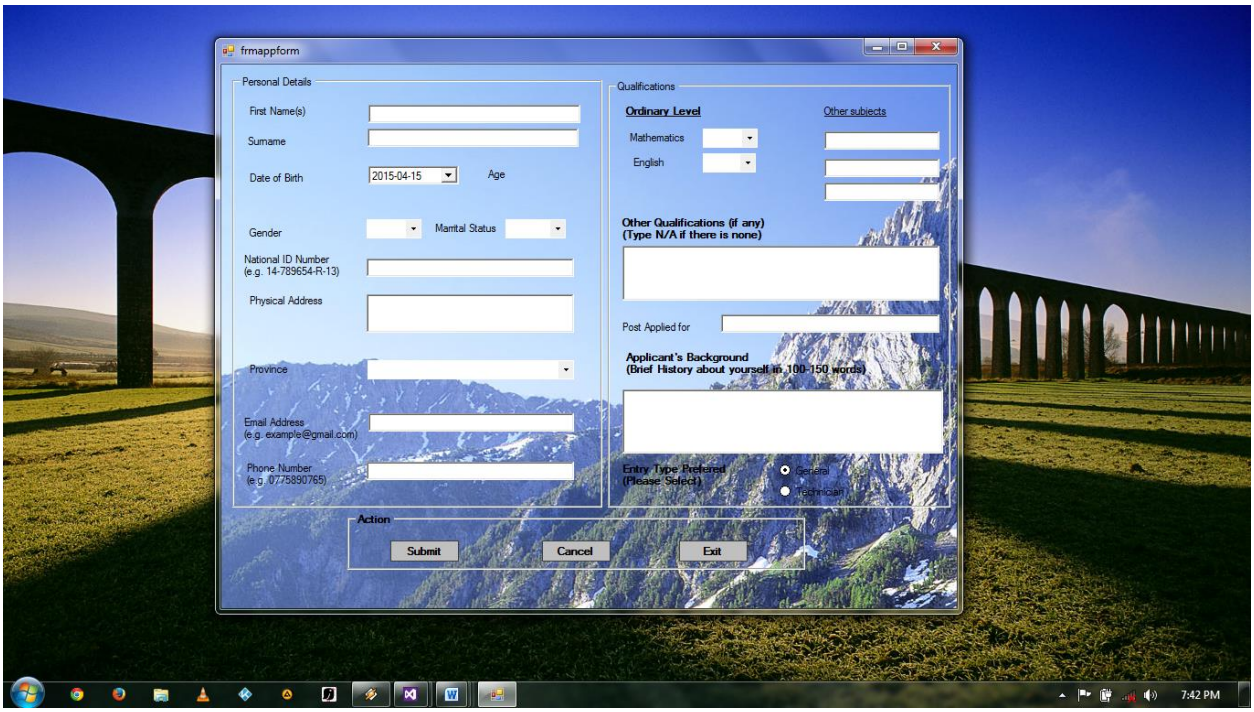

Fig 6.8 Application Form Screen

After filling in of the respective details, the submit button is used to submit the application to the recruiting offices database where it will be accessed and processed. Cancel and Exit buttons are used to cancel the application form screen and go back to the main form and to exit th system respectively.

Recruting Staff Screen

This is the form used by the recruiting staff to get applicant information for consideration. Here they can choose to select an applicant or discard and applicant based on the required qualifications. They can view applicants by scrolling down the applicants in the database there by viewing their respective qualification as shown in the figure below:\

Fig 6.9 Applicant Selection Screen

APPENDIX B: INTERVIEW SCRIPTS

Interview script

1) How do you feel about upgrading your recruitment system?
   .....
   .....
   .....
2) Can you give an outline of your tasks that you perform?
   ……
   ……
   ……
   ……
3) What information is considered crucial for your applicants?
   ……
   ……
4) What information do you need from the shareholders?
   ……
   ……
   ……
   ……
   ……..
5) Of all the tasks that you perform which are most demanding and which is most performed?
   ……
   ……
6) For each task that you perform can you describe your information requirements, processes and outputs?
   ……
   ……
7) Can you provide any documentation that you use that you use in performing the identified tasks?
   ……
8) Do you think you are doing the above tasks effectively and efficiently? If not of otherwise any suggestions for improving?
   ……
   ……
   ……
9) In the upgraded system how do you wish to perform operations?
   ……
   ……
   ……

10) How often do you handle applications from the applicants?
    .....
11) What kind of applications do you often handle?

……
……
……

12) How do you perceive your efficiency in handling applications?

……
……

Any other information that you might need during performing your daily operations, is it readily available in a useful format? If not identify the information and layout proposal of how you want the information formatted? …

……
……

APPENDIX C: SAMPLE QUESTIONNAIRE FOR MANAGEMENT

To be answered by the Management only

- Answer all the questions
- Give accurate details on all answers

1) How do you feel about the recruitment system?
   ……
   ……
   ……
2) What problems are you experiencing in using the system?
   ……
   ……
   ……
3) How do you capture your applicants' information?
   ……
   ……
   ……
4) How could an applicant know about notices, date and time for interviews?
   ……
   ……
   ……
5) Are there any restrictions to access information in the organization?
   ……
   ……
   ……..
6) How often the organization files are updated?
   ……
   ……
   ……
7) How do you handle back up issues?
   ……
   ……
   ……
8) Would you apparent if I try to come up with the system which will improve your recruitment system?

   ……
   ……
   ……

APPENDIX D: SAMPLE QUESTIONNAIRE FOR STAFF

To be answered by the operations staff only
Tick appropriate box

1) On average how often do you receive applications?

   None ☐ every day ☐ after one week ☐

2) How much time do you require in processing the application?

   10 ☐ 20 ☐ 30 ☐ more than 1hour ☐

3) Do you find any difficulties in the application processing?

   Yes ☐ No ☐ Sometimes ☐

4) What do you consider as problems of the current system?

   ……
   ……
   ……

5) What do you recommend as solutions to the problems?

   ……
   ……
   ……

6) Does the system check data duplication and validation?

   ……
   ……
   ……

7) What changes do you like to see taking place with your routine?

   ……
   ……
   ……

APPENDIX E: OBSERVATIONS SCORE SHEET

Date:

……

Time:

……

Department under investigation:

……

Observation	**Note/Summary**	**Recommendation/Action**

APPENDIX F: CODE SNIPPETS

Database Connection

```
Imports MySql.Data.MySqlClient
Dim scon As MySqlConnection = New
MySqlConnection ("Server=localhost;uid=root;password=;database=zrp" )
If scon.State = ConnectionState .Open Then
                scon.Close()
                Exit Sub
            End If
            scon.Open()
```

User Registration

```
If txtName.Text = "" Or
                txtSName.Text = "" Or
                txtPass.Text = "" Or
               txtConfPass.Text = "" Or
               cmbLevel.Text = "" Then
                MsgBox("Fill in all fields to proceed" , vbExclamation)
                Exit Sub
            End If

            If txtPass.Text <> txtConfPass.Text Then
                MsgBox("Password mismatch, retype your password" , vbExclamation)
                txtPass.Clear()
                txtConfPass .Clear()
                Exit Sub
            End If

            Dim cmd As MySqlCommand = New MySqlCommand("INSERT into recruiting_stafff
values(@Name,@Surname,@UserID,@Password,@Level)", scon)
            With cmd.Parameters
                Label7.Text = stil()
                .AddWithValue( "@Name",txtName.Text)
                .AddWithValue( "@Surname", txtSName.Text)
                .AddWithValue( "@UserID" , Label7.Text)
                .AddWithValue( "@Password", txtPass.Text)
                .AddWithValue( "@Level" , cmbLevel.Text)
            End With
            scon.Open()
            cmd.ExecuteNonQuery()
            MsgBox("Your User ID is " + Label7.Text + ". Take Note of it." , vbInformation,
"Operation Successful" )
            clear()
            TextBox3.Clear()
            Label7.Text = " -------- "
            scon.C lose()
```

Log In Form

```
Dim cmd As MySqlCommand = New MySqlCommand("SELECT * FROM recruiting_stafff WHERE UserID
= '" & txtUserID.Text & "' AND Password = '" & txtPass.Text & "' ", scon)

        If scon.State = ConnectionState.Open Then
            scon.Close()
            Exit Sub
        End If

        scon.Open()
        Dim sdr As MySqlDataReader = cmd.ExecuteReader()

        If txtUserID.Text = "" And txtPass.Text = "" Then
            MsgBox("Enter your userename and password to proceed" ,
MsgBoxStyle.Exclamation, "Login Error")
        ElseIf (sdr.Read() = True) Then
            mnm()
            frmappmain.Show()
            Me.Hide()
        Else
            MsgBox("Incorrect user id or password" , MsgBoxStyle.Exclamation, "Invalid
login")
            scon.Close()
            clear()
        End If
        scon.Close()
```

Application Form

```
Dim cmd As MySqlCommand = New MySqlCommand("INSERT into app_details
values(@AppID,@NatID,@FName,@SName,@DOB,@Address,@Province,@Phone,@Email)", scon)
        Dim cmg As MySqlCommand = New MySqlCommand("INSERT into zrpapplications
values(@AppID,@AppDate,@Post,@Maths,@English,@OtherSubjects,@AppBack,@ProfQs,@EntryType,@
AppStatus)", scon)
        Dim cmp As MySqlCommand = New MySqlCommand("INSERT into qualifications
val ues(@AppID,@AppDate,@Post,@Maths,@English,@OtherSubjects,@AppBack,@ProfQs,@EntryType,@
AppStatus)", scon)

        If txtFName.Text = "" Then
            MsgBox("Enter your first name to proceed" , vbExclamation)
            Exit Sub
        End If

        If txtSName.Text = "" Then
            MsgBox("Enter your last name to proceed" , vbExclamation)
            Exit Sub
        End If

        If txtAge.Text = "" Then
            MsgBox("Enter your age to proceed" , vbExclamation)
            Exit Sub
        End If

        If DOB.Text = "" Then
            MsgBox("Enter your date of birth to proceed" , vbExclamation)
```

```
            Exit Sub
        End If

        If   cmbGender.Text =   ""   Then
            MsgBox("Choose your gender to proceed"       , vbExclamation)
            Exit Sub
        End If

        If   cmbMariStat.Text =     ""   Then
            MsgBox("Choose your marital status to proceed"            , vbExclamation)
            Exit Sub
        End If

        If   txtNatID.Text =      ""   Then
            MsgBox("Enter your nation      al id number to proceed"       , vbExclamation)
            Exit Sub
        End If

        If   txtAddress.Text =      ""   Then
            MsgBox("Enter your physical address to proceed"            , vbExclamation)
            Exit Sub
        End If

        If   txtEmail.Text =      " "  Then
            MsgBox("Enter your email address to proceed"          , vbExclamation)
            Exit Sub
        End If

        If   txtTel.Text =      ""   Then
            MsgBox("Enter your phone number to proceed"        , vbExclamation)
            Exit Sub
        End I f

        If   cmbMaths.Text =   ""   Then
            MsgBox("Choose your symbol for the maths subject to proceed"              , vbExclamation)
            Exit Sub
        End If

        If   cmbEng.Text =   ""   Then
            MsgBox("Choose your symbol for the English subj           ect to proceed"     ,
vbExclamation)
            Exit Sub
        End If

        If   txtSub1.Text =     ""   Or  txtSub2.Text =     ""   Or  txtSub3.Text =     ""   Then
            MsgBox("Enter your other subjects to proceed"            , vbExclamation)
            Exit Sub
        End If

        If   txtProfQ.Text =      ""   Then
            MsgBox("Enter your professional/other qualifications to proceed or type N/A
if there is none"       , vbExclamation)
            Exit Sub
        End If

        If   txtPost.Text =      ""   Then
            MsgBox("Enter po   st being applied for to proceed"           , vbExclamation)
            Exit Sub
```

```
        End If

        If  txtBackgrnd.Text =  ""  Then
            MsgBox("Enter your background to proceed"  , vbExclamation)
            Exit Sub
        End If

        If  txtAge.Text <=  17  Or  txtAge.Text >= 41  Then
            MsgBox("Age out of range, age range is 18  -  40 years old"  , vbCritical)
            Exit Sub
        End If

        If  RadioButton1.Checked =  True  Then
            lblEntType.Text = RadioButton1.Text
        ElseIf  RadioButton2.Checked =  True  Then
            lblEntType.Text = RadioButton2.Text
        End If

        Dim dt  As New DataTable
        Dim ds  As New DataSet
        ds.Tables.Add(dt)
        Dim da  As New MySqlDataAdapter ("select * from app_details"  , sc  on)
        da.Fill(dt)
        Dim ID  As String  = txtNatID.Text
        For  Each  DataRow In  dt.Rows
            If  ID = DataRow.item(1)  Then
                MsgBox("You Cant Submit Application For Same ID Twice"  , vbCritical)
                txtNatID.Clear  ()
                Exit Sub
            End If
        Next

        lblAppID.Text = stil()
        With  cmd.Parameters
            .AddWithValue(  "@AppID", lblAppID.Text)
            .AddWithValue(  "@NatID", txtNatID.Text)
            .AddWithValue(  "@FName", txtFName.Text)
            .AddWithValue(  "@SName", txtSName.Text)
            .AddWithValue(  "@DOB", DOB.Text)
            .AddWithValue(  "@Address", txtAddress.Text)
            .AddWithValue(  "@Province"  , cmbProv.Text)
            .AddWithValue(  "@Phone",  txtTel.Text)
            .AddWithValue(  "@Email", txtEmail.Text)
        End With

        With  cmg.Parameters
            .AddWithValue(  "@AppID", lblAppID.Text)
            .AddWithValue(  "@AppDate", AppDate.Value.ToShortDateString)
            .AddWithValu  e("@Post", txtPost.Text)
            .AddWithValue(  "@Maths", cmbMaths.Text)
            .AddWithValue(  "@English"  , cmbEng.Text)
            .AddWithValue(  "@OtherSubjects"  , txtSub1.Text +  ", "  + txtSub2.Text +  ", "  +
txtSub3.Text)
            .AddWithValue(  " @AppBack", txtBackgrnd.Text)
            .AddWithValue(  "@ProfQs", txtProfQ.Text)
            .AddWithValue(  "@EntryType" , lblEntType.Text)
            .AddWithValue(  "@AppStatus" ,  " ---  ")
        End With
```

```
            With   cmp.Parameters
                  .AddWithValue  ( "@AppID", lblAppID.Text)
                  .AddWithValue(   "@AppDate", AppDate.Value.ToShortDateString)
                  .AddWithValue(   "@Post" , txtPost.Text)
                  .AddWithValue(   "@Maths", cmbMaths.Text)
                  .AddWithValue(   "@English"  , cmbEng.Text)
                  .AddWithValue(   "@OtherSubjects"   , txtSub1.Text +        ", "     + txtSub2.Text +       ", "     +
txtSub3.Text)
                  .AddWithValue(   "@AppBack", txtBackgrnd.Text)
                  .AddWithValue(   "@ProfQs" , txtProfQ.Text)
                  .AddWithValue(   "@EntryType" , lblEntType.Tex      t)
                  .AddWithValue(   "@AppStatus" ,   " ---   " )
            End With
            scon.Open()
            cmd.ExecuteNonQuery()
            cmg.ExecuteNonQuery()
            cmp.ExecuteNonQuery()
            MsgBox("Application submitted successfully. Your Applicant ID is "                          +
lb lAppID.Text +      ". Take Note of it."          , vbInformation,        "Operation Successful"      )
            clear()
            scon.Close()
      End Sub
      Sub clear()
            lblAppID.Text =       ""
            txtPost.Clear()
            cmbMaths.SelectedIndex =      - 1
            cmbEng.SelectedIndex    =  - 1
            txtSub1.Clear()
            txtSub2.Clear()
            txtSub3.Clear()
            txtBackgrnd.Clear()
            txtProfQ.Clear()
            txtAge.Text =      ""
            cmbGender.SelectedIndex =     - 1
            cmbMariStat.SelectedIndex =       - 1
            lblEntType.Text =       ""
            txtNatID.Clear()
            txtFName.Clear()
            txtSName.Clear()
            txtAddress.Clear()
            cmbProv.SelectedIndex =      - 1
            txtTel.Clear()
            txtEmail.Clear()
      End Sub
      Public    Function    stil()      As  String
            Dim  sRetur n  As  String    =  ""
            Randomize()
            Dim  iRandom1 =  CInt  (9999 * Rnd())
            Dim  iRandom2 =  CInt  (9999 * Rnd())
            Dim  iRandom3 =  CInt  (9999 * Rnd())
            'Const Alphabet As String = "QWERTYUIOPLKJHGFDSAZXCVBNM"

            Dim  s4  As  String    =  iRandom1.ToString.Substring(0, 1)
            Dim  s5  As  String    = iRandom2.ToString.Substring(0, 1)
            Dim  s6  As  String    = iRandom3.ToString.Substring(0, 1)
            Return   s4 & s5 & s6
      End Function
```

Applicant Selection Form

```
Dim cmg As MySqlCommand = New MySqlCommand("INSERT into selected_applicants
values(@AppID,@AppDate,@Post,@Maths,@English,@OtherSubjects,@AppBack,@ProfQs,@EntryType)"
, con)

        With cmg.Parameters
            .AddWithValue("@AppID", txtAppID.Text)
            .AddWithValue("@AppDate", AppDate.Value)
            .AddWithValue("@Post", txtPost.Text)
            .AddWithValue("@Maths", txtM.Text)
            .AddWithValue("@English", txtE.Text)
            .AddWithValue("@OtherSubjects", txtOther)
            .AddWithValue("@AppBack", txtAppBack.Text)
            .AddWithValue("@ProfQs", Label9.Text)
            .AddWithValue("@EntryType", txtEntry.Text)
        End With
        con.Open()

        cmg.ExecuteNonQuery()
        MsgBox("Done")
        delete()
        clear()
        con.Close()
    End Sub
    Sub clear()
        txtAppID.Text = ""
        txtPost.Text = ""
        txtM.Text = ""
        txtE.Text = ""
        txtOther.Text = ""
        txtEntry.Text = ""
        Label9.Text = ""
        txtAppBack.Text = ""
    End Sub
    Sub delete()
        Dim cmd As MySqlCommand = New MySqlCommand("delete from qualifications where
AppID = @AppID", con)
        cmd.Parameters.AddWithValue("@AppID", txtAppID.Text)
        If con.State = ConnectionState.Open Then
            con.Close()
        End If
        con.Open()
        cmd.ExecuteNonQuery()
        ' MsgBox("Record deleted")
        filldatasetandview()
        bindfields()
        con.Close()
        clear()
    End Sub
    Sub AddDets()
        Dim cmg As MySqlCommand = New MySqlCommand("INSERT into discarded_applicants
values(@AppID,@AppDate,@Post,@Maths,@English,@OtherSubjects,@AppBack,@ProfQs,@EntryType)"
, con)

        With cmg.Parameters
            .AddWithValue("@AppID", txtAppID.Text)
```

```
                .AddWithValue( "@AppDate" , AppDate.Value)
                .AddWithValue( "@Post", txtPost.Text)
                .AddWithValue( "@Maths", txtM.Text)
                .AddWithValue( "@English" , txtE.Text)
                .AddWithValue( "@OtherSubjects" , txtOther)
                .AddWithValue( "@AppBack", txtAppBack.Text)
                .AddWithValue( "@ProfQs", Label9.Text)
                .AddWithValue( "@EntryType" , txtEntry.Text)
            End With
            con.Open()
            cmg.ExecuteNonQuery()
            delete()
            clear()
            con.Close()
        End Sub
        Private Sub Button5_Click(sender As Object , e As EventArgs ) Handles Button5.Click
            Dim response As String
            response = MsgBox( "You are about to discard this applicant " & txtAppID.Text,
vbExclamation + vbYesNo)
            If response = vbNo Then
                Exit Sub
            Else
                AddDets()
                delete()
                MsgBox("Done" )
                Exit Sub
            End If
        End Sub
```