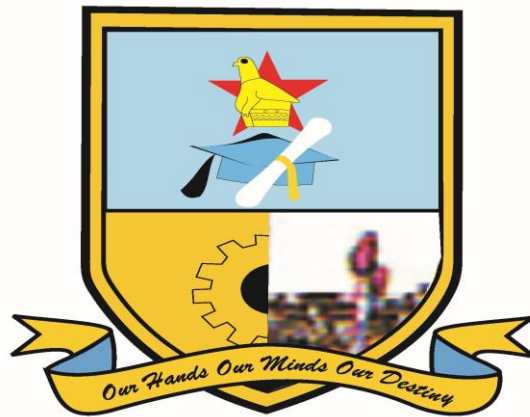# MIDLANDS STATE UNIVERSITY SKILL BUNDLE SYSTEM

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R141690W

Midlands State University Skill Bundle System

Submitted in partial fulfilment of the requirements for the degree of

BSc Information Systems Honours

Department Computer science and Information Systems

In the

Faculty of science and technology

At the

Midlands State University

Gweru

October 2017

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ABSTRACT

Midlands's State University Skill Bundle is a system documented in this project file, which deals with the bundling of student with skills in one web application. Skill Bundle exist to take advantage of the skills in the university from all parts of world through faculties and departments for students to share resources and skills instead without the involvement of any kind of currency. This document explains that the system will offer users a form of digital currency or points for free to exchange with some skill among students online. This in turn builds a one single platform, which is rich in skill and promotes the spread of quality skills and high education as well as return on creativity. This in return eliminates problems among students of lacking motivation due to low or little room for creativity among each other. Thus, this document shows how students utilize a chat space, which is known within the system for communication about their request made within the system.to clearly understand the concepts of this idea (Skill Bundle), reading further inside the document will elaborate to simplify the need and purpose of the system document as well as its functionality.

DECLARATION

I, **Kudakwashe Taitia** hereby declare that l am the author of this dissertation. I authorize the Midlands State University to lend this dissertation to others for the purpose of scholarly research.

Signature……………………………. Date……………………………………………………

APPROVAL

This Dissertation entitled "**Midlands State Skill Bundle System**" by **Kudakwashe Taitia** conforms to the regulations governing the award of the **BSc Information Systems Science Honour's Degree** of Midlands State University, and is approved for its contribution to the knowledge and literal presentation.

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Supervisor……………………………………………………………………………….

Date………………………………………………………………………………..

ACKNOWLEDGEMENTS

DEDICATION

To the Almighty GOD who creates opportunities such as these which we barely recognize sometimes and to myself.

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List of Acronyms

IT   = Information Technology

SDLC   = System Development Life Cycle

NPV   = Net Present Value

ROI   = Return On Investment

DFD   = Data Flow Diagram

ER   = Entity Relationship

LAN   = Local Area Network

WAN   = Wide Area Network

PC   = Personal Computers

SQL   = Standard Query Language

CHAPTER 1: INTRODUCTION
1.1 INTRODUCTION

According to my own understanding, an introduction refers to the first or beginning of part of explanation intended by the writer to brief interested parties on the matter behind a certain research. An introduction is usually written in the form of a single paragraph or a few lines outlining a particular opinion or fact. Anyways, this research is about a proposed system known as the **MSU Skill Bundle** system. This system intends to bring students on one network through websites or applications so that they can share their acquired skills through requests made by other system users (students) at a cost which is in the form of digital currency which is credited to the one who joins the network. Such digital currency is then used to exchange or trade for certain skills such as a functioning (running) website code or well-designed magazine from skilled graphic designers on campus as well as on the network and so on. Midlands State University students may find this system very useful to promote creativity in and around the organization so as to compete with other institutions.

1.2 BACKGROUND

MSU Skill Bundle system is all about bringing oneness through a network of combined faculties with all sorts of skills being linked together to help each other to pass and excel academically with excellence.

1.2.1 BACKGROUND OF THE ORGANISATION

Back then the Midlands province was identified and picked as a possible province to site the second higher learning (university) institution. After having lost two other opportunities to have an institution in the province Midlands to Harare (Catholic University and Open University), these two institutes later joined heads to consider the birth of a Midlands province university which came to be known as MSU (Midlands State University). Before its birth, the foundation of National University of Science and Technology in Bulawayo was another opportunity (bid) lost by Midlands to build its own provincial higher learning institute. His Excellency, the President of Zimbabwe R G Mugabe, came to accept the idea of building a national university in the Midlands province through the Provincial political leadership. Therefore, such a move back then gave the conversion of Gweru teachers College to one big university to accommodate the need for higher

education in the province and around the nation. This came to succeed through the works and commitments done by the Technology's policies agencies and the Ministry of Higher Education so as to grant Degrees in such an institution. The enrollment process of students around the Province started when it was however very small, when it began in 1998 at Gweru teacher's colleges. The first students to be enrolled studied Bachelor of Commerce with Education and Bachelor of Science with Education degree programs, which were issued by the University of Zimbabwe. The efforts and devotions made by the Ministry of Higher Education and Technology they gave the rise of this transformation despite the lack of government national funding through the means of the State University in the Midlands Act or April 1999.

1.2.2 ORGANIZATION STRUCTURE

Midlands State University is one of the first three Universities to pop out back in the day in Zimbabwe. An organizational structure is a chart diagram that contains the layout the span of control and the means of delegation among managers and subordinates in an organization (Weiss (2014)). A higher learning or tertiary institution is located in Gweru while being led and directed by the President of the Republic of Zimbabwe who is currently the Chancellor. The Vice Chancellor is the known delegate of the Chancellor who is selected by the President to run and direct day-to-day operations around the institute. Below the Vice Chancellor comes more delegates who help push the organization to daily success on operations. As each organization exist in the world of business, it is recommended to have a diagram, which displays the level of authority and the span of control that is known as the Organogram or Organizational chart.
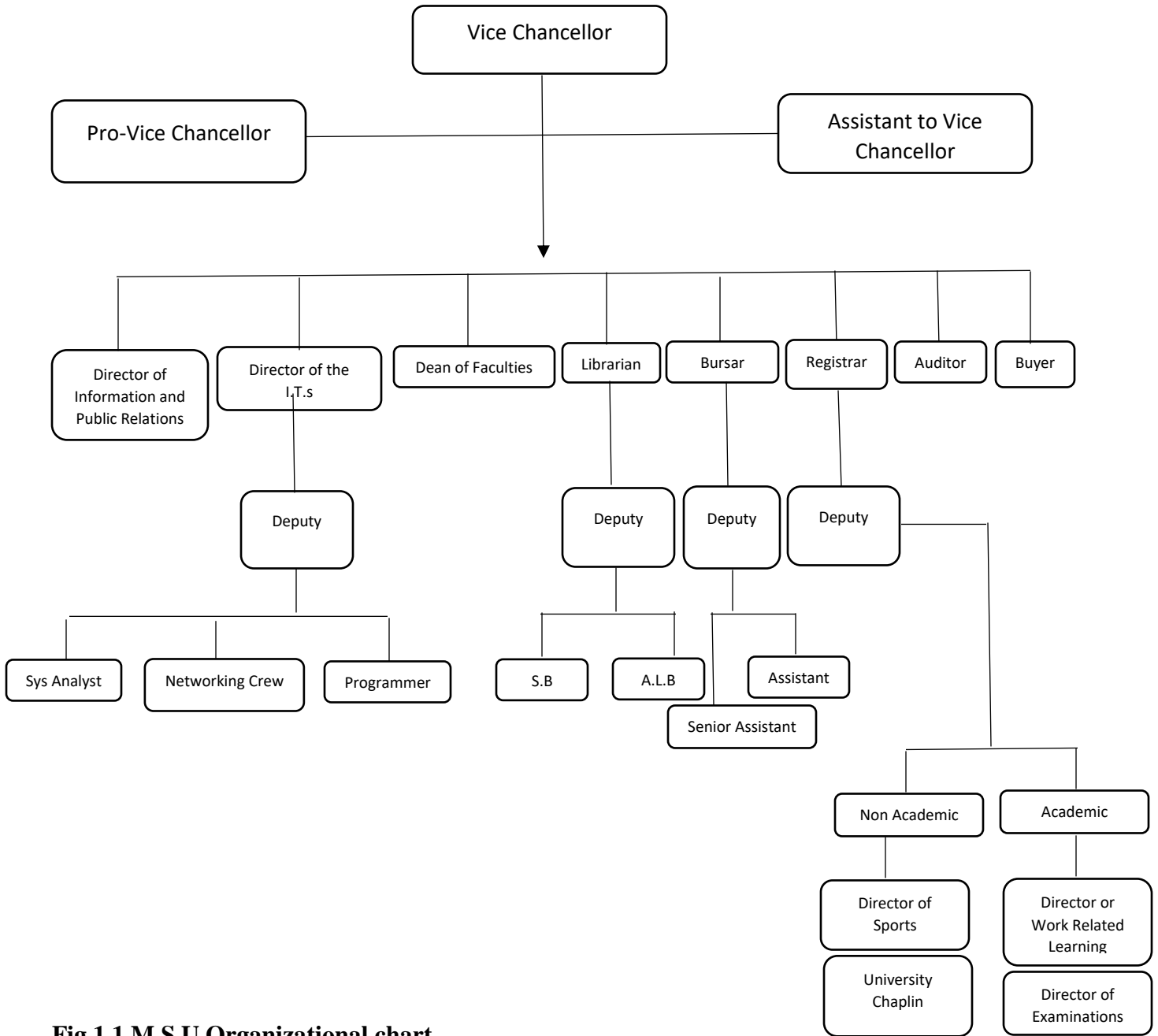
Fig 1.1 M.S.U Organizational chart

1.2.3 MISSION

Guided by its Vision, Midlands State University aims at being a leading internationally respected University which embraces diversity and community engagement whilst at the same time inspiring a spirit of life-long learning. This would be achieved through commitment to:

> ➢ a results based culture of problem solving through quality and relevant research, teaching and training by means of flexible packaging, work related learning and strategic partnerships with the University's stakeholders for the immediate and ultimate benefit of humanity;
> ➢ sustainable socio-economic transformation through promotion of managerial skills and generation, dissemination and application of knowledge,
> ➢ total human capital development in an environment of a caring institution;
> ➢ the use of Information Communication Technologies (ICTs) and the virtual classroom as principal teaching and training modes of delivery and research;
> ➢ gender equality and equity in student admissions, staff recruitment and promotion policies;
> ➢ enhancing the quality of people's lives through new ideas and skills for sustainable utilization of resources;
> ➢ promotion of relevant and actionable quality research through both taught and research post graduate studies as means of generating new knowledge;
> ➢ good corporate governance policies and practices which are underpinned and expressed through the values of honesty, integrity, accountability and transparency and internationalization of higher education

1.2.4 VISION/OUR STRATEGIC INTENT

To be a unique, development-oriented, pace-setting and stakeholder-driven University that produces innovative, enterprising and internationally acclaimed graduates for the empowerment of society and creation of wealth.

1.3 PROBLEM DEFINITION

Designers today barely think about students developing themselves to become creative and innovative as well as being helpful to others in some sort of way academically. At this period, students are given a chance to link around academically in their respective faculties and come up with a network of help and assistance without spending a cent on gaining a requested service.

- ➢ Students do not have a platform to communicate with each other and ask for academic help from others remotely.
- ➢ Access to some information is limited since some faculties have students who are stingy with data.
- ➢ Expects or skill students in most faculties are resources underutilized.
- ➢ Poor performance among students from different faculties as they lack assistance.
- ➢ Some projects are time consuming therefore giving the average performance due to lack of sufficient time.

1.4 AIM

This system intend to eliminate problems such as those of poor designs among students and other intrinsic differences mentioned in problem definition, thus the system is proposed to create a free environment for skill exchange and a less stressful learning realm for all candidates.

Hence, the major aim is to develop a computerized, well networked, cooperative and coordinated platform for students for convenience sake.

1.5 OBJECTIVES

- ➢ To allow users to create an online skill bundle account listing programme and faculty he/she belongs to as well as skill acquired and capabilities.
- ➢ To provide a form of digital currency to all joining members for free to use as currency for trade in the skill bundle.
- ➢ To enable the issue of requests and notifications of requests to all users
- ➢ To implement a matching tool which allows specific skilled users to be matched with specific requests

- ➢ To allow the review and grading or rating of solutions as soon as the users receive and analyse the solutions sent to their account
- ➢ To implement a download lock tool which restricts members from downloading the posted solutions to their accounts before reviewing and grading.
- ➢ To allow members to ask for a repost of solutions if the solutions are below requester average standard rating or grade.
- ➢ To allow users to chat or comment on reviewed solutions within the account inbox chat.

1.6 TOOLS AND INSTRUMENTS

During the analysis and research phases the following came to be the list for the needs or things necessary to enforce the smooth implementation of the system: -

- ➢ To design a consistent and uniform mechanism which enforces data consistency and information security from user view point at any time and place in any network.
- ➢ Create a database which will either be centralized and also decentralized to encourage a speedy access of sent solutions, as well as a database with restricted access and back up facilities
- ➢ To build a system which relates solutions to appropriate sent requests, which enhances the quick tracking of exchange needs and duration limits stated by the solution seeker.
- ➢ Stable database should be enforced as well as stable flow of skills being matched to requests

When it comes to the development phase of the system the developer may need the following design tools.

DREAMWEAVER CS3: This is one of the most stable and flexible platforms which allows developers to design empowered graphical web based client interfaces for transactions to be visible. Such a tool encourages debugging of errors during development and suggest possible build solutions.

Microsoft SQL Server 2012/ MYSQL Server 5.1: - Microsoft SQL server is a Microsoft database management system for managing relational data queries within the database.

- Recommended because it is secure and contains solid data protection layers which secure user data from unauthorized users. Access controls can be manipulated to set access limits
- Encourages cross platform operability that is, it can be mounted and put to use on most operating systems such as Windows, Linux and Mac OS etc without affecting system performance.
- Microsoft SQL and MYSQL are open source platforms thus, anyone can have full access to its functions since it is General license for public access.

Java Script: - This is a solid scripting language used to fully design web functions and other system components useful to balance the system behavior through Java complex scripting or coding.

Visual Studio 2016 which supports PHP and Mining of Data sets (OLAP tools)

- PHP is another free open source tool which developers prefer when coming up with web system since it offers technical support and its functions are constantly updated to promote competitive designs worldwide.
- It is also offered for free to the community through the General Public License
- PHP is highly compatible with other web based platform such as HTML 5 and all operating systems or web servers enabling it to work across different systems.
- Can help in the design of attractive interfaces (Apache/MYSQL)

1.7 JUSTIFICATION
As of justification nothing can stop the system development as all the requirements are largely accessible in or outside the institution.

- The proposed system will surely boost the student research performances as help is given through this platform after its fully implemented thus, this will help make the users more competitive as well as the organization to other institutions.
- The proposed system will encourage free access of some unavailable information which users need to know about as they do their researches.
- Access to this proposed system will enhance the rapid distribution of data between users and institution

- The institute will have a measurable level of control on functions and performance as its technicians work in line with user to fully enrich the institutes policies and promote user satisfaction by limiting duplications and timing delivery of requests on user schedule.
- The proposed system comes with security of data as one of the advanced facilities which promotes effective use of the system by joiners.
- So far the needed equipment's are readily available to allow the start of the development on the proposed system
- The system is going to maintain all the records of transactions made within its operation periods.

1.8 CONCLUSION

To conclude, here the proposed system sounds to be very problem solving since its documentation outlines the current problems being faced by university candidates in their research. Therefore, as a solution to such stated problems the proposed system "**MSU SKILL BUNDLE"** is obliged to solve all these and help candidates. The above stated ideas and aims were given a good thought and review and also accepted by most stakeholders in the institution and also the researcher. Thus, with helping hands and efficient constant supply of resources to the development team the plans set will be a success throughout the critical stages.

CHAPTER 2: PLANNING PHASE
2.1 INTRODUCTION
According to Michael Todaro (1986), planning refers to the act of reducing all kinds of risks through the elimination of uncertain conditions and adding effort and resources to known conditions. Michael Todaro also looked at plans as forecasts which are future driven procedures. In this chapter, the planning phase is to be explained and all planned schedules laid out. At this phase all issues concerning the product development will be drafted and costs stated from the beginning of the project till its finalization. The Planning phase only concentrate on the reason behind the development of proposed system while showing the degree of feasibility whether to make or not to make the system.

2.2 REASONS FOR BUILDING THE SYSTEM
This system has to be developed for quite a number of reasons from both the development team and the institution stakeholders since the current system is said to be less accommodative to such facilities or functions, so the current system is however failing to satisfy the users and the whole institution. Listed below are some of the major reasons to develop and implement the system: -

➢ Convenience – Potential users of the system are general students and other university stakeholders who can get some of their responsibilities done through such platforms whether away from the class resource or near.

➢ Fair Digital Charges – Due to effective communication which is enforced by the institution within the system, there will be set agreed terms and conditions for trade within the system so that users do not overcharge each other but maintain a fair charge on any transaction. This will keep the digital currency inflation on a constant rate.

➢ Skill bundle is being proposed to help those who are interested in thinking big and doing things without limits while utilizing all the brains around to help prosper in their academic or non-academic plans.

➢ Creativity and innovation – Skill bundle creates room for users to develop unique resource full tools which promotes individuals and other interested parties to solve day to day problems in all kinds of business areas

➢ Skill Bundle offers users with effective maintenance of documents and user account resources. This is done according to user specifications and request for additional

information can be done before the exchange or transactions start. All charges and expected solution output are made known before one accepts to transact with the requests.

➢ The proposed system will initially give users the privileges of enjoying quality solutions and information sourced out from the most skilled individuals at costs less than the real monetary value.

➢ Services such as Easy Transfer – the system will allow automatic currency transfer and solutions from all known relevant channels within the institution.

➢ Solution Review – the users will access the review option without using the solution for their intended use. This helps protect the producer of the solution as well as the requesters digital currency.

➢ Share Ideas – the system creates a learning environment were users can exchange ideas which originate from sources all around the institution and the system members.

➢ Student Resource Database – this system will allow users to access some resource which are research oriented to help in conducting certain projects. All these will be stored in a centralized data source which will be available 24/7 to system stakeholders.

2.3 BUSINESS VALUE

Business value (Stacia (2008)) in general terms it is the worth one business has, taking into consideration all its assets and also its goodwill (reputation) as well as its share stock value of the business. In the business, there are a few strategic areas to be looked at to know the benefit, which are:

2.3.1 Organizational Value

Strategically, the business is considered viable and technologically capable of handling any internal challenges as one institute aiming to achieve one purpose and at this it should also strive to maintain or build its goodwill and image and to reach its long term goal (Lee and Vachon, (2016)). The internal (Organizational) values may include the following:

i. Oneness
   All divisions or departments should work hand in hand encouraging teamwork in and around the institute.

ii. Standards of the Identical nature

The institute should have a set of standards which are observed at any level of management or department, examples of such standards may include formal working protocol, standard working conditions and working environments, service conducts to customers and human resource management skills.

iii.   Good operational communication

Communications should be very effective that is, feedback should flow either from top to bottom or vice versa. This brings about satisfaction to all intended groups in the institution.

2.3.2 Managerial Value

The intended system should promote management fast and effective decision making which aids in problem solving within the organizations meetings or discussions. This is done to enable managers to come up with forecasts which helps in the future to maintain quality services to its all their system users. Managerial values according to (Nedelko,(2017)) refers to the long term preferences made by managers on resource utilization over a period of time.

2.3.3 Operational Value

This value aims to encourage reduction of slow responses on transaction processing during client service requests as well as the lapse which it takes to solve a particular problem mainly the maximum service duration per user (Curley, (2004)).

2.3.4 Security value

Security is always a major concern to all system holders, thus the value behind a system should encourage the safe protection user data and resources, (Shelly and Rosenblatt, (2011)) and authentication should only belong to the original account holder within the system. Therefore, the organization should implement a system which is secure enough for users to use and conduct their intended processes within the system without being worried about hackers.

The institutional business values outlined above relate to the expected benefits which will be brought by the system to be designed to all those who join the Skill bundle system. Therefore, after the careful and thoughtful consultations with a lot of interested parties it has been realized that the true benefits can be categorized into the following parts;

2.3.5 Tangible Benefits

Laudon and Laudon (2016) defined tangible benefits as those benefits of the proposed system which are computable and as such they occur directly the system's operations in real time. These are those types of outputs recognized as profits in business terms and are known as financial benefits so some of which many include:

➢ Quality presentation of solutions from requests which signify creativity in one's work and uniqueness.

➢ Improved resources allocation within the network available for all users

➢ Reduced duplication of resource outputs

➢ Thorough review of needs and solutions

➢ Automatic digital currency award for all members.

Intangible Benefits

➢ Satisfaction of users is improved

➢ Secure networks and other system controls

➢ Proper reports generation for error eliminations

2.3.6 Intangible Benefits

In business, intangible benefits refer to those returns, which cannot be expressed in financial terms while having significant impact on business operations and performance within the organizations scope. Intangible benefits cannot be directly computed and as such they are challenging to compute (Rosenblatt, (2014)).

➢ Security maintenance and development

➢ Staff motivation

➢ Advanced system performance and efficiency

➢ User confidence and dependency establishment

➢ Uniformity so as to maintain a recognized level of standards nationwide

➢ Accountability and responsibility within the system environment

2.4 FEASIBILITY STUDY

This refers to the practicality analysis which is carried by the management or even the project team to fully understand the needs and requirements a particular idea or project so as to come up with some sort of a risk assessment plan (Shelly and Rosenblatt, (2011)), which helps in considering if this is applicable or not. Such a study attempts to show whether the project can be designed within a specific set of targets as well as set time constraints. If the project meets the set constraints it is however considered an acceptable one since it proves to outweigh the shortcomings expected from its failure. Therefore, feasibility come to outline if the project system should be created or implemented, measure if the objectives set for the system can be achieved within the organizational current monetary, political, administrative, commercial and technical states (Rosenblatt, (2014)). However, such things will outline why the proposed system should be seen as a helpful tool to help the institution in upgrading and improving the business's IT structures and be in line with environment needs and changes.

1. Possibilities concerning the practicality aspects of the proposed system (Is this going to run smoothly?)
2. Possibilities of the system fully working in the intended environment (What kind of changes will be noted in the current available working environment and its operations as well as which ones become advanced?)
3. Financial constraints (is it going to be financially manageable or not?)

2.4.1 Technical Feasibility: Can it be done?

At this stage the team and the institutes management seat together and analyze if the listed system requirements match perfectly with the available structures or resources. Thus the two may consider the following aspects:

- Are the listed requirements technological available within the organization?
- Are the extra needs needed for development currently available for exploitation –
  Such as the programming expects, design expects and other systems Gurus.

Rosenblatt (2014) defined technical feasibility as the need for technical resources to accommodate the development, purchasing installing and operating the proposed system. So, as the software and hardware issues are solved and all made compatible to each other as needed by the project owner

showing that there is a well-established level of technical feasibility. Then this leaves room to consider the financial aspects which are as important as other factors that leads to the rejection or acceptances of a particular project.

Since the world is slowly growing digital, many people have no problem adapting to any system changes and new technologies because there is a considerable level of computer literacy as IT technologies dominate all-round the globe. This will reduce the costs associated with training the stakeholders associated with the system. As soon as the hardware and software are configured to meet requirements proclaimed by the proposed system and establish a well organised technical possibility, it is however necessary take into consideration the financial factors which significant make a project acceptable and feasible. However, apart from the high level of computer literacy, there is little concern needed to train the people going to use the system on how to use it after its existence. Therefore, on such terms the system development however made easier as users specify some of their needs before system introduction.

i.   Project size

As on this phase the projects size looks big and a bit complex in nature since most of the objectives needs proper coding skills and good development strategies. Interface designs are going to be made or created using the HTML and PHP based structures so that the interfaces are functional and attractive for both the internal and external users within the institution scope. As for databases, they will be created using either MYSQL or Microsoft SQL since either of the two support OLAP.

The technical feasibility checks show the existence and capabilities of both the system's hardware and software requirements within the institute. Therefore, there will be less costs since most of the requirements are readily available the only needed thing to do is to separate one of the computer servers to support backups for the system. The organization already have state of the art kind of hardware specs which will support the system implementations around the network for exploitation during research. The network being referred to is either the local network linked through cables which facilitates Server/client kind of structure or set up or access through the internet networks. As known in all organizations the IT division is home to many legalized computer systems which are necessary for systems development and project viability. Therefore,

the shortage of skilled and very committed programmers is the only noticeable shortfall on all the necessary needs but it will not be considered as a drawback to the system development process.

ii.   Hardware Requirements

Such a system will need speedy super business computer system which will help process transactions and other requirements in the shortest processing time. So far the institute is known to have a lot of Hewlett Package (HP) products such as the HP 4500 which acts as a server, which is not a bad system to adopt but one of the average choice to pick. The availability of these items is currently assumed by online suppliers are available just need to the appropriate ones who are reliable.

Table 2.1 System Hardware needs.

Tool (Instrument)	Specifics
RAM	**16GB**
HARD DISK DRIVE	**8 Terabyte**
PROCESSOR	**Xeon 3.6 MHz**
DISPLAY	**18 inch LCD *4**
NETWORK CARD	**2000.0 Mbps**
FAST BACKUP MEDIA	**DVD Re-Rewriteable Drive**
PORTABLE MEDIA	**External Hard Disk Drives**

iii.   Network Specifications

As of inward observing purposes, our proposed framework will profit by the current sound well protected link foundation that has to likewise empower its visibility from the outside outer condition. There are a few useful viewpoints that might be considered preceding the advancement of the framework which are as follows:

➢ **Availability of technical specialists**: when coming up with a system one needs to have the technical experts set and ready to deploy their skills on how to achieve full system implementation and functioning as expected as well as teaching users on how micro

manage the system whether in the short or long run. Periodic calls, training and system maintenance will be enforced through the hired contractors or permanent developer within the institute.

➢ **Sourcing out costs of IT persons**: Comparisons should be made on whether is it viable to utilize the permanent internal IT personnel or make a choice to source out IT experts to help finish the job or project on supporting and maintaining the framework. The costs associated with both should be written down and analyzed to cut or maintain costs. Therefore, such analysis will bring out questions such as affordability.

➢ **Training**: issues concerning the day-to-day usage of the system are taken down through training of the new IT personnel after the new system has been deployed. IT personnel should be taught on how use and work around the system and know the basics of problem diagnostic for sake of system break downs. Therefore, this will encourage efficient use of resources as well as value addition through quality service delivery while user satisfaction is guaranteed.

➢ **Consultation**: issues such as system support and system management should be considered and forecasts made to suit the consulting company charges after the implementation of this system from the help of consulting team if it is externally based which is usually the case.

➢ **Consultancy costs**: as an institute, management should note all aspects stated by the consulting contract offered by developers. Doing this will help single out, if this project is feasible or not and usually consultancy seems to be much cost efficient than other relative options.

The overview of the technical feasibility here shows that the proposed system appears to be very applicable without technical compromise. The institution bears many technical supporting groups, which are ready to make this kind of system possible.

2.4.2 Operational Feasibility

Somerville (2016) stated that operational feasibility means the need of a proposed system to be efficiently and effectively used after it has been developed. This is done to analyze whether the system is compatible with the operations that are done daily within the organization. The proposed system is expected to act and run towards the elimination of operational problems and achieve all its objectives without compromising operations but increase institutional benefit.

The Current System vs. The Proposed System

In relation to the current system which is being used on the E-learning platform, a few users accepted its functions but there is no room to fully feel comfortable in chat rooms and ask for all your needs and receive response quickly from all system users. Therefore, ideally this proposed system seems to help solve some of the e-learning platform problems. So for this system to be fully concentrated upon it should completely out class the current available functions through checks of comparisons between the two.

Expected throughput: Solutions in relation to inputs, the quantity of transactions passing through the software from certain inputs to its end products over a particular period on time.

Operational Speeds: consider the speed of completing a particular transaction between the two systems after processing.

Integration of Institutional Departments: the proposed software should purely connect and link departments and all its functions to the institution system users while allowing the share of resources such as databases easy.

Objective Achievement: the software should be obligated to attain each and every objective stated in the objective section as mentioned before while improving service delivery and as well encourage quality decision making within the institutions management.

2.4.3 Economic Feasibility

Basically when a certain software is being analyzed, the team expect to design something that will produce more benefit that costs while being efficiently functional. If the benefit exceeds the amount of expenditure in any level, this will allow investors and management to accept the proposed system implementation. Techniques such cost benefit analysis are adopted to calculated the measurable return and expected costs. Economic feasibility is however, done to see if the system is fundable and economically feasible this has been supported by (Shelly and Rosenblatt, (2011)). This feasibility study is important to come up with the cost to be incurred and the benefit or return expected from the use of the system. All this will be achieved through cost benefit analysis techniques.

Running expenses: refers to those negative charges incurred while the system is functioning and running daily.

Implementation Costs: refers to those costs which are incurred initially during the development of the whole system that is costs attached to very stage in the development stage and these are one-time costs (Investment costs).

2.4.3.1 Cost Benefit Analysis

Coming up with a computer based system is often challenging and considered as a venture which produces high returns if designed well to the institute or organization. Weingadt, Kimmel and Kieso (2010), stated that cost benefit analysis is a way of identifying the costs and benefits of engaging in a certain investment after analysis and evaluations have been undertaken Cost benefit analysis technique helps the decisions makers on making decisions such as the prediction of risk to be involved as well as the rate of income if successfully implemented.

Table 2.2 Cost Benefit Analysis

Years	2017	2018	2019
Benefits	USD	USD	USD
Value addition on Services	1100	800	800
Efficiency Increment	700	900	1200
Security Maintenance	750	750	750
Stationery reduction	100	100	100
Sum of Benefit	**2650**	**2550**	**2850**
Developmental costs			
Technical Labour	900	0	0
Licensed Software	900	0	0
Software components (Additional)	2500	0	0
Training Expense	300	0	0
Developmental Cost (Sum)	**4600**	**0**	**0**
Operational Expenditure			
Maintenance and Repairs	600	600	500
Bond Paper	400	400	400
Additional Costs	450	550	800
Total	**1450**	**1550**	**1700**
Total Costs	**4600**	**1550**	**1700**
Total Benefits	**2650**	**2550**	**2850**
Profit/Loss	**(1950)**	**1000**	**1150**

Table 2.3 Cash flows

Year	Project Skill Bundle ($)
0	-4600
1	2650
2	2550
3	2850

2.4.3.2 Net Profit

This is the actual return or profit gained after all costs and gross profit have been paid (Randall, (1996))

Total Benefits – Total Costs

$$= (2650 + 2550 + 2850) - 4600$$
$$= 8050 - 4600$$
$$= 3450$$

2.4.3.3 Return on investment

Refers the measure of perform calculated to see how much return is being recognized in an investment (Randall, (1996)).

R.O.I. $\quad = \quad$ **Average total profit (annual) x 100%**

Investment (Total)

Profit per year $\qquad = 8050 - 4600$

$\qquad = 3450$

Average total profit $\qquad = 3450 / 3$

$\qquad = \underline{1150}$

Therefore Return On Investment $\quad = \underline{1150}$ x 100%

$\qquad\quad$ 4600

$\qquad = \underline{25\%}$

2.4.3.4 Net Present Value based on a discount factor of 10%

Refers to the value of sum money known as cash flows against some rate to see the value of such amounts in the coming future prior to investment. (Randall, (1996))

Discount Factor = $1/(1+r)^t$;   where r = Discount rate and t = time

Present Value = Value in Year * Discount Factor

Net Present Value = Total of Present Values

Table 2.4 Net Present Value

Years		Value (/Year)	Discounting Factor	Net P.V. $
0		-4600	1	- 4600
1		2650	0.909	2408.85
2		2550	0.826	2106.3
3		2850	0.751	2140.35
Net P.V. Total				**2055.5**

As seen from the calculation prescribed below the system has proven to be cost effective and can encourage budgeting so that system flow becomes smooth. Concerning economic feasibility the university is willing to accommodate the calculated estimates into their budget as seemed manageable.

2.4.4 Organizational Feasibility

Looking at all the mentioned reasons, review and assumptions stated above, the researcher and the other involved parties find it very feasible to adopt this system in the institution since it seems to be helpful to many students and university stakeholders.

System users: the potential users which are students, have an interesting impatient vibe which shows that the proposed platform will surely handle well in minimizing resource search efforts within the campus as it shall be made available to any user who requests for such items on the platform.

Overall view of the organization, presents the developer with some insight that, the university as a whole is ready to utilize its resources to fully acknowledge the development of such platforms

within expected areas. Concerning the feasibility study done, the analysis shows that this system is feasible and manageable from the technical aspect of feasibility to economic feasibility.

2.5 Risk analysis

This refers to some exercise that is carried out to minimize the level of uncertainty within a particular project or investment. According to Pressman (2005), risk has two features which are loss and uncertainty, therefore, most projects have that level of discomfort which is either caused by internal or external variables. Thus actions to prevent such impacts can be identified and used against risks to avoid consequences. Risks likely to occur include: -

2.5.1 Technical risks

➢ Power cuts and load shedding schemes may be risks which slows the access to servers and other system functions hence, automatic generators may be installed in case of such inconveniences.

➢ Changes in user preferences and tastes may affect the use of the system however, user involvement and training plans may act as countermeasures.

➢ User computer illiteracy may act as another drawback so training can also be used to help as they will be well educated on how to use the system.

2.5.2 Economic risks

Since Zimbabwe is currently facing the currency flow challenges, the institution is also facing the same problem around all its cash access points for anyone. This increased the cash flow problems in trying to attain the requirements of the system such as the hardware and software tools which are intended to help in the system development. Such a risk can be assumed to be in the range of 54%, so a loan can be acquired as a source of finance from outside university friends. Such a loan will help implement the system and its requirements.

2.5.3 Other risks

Viruses are common nowadays so such risks can be encountered after the system has been installed but there many ways to deal with quite a number of viruses, which is through Anti viruses that are paid for and licensed to fully protect the system. Some institutional hardware systems are way

outdated but functional and the institute is very reluctant to make updates yearly as technology changes every year. Hence, the management needs to be encouraged on making budgets so systems upgrades may be implemented and maintained annually.

2.6 Stakeholders Analysis

In this case, the stakeholders view the system as significant and very cost effective. Stakeholder analysis in conflict resolution, project management, and business administration, is the process of the assessing a decision's impact on relevant parties Fletcher (2000). This information is used to assess how the interests of those stakeholders should be addressed in a project plan, policy, program, or other action.Stakeholders are individuals, establishment, social gathering, or society with an enthusiasm for the purpose or that are influenced by the association straightforwardly or by implication, they can be internal or outside of the association (Edward, 2013). Stakeholder dangers can likewise be seen as dangers that are probably going to be confronted by authoritative partners (Gosy, 2007).

1. **Internal stakeholders**

- **Directors** –This group is a gathering of chose or designated individuals who mutually supervise and screens the exercises of an organisation or association. Their purpose is to guarantee, assure extend and monetary bolster which incorporates paying of all administrations that are significant for the advancement of the venture to its finishing. These expenses may range from arrangement, support, operational and improvement costs. Their pool of enthusiasm for venture support will prompt the disappointment of the venture.

- **System end clients** – In data innovation, end clients are people whom an equipment or programming item is composed by designers (Robson, 2010). They are in charge of getting, approving and reacting to information forms in the software. Blunders or carelessness of end clients will extraordinarily influence yield of the software.

- **Application programmers and experts**-They are the software engineers who do the coding of the software program, composing client issue in a way which a PC can understand. Disappointment of software engineers to comprehend client necessities

completely and its functionalities will prompt the improvement of wrong application which won't take care of the issue.

- **Application designers –** They speak with the advanced PC through utilisation of various coding dialect systems. Substandard procedures and strategies can prompt the danger of getting poor software programs.

2 **External to the association**

- University graduates – These are the people which are intended to use the system and enjoy it benefits.

2.7 Work plans

A work plan is a list of all the project's activities right from the start up to its completion accompanied by the weekly times required for the project to be completed (Eppingner, (2008)). It aims at highlighting the starting and ending date of each activity as well as the overall project.

Analysis - This stage aims to enlighten the analysis behind system responsibilities and its abilities and notes made to explain the projects views and direction. It is often referred to as the spine of the project structure.

Design - After analysis, the design stage is used to show tools and procedures to be used in the development of the proposed system while maintaining set standards.

Implementation - This involves the syntactical coding of system structures, while coming up with a program that serves the intended purpose no matter what through testing of the system before implementation. Then this leads to the implementation stage were the whole efforts and project plans are installed and made open for use. Training and system maintenance are the last things to be observed while reviews are made and analyzed by officials within the system environment.

2.7.1 Project Schedule

Bohl (2000) states that project schedule is the tool that communicates what work needs to be performed, which resources of the organization will perform the work and the timeframes in which that work needs to be performed.

Table 2.5 Work schedule

Phase		Activity	Start Date	End Date
I: Project Proposal	1	Introduction	14/05/2017	
	2	Topic and Problem Definition	14 Days	
	3	Objectives		
	4	Justification		28/05/2017
II: Planning	5	Why build the system	29/05/2017	
	6	Identify business value	21 Days	
	7	Analyze feasibility		
	8	Develop work plan		19/06/2017
III: Analysis	9	Information gathering	21/06/2017	
		Existing System Analysis		
	10	Process Analysis		
	11	Data Analysis	14 Days	
	12	Weakness of working System		
	13	Evaluation Alternative		
	14	Requirements Analysis		05/07/2017
IV: Design	15	System Design	07/07/2017	
	16	Architectural Design		
	17	Physical Design	30 Days	
	18	Database Design		
	19	Program Design		
	20	Interface Design		07/08/2017

V: Implementation	21	Introduction	10/08/2017	
		Coding		
	22	Application Testing	**30 Days**	
	23	Installation		
	24	Review & Maintenance		
	25	Training & User Manual		10/09/2017

Date Format – DD/MM/YY

2.7.2 Gantt Chart

This is an outline, which shows every one of the exercises required to come up with the proposed system and finish the entire project (Eppingner (2008)). Each activity's duration is shown in weeks and they are shown in a sequential format up to the project's completion time.

Fig 2.1 Gantt Chat   **Weeks**

Activity Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Proposal	■	■													
Feasibility (Planning)			■	■	■										
Analysis of Systems						■	■								
Design of System								■	■	■					
System Implementation												■	■	■	■
Documentation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

2.8 Conclusion

This chapter focused on:

➤ Comparison between the proposed and current system

➤ The level at which the organization will find some academic problems through user satisfaction analysis and system confidence.

- The amount of return and costs to be consumed during project implementation as well as its development time durations.
- The availability of technical tools and technical specialists, system technical requirements as well as its technical forecasts.

Therefore, the next stage that comes after the planning stage aims to analyze the systems currently running within the institute for user and understand how its functioning and tackling problems. Hence attention now may be directed to the proposed platform to fully plan ahead and encourage its deployment around the institution.

CHAPTER 3: ANALYSIS PHASE

3.1 INTRODUCTION

Computer based frameworks are designed to meet the needs of some targeted or intended potential users while service delivery and value addition are perfected to enable quality system performance. This is achieved through group works which encourage users to be involved in the development team during institutional system development, user requirements are met and observed within the system functionalities, in relation to Godfrey (1999) quotes, the way toward reviewing, and cleaning, changing and displaying information with the objective of featuring valuable data. This is however done to cover all the short comings and other limitations which are currently at hand within the institution, so the proposed system will have to focus on overcoming the mentioned needs. In the analysis stage which was done on the current system, many kinds of research methods were used in the collection of data and other relevant information.

In this chapter, the most important aspects that form part of the system such as the processes, output from those processes as well as inputs within the system are structured out and closely looked at. More focus is also paid upon those who drives the proposed system so as to eliminate poor system functionality while focusing on user needs within this institution such as document delivery. UML process modelling is also used to show process structures as well to show the traditional line on how the current processes are being exhibited. Such a stage or model has been laid out into the following practices:

- ➢ Demonstration of method and function models
- ➢ Shortfalls of the current software
- ➢ Benefits and the capabilities of the current software
- ➢ Needs of the users on the proposed software or project

3.2 DATA GATHERING METHODOLOGIES

On this phase, a detailed analysis is done to have all the necessary facts about the systems currently working while taking notes on all the strengths and weaknesses housing the system being studied. Data gathering approaches are devices, gadgets or methods that can be utilized to gather data concerning the operations of the present system together with issues it presents to clients (Karathiya, 2014). This mission of gathering data is however done to fully understand and agree on terms of functionality within the system while noting the standard needs of data users. This is achieved by user involvement while doing the fact-finding process.

The following are the most aims and plans of this phase.

- Current system operations
- The management targets as well as the yearly operational tasks currently existing
- Activity frequency on activities which are highly operational within the system scope
- Operations recognition
- Checks on labour capacity and its range
- Tasks and responsibilities methodologies checks

The currently working system details were gathered using the following kinds of research tools and methodologies to gather the needed information about the working software at hand:

3.2.1 QUESTIONNAIRES

In my opinion questionnaires refers to a list of drafted questions which are documented either on paper or as soft copy while relating to a particular system behavior and expectations. Bell (1999), relates a questionnaire to a technique which is structured in nature used for primary data collection. Bell as also believed that it is a list of written down questions set for individual response by providing answers on the document as written words. Such a tool is made up of properly organized inquiry questions and optional dialog questions used to encourage the wide range of data gathering from all attentive respondents. Quantitative and qualitative data may be gathered also using this method so that such kind of data can be useful in many aspects of system evaluation and for also for factual research reasons. During system draft and preparations a few questionnaires were

distributed in and around the system potential environment which is Midlands State University for data gathering, the first issue was on August 2017 and the return data was set to be on the August of the same year. However below there is a list of favorable and adverse effects found from the use of questionnaires as a data collection tool. Around 28 copies were return out of a sample of 30 copies.

Reasons for adopting questionnaires

- Questionnaires are known to be very cost effective and easier to implement as compared to interviews
- As the analyst, questionnaires are an aid to interviews as it contains pre-formulated questions which bring answers to complex and confusing system parts as an advantage.

ADVANTAGES

A few of the following has been adopted from Finn, J etal (2008)

- Such a tool allowed respondents to be free and open when responding to me
- A lot of time is saved since multiple respondents can respond at one given period separately.
- It promoted anonymity which in turn encourages quality information from real responses
- Less complex to come up with as compared to interviews were personal judgement has to be enforced and leads to time exhaustion.

As mentioned above this technique has proven to have favorable results as well as some limitations which are going to be listed below as disadvantages of this method of data collection in system analysis even though it proves to be effective as a massive data provision.

DISADVATNAGES

- Low feedback challenges - Some of the questionnaires were not returned and responded to as expected
- Did not give users room to understand quickly since oral questions are usually out of context and reach
- Questionnaires took time to produce a collective feedback as compared to interviews

- Costly – the paper work involved in designing questionnaires leads to the over consumption of stationery on targeted areas

Findings from questionnaires

About two thirds of the group managed to fill in the details and express their opinions about the proposed system. New features such as duration of waiting for results has been emphasized for development in the upcoming web platform.

3.2.2 Interviews

According to some author back in the 90s, interviews are conversations that occur for a specific purpose between two parties (the interviewer and the interviewee). A topic is raised between the two parties were the one who asks the questions is known to be the interviewer and the interviewee is the person giving answers about the topic at hand for data gathering purposes on that particular area of concern (Kyale, (1996)). Since this method is often considered very effective in gathering information, l took it into play by picking random students in different departments to access and find solutions on how the system will behave when fully initialized on campus. One of the IT staff Mr Giyane has seen some credibility within the system and he personally gave some opinions on how the system should work and be structured during its proposal stages. So this technique gave me a lot data which am still analyzing to fully come up with one piece of work to act as my plan as well as my total system structure and functions. The following are the advantages noted during the use of this data collection method.

ADVANTAGES

- Useful in unstructured investigations during system modelling
- Gestures and other physical expressions was observed from all parties. Such behaviors help in noting the unwanted features and also the joy within some features
- Freedom of expression was observed while allowing system objectives adjustments for purposes such as user friendly abilities as well as understandability on user side.
- Feedback was received as a soon as the interviewee understand what the system is all about.
- Satisfaction and close contacts was encouraged by interviews as both parties build a relationship which promotes trust within the system scope and parties as students feel like they play a significant role in system development phase since they are consulted regularly

DISADVANTAGES

- Time consuming – data collection in interviews was often time wasting since some conversations take long.

- Disturbances usually occurred during my interviews were some interviewees did not wait in line to express their feelings.

- Some of the questions were ignored and taken for granted

- The usefulness of the data collected depends upon the skills and experience of the interviewer as well as the analysis of this data.

- Students often gave just their oral opinions as support and less skills and cooperation to system development.

Findings from questionnaires

The half of my colleagues tried to answer the questions and express their opinions about the proposed system. New features such as duration of waiting for results and system output and internal confidentiality was been emphasized for development in the upcoming web platform.

3.3 ANALYSIS OF THE EXISTING SYSTEM

The current system on this phase has been familiarized through the use of the data gathered from the previous methodologies mentioned above. Components such as inputs, outputs and processes as well as security aspects have been made known thoroughly by close analysis of all those things.

3.3.1 Creating Registered Account

The system works in the following fashion, students register with the university manually using documents and other registration related items and all these contents taken for storage at the student records office for filing. Thereafter, the students is now able to own a student E-Learning account which is made known to the student by registration directives. The student now go on to the main university website for e-learning account authentication credentials and confirmation of his or her registration details, and this is only possible if one is registered. Therefore, when all this has been completed, students can now track uploaded information which is academically related to the user from different sources.

3.3.2 Store

This phase utilizes the storage of information relating to students who are registered in different departments. All the details concerning a particular student is stored in databases which allows viewers to see their data separately from other users. Details such as banking transfers (fees and residence), results and transcripts as well as user details and learning protocols are accessible from e-learning platforms from database links. In this case, if one intends to pull out some data, an accompanying operation has to be performed to allow one to view the exact request.

3.3.3 Process Analysis

This includes the disintegration of the system's work into their coherent parts and the generation of the appropriate model of the procedures and dataflow (Darnton, 2012). It enlighten the stage by stage movement of operations within the system in a process like manner and helps to show the inputs and outputs through activities involved at every stage within the system processing phases. Process analysis is used to fully explain the activities held in the system for the purpose of usability and reliability all working in favor of operability to bring about user satisfaction. Process analysis helps also with the removal of unwanted or useless codes and functions so as the enhance system efficiency and smoothness.

Start

Login

no

Check the application form is
submitted or not

yes

Account

Stop
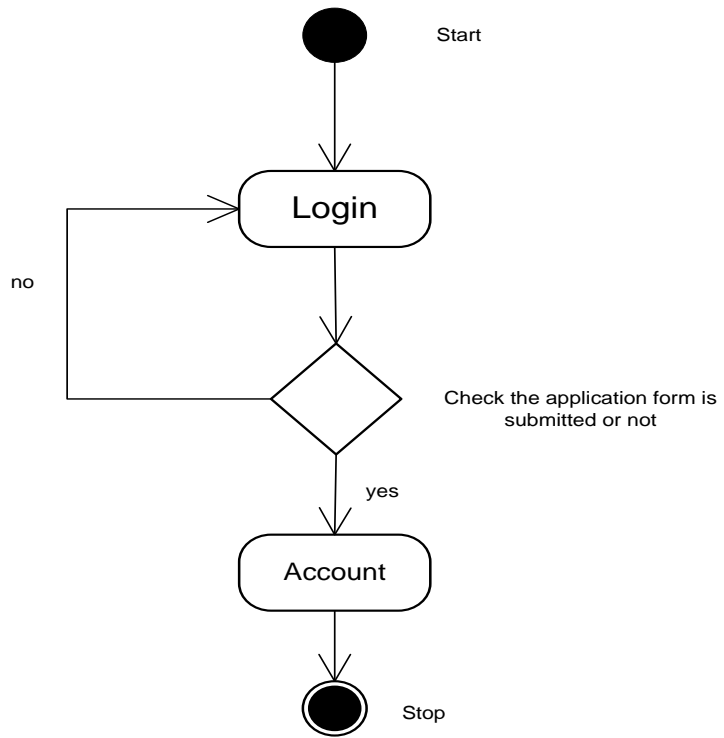
Fig 3.1 Activity Diagram of the New Account Creation.
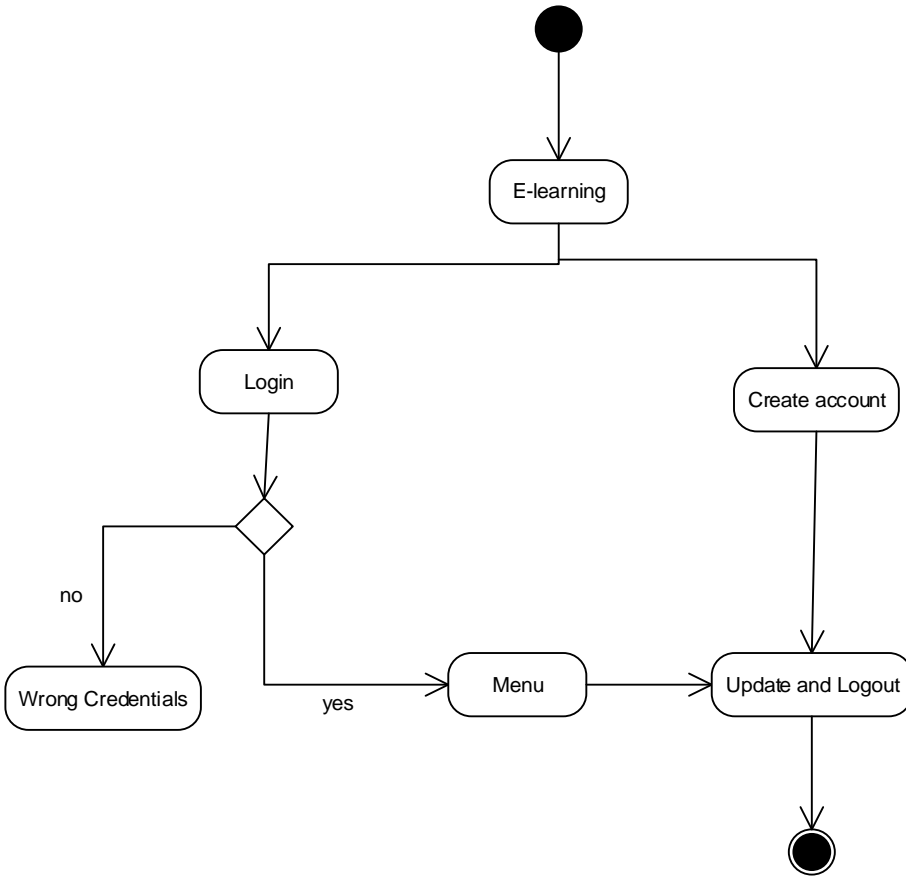
Fig 3.2 Activity Diagram for E-learning

3.4 DATA ANALYSIS

According to Godfrey (1999) an author back in the day, there are two methods used to show data structures, inputs, outputs, processes of the existing system which are context diagrams and data flow diagrams. Context diagrams are used to display various small systems (interactions of sub entities within the system) within the current system and also the tasks performed and services (process) carried out in the main processes of the system.

3.4.1 CURRENT SYSTEM CONTEXT DIAGRAM

Context diagram refers to the representation of data flows within a particular system represented in the simplest way showing how the model works and all the aspects involved, this is according to Scot (1999). System boundaries are outlaid to show some of its strength and weaknesses during

real world operation. Context diagrams are also useful in depicting connections of entities and real world within the system environment to signify system openness to all.
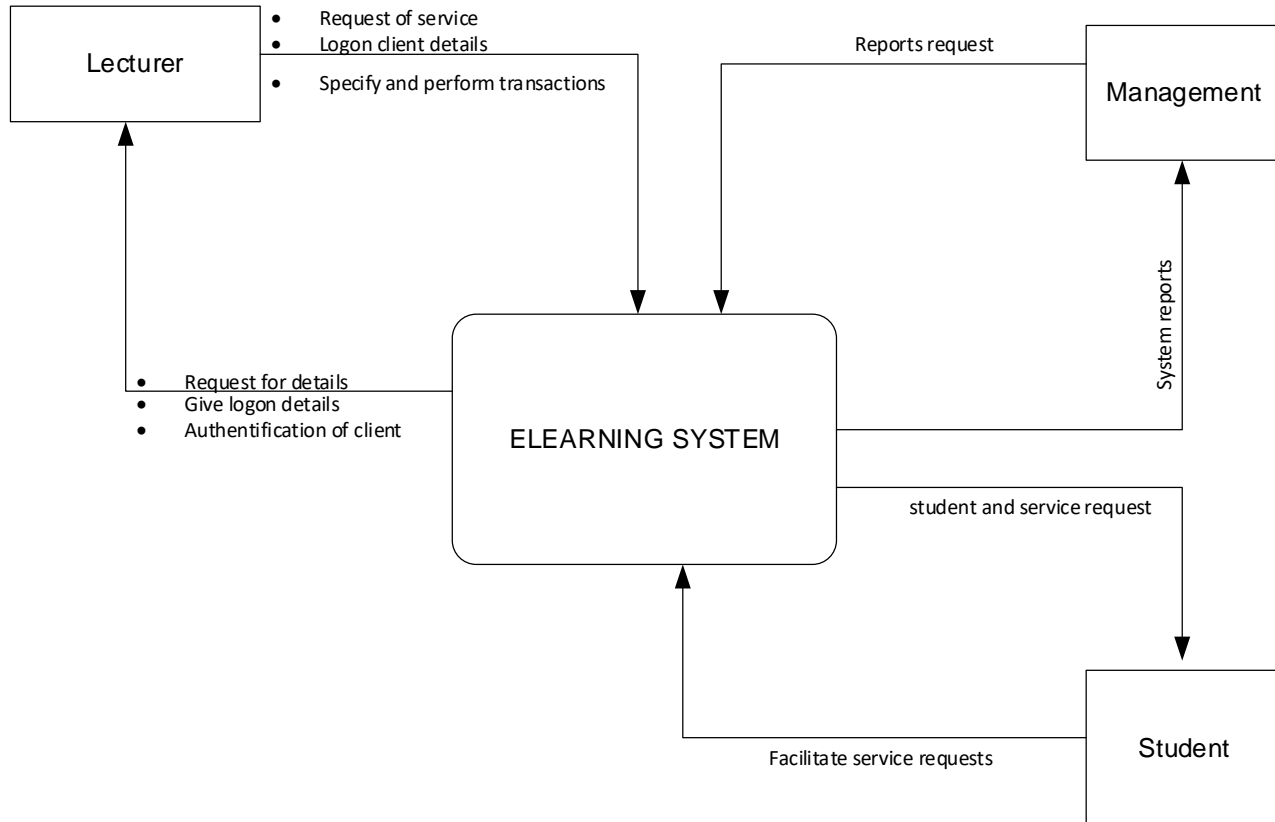
Fig 3.3 Context diagram of the current system

Data flow Diagram

As indicated by Bertin (2013), depicting a whole system in a diagrammatic manner utilizing the majority of the segments, for example, substances that follow up, data flow, information stores and procedures that the software does in called a DFD. It is a helpful device that is utilised as a part of increased more knowledge of how a system really works (Pierce, 2005).
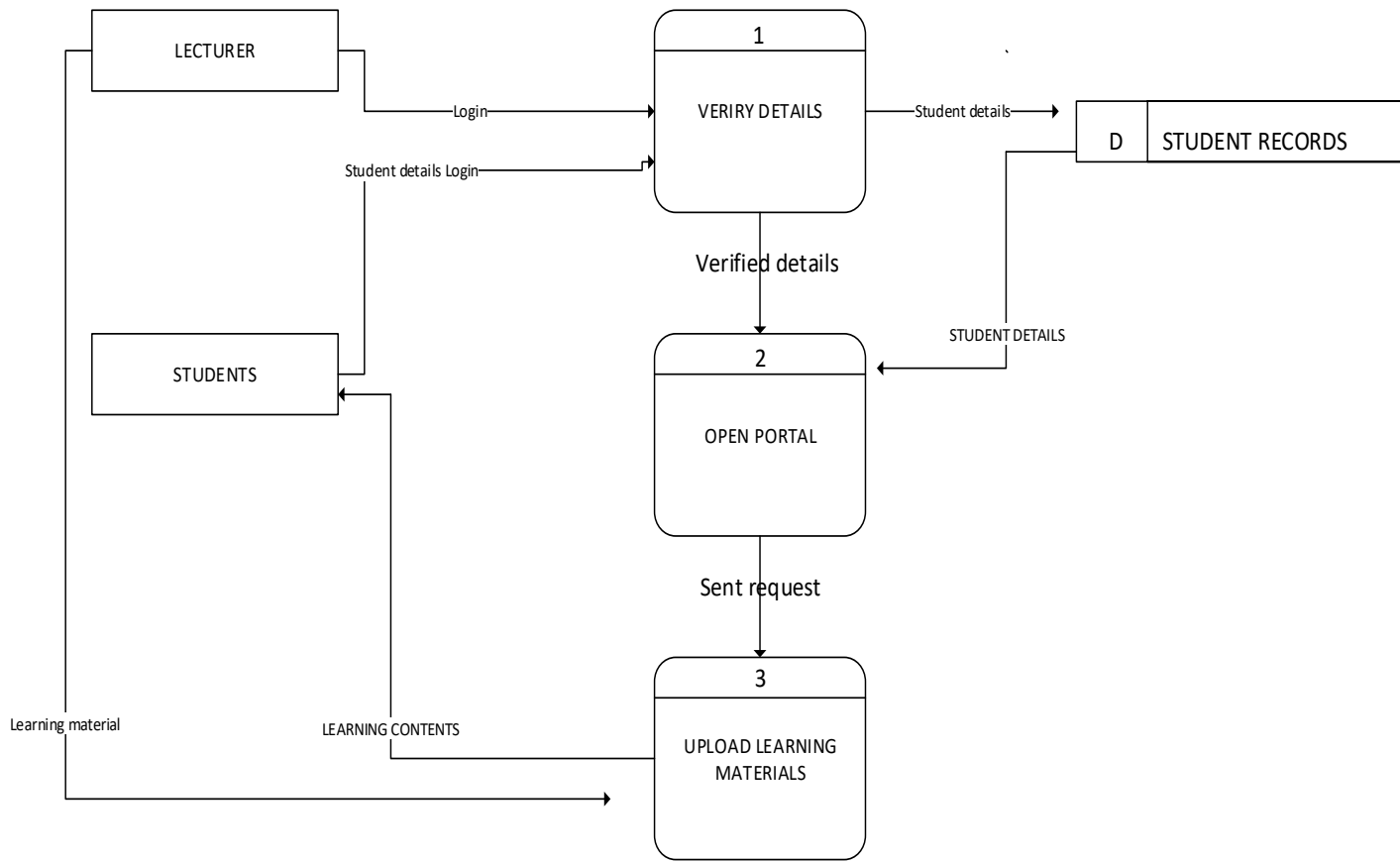
Fig 3.4 Data Flow Diagram for the Current System
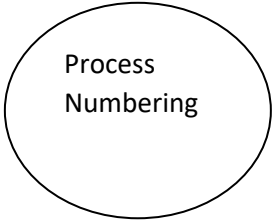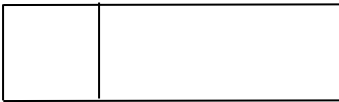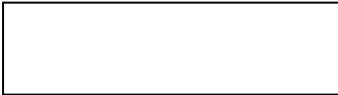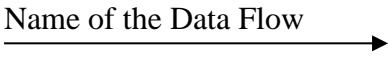
Item	Function
i) **Process** Process Numbering	Shows the system actions in conditions were inputs are added to it and output is given in a desired format
ii) **Data Store**	This becomes usefull when data is needed to be stored for later use. Also known as the Data repository or relation
iii) **Entities (external)**	Known to be real world objects or physical system elements either within or external to system boundaries.
iv) **Data Flow** Name of the Data Flow	Displays the flow of data in directional arrows or flows.

Table 3.1 DFD KEY

3.5 WEAKNESS OF THE CURRENT SYSTEM

Midlands State University designed a platform, which is known as E-learning used to offer student all the resources they need academically but this has been known by students to be incorrect. E-learning works perfect in all the other aspects but fails to give students a platform which enables them to share academic resources in a profitable manner in respect of the users. This platform allows lecturers to upload learning resources in readable formats for students to download. The documents uploaded can be viewed by all without any filters on the viewing of uploads. The following are the weaknesses which lead to the development of the proposed skill bundle platform.

- Less users due to poor interfaces and functionalities
- Inadequate feedback on uploaded data as well as clarity on information
- Ones personal skills are never known and approved

- Personal private chats are unavailable for further questions on some academic issues
- Skills from other departments may never be borrowed within the system that is, outsourcing is not encouraged.
- Poor academic help facilities as one has to find students manually by moving around related departments seeking help.
- The current system does not encourage creativity as skill improvement is not one of its major concerns.
- Chat rooms are rarely used for idea improvements and advancement in academic researches.
- There is no secure way of sharing resources within the platform

3.5.1 Strengths of the Existing System
The current system has its own strengths built in which are:
- Lecturer involvement is encouraged for reliability
- Documents uploaded on this platform are used as reference by all
- The system is user friendly
- Resources thrown in the system are open for exploitation to all
- Resources in the system are reliable

3.6 ALTERNATIVE EVALUATION.
In coming up with alternative methods to deal with weaknesses known to exist in the current system certain alternative evaluations have to be carried out and these are briefed as follows but first they are listed below:
- Outsourcing that is buying a packaged software.
- Improvement or redeveloping the existing system.
- Developing a new sytem

3.6.1 Alternative 1: Improvements of the current system
Such an alternative tries to make modern improvements while updating system functions and designs so as to keep the system operations modern as well. Old system operations will be maintained but improvements made to suit user needs and satisfaction. The entire old system will be running during the changes phase, users will notice changes on functions gradually during this

this process. Ghezzi (2004), emphasizes that improvements is when changes are made known to management and requests acted upon the current running system. Requirements are effected partially after the critical analysis has been carried out.

a) **Reasons**
- This allows the system to remain as it was from the beginning
- To maintain the occurrence of errors and reduce their occurrence
- Database links maintenance
- Hide threats on security and remove them

b) **Advantages**
➢ Reduces costs or maintains them
➢ Promotes user involvement besides having all changes done automatically by computer engineers
➢ Discourages resistance to change
➢ No training costs and time since users will be familiar with system
➢ Global competitiveness is built

3.6.2 Alternative 2: In-house Development

The second alternative, which can be used to solve the current system challenges, may be in house development, which involves the development a new system after critically analyzing the current system and technological changes. It involves the installation of a completely new system to the system environment by replacing the current one with the newly developed. Ghezzi (2004), states that in house development involves the development or creation by coding a new system from scratch within the system environment or organization. All concerned project team members try to come ip with new methodologies, technologies, innovative skills which are suitable to solve institutional problems once for a while.

a) **Advantages**
➢ Fast distribution of resources and tasks among team members and the whole institution
➢ Promotes user-developer involvement as well as on levels of accessing system components
➢ Improves accuracy and system efficiency
➢ Improves reliability among users as system security is one of the major concerns since only registered personal have access to the facilities

- ➤ Encourages fast processing of data because of the use of new technological skills
- ➤ Increases user satisfaction since interviews and questionnaires give user a way of expressing their needs and system functions
- ➤ Reduces manual collection of data

b) Disadvantages

- ➤ Its time consuming to develop and finish
- ➤ Startup expenses are often high due to the costs involved in gathering implementation equipment.

3.6.3 Alternative 3: Out Sourcing

Involves the organization being able to buy an already finished software package from the software dealers or markets, which suit the analyzed and listed requirements. Such a system is then dropped or installed within the system environment and then system installers will make the system familiar to users through training. An author known as Krugman (2009), states that out sourcing is giving always system responsibilities to external parties who might produce or develop a needed platform.

a) Reasons why not

- ➤ Most of the packages sourced out end up being difficult to use
- ➤ Packages from external sources are relatively expensive
- ➤ Usually the packages are known to be big and useless as they may contain unintended functions
- ➤ Some software packages end up being problematic as crushes occur regularly
- ➤ Maintenance of this software is commonly difficult and it will be needing developers of the system to support such actions.
- ➤ Too much is consumed during the grasping of the package.

b) Advantages

- ➤ Some extra features may be useful for other purposes
- ➤ Little labor is needed in running and developing the system.
- ➤ Development schedules are not necessary since it saves time on installation.
- ➤ Security and maintenance support is often provide and guaranteed always by system developers

3.6.4 Recommended Alternatives

After the analysis of the three alternatives to developing the proposed system, it was concluded to be viable in adopting the in-house development approach. This is on the grounds that meeting the client prerequisites is of remarkable understanding and it will only be accomplished through including clients in the process of coming up with the system that is from designing to development. The firm will encounter low expenses in terms representing knowledge about the system to clients to familiarize them to all the components of the system. General updates and support exercises to the system lies in the hands of the internal IT staff stimulating a cost decrease over the firm's long run. More so, the development infrastructure will also be used for future projects. The table underneath demonstrates each strategy's diverse expenses.

Alternative	Cost (USD)
Outsourcing	4 000
Improvement	1 500
Development	3 010

Table 3.2 Alternative evaluation

3.7 REQUIREMENTS ANALYSIS

Requirements analysis can be additionally called prerequisites designing which is a way towards deciding client's desires for new or improved software (Grady, 2010). Requirement analysis refers to a process whereby the development team find out, document and evaluate the needs of the framework at hand. Analysis is mainly centered on coming up with quantitative as well as qualitative aspects of the system to be designed and all the other challenges that might arise.

3.7.1 Functional Requirements

It is portrayed as collection capacities and components that has to be merged by a system with the objective of fulfilling the needs of the business to create a willingness for clients to acknowledge the system (Surhone, Timpledon and Marseken, (2010)). These are known to be observable system functions, which are expected during system operation that is its duties and actions performed by the system before and after full installation. Some of the responsibilities may be:

- Information detailing types of data functional to the system as input.

- Information giving the type of responses given or done by each screen

- Information showing flows of work inside the system.

- Information explaining the type of outputs such as reports found in reports

- What types of users allowed?

- Details on how the system achieves the mandatory expectations

Functional requirements terms out the possible functions which can be displayed at each level and screens during full system execution, as well as all its requested outputs to satisfy system clients through process flow critical analysis.

1. **Interface requirements**
   - Numeric entry of information within functional fields.
   - Differentiation of users that is, administrator and student on log in interfaces.
   - Acceptance of unique characters on passwords

2. **Business requirements**
   - Training of users must be according institutional policies
   - Requests must be done according to user preferences.
   - Button clicks should lead straight approval flows

3. **Regulatory requirements**
   - Databases should have a operational tracking option
   - Restrictions on account entry should be enforced
   - Transfer of data and other information have to be marked for maximum security

4. **Security requirements**
   - Interested parties in the Data Entry Section can only initialize a request but cannot approve or erase a request.
   - Known Administrators group can only manage deletion of request and reversal of transactions as well as removal of users but cannot add or approve requests
   - General users can create request and act upon request and nothing else. Administrators not by general students can reverse transactions.
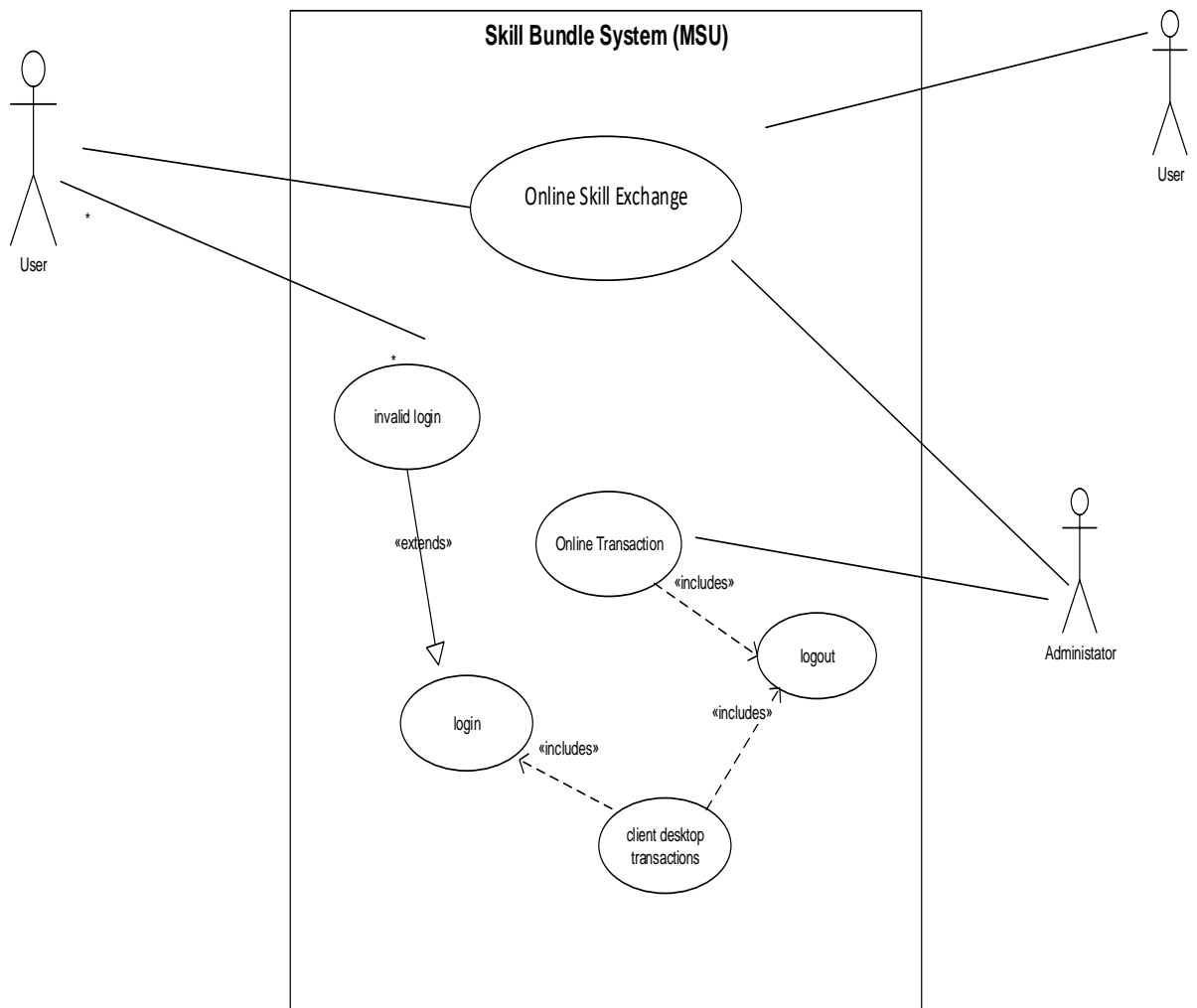
Fig 3.5 Use case Diagram

3.7.2 Non-Functional Requirements

According to Sommervile (2008), non-functional requirements refer to regulations set on functions of the system before system delivery. Such constraints may be set to reduce redundancy and duplication of data on main system aspects. Therefore, the system will have the following:

- System should be compatible to all operating systems

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- Registration can only be done once to reduce multiple user accounts
- System storage capacity should be enforced for backup and restore capabilities
- Request expiration dates
- Real time responses should be acknowledged on chats
- Large file restrictions should be set were necessary.

Nonfunctional requirements are the ways in which the system has to perform allowing qualitative aspects of the system to be accurate and reasonable. More examples of such requirements are:

- System ability.
- Dependability.
- Privacy and security.

3.8 CONCLUSION

Summing up things, computers nowadays exist to make life much easier because it brings about the involvement of technologies in problem solving as proposed by the new skill bundle provisioned for students at MSU, which aims to increase creativity and skill development. The above chapter was meant to explain the characteristics of the existing system by thorough analysis of the techniques used in the development of a particular system. Alternatives have shown ways in which the proposed system can prosper and become feasible in all views with comparisons made across all results collected from data gathering methodologies. The following phases is known as the design stage which tries to eliminate confusion by clearly showing the physical structure of the system and how interfaces are going to look and all the functions. This chapter has helped to pave way for the developer through the analysis of all the mentioned aspects of the current system above.

CHAPTER 4: DESIGN PHASE

4.1 Introduction

The design phase is mainly concerned with achieving what the proposal aims to make feasible that is, the system actual design in terms of log in pages and other functional forms within the system at hand. Design stage comes after the planning and analysis stages of system development. This means that the system's main objectives are clearly displayed as system functional parts in diagrammatic format first and then the actual system structure pictorial representation shown in the implementation phase. Concisely this stage represents the structures from database design, interfaces, system structural representation, physical design or even system environmental configurations. As mentioned by Kendal (2002), a design refers or known as the method of implementing specific kinds of norms and framework schemes for describing one specific methodology or system procedures to allow changes to be physically realized.

4.2 System Design

In definition system design is just the process of coming up with a planned structure of the system, which becomes a yardstick or guide on how the system should look and work. Eppinger (2000) thought that system design involves the specification of modules, interfaces, architecture, data, as well as the components required by a specific target system project to meet and satisfy all needed features. This stage provides solutions to this statement, "In what way will the system operate?" All known useful and perfect systems ought to contain following attributes:

- Reliability
- Security
- Effectiveness
- Security
- Maintainability

These features are currently being enforced within system functionalities and made available for user satisfaction.

4.2.1 Maintainability

This is one of the system characteristics that aims to allow system restores when faults or failures occur during operations. System maintainability provides users and all system entities the ability of reversing errors and faults in the system back to its normal operating state using particular built in protocols and algorithms. There are two main components within this characteristic that is, serviceability which states that there should be easy way of carrying out set system inspections (critical analysis) and repairing. The second one is reparability, which is the capability of reinstating operations to its normal state after a fault or error. Therefore, a standard system has to be easy to maintain in cases were updates and improvements have to be introduced. This means that the system has to be very flexible in the business environment in which it is operate.

4.2.2 Reliability

Reliability is highly concerned with system performance, which is expected at any time by its users, meaning that the system to be installed has to function exactly as expected without any failures and disappointments. Developers have to come up with a perfect system that promotes smooth system flow through well-programmed functions and the developed system should not fail during day-to-day running. Issues found within the current system should never be found on the new coming framework, this means that users will be able to upload and communicate with each other smoothly immediately from the system components.

4.2.3 Effectiveness

Refers to the degree of solving system issues at once and the ability of one package to achieve targeted goals within specific limits. Students need to be able to share requests and all system inputs and output resources within the platform. The percentage of benefit has to be high while costs being maintained at low levels making the system favorable to use and easy to work with. Users and other system entities have to be useful during system development to encourage institutional system interest and efforts incorporated from all entities available.

4.2.4 Security

Security is universal in all systems developed nowadays, students usually do not like their academic stuff being duplicated or plagiarized by others so the security on this skill bundles tries to eliminate that unfortunate circumstance by log in passwords and account documentary lock since such files are stored in zip forms which are locked with passwords randomly set by user or uploader. The system its self contains session security protocols and log in credentials for each

user as well as distinct access levels, which are used by some security system around the world such on banks and data store frameworks.

4.2.5 Efficiency

In the Skill bundle system efficiency is evidenced through the use of predefined time limits were processes have to operate at set standards and that capability enforced around all system functions. The measure of time has to be efficiently enforced to lessen user disappointments, thus smooth running of processes have to be encouraged and made known to exist within system evaluation.

4.2.6 How The Proposed System Is Going To Work?

a. System Inputs

1. System Users Details – refers to the type of details for entities in the real world who tend to be interested in the use of the implemented system

2. Administrator's Details – involves the contact details of the admin members who manage users and system behavior

3. Review details - involves the kind of feedback give from one user receiving a service to the other within the chat box.

b. System Processes

✓ Session verification – The Kerberos algorithm has been adopted to check whether the session at hand has been accessed using the correct login details otherwise without that it will cancel and brought back to the log in page.

✓ Hashing of password credentials – passwords are hidden or encrypted during account creation and log in. This is done through mcrypt-enc Solution Algorithms.

✓ Digital currency allocation – during user account creation the system automatically credits new users with a default amount of points used for trade within the Skill bundle platform. First time log in of the new member allows the system to credit that user with some points

c. System Outputs

✓ Account Balance – refers to the amount of points available within ones account after a trade

✓ Encrypted password – within the database hashed passwords are known to exist shown for security reasons

✓ Notifications – notifications are made known to users if a need arise or during trade within the system

4.3 Data Analysis
4.3.1 Context Diagram for the Proposed System

It is a conceptual portrayal of the whole system exercises through utilization of free individuals and how they cooperate in the software system (Piece, 2005). This unique portrayal demonstrates the information traded among the diverse individuals and is otherwise called level zero DFD. The principle goal of the production of a context graph is to help in planning so as to visualize how the data will move around in the system.
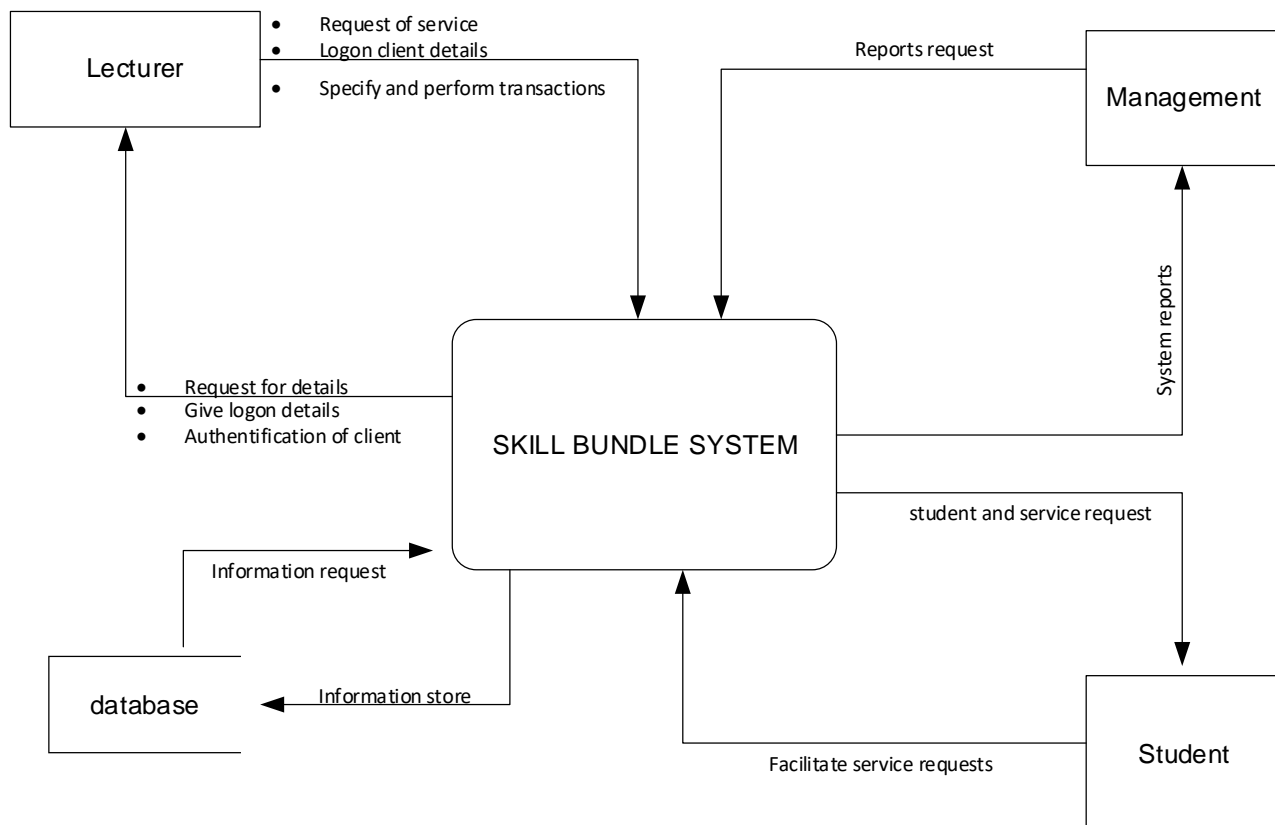
Fig 4.1 Context diagram for proposed system

4.3.2 Data Flow Diagram of the Proposed System

As indicated by Bertin (2013), depicting a whole system in a diagrammatic manner utilizing the majority of the segments, for example, substances that follow up, data flow, information stores and procedures that the software does in called a DFD. It is a helpful device that is utilized as a part of increased more knowledge of how a system really works (Pierce, 2005).
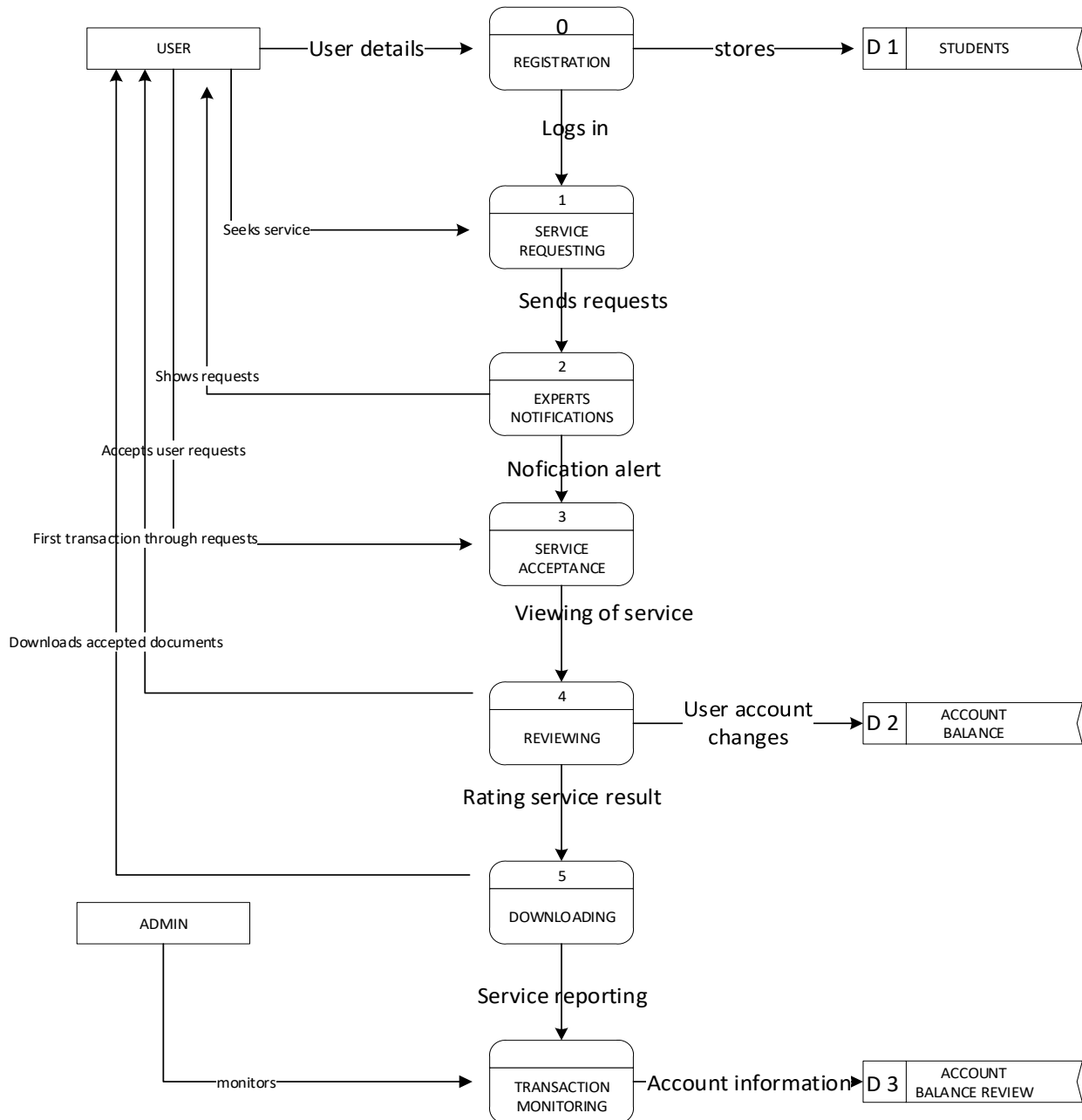
Fig 4.2 Dataflow diagram for proposed system

	Entity
	Process
	Data store
	Data flow
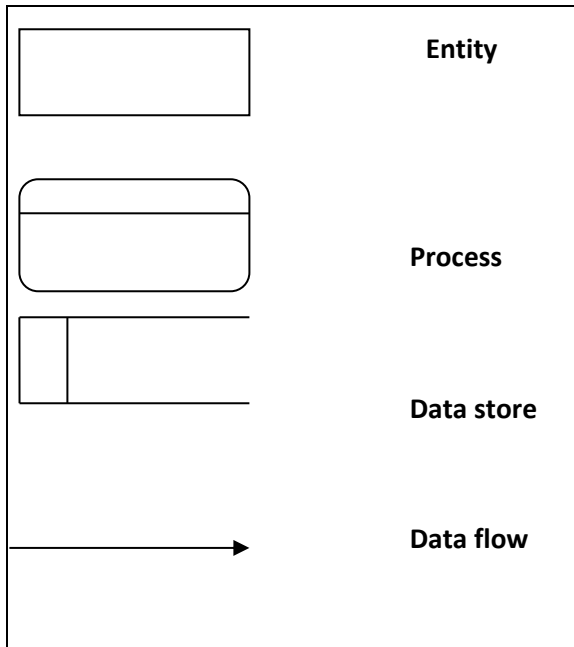
Table 4.1 Data Flow Diagram Key

4.4 Architectural Design

Structural design shows the exact static parts and the components within a given system in an organization. Sommerville (2004), states that it displays specific foul areas such as software, methodologies, user and hardware components. Architectural design refers to the drafted plan to describe the software, hardware and the communication link between the new system nodes, security as well as overall backing. The link being referred to here is the connection between system computers to form a physical structure, which signifies a network in the system environment. Skill bundle has its network variables built within the institution close to the main servers; this helps with the maintenance of the system if a need arise. Maintenance of the system servers will be done simultaneously with that of the main institutional networks and data stores. The objective of setting up the architecture in such a fashion is to minimize risks and bottlenecks within the system, since it runs on dependable systems the architecture has to be built in a way that allows it to have defense mechanisms which allows it to protect itself from hardware or software related threats. Backups systems are to be enforced within the system to promote consistency before and after system faults occurs. Power cuts are known to be daily problems in the systems environment therefore; UPS systems have to be introduced to reduce such negative impacts on the system. The following features are architectural design components known to exist in the system:

- Client machines – consists of the interface platforms were the written or coded system is going to reside. Such nodes in the system are going to be useful in communicating with databases for ongoing transaction processing through servers.

- Server – using Apache, all the needed instructions and commands are to be manipulated using this system for database storage purposes. Apache is one of the easy and low cost server management application, which can be used to manipulate user input and ensure integrity and consistency within database systems.

- Network cables – fibre optic cables or other forms of network cables will be used to encourage local area networks and wide area networks

- Printers – such equipment's are known to be necessary for printing specific reports when analysis need to be carried out within the institute.
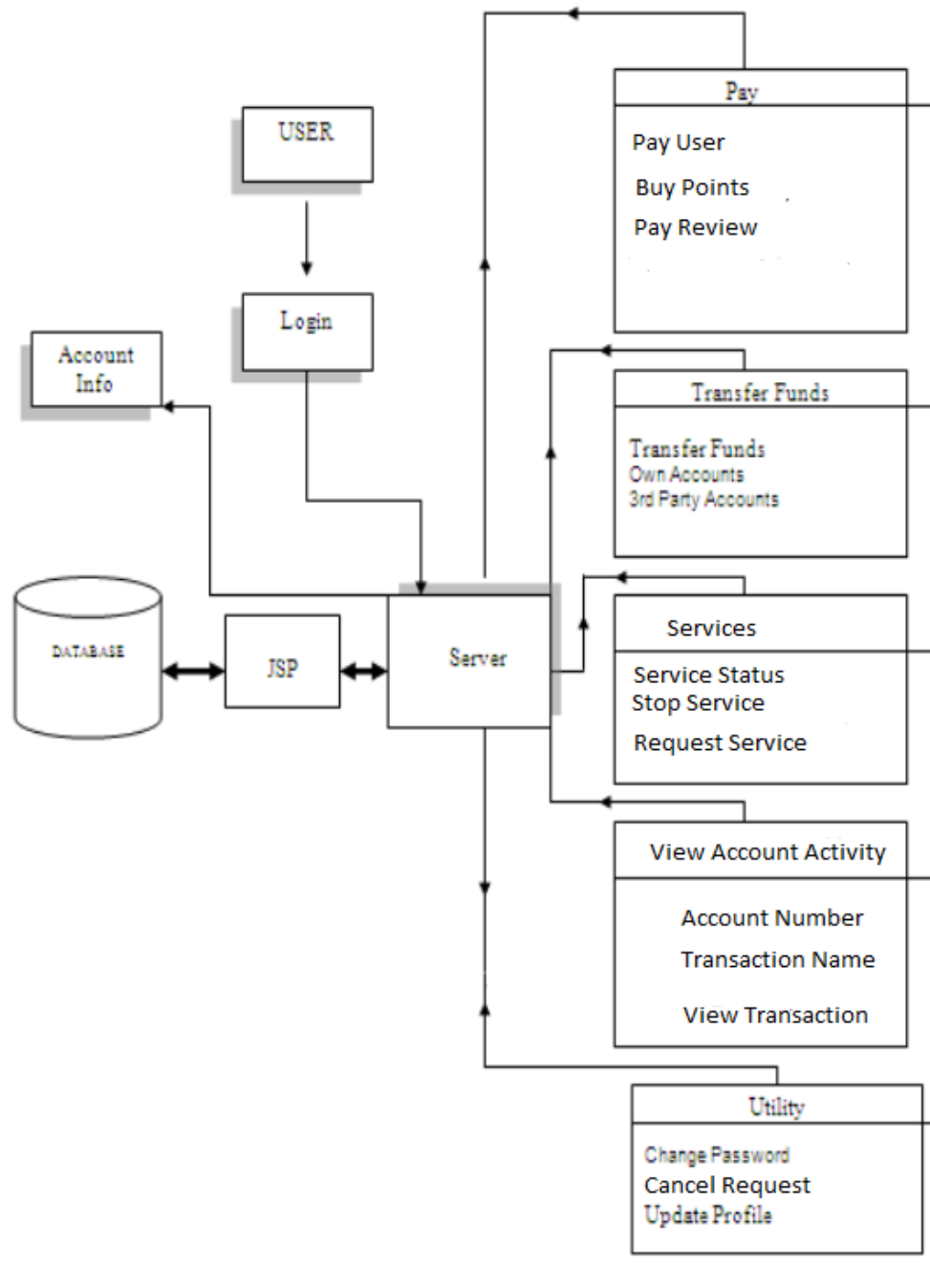
Fig 4.3 Architectural design

4.3.1 Intranet Connection

Midlands's state university has been in the business using a client-server platform, which is going to be needed as well by the skill bundle system. This architecture will be very useful because it will enable the users to interact smoothly without any disruptions inside the network connections. This architecture is favorable for use because of the following:

➢ Control and Security – it stores data in one location making the system highly protective and easy to manage and control services.

➢ Costs of coming up with this architecture are relatively low and easy to maintain

➢ The level of scalability is high meaning that there is the ability to increase the systems structures capacity.
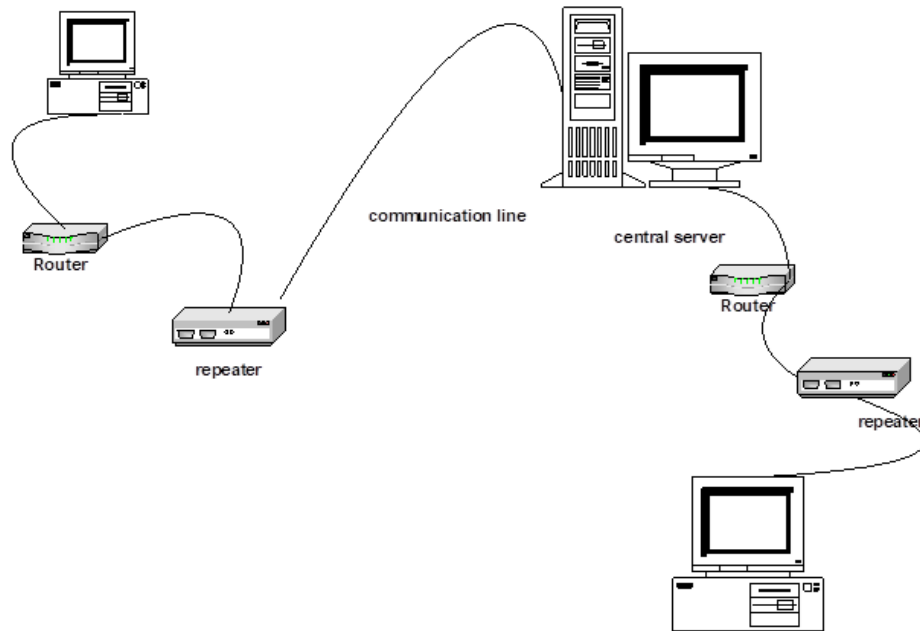
Fig 4.4 Intranet connection

4.4 Physical Outline

The physical design consists of the visible arrangement of gadgets for the framework in its operational grounds or station. This design phase is there to describe how the system will be visibly known on the ground; the skill bundle system has a composite structure known by many system administrators. Some requirements will be listed below but this system will allow students or clients to connect to the servers or other system components using wide area networks in case of those trying to connect to their accounts remotely and as for those around the system local environment, local area or wide area connections will be available for networking purposes. The following are the requirements necessary for system worthiness and progressiveness:

Software Requirements

- ➢ Windows 7,8,8.1 or better
- ➢ Microsoft Packages
- ➢ Dreamweaver or Brackets
- ➢ Windows Server systems
- ➢ Browsers (Chrome, Opera, Mozilla)

Hardware Components

- ➢ Xeon Computers
- ➢ Hewlett Package Printers
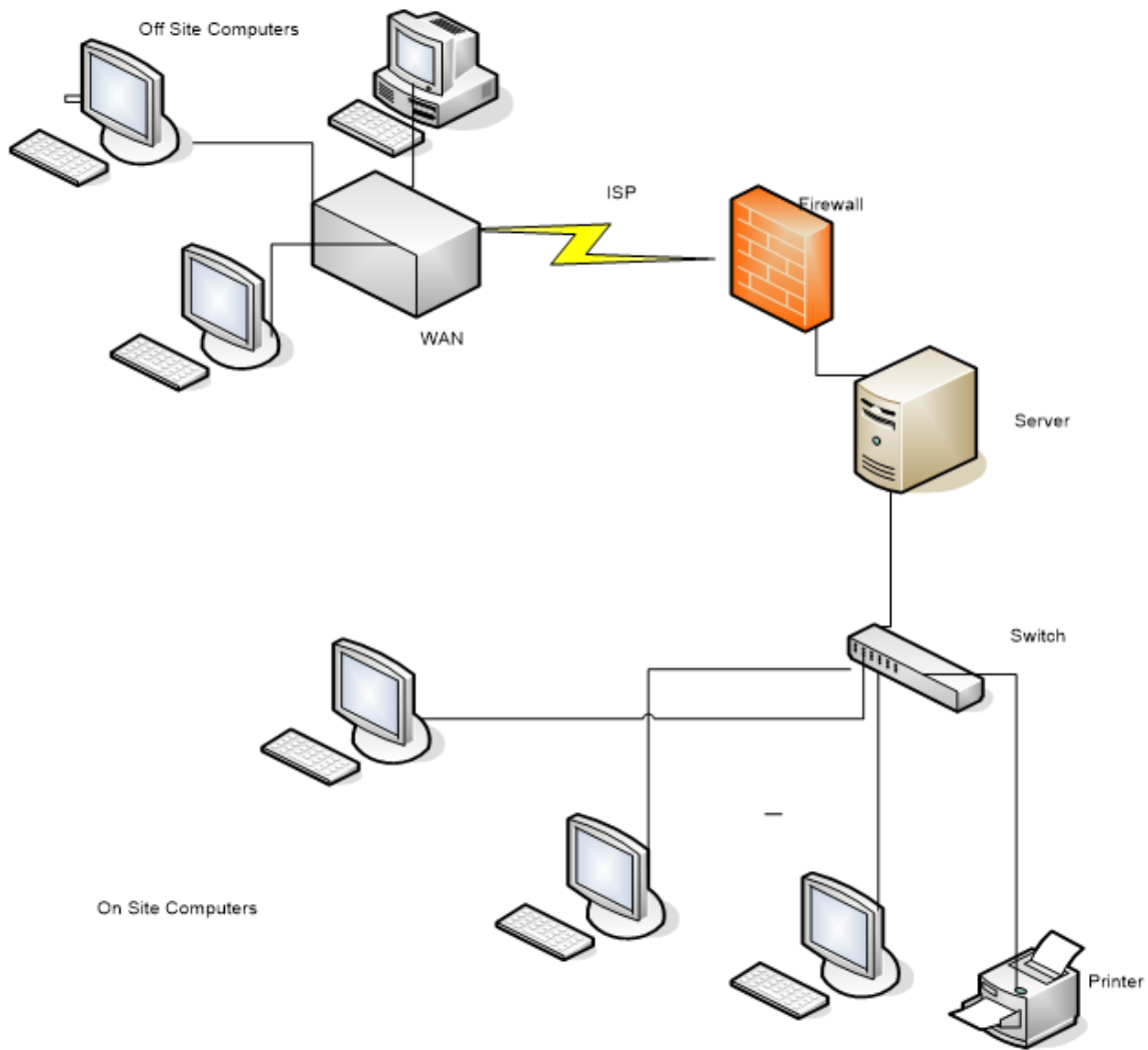
Fig 4.5 Physical Design

4.4.1 How Programming And Equipment Will Associate
User Machines:

These are also known within the system environment as PCs or user workstation, were the GPI (Graphic User Interface) software's operate on. In this case, all the nodes connected to the system are going to be mapped or linked to system servers through the use of access points and modems.

Database Server:

MySQL or XAMPP Control Panel can be operational and ran for data store purposes

4.5 Database Design

On the database design, the structure to be enforced for user satisfaction involves the three level database structure, which will allow the skill bundle system to have secure access levels of information from different levels and users. As mentioned by authors Coronel and Crocket (2008), database design consists of ways to change access levels while involving a unique process of formulating a database model significant for a particular system. The three levels of the three level model database structure will be briefly explained below:

Physical Level

Refers to the original state in which data is stored within the database being used and this level is often known as the primary level of abstraction.

Conceptual Level

As mentioned by Coronel and Crocket (2008), this shows the actual data current ready for storage and its links or relationship within the data elements. This level concentrate on grouping data into tables according to its relevance or similarity to one another this is done through query definitions.

External View Level

This level eliminate database errors and shows the correct information as requested by users or directly linked to a specific user at a given point in time. It shows records and tables to report information relating to that original user. Structured Query Language SQL does the manipulation of this form of database level.
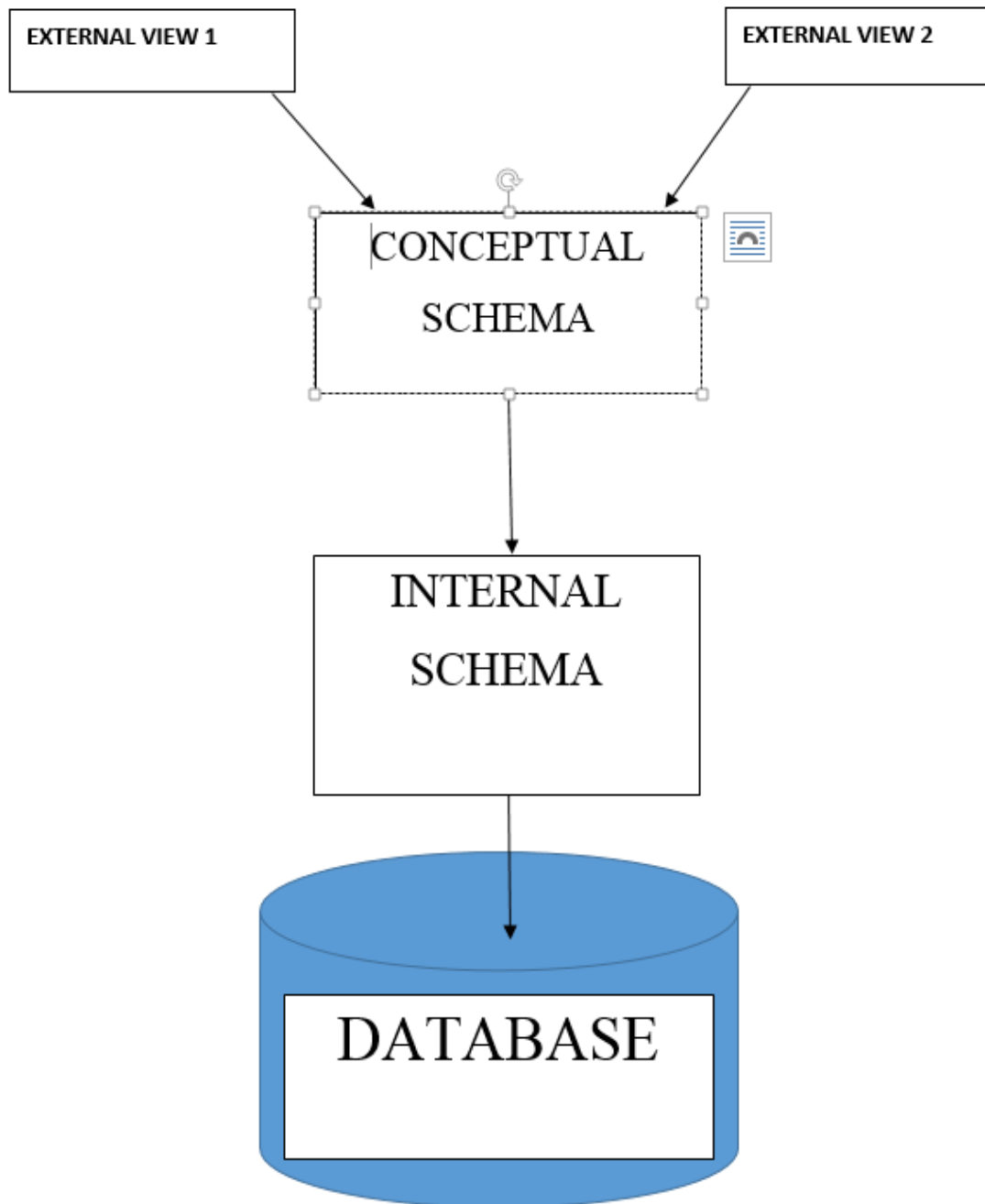
Fig 4.6 Database Design

4.5.1 Data Dictionary
Table Name
Table 4.2: Login Table

Key	Field Name	Data Type	Length	Nullable
	Username	varchar	30	NO
PK	password	varchar	30	NO

Table 4.3 Studentid Table

Key	Field Name	Data Type	Length	Nullable
PK	studentid	varchar	20	YES
	firstname	varchar	25	NO
	lastname	varchar	25	NO
	loginid	varchar	30	NO
	accpassword	varchar	50	NO
	status(current)	varchar	10	NO
	programme	varchar	25	NO
	phonenumber	varchar	25	NO
	department	varchar	25	NO
	last login	datetime		NO

Table 4.4 Admin Table

Key	Field Name	Data Type	Length	Nullable
PK	adminid	INT	10	
	admin_name	varchar	25	
	loginid	varchar	30	
	password	varchar	25	
	emailaddress	varchar	50	
	contacts	varchar	18	
	last_login	datetime		

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Table 4.5 Accounts Table

Key	Field Name	Data Type	Length	Nullable
PK	accountstatus	varchar	15	
	studentid	varchar	25	
	skill	varchar	18	
	requestsdetails	varchar	30	
	servicedetails	varchar	50	
	accounttype	varchar	20	
	accountbalance	double		

4.6 Program Design

The proposed idea to be designed comes with object-oriented features, which are coded through object oriented programming skills. Such programming domains are going to be adopted to allow the breaking down of modules through the division of the whole system into small sub part. In preference, the system design procedure is community driven and partner cooperative to reuse or perfect project utilities so that satisfaction is gained from all project areas. Therefore, the more effort invested in a project the more likely the success of this operation.

4.6.1 Class Diagram

A class diagram is derived from the data flow diagram to show the core existence of object oriented modules were the system states and operations or behaviors of the system are expressed diagrammatically. It is usually used to display the connections and kinds of items one system can contain. The diagram below is an illustration of the Skill Bundle system class demonstration.

Class Diagram

Fig 4.7 Class Diagram
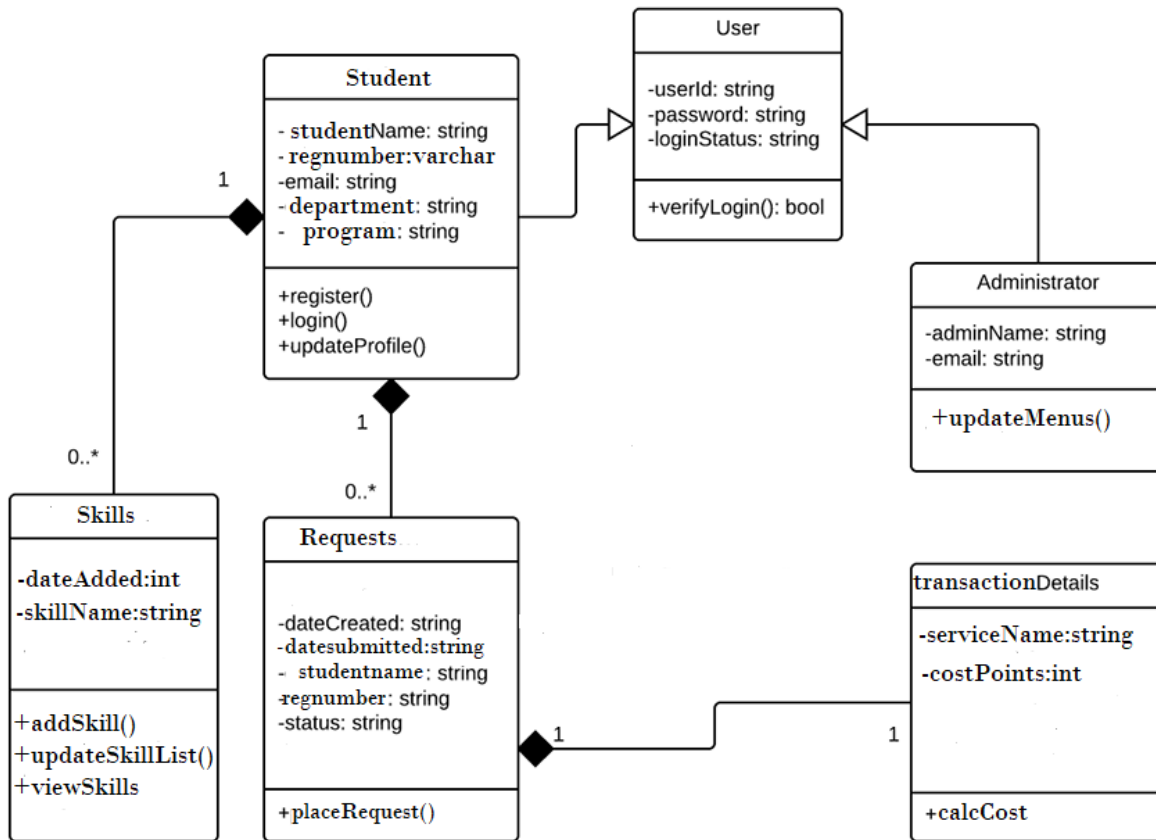
4.6.2 Sequence Diagram

This grouping shown underneath is a representation of the considerable number of levels or phases going to be associated with the framework. It shows the grouping of exercises, that is, who is included as well as the time that all that happens. Progression plots, close to class diagrams and physical data prototypes will be exactly as specialists might want to view as next to the most basic arrangement stage to show day-to-day institutional application change.
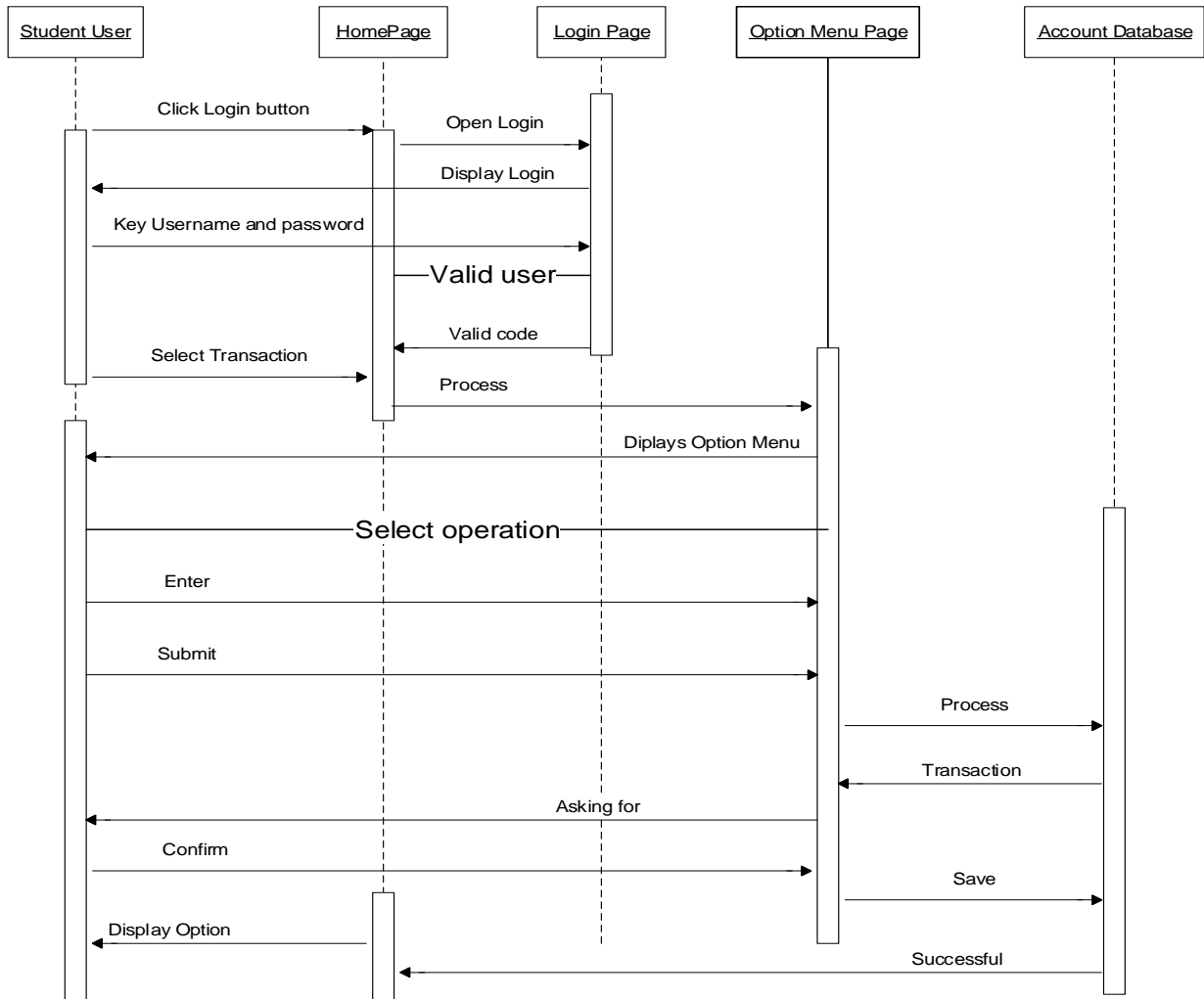
Fig 4.8 Sequence diagram for Pay Transaction
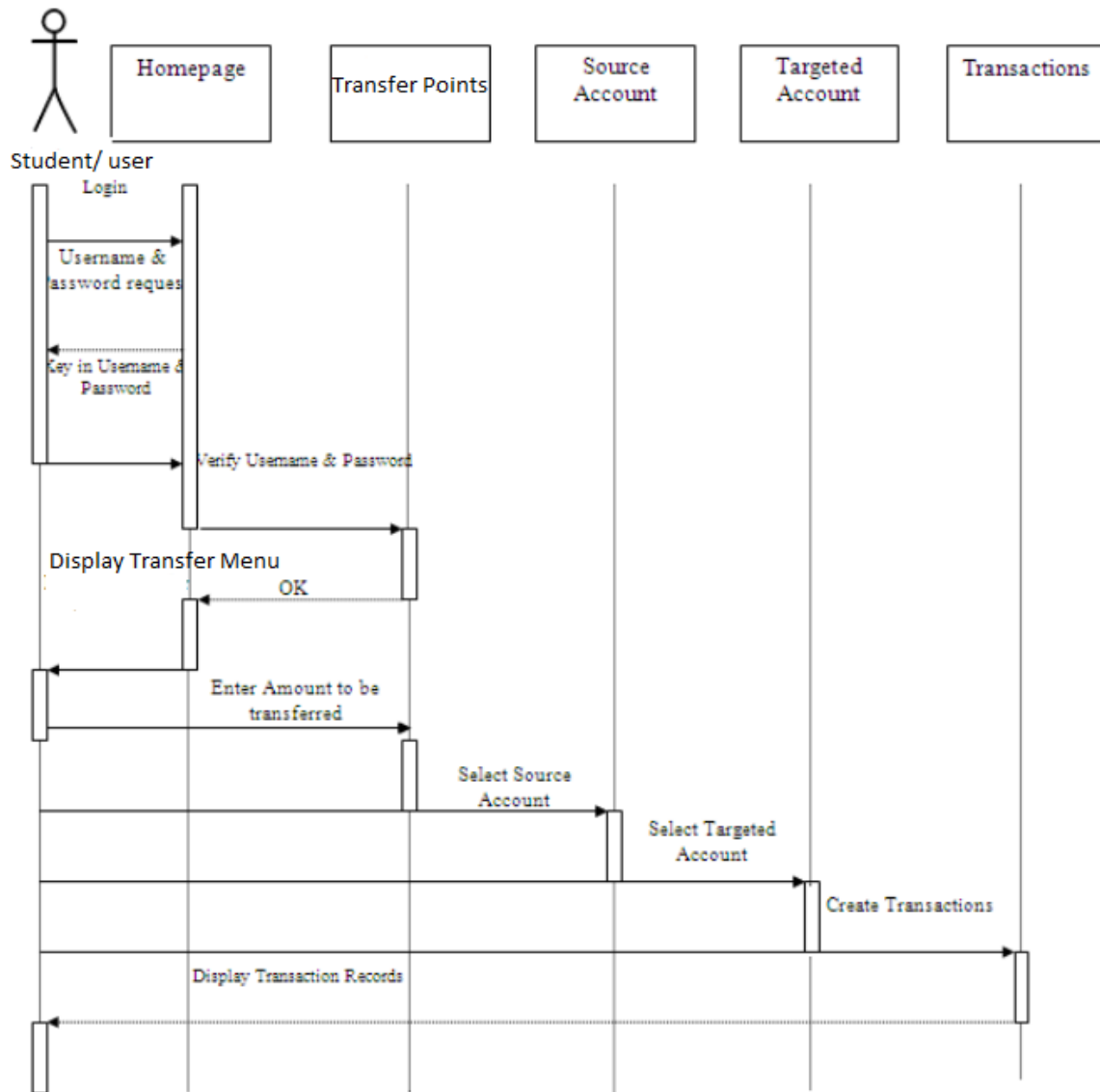
Fig 4.9 Sequence diagram for transfer point
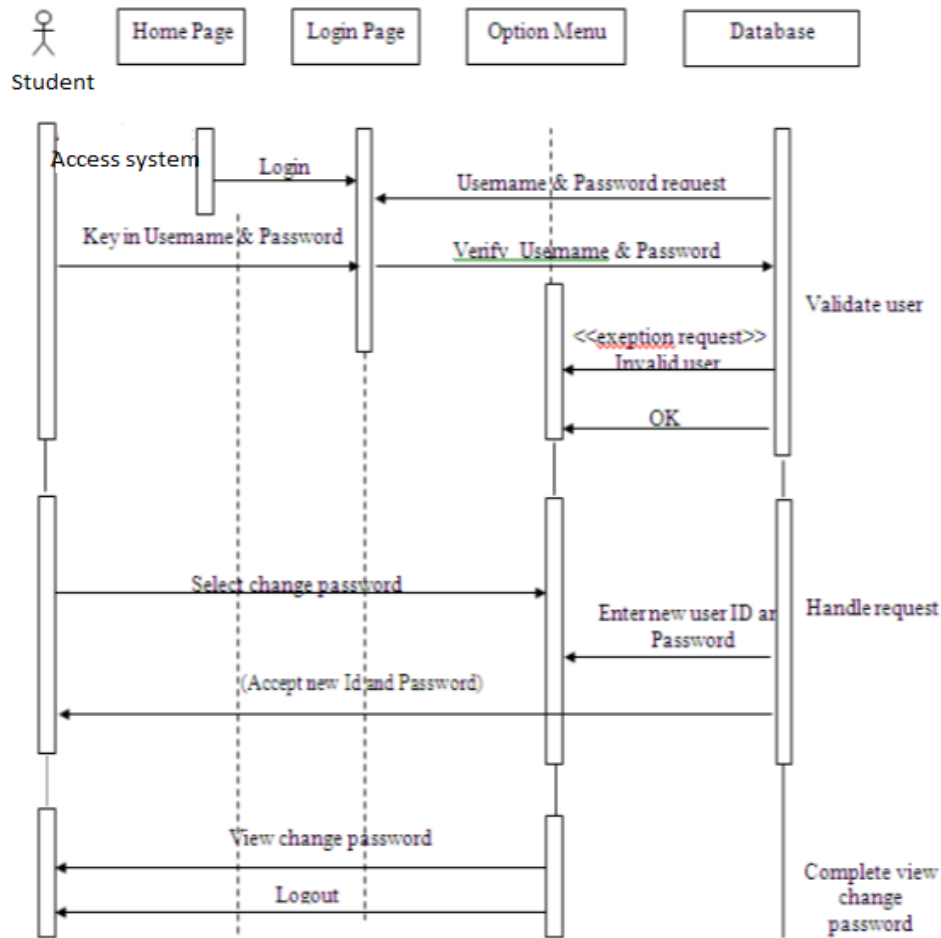
Fig 4.10 Sequence diagram for Utility

4.7 Interface Design

In theory, this is used to show the data structures of the kinds of data or information a project system might have visually to users. Interface design is of paramount importance since it is the one that determines the acceptance and acknowledgement of the system or not (coronel and Crocket, 2008). The GUI platform to be introduced here enables system users to find it easy to understand and manipulate data fields or functions since this is one of the key system objectives for users to understand what the system will do for them through menu scripts or buttons. User credentials inputting is known to be the starting page or phase of all or many system so that one's account is not hacked or improperly accessed by unauthorized personnel. In general, interface designs are just ways in which the framework interacts with the outside entities.

4.7.1 Menu design

After a successful login the user will be directed to the main menu page which contains all the functionalities links of the video streaming system. This page will display several sub-menus which are designed to accommodate more data without compromise on the presentation of information.

4.7.1.1 Main menu

Main menu helps with maintenance of the system, run daily, weekly and monthly maintenance scripts. It also helps in fixing common disk problems by repairing disk permissions and volumes.
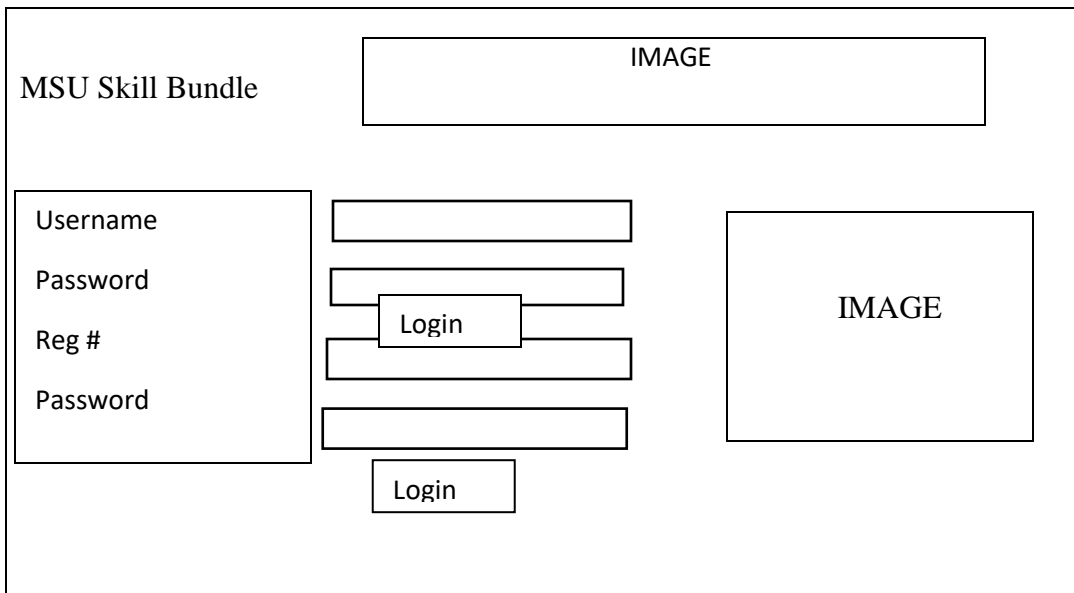
Fig 4.11 Main Menu

4.7.1.2 Sub menus

It refers the kind of menu accessed from a more general menu within a particular framework
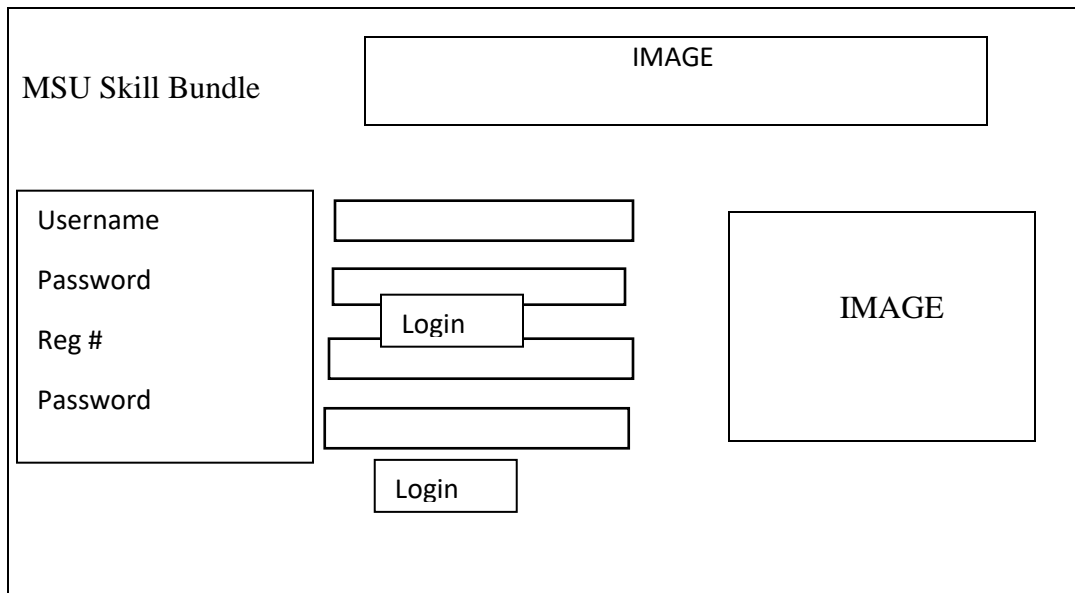
Fig 4.12 Sequence diagram for Utility

4.7.2 Input Design

This part of the system allows system users to enter data through input fields and interfaces with data entry capabilities. Kendall and Kendall (2006) stated it is branded with login forms which provide the system user a right to access certain components within the system. Database records are created to store such information without the user's effort to acknowledge such functions. The major objective of this part is to validate data inputs and to promote data integrity and consistency within the system. In addition, most of the fields in this criteria will be labelled properly to eliminate confusion are issue out error messages to alert those mismatch and human errors placed by users during system usage. Below comes a list of some applied specific rules known in these criteria on input forms:

- Two or more forms cannot be visually opened without a certain allowed level of delay
- Titles must be appropriately labelled
- Tab key functions must be enforced to allow next field activation
- Users are to choose or start certain past or historical data elements recorded in records during input use
- Data consistency should be known and guaranteed always

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- Information lapse eliminators must be adopted and enforced for data quality
- For satisfaction and system usage guarantees, message or notifications must be available throughout the system interfaces.

```
                      ┌─────────────────────┐
                      │  Register and Log in │
                      └─────────────────────┘
                                 │
                                 ▼
                      ┌─────────────────────┐
                      │        Menus         │
                      └─────────────────────┘
             ┌───────────────────┼───────────────────┐
             ▼                   ▼                   ▼
     ┌───────────────┐   ┌───────────────┐   ┌───────────────┐
     │ Source Files  │   │Database System│   │System Reports │
     └───────────────┘   └───────────────┘   └───────────────┘
             │                   │                   │
             ▼                   ▼                   ▼
```

1. System locks	1. Users Accounts	1. Complaints
2. Website connections	2. Skills	2. Services History
3. Exit	3. Contacts	3. Users details
	4. Passwords	4. Points payables
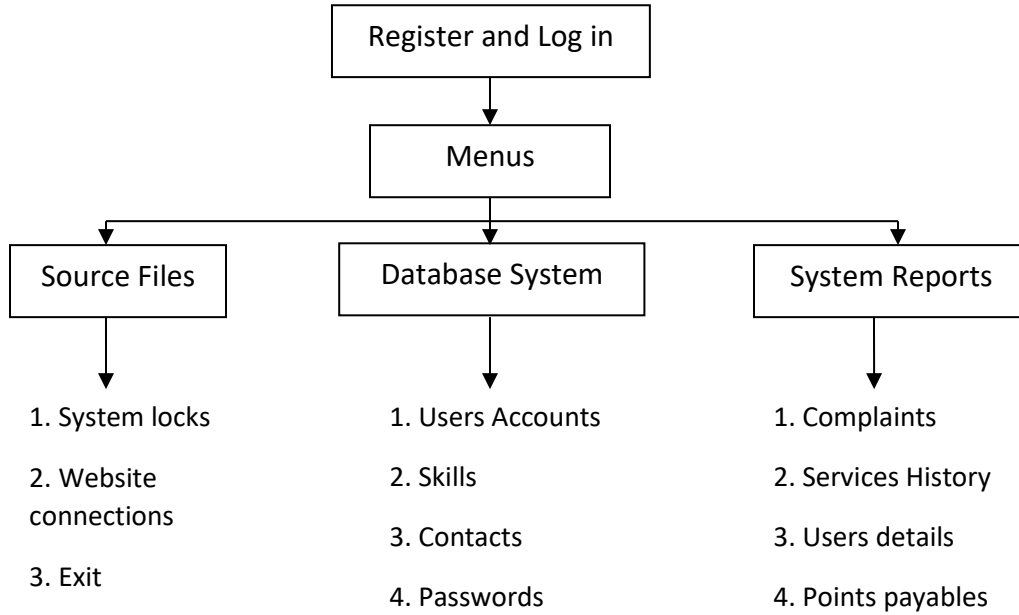
```
┌──────────────────────────────────────────────────────────────┐
│ Midlands State Skill Bundle System                             │
├──────────────────┐                                             │
│ HOME             │                                             │
└──────────────────┘                                            │
│              ┌─────────────────────┐                           │
│              │     Admin Login     │                           │
│        ┌─────┴───────────┬─────────────────────────┐          │
│        │ Username:       │  *****************       │          │
│        │  ┌──────────────┴──┬──────────────────────┤          │
│        │  │ Student Login   │  *****************    │          │
│        ┌──┴─────────────────┼───────────────────────┐         │
│        │ Reg Number:        │  ********************  │         │
│        │ Password:          │  ********************  │         │
│        └────────────────────┤                        │        │
│                  ┌──────────┴──────────┐                       │
│                  │       Log in        │                       │
│                  └─────────────────────┘                       │
│  ┌──────────────────┐                                          │
│  │ Create Account   │                                          │
│  └──────────────────┘                                          │
└──────────────────────────────────────────────────────────────┘
```
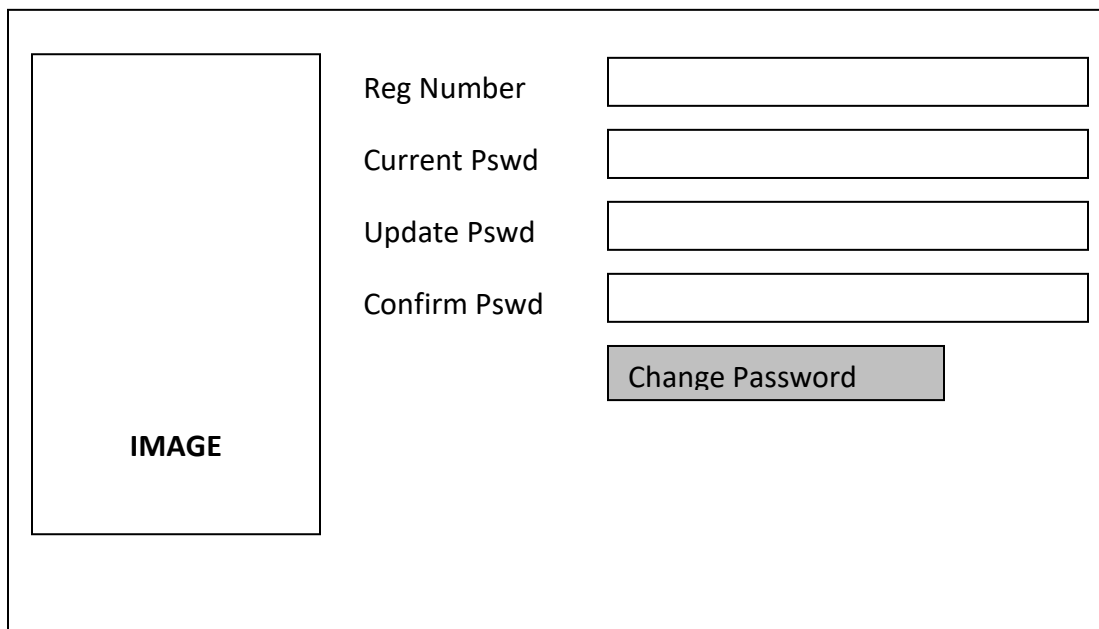
Fig 4.13 Log in Form

4.7.2.1 Log in Form

This is the entry point of the system. The staff enters his credentials thus username and password. These credentials are actually articulated with their access levels thus either Outside candidate, internal candidate or admin. The main form has a company logo and allows you to login the system.

4.7.2.2 Change Password Form

Reg Number	
Current Pswd	
Update Pswd	
Confirm Pswd	

Change Password

IMAGE

Fig 4.14 Change Password

4.7.3 Output Design

An author once said Joanne (2006), whenever a system allows one to create input output becomes a responsive action behind all. The output interface tries to focus on the issuing or display of results from inputs and other system processes requested or default settings set to produce such results.

First name	Surname	Reg Number	Progamme	Balance
Mike	Joko	R141789I	HINFO	43
Admire	Dakwa	R095858K	HTEL	34

Malcolm	Major	R076530M	HRM	60
Sandra	Nhumo	R138945P	HINFO	20

Fig 4.15 View Report Users

Download Document>>   Review>>

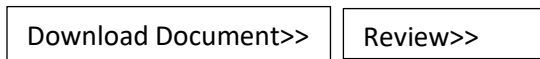**Fig 4.16 Download icons**

4.8 Sample Code Snippets

Logging In

Enter Registration Number and password

If correct then

 Go to use Account home page

Else

 Try again

  If number of attempts =5 and log in unsuccessful then

   Go to registration page

 End If

Opening a Registered account

Enter Registration number

 If registration number = false

Then

 Enter correct registration number

If Account Number=True

Then

Register

End if

End if

If department name=false then

Enter correct Department name

Else

Register

End if

End if

Point payment module

If registered user account

Case 1 Award points (20)

Case 2 Notify user's Account

Case 3 view account details

Case 4 Validate payment

If Valid then

Process payment

Else

Reject payment

Else end if

Change password online

Enter account registration number

If correct then

Check old password and new password

Go to userAccount page

Else

    Try again

        If number of attempt=3 and log in unsuccessful then

    Log out

End if

Report processing

Invoke a database SQL query

If query is valid then

    Refresh report data

    View report data on screen

    Show printable report

Else

    Generate informative message to user

End if

4.9 Security Design

Godfrey (1999) states that, "security design is an approach to software and hardware as free of vulnerabilities and impervious to attack as possible through the use of authentication, continuous testing and adherent to the best programming practices." The system was developed using PhP one of the common programming languages and the database was protected. The system is also going

to be protected from malicious attacks with antiviruses and firewall. Finally, a backup is also available to ensure that there is recovery after system failure

4.9.1 System Security
This is one of the most important aspects of the project. There is a need to protect the system as any harm that can come to it can affect the day-to-day operations of the business.

4.9.2 Physical Security
This aspect covers the physical environment of the system. The major part of the system is the system server, which will be maintained on a weekly basis and will be locked up in a different room from the other computers access of which will be limited to certain individuals. The physical security will also include where the backup information is going to be located and the server will be fitted air conditioners to prevent the machines from overheating.

4.9.3 Software Security
➢ Administrators' passwords and usernames will be used to gain access to the system, to ensure that privacy prevails and to avoid data destruction by malicious-users. Only authorized users will have usernames and passwords for the system.
➢ The system uses passwords and security levels; each user is assigned a password by the system administrator who has super rights. The modules and the right to view depend on the level of permissions assigned.

4.8 Conclusion
This chapter is meant to give the reasons for implementing the Skill Bundle as it tries to fully display the design strategy behind the system and its capabilities to institutional departments. Skill Bundle system has the above mentioned features in its design phase, thus all the stated design protocols have to match the actual feasible system. However, this design phase needs to be turned into an actual thing, which concludes the existence of the Skill bundle system at Midlands state.

CHAPTER 5 IMPLEMENTATION

5.1 Introduction

Krugman (2009) mentioned, "Implementation involves the process of handing over and deliver the proposed finished system to the actual system environment for users to start using it". This stage aims to deeply explain the means in which the new proposed system is going to be installed and incorporated with systems currently available in the MSU institution. Skill bundle system, in this phase will be introduced as one of the new systems that will change academic results at all organization levels and this chapter will try to show various ways of implementing the new thing around the campus.

5.2 CODING

According to Wang S and Wang H (2012). The coding section provides the coding structure and small code snippets, which led to the purification of some code element and system development. The coding phase is all about the standards of codes and their description to facilitate the spread of system knowhow to all system administrators from the development team. Coding describes the interlink of system sections from database links, log in pages, essential key settings and also interface designs as well as presentation of these system aspects. Once the database design has been made clear, one can start with interfaces or graphical user interfaces to link these elements together to for a system the is well coordinated. Functional modules called methods can be designed behind these interfaces so that all system objectives become feasible and operational within the platform. After all, these modules become fully functional the testing occurs prior to system implementation and completion. Therefore, the coding section becomes a useful topic to include in the implementation phase just to briefly explain the code for troubleshooting purposes, internal analysis and these involve framework testing, module testing and block testing.

5.2.1 Sample Code Snippet for modules within the system.
LOG IN

```php
<?php
include_once('/register.php');
@$_username=$_POST['username'];
```

```php
@$_password=$_POST['pwd'];

if (isset($_POST['enter'])){
$_login=mysql_query("SELECT * FROM registration WHERE username='$_username' AND
password='$_password'")or die(mysql_error());

$_entrance=mysql_num_rows($_login);
if($_entrance==1){
$_logging=mysql_fetch_object($_login);
$_regnumber=$_logging->registrationnumber;
$_name=$_logging->name;
$_surname=$_logging->surname;
$_accesslevel=$_logging->accesslevel;
$_fullname=$_name." ".$_surname;
session_start();
switch($_accesslevel)
{
case "student":
$_SESSION['level']=$_accesslevel;
$_SESSION['regnumber']=$_regnumber;
$_SESSION['fullname']=$_fullname;
echo ("<script> window.location='students/index.php';</script>") ;
break;
case "lecturer":
$_SESSION['level']=$_accesslevel;
$_SESSION['fullname']=$_fullname;
echo("<script> window.location='lecturer/index.php';</script>");
break;
default:
echo "page cannot be displayed";
break;
```

```php
}



}
else
{
echo "invalid login";
}
}
?>
```

CONNECTION TO DATABASE

```php
<?php
mysql_connect("localhost","root","")or die(mysql_error());
mysql_select_db("project")or die(mysql_error());
?>
```

REGISTERING A STUDENT

```php
<?php
include_once('lovejoy/register.php');
@$name=mysql_real_escape_string($_POST['Name']);
@$surname=mysql_real_escape_string($_POST['Surname']);
@$programme=$_POST['programme'];
@$reg_no=$_POST['Regnumber'];

@$username=mysql_real_escape_string($_POST['Username']);
@$password=mysql_real_escape_string($_POST['password']);
@$confirmpassword=mysql_real_escape_string($_POST['Confirmpassword']);
@$_accesslevel="student";
if(isset($_POST['enter'])){

if($password <> $confirmpassword){
```

```php
echo("<script>alert('passwords do not match');</script>");
exit();
}

if(strlen($reg_no)!=8){
echo("<script> alert('$reg_no is not the required format');</script>");
exit();
}
$registration=mysql_query("SELECT    registrationnumber    FROM    registration    WHERE
registrationnumber='$reg_no'")or die(mysql_error());
$promise=mysql_num_rows($registration);
if($promise>=1){
echo ("<script> alert('$reg_no already registered');</script>");
exit();
}
$register=mysql_query("INSERT    INTO
registration(name,surname,programme,registrationnumber,username,password,accesslevel)
VALUES('$name','$surname','$programme','$reg_no','$username','$password','$_accesslevel')")o
r die(mysql_error());
if($register){
echo ("<script> alert('$reg_no succesfully registered');</script>");
exit();
}
}
?>
```

5.3 System Testing

This phase on implementation creates room for developers to complete their code testing and testing the interfaces as well as system objectives listed in the proposal and introduction chapter. System testing was completed with tests being run on design and system structure all in one to allow the deployment of a functional framework in institutions systems platforms.

5.3.1 System vs objectives

➢ **First objective** - To allow user to create an online skill bundle account listing programme and faculty he/she belongs as well as skill acquired and capabilities.

Fig 5.1 First Objective

Fig 5.2 First objective part 2

Fig 5.3 First objective part 3 Adding skill

➢ **Second objectives** - To provide a form of digital currency to all joining members for free to use as currency for trade in the skill bundle.
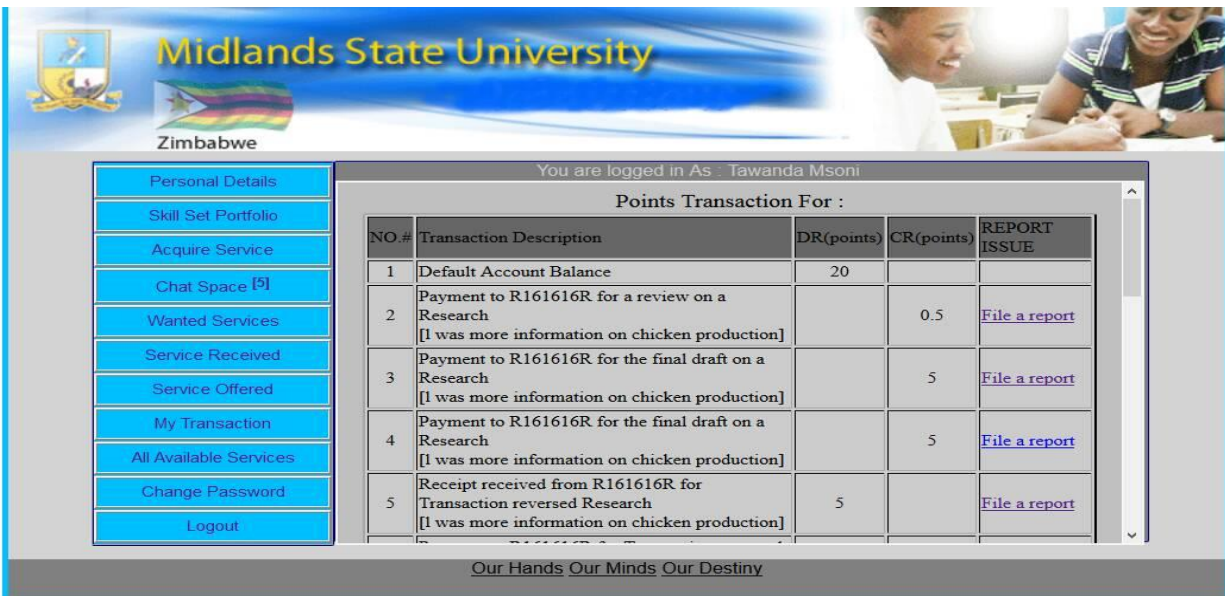
Fig 5.4 Second objective

➢ **Third objectives** - To enable the issue of requests and notifications of requests to all users

Fig 5.5 Third objective

➢ **Fourth objectives** - To implement a matching tool which allows specific skilled users to be matched with specific requests

Fig 5.6 Fourth objective

➢ **Fifth objective** - To allow users to comment on reviewed solutions in account inbox chat.

Fig 5.7 Fifth objective

5.3.2 Accounts Alerts Form

The accounts alerts comes soon after logging into ones account which enable one to view the main account window which displays options for transacting with the Skill Bundle platform. This form allows the user to view and manipulate all the system functions and usable options open to all.

Fig 5.8 Account Alert Page

5.3.3 Administration Form

This form is available to administrators only for system control and user administration. Skill bundle administrators use this platform for the purpose of managing user details, transaction details and so on. User details such as login credentials are not made available to administrators for security reasons, this is seen through the implementation of hash functions and other encryption ciphers known to security domains in system security.
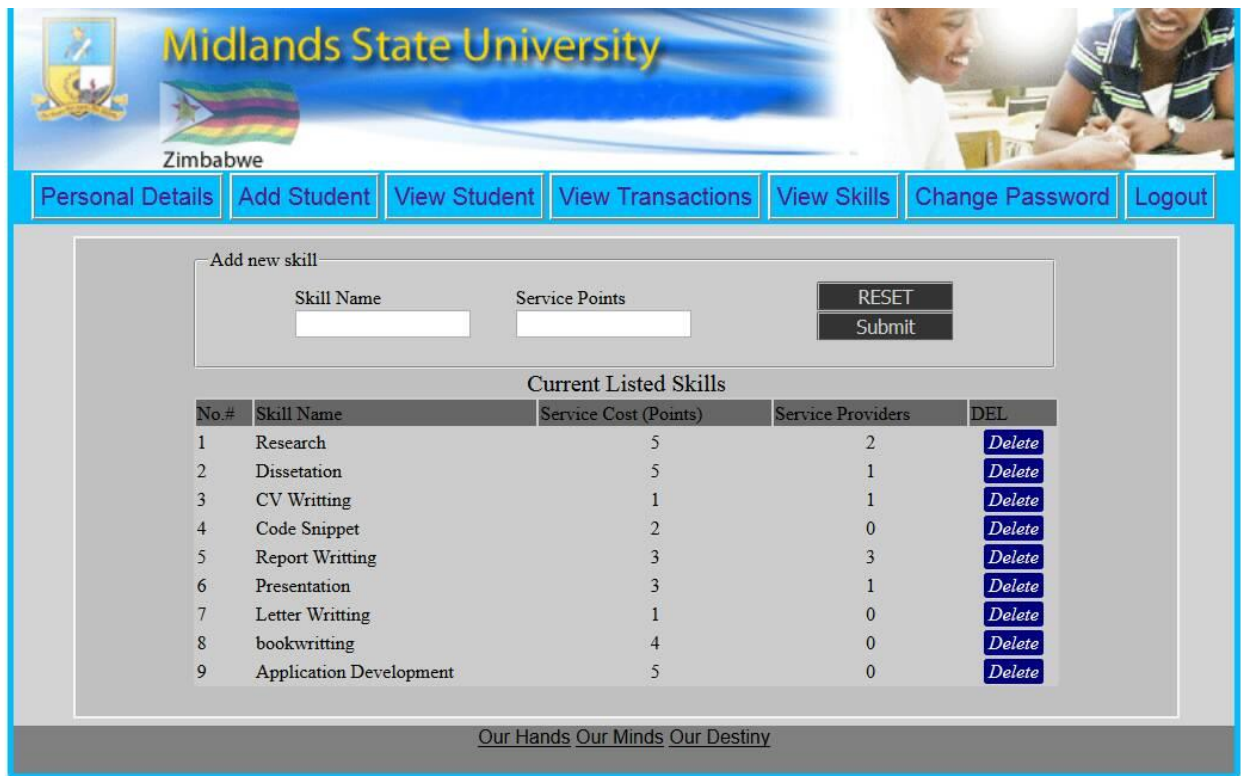
Fig 5.9 Administrator Controls

5.3.4 Testing methods

In testing techniques, the following two testing methods were incorporated for testing purposes and these include Black Box Testing and White Box Testing.

5.3.4.1 Black box testing

Involves Godfrey (1999),the technique of testing internal functions and methods built within the system to be implemented through testing for technobabble where the internal aspects of the system are continuously tried out to aid system smoothness. It is also known as functional testing. The analysts test the systems functionality not code or programmed segments. All functions within the system are tried out to see what exactly the system does. An example would include the tester trying out certain inputs on specific fields to enable one to view all the systems output produced from that input.

Errors On Interface

The following relate to issues concluded concerning interfaces:

- All of the systems windows or pages end their session of close properly
- Functions expected are made available when requested for by a user
- All clicks and mouse functionality as well as console manipulation are well defined and referred to appropriately.

5.3.4.2 White box testing

Godfrey (1999) is known to involve case testing models or methods, which brings about the information on structural knowledge, and it is also known as the glass box or open box testing. A software module is used to facilitate testing of the glass type through the express selection of specific information to enable subject matter to be resolved as productive information is produced. As reference, code can be an example of such tests were validation, executibility and verification has been noted to be useful in the completion of this significant testing model.

5.3.4.3 Module Testing

According to author (Godfrey (1999)) this is known as segment or part system testing whereby part of the system are tested by selecting areas to testing within the whole system for may be objective achievement purposes.

So, in general this involves the execution of modules within the system and also running the system on niche targets or on simulators available within the system. This promotes dynamic white box testing

5.3.4.4 Framework Testing

This allows the integration of all modules into one test done at once a single unit of test to see if the whole system functions properly. The system modules have to function legibly in the grounds in which it is expected to belong. Godfrey(1999), states that framework testing is trying the whole processing aspects and data frames within the system as a whole. This involves the checking of the whole skill bundle system as one checking on all system objectives functionality.

5.3.4.5 Acceptance Testing

Such a test mechanism allows users to acknowledge and accept the system, which is to be implemented around the institution. Acceptance testing as mentioned by (Sommerville(2004)),

occurs when the designed system has been laid out and user involvement accomplished, the two will come to an agreement of saying that system implementation is now valid and ready after all the errors and system faults have been dealt with. Users will be invited to have a check on the systems behavior and functionality, then remarks are made to facilitate total system acceptance.

5.3.4.6 Beta testing

True information is used by users to clarify system functionality and credibility as stakeholders try all kinds of information which they think the system might need during system operations.

This type of test enhances system delivery after user approval and error eliminations.
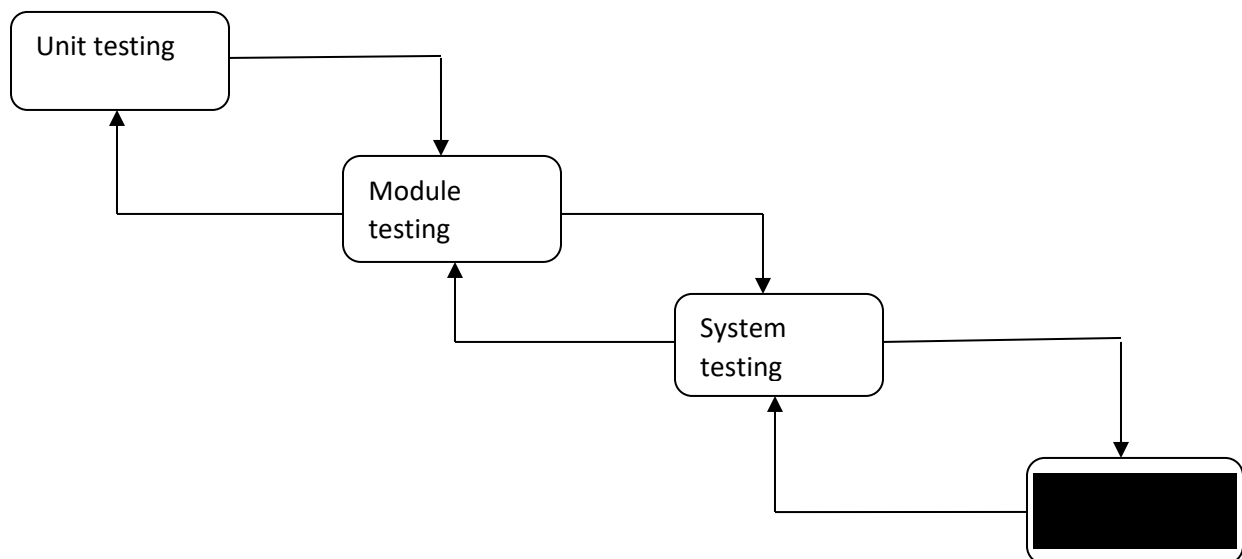
Fig 5.1 General Testing Process

5.3.4.7 System Security Testing

System security on this skill bundle can be enforced through passwords and confirmation codes as well as all other physical and software based security measures or protocols. Physical measures are known in system defence as the introduction of protected system environment through the use of padlocks of server room, robber bars, enclosed rooms for specific systems or even fire guards or official security personnel. Security of the system can be viewed as the enforcement of sabotage dwindlers, premeditated negative use of system modules, hacks elimination and so on. The goal of this operation or type of testing is to make sure that the system operates free from misuse or potential risks present in the world around it. Operations have been made to facilitate the systems full protection, most of the mentioned above security measures have been implemented and made

ready for system protection. However, some new methods such as firewalls, antiviruses ad network scanners have been introduced as a way to keep risks but some of them are to be implemented, as for now some are just mentioned for concern sake. Network spoofing scanners, malware or spam eaters as well as IP lock or hide systems modules are to be introduced as measures to security threats. Quantum cryptography is also one of the new security measures, which need to overtake encryption known in the systems running nowadays on this institution.

5.4 Installation

After the system is ready and made ready for delivery, it is installed were it is expected to be installed in the systems environment within the institution. This process maybe done through CD disks which contain system installation files and data logs. An arrangement on the ways in which this will be done are written down for amateur self-tutoring. The back-ups of the system software components will be stored either on external sources, which include flash and disk drives or internal ones, which are local hard disk drives. The changeover of the system or preferably parallel installation of the system will be done as direct and immediately as possible as per user's needs. This process will bring about the gathering of programming as well as equipment management at the deployment site.

5.4.1 User Training

Administrators in IT department – this involves the acknowledgement of admin functions within the system to be introduced. Things such as how to introduce new items to the system, system reinforcement and how to investigate and reverse system errors and abuse.

Normal Users – these will be incorporated in the primary use section of the system and will have all main system functions in their platform. Their web possibilities will be explained and made known clearly.

5.4.2 Training plan

This form of teaching and educational set up will involve models such as in door training and class division whereby the whole IT department if encouraged and strictly invited to attend all class programs to eliminate confusion among technical staff. This therefore, enables trouble shooting to be done easy without one being lost within the system platform.

Table 5.1 Category 1 IT administrators

System Users Class	IT management
Training Program	Training on system performance and behaviour reviews
Needs	Significant number of laptops or other computer systems as well as projectors
System developer or Trainer	Systems analysts and advisers

Table 5.2 Category 2 Users of the system

System Users Class	IT management, Users
Training Program or Parameters	Training on system performance and behaviour, uploading files, changes on documentations, etc
Needs	Significant number of laptops or other computer systems as well as projectors
System developer or Trainer	Systems analysts and advisers

Table 5.3 Members

System Users Class	Members
Training Program	Login processes, registration, sending feedback and password recovery
Needs	Significant number of laptops or other computer systems as well as projectors
System developer or Trainer	Systems advisers and IT administrator

5.5 System Conversion

Such an appraisal has particularly examine toward those platform executions done association to its objectives. The resulting system then goes through some contemplation against those initial destinations were it will comfortably sit. This will by any means evaluate those wander need that will end frustration alternately to system installation accomplishment. At the moment the system performs great to its greatest potential which is appealing to users and other stakeholders.

5.5.1 Conversion Methods

In the process of implementing the new developed system a few conversion methods were taken into account and were known to be the best to adopt for transformation. The list below shows the most favourable of the conversions chosen:

- Direct conversion
- Pilot conversion
- Phased conversion
- Parallel conversion

5.5.2 Direct conversion

Godfrey (1999) stated that this is the setting aside of the whole currently working protocols and platforms while a new one comes into play. This means that the new system will be introduced after the full removal of the working system.

Advantages Godfrey (1999)

- Eliminates duplication and copying of previous standards
- Reduces costs as one system will be running within the institution

Disadvantages

- Risk is high as new system might fail
- No backup in the event of system operations failure

5.5.3 Parallel conversion

Ghezzi (2004), shown that, the old framework will concurrently operate alongside the newly introduced while allowing users to familiarise themselves with the new item. This however promotes risks control concerned on new system failure.

Advantages

- Known to be less risky

Disadvantages

- It is costly as two systems operate at the same time

- Only suitable for the same type of frameworks

5.5.4 Pilot Conversion

Bohl (2000) exclaimed that, this is done when the new system is made common only on niche targets in the organisation while the rest of the organisation maintains old system usage.

Advantages

- Risk is minimal as failure is less common
- System tests are made on the site to ensure system smoothness
- Less costly as only a segment or few sites experience the change

5.5.5 Phased Changeover

Eppingner (2008), wrote, system installation can be done in phases were a few changes occurs within the system over a period. The new system is broken into phases, which are dropped phase by phase within the system environment. The costs involved are basically on average as phases are implemented gradually and this is the same on the risk involved.

5.5.6 Recommended Conversion method

Parallel conversion is the most considerable conversion method, which can be adopted for new system introduction such as on Skill bundle platform. The backup facility exists since this model of conversion eliminates the risk of losing data by directly implementing the system at once. Both systems will take up their back up as expected and those used for system maintenance and comparison purposes. After such comparisons is the new system purely beats or proves to be than the old system the takeover can be done.

5.6 Maintenance.

Sommervile (2004), maintenance is the constant process of checking for errors or program glitches and bugs so as to ensure that the system continuously achieve its objectives on a daily basis. This is evidenced through periodic checks, system audits and members of the IT department or system administrators to minimise system down time and promote system worthiness do this thoroughly.

5.6.1 Type of maintenance

Maintenance in system analysis and design is known to have a few types that comes with the brief explanation of the subject. The following are well-briefed types of maintenance that this document is going to carry:

- Corrective Maintenance
- Perfective Maintenance
- Adaptive Maintenance

5.6.1.2 Corrective maintenance

Indicates the type of action which is taken in response to errors or faults known to occur within the system platform by taking corrective actions. It is the up keeping of framework modules such that code errors are never shabby. Errors such as dividing a particular sum, which should have been added, are taken into account to correct this. Such an investigation is held by expects and analysts were the system modules will have to be reconstructed to effectively overcome such problems at once.

5.6.1.2 Perfective maintenance

Includes the type of support given to the system to continually change the system interfaces and designs. This is usually done to ensure that user requirements are constantly met and achieved to keep the system competitive. This promotes new functional and non-functional requirements and benefits to be generated by user involvement while the institution aims to ensure system updates and perfection.

Table 5.4 Back Up Plan

	Time	Storage Venue
Application Setup Files Back Up	Twice per annum	IT Physical Storage
Database Back Up Plan	Three times Daily(04.00am, 12.00pm, 21.00pm)	IT Physical Storage

5.6.1.3 Adaptive maintenance

Occurs when the system environment changes its physical elements. This involves the technological changes known to exist in the world around running systems. Hardware components usually change every year and better ones becoming available for better system performance this is the same on operating systems such as windows software. In addition, it is advised that the system analysts and administrators to stay vigilant and very observant with other PhP and web based systems to see if they can inherit any changes in program development changes.

The Maintenance Process
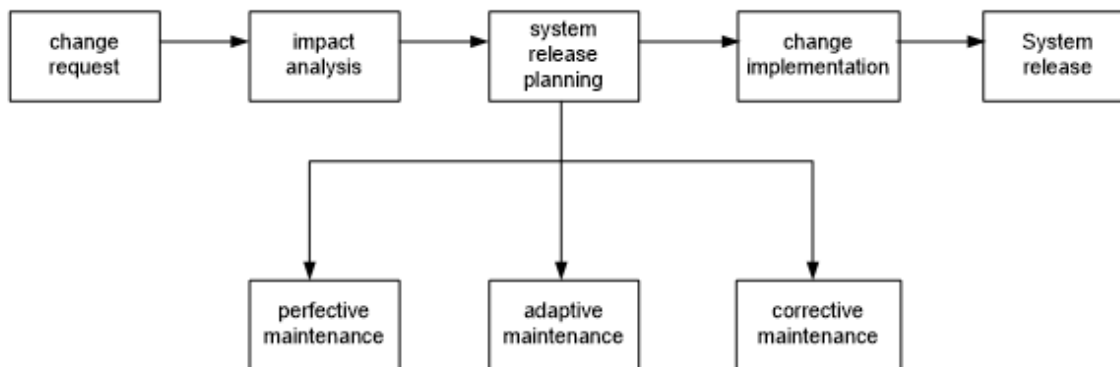
Fig 5.2 Maintenance Process

5.6.1.4 Recommended Maintenance Strategies

Because the development of the web system has been promoted by the needs of the users and the continuously change in the technology on web systems and operating systems the recommended strategy would be adaptive maintenance. This web platform will be maintained to adapt to both the user needs and the changes in technology either in the form of updates of complete application upgrade.

5.7 System Security"

This is one of the most important aspects of the project. There is a need to protect the system as any harm that can come to it can affect the day-to-day operations of the business.

5.7.1 Physical Security

This aspect covers the physical environment of the system. The major part of the system is the system server, which will be maintained on a weekly basis and will be locked up in a different room from the other computers access of which will be limited to certain individuals. The physical security will also include where the backup information is going to be located and the server will be fitted air conditioners to prevent the machines from overheating.

5.7.1.2 Software Security

➢ Administrators' passwords and usernames will be used to gain access to the system, to ensure that privacy prevails and to avoid data destruction by malicious-users. Only authorized users will have usernames and passwords for the system.

➢ The system uses passwords and security levels; each user is assigned a password by the system administrator who has super rights. The modules and the right to view depend on the level of permissions assigned.

5.8 Recommendations for Future Developments

This is also one of the most vital aspects in project development and implementation. In the future there is need to improve and maintain system performance and existence. The following are recommendations, which will need to be, adhere to in the future:

- **Maintenance** – keep the program codes very secure through updating the code structure from new coding languages improvements
- **Security** – antiviruses should be installed to reduce infections from malware and viruses on the software part. Physical security aspects are mandatory for installations to maintain system functionality and presents.
- **User involvement** – users involvement should be gradually promoted and carried out to keep the system user friendly and perfect for anyone who needs it.
- **Staff recruitment** – the IT department has to have new skilled labour year in year out to allow technological development as well as new idea generation

5. 9 Conclusion

Skill Bundle as conclusion is a money-free, digital market place connecting students who need skills and services with those who provide or have them. Central to the philosophy of skill bundle is that everyone – regardless of socio-economic background – has skills and services to offer. In theory, these skills and services are tradeable for someone else's without the use of money but through the use of points made available to all those who join. Skill bundle is about turning this theory into practice as seen within the screen short mentioned above.

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APPENDICES
Appendix A: User Manual
Introduction

This is known to exist after the system has been completely developed and ready to function in the institution or organization to which it belongs. User manuals are designed to facilitate system ease among the potential user. Theoretically, its use is for creating understanding and familiarity of the system all across buttons and menus available for use. It is also used for reference purposes in cases were one has failed to under the purpose of some menus in system operations and menus. So, basically the term manual in system development refers to smooth operation aid book available for users of the system, to appropriately use the system.

Skill Bundle need a server to run on to improve database management protocols and increase access speeds for packet transfers during system execution and running.

Users generally have to register using their registration number for easy identification and secure their accounts with a password of their own, either the same for their e-learning or different one.

As a security feature, the system has adopted the Kerberos Algorithm. Thus, as soon as the user gains access to the system's database, a random variable is created inside the system known as the first head, and when the user enters the correct details, the second variable is created and then paired with the first variable. Therefore, if the user attempts to access the other pages without proper login procedures, the system will transfer back the user to the login page while having detected that the variables have not been paired properly.

NB: In essence, the database password are encrypted for security reasons, so account holder is the only one who knows the password.

Login Form

Users and administrators use this page to log in the system at once and also to allow creating of accounts to new users
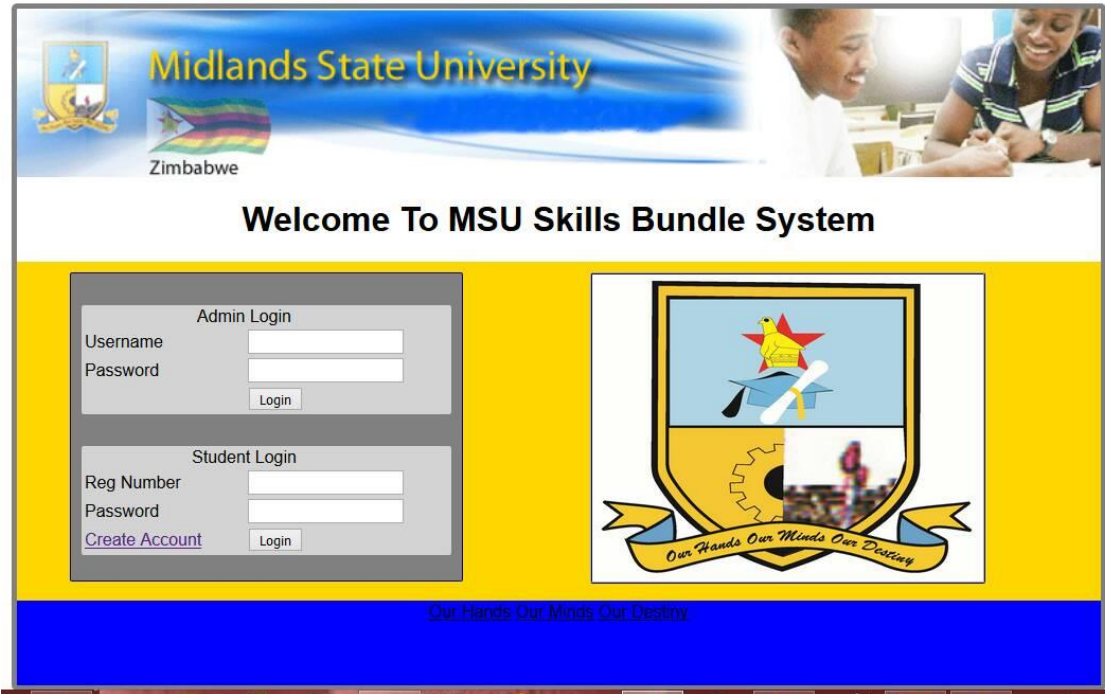
Fig A1 Login Form

Accounts alert Form – This page comes soon after a user logs in to his account. It displays options of menus such as chat space to message service providers and so many more as show below.
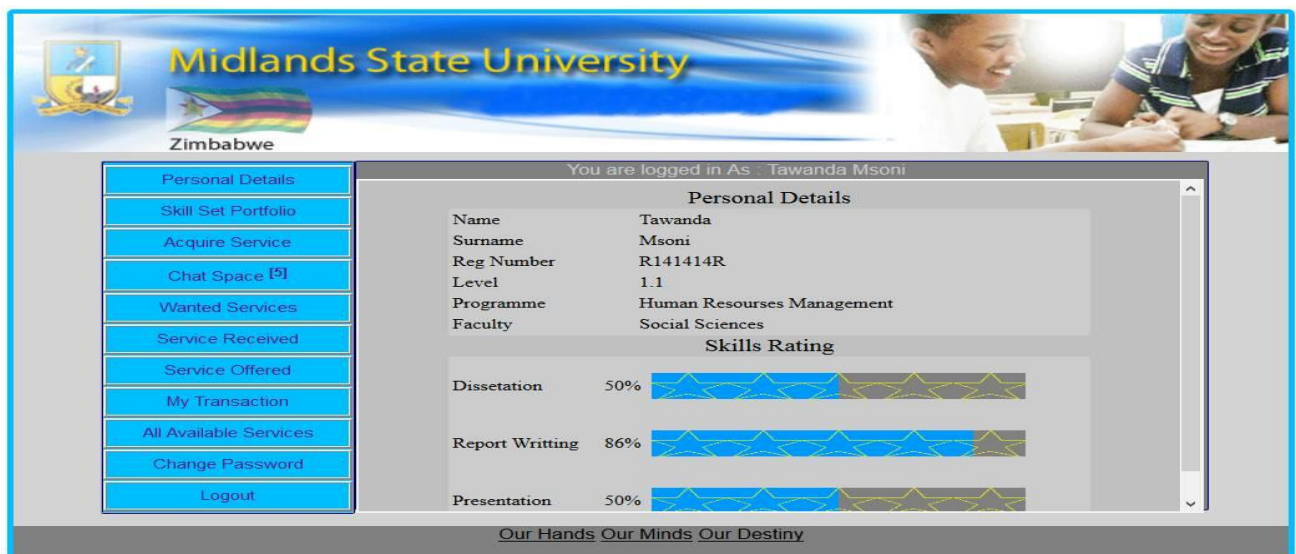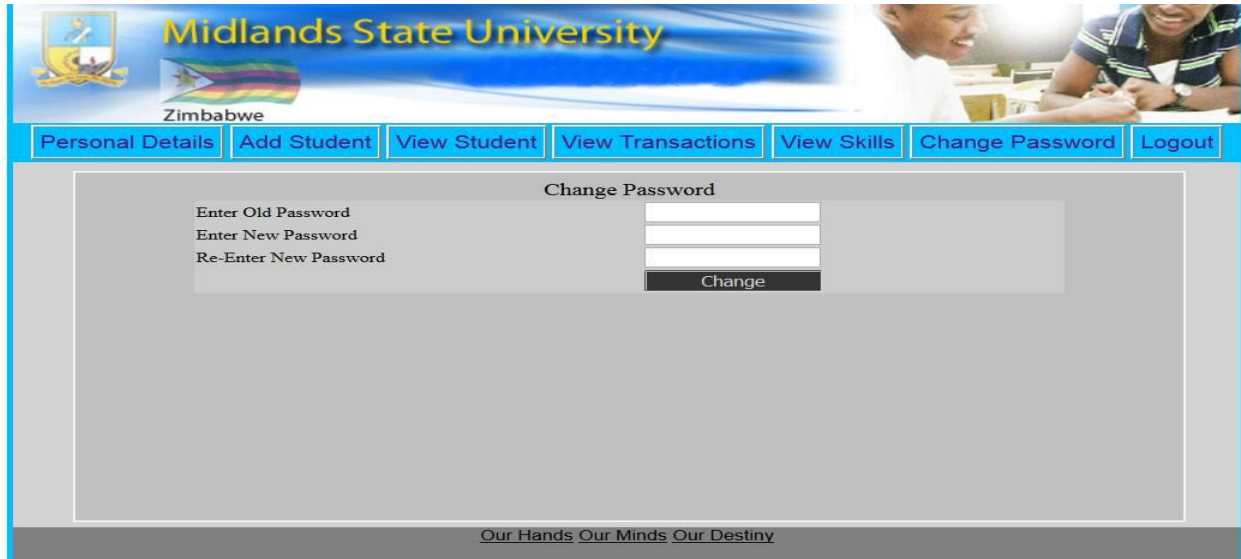
Fig A2 Accounts Alert

Change password form
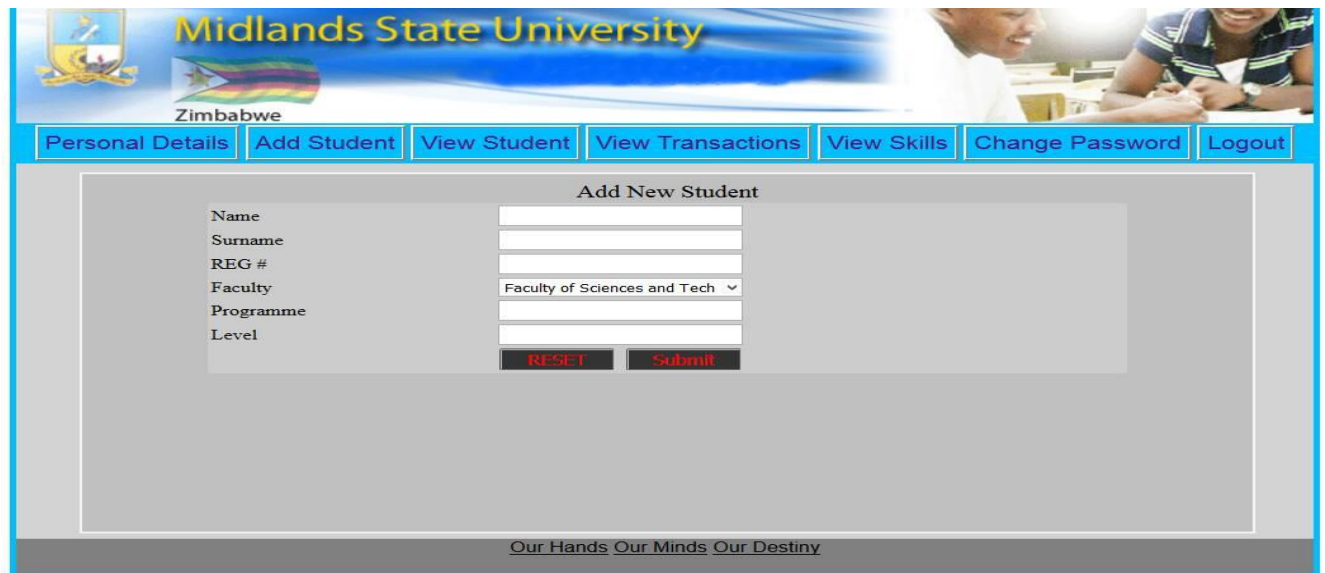
The client or user can change the password not anyone else since in the database the password
details are hashed.

Fig A3 Change Password

Administration form - This form has options only available administrators only since it
focuses on system control options such as reverse transaction and add students

Fig A4 Administration Form

Add Skill platform - This encourages the users to highlight and sell their new skills to all system users by adding skills that they have developed during studies.
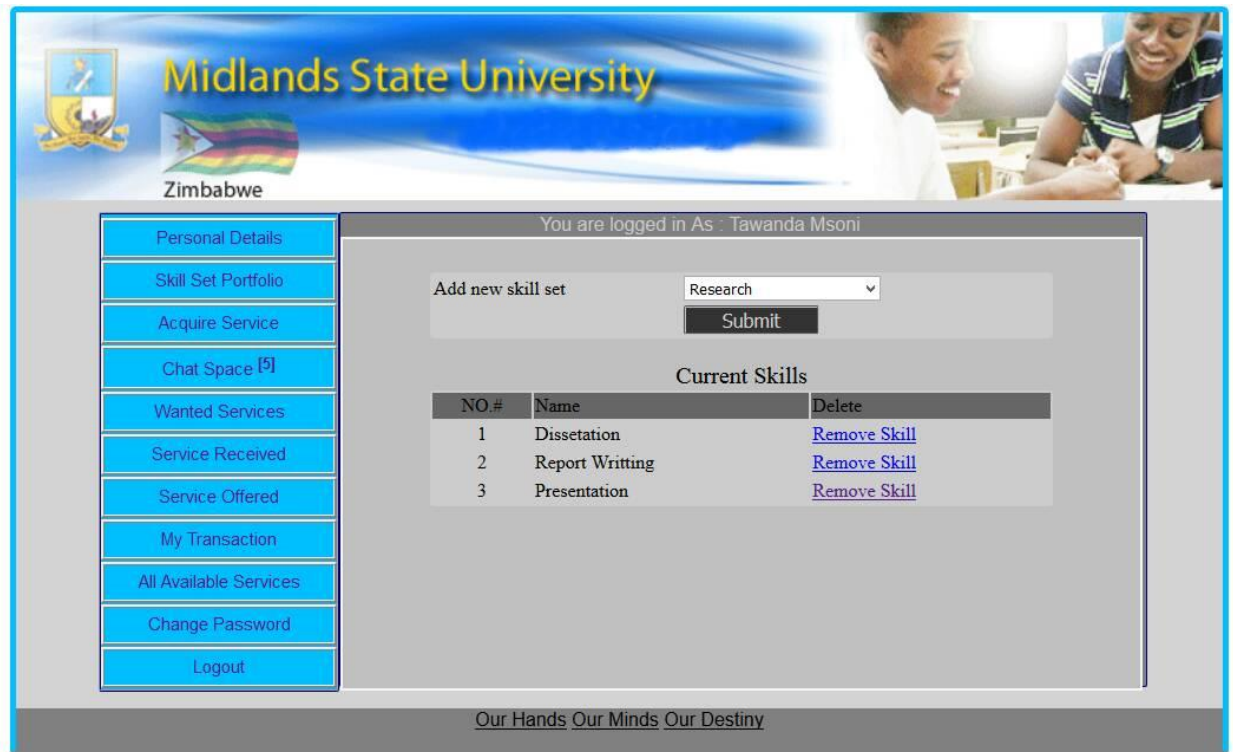
Fig A5 Add Skill Platform
This other one shows the administrator adding new requested skills from students to the platform

Appendix B: Questionnaire
Questionnaire Cover note

MIDLANDS STATE UNIVERSITY

FACULTY OF SCIENCE AND TECHNOLOGY

18 August 2017

Dear Participant

My name is Taitia Kudakwashe, a student from Midlands State University studying information systems honours degree. I wish to consider your organisation in partial fulfilment of my second year project to investigate about how your current system works specifically in the sales department. I have attached a questionnaire to this cover note and hereby request for your time to assist me with the information required in the questionnaire. You are assured that the information collected will be maintained on private and confidential basis and will be treated for academic referencing.

I look forward to your favourable response**.** For any additional information or queries feel free to contact on the details below.

Contact details:

ktaitia@gmail.com

+263777823714

Yours faithfully

Taitia Kudakwashe

Sample of Questionnaire Questions

Please put a tick (YES ☑ / NO ☐) in the appropriate box to input your response

1) What is the name of the system that you are currently using?...

2) Do you think internet skill share is a safe way to share academic skills? YES ☐ / NO ☐

3) Do you have any problems during your interaction with current system?   YES ☐ / NO ☐

4) What are your suggestions for developing a secure online skill system?...
………………………………………………………………………………………………
……………………………………………………………...

5) What makes you want to shift from the current system to another?
………………………………………………………………………………………………
……………………………………………………...

6) Are you facing serious problems that may call for a new system?

YES ☐ / NO ☐

7) Do you want the current system to be phased out or you just want it to be developed or modified somehow? ....
…………………………………………………………………….....................................

8) Kindly, highlight briefly some of the problems of the current system
………………………………………………………………………………………………
…………………………………………………………………………………………

9) Does your colleagues have any knowledge on computers?   YES ☐ / NO ☐

10) Do you think your colleagues will welcome the idea of computerizing the system
YES ☐ / NO ☐ / NOT SURE ☐

11) Does the organization have enough funds support to finance the new system?
YES ☐ / NO ☐

Questionnaire for other staff

1) Are you comfortable with the system being computerized

<div align="right">YES ☐ / NO ☐</div>

2) If NO why do you say so?...

    …………………………………………………………………………………………………

    ……………………………………………………………….................................

3) If YES how do you want to see the security features of system enhanced?

    …………………………………………………………………………………………………

    …………………………………………………………………………………………………

4) Do you think the institution will benefit from secure skill transactions?

<div align="right">YES ☐ / NO ☐</div>

5) Are you prepared for a change in the system?

<div align="right">YES ☐ / NO ☐</div>

6) Are you duties being seriously affected by the operation of the current system?

<div align="right">YES ☐ / NO ☐</div>

7) Do you want the current system to be totally removed or to be modified somehow?

    ……………………...

    ....

Appendix C: Sample Interview Questions

1. Name of Interviewer _____

2. Position of Interviewee _____

3. Department of Interviewee _____

Interview Questions

1. Do you think online skill sharing OR electronic skill bundle are secure?

_____

2. How would you rate the current Skill System how and why?

_____

_____

_____

3. What are the problems that are arising from this current system?

_____

_____

_____

4. What is the average time taken to complete a skill transaction?

_____

_____

5. What do you think can be done to improve the system?

_____

_____

6. What mechanisms are used if one forgets a password or loses the card?

_____

_____

7. Do you think the improving system security would be appropriate? Why?

_____

_____

8. Any other comments or additions?

_____

_____

        Signature _____

Appendix D: CODE SNIPPET

LOG IN

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Untitled Document</title>
<link href="main.css" type="text/css" rel="stylesheet"/>
</head>


<body>
<div id="container">
        <div id="header">
                <img src="img/header.png" id="header_pic"/>
        </div>
        <div id="heading">
                <h1>Welcome To MSU Skills Bundle System</h1>
        </div>
        <div id="main">
                <div id="left">
                        <form id="form1" method="post" action="index_processor.php">
                         <table>
                                <caption>Admin Login</caption>
                            <tr>
                            <td width="150px">Username</td>
                            <td><label>
                                    <input type="text" name="admin_username" required/>
                             </label></td>
                            </tr>
```

```html
                        <tr>
                         <td>Password</td>
                         <td><label>
                                <input type="text" name="admin_password" required/>
                         </label></td>
                        </tr>
                        <tr>
                         <td> </td>
                         <td><label>
                                <input         type="submit"           name="admin_submit"
value="Login" />
                         </label></td>
                        </tr>
                      </table>
                     </form>

                     <form id="form2" action=index_processor.php" method="post">
                      <table>
                            <caption>Student Login</caption>
                           <tr>
                            <td width="150">Reg Number </td>
                            <td><label>
                                 <input type="text" name="student_reg_number" required/>
                            </label></td>
                           </tr>
                           <tr>
                            <td>Password</td>
                            <td><label>
                                 <input type="text" name="student_password" required/>
                            </label></td>
                           </tr>
```

```
                    <tr>
                     <td><a href="create_account.php">Create Account</a></td>
                     <td><label>
                            <input      type="submit"        name="student_submit"
value="Login" />
                            </label></td>
                    </tr>
                 </table>
              </form>
        </div>
        <div id="right">
              <img src="img/logo.jpg" id="right_img"/>
        </div>
     </div>
     <div id="footer">
           <li>Our Hands</li>
           <li>Our Minds</li>
           <li>Our Destiny</li>
     </div>
</div>
</body>
</html>
```

CONNECTION TO DATABASE

```
<?php
mysql_connect("localhost","root","")or die(mysql_error());
mysql_select_db("project")or die(mysql_error());
?>
```

REGISTERING A STUDENT

```
<?php
include_once('register.php');
@$name=mysql_real_escape_string($_POST['Name']);
```

```php
@$surname=mysql_real_escape_string($_POST['Surname']);
@$programme=$_POST['programme'];
@$reg_no=$_POST['Regnumber'];

@$username=mysql_real_escape_string($_POST['Username']);
@$password=mysql_real_escape_string($_POST['password']);
@$confirmpassword=mysql_real_escape_string($_POST['Confirmpassword']);
@$_accesslevel="student";
if(isset($_POST['enter'])){

if($password <> $confirmpassword){
echo("<script>alert('passwords do not match');</script>");
exit();
}

if(strlen($reg_no)!=8){
echo("<script> alert('$reg_no is not the required format');</script>");
exit();
}
$registration=mysql_query("SELECT    registrationnumber    FROM    registration    WHERE
registrationnumber='$reg_no'")or die(mysql_error());
$promise=mysql_num_rows($registration);
if($promise>=1){
echo ("<script> alert('$reg_no already registered');</script>");
exit();
}
$register=mysql_query("INSERT    INTO
registration(name,surname,programme,registrationnumber,username,password,accesslevel)
VALUES('$name','$surname','$programme','$reg_no','$username','$password','$_accesslevel')")o
r die(mysql_error());
if($register){
```

```php
echo ("<script> alert('$reg_no succesfully registered');</script>");

exit();

}

}

?>
```

Skill

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"

"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head>

<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />

<title>Untitled Document</title>

<link href="tables.css" type="text/css" rel="stylesheet"/>

</head>


<body>

<?php

include('../db_con.php');

include('student_class.php');

session_start();


$query = mysql_query("SELECT * FROM skills");

?><br/>

<form id="form1" name="form1" method="post" action="skill_set_portfolio.php">
```

```html
<table>

 <tr>

  <td>Add new skill set </td>

  <td>

            <select name="available_skills">

                  <?php

                  while($skill=mysql_fetch_assoc($query)){

                  ?>

                  <option value="<?php echo $skill['name']; ?>"><?php echo $skill['name'];
?></option>

                  <?php

                  }

                  ?>

            </select>

        </td>

 </tr>

 <tr>

  <td> </td>

  <td><label>

    <input id="static" type="submit" name="Submit" value="Submit" />

  </label></td>

 </tr>

</table>
```

```php
</form>

<?php
//run by default

$reg_number = $_SESSION['student'];

$query1 = mysql_query("SELECT * FROM student_skill_portfolio WHERE reg_number =
'$reg_number'");

$row1 = mysql_num_rows($query1);


if($row1 == 0){

        echo '<h2>Currently you do not have any skill in your portfolio</h2>';

}
else{

        ?>

        <br/>

        <table class="heading">

        <caption>Current Skills</caption>

        <tr>

                <td align="center">NO.#</td>

                <td>Name</td>

                <td>Delete</td>

        </tr>

        <?php
```

```php
        $num = 0;

        while($skill = mysql_fetch_assoc($query1)){

                $num = $num +1;

                $name = $skill['skill'];

                $id = $skill['id'];

                echo '<tr>

                        <td align="center">'.$num.'</td>

                        <td>'.$name.'</td>

                        <td><a href="delete_student_skill.php?id='.$id.'"

        onclick="return confirm(\'Note that if you delete the skill your Skill Rating will be
deleted too?\')">

        Remove Skill</a></td>

                        </tr>';

        }

        ?>

        </table>

        <?php

}



//unused try to use the obj

$student = new Student($_SESSION['student']);

$std=$student->skill_set();
```

```php
//adding new skill set

if(isset($_POST['Submit'])){

        $acqu_skill = $_POST['available_skills'];

        $reg_number = $_SESSION['student'];


        $query1 = mysql_query("SELECT * FROM student_skill_portfolio WHERE
reg_number = '$reg_number' && skill = '$acqu_skill'");

        $query1_num = mysql_num_rows($query1);


        $query3 = mysql_query("SELECT * FROM student_skill_portfolio WHERE
reg_number = '$reg_number'");

        $query3_num = mysql_num_rows($query3);


        if($query1_num >= 1){

                ?>

                        <script>

                        alert('You Already have this selected skill in your skill set');

                        window.location='skill_set_portfolio.php';

                        </script>

                <?php

        }
```

```php
else if($query3_num >= 3){

    ?>

        <script>

        alert('You cannot exceed more than 3 skill sets in your portfolio');

        window.location='skill_set_portfolio.php';

        </script>

    <?php

}

else{

    $query2 = mysql_query("INSERT INTO student_skill_portfolio
(reg_number,skill) VALUES ('$reg_number','$acqu_skill')");


    if($query2){

        ?>

            <script>

            alert('New skill set have been succesfully Added');

            window.location='skill_set_portfolio.php';

            </script>

        <?php

    }

    else{

        echo mysql_error();

    }
```

```
            }

    }

    ?>

    </body>

    </html>
```