**LIRA UNIVERSITY**

**FACULTY OF MANAGEMENT SCIENCES**

**DEPARTMENT OF COMPUTING AND INFORMATION SCIENCES**

**PROJECT PROPOSAL**

**AN ONLINE ACADEMIC DOCUMENTS REPOSITORY** **SYSTEM FOR LIRA UNIVERSITY**

**A PROJECT PROPOSAL SUBMITTED TO THE FACULTY OF MANAGEMENT SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE OF LIRA UNIVERSITY.**

**June, 2022**

# **DECLARATION**

We, the undersigned students declare to the best of our abilities that this proposal is our original work and that it has never been submitted to any university or any other institution of learning for academic or any other reasons. We are therefore glad to present for examination purposes.

|  |  |  |  |
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# APPROVAL

This is to certify that the project proposal entitled “Online Academic repository System **for** Lira University” has been drafted under our supervision and is submitted to the board of examiners with our approval

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# LIST OF ACRONYMS

APACHE…………………………………………………Acral Pseudo lymphomatous Angiokeratoma of Childhood

CSS…………………………………………………………………………. Cascading Style Sheet.

DB………………………………………………………………Database

HTML………………………………………………………………………Hypertext Markup Language.

LU…………………………………………………………………………...Lira University.

MYSQL……………………………………………………………...My Structured Query Language

OADR………………………………………………………………………Online Academic Document Repository.

PHP………………………………………………………………………Hypertext Preprocessor.

XAMP………………………………………………………………. Cross-platform Apache, MySQL, PHP and Perl

# **CHAPTER ONE:**

### INTRODUCTION

## 1.1 Introduction.

Efficient accessibility to academic information, for example past papers, internship reports, project proposals, concept papers and students research work, is essential to the progress of any student in Academic institutions. When resourceful scholastic information is received in timely and efficient manner, the student is ultimately better focused to achieve his or her educational goals. This chapter involves the background, statement of the problem, objectives, scope, research questions, significance and justification of the study.

## Background.

An institutional repository (IR) is a system that collects, preserves, manages, and provides access to intellectual products of a community ( [1]). Institutional intellectual products may include faculty work, student research and proposals, reports, past papers, and so on. IRs provide a mechanism for an institution to showcase its scholarly output, centralize and introduce efficiencies to the stewardship of digital documents of value, and respond proactively to the escalating crisis in scholarly communication.

The growing trend towards online scholarly communication and lack of scholarly content management systems among universities has made digital repositories more important for the collection and distribution of scholarly materials [2]. Today, digital repositories are used at academic institutions to store and disseminate scholarly outputs of universities. [3].

Globally, Web-based Academic systems started as an alternative to libraries Academic Systems, Lightspan, Inc.’s (Nasdaq: LSPN) August 9, 2000 where study information was made available on internet to facilitate research and learning using search engines. For example, MIT’s institutional repository which is implemented in the DSpace system and it’s a gateway to 30000 digital items including technical reports, working papers, preprints and theses, **Repositório Digital Universidade Federal do Rio Grande do Sul LUME.** The LUME is the digital repository of scholarly work produced by Universidade Federal do Rio Grande do Sul, one of Brazil’s largest public federal research universities. Size of the collection**:** 177555 (metadata count), Topics covered**:**Multidisciplinary, Items available**:**Theses, Dissertations, Articles from Scholar or Professional Periodicals, Graduation and Post-graduation Monographs, Research Technical Reports, and Records of Work Produced and Presented in Events, Photographs, and Videos.

In Africa, examples of repositories according to [information made available by the African Studies Centre, Leiden](https://ilissafrica.wordpress.com/tag/institutional-repository/), including its ‘[Connecting Africa](http://www.connecting-africa.net/index.htm)’ project, a gateway to African research information and materials produced worldwide (and particularly useful for consulting material in European university repositories) include KARI e-repository in Kenya, and University of Tripoli digital repository in Libya.

In Uganda, web-based systems were introduced by school-Net in 1997 but development was slow due to lack of proper infrastructure and the technical know-how and also resources like stable and affordable internet facilities which were required for the system to run. (CFI, I-Network, 2001) but due to development in internet facilities most academic work is now web-based. Examples of digital repositories in Uganda include Open access digital repository of Busitema University.

At Lira University, academic documents such as past papers, reports, and so on are stored in paper form hence the need for a well-developed academic repository. It has the potential to increase research, improve and enhance performance of students as well as increasing the visibility of academic outputs by students such as reports, research, proposal, concept papers, past papers and other academic documents. A gap has been identified in the way Lira University stores its academic documents hence the need to develop an online web-based academic repository for scholarly materials of Lira University.

## Problem statement.

At Lira University, there is a challenge in access and storage of past academic documents such as past papers, reports, concept papers, project proposals, students’ research work and so on. Access to past papers most especially when students are preparing for examinations is hectic thereby hindering their preparations. The documents could also be damaged due to fire incidents for example in September,2020 Makerere University main building got gutted by fire thereby destroying precious documents such as the University seal (Daily Monitor,21 September, 2020), searching and sorting of the documents is very hectic and slow, congestions are already in the library as students are looking for past proposals, reports, concept papers and other documents is very evident.

Systems such as **Lira University Institutional repository** (LU-IR) (which is a digital service that collects, preserves, and distributes digital material. Repositories are important tools for preserving an organization's legacy; they facilitate digital preservation and scholarly communication),

Despite the solutions that have been mentioned above, there is still gaps that have not been fulfilled such as easier access, storage and retrieval of past academic documents such as past papers, proposals, reports among others.

Nevertheless, coming up with an online academic repository system will eventually facilitate the ease of storage access and retrieval of past academic documents by students, lecturers as well as university administrators.

## 1.4 Objectives

### 1.4.1 Main objective.

To develop an online academic repository system for Lira University that will facilitate ease of storage and retrieval of past academic documents.

### 1.4.2 Specific objectives.

1. To review the inherent weaknesses regarding the current system in order to identify requirements for developing an online academic repository system.
2. To develop an online academic repository system in accordance with the analyzed requirements.
3. To test and validate the developed system

## Research questions:

1. How are academic documents being managed at Lira University and what are challenges experienced while accessing the past academic documents currently?
2. What are systems in place and what type of infrastructure do exist? Are they compatible with the proposed system or integration is a possible solution?
3. Is it effective and satisfactory to the Administration, students, staff members and Management of Lira university?

## Scope of the study

### Conceptual scope

The study will focus on the development of an online academic repository system to ensure timely and efficient management and maintenance of past academic documents.

### Time scope.

The study will take a period of three months to be completed. Because with the skills we have gained in the three years course in system designing and development. We are certain that this period is enough for us to put into practice the skills we have been acquiring and it will include the system development, system testing, implementation and report writing.

## Significance of the study.

### To Lira University.

As a result of various researches carried out so as to come up with the best feasible system, this helps the University in easy maintenance and storage of past academic documents.

### To Academia.

**The** study will provide full time access to the past academic documents such as past papers, reports, project proposals, research work to both the Lecturers and students which will boost the performance of students and academic staff of Lira University.

The system helps to guide the academic world on the process of system design and development, act as a reference for development of related systems and will facilitate us in the coming up of solutions to problems in future.

## **Justification.**

The presence of an internal infrastructure to store, manage, re-use and curate digital materials is increasingly important as the cost of purchasing and storing physical copies of is a burden faced by most universities. There is only a finite amount of space within universities, namely in the libraries, to store such an amount of printed content.

# **CHAPTER TWO**

## **LITERATURE REVIEW**

## 2.0 Introduction

This section includes critical review of previous work and systems related to the proposed system as well as an analysis of the existing knowledge related to the study and the technologies to be used. The review includes research work from journals and books cited with the objective of revealing contributions, weakness and gaps within the subject.

## 2.1 Academic Repository System.

A ‘repository’ is where items (or data) are stored.

A digital repository is a place for storing any documents, files or data online.

So, what is an academic repository? An academic repository is a specifically designed digital repository used by universities all around the world to store their documents.

An academic repository allows researchers, students and other members of academic staff to preserve their documents in an easily manageable cloud-based system. With many academic repositories, the level of openness surrounding the contained content of each submission can be determined. This allows the content to be available to people who wish to read it only inside of the university if it is freely available. It also allows researchers to put an embargo, or specific filters, on their document to limit who can see it. This is common for sensitive content, such as research in a thesis which has potentially viable content for a patent, or contains content that is wanted to be kept secret, but at a time when the thesis must be added into the repository in order to graduate.

Often, repositories will offer many search functions for the user and will allow researchers to isolate documents based on key words and subject, amongst other criteria. To store data in a repository, filling out forms to the university is often required and is mainly used to obtain the metadata, set the level of embargo on the manuscript and to confirm from a legal perspective that the researcher is happy to place the content on the cloud and it doesn’t infringe on any copyright or other intellectual property.

### 2.1.1 Global overview of institutional repositories adoption and usage

Institutional repositories have widely been used to disseminate and communicate scientific

information (Okumu, 2015). Literature indicates Europe, America and Australia have a higher

adoption rate of institutional repositories compared to other continents across the globe (Abrizah

2010; Okumu, 2015; Cullen and Chawner 2010). According to Cullen and Chawner (2010), in

2006, all Australian universities had functioning institutional repositories. In fact, Europe leads

other continents with 47.92% of universities having institutional repositories. Adoption and usage of institutional repositories in developed countries is being influenced by the availability and

extensive dissemination of scholarly work, authors’ professional visibility, constraints in self-archiving, perceived poor quality of repository materials, copyright issues, fear of plagiarism, lacking quality control and less prestige (Tmava & Miksa 2017; Casey 2012). Despite heightened

adoption and usage of institutional repositories in developed countries, the rate of submission of

scholarly works among American Universities is fairly low (Casey, 2012).

In Asia, literature indicates India, Taiwan, Japan and Thailand lead other Asian countries in

adopting and using institutional repositories (Okumu 2015; Abrizah, 2010). Increased adoption of

institutional repositories in Asia are attributed to a number of factors. These include user

awareness of archiving and quality control policies, availability of documents in the repositories,

types of the publications and ease of use of the institutional repository software and system

(Ammorukleart, 2017). Other adoption factors in Asia are expected academic benefits, visibility,

cultural issues, content availability, accessibility and quality, user awareness, fear of plagiarism,

attitude and copyright issues (Kim, 2010; Ammorukleart 2017: Park and Qin, 2013).

Contrary to the developed and Asian countries, African countries have recorded a low adoption

rate of institutional repositories (Ezema, 2013; Kathewera, 2016; Lwoga & Questier 2014; Dulle

2010; Fasae, et al. 2017) The adoption of institutional repositories in Africa has not been

promising and among the factors contributing to the low adoption are lack of institutional

repositories awareness, unreliable electricity, insufficient information communication and

technology (ICT) skills and lack of skilled manpower (Christian, 2008; Nwakaego, 2017; Saulus,

Mutula & Dlamin, 2017). Other critical adoption factors in Africa and most developing countries

include expected repositories’ benefits, awareness and understanding of self-archiving service

(Anenene, Alegbeleye & Oyewole 2017; Bamigbola 2014; Dulle 2010); ignorance of publishers’

policy (Bamigbola 2014). In Tanzania where this study was conducted, adoption and usage of

institutional repositories has not been promising. Low adoption and usage of institutional

repositories is attributed to inadequate content in repositories; accessibility; discoverability; poor

visibility of local content; lack of motivation and skills (Mgonzo & Yonah, 2014; Muhogole & Laizer 2014; Muneja, 2010) for the modalities of offering information literacy (IL) programs (Lawal, Underwood, Lwehabura & Stilwell, 2010); lack of an understanding of copyright laws (Lwoga & Questier 2014); lack of awareness; attitude; insufficient information searching skills and Internet connectivity (Dulle, 2010). From the literature reviewed, it appears adoption and usage of institutional repositories in developing countries are mostly affected by the lack of awareness of the services available, limited technical expertise, copyright issues, insufficient resources and

managerial, while adoption in developed countries seem to be largely influenced by the quality of

resources and authors’ visibility.

Based on the reviewed literature, it appears the nexus between adoption and usage of

institutional repositories are being influenced by critical success factors. These include quality

services offered which meet user needs (Armstrong 2014; Nwakaego 2017); cost in managing

institution repositories (Kim, 2010); ease of use and visibility (Ammorukleart, 2017); quality

control, poor infrastructure, management commitment, policy issues, funding and lack of human

resource for planning, developing and managing institutional repositories (Lagzian, Abrizah &

Wee 2015; Nwakaego, 2017) and access to quality full text repository contents (Armstrong,

2014). In particular, a clear institutional repository policy and managerial issues are crucial in the

operability and sustainability of institutional repositories as they guide on the type of content

deposited, preserved, withdrawn and the day-to-day interoperability of institutional repositories

(Kakai, 2018; Moahi, 2018; Lagzian, Abrizah & Wee 2015). Adoption, use and sustainability of

institutional repositories also extensively depend on the volume of research and repository

content submission in a particular field of study.

## 2.2 Benefits of online Academic Repository System

There are a number of benefits for both the researchers and institutions involved, but the most prevalent benefits are:

* Easier for your publications to be included in the Research Excellence Framework (REF) or other similar academic frameworks measuring research quality.
* Enabling fast, simultaneous remote access to academic documents.
* Allowing institutions to manage their own records and intellectual assets efficiently
* Makes the documents easy to reuse for new lectures, research, seminars etc.
* Minimizes physical storage requirements that bring about congestion.
* Enables both the metadata and intellectual object to be in the same location
* Allows for an external validation of research results.
* Enables persistent access to deposits.
* Increases research visibility
* Allows for a long-term proof of authorship, assurance and credibility for unpublished papers.

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## **2**.3 Reasons why Lira university needs an Online Academic Repository System?

The presence of an internal infrastructure to store, manage, re-use and curate digital materials is increasingly important as the cost of purchasing and storing physical copies of research documents (i.e., reports, proposals), and student manuscripts is a burden faced by Lira university. There is only a finite amount of space within universities, namely in the libraries, to store such an amount of printed content.

In this all-digital age, it is now easier than ever to store academic content on file and in ‘the cloud’, saving on such space and helping to stop university libraries from becoming overcrowded.

A second consideration towards the digital movement is the cost of journals. Academic journals are becoming more and more costly, especially as a lot of journals have predominantly moved to digital formats, raising the price of the less-popular printed publication versions. Whilst it is true that the cost of digital journals is increasing, the cost is not anywhere near that of printed journals and digital copies can be easily stored and used by people inside the university with ease.

Repositories are there to help store content, such as journals, to be easily used by people within the university itself, but the presence of an easily accessible and searchable system allows for the research produced within the university to be accessible for everyone to see: this is particularly true for journal publications which often sit behind a paywall (unless open access) on the original journal website, but are often freely available through university repositories.

2.4 **Development tools for an online academic documents repository system**

# **CHAPTER THREE:**

## **METHODOLOGY**

## 3.1 **introduction**

This section describes the methods that will be employed in carrying out the research, techniques and tools that will be used to achieve the specific objectives and eventually lead to the design and development of the proposed online academic document repository system. These include data collection methods, project design, tools and implementation, testing and evaluation, procedures and ethics, limitation and delimitation.

### project Design

The research design involves capturing data using qualitative and quantitative approaches that is using survey and cross-sectional designs where questionnaires, interviews and observation methods to collect data from respondents. Data analysis will be done using graphs, pie charts.

* 1. **Data collection.**

The categories of data for the project will be both from primary and secondary sources

Once the goal was set, data collection process began to get information about an online academic document repository system and past works on this domain. This will involve acquiring data directly from clients for whom the system will be developed for.

This was achieved using the following; Using a set of predetermined questions; One on one

discussions were held with students and staff of Lira University; Interviews

were used because they are easy to administer given the reasonably small sample size to be used.

a) Interviews

These further provided insight into the problem at hand. In order for the proposed system to

satisfy organizational goals, it had to be interactive, user-friendly and at the same time secure.

Different groups of stakeholders were approached and considerations were made of factors such

as educational levels, age and gender and so on and so forth. This was the best technique in the

sense that respondents gave an exclusive expression of what they experience, feel and do to

access and capture information at the University. Concerns were raised and this prompted further

probing of the problem hence giving a confirmation to earlier findings which were observed. It

enabled capturing data which could not be observed or collected using questioners since this was from independent source rather than the author which likely to sound biased.

b) Observation

This involved the data collector to be stationed at the premises of Lira University Library, to monitor the flow and duration of activities. On estimate 5- 10 students lined up in the library in search of past papers and other academic documents such as project proposals, research work etc. On average each inquiry would take 8-12 minutes. The advantage of this method is that Actual data was collected rather than theory though no pictures taken.

c) Questionnaire

As a consequence of the need for adequate time management, questionnaires were issued to various randomly sampled stakeholders around LU. And thus, a carefully assorted list of questions was generated seeking straightforward and simplified answers. The questionnaire method was employed in the hope that nearly universal set of user requirements should be generated from the answers of varied stakeholders.

* 1. **Tools**

**3.4.1 software tools**

These are the tools or development environments that we will use in the development of an online academic document repository. For example, visual studio code which is a streamlined code editor that will help us in debugging the code, running tasks, version control as well as providing tools for quick code build and debug that fastens our development process.

* + 1. **Programing languages**

The backend of the system is developed with PHP and the frontend of the system will be developed with Bootstrap. Hence, this section is providing a brief description of these technologies used for this project.

**XAMPP** is a [free and open sourc](https://en.wikipedia.org/wiki/Free_software)[e cross-platfor](https://en.wikipedia.org/wiki/Cross-platform)[m web serve](https://en.wikipedia.org/wiki/Web_server)[r solution stack](https://en.wikipedia.org/wiki/Solution_stack) package developed by Apache Friends, consisting mainly of the [Apache HTTP Server,](https://en.wikipedia.org/wiki/Apache_HTTP_Server) [MariaDB](https://en.wikipedia.org/wiki/MariaDB) [.](https://en.wikipedia.org/wiki/Database) It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. Everything needed to set up a web server – server application (Apache), database (MariaDB), and scripting language (PHP) – is included in an extractable file. XAMPP is also cross-platform, which means it works equally well on Linux, Mac and Windows. Since most actual web-server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server extremely easy as well. Hypertext Markup Language (HTML) is the standard [markup language](https://en.wikipedia.org/wiki/Markup_language) for creating [web pages](https://en.wikipedia.org/wiki/Web_page) and [web applications.](https://en.wikipedia.org/wiki/Web_application) With [Cascading Style Sheets](https://en.wikipedia.org/wiki/Cascading_Style_Sheets) (CSS) and [JavaScript,](https://en.wikipedia.org/wiki/JavaScript) it forms a triad of cornerstone technologies for the [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web)[.](https://en.wikipedia.org/wiki/HTML#cite_note-4) [Web browsers](https://en.wikipedia.org/wiki/Web_browser) receive HTML documents from a [web server](https://en.wikipedia.org/wiki/Web_server) or from local storage and [render](https://en.wikipedia.org/wiki/Browser_engine) the documents into multimedia web pages. HTML describes the structure of a web page [semantically](https://en.wikipedia.org/wiki/Semantic_Web) and originally included cues for the appearance of the document.[HTML elements](https://en.wikipedia.org/wiki/HTML_element) are the building blocks of HTML pages. With HTML constructs, [images](https://en.wikipedia.org/wiki/HTML_element#Images_and_objects) and other objects such as [interactive forms](https://en.wikipedia.org/wiki/Fieldset) may be embedded into the rendered page. HTML provides a means to create [structured documents](https://en.wikipedia.org/wiki/Structured_document) by denoting structural [semantics](https://en.wikipedia.org/wiki/Semantics) for text such as headings, paragraphs, lists, [links,](https://en.wikipedia.org/wiki/Hyperlink) quotes and other items, Bootstrap is a [free and open-source](https://en.wikipedia.org/wiki/Free_and_open-source_software) front-end framework for designing [websites](https://en.wikipedia.org/wiki/Website) and [web applications.](https://en.wikipedia.org/wiki/Web_application) It contains [HTML-](https://en.wikipedia.org/wiki/HTML) and [CSS-](https://en.wikipedia.org/wiki/CSS)based design templates for [typography,](https://en.wikipedia.org/wiki/Typography) forms, buttons, navigation and other interface components, as well as optional [JavaScript](https://en.wikipedia.org/wiki/JavaScript) extensions. Unlike many web frameworks, it concerns itself with [front-end development](https://en.wikipedia.org/wiki/Front-end_web_development) only,JavaScript often abbreviated as JS, is a [high-level,](https://en.wikipedia.org/wiki/High-level_programming_language) [interpreted](https://en.wikipedia.org/wiki/Interpreted_language) [programming language.](https://en.wikipedia.org/wiki/Programming_language) It is a language which is also characterized as [dynamic,](https://en.wikipedia.org/wiki/Dynamic_programming_language) [weakly typed,](https://en.wikipedia.org/wiki/Weak_typing) [prototype-based](https://en.wikipedia.org/wiki/Prototype-based_programming) and [multi-paradigm.](https://en.wikipedia.org/wiki/Multi-paradigm_programming_language) Alongside [HTML](https://en.wikipedia.org/wiki/HTML) and [CSS,](https://en.wikipedia.org/wiki/CSS) JavaScript is one of the three core technologies of the [World Wide Web.](https://en.wikipedia.org/wiki/World_Wide_Web) JavaScript enables interactive [web pages](https://en.wikipedia.org/wiki/Web_page) and thus is an essential part of [web applications.](https://en.wikipedia.org/wiki/Web_application) The vast majority of [websites](https://en.wikipedia.org/wiki/Website) use it, and all major [web browsers](https://en.wikipedia.org/wiki/Web_browser) have a dedicated [JavaScript engine](https://en.wikipedia.org/wiki/JavaScript_engine) to execute it. Microsoft Visual Studio Code - a free source code editor and a powerful editor that supports several languages. Running in any Operating system environment, it’s use is governed by GPL License. It is used to edit PHP scripting language, Cascading Style Sheets (CSS) is a [style sheet language](https://en.wikipedia.org/wiki/Style_sheet_language) used for describing the [presentation](https://en.wikipedia.org/wiki/Presentation_semantics) of a document written in a [markup language](https://en.wikipedia.org/wiki/Markup_language) like [HTML.](https://en.wikipedia.org/wiki/HTML) CSS is a cornerstone technology of the [World Wide Web,](https://en.wikipedia.org/wiki/World_Wide_Web) alongside HTML and [JavaScript.](https://en.wikipedia.org/wiki/JavaScript) CSS is designed to enable the separation of presentation and content, including [layout](https://en.wikipedia.org/wiki/Page_layout)[, colors,](https://en.wikipedia.org/wiki/Color) and [fonts.](https://en.wikipedia.org/wiki/Typeface) This separation can improve content [accessibility,](https://en.wikipedia.org/wiki/Accessibility) provide more flexibility and control in the specification of presentation characteristics, enable multiple [web pages](https://en.wikipedia.org/wiki/Web_page) to share formatting by specifying the relevant CSS in a separate CSS file, and reduce complexity and repetition in the structural content

* + 1. **Hardware development requirements**

It is used to research on existing systems and as well download resources for software development.

**Smart and featured phone**

Used for internet access, data collection and system testing.

**Computer (Laptop)**

Used for System design, development, testing and hosting locally using local servers like XAMP, Database Management System (Used for database design and development for efficiency).

* 1. **Testing**

**3.5.1 introduction**

Testing is an important part of the systems design. It involves checking for correctness, which is one of the focuses of the project. The best way to test to see if the system is working correctly, is to use black box testing (or functional testing). What black box testing does is to feed in inputs and obtain relevant outputs. These inputs and outputs are then studied and checked to make sure that they are the desired results, in order to make sure that the system is behaving properly. The testing process in systems like the one that we will attempt to build is not an easy job. We are planning to perform test in parallel with the implementation of the new system and we are going to follow some testing procedures described in the software engineering lliterature. We will first build our database and we will insert sample data in it. Note that even if the data that we will put are samples, they are going to be taken from our mighty LU. Here we have to mention that we will have of course a smaller in physical size database, than in a real environment, but the most important is the quality of the sample data. And this quality will be the quality of a real environment. The functionality of the database will be tested with sample operations, such as **queries**, **updates**, **insertions** and **deletions**. Then, we will test the functionality of each module with our database. The same testing approach we will follow with the new system. The various tests to be performed are: Unit testing, Integration testing, System testing and acceptance testing.

3.5.1 Unit testing

The software units in the system are modules and routines that are assembled and integrated to perform a specific function. As a part of unit testing, we will execute the program for individual modules independently. This enables, to detect errors in code and logic that are contained within each of the modules. This testing will include entering data i.e., filling forms and ascertaining if the value matches to the type and entered into the database. The various controls will be tested to ensure that each module performs its action as required.

3.5.2 Integration testing

Data can be lost across any interface; one module can have an adverse effect on another. Sub functions when combined, may not produce the desired major functions. Integration testing is a systematic testing to discover errors associated within the interface. The objective is to take unit tested modules and build a program structure. All the modules will be combined and tested as a whole.  
This testing provides the assurance that the application is a well-integrated functional unit with smooth transition of data.

**3.5.3 System testing**

Here the objective is to make sure that the system can perform the way the customer has asked it

to and that the system design has been implemented correctly. The two major issues that need to be taken into consideration here are: Functional testing and Performance testing

Functional testing checks that once the system has been integrated together, it works as desired,

by checking that the functional requirements have been satisfied.

Performance testing checks that the non-functional requirements have been satisfied. This will

include security matters, speed, accuracy, and reliability.

3.5.4 User acceptance testing

User acceptance of a system is the key factor for the success of any system. The OADR system which will be under consideration, will be tested for user acceptance by constantly keeping the records of applicants and making changes to the details and password whenever required.

* 1. **Validation**

Validation is one of the most important phases of project management and it can generally occur as one step or multiple steps of the process, usually in stages and is used to determine if the project is meeting end user’s expectations.

Therefore, validation will be carried out in order to assess the operational system to ensure that it meets the intended purpose and needs of the prospective end users and the developers

# References

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