

Design and Development of a University Portal for the Management of Final Year Undergraduate Projects

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ABSTRACT

Processes associated with undergraduate final year projects have always been a manual process which requires a lot of paperwork and could sometimes be a cumbersome and tiring task for the personnel in charge. The manual process sometimes leads to time wasting, impeding of project work because the student carrying out the project work is not able to update the lecturer on the level of execution of the project. Also due to unavailability of a content management system or repository, duplicity of previously carried out final year projects is experienced. It could be sensed by the project supervisors or the personnel in charge that this particular project has been done but where is the proof? Where is the system that out rightly bounces the topic back when the student puts it forward or bring forth a list of projects that has keywords present in the chosen project topic? This project work therefore, eliminates or reduces the error of allowing a student to carry out a project that has been done before as well as cutting down on the cost and time required by the student to produce a quality technical report. It also helps to prevent the forgery of signatures usually experienced during the final clearance stage of the students after the conclusion of the project work. During the clearance stages, the completed stages will be noted by the computer until the final stage of the clearance stage is completed and the print button can be clicked upon by the student to bring forth the completed clearance form. In this work, we developed an intranet portal platform that can integrate all the processes above into one system.

Keywords: Final year project, intranet, platform, portal, Management system

1.0 INTRODUCTION

Over the years, portals have become popular in the information system community. A web portal is seen as a special internet (or intranet) site designed to act as a gateway to give access to other sites. A portal aggregates information from multiple sources and makes that information available to various users. It provides a gateway not just to sites on the web but to all network accessible resources. It offers centralized access to all relevant content and applications [1]. Although there exists so many definitions of the web portal from various perspectives, a

common ground to the description of the portal is a single, personalized interface through which users access all information resources in a secure, consistent and customisable manner [2]. Portals connect users not only with everything they need but also with every one they need and provide all the tools they need to work together [4]. Portals were projected to turn the web from institution-centric repository of information to a dynamic user-centric collection of everything useful to the person in a particular role and this is projection has been realized [3]. Portals have these days become of interest in higher-education

institutions. University portals integrate campus-specific information and activities which is stored in the campus electronic vaults such as databases, file systems and existing application systems, with unstructured data (text) from on and off campus [4]. Portal technology is used as a tool to enhance institutional efficiency and productivity. The portal is seen as a system to get ourselves (institutions) organized to better form lifelong impressions [5]. It enables university information system users to communicate with the university information sub-systems securely. Most universities especially in developed countries are either developing or purchasing portal solutions for their needs. Been employed in a smaller setting or department, it can be used to automate processes and also enable communication and interaction. Interaction is defined as a reciprocal action or influence [6] or a way of communication or relation between persons [7]. Interaction underlines that in the education portal concept, learning is not just about covering content and it is not technology alone [8]. Communication in an education portal environment involves teachers, students and supporting administrative staff. The portal can provide its users with easier access to information as well as with information that is more relevant to them. Lack of or delayed communication can hamper progress and slow down the rate at which work is done. The setting up of a portal, to aid communication is a good step in the educational sector, as physical presence is not mandatory to be able to pass across message, data, information, documents or verify paperwork carried out by students. One of the solutions or functions provided by the portal is an automated and paperless system. Processes which would

have been done manually and resulted in the use of paper circulation, is now been made efficient by the adoption of the portal system.

2.0 OVERVIEW OF THE SYSTEM

The system is a portal used for the automation of the processes associated with the management of final year projects in the department of Electrical and Information Engineering, Covenant University, Nigeria. The processes start from the allocation of project supervisors to students down to the final clearance of the student after the project defence. The processes to be automated are outlined below.

- Allocation of project supervisors to student.
- Interface where students can check who their respective supervisors are and the various supervisors being able to check which students have been allocated to them for supervision.
- Communication Avenue between the students and project supervisor.
- Communication Avenue between the student, project supervisor and project co-ordinator.
- Uploading of the Initial project report to the various supervisors by students.
- Uploading of final project report to the repository by students.
- Clearance of the students after final year project defence

A Use Case Diagram of the system that displays the relationship between actors and use cases is shown in Fig. 1.

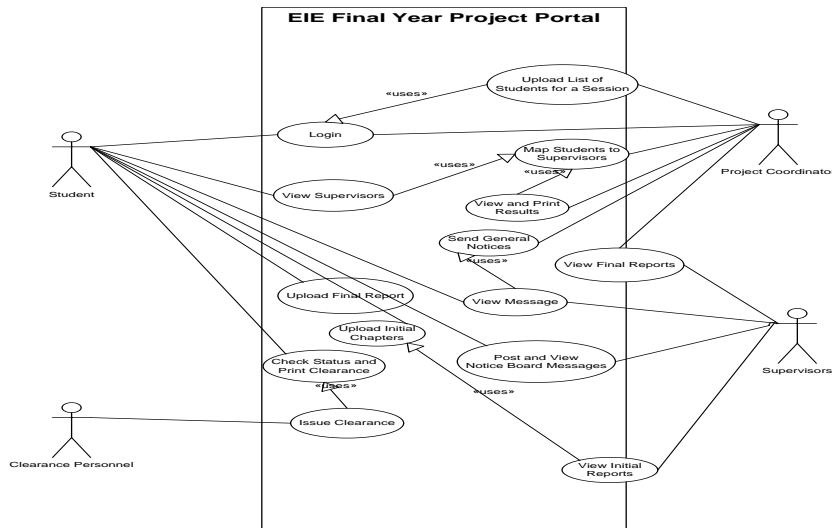


Fig 1: A Use-Case diagram describing the EIE final year project management portal

In the figure above, we have four actors and fourteen use cases. The four actors in this use case diagram are the project co-ordinator, students, project supervisors, and the clearance personnel. The project co-ordinator logs into the portal to upload the list of the final year students in the department and the current lecturers, he runs the program that maps students to the lecturers that will supervise them, he also communicates with both the lecturers and the students on any information as regards final year projects. The students log into the portal to check who their project supervisors are, communicate as regards the project topic and its implementation with their project supervisor, upload the soft copies of their project report so they can be corrected by the project supervisor, upload the final soft copy of the project report after the project defence and print their clearance form which is given to show that the student has submitted the necessary things. The project supervisor logs into the portal to know the students that has been allocated to him for supervision, checks the repository to see

if the submitted project topic by the student has been researched upon or implemented before, and communicates with them as regards their project topic, report and implementation. The clearance personnel logs in to clear the students as they submit the necessary equipment which include the project hardware or software, hard copy project report, soft copy project report and borrowed laboratory tools.

A class diagram in the UML is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods) and the relationships between the classes. The classes in a class diagram represent both the main objects and or interactions in the application and the objects to be programmed. In the class diagram these classes are represented with boxes which contain three parts. The upper part holds the name of the class, the middle part contains the attributes of the class and the bottom part gives the methods or operations the class can take or undertake.

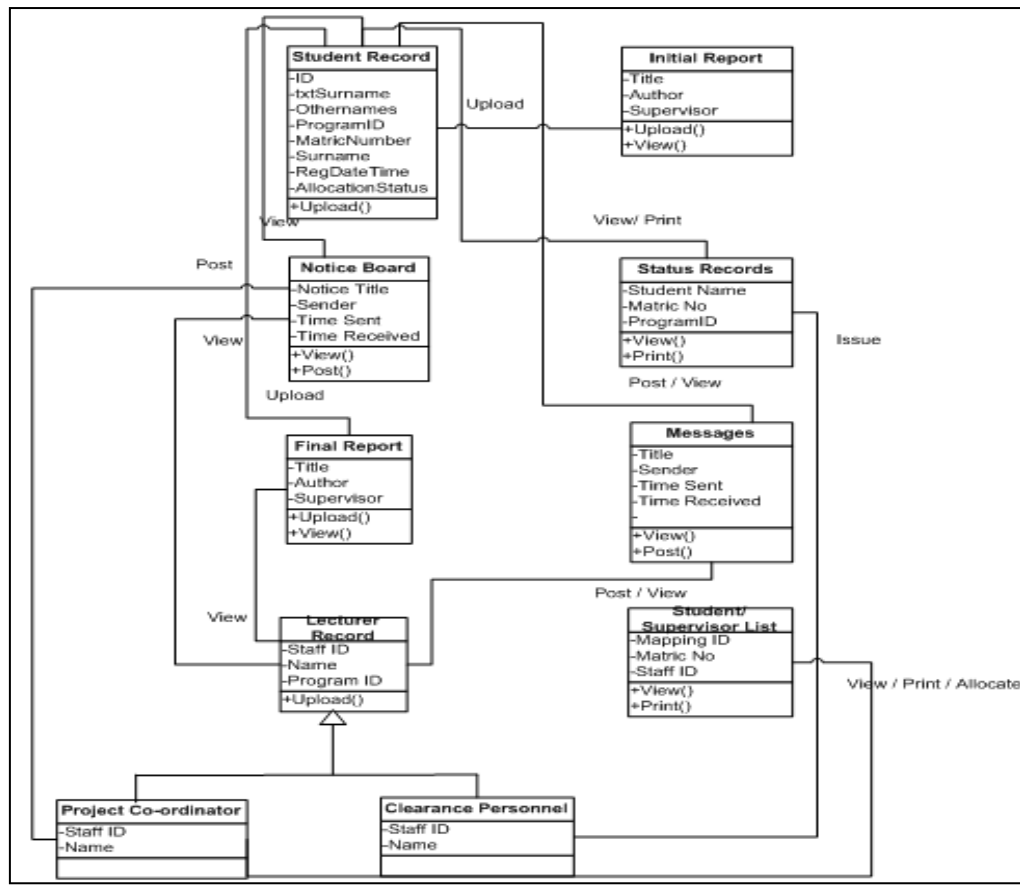


Figure 3: Class Diagram for the EIE Final Year Project Portal.

3.0 SOFTWARE DEVELOPMENT OF THE SYSTEM

3.1 CODING IMPLEMENTATION

The implementation of this project involved majorly coding/programming of the various interfaces. We have the project co-ordinator, supervisor, student and the clearance personnel interfaces. Each represented a particular module. In each of the modules, we have sub modules. Codes are written for each of the sub modules, there exist both a.aspx page and .aspx.cs page. These pages stand for a page written with asp.net and an asp.net page with a code behind language of c-sharp. There exist a master page which contains the features that are common to every module; this includes the

various banners and side bars, which are seen on all of the pages. Codes were written for the master page too. Described below are the programming languages employed in this project and the various functions they carried out in the actualization of the project.

3.2 HYPERTEXT MARKUP LANGUAGE (HTML)

HTML was employed in the front end design of the portal; its tags were used alongside the ones provided by ASP.NET. Cascading style sheets were also employed. Below is a Screenshot of the HTML codes employed in designing a part of the home page.

```
<html>
  <head>
    <title>Object reference not set to an instance of an object.</title>
    <style>
      body {font-family:"Verdana";font-weight:normal;font-size: .7em;color:black;}
      p {font-family:"Verdana";font-weight:normal;color:black;margin-top: -5px}
      b {font-family:"Verdana";font-weight:bold;color:black;margin-top: -5px}
      H1 { font-family:"Verdana";font-weight:normal;font-size:18pt;color:red }
      H2 { font-family:"Verdana";font-weight:normal;font-size:14pt;color:maroon }
      pre {font-family:"Lucida Console";font-size: .9em}
      .marker {font-weight: bold; color: black;text-decoration: none;}
      .version {color: gray;}
      .error {margin-bottom: 10px;}
      .expandable { text-decoration:underline; font-weight:bold; color:navy; cursor:hand; }
    </style>
  </head>

  <body bgcolor="white">

    <span><H1>Server Error in '/ProjectPortal' Application.<hr width=100% size=1 color=silver></H1>

    <h2> <i>Object reference not set to an instance of an object.</i> </h2></span>

    <font face="Arial, Helvetica, Geneva, SunSans-Regular, sans-serif ">
```

Fig. 4: Screenshot of the HTML codes employed in programming a section of the home page.

3.3 ASP.NET

ASP.NET which stands for active server pages dot net was employed as the server scripting language. It was used to create the dynamic web pages which make up the portal. It was engaged in the back-end design of this project. It helped to supply server controls which includes the HTML server controls (traditional HTML), web server controls (New ASP.NET tags) and the Validation Server Controls (for input validation). Most of the controls in ASP.NET were employed in this project. It provided security by use of the Login control (which provides login functionality), LoginStatusControl (to control the login status), the LoginName control (to display the current user name), a

LoginView control, to provide different views depending on login status etc. We have master pages that allow you to create a consistent look and behaviour for all the pages. The master page provides a template for other pages, with shared layout and functionality. The master page defines placeholders for the content, which can be overridden by content pages. The output page is a combination of the master page and the content page. When users request the content page, ASP.NET merges the pages to produce output that combines the layout of the master page with the content of the content page. Below is a Screenshot of the codes that programmed a part of the master page for this project.

```

<? Master Language="C#" AutoEventWireup="true" CodeFile="MasterPage.master.cs" Inherits="MasterPage" %>

<!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 id="Head1" runat="server">
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
<title>
Project Portal
</title><link rel="stylesheet" type="text/css" href="styles/PortalPagestyles.css" />
<script type="text/javascript">

//Contents for menu 1

var menu1=new Array()
menu1[0]='<a class="selected" href="Upload/UploadStudentList.aspx"> Upload Student List</a>'
menu1[1]='<a href="http://www.devaap.net">Upload Lecturer List</a>'

//Contents for menu 2, and so on

```

Fig. 5: A Screenshot displaying the codes for a part of the master page of the portal

3.4 C-SHARP LANGUAGE (C#)

C# was employed as the programming language for the code behind file. It was used to write the codes in the event handlers for the various events employed in the web pages and the portal as a whole. It was also used in writing sub-routines for the various methods employed in the web pages. Examples of some of the methods, out of the numerous methods present in the project, in which it was employed,

include; the Page_Load, getReportUrl, getReportText, btnSave_Click, btnSave_Click, btnUploadTheFile_Click, btnAllocate_OnClick, btnSave_Click, btnUploadTheFile_Click etc. It alongside ASP.NET and Microsoft SQL serve as the backbone languages and packages employed in the implementation of the portal.

Below is a Screen shot displaying a section of the codes written for one of the web pages.

```

using System;
using System.Collections;
using System.Configuration;
using System.Data;
using System.Linq;
using System.Web;
using System.Web.Security;
using System.Web.UI;
using System.Web.UI.HtmlControls;
using System.Web.UI.WebControls;
using System.Web.UI.WebControls.WebParts;
using System.Xml.Linq;
using ProjectPortal.Common.Data;
using ProjectPortal.Common.Utility;
using ProjectPortal.BusinessFacade;
using System.IO;

public partial class Student_ViewUpdatedReport : System.Web.UI.Page
{
    protected void Page_Load(object sender, EventArgs e)
    {
        Int64 UserId = Convert.ToInt64(Session["UserId"]);
        Int64 std = Convert.ToInt64(new UserSystem().RetrieveUser(UserId).UniqueUserId);

        lblCurrentOperation.Text = string.Format("Current Allocation List: ");
        gvList.DataSource = new StudentAllocationSystem().GetAllCurrentAllocation(std);
        gvList.DataBind();
    }
}

```

Fig. 6: Screenshot displaying a section of the codes written for one of the web pages.

3.5 MICROSOFT SQL SERVER 2005

This is the relational database management server that is used in the portal. It stores data in the form of tables. It is made of the following tables: Lecturers Record, Project

Allocation Record, Project Store record, Student Record, Supervisor Record, Users Record, and Notice Board Record.

Below are screen shots of the database and contents

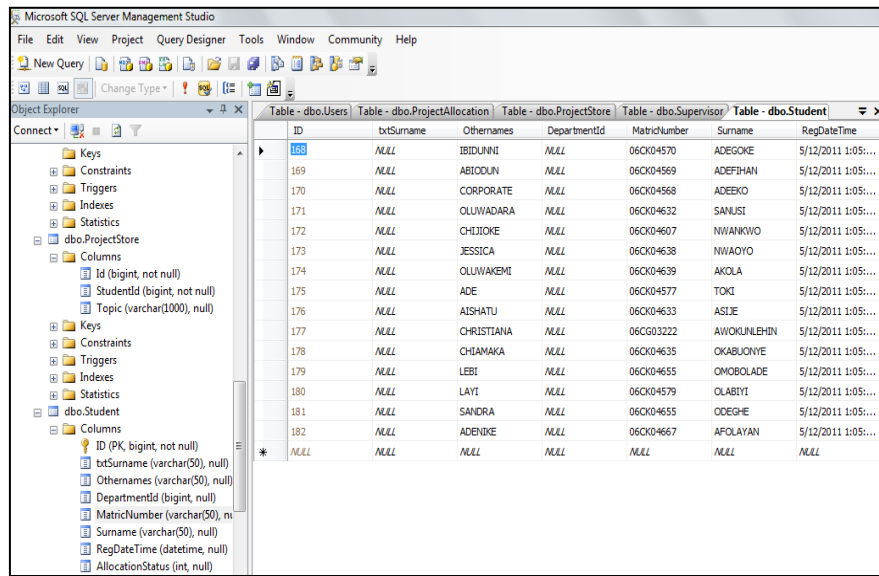


Fig. 7: Screenshot displaying the database application and the student table opened.

4.0 RESULTS

As described previously, four actors which include the project co-ordinator, project supervisor, the student and the clearance personnel will have access to the portals and the home pages or functionalities might defer with actor. Below

are the Screen shots of the various interfaces of the working system pertaining to the different actors.

4.1 LOGIN PAGE

This page appears the same for all actors. It is the first page every actor meets on typing the URL of the portal



Fig. 8: Screenshot showing the Login page

4.2 PROJECT CO-ORDINATOR MODULE

This is particular to the project co-ordinator. It is the first page he or she sees on logging into the portal

4.2.1 HOME PAGE

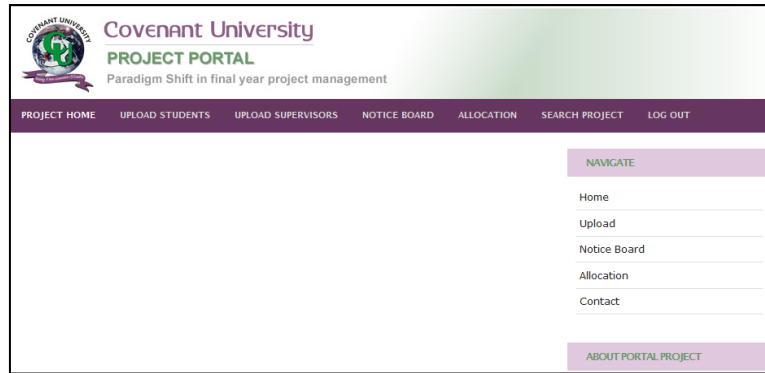


Fig. 9: Screenshot showing the Project Co-ordinator’s homepage.

4.2.2 ALLOCATION PAGE

This page comes up when the project co-ordinator clicks on the *allocation* button.

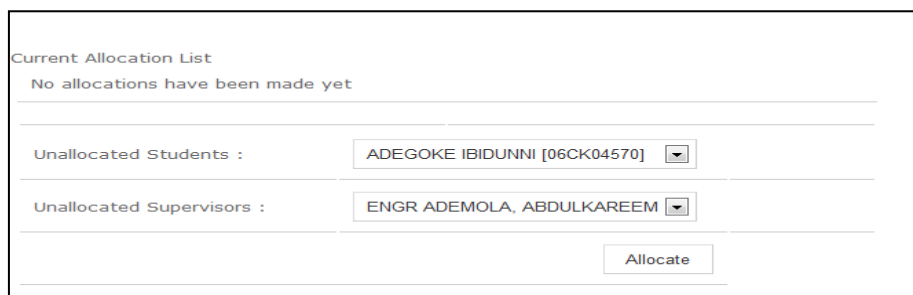


Fig. 10: Screenshot displaying the allocation page.

4.3 STUDENT MODULE

4.3.1 HOME PAGE

This is the page displayed after the student logs into the portal.



Fig. 11: This page displays the home page seen by the student

4.3.2 CHECK ALLOCATION PAGE

This is the page that is displayed when the student clicks on the *check allocation* button. This enables him or her to view his or her supervisor.

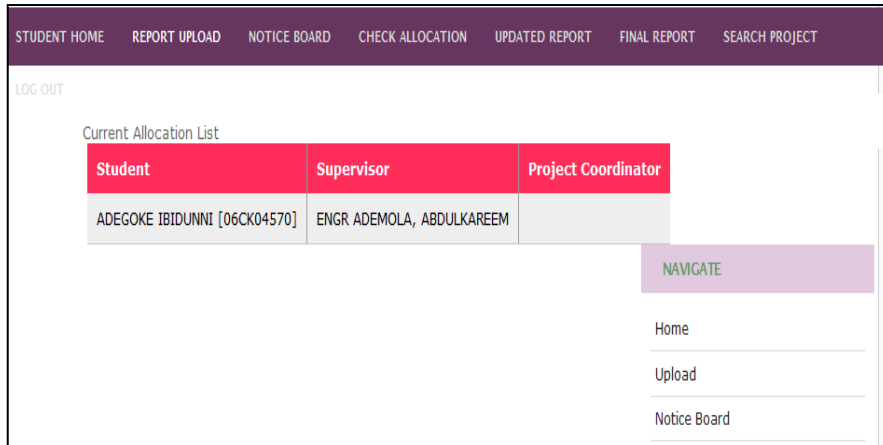


Fig. 12: Screenshot displaying the check allocation page.

4.3.3 REPORT UPLOAD PAGE

This is the page seen by the student when he or she clicks on the *report upload* button.

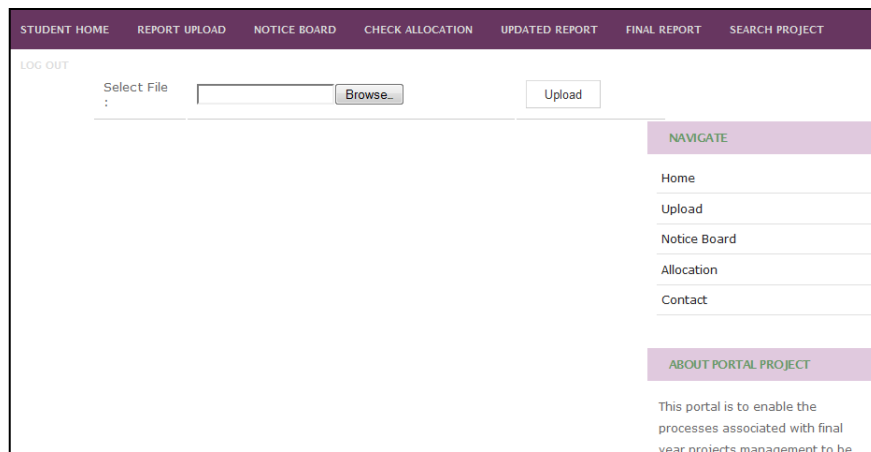


Fig. 13: Screenshot displaying the report upload page

4.4 PROJECT SUPERVISOR MODULE

4.4.1 HOME PAGE

This is page seen by the project supervisor when he or she logs into the portal.

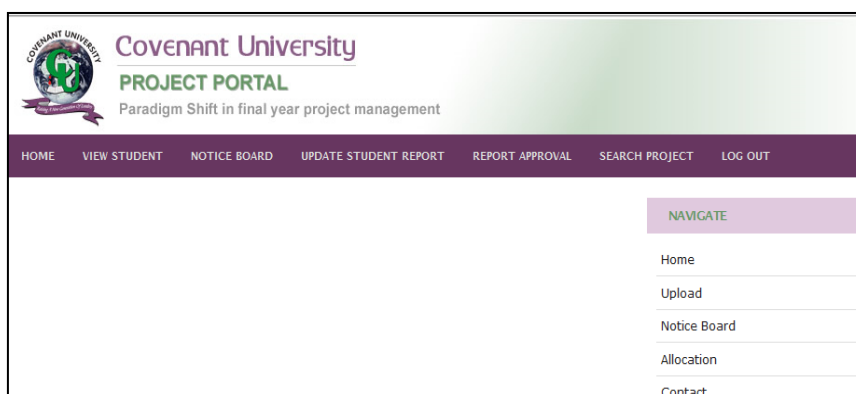


Fig. 14: Screenshot displaying the home page seen by the project supervisor.

5.0 CONCLUSION

This project was aimed at designing and developing a portal for the management of the processes associated with undergraduate final year projects in the department of Electrical and Information Engineering (EIE) of Covenant University. The aim and objectives of this project has been actualized. Although there were challenges during the coding/ programming, but a way was discovered to solve them. The ultimate achievements are: the portal has been able to prevent the duplication/ replication of final year projects, it has been able to automate the allocation of supervisors to students, students are able to communicate with their supervisors and vice versa, student are able to upload their initial reports and the respective supervisors able to review and update the reports and send it back to them. Effective clearance of students is made possible because, students do not have access to the clearance paper until they have fulfilled all the requirements to be cleared. This system can be utilized in any institution of learning.

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