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Digital Study Plan

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Abstract

Digital Study Plan is an online application, built as a web enabled project in ASP.net programming language. Its main purpose is to allow students to browse study plan anytime and anywhere reducing a lot of paper work. This application provides information about courses to the students who are joining the institution, students who are already studying in the institution and also to transfer students. This Digital Study Plan enables a student to check his remaining courses to be completed at any time as this application is online. The main goal is to enlighten the student about the available/remaining courses and their respective description along with credit hour information. The main modules of the project are: Admin/Advisor and Students

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Acknowledgment

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1. Project Description

1.1 Competitive information

Goal of this project is to manage the courses, students and admin modules or functionalities of Governors State University and is suitable for any educational domain which needs similar
aspects. A pure web application is designed and developed to meet the course and student management system and the entire access or control to the system is given for Admin role of the application. Two important roles are identified for this Digital Study Plan Web application i.e. Students and Admin, where their roles and responsibilities are assigned at the programming and database level, while they access the application with the privileges as provided. Admin will add, edit or update the courses and students information at various registration levels and student will login to the system view the profile and courses as per the requirements statement given.

1.2 Future enhancements

Current project is developed on Microsoft Visual Studio environment and has the web access features. Server is created on local host and in future the scope of the application can be extended by moving the application and database entities to client-server architecture. Mobile based access to the application can also be provided further, by deploying the Mobile OS i.e. Android, Windows or iOS features for the respective application.

2. Technical Description

2.1 Scope

Scope of proposed Digital Study Plan will enable the university students and admin to view access and update the courses and related information. Entire courses are mainly categorized into four types like pre-requisites, required, elective and transferred and the respective database management of these courses is done by Admin role of the system. Admin will create, update and edit the course details and assign them to the students of the university during registration. Edit or Update features are available only for Admin role and Student is just assigned with view functionality of his or her profile and login to the system. System will display all the course details and student profile details with rich user interface as developed
with C# web pages and SQL Server database tables. Required business logic of the system is developed with the Microsoft Visual Studio 2012 IDE and SQL Server 2012 DBMS.

2.2 High level functionalities of the system

Main features, functionalities and requirements of the proposed Digital Study Plan application are as provided

- Admin will access the course and student details against their database tables
- Students will login and view their profile and courses
- Courses are categorized under four types like Prerequisites, Core or required, Elective and transferred subjects, where the data will be fetched from the course tables from Database
- Courses are created, edited, updated against the student registration numbers of Admin role
- Students can view their profile with the data fetched from database and contains the details like Name, Student id, Course, Admission year, Contact details, Mobile number, email, GSU email, academic details, GPA and credits. This page is read-only for student role
- Admin will search the students with ID and fetch the details from database and further acts on the courses with the functionalities like Display, Create and Update
- These features are used to edit the student profile and respective courses by admin

2.3 Application Architecture

Architecture of the proposed Digital Study Plan System architecture is designed and implemented at the modular level against the roles of the application i.e. Students and Admin. System level dependencies, workflows and actions of these roles are characterized in this architecture and the corresponding architecture diagram is as shown below
Fig 2.3.1: Digital Study Plan Application architecture diagram

2.4 Project information or data flow diagrams

Information or Data flows will be among the Admin, Student and Course modules of the proposed Digital Study Plan and a high level flow diagram is shown below
2.5 Capabilities

Capabilities of the proposed system are estimated against the Software and Hardware Requirements considered while developing the application and they are as discussed below

2.5.1 Software Requirements

- Windows 7 or 8 64 bit operating system
- SQL Server 2008 Enterprise Edition Database Management system
- Visual Studio 2012 Web application development Platform
- ASP.Net and C#.net web technologies
2.5.2 Hardware Requirements

- Minimum 4GB RAM
- Minimum 250 GB Hard disk
- Intel Core i3 Processor or later

3. Project Requirements Analysis

Brief description and scope of the proposed Digital Study Plan web application and based on the functional requirements, detailed analysis of the actual requirements at module are defined in this section. All the requirements are identified at the user functionalities or roles level and further the additional requirements like maintenance, operations, administration and security are also discussed and given as below

3.1 Requirements Identification

Each and every requirement is given an unique ID and this is used to test the application further, once the code is ready and deployed and the list of requirements are as given

- **DSP_Admin_REQ0001**: Admin will access the application and have access to create, update and delete the students and courses with the interface components and database connectivity provided
- **DSP_AdminRS_REQ0002**: Admin will Register a new student to the system with a web access form and corresponding details like student name, id, course, contact details, email address and admission details
- **DSP_AdminAC_REQ0003**: Admin will Add courses to the system at the database level, where there are four different categories of courses i.e. Prerequisites, Core,
Electives and Transferred subjects. Each of the course will be identified by its Course ID and Type for further actions

- **DSP_AdminVS_REQ0004**: Admin will View the student details as registered with the system by searching the database using Student id
- **DSP_AdminUS_REQ0005**: Admin will Update the student profile and course details once the required student information is searched and fetched from database details
- **DSP_StudentLogin_REQ0006**: Student will Login to the System and can further access the functionalities as assigned to the respective role
- **DSP_StudentVPl_REQ0007**: Student will click on Profile Link to view his/her profile, which will display the registration details by fetching them from the database tables
- **DSP_StudentVC_REQ0008**: Students will click on the course links as categories at 4 level i.e. Prerequisites, Core, Electives, Transferred subjects and view the respective details like course id, course name, credits and other additional information

3.2 **Operational and Maintenance Requirements**

Entire application will be created and configured by Admin and has the complete access on the system. Admin will register, update or edit the course and student details of the system, where student is given view access.

4. **Project Design Description**

Digital Study Plan project is designed and implemented using C#.net development technologies and SQL Server 2012 Database management System. Application has three levels of requirements at the design level i.e. Admin, Student and Courses and the high level design description of these modules are as discussed
4.1 Admin Module

- Admin will create the database table as required for the application i.e. Student table, course table and respective data
- Admin will Register the students and generate user id and password for them
- Admin will add courses at four categories i.e. Prerequisites, Required or core, Electives and Transferred subjects
- Admin will search for student details and can either view, update or delete the respective information from/to database

4.2 Student Module

- Students will access the Digital Study Plan system by a login functionality as created by Admin against their student id and password
- Students will view their profile, which will contain the details like student name, student id, courses registered, contact and admission details
- Students will view their courses i.e. Already completed courses, current or required courses, elective courses and transferred courses along with the details like course id, course name, credits and other additional information as saved to the database tables

4.3 Additional UI Design aspects

- Entire web pages are designed with the UI elements, forms, CSS and images or icons as gathered from Governors State university website (http://www.govst.edu/)
- Home Page, Contact Page and About page are also displayed with the current Digital Study Plan Application and all the content is managed statically
- Student Login and Admin accessed pages will have the same UI, as loaded from the other pages of the web application and the required dynamic content as loaded or fetched from the database tables

5. Project Specifications and Interfaces
Specifications of the Digital Study Plan are further elaborated at the interface components and here UML Modelling is done and the required diagrams are shown below
5.1 Use cases

Two users have the primary roles over the proposed Digital Study Plan application and they include Student and Admin and the respective use case views are provided below.

5.1.1 Admin Use case scenario

Administrator of Digital Study Plan System has the complete access and control over the application in terms of adding, updating and editing the Student and Course Details and the respective use case scenarios are shown below.

![Admin Use case scenario diagram]

*Fig 5.1.1.1: Admin use case diagram*

5.1.2 Student Use case Scenario

Student has the author or view access on the system and the respective use case scenarios for the student role are shown in the below diagram.
5.2 Class Diagram

There are three important classes as identified for the current Digital Study Plan System and the actual attributes, parameters and methods of these classes are shown in the below Class Diagram


**Fig 5.2.1: Class Diagram**

5.3 Entity Relationship Diagram

Database entities or tables as required for the proposed Digital Study Plan System are analyzed and the corresponding relationships with the primary key and foreign key attributes are modelled and given in the below ER diagram
6. Testing

Entire design and implementation as done over the proposed Digital Study Plan is tested once the required coding and database development is completed at the unit level. Few unit test cases are created in parallel while developing the code and manual testing is adopted for testing the current project. Test cases are discussed with the respective outcome i.e. Application Snapshots and given below.

6.1 Home Page

Home page of the current Digital Study Plan Application will contain the University Logo and four buttons i.e. Home, About, Contacts and Courses. A simple page will be loaded on
left to the web page and centre of the page will contain some static information like Welcome Message and the actual outcome of this test case is given below

![Home page of Digital Study Plan System](image)

*Fig 6.1.1: Home page of Digital Study Plan System*

### 6.2 About Page

About page should be displayed on clicking the About Button from the Home page and this will redirect the page to Governors State University About Us static content. Few images will be loaded below to the buttons and some static content will be displayed and the actual outcome of this test case is as shown below
6.3 Coursed Page

Courses page is displayed once the Courses button is clicked and the navigation will redirect the users to a static page. This page should contain, static course details and information of the proposed system and the actual outcome of this testing is shown below.

Fig 6.3.1: Courses page of Digital Study Plan
6.4 Sign in page

Sign-in link will appear on the Home page and when the user clicks on this link, a separate web page should be displayed. This page will contain all the four buttons as mentioned in the home page, an image to the right side of the page and the centre of the page should hold the Login Form. This form will contain the UI elements like User name, Password, Remember me option with a check box and Login Button and the actual outcome of this test case is as shown below.

![Sign-in page](image)

**Fig 6.4.1: Sign-in page**

6.5 Admin Login

Admin should be able to login with the Login Form as discussed and the credential for successful login include, user id=1 and password=admin1 and the actual outcome of this test case is as provided.
Fig 6.5.1: Admin Login page of Digital Study Plan

6.6 Admin Home Page

Admin login on success, should display the Admin Home page with the university Logo, Sing out link, Enter Student ID Label, Input field and buttons like Display, Create and Update. Actual outcome of this test case is as shown below
6.7 Entering Student ID and Display Button onClick Event

Admin should be able to input the student ID and click the Display Button to view the corresponding student details. Actual outcome of this test case is as shown below.
6.8 Student Details page

Once admin enters the student id, further student details are displayed on a new web page with the information related to Student ID, First Name, Last Name and Back to Admin Home page link. Course details of the student as categorized against Prerequisites, Required, Elective and Transferred subjects are displayed in table over centre of the page and the actual outcome of this test case are shown below

![Student Required Courses View](image)

*Fig 6.8.1: Student Required Courses View*
6.9 Edit Functionality

Admin should be able to edit the details of student Edit Link and the page will be opened in edit mode. Actual outcome of this test case is as shown below
6.10 Update Functionality

Edited data should be updated to database and display back on the same page, when Admin clicks on Update button. Actual outcome of this test case is as shown below

![Updated Student Details](image)

*Fig 6.10.1: Updated Student details*

6.11 Create Student

Admin should navigate back to Admin home page, once the Back to Admin Link and able to create a new student details by clicking on the create button. Actual outcome of this test case is as shown below
Fig 6.11.1: Create new student form

Fig 6.11.2: Create new student with course details entered
6.12 Student Login

Student should be able to login with the Digital Study Plan web application with their student id and password and access the system by clicking on Login button. Actual outcome of this test case is as shown below.

![Student Login page]

*Fig 6.12.1: Student Login page*

6.13 Student Home Page

Student login on success, should display the home page with four links i.e. Profile, Prerequisites, Core and Electives and an image left to the page. Actual outcome of this test case is as shown below.
6.14 **Student Profile**

Students should be able to view their profiles in read-only page, once they click on the Profile Link. Outcome of this test case is as shown below.
6.15 Student Course Details pages

Students should be able to view their respective courses as created by admin under four categories i.e. Prerequisites, Required, Electives and Transferred. Outcome of this test case is shown in the below snapshots.

**Fig 6.15.1: Prerequisite courses page**

**Fig 6.15.2: Core courses page**
Primary objective of this project is to design and develop Digital Study Plan web portal for Governors State University. This system will enable the students to view their profiles and the corresponding courses at four categories i.e. Prerequisites, Required, Elective and Transferred. Two roles are created for this system like Admin and Student and the respective functionalities are implemented in Microsoft Visual Studio and SQL Server Database management. All the entities are identified based on the business logic and the respective tables are created and the database connectivity is done with the ASP.net and C#.net web pages. UI related elements like CSS and HTML are used from the website of Governors State University and rest of the functionalities are developed and deployed as mentioned in the previous sections. Admin has the entire access and control on the Digital Study Plan system and can add, edit and update both the course and student details. Thus, this system will enable a simple and quick course management for students of Governor State University.

7. Conclusion

Fig 6.15.3: Elective courses page
References


