Software Engineering Project Format
(Fall2023)

An Integrated University Department Information System (IUDIS)

Vladimir Nikulin, 3745471
Md Yasin Rahman, 3733078
Ammar Ismail 3714531

Advisor: Dr. P. K. Mahanti

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Preface

Universities have the combined challenge of upholding academic excellence while effectively managing their administrative procedures in a time of rapid technological breakthroughs and a constantly changing higher education landscape. There has never been a more pressing need for a streamlined and integrated approach to university department information management.

The objective of IUDIS is to completely transform how universities connect with, store, and use their data. This extensive system attempts to integrate multiple departmental tasks into a seamless, approachable platform, including student admissions, faculty management, research support, financial operations, and more.

The IUDIS project, which offers a uniform solution to streamline the intricate network of processes that support our academic endeavors, stands as a light of progress as universities work to adapt to a world that is becoming more and more digital. Transparency, accessibility, and scalability are upheld by the initiative, which promotes an atmosphere where data-driven decision-making is the norm.

As universities try to adapt to a world that is becoming more and more digital, the IUDIS project, which offers a consistent solution to streamline the intricate network of operations that support our academic aspirations, shines as a light of development. The project upholds transparency, accessibility, and scalability and encourages a culture in which data-driven decision-making is the norm.

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1.1 Overview

Purpose, Scope, and Objective

Purpose

- The primary objectives of the IUDIS project are as follows:
- Integration: Develop a system that integrates all departmental functions, including student records, laboratory-administration, faculty assignments, financial transactions, and research contract reporting.
- Efficiency: Streamline administrative processes to reduce manual effort, minimize paperwork, and improve the decision-making process.
- Accessibility: Provide a user-friendly interface accessible to all authorized users, including faculty, chair of department and administrative staff.
- Scalability: Build a system that can accommodate future growth and evolving departmental needs.

Scope of Work

- Requirements analysis and documentation.
- System design and architecture.
- Development of the IUDIS platform.
- Integration with existing university systems (e.g., student information system, finance system)
- User acceptance testing (UAT).

Objectives

- **Streamlined Operations:** To simplify and automate complex administrative processes within universities, reducing redundancy and inefficiency.
- **Enhanced Accessibility:** To make critical information and services easily accessible to administrators, faculty, and students through a user-friendly interface.
- **Data-Driven Decision-Making:** To promote a culture of data-driven decision-making by providing real-time analytics and reporting capabilities.
- **Scalability:** To create a system capable of adapting to the evolving needs of universities, accommodating growth and changes in technology.

1.2 Project description

Goal: The primary objective of the Integrated University Department Information System (IUDIS) project is to revolutionize how our university manages administrative processes and information. We aim to create a comprehensive and user-friendly system that enhances operational efficiency, promotes data-driven decision-making, and simplifies interactions across various university departments.

Services to Be Provided by IUDIS:

- Connection to university system
- Student records,
- Laboratory-administration,
- Faculty assignments,
- Financial transactions
- Research contract reporting.

Project Approach: For critical features such as student admissions, faculty management, and research support, we will write custom programs to support these functionalities. This approach allows us to tailor the system to our university's specific needs and requirements. For financial operations, we plan to integrate IUDIS with existing financial software to leverage the capabilities of proven and reliable financial tools. In summary, the IUDIS project's goal is to transform our university's administrative processes through a combination of custom software development and strategic integration with existing software solutions. This approach ensures that we meet our objectives efficiently while maintaining the highest standards of data security and user experience.

1.3 Team profile

Java Developers: Vladimir Nikulin (backend)**,** Md Yasin Rahman (frontend), Ammar Ismail

- Write, test, and maintain Java code.
- Collaborate with architects to implement features.
- Debug and troubleshoot issues.

Quality Assurance: Ammar Ismail

- Develop and execute test plans.
- Identify and report defects.
- Ensure software quality and reliability.

Database Administrator: Vladimir Nikulin

- Manage the project's database systems.
- Optimize database performance.
- Ensure data security and integrity.

Software Architect: Md Yasin Rahman

- Define the system architecture and design.
- Ensure the project adheres to best practices.
- Review and approve technical decisions.

1.4 Assumptions and Constraints

Assumptions:

- **Stakeholder Collaboration:** The success of the IUDIS project assumes active collaboration and engagement from all relevant stakeholders, including administrators, faculty, students, and IT personnel.
- **Adequate Funding:** The project assumes that the necessary funding and resources will be available throughout the project lifecycle to support development, implementation, and maintenance.
- **Availability of Skilled Personnel:** It is assumed that skilled developers, project managers, and IT professionals will be available to design, develop, and maintain the system effectively.
- **Data Availability:** The project assumes access to accurate and complete data from existing university systems for integration into IUDIS.
- **Compliance with Regulations:** IUDIS will adhere to all relevant data protection and privacy regulations, and it is assumed that these regulations will not undergo significant changes during the project.
- **Network Infrastructure:** The project assumes that the university's network infrastructure is capable of supporting the system's data transfer and access requirements.
- **User Training:** It is assumed that adequate training resources and programs will be available to ensure that users can effectively utilize the system.

Constraints:

- **Budgetary Constraints:** The project operates within a predefined budget, which may limit the scope of customization and feature development.
- **Time Constraints:** There is a fixed timeline for project completion, which may impact the thoroughness of testing and implementation.
- **Resource Limitations:** Availability of skilled personnel and IT resources may be limited, potentially affecting project timelines and scope.
- **Legacy Systems:** The need to integrate with existing legacy systems can impose constraints on data migration and system compatibility.
- **Data Quality:** Inaccurate or incomplete data in existing systems may pose challenges during data migration and integration.
- **Security and Privacy Regulations:** Strict adherence to data security and privacy regulations may limit certain data processing and sharing capabilities.
- **Change Management:** Resistance to change within the university community may impact the successful adoption of IUDIS.
- **Hardware and Software Compatibility:** Compatibility issues with existing hardware and software can constrain system implementation.
- **Scalability:** The system's scalability may be limited by available resources and infrastructure.
- **User Acceptance:** The successful adoption of IUDIS relies on user acceptance and engagement, which can be influenced by various factors, including the system's design and usability

1.5 Project Schedule

The schedule for this project can be broken down by target-goals and man hours as follows:

Human hours(hh)

Task	**Sept(15)**	**Sept (22/29)**	**Oct (6/13)**	**Oct (20/27)**	**Nov(3/10)& Nov(17/24)**	**Dec(1)**
Project plan	4hh	6hh				
Project Organization& Information		8hh	10hh			
Finalize Results				12hh	8,6hh	
Write Draft of Report					,6,6hh	
Formulate Presentation					6,6hh	
Present Project Report						3hh

2.0 Project organization:

Organizing a project step by step as a team involves careful planning, effective communication, and collaboration among team members. Here is a step-by-step guide to help you organize a project as a team:

Step 1: Define the Project

1.1 Identify the Project Objectives:
- Clearly define the purpose and goals of the project. What do you aim to achieve?

1.2 Scope the Project:
- Determine the project's boundaries, including what is and isn't part of the project.

Step 2: Assemble Your Team

2.1 Identify Team Members:
- Select individuals with the necessary skills and expertise to complete the project.

2.2 Define Roles and Responsibilities:
- Assign specific roles and responsibilities to team members, including a project manager or leader.

Step 3: Create a Project Plan

3.1 Develop a Project Timeline:
- Create a timeline with milestones and deadlines for each phase of the project.

3.2 Define Tasks and Activities:
- Break down the project into actionable tasks and activities. Assign responsibilities for each task.

3.3 Allocate Resources:
- Determine the resources (e.g., budget, equipment, materials) needed for the project.

Step 4: Communication and Collaboration

4.1 Establish Communication Channels:
- Decide on the tools and methods for team communication, such as email, project management software, or regular meetings.

4.2 Set Meeting Schedules:
- Schedule regular team meetings to discuss progress, issues, and updates.

Step 5: Risk Assessment and Mitigation

5.1 Identify Risks:
- Identify potential risks and obstacles that could impact the project's success.

5.2 Develop Mitigation Strategies:
- Create plans to mitigate or manage identified risks.

Step 6: Execute the Project

6.1 Begin Task Execution:
- Start working on project tasks as per the project plan.

6.2 Monitor Progress:
- Keep track of the progress of each task and the project as a whole.

6.3 Address Issues:
- If issues or obstacles arise, address them promptly and collaboratively.

Step 7: Quality Assurance

7.1 Ensure Quality:
- Implement quality control measures to ensure that project deliverables meet the required standards.

Step 8: Stakeholder Communication

8.1 Keep Stakeholders Informed:
- Regularly update stakeholders on project progress, changes, and any potential impact on them.

Step 9: Project Documentation

9.1 Maintain Records:
- Keep detailed records of project activities, decisions, and communication.

Step 10: Testing and Validation

10.1 Test Deliverables:
- Verify that project deliverables meet requirements and objectives.

Step 11: Review and Adjust

11.1 Review Progress:
- Regularly review the project's progress against the timeline and objectives.

11.2 Adjust as Needed:
- Make adjustments to the project plan if required based on feedback and changes in circumstances.

Step 12: Project Closure

12.1 Obtain Stakeholder Approval:
- Ensure that project stakeholders approve the project's deliverables.

12.2 Release Resources:
- Release any resources tied to the project that are no longer needed.

12.3 Evaluate the Project:
- Conduct a project review to identify lessons learned and areas for improvement.

3.0 UML GRAPH

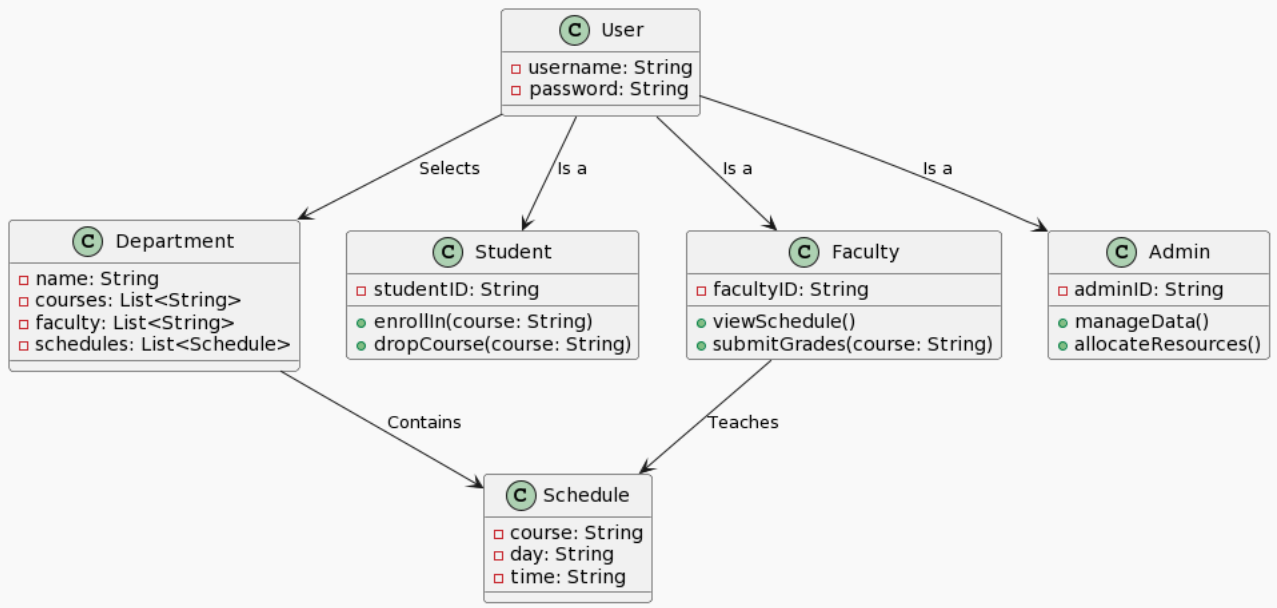

Figure:UML DIAGRAM

4.0 ER DIAGRAM:

Entity-Relationship (ER) diagram for an Integrated University Department Information System refers to the relationship between Data objects.The Data base for Integrated University Department Information System has the following entities:

1. ***University***: Represents the whole university.

   Attributes: University ID, Name, Location, Contact Information, etc.

2. ***Department***: Represents individual departments within the university.

   Attributes: Department ID, Name, Head of Department, Location, etc.
3. ***Faculty:*** Represents the faculty members working in the university.

   Attributes: Faculty ID, Name, Contact Information, Department ID, etc.
   Student: Represents the students enrolled in the university.
4. ***Student***: Represents the students enrolled in the university.

   Attributes: Student ID, Name, Contact Information, Major, etc.
5. ***Course:*** Represents the courses offered by the university.

   Attributes: Course ID, Name, Credits, Department ID, etc.
6. ***Enrollment:*** Represents the enrollment of students in courses.

   Attributes: Enrollment ID, Student ID, Course ID, Enrollment Date, etc.
7. ***Teaching:*** Represents the assignment of faculty to teach courses.

   Attributes: Teaching ID, Faculty ID, Course ID, Semester, Year, etc.
8. ***Support Staff:*** Represents non-academic staff working in the university.

   Attributes: Staff ID, Name, Contact Information, Department ID, Role, etc.

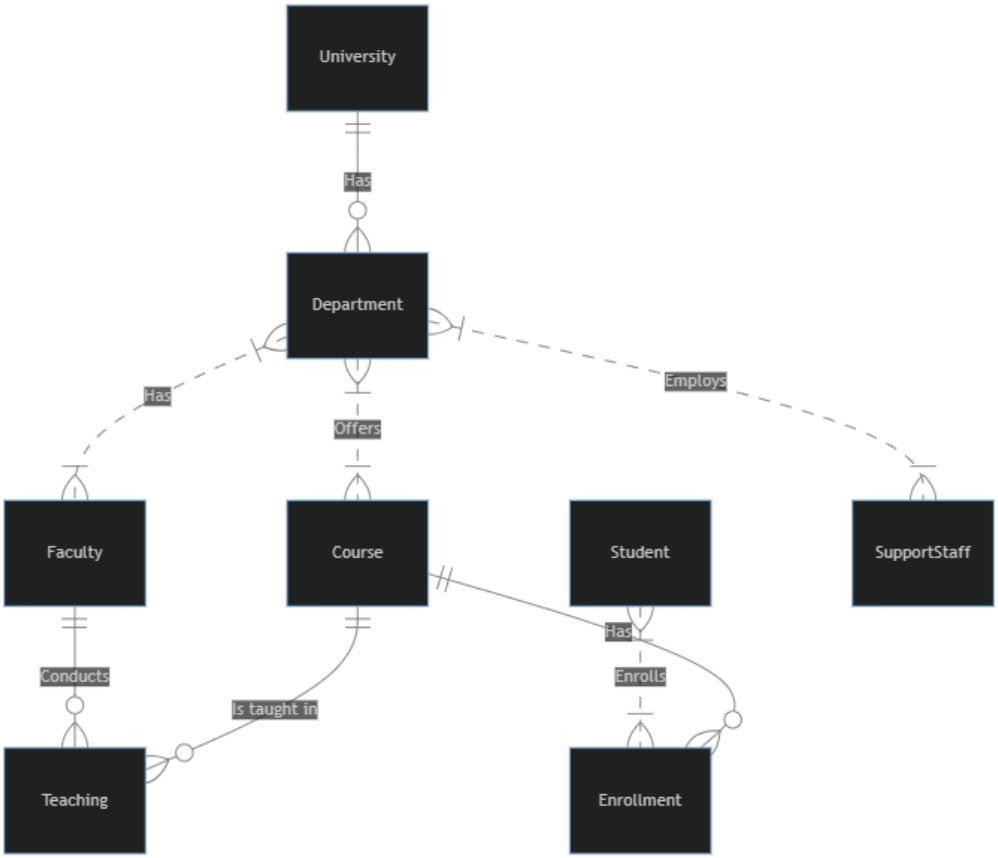

Figure: ER Diagram

5.0 Activity Diagram:

Here is an activity diagram of our Integrated University Department Information System:

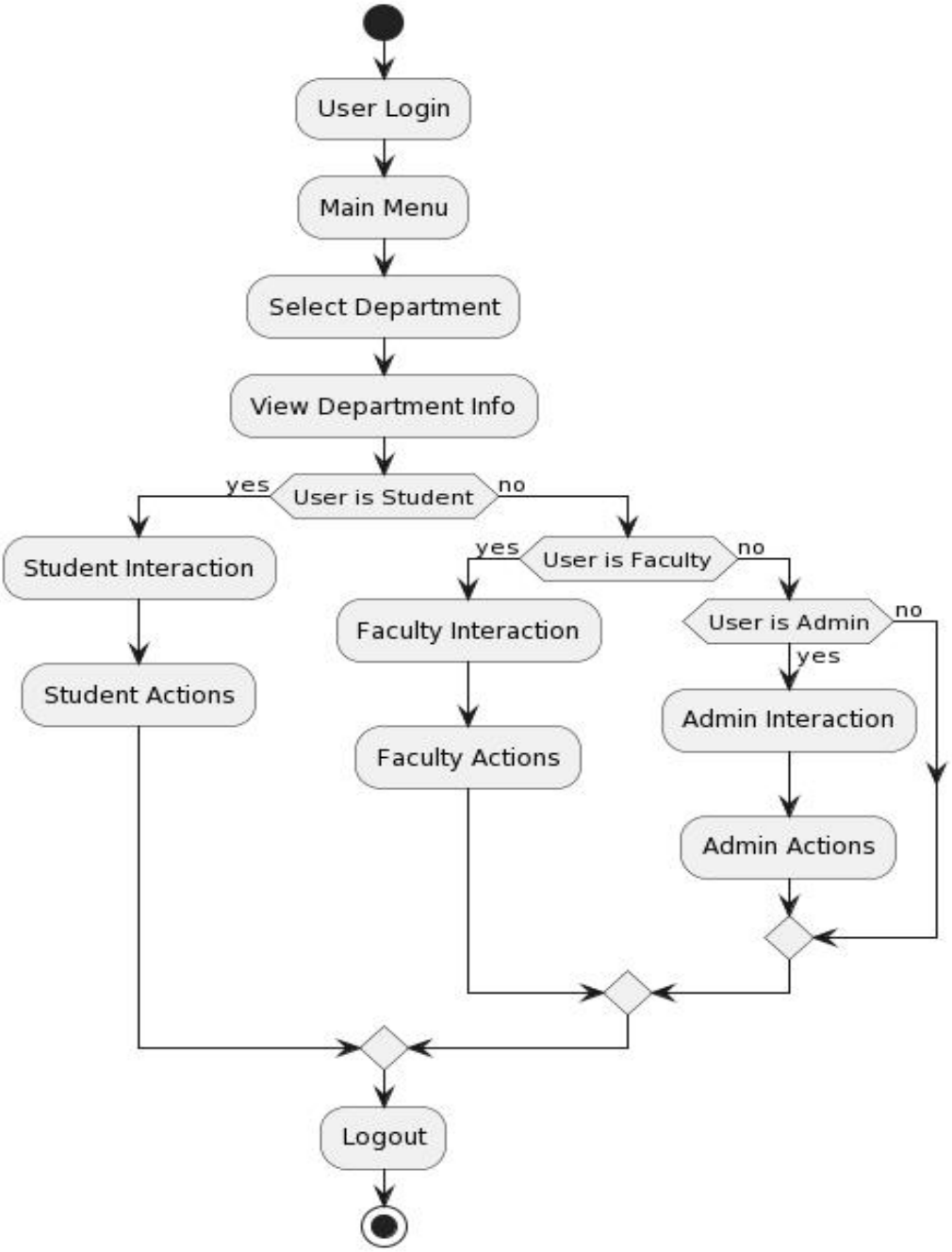

Figure: Activity Diagram

6.0 Interface (login Screen):

Here is a login interface we designed for our Integrated University Department Information System.

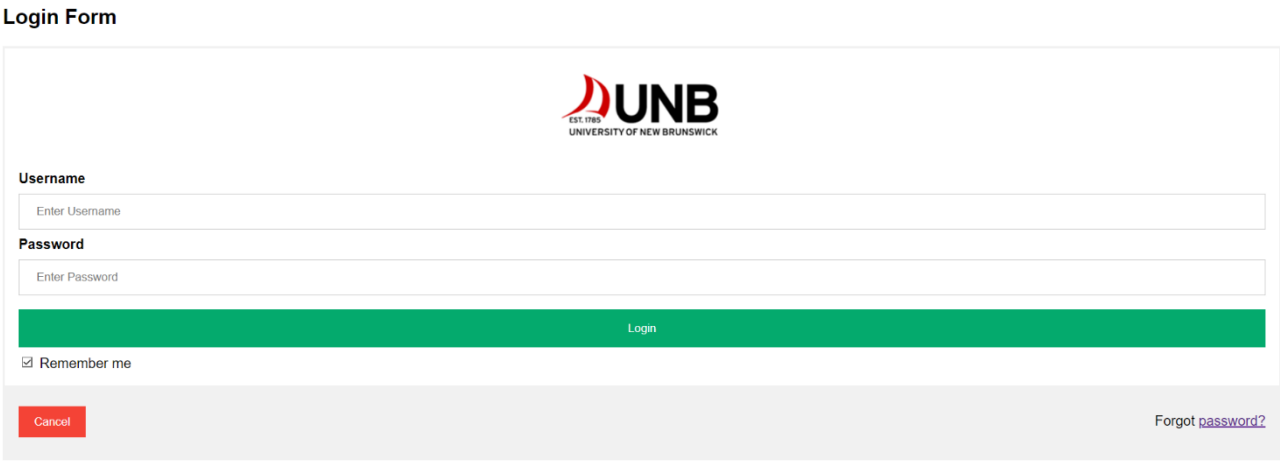

Figure: Login interface

We have designed an interface where the users will give their credentials and the webpage will direct the user to the designated page. It also includes an 'remember me' option which enables users to save their login credentials.