A Web Based Project on

"Academic Data Repository System"

The University of Burdwan

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• Acknowledgment

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We wish to affirm that this project was completed solely by us and represents our original work.

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❖ This is to certify that this project entitled **"Academic Data Repository System"** submitted by Anirban Santra (Roll No. 210342000006), Subhra Shaw (Roll No. 210342000062), Subhradeep Kundu (Roll No. 210342000063), and Debayan Kumar Adak (Roll No. 210342000020), students of the Department of Computer Science, Government General Degree College, Singur, Hooghly, West Bengal, in partial fulfilment of the requirement for the award of Bachelor of Science by The University of Burdwan, West Bengal, is a record of the students' own study carried out under my supervision and guidance. This report has not been submitted to any other university or institution for the award of any degree.

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Contents

1. Introduction

"Academic Data Repository System" is a web-based project specifically developed for official use by colleges. This system stores comprehensive data about each teacher, including their qualifications, publications, and conference details. Additionally, it maintains records for every department, covering user details, faculty research information, student results, and activity-related data etc.

Access to the system is controlled by authentication, ensuring that users only have limited access to the data relevant to them. Users can view and download their own details in .csv format. Data is periodically updated to reflect current activities and accomplishments.

The admin has complete control over the system, with full access to all user's data (personal info, promotion details, conference details, publication details, course details and award details) and departmental data (seminar info, routine details, book details, faculty research info, student activity details). The system is also capable of storing documents in various formats, such as .pdf, .jpg, .jpeg, and .png, which can be retrieved as needed.

Each user can access the relevant information from their personal computer or laptop or mobile, ensuring convenience and flexibility. The **"Academic Data Repository System"** not only enhances data management efficiency but also ensures the security and integrity of sensitive academic information. This centralized system streamlines administrative processes and supports better decision-making within the institution.

- **Section 1** provides a brief introduction to the project.
- **Section 2** explains the project's objectives.
- **Section 3** describes the technical design with ER diagram and DFD.
- **Section 4** details the implementation information (e.g., frontend, backend) and the tools used (e.g., VS Code, XAMPP).
- **Section 5** presents the system's outcomes or results, including related screenshots.
- **Section 6** is the conclusion.
- **Section 7** outlines future improvements that we plan to develop.

2. Project Objective

After developing this system, we are able to overcome the following problems:

1. We had to store different details such as result details, user details, seminar details, etc., in separate files. Some details also varied across different academic sessions, like result details and routine details. This made it difficult to maintain such a large number of files.

2. It was difficult to find the actual data as it was scattered in different folders.

3. All the details were stored on only one computer, which was inefficient for access, i.e., each user couldn't access their related data from their own machines.

4. It was difficult to associate images with the relevant information. For example, the conference image folder consisted of 1000 images, making it very difficult to relate each image to its respective conference.

5. Retrieving specific information required manual searching.

6. There was a lack of security or authentication. Any user operating the computer where all the information was stored could view any data, which was not permitted.

3. Technical Design

MySQL is an open-source relational database management system used for storing and managing data. PHP is a popular server-side scripting language designed for web development. Together, they are commonly used in building dynamic, database-driven websites and applications.

3.1. Database Design

We used MySQL as the database for this project due to its free availability and ease of use. MySQL is a popular open-source relational database management system that is widely adopted in the industry. Its reliability, scalability, and performance make it an excellent choice for a wide range of applications, from small projects to large-scale enterprise systems.

One of the key advantages of MySQL is its user-friendly interface and straightforward setup process, which allows developers to quickly start working with databases. MySQL also provides robust support for SQL (Structured Query Language), enabling complex queries, transactions, and data manipulations with ease.

Additionally, MySQL offers strong security features, including user authentication, data encryption, and secure connections, which help protect sensitive information and maintain data integrity. The database system's compatibility with various programming languages, such as PHP, Python, and Java, ensures seamless integration with different backend technologies.

Moreover, MySQL's active community and comprehensive documentation provide a wealth of resources for troubleshooting, learning, and optimizing database performance. Its support for ACID (Atomicity, Consistency, Isolation, Durability) properties

3.1.1 Entity Relationship Diagram (ERD)

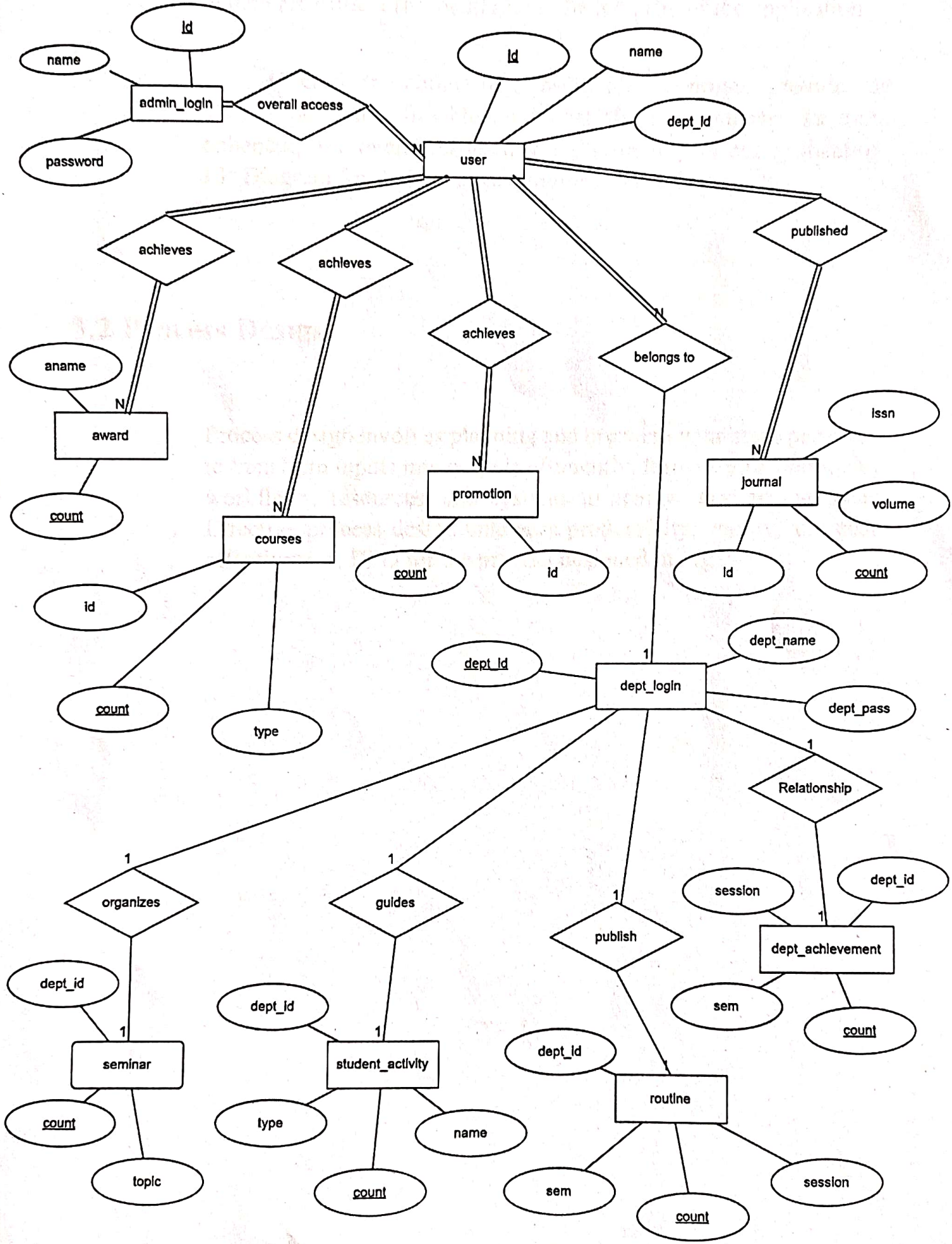

Fig 1: ER Diagram

guarantees reliable transaction processing and data consistency, which are critical for maintaining the integrity of the application.

Overall, the choice of MySQL for our project provided us with a powerful, flexible, and cost-effective database solution, enhancing the overall efficiency and reliability of our application. ER Diagram for that database provided in Fig 1-

3.2 Process Design

Process design involves planning and organizing the steps necessary to transform inputs into outputs efficiently. It focuses on optimizing workflows, resources, and systems to achieve desired outcomes. Effective process design enhances productivity, quality, and cost-effectiveness. DFD for the process designed in Fig 2-

3.2.1 Data Flow Diagram (DFD)

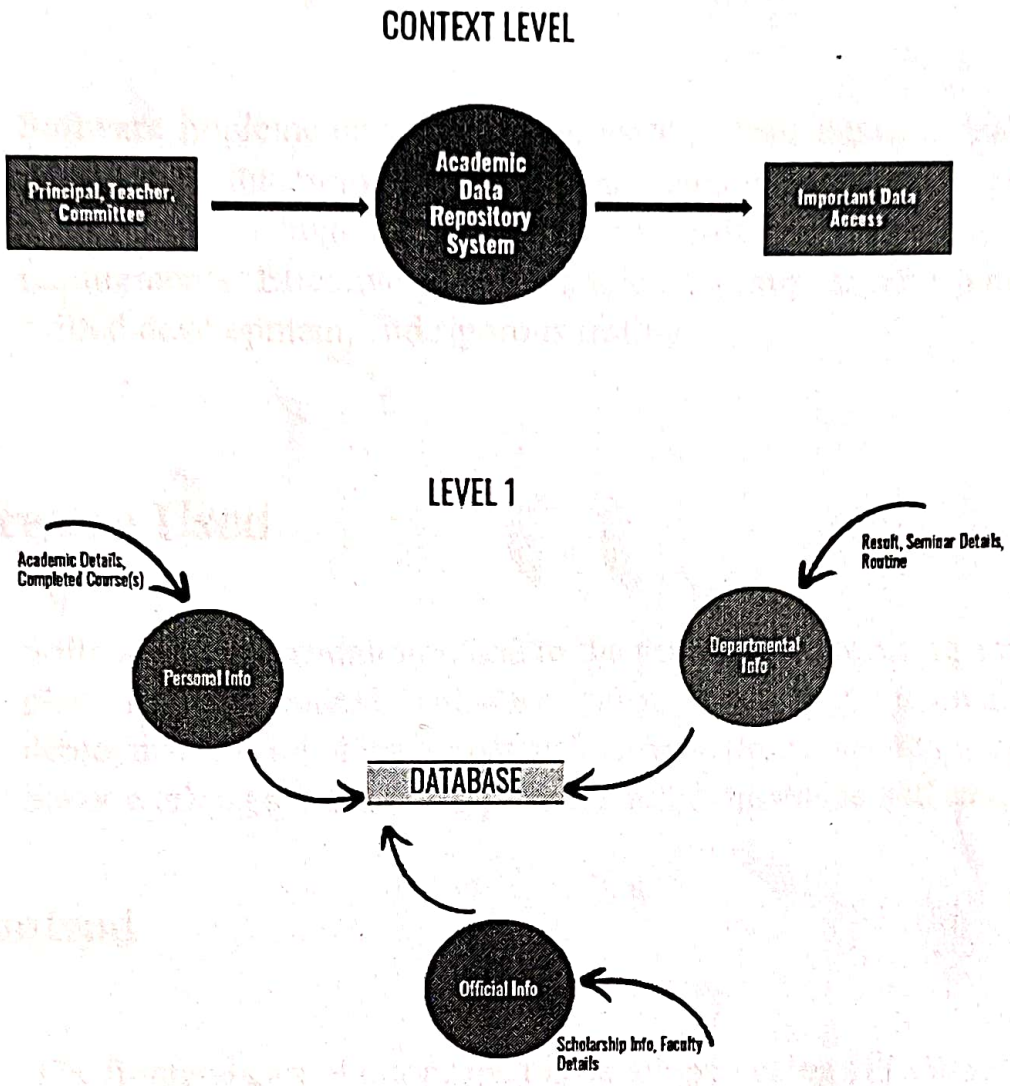

Fig 2: Data Flow Diagram

4. Implementation

Software implementation is the process of translating a design or plan into a functioning software application. It involves coding, testing, and debugging to ensure the software meets specified requirements. Effective implementation requires careful planning, skilled development, and rigorous testing.

4.1 Software Used

Software implementation refers to the process of executing a design plan into functional software through coding, testing, and deployment. It involves translating specifications and requirements into a working system using programming languages and tools.

4.1.1 Frontend

The frontend part of our project is developed using HTML5, CSS3, and JavaScript. We utilized JavaScript for client-side validation, ensuring that user inputs are checked and validated before being sent to the server. This enhances the user experience by providing immediate feedback and reducing the load on the server.

In addition, we leveraged the CSS framework Bootstrap to streamline the design process and create a responsive, visually appealing interface. Bootstrap offers a comprehensive collection of pre-designed components and utilities, such as navigation bars, buttons, forms, and grids, which helped us build a cohesive and consistent layout quickly and efficiently.

By combining HTML5, CSS3, and JavaScript with Bootstrap, we were able to develop a dynamic and interactive frontend. HTML5 provided the structure and semantics for our web pages, CSS3

allowed us to style and animate elements with precision, and JavaScript enabled us to add interactivity and functionality. This combination ensured that our frontend was not only aesthetically pleasing but also highly functional and user-friendly. Overall, the use of these technologies allowed us to create a robust and engaging frontend for our project.

4.1.2 Backend

We used PHP to develop the backend part of our project due to its ease of use and user-friendly interaction with the server. PHP is a widely-used, open-source scripting language that is particularly well-suited for web development. Its syntax is straightforward and easy to learn, making it accessible for developers of all skill levels.

One of the main advantages of PHP is its seamless integration with various databases, such as MySQL, PostgreSQL, and SQLite. This makes it an ideal choice for creating dynamic web applications that require robust data management capabilities. PHP also offers extensive built-in functions and a vast array of libraries and frameworks, which can significantly speed up the development process and reduce the amount of code that needs to be written from scratch.

Furthermore, PHP's compatibility with most web servers, including Apache and Nginx, ensures that it can be easily deployed in different hosting environments. The language's strong community support and comprehensive documentation provide valuable resources for troubleshooting and learning best practices.

Overall, PHP's user-friendly nature, powerful features, and flexibility make it an excellent choice for backend development, allowing us to create a reliable and efficient server-side infrastructure for our project.

4.2 Tools Used

The following tools are used in the development of our project-

4.2.1 VS Code

We used Visual Studio Code (VS Code) for writing the corresponding code because it provides a very helpful and user-friendly environment. The integrated error checking mechanism is particularly beneficial for programmers, allowing them to identify and resolve issues quickly. Additionally, VS Code offers a wide range of extensions and plugins, which enhance productivity by adding functionalities such as syntax highlighting, code snippets, and debugging tools. The intuitive interface and customizable features make it an excellent choice for both beginners and experienced developers. Overall, using VS Code significantly improves the efficiency and quality of the coding process.

4.2.2 XAMPP

We used the PHP programming language to develop the backend part of our project. To facilitate this, we utilized XAMPP, which provides an excellent environment for interacting with the server. XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, which includes Apache HTTP Server, MariaDB, and interpreters for scripts written in PHP and Perl.

By using XAMPP, we were able to easily set up a local server, which is essential for testing and development purposes. It simplifies the process of managing databases, running PHP scripts, and debugging code. The user-friendly control panel of XAMPP allows us to start and stop services with a single click, manage server configurations, and monitor server logs. Moreover, its compatibility with different operating systems makes it a versatile tool for developers working in various environments. Overall, XAMPP

significantly enhances our development workflow by providing a stable and efficient server setup for our PHP-based backend.

5. Result and Discussion

The results section presents the data and findings gathered during the project, showcasing key outcomes and trends. The discussion interprets these results, explaining their significance, implications, and potential areas for further research.

5.1 Individual Section

This section contains detailed information for each teacher, including personal information, promotion details, conference details, publication details, course details and award details. Each individual user can view and download their respective information as needed, ensuring they have easy access to their professional records.

5.1.1 Personal Details: This part contains name, email, qualification etc related information. Following Fig 3 described it-

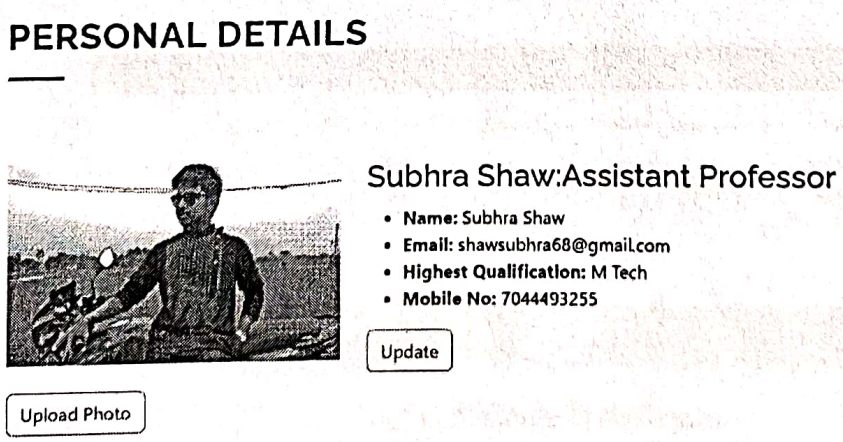

Fig 3: Personal Details

5.1.2 Promotion Details: Promotion details section includes promotion date, previous promotion level, current promotion level etc as in Fig 4-

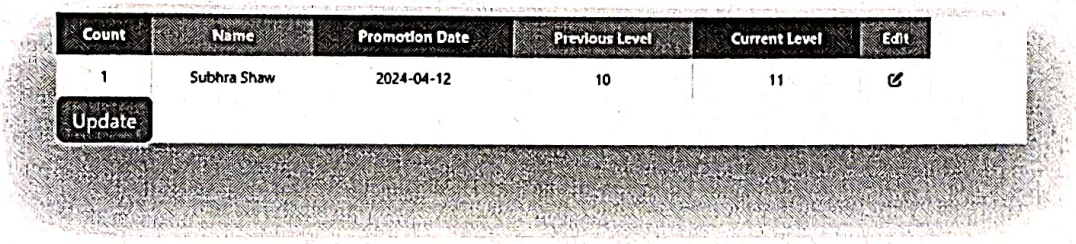

Fig 4: Promotion Details

5.1.3 Conference Details: This section includes conference name, venue, duration etc information as in Fig 5-

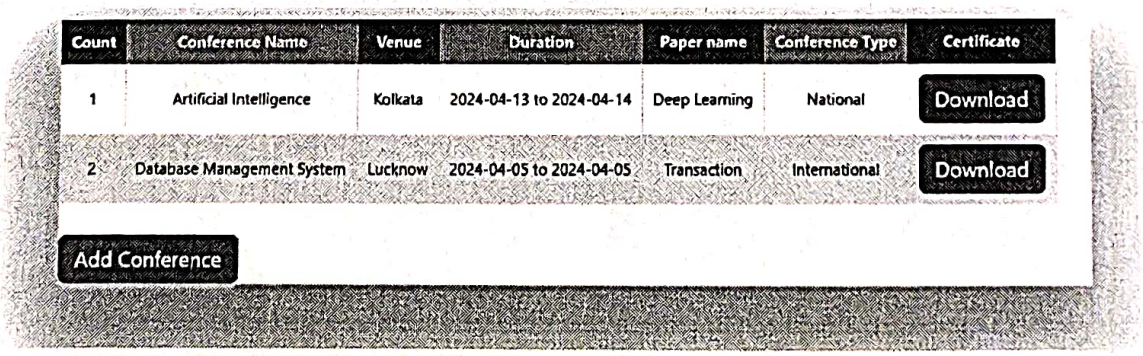

Fig 5: Conference Details

5.1.4 Publication Details: Publication details includes journal publication, book publication details as in Fig 6 and Fig 7 -

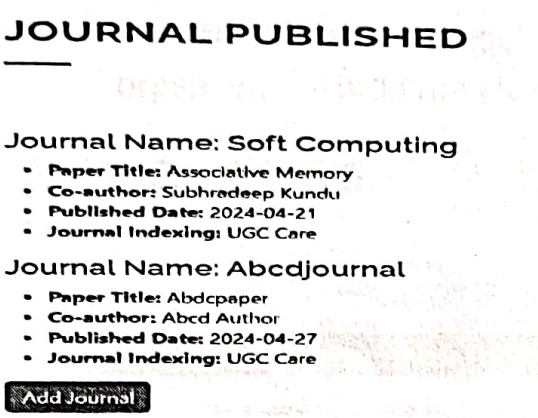

Fig 6: Journal Details

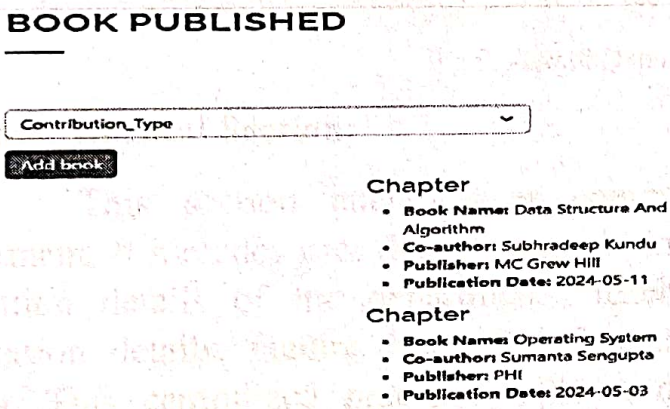

Fig 7: Book Details

5.1.5 Course Details: It includes course name, duration, organizer, course certificate etc information. Following Fig 8 described it as follows-

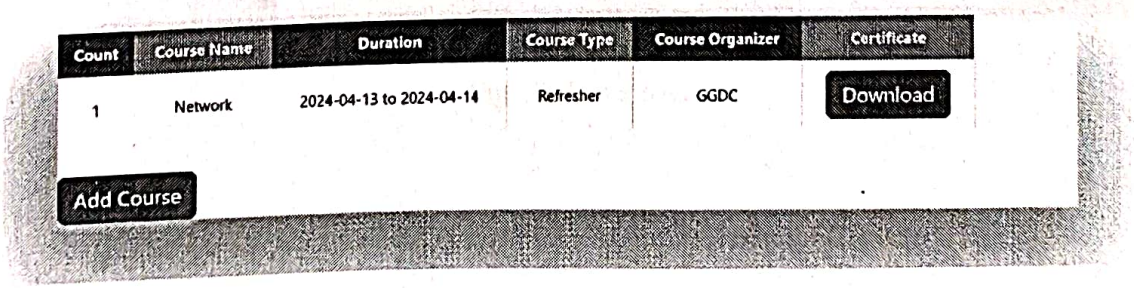

Fig 8: Course Details

5.1.6 Award Details: It includes award name, awarded date, organizer, award type etc information as in Fig 9-

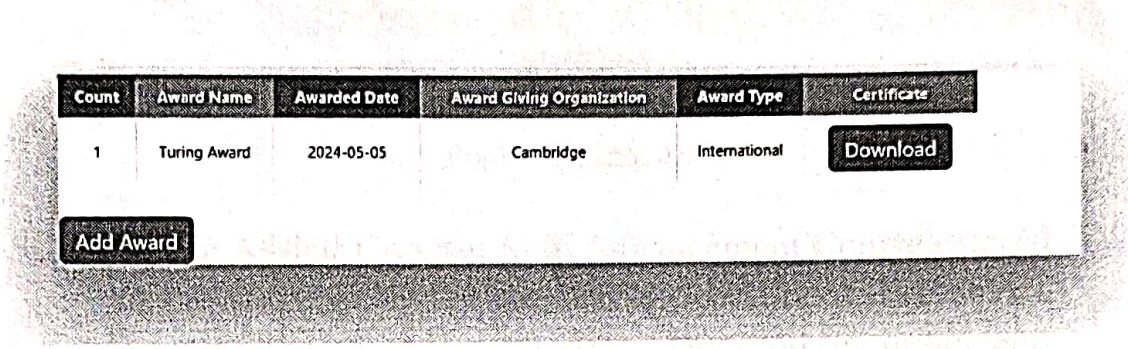

Fig 9: Award Details

5.2 Departmental Section:

This section encompasses comprehensive data for each department. It includes user details, seminar information, routine details, promotion details of the department's teachers, result details, book publication details, faculty research information, and student activity details. This centralized repository allows departments to efficiently manage and access pertinent information.

5.2.1 View User: The user can view how many users are(active)/have been(inactive) in the respective departments as in Fig 10-

Fig 10: View user

5.2.2 Seminar Details: Seminar organized by a department. It includes resource person, designation of speaker, institute of speaker and duration as in Fig 11-

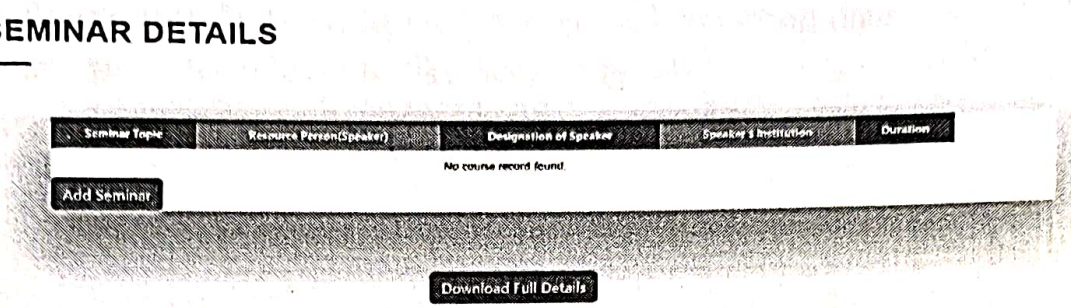

Fig 11: Seminar details

5.2.3 Value Added Course: Skill Enhancement Course offered to the students by the respective department. It includes Course title, Duration in days, Duration in hours and attendance sheet of the students as Fig 12-

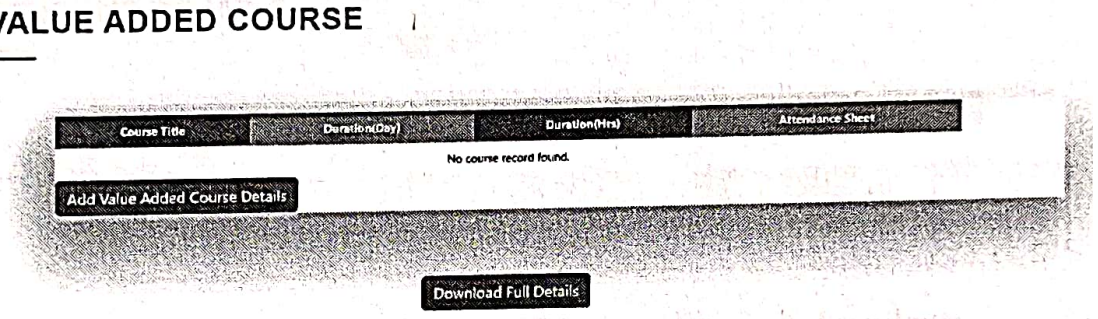

Fig 12: Value Added Course

5.2.4 Routine: Department member can add or download routine of a particular semester from a particular session. It includes Semester, session, download routine option as Fig 13-

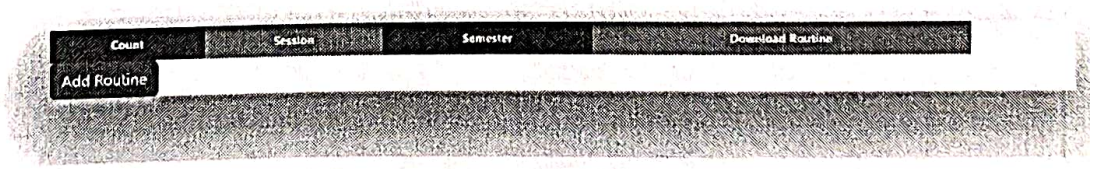

Fig 13: Routine

5.2.5 Promotion Details: In includes name, Promotion date and promotion level as like below Fig 14-

PROMOTION DETAILS

Fig 14: Promotion details

5.2.6 Student Details: It includes session, semester and total number of students like Fig 15-

STUDENT DETAILS

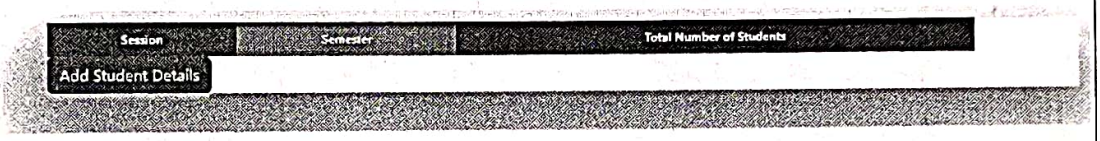

Fig 15: Student details

5.2.7 Result Details: It includes session, semester, total students appeared, and total passed students. Adding results means adding number of students having same grades also.

RESULT DETAILS

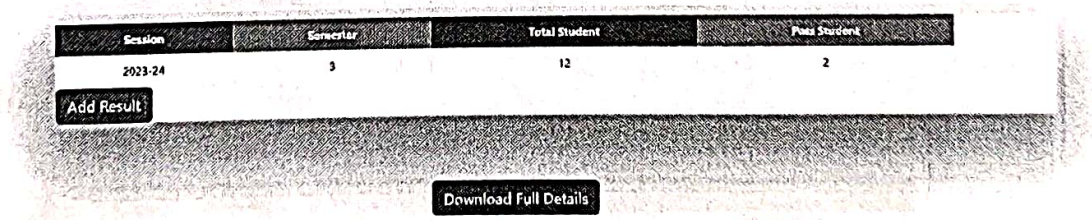

Fig 16: Result details

5.2.8 Achievement Details: It shows achievements by the students. Can upload achievements image also. It includes session, semester, achievement details, image of the achievement.

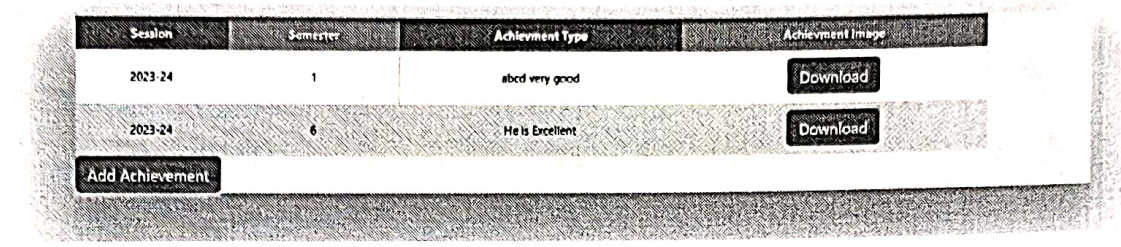

Fig 17: Achievement details

5.2.9 Books Donated to the library: Details of the books that is donated to the library by the departments. It includes book name, publisher, date of donation and accn number.

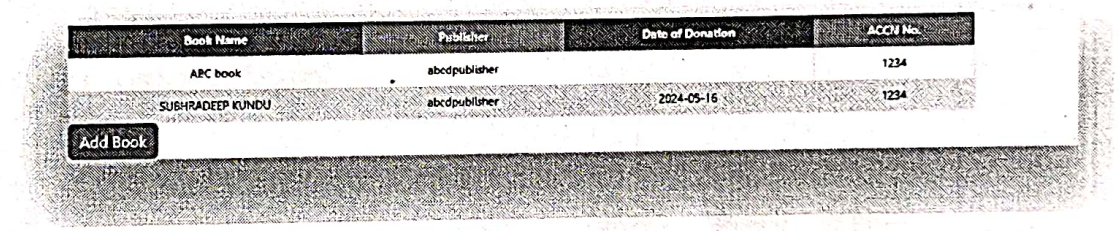

Fig 18: Books donated

5.2.10 Curriculum Details: It includes Cross-Cut Issues, iks, course outcome, course specific outcome, program specific outcome.

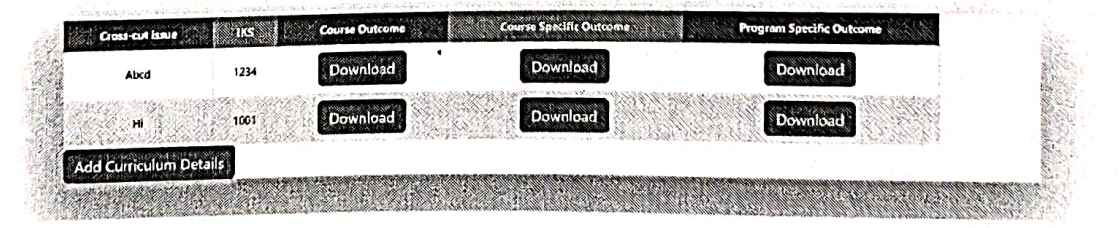

Fig 19: Curriculum details

5.2.11 Faculty Research Activity: Faculty of a particular department can upload some information about their research thesis. It includes project name, funding agency, start date, end date, project investigator, project co-investigator (if any), year of award, sanctioned amount, project type and download sanctioned order.

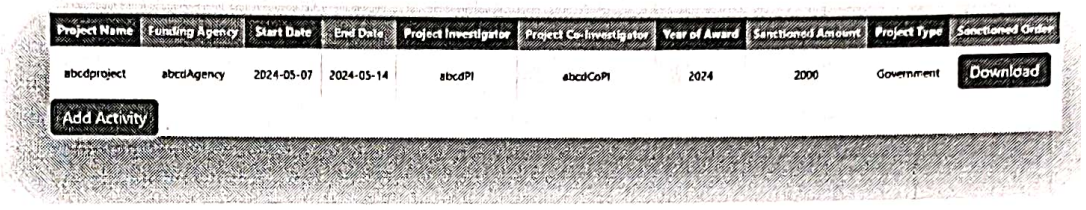

Fig 20: Faculty Research Activity

5.2.12 Students Activity: Project, field trips etc. student's activity data can be uploaded in this section. It includes type, students name, supervisor name, project name, IKS, students list (.pdf or .jpg), report file, geotag image (if any).

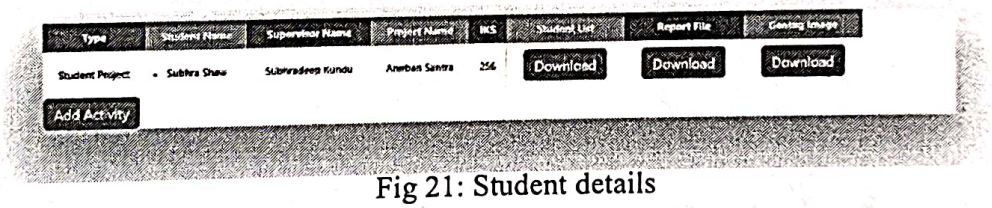

Fig 21: Student details

6. Conclusion

A well-designed data repository system serves as a vital cornerstone for organizations seeking to harness the power of their data assets. By centralizing and securely storing diverse datasets, such a system facilitates seamless data access, management, and analysis. The integration of robust security measures ensures data integrity and compliance with regulatory standards, while the scalable architecture supports evolving data needs and organizational growth. Ultimately, a comprehensive data repository system not only enhances operational efficiency but also empowers data-driven decision-making, fostering innovation and competitive advantage in a rapidly changing technological landscape.

7. Future Scope

In the future, this repository system can be enhanced to store vast amounts of information and support concurrent accessibility for a greater number of users. It will be capable of extracting more specific details, and a more user-friendly interface will be developed to improve the overall user experience.

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