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DBMS MINI PROJECT REPORT
on
“PLACEMENT MANAGEMENT SYSTEM”

Submitted by

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BACHELOR OF ENGINEERING
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at



SAHYADRI

College of Engineering & Management

(An Autonomous Institution)

MANGALURU

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CERTIFICATE

This is to certify that the DBMS mini project work entitled “**PLACEMENT MANAGEMENT SYSTEM**” has been carried out by **JITHESH P SHETTY (4SF22CS085), DHEERAJ K B(4SF22CS059)**, the bonafide students of Sahyadri College of Engineering & Management in partial fulfillment of the requirements for the V semester of Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University, Belagavi during the year 2024 - 25. It is certified that all suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

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DECLARATION

We hereby declare that the entire work embodied in this DBMS mini Project Report titled **“PLACEMENT MANAGEMENT SYSTEM”** has been carried out by us at Sahyadri College of Engineering & Management, Mangaluru under the supervision of **Mrs. Vidya V V** and **Mr. Harisha**, in partial fulfillment of the requirements for the V semester of **Bachelor of Engineering** in **Computer Science and Engineering**. This report has not been submitted to this or any other University for the award of any other degree.

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Abstract

The Placement Management System is a comprehensive platform designed to automate and streamline the placement process in academic institutions. By integrating functionalities for students, placement officers, and heads of departments (HODs), this system addresses the inefficiencies of traditional manual processes. The system enables real-time eligibility verification, application tracking, and participation management, ensuring transparency and operational efficiency. Built using MySQL as the database backbone and PHP for server-side scripting, the system leverages modern web technologies like HTML and CSS to deliver a user-friendly interface. XAMPP serves as the development environment, providing a seamless integration of services required for testing and deployment. Key features include centralized placement drive management, CGPA-based eligibility checks and attendance tracking for placement drives. This project also incorporates database triggers and stored procedures to ensure data integrity and automate routine operations. By implementing this system, institutions can reduce administrative overhead, improve the accuracy of placement data, and offer a streamlined experience to all stakeholders involved in the placement process. With its modular and scalable design, the Placement Management System lays a strong foundation for future enhancements, such as advanced analytics and integration with external recruitment platforms, making it an indispensable tool for modern academic institutions.

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Chapter 1

Introduction

The Placement Management System is a comprehensive digital platform designed to streamline the placement process for educational institutions. It is aimed at addressing the growing challenges faced by students, placement cells, and academic administrators in coordinating placement activities efficiently. This system bridges the gap between all stakeholders by offering an organized and user-friendly way to manage placement operations. By leveraging modern technologies, the Placement Management System enhances transparency, accountability, and accessibility, ensuring a seamless and efficient placement experience for all users.

The primary objective of the system is to provide a centralized solution for managing placement drives, student participation, and company recruitment processes. Educational institutions often deal with large volumes of student data, multiple placement drives, and varying eligibility criteria. Managing these processes manually can be time-consuming, prone to errors, and inefficient. The Placement Management System solves these challenges by automating key tasks and providing role-specific functionalities tailored for students, placement officers, and Heads of Departments (HODs).

For students, the system provides functionalities to view and apply for placement drives. Students can easily register themselves, check their eligibility based on CGPA criteria, and track their participation status. They are also notified of upcoming drives and can view the details of companies participating in the recruitment process. This streamlines the student experience by removing the need for manual communication and providing a transparent mechanism for application tracking.

For placement officers, the system offers tools to manage placement drives efficiently. They can create and update drives, add company details, set eligibility criteria, and monitor the participation of students. Additionally, placement officers can use the system to analyze drive performance, maintain records of selected candidates, and ensure compliance with institutional policies. This reduces administrative overhead and enables placement officers to focus on strategic tasks, such as building relationships with recruiters.

For HODs, the system provides a platform to oversee departmental participation in placement drives. HODs can monitor the attendance and performance of students from their respective departments, ensuring that students meet eligibility criteria and actively participate in the recruitment process. The

system also allows HODs to grant attendance for placement activities, promoting a balanced approach to academics and career development.

From a technological perspective, the Placement Management System leverages a Database Management System (DBMS) to ensure secure and efficient handling of data. MySQL serves as the backbone for data storage, enabling the management of large datasets with minimal latency. The system uses PHP for backend logic, ensuring dynamic content rendering and secure user authentication. The frontend is built with HTML and CSS, providing an intuitive and responsive interface. Additionally, XAMPP serves as the development and testing environment, combining a web server, database server, and scripting tools into a unified platform.

Key features of the Placement Management System include:

1. **Role-Based Access Control:** Separate functionalities for students, placement officers, and HODs ensure tailored access to relevant features.
2. **Placement Drive Management:** Placement officers can easily manage and monitor multiple drives.
3. **Eligibility Verification:** The system automatically verifies student eligibility based on predefined CGPA criteria, reducing manual effort.
4. **Attendance Management:** HODs can grant and track attendance for placement activities, ensuring accountability.
5. **Real-Time Updates:** Students, placement officers, and HODs can access real-time updates on placement activities, improving communication.

By automating the placement process, the system minimizes the potential for errors, reduces administrative workload, and fosters a more organized approach to campus recruitment. It also ensures that students have equal opportunities to participate in placement activities, helping them prepare for their professional careers.

The Placement Management System is designed to be scalable and adaptable, making it suitable for institutions of varying sizes. The project also lays the groundwork for future enhancements, such as incorporating machine learning algorithms for predictive analytics, integrating third-party recruitment platforms, and providing detailed performance metrics. Overall, this system is an essential tool for modern educational institutions seeking to enhance their placement processes and equip students with the resources they need to succeed in the competitive job market.

Chapter 2

Literature Survey

No.	Authors	Title	Publication	Year	Description
1	[1]Sharma, P., & Gupta, R.	Placement Management System	International Journal for Research in Applied Science and Engineering Technology	2021	Discusses the automation of placement systems with features like role-based access control and real-time notifications.
2	[2]Patel, K., & Mehta, S.	College Placement Management System	International Journal of Creative Research Thoughts	2020	Focuses on the design and implementation of a system for college placements, emphasizing user experience and scalability.
3	[3]Verma, A., & Kumar, R.	Training and Placement Management System	International Journal of Advanced Research in Computer and Communication Engineering	2019	Explores the integration of training modules within placement systems to enhance student readiness
4	[4]Smith, J., & Brown, T.	A Comprehensive Guide to Relational Database Design	ACM Digital Library	2018	Covers principles of database design, including normalization and referential integrity.
5	[5]Johnson, L., & Lee, W.	Use of Triggers and Stored Procedures in Modern Web Applications	IEEE Access	2020	Delves into the use of triggers and stored procedures to enhance data integrity and automate tasks.

6	[6]Davis, H., & Thomas, E.	Automation in Placement Systems	International Journal of Engineering Research	2018	Highlights the benefits of automating repetitive tasks in placement systems for improved accuracy.
7	[7]Martin, A.	Web-Based Placement Management Solutions	Journal of Computer Science Applications	2020	Provides an overview of web technologies and frameworks for developing scalable placement systems.
8	[8]Wright, K.	Optimizing Database Queries for College Applications	ACM Transactions	2019	Focuses on techniques for optimizing database queries to ensure efficient data retrieval.

The literature survey highlights various methodologies and technologies used in placement management systems, emphasizing their evolution and contributions:

- **User-Centered Design and Usability:** Emphasis on user-friendly interfaces and real-time updates using technologies like HTML, CSS, and JavaScript, enhancing user experience and facilitating seamless interactions for stakeholders.
- **Database Optimization and Design:** Effective database designs employing normalization to ensure data consistency and efficient storage, forming the backbone of robust placement management systems[9].
- **Automation with Stored Procedures and Triggers:** Utilization of stored procedures and triggers to automate complex tasks such as eligibility verification and maintain data integrity, streamlining processes and reducing manual errors.
- **Scalability and Performance:** Designing systems for scalability and high performance through modular design and optimized database operations to handle increasing user numbers and data volumes without performance degradation.

Chapter 3

Problem Formulation

3.1. Problem Statement

Managing campus placements manually in educational institutions often leads to inefficiencies, errors, and miscommunication. The absence of a centralized system creates challenges in handling large datasets, such as student details, placement drive information, and eligibility criteria. Key processes like verifying student eligibility, tracking participation, and updating attendance statuses become time-consuming and prone to errors. Additionally, limited automation and ineffective communication hinder the coordination between students, placement officers, and HODs, leading to missed opportunities and reduced transparency. These issues necessitate a robust Placement Management System that streamlines operations, automates key processes, enhances communication, and ensures transparency, providing a seamless and efficient placement experience for all stakeholders.

3.2.Objective

The objective of this project is to design and implement a robust Placement Management System that automates and streamlines the placement workflow for educational institutions. The system aims to centralize data management, enabling placement officers to efficiently organize placement drives and students to track their participation and status in real-time. By incorporating technologies like MySQL, PHP, and triggers or stored procedures, the system enhances operational efficiency, ensures transparency, and fosters better communication among stakeholders. The ultimate goal is to create a scalable, secure, and user-friendly platform that benefits students, placement cells, and HODs alike.

Chapter 4

Methodology

The Placement Management System employs a structured and systematic approach to design, development, and deployment, ensuring efficiency and reliability.

4.1. Requirement Analysis

The project begins with an in-depth understanding of the requirements of different stakeholders, including students, placement officers, and Heads of Departments (HODs). Key functionalities identified include role-based access control for students, placement officers, and HODs; management of placement drives with eligibility criteria; automation of student eligibility verification and participation tracking; and real-time updates and notifications for stakeholders. Enhancements in this phase include conducting regular user feedback sessions to gather input and refine requirements, as well as performing a competitive analysis of existing placement management systems to identify best practices and unique features.

4.2. System Design

The design phase focuses on creating a robust architecture for the system. Key design elements include an Entity-Relationship (ER) Diagram to visually represent the relationships between entities such as Students, Placement_Drives, Placement_Participation, HODs, and Departments.

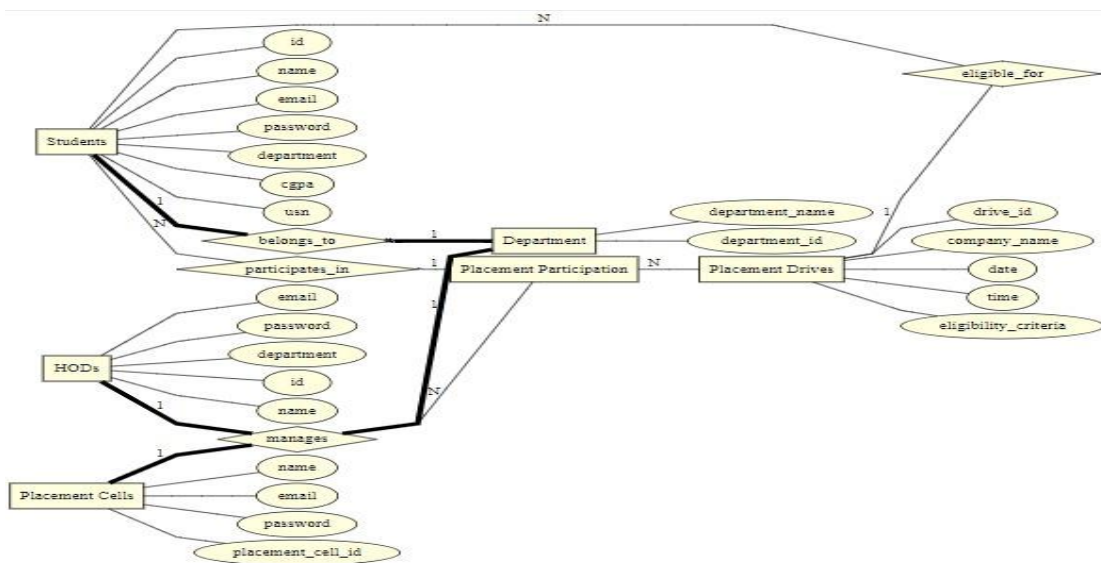


Figure 1: ER Diagram

Additionally, a Schema Diagram detailing the database schema, including primary and foreign keys, ensures referential integrity.

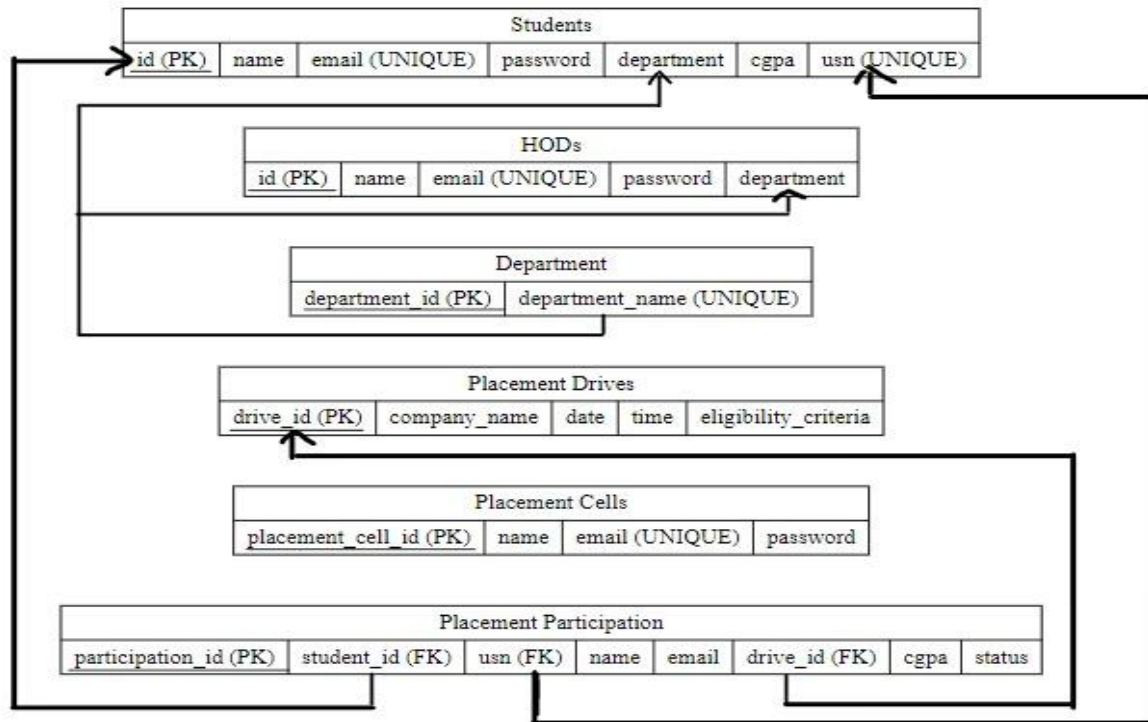


Figure 2: Schema Diagram

Enhancements in this phase include adopting a modular approach to system design for easier maintenance and future enhancements, considering scalability to handle an increasing number of users and data volume, and incorporating security measures such as encryption and access controls.

4.3. Development

The development phase involves the implementation of the system using the identified tech stack, which includes PHP for server-side scripting, MySQL to store and manage structured data, and HTML and CSS for an intuitive and user-friendly interface, all within a XAMPP development environment. Enhancements in this phase include adopting Agile practices like Scrum for iterative development and regular feedback, implementing a code review process to ensure code quality and consistency, and using version control systems like Git to manage codebase changes and collaboration.

4.4. Role-Based Functionalities

Each user type has distinct functionalities within the system. Students can view and apply for placement drives, update their participation status, and check their eligibility. Placement officers have the ability to create and manage placement drives, view eligible students, and monitor application statuses. HODs oversee students' participation from their department and approve or track their attendance. Enhancements include providing customized dashboards for each user type to display relevant information and metrics, and enabling advanced search and filter options for placement drives and student applications.

4.5. Implementation of Stored Procedures and Triggers

To enhance database operations, stored procedures automate the eligibility checking for students applying to placement drives, while triggers ensure data consistency by auto-adding new departments when students or HODs are inserted with a department not yet in the database. Enhancements involve optimizing stored procedures and triggers for performance, as well as implementing logging and monitoring to track execution and troubleshoot issues.

4.6. Testing

Extensive testing is performed to ensure the functional correctness of features like eligibility checks, drive management, and participation tracking; security to prevent unauthorized access; and scalability to handle multiple users simultaneously. Enhancements include incorporating automated testing for regression and continuous integration, conducting User Acceptance Testing (UAT) with real users to validate system functionality and usability, and performing load testing to ensure the system can handle concurrent users and large data volumes.

4.7. Deployment

The system is deployed on a local XAMPP server, allowing placement officers and other stakeholders to use it within the institution's network. Enhancements in this phase include setting up a staging environment for pre-deployment testing and using deployment automation tools to streamline the deployment process and reduce downtime.

4.8. Maintenance and Future Enhancements

The system is designed to allow for easy updates and scalability. Potential future enhancements include adding email notifications for placement updates and integrating analytical dashboards for placement statistics. Additional enhancements involve scheduling regular maintenance windows to apply updates and patches, establishing a continuous feedback loop with users to gather suggestions for future enhancements, and integrating advanced data analytics to provide insights into placement trends and performance.

This methodology ensures that the Placement Management System is reliable, efficient, and user-friendly while meeting the core objectives of automating and streamlining the placement process. It also allows for adaptability to changing requirements and future growth.

Chapter 5

Results and Discussion

The Placement Management System incorporates a robust database management component that has significantly enhanced the efficiency and functionality of the system. This section presents the outcomes of the project with a focus on the database management aspects and discusses key findings and observations.

5.1.Results

1. Efficient Database Design and Management: The project began with the creation of a comprehensive database for the placement management system, which included tables for students, HODs, placement drives, placement cells, and placement participation. The database was designed with normalization principles to minimize redundancy and optimize query performance. The database schema ensured referential integrity through the use of primary and foreign keys.

2. Automated Eligibility Verification: One of the standout features is the stored procedure `get_eligible_students`, which automates the eligibility verification process for students applying to placement drives. This procedure efficiently checks students' CGPA against the eligibility criteria for specific placement drives, ensuring that only eligible students can apply.

3. Data Consistency and Integrity: The use of triggers has greatly contributed to maintaining data consistency and integrity. For example, the `before_student_insert` and `before_hod_insert` triggers ensure that new departments are automatically added to the department table if they do not already exist. This automation prevents inconsistencies and ensures that all related data remains up-to-date.

4. Role-Based Access Control: Role-based access control has been implemented to ensure that users have appropriate permissions based on their roles. This feature enhances security and data integrity by restricting access to sensitive information and functionalities according to user roles.

5. Real-Time Data Updates: The system's real-time updates and notifications, facilitated by efficient database operations, allow stakeholders to receive timely information about placement activities. This feature improves user experience and engagement, ensuring that users are always informed about the latest developments.

6. Performance and Scalability: Load testing has demonstrated that the system can handle multiple concurrent users and large volumes of data without performance degradation. The optimized queries,

stored procedures, and triggers contribute to the system's ability to scale effectively, accommodating future growth.

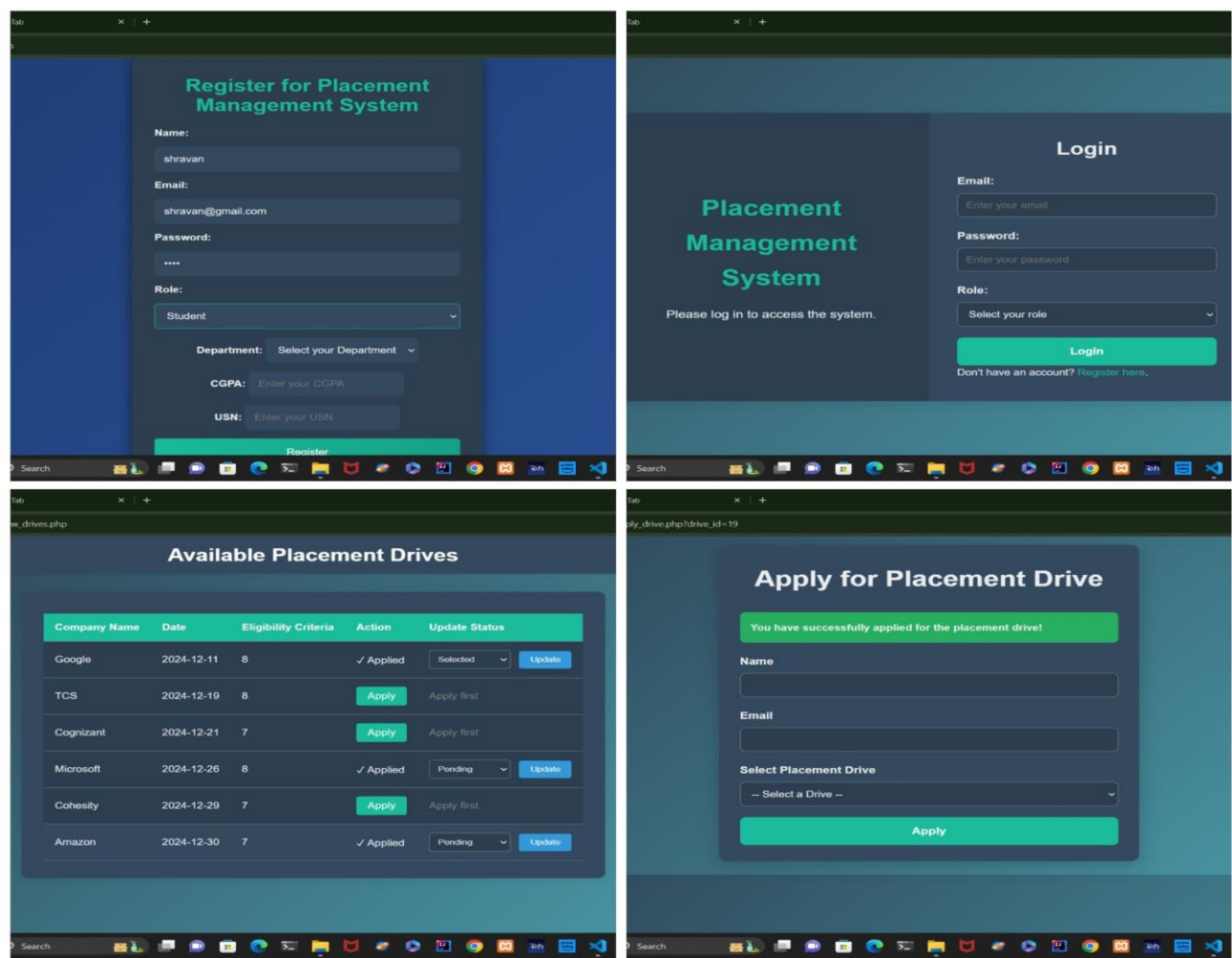


Figure 3: UI for Student

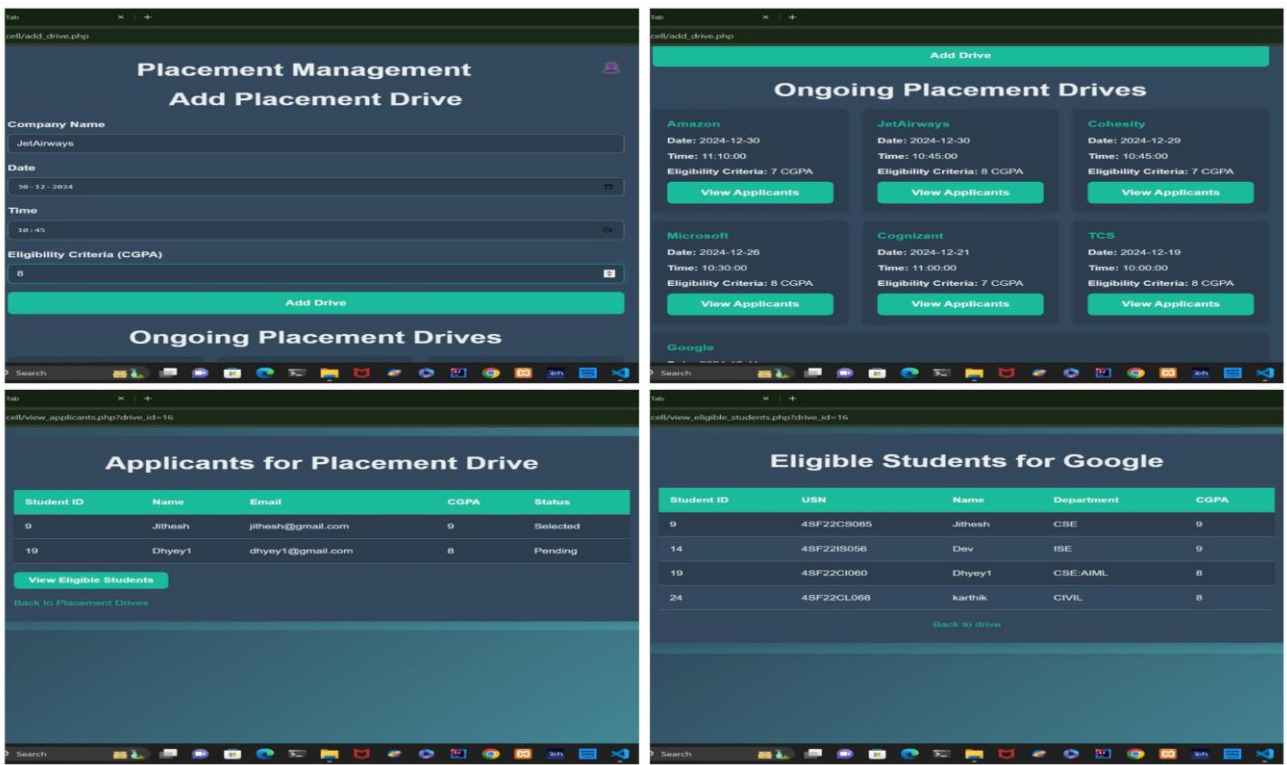


Figure 4: UI for Placement Cell

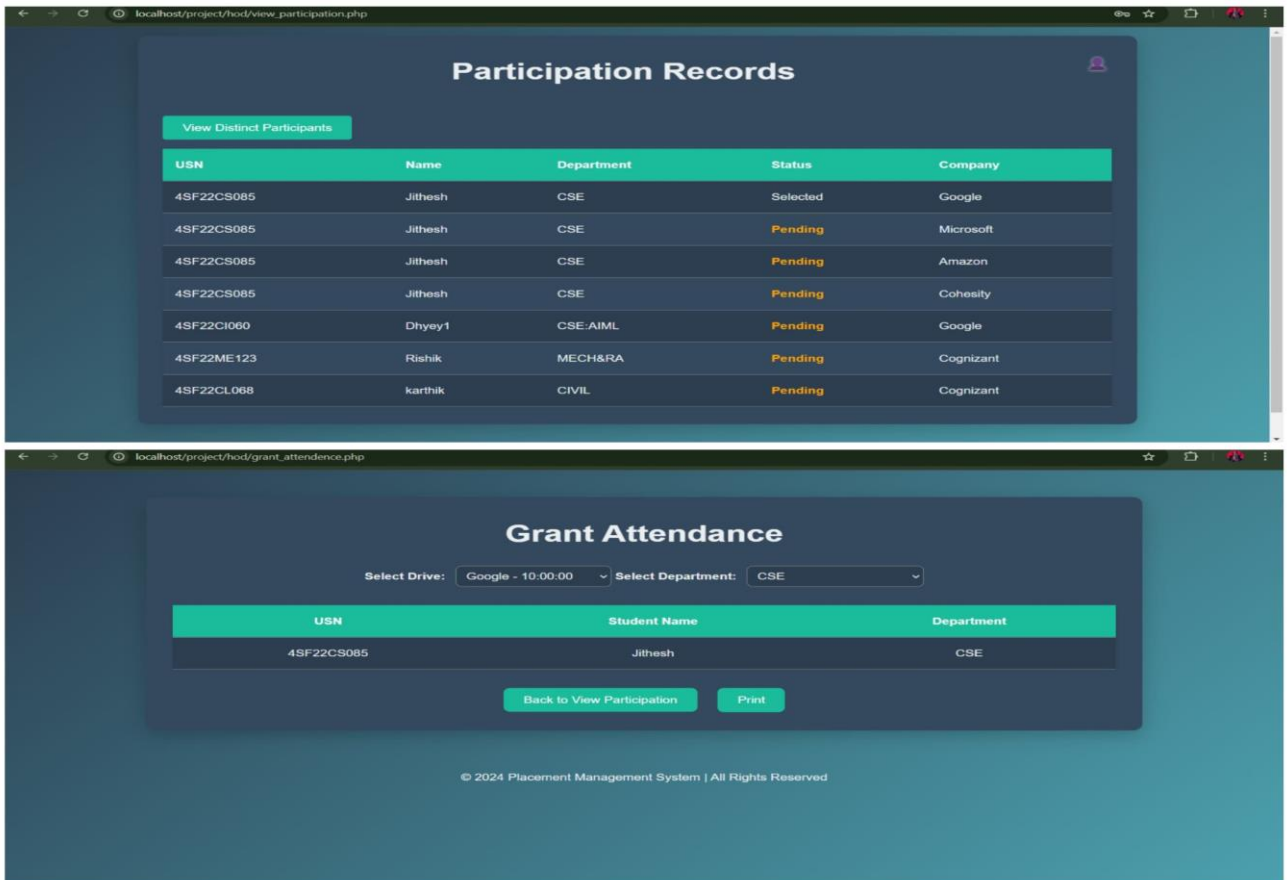


Figure 5: UI for HOD

[illegible]

The screenshot shows the phpMyAdmin interface for a database named 'placement_management'. The 'placement_drives' table is selected, and the 'Structure' tab is active. The table contains 6 rows of data. The interface includes a sidebar with a database structure tree, a top navigation bar with tabs for Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, and Triggers, and a main content area displaying the table data and various options.

drive_id	company_name	DATE	TIME	eligibility_criteria
15	TCS	2024-12-19	10:00:00	8
16	Google	2024-12-11	10:00:00	8
17	Cognizant	2024-12-21	11:00:00	7
18	Microsoft	2024-12-26	10:30:00	8
19	Cohesity	2024-12-29	10:45:00	7
20	Amazon	2024-12-30	11:10:00	7

The figure consists of two screenshots of the phpMyAdmin interface. The top screenshot shows the 'students' table, and the bottom screenshot shows the 'placement_participation' table. Both tables are displayed with their respective data rows and columns.

Table 1: students

student_id	name	email	PASSWORD	department	cpga	usrn
9	Jithesh	jithesh@gmail.com	\$2y\$10\$2yYnOn6g6ktn/afatU5R6ueQJVFjQD56R5WF3qOZqLw	CSE	9	45F-22C5085
14	Dev	dev@gmail.com	\$2y\$10\$3SWtC31dagpt.c5tRRuNkksMy6uJ.FzqLUNAB7	CSE	9	45F-22C5056
19	Dhyye1	dhyye1@gmail.com	\$2y\$10\$5yWobMykKnGvHq2xqixYLOPv8KCVwMPuZV5gq11I	CSE	8	45F-22C1060
22	Roshik	roshik@gmail.com	\$2y\$10\$5MMCPBlaLZDM8.SkZU.BGbuqgmMxepXZF.G4DRQHcB2	MECH&RA	7	45F-22C1060
23	Rajesh	rajesh@gmail.com	\$2y\$10\$CMURCOUNVQAqANBC/NAdaU.ABHEf.hNqER5ZngXP	CIVIL	7	45F-22C1118
24	Karthik	karthik@gmail.com	\$2y\$10\$2qy7u2bzk4xmsULzPKfRemOR4Xy9JzgtBQ09uU9gLR	CIVIL	8	45F-22C1068
25	Shravan	shravan@gmail.com	\$2y\$10\$3tBHLfJ2tBQ35XHReEgncYK9jundSE.TccBwzuOG5	ECE	6	45F-22C1111

Table 2: placement_participation

participation_id	student_id	name	email	drive_id	status	cpga	usrn
11	9	Jithesh	jithesh@gmail.com	16	Selected	9	45F-22C5085
16	19	Dhyye1	dhyye1@gmail.com	16	Pending	8	45F-22C1060
17	22	Roshik	roshik@gmail.com	17	Pending	7	45F-22C1060
18	9	Jithesh	jithesh@gmail.com	18	Pending	9	45F-22C5085
19	24	Karthik	karthik@gmail.com	17	Pending	8	45F-22C1068
20	9	Jithesh	jithesh@gmail.com	20	Pending	9	45F-22C5085
21	9	Jithesh	jithesh@gmail.com	19	Pending	9	45F-22C5085

Figure 8: Table for Students and Placement participation

5.2.Discussion

The development and implementation of the Placement Management System have highlighted the critical role of efficient database management in ensuring the system's success. The following key points emerged from the project:

- 1. Importance of Comprehensive Database Design:** The project's success underscored the importance of a well-designed database structure. The use of normalization and careful schema design minimized redundancy and optimized query performance, ensuring efficient data operations.
- 2. Automation through Stored Procedures and Triggers:** Automating repetitive tasks such as eligibility verification through stored procedures has significantly improved accuracy and efficiency. Triggers have played a vital role in maintaining data consistency and integrity, highlighting their importance in complex database systems.
- 3. Security and Access Control:** The implementation of role-based access control and other security measures within the database was essential in protecting sensitive data. This approach ensured that only authorized users could access and modify data, maintaining data integrity and confidentiality.

4. Scalability and Performance Optimization: Designing the database for scalability and performance was crucial in handling future growth. Optimizing queries, stored procedures, and triggers ensured that the system could manage increasing user numbers and data volume without compromising performance.

5. Continuous Improvement and Maintenance: The project's success highlighted the importance of regular maintenance and continuous improvement. Establishing a feedback loop with users and scheduling regular updates ensured that the system remained relevant and effective in meeting evolving needs.

Chapter 6

Conclusion

The Placement Management System was designed and implemented to address the complexities and inefficiencies of managing placement activities in educational institutions. The system has successfully automated key tasks such as eligibility verification and participation tracking, significantly reducing manual errors and administrative workload. The integration of role-based access control and real-time updates has enhanced user experience and data security, ensuring that only authorized users can access sensitive information.

The database design, employing normalization principles, has optimized data storage and retrieval, providing a robust backbone for the system. Stored procedures and triggers have further automated complex tasks, ensuring data consistency and integrity. The modular design and scalability considerations have positioned the system to handle future growth in user numbers and data volume without performance degradation.

Positive feedback from stakeholders has underscored the system's effectiveness and usability, highlighting its potential for broader adoption. The project has not only achieved its core objectives but has also provided valuable insights into best practices for developing efficient and user-friendly placement management systems.

6.1. Future Scope

The Placement Management System offers several opportunities for future enhancements and improvements:

1. **Integration with External Systems:** Integrating the system with external platforms such as LinkedIn, job portals, and company databases can provide students with more comprehensive placement opportunities and improve the overall placement process.
 2. **Advanced Analytics and Reporting:** Incorporating advanced data analytics and reporting tools can provide valuable insights into placement trends, student performance, and company preferences. These analytics can help institutions make data-driven decisions to improve their placement strategies.
 3. **Mobile Application Development:** Developing a mobile application for the system can provide users with on-the-go access to placement activities, notifications, and updates. A mobile app can enhance user engagement and convenience.
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4. **Artificial Intelligence and Machine Learning:** Implementing AI and machine learning algorithms can offer intelligent recommendations, trend analysis, and predictive analytics. These technologies can improve the system's functionality and provide personalized support to students and placement officers.
 5. **Enhanced Security Measures:** Continuously updating security protocols and incorporating advanced security measures such as biometric authentication and blockchain technology can further protect sensitive data and ensure system integrity.
 6. **Feedback and Continuous Improvement:** Establishing a continuous feedback loop with users and regularly updating the system based on their suggestions can ensure that the system remains relevant and effective in meeting evolving needs.

By pursuing these future enhancements, the Placement Management System can continue to evolve and adapt, providing even greater value to educational institutions and their stakeholders. The system's potential for scalability and integration with emerging technologies positions it as a vital tool for managing placement activities in the digital age.

Chapter 7

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