**GOVERNMENT POLYTECHNIC COLLEGE**

**NEDUMANGADU**

**INTEGRATED COLLEGE PLACEMENT CELL PORTAL**

A PROJECT REPORT

Submitted by

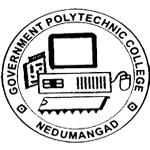
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to

The State Board of Technical Education (SBTE) in partial fulfilment of the requirements

for the award of

**Diploma in Computer Hardware Engineering**



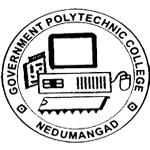
**Department of Computer Hardware Engineering**

**2022 – 2025**

**GOVERNMENT POLYTECHNIC COLLEGE**

**NEDUMANGADU**

**DEPARTMENT OF COMPUTER HARDWAREENGINEERING**



**CERTIFICATE**

This is to certify that the project report entitled “**INTEGRATED COLLEGE** **PLACEMENT CELL PORTAL**” is a bonafied recored of the Major Project done by **SEFIN R R (2201150650), JAYASOORYA J S (2201150636),**

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**ABHINAND S A**

**ABSTRACT**

Placements and alumni engagement form an essential part of academic institutions, directly influencing student growth, career opportunities, and institutional reputation. While placements open doors for students to secure employment and showcase their skills to potential recruiters, alumni networks create long-term connections that support both students and the institution in multiple ways. However, in many colleges, placement activities and alumni data management are still handled manually. This approach is time-consuming, prone to errors, and lacks centralized coordination, which often leads to inefficiencies during recruitment drives and difficulties in maintaining alumni records.

To address these challenges, the **Placement & Alumni System Website** has been developed as a comprehensive web-based platform. The system aims to automate placement-related tasks, streamline communication among stakeholders, and maintain a structured alumni database. By integrating placement and alumni functionalities into a single solution, the project ensures that institutions can manage these critical activities more effectively while reducing administrative workload.

The proposed system is built using **Django (Python)** as the backend framework, with **SQLite3** serving as the database to store structured information about students, companies, and alumni. The frontend is developed using **HTML, CSS, and Bootstrap**, ensuring a responsive design that works seamlessly across devices. The application supports role-based access, offering distinct functionalities for different stakeholders such as Admin (Placement Officer), Head of Department (HOD), Faculty, Students, Companies, and Alumni. Each role has been carefully designed to meet its specific responsibilities, ensuring transparency, security, and ease of use.

Key features of the system include secure authentication, student data management, automated eligibility checking for job postings, and company-specific recruitment drives. Students can upload resumes, view eligible job postings, and apply directly through the portal. Companies can register, post job openings, and access lists of candidates that meet their eligibility criteria. Faculty and HODs oversee and verify student data, while administrators maintain complete control over system operations and report generation. Additionally, alumni can register and update their professional details, creating a valuable repository of institutional connections that can be used for future networking and growth.

The Placement & Alumni System Website provides numerous advantages. It minimizes paperwork, ensures accurate and reliable data, and offers real-time access to placement and alumni information. The platform improves communication between students, recruiters, and administrators while maintaining a long-term alumni network. Ultimately, this system empowers educational institutions by offering a modern, scalable, and user-friendly solution that enhances the efficiency of placement processes and fosters meaningful alumni engagement.

# CHAPTER 1

# PROJECT BACKGROUND

## INTODUCTION

Manual management of **training, placement, and alumni records** in many colleges depends heavily on human intervention, which increases the chances of errors and inefficiencies. The primary challenge lies in **collecting, searching, and updating student and alumni data**. Placement Officers are responsible for handling student profiles, documents, academic records, and coordinating with recruiting companies. They also need to notify eligible students whenever a company posts specific requirements. This process becomes tedious and time-consuming as the number of students and companies increases.

In addition, maintaining **alumni records** manually is equally challenging, as tracking updates in employment status, designations, or contact information requires repetitive work. The lack of a centralized digital platform often results in **missing data, delays in communication, and difficulty in generating accurate reports**.

The **Placement & Alumni System Website** addresses these challenges by offering a robust online platform to manage placement activities and alumni records. With role-based access for Admin, HODs, Faculty, Students, Companies, and Alumni, the system ensures secure data handling and smooth operations. It allows students to create/update profiles, companies to post jobs, and alumni to register and update their professional details. Placement Officers can efficiently manage the process and generate reports, while avoiding the limitations of manual systems.

**Purpose**

The purpose of the **Placement & Alumni System Website** is to automate and streamline placement and alumni-related processes in educational institutions. It provides a centralized, secure, and user-friendly platform where:

* Students can register once, update their academic and personal information, upload resumes, and apply for company postings.
* Companies can post job requirements and view eligible student profiles directly.
* Alumni can maintain updated professional records, helping the institution build long-term connections.
* Faculty and HODs can verify data, monitor progress, and mentor students effectively.
* Administrators can oversee the entire system and generate real-time reports.

By reducing manual work, minimizing errors, and saving time, the system ensures that placement activities and alumni engagement are carried out smoothly. It also reduces the workload of placement officers, improves communication, and maintains accurate records for institutional growth.

## Scope

The project has a broad scope as it enhances the **efficiency, productivity, and reliability** of placement and alumni management processes. Unlike manual systems, the **Placement & Alumni System Website** prevents duplication of work, reduces paperwork, and enables easy retrieval of information. It provides:

* **Centralized management of student and alumni records**, ensuring up-to-date information at all times.
* **Automation of eligibility checking**, allowing companies to quickly access suitable candidates.
* **Seamless alumni data handling**, strengthening institutional networks.
* **Role-based access control** for Admins, HODs, Faculty, Students, Companies, and Alumni to ensure transparency and security.
* **Fast, user-friendly, and reliable operations**, enabling quick access to student placement status and alumni details.

The system helps placement officers and institutions overcome difficulties in handling large volumes of student and alumni data. By digitizing and centralizing records, it reduces time, cost, and effort while ensuring accuracy. Ultimately, the project facilitates a **modern, scalable, and paperless solution** that improves institutional productivity, boosts stakeholder morale, and supports long-term growth.

## 1.2. PROJECT OVERVIEW

The **Placement & Alumni System Website** is a web-based platform designed to streamline and automate the management of placement activities and alumni records in educational institutions. Traditional manual processes often involve repetitive tasks such as collecting student data, verifying academic details, maintaining alumni information, and notifying students about job opportunities. These tasks are not only time-consuming but also prone to human error. The proposed system overcomes these challenges by providing a centralized and role-based digital solution.

The system integrates multiple stakeholders into a single platform with distinct functionalities:

* **Admin (Placement Officer):** Maintains complete control over the portal, manages student and alumni records, verifies data, and generates placement reports.
* **Head of Department (HOD):** Monitors department-wise student information, verifies academic details, and ensures accuracy of placement records.
* **Faculty:** Assists in updating student information and provides academic support during the placement process.
* **Students:** Create and update personal and academic profiles, upload resumes, and apply for company job postings.
* **Companies:** Register on the portal, post job openings, and view eligible student profiles based on predefined criteria.
* **Alumni:** Register and update professional details, enabling the institution to maintain a strong alumni database for networking and future growth.

The backend of the system is developed using **Python Django**, ensuring robust server-side functionality and secure role-based authentication. The database is managed using **SQLite3**, providing structured storage for student, company, and alumni records. The frontend is built with **HTML, CSS, and Bootstrap**, ensuring a responsive and user-friendly interface accessible across devices.

The platform supports **one-time registration** for students and alumni, minimizing redundancy in data entry. Automated eligibility checking ensures that students are notified only about job postings relevant to their academic performance and skills, reducing manual filtering by placement officers. Alumni engagement is seamlessly integrated into the system, allowing institutions to track alumni career growth while fostering long-term connections.

Overall, the Placement & Alumni System Website provides a **modern, scalable, and efficient solution** to placement and alumni management. It reduces paperwork, saves time, improves communication, and enhances institutional reputation by ensuring smooth and transparent recruitment and alumni engagement processes.

## 1.3. FUTURE ENHANCEMENTS

## The ****Placement & Alumni System Website**** is designed to be scalable and adaptable, leaving room for future improvements that can further enhance its effectiveness. In the future, the system can be extended with features such as an automated resume builder that generates professional CVs directly from student profiles, as well as artificial intelligence–based matching to recommend the most suitable job opportunities to students based on their academic performance and skills. Mobile application support for Android and iOS can also be introduced, ensuring that students, companies, and alumni can access the portal anytime and anywhere. Real-time notifications through email or SMS may be integrated to keep users updated about job postings, interview schedules, and alumni events. Additionally, advanced analytics and dashboards can be developed to provide deeper insights into placement statistics, department-wise performance, and alumni career growth. The platform can also incorporate video interview integration to support remote hiring processes and extend its capabilities to foster alumni networking and mentorship opportunities. Over time, the system could be deployed on cloud platforms to enhance scalability and data security, while blockchain-based credential verification may be adopted to ensure authenticity of academic and professional records. These enhancements would make the system more robust, user-friendly, and future-ready, addressing the evolving needs of institutions, students, recruiters, and alumni.

## 1.4. SYSTEM STUDY ANALYSIS

System analysis is a detailed study of the various operations performed by a system and their relationships within and outside the system. It helps in identifying the problems in the existing system and in determining the requirements for developing an improved system. In simple terms, system analysis can be defined as “figuring out what to make before making it.” It provides a clear understanding of both functional and non-functional requirements, ensuring that the new system effectively solves the challenges of the current process.

System analysis can be categorized into the following five parts:

* **System Planning and Investigation** – Understanding the objectives of the placement and alumni management process and investigating the shortcomings of the existing manual system.
* **Information Gathering** – Collecting relevant data from placement officers, students, faculty, companies, and alumni to understand their needs and expectations.
* **Applying Analyzing Tools for Structured Analysis** – Using analytical methods such as data flow diagrams, process models, and ER diagrams to represent the system clearly.
* **Feasibility Study** – Evaluating whether the proposed system is technically, economically, and operationally feasible within the given resources.
* **Cost/Benefit Analysis** – Analyzing the estimated costs of developing and maintaining the system compared with the benefits it provides, such as reduced workload, faster operations, and better accuracy.

Through this structured system study and analysis, the **Placement & Alumni System Website** ensures a strong foundation for development, minimizing risks and maximizing efficiency in placement and alumni-related activities.

**1.4.1. EXISTING SYSTEM**

The current placement and alumni management process in colleges is mostly **manual**, relying on physical records, spreadsheets, and personal communication. Placement officers have to collect and update student data, prepare eligibility lists, and notify students, which becomes time-consuming and error-prone as the number of students increases. Alumni details are also poorly maintained, leading to outdated records and weak engagement. Overall, the existing system lacks automation, is tedious to manage, and creates delays in placement activities.

**1.4.2. PROPOSED SYSTEM**

The proposed **Placement & Alumni System Website** replaces the manual process with a centralized, automated, and user-friendly web portal. It provides role-based logins for admins, HODs, faculty, students, companies, and alumni. Students can update profiles and apply for jobs, companies can post vacancies and view eligible candidates, while placement officers can easily manage records and generate reports. The system ensures faster access, accurate data, real-time updates, and secure storage, making placement and alumni management more efficient and reliable compared to the existing manual system.

## 1.5. SYSTEM SPECIFICATION

### Software Requirements

* **Frontend**: HTML, CSS, Bootstrap
* **Backend**: Python (Django Framework)
* **Database**: SQLite3
* **Web Server**: Django Development Server / Apache (optional)
* **Operating System**: Windows / Linux

### Hardware Requirements

* **Processor**: Intel i3 or higher
* **RAM**: Minimum 4 GB
* **Hard Disk**: 250 GB or above
* **Display**: Standard resolution (1366x768 or higher)

# CHAPTER 2

# LITERATURE REVIEW

## EXISTING PLACEMENT MANAGEMENT SYSTEMS:

Placement management in many institutions is still handled through **manual processes** or basic digital tools such as spreadsheets, emails, and offline records. In these systems, placement officers are responsible for collecting student details, verifying eligibility criteria, and preparing lists for company recruitment drives. Communication with students is often done manually through notices, phone calls, or emails, which can lead to delays and missed opportunities.

Some institutions have adopted **basic web portals**, but these systems are often limited in scope. They may not provide role-based access, automated eligibility checks, or effective data management features. Alumni records, in many cases, are poorly maintained, making it difficult for institutions to track graduates’ career progress or build strong alumni networks.

Overall, existing placement management systems are **time-consuming, prone to errors, and lack efficiency**. As the number of students and companies increases, the limitations of manual or semi-digital systems become more evident, highlighting the need for a centralized, automated, and scalable solution.

* 1. **EXISTING SYSTEMS AND PROPOSED SOLUTIONS:**

Placement management has always been a crucial aspect of higher education, as it directly connects students with career opportunities and employers with skilled graduates. Traditional placement management systems relied heavily on **manual processes**, where student records, company requirements, and placement activities were handled using registers, spreadsheets, and physical documents. These methods demanded significant administrative effort, were time-consuming, and were prone to human errors such as **data duplication, loss of records, and miscommunication** between stakeholders [1].

With the advancement of technology, some institutions transitioned to **desktop-based applications** and local databases for managing placement records. Although these solutions improved data storage and retrieval, they lacked **remote accessibility, scalability, real-time updates, and collaborative features** [2].

In more recent years, **web-based placement portals** were introduced, providing centralized data management and online access for students and recruiters. These systems allowed Placement Officers to maintain student profiles, track company requirements, and publish notifications more efficiently. However, existing solutions still faced challenges such as **limited role-based access control, lack of mobile compatibility, outdated interfaces, and absence of automated eligibility checks or reporting tools** [3].

Some systems attempted to extend functionality by integrating external tools such as **resume builders, online test modules, and interview scheduling platforms**. While these features added value, they were often fragmented, requiring users to rely on multiple applications instead of a single, seamless platform [4].

Furthermore, most systems lacked **predictive analytics, AI-powered recommendations, real-time notifications, and multi-department scalability**. Without these capabilities, placement officers struggled to analyze trends, identify eligible candidates efficiently, and ensure smooth communication with recruiters [7].

### Identified Challenges in Existing Systems

### From comparative analysis, several gaps have been identified in traditional and semi-digital placement management solutions:

* **Manual Shortlisting and Eligibility Checks** – Academic criteria and eligibility were verified manually, making the process slow and error-prone [2].
* **Limited Mobile Accessibility** – Many systems were not mobile-friendly, restricting real-time access for students and recruiters [7].
* **Complex User Interfaces** – Poorly designed and outdated user interfaces discouraged adoption and reduced usability [4].
* **Decentralized Data Management** – Data was often managed department-wise, preventing centralized access and tracking [3].
* **Security Concerns** – Older systems lacked robust authentication and access control, exposing sensitive student data to risks [1].
* **Lack of Automated Notifications** – Most systems relied on manual communication or basic email alerts, causing delays in updates [2].
* **Absence of Advanced Analytics** – Institutions had limited insights into placement statistics, recruiter participation, and student success trends [7].
* **Rigid Customization Options** – Many systems could not be adapted or scaled according to institutional needs [4].

## 2.3. GAP ANALYSIS:

Despite the progress in placement management systems, several shortcomings remain in existing solutions. These limitations hinder efficiency, scalability, and overall user satisfaction. A comparison of the current issues and how the proposed system addresses them is given below.

### Identified Gaps in Existing Systems

* **Manual Efforts Still Required:** Many existing systems relied on manual shortlisting and eligibility checks for students, leading to inefficiencies [2].
* **Limited Accessibility:** Lack of mobile-friendly interfaces made it difficult for users to access placement information anytime, anywhere [7].
* **Poor User Experience:** Complicated navigation, outdated designs, and unresponsive interfaces affected user satisfaction [4].
* **No Centralized Database:** Some systems operated department-wise without integrating all student and company data into a unified, centralized platform [3].
* **Minimal Data Security:** Older systems lacked secure login features and proper role-based access control, risking data privacy [1].
* **Absence of Analytics and Reports:** Institutions had no real insights into placement success rates, student performance, or recruiter engagement history [7].
* **Inadequate Customization:** Existing portals were often rigid and did not allow easy modification based on evolving institutional needs [4].

### Comparative Analysis

|  |  |  |
| --- | --- | --- |
| **Feature** | **Existing Systems** | **Proposed System** |
| **Data Management** | Manual / Local Databases | Centralized Web-Based Database |
| **Accessibility** | Limited (No mobile support) | Mobile-friendly, responsive UI |
| **Security** | Weak access control | Secure login with role-based authentication |
| **User Experience** | Complex, outdated UI | Modern, user-friendly, responsive interface |
| **Paperwork Reduction** | High dependency on physical records | Fully digitalized process |
| **Recruiter Integration** | Limited recruiter access | Direct recruiter-student and recruiter-admin interactions |
| **Analytics** | Minimal or none | Advanced placement statistics & performance insights |
| **Customization** | Rigid and inflexible | Scalable, adaptable, and customizable features |

## IMPROVED FEATURES IN PROPOSED SYSTEM:

The proposed **Placement & Alumni System Website** introduces several enhanced features that overcome the limitations of existing placement management systems. Unlike manual or semi-digital systems, the proposed solution offers **centralized data management**, allowing administrators, HODs, faculty, students, and companies to access accurate information from a single platform.

The system ensures **mobile-friendly and responsive design**, enabling users to access placement details anytime and from any device. With **secure login and role-based access**, sensitive data is protected, and each user can perform their tasks without compromising privacy or integrity. The user interface is designed to be modern and intuitive, simplifying navigation and improving overall user experience compared to older systems with outdated or complex layouts.

Paperwork is significantly reduced as all student profiles, resumes, and alumni records are maintained digitally. Companies can directly post job openings, view eligible candidates, and interact with placement officers, creating **better recruiter-student engagement**. Furthermore, the system provides **advanced analytics and reporting**, offering insights into student performance, placement trends, and department-wise statistics, which were largely absent in traditional systems.

Finally, the proposed system is **scalable and customizable**, allowing institutions to adjust features, add departments, or extend alumni engagement modules as per their evolving requirements. These improved features collectively ensure a faster, more reliable, and user-friendly platform that enhances both placement and alumni management processes.

# CHAPTER 3

# 3. TECHNOLOGIES AND TOOLS USED

# 3.1 Frontend Technologies

* **HTML (HyperText Markup Language):** Used to structure the web pages and content of the system.
* **CSS (Cascading Style Sheets):** Provides styling, layout, and visual design for responsive and attractive user interfaces.
* **Bootstrap:** A front-end framework that ensures mobile-responsive and modern UI components, simplifying the design process for different devices.

## 3.2 Backend Technologies

* **Python:** The primary programming language used for server-side scripting and logic.
* **Django Framework:** A high-level Python web framework used to build secure, scalable, and maintainable web applications. Django facilitates rapid development and provides built-in features like authentication, ORM, and URL routing.

## 3.3 Database

* **SQLite3:** A lightweight relational database used to store student profiles, company details, placement records, and alumni information. It integrates seamlessly with Django and supports efficient data retrieval and management.

# CHAPTER 4

## 4. FEASIBILITY STUDY

The primary objective of a feasibility study is to determine whether a proposed system is worth developing. At this stage, a **cost-benefit analysis** is performed to ensure that the benefits gained from the system outweigh the costs associated with its analysis, design, and development. A feasibility study also assesses whether the system can be implemented successfully, meets user requirements, and provides tangible value to the organization.

### Steps in Feasibility Analysis

Feasibility analysis typically involves the following steps:

1. Form a project team and appoint a project leader.
2. Prepare a system flow chart.
3. Enumerate potential candidate systems.
4. Describe and identify characteristics of candidate systems.
5. Describe and evaluate performance and cost-effectiveness of each candidate system.
6. Weight system performance and cost data.
7. Select the best candidate system.
8. Prepare and report final project directives and management recommendations.

The proposed **Placement & Alumni System Website** has been evaluated in the following aspects of feasibility:

* Technical Feasibility
* Operational Feasibility
* Economic/Financial Feasibility
* Behavioural Feasibility

## 4.1 Technical Feasibility

Technical feasibility evaluates whether the existing technology and infrastructure can support the proposed system and whether the selected platforms meet the project’s requirements. It involves assessing the suitability of front-end and back-end technologies, database management, and server capabilities.

In our system, the combination of **Python Django**, **SQLite3**, **HTML, CSS, and Bootstrap** has been chosen based on factors such as scalability, reliability, maintainability, and ease of integration. The system’s technical requirements are fully supported by current infrastructure, making the project **technically feasible**.

## 4.2 Operational Feasibility

Operational feasibility measures how easily the system can be implemented and used by its intended users. The system must be user-friendly, efficient, and reduce the workload of stakeholders.

The proposed system provides **role-based modules** for Admins, HODs, Faculty, Students, Companies, and Alumni, ensuring that all users can interact with the system easily without understanding its internal workings. With a **modern, intuitive interface**, responsive design, and simplified navigation, the system enhances productivity and is thus **operationally feasible**.

## 4.3 Economic Feasibility

Economic feasibility analyzes the cost-effectiveness of the system by comparing the expected benefits with the projected costs of development, implementation, and maintenance.

The proposed system reduces manual labor, paperwork, and time spent on repetitive tasks, resulting in significant **savings in administrative costs**. Moreover, the use of **open-source technologies** such as Python, Django, and SQLite3 minimizes software licensing costs. Therefore, the system is considered **economically feasible**, as the benefits outweigh the development and operational costs.

## 4.4 Behavioural Feasibility

Behavioural feasibility evaluates whether the system will be accepted and effectively used by the stakeholders. Resistance to change, training requirements, and the impact on existing workflows are key considerations.

The proposed system is designed to be **user-friendly and intuitive**, requiring minimal technical skills. Training sessions can be conducted to familiarize staff with the portal. The system ensures smooth adoption while positively impacting organizational workflows, communication, and data management. Hence, it is **behaviourally feasible**.

# CHAPTER 5

## 5. SYSTEM DESIGN

System design defines a feasible solution and provides detailed procedures for implementing the proposed system, based on the feasibility study. It transforms analysis into a structured blueprint, covering both **logical design** (input/output specifications, data flow) and **physical design** (implementation details, database structure, user interface).

## 5.1 Input Design

`Input design ensures that raw data is collected accurately and efficiently to produce desired outputs. Proper input design improves overall system quality and usability.

### 5.1.1 Objectives of Input Design

* Design effective data entry procedures and screens.
* Reduce input volume and prevent redundancy.
* Create source documents or digital forms for data capture.
* Implement validation checks and effective input controls.

### 5.1.2 Data Input Methods

* **Batch Input Method:** Offline data entry processed periodically.
* **Online Input Method:** Direct user entry into the system via forms.
* **Interactive Data Entry:** Real-time input with immediate feedback.

### 5.1.3 Input Integrity Controls

* Field-level validation to ensure correct format and completeness.
* Transaction logs for tracking changes and supporting recovery in case of failures.

## 5.2 Output Design

Output design ensures that the system provides information in a usable and timely manner for decision-making.

### 5.2.1 Objectives of Output Design

* Produce outputs that meet user requirements and serve the intended purpose.
* Deliver the appropriate quantity and format of output.
* Ensure outputs reach the right stakeholders on time.

### 5.3.2 Types of Outputs

* **Detailed Reports:** Complete data with minimal filtering for planning and control.
* **Summary Reports:** Categorized and summarized trends for managers.
* **Exception Reports:** Filtered reports highlighting exceptions or deviations.

### 5.2.3 Output Integrity Controls

* Include date/time, report titles, pagination, and verification messages for accuracy.

## 5.3 Normalization

Normalization organizes database tables to eliminate redundancy, simplify maintenance, and improve query efficiency. The proposed system uses **Second Normal Form (2NF)**, ensuring:

* Each row represents a unique entity attribute.
* Non-key attributes are fully dependent on the primary key.
* Reduced insertion and deletion anomalies.

Tables are designed up to **Third Normal Form (3NF)** where all non-key attributes depend solely on the primary key. Some tables are optimized to reduce unnecessary linking without violating normalization rules.

#### Normal Forms Used

* **1NF:** Removes repeating groups; ensures atomic values.
* **2NF:** Eliminates partial dependency; every non-key attribute fully depends on the primary key.
* **3NF:** Removes transitive dependency; non-key attributes depend only on the primary key.

**Module Design**

#### **Admin Module:**

* Add courses and departments
* Approve Faculty and Company
* Manage Faculty’s
* View students and faculty
* View placed students
* View Report

#### **Faculty Module**

* Approve Students
* Approve Resume
* View Students
* Send Notification to Students
* Placement Faculty can add placement training videos and questions
* Hod can approve Faculty

#### **Student Module**

* Update Profile and resume
* View companies

#### **Company Module**

* Add Jobs
* Search students
* View student information