Texas College Of Management & IT

FinalYear Internship synopsis

On

Web Developer

At

API Power Company Limited

Under The Supervision Of

Prof. Dr. Suman Thapaliya

HOD Of Information & Technology Department

Submitted By:

Sameer Pokhrel

BIT 6^{th} Semester

April 14, 2024

DECLARATION

I hereby declare that this internship report is prepared based on activities done in API Power Company Ltd., submitted to Texas College of Management and IT, Lincoln University Malaysia is my original work done based on learning during the internship program for the partial fulfillment of the requirement of Bachelor's in Information and Technology except for the references I have listed. At this moment, I declare that this report has not submitted to any other University or any other institution for examination.

Signature:

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Texas College of Management and IT

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Acknowledgements

I would like to express my sincere gratitude to API Power Company Ltd. for their invaluable assistance and support throughout the internship and I am extremely privileged to have got this opportunity to work on web projects with API Power Company. Their guidance and encouragement have been instrumental in the completion of this work.

Signature:

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Texas College of Management and IT

Lincoln University, Malaysia

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3 List Of Abbreviations

CEO: Chief Executive Officer

CTO: Chief Technology Officer

COO: Chief Operation Officer

HOD: Head of Department

MVC: Model-View-Controller

DRY: Don't Repeat Yourself

ORM: Object-Relational Mapping

CSRF: Cross-Site Request Forgery

4 CHAPTER 1: INTRODUCTION

4.1 Introduction To Internship

An internship is a short-term work opportunity provided by companies or organizations to students or recent graduates. It offers hands-on experience in a particular field, allowing interns to apply knowledge gained from academic studies in a real-world setting. Internships typically last from a few weeks to several months, and they can be either paid or unpaid. Interns often work closely with professionals in their field, gaining valuable skills, industry insights, and networking opportunities. The primary goal of an internship is to provide practical learning experiences that enhance academic learning and prepare individuals for future career opportunities.

4.2 Purpose Of Internship

Internships serve as vital stepping stones for students and recent graduates, offering them a platform to bridge the gap between academic learning and practical application. Through internships, individuals gain invaluable hands-on experience in their chosen field, allowing them to apply theoretical knowledge in real-world scenarios. This experiential learning not only helps develop and refine technical skills but also fosters the cultivation of essential soft skills such as communication, teamwork, and problem-solving. Moreover, internships provide a valuable opportunity for career exploration, enabling participants to gain insights into various roles and industries, thereby helping

them identify their passions and career aspirations. Additionally, internships offer a networking goldmine, allowing interns to connect with professionals in their field, potentially opening doors to future job opportunities and mentorship. Furthermore, internships bolster resumes, enhancing marketability and showcasing practical experience to potential employers. Beyond skill acquisition, internships also offer a glimpse into workplace culture and dynamics, equipping participants with the tools and insights needed to thrive in professional environments. Ultimately, the purpose of an internship extends beyond the duration of the placement, serving as a transformative experience that empowers individuals with the knowledge, skills, and connections necessary to embark on successful career journeys.

4.3 Objective Of Internship

An internship program is a chance to integrate practical career-related experience into undergraduate education through supervised work. It involves experiences that blend learning with hands-on activities, aiming to achieve the following objectives:

- Provide hands-on experience in a specific field.
- Develop and refine technical and soft skills.
- Explore various career paths and industries.
- Build professional networks and connections.

- Enhance resume with relevant work experience.
- Gain insights into workplace culture and dynamics.
- Prepare individuals for successful careers through practical learning experiences.

4.4 Motivation

An internship provides a motivation to come up the challenges, and create working environment in the industrial production of the IT solution and services. It encourages team coordinate and discipline working in the real field for implementing the theoretical knowledge.

4.4.1 Motivation for choosing Backend Development(Django)

Choosing backend development with Django offers numerous advantages for your career in information technology. It provides hands-on experience in building robust web applications efficiently. This internship opportunity in Django backend development promises not just coding practice, but also a chance to sharpen problem-solving skills and contribute to the ever-expanding digital landscape. It's a gateway to a promising future in IT, where innovation and technical prowess intersect.

5 CHAPTER 2: DESCRIPTION OF THE ORGANIZATION

5.1 Introduction to Company

Api Power Company was established and incorporated as Private Company in 5th Ashad, 2060 B.S. (19th June 2003) under "The Company Act, 2053" and later converted into a Public Limited Company on 6th Shrawan 2070 B.S. (21st July 2013) having Registration number 114473/059/060 registered at Office of The Company Registrar, Ministry of Industry, Commerce and Supplies, GoN. The company has its Corporate Office located at 4th Floor, Trade Tower Nepal, Thapathali, K.M.C.-11, Kathmandu, Nepal.

Api Power Company Limited is one of the leading Companies in Nepal's Power Sector with Power Generation and Supply to National Grid as its core business. The main objective of the company is to generate electricity through renewable resources abundantly available in the country.

Api Power Company Limited is committed to operational excellence and believes in good governance, corporate citizenship and creating value for stakeholders.Company is registered with Securities Board of Nepal and the Shares of the Company 'API' are listed in Nepal Stock Exchange and is freely traded in the market.

Company has owned and developed various Hydroelectric and Solar Projects.

5.2 Major Function Of Company

Api Power Company Limited is a prominent player in Nepal's power sector, with its core business focused on power generation and supply to the national grid. Let's delve into the key functions of this company:

5.2.1 Electricity Generation:

The primary objective of Api Power Company Limited is to generate electricity. They achieve this by harnessing renewable resources that are abundantly available in Nepal. Their commitment to operational excellence ensures a reliable and sustainable power supply.

5.2.2 Renewable Energy:

Api Power actively contributes to Nepal's energy landscape by utilizing renewable energy sources. Their projects include hydroelectric and solar power generation. Notable hydro projects include the Naugarh Gad Small Hydroelectric Project (8.5 MW), Upper Naugarh Small Hydroelectric Project (8 MW), and the Upper Chamelia Hydroelectric Project (40 MW).

5.3 Company Selection

Among the criteria as being provided based on the requirement of course and since my forte was on web development and considering the fact like an energy company would need a full stack developer I selected API Power Company

Ltd, a energy based company which is listed on Nepal Stock Exchange and is reputed for having tech employees with a vast experience and an abundant excellence where I got to meet like minded tech experts and got to learn so much from them and the company as well.

5.4 Company Hierarchy

API Power Company Ltd. has a hierarchial organization structure. Based on the organizational structure provided, here is a concise hierarchy:

General Assembly of Share Holders 1)Board of Directors 1.1)Audit Committee 1.2)Executive Director 1.2.1)Advisors 1.2.2)Head Office 1.2.2.1)Technical Division 1.2.2.2)Finance Department 1.2.2.3)Administration Department 1.2.2.4)RTS Department 1.2.3)Projects 1.2.3.1)Project Manager 1.2.3.1.1)Technical Division 1.2.3.1.2)Account Adm. Dept. 1.2.3.1.3)Store Department This structure outlines the levels of governance and management, starting from the shareholders down to the project management teams. Each level has distinct roles and responsibilities within the organization

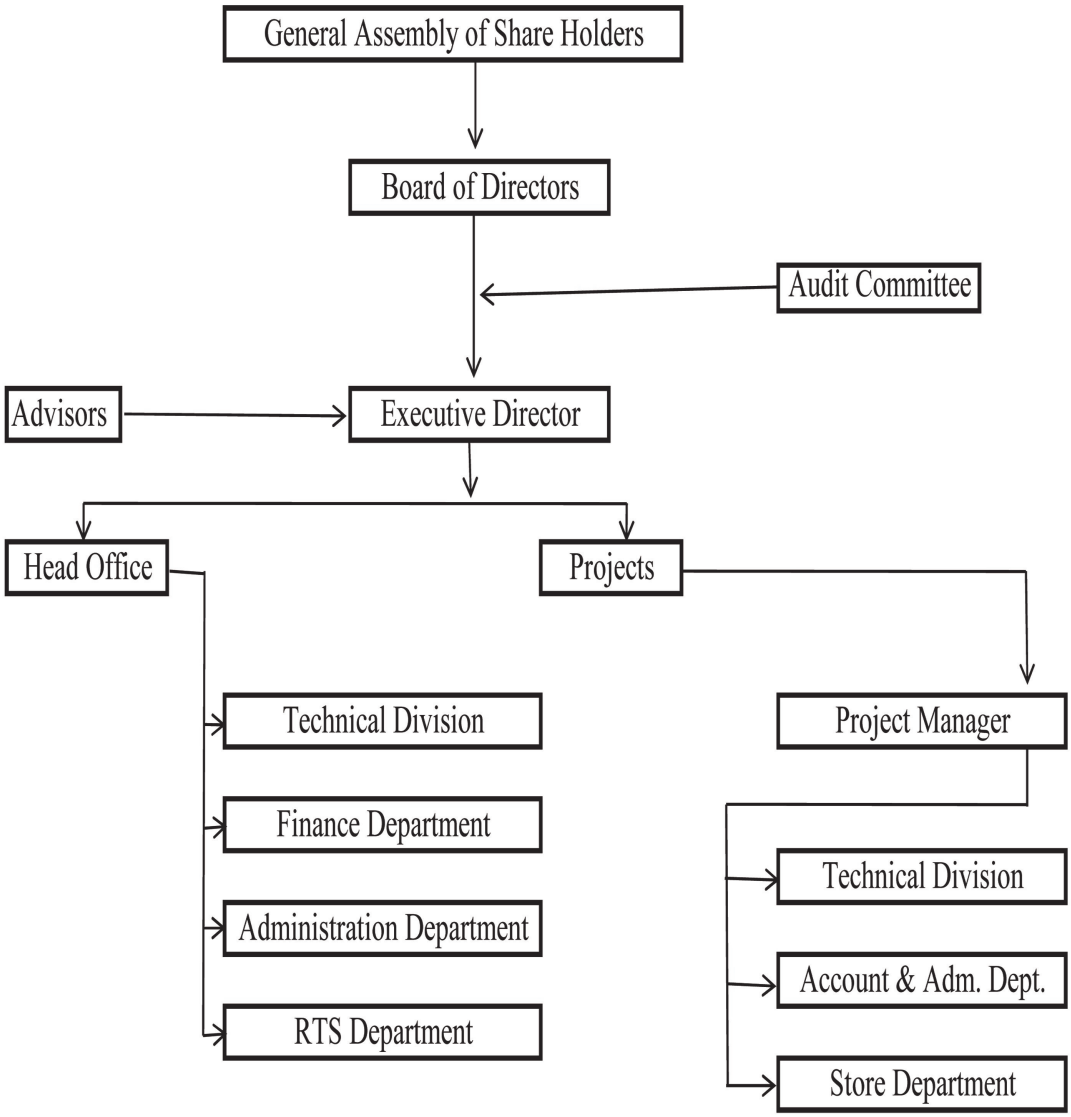

Figure 3: API Organizational Structure

5.4.1 S/W development Team

This department is responsible for carrying out the entire development related task under the supervision of CTO, product manager and project manager or supervisor. Coding, Designing, Database Design are some of the tasks done by software development team.

5.4.2 S/W Deployment Technical Team

Software Deployment Technical team is responsible for testing, deployment and analysis of software in between the development process or after complete development of the software. This team is comprising of software tester, quality controller, quality assurance, technical engineer and technical support personnel. Deployment and publishing of software is one of the major tasks of this team. Support after the deployment of software in client side is provided under the supervision of this team

5.5 Placement

To get the company for the internship, the authorities of the company carried out an interview. Upon being selected for the internship, the organization was joined on. During the internship period, the organization provided me with the work space. The working environment was good. Regular visit of the project supervisor was done to deliver the updates about the project progress.

5.6 Duration and Internship Plan

5.7 Responsiblity Assigned

During my internship at API Power Company Limited, I was tasked with developing websites to keep pace with the evolving digital landscape. My primary responsibility was backend development using Django. This involved studying web development fundamentals, conducting research, and leveraging internet resources to facilitate the development process. As a backend developer, I focused on implementing Django to create efficient and functional web solutions. The variety of task performed are describe below:

1. Designed and implemented user-friendly vacancy posting interface.
2. Developed secure functionality for updating job vacancies.
3. Integrated feature for selecting candidates efficiently.
4. Implemented secure user details update functionality.
5. Facilitated secure deletion of outdated vacancies.
6. Facilitated secure deletion of outdated vacancies

6 CHAPTER 3: INTRODUCTION TO DJANGO PROGRAMMING

6.1 Introduction

Django is a widely-used, high-level Python web framework designed for rapid development and clean, pragmatic design. It follows the Model-View-Controller (MVC) architectural pattern and promotes the "Don't Repeat Yourself" (DRY) and "Convention over Configuration" principles. Django simplifies web application development by providing builtin features for tasks such as URL routing, database migrations, and user authentication. Created by a community of developers, Django is maintained by the Django Software Foundation, a non-profit organization dedicated to the ongoing improvement, expansion, and promotion of the Django framework and its ecosystem. It offers a versatile and secure environment for building scalable and maintainable web applications.

6.2 Django Features

Django, a popular Python web framework, comes with a rich set of features that facilitate the development of robust and maintainable web applications. Some key features of Django include:

1. Model-View-Template (MVC) Architecture: Django follows the MVT architectural pattern, organizing code into models (data handling), views

(presentation logic), and template (frontend).

2. Object-Relational Mapping (ORM): Django provides a powerful ORM system that allows developers to interact with databases using Python objects, simplifying database queries and migrations.

3. Admin Interface: Django includes an automatic admin interface that enables developers to manage database records easily. It is customizable and can be quickly set up to manage models.

4. URL Routing: Django's URL routing system helps map URLs to specific views, making it easy to design clean and maintainable URL structures for web applications.

5. Template Engine: Django has a built-in template engine for HTML rendering, allowing developers to separate the presentation layer from business logic, promoting code readability and maintainability.

6. Authentication and Authorization: Django provides a secure authentication system for user authentication and includes built-in tools for managing user permissions and access control.

7. Middleware Support: Django middleware allows developers to process

requests globally, providing a way to add functionalities such as authentication, security, and caching to the application.

8. Security Features: Django incorporates security measures like protection against SQL injection, clickjacking, and Cross-Site Request Forgery. It encourages best practices to ensure secure web application development.

9. Scalability: Django supports horizontal scaling, making it suitable for building scalable applications. It can be used with various deployment options and works well with popular databases and web servers

6.3 Django Pros and Cons

6.3.1 Pros Of Django

1. Rapid Development: Django's high-level abstractions and built-in features, such as the admin interface, ORM, and form handling, enable developers to build applications quickly and efficiently.
2. DRY Principle: Django encourages the "Don't Repeat Yourself" (DRY) principle, reducing redundancy in code and promoting code reusability.
3. Versatility: Django is versatile and can be used for various types of applications, from simple websites to complex, scalable web applications.
4. Security: Django incorporates numerous security features, such as protection against SQL injection, and cross-site request forgery (CSRF), making it

a secure framework.

5. Community and Documentation: Django has a large and active community that provides extensive documentation, tutorials, and support. This community-driven approach ensures continuous improvement and a wealth of resources.

6. Scalability: Django is designed to handle scalable applications, supporting horizontal scaling and integration with various deployment options.

7. ORM (Object-Relational Mapping): Django's ORM simplifies database interactions by allowing developers to use Python code to interact with databases, reducing the complexity of raw SQL queries.

8. Built-in Admin Interface: The automatic admin interface provided by Django allows developers to manage database records easily without having to build a separate administration panel.

9. Batteries-Included Philosophy: Django follows a "batteries-included" philosophy, providing many built-in features and libraries that cover common development needs.

10. Middleware Support: Django's middleware system allows developers to process requests and responses globally, adding functionalities like authentication, security, and caching

6.3.2 Cons Of Django

1. Learning Curve: For beginners, Django's comprehensive features may result in a steep learning curve compared to simpler frameworks.

2. Monolithic Structure: Some developers argue that Django's monolithic structure can be restrictive for certain projects, especially those requiring more flexibility in component choices.

3. Overhead for Small Projects: The extensive features in Django might be overkill for small projects or simple websites where a more lightweight framework could be sufficient.

4. Opinionated: Django follows certain conventions and may be considered opinionated, which might limit flexibility for developers who prefer more control over project structure and components.

5. ORM Performance: While Django's ORM simplifies database interactions, it may not be as performant as writing raw SQL queries for complex operations, leading to potential performance trade-offs.

6. Template Language Complexity: Some developers find Django's template language less expressive compared to other template engines, which could be a drawback for those accustomed to more feature-rich alternatives

6.4 Scenario of Django in Nepal

Django, being a versatile web framework, presents various opportunities in the context of Nepal, fostering the growth of robust and scalable web applications.

1. Web Development Demand: As the demand for web applications continues to rise in Nepal, Django's capabilities make it well-suited for addressing diverse development needs.

2. Tech Talent Development: Embracing Django creates opportunities for local developers to enhance their skills in a widely-used and powerful framework, contributing to the growth of a skilled tech workforce.

3. Startups and SMEs: Django's rapid development features make it ideal for startups and small to medium-sized enterprises (SMEs) in Nepal, enabling them to quickly launch and scale their web applications.

4. E-Government Initiatives: With the increasing focus on digitization and e-governance, Django provides a reliable framework for developing secure and efficient government web applications in Nepal.

5. Education and Training: The use of Django in educational institutions can offer students practical experience in web development, aligning their skills with industry demands.

6. Community Engagement: Django's active global community provides opportunities for Nepali developers to engage, collaborate, and contribute to the framework's improvement.

7. Tech Entrepreneurship: Django's suitability for rapid prototyping and development makes it conducive for tech entrepreneurs in Nepal to bring innovative web-based solutions to market quickly.

8. E-commerce Growth: With the increasing popularity of online commerce in Nepal, Django's versatility supports the development of robust and scalable e-commerce platforms.

9. Open Source Contributions: Active participation in Django's open-source community can provide Nepali developers with opportunities to contribute

to global projects and enhance their reputation in the tech industry.

7 CHAPTER 4: INTERN ACTIVITIES

7.1 Learning the process

As an intern, my initial task was to familiarize myself with the company's processes and tools used for project development. With guidance from mentors and senior colleagues, I learned about the tools essential for Django development and project execution. I learned the following tools were used in the organization for developing a system: 1. Django Framework: I learned to work with the Django framework, which provides everything needed to develop web applications efficiently.

2. Python Programming Language: Since Django is based on Python, I honed my skills in Python programming to build Django applications effectively.

3. Integrated Development Environment (IDE): I utilized IDEs like Visual Studio Code (VS Code) or PyCharm for writing Django code. These IDEs offer Django extensions for streamlined development.

4. Django Packages: Django offers a vast ecosystem of packages that extend its functionality. I learned to manage packages using the 'requirements.txt' file and pip commands for installation and upgrades.

5. Responsive Design: I grasped the importance of designing responsive user interfaces for web applications and used Django's built-in tools and libraries for this purpose.

6. Django Extensions: I explored and utilized various Django extensions

to enhance development productivity and add specific functionalities to web applications.

7. Testing: I utilized Django's testing framework for unit testing, integration testing, and ensuring the quality and functionality of web applications.

8. Documentation and Community Resources: I relied on official Django documentation, tutorials, and community forums for reference, guidance, and problem-solving during development.

7.2 System Overview of Placement Cell

The Placement Cell serves as a specialized software solution tailored to optimize all aspects of placement-related operations. Its primary objective is to automate key functions like job postings, with the aim of simplifying the placement process for both students and administrators. By centralizing data pertaining to job postings, company profiles, and student resumes, the Placement Cell facilitates easy retrieval of pertinent information

7.3 Understanding the Existing Projects

1. Read the source code.

2. It has the virtue of always being current.

3. If unit tests are provided, read them since they often demonstrate how a class, library, or framework should be used.

4. Refactor a section of source code

7.4 Setting Project Objectives

After studying the existing systems, we found out what our project was supposed to do and set the following objectives. 1. Automate the Placement Process: The primary objective of Placement Cell is to automate and digitize the manual and time-consuming tasks involved in managing placements. By implementing the Placement Management System, the project aims to streamline processes such as job posting, application management, and placement tracking.

2. Enhance Efficiency and Effectiveness: The project seeks to improve the overall efficiency and effectiveness of the placement process. By automating key tasks and providing a centralized platform, Placement Cell will reduce administrative burdens, eliminate paperwork, and enable real-time tracking and monitoring of placement activities. This will

result in faster turnaround times, increased productivity, and improved placement outcomes.

3. Optimize Student Experience: One of the objectives of the project is to enhance the placement experience for students. Placement Cell will provide students with a userfriendly interface to search for job opportunities, submit applications, track their progress, and access relevant placement-related information. By simplifying processes and improving transparency, Placement Cell aims to provide equal opportunities and empower students in their career development.

4. Facilitate Data-Driven Decision-Making: The project seeks to provide

valuable insights through analytics and reporting functionalities within the Placement Management System. By analyzing placement trends, success rates, and feedback data, administrators and faculty members can make data-driven decisions to optimize placement strategies, improve student support, and align industry requirements with curriculum offerings.

5. Enhance Stakeholder Satisfaction: Placement Cell aims to enhance the satisfaction of all stakeholders involved in the placement process, including students, faculty, and recruiters. By providing a user-friendly, efficient, and transparent platform, the project intends to improve stakeholder engagement, collaboration, and overall satisfaction with the placement process

7.5 Requirement Analysis

7.5.1 Functional Requirements

Functional Requirements:

1. **User Registration and Profiles**:

- Students can create/update profiles containing personal information, academic records, and skills.

- Recruiters can register/manage profiles, providing company details and specifying job requirements.

2. **Job Posting and Management**:

- Recruiters can post/update job vacancies, including descriptions, qualifications, and required skills.

3. **Job Application and Tracking**:

- Students can search for jobs and apply, tracking the status and outcomes of their applications.

4. **Document Management**: - Students are able to upload/manage resumes, cover letters, and other relevant documents.

- Recruiters have the capability to review and download applicant documents.

5. **Placement Tracking and Reporting**:

- Users can monitor the progress of placements, while the system generates reports on placement metrics.

6. **User Roles and Permissions**:

- Different user roles (students, faculty, administrators, recruiters) are assigned varying access levels.

- Administrators have the authority to manage accounts, permissions, and system configurations.

These functional requirements outline the core features and capabilities of the system, encompassing user registration, job posting, application tracking, document management, placement monitoring, and role-based access control.

7.5.2 Non-Functional Requirements

1. Performance: Responsive system with quick response times for key functions, capable of handling high user volumes without slowdowns.

2. Scalability: Designed to grow with increasing users, job postings, and applications without sacrificing performance.
3. Reliability: Highly reliable with minimal downtime, robust error handling, and data integrity measures.
4. Security: Strong security measures to protect sensitive data, with authentication and authorization controls.
5. Data Integrity and Privacy: Ensures data accuracy, consistency, and privacy compliance with backup and recovery mechanisms.
6. Compatibility: Compatible with various browsers, operating systems, and devices, following web standards and accessibility guidelines.

7. User Experience: Intuitive interface, clear navigation, and effective feedback mechanisms for a positive user experience.
8. Maintainability: Modular design for easy updates and bug fixes, with clear documentation and version control.
9. Compliance: Adherence to industry standards, legal requirements, and institutional policies, including data protection regulations and privacy laws.

7.6 Defining the Context

A context diagram in engineering is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram is a high-level view of a system. The context diagram for the assigned project is shown below in the figure:

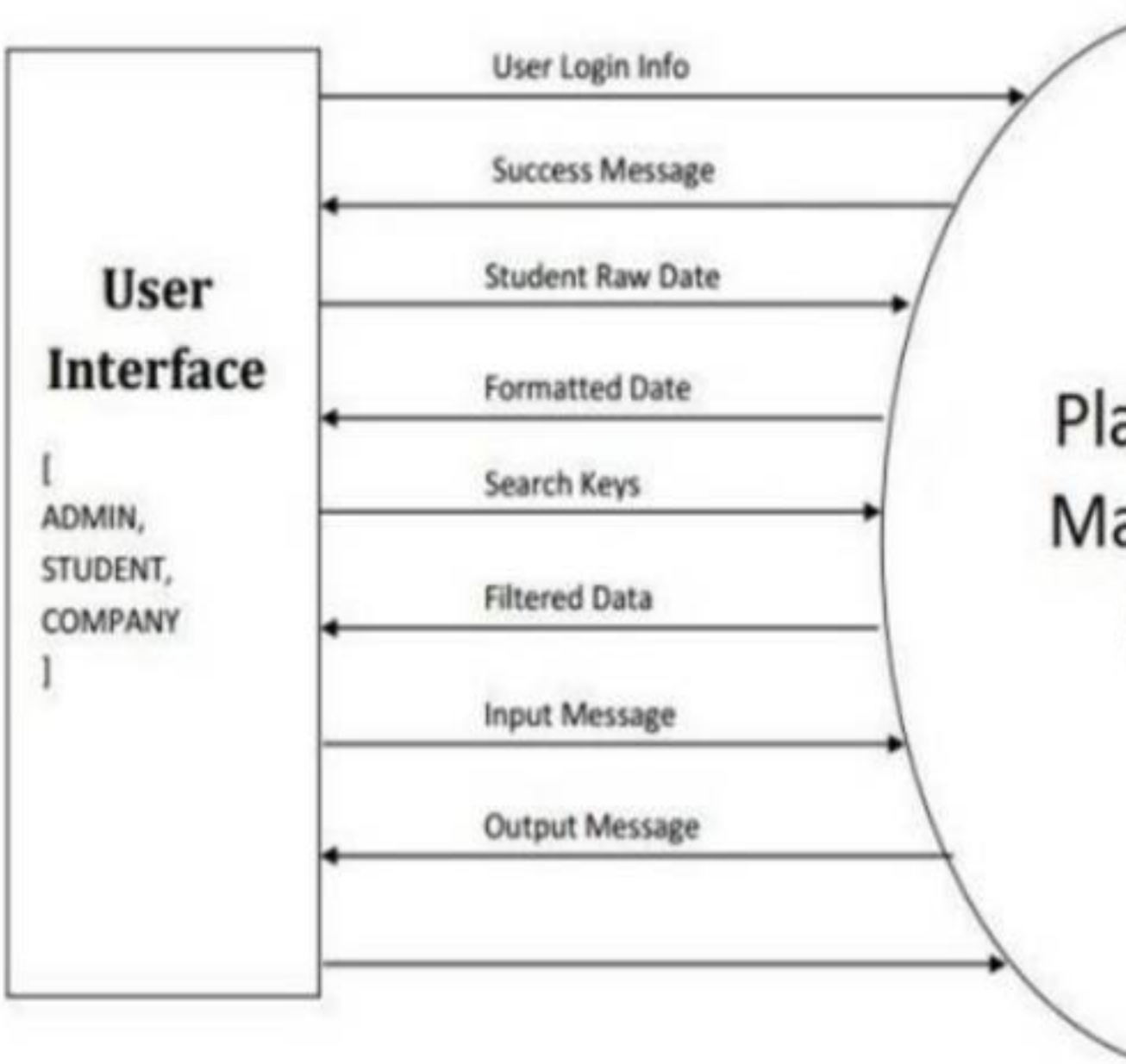

Figure 4: Context Diagram

7.7 System Design

7.7.1 ER-Diagram

An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation of an information system that represents the relationships among entities, objects or events within that system

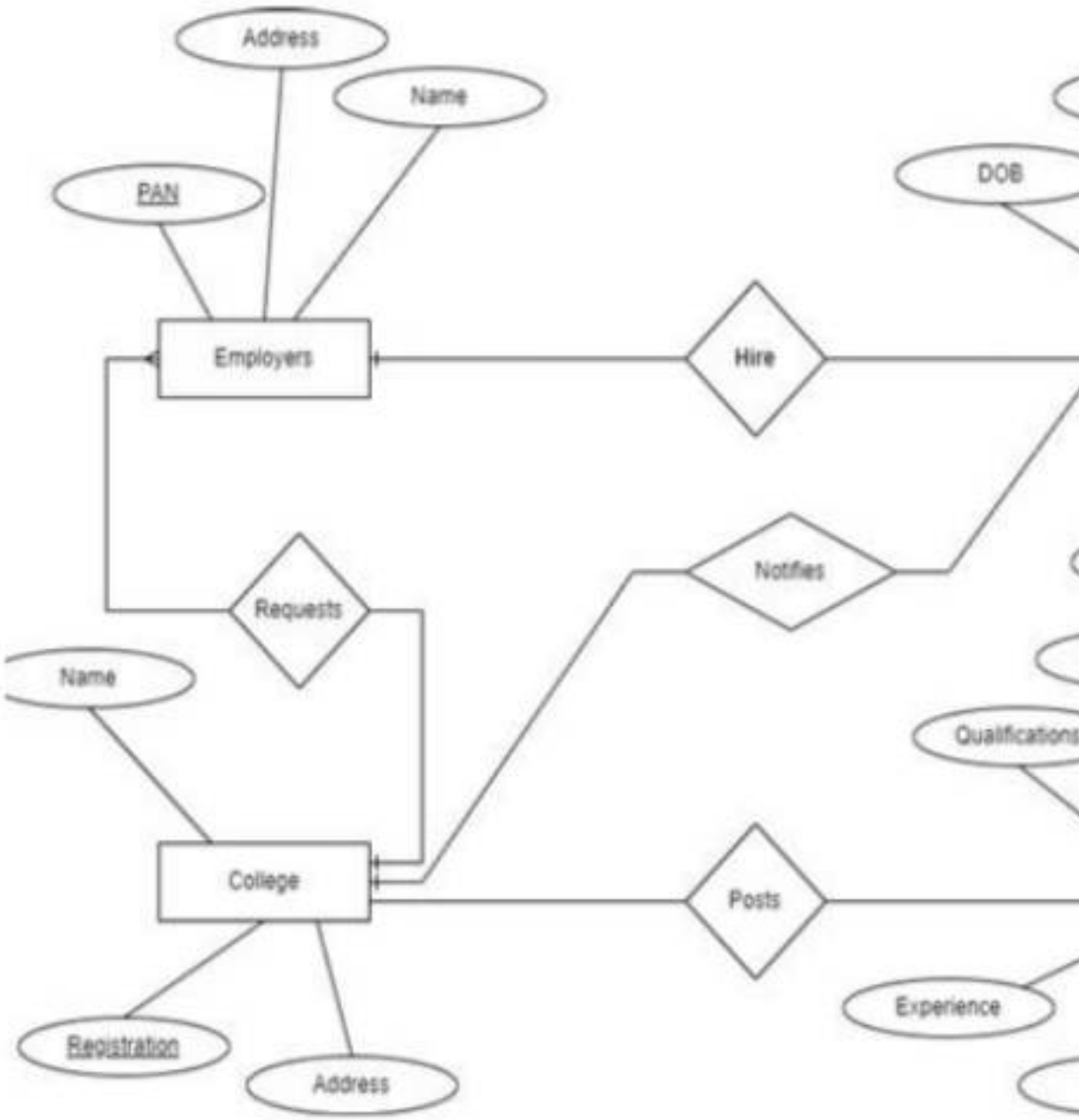

Figure 5: Caption

7.8 UI:User Interface Design

7.9 AGILE Development Model

Apart from all the project related activities, one of the most important tasks was also carried out throughout the internship period that was discussions and meetings.

- Team members were supposed to attend a daily discussion about the progress of project.
- Meeting with the mentor was conducted weekly to discuss the progress and to get the feedbacks from him to improvise the project

8 CHAPTER 5 : ASSESSMENT OF INTERNSHIP

8.1 Learning From Internship

The time I have spent at API Power Company Limited as an intern, was a great experience. I got opportunity to learn in a professional environment. This helped me to improve my skills, knowledge, abilities and to work in a group. Apart from this,

1. I have learned that problem solving skill is very important.

2. It helped me develop a strong work ethic.

3. It helped me realize that in professional world deadline is a very serious subject and hence proper planning and work discipline must be maintained throughout the office period.

8.1.1 Workflow In Corporate Environment

The internship program presented me with the opportunity to work in real world working scenario and experience the workplace culture and tradition.

8.1.2 Team Work and Collaboration

Team work and collaboration is vital in context of an organization. I experienced how the project is completed with the combined efforts of all group

members. Additionally, I came to know several tools that is used to develop the web developing in organization.

8.1.3 Working Mechanism of Web Development

Good understanding of how backend development is processed in real world helps to develop the system. The internship program helps me to well verse in working mechanism of the web development using Visual Studio along with other tools

8.1.4 Implanting the Algorithm in Project

In studies we study many algorithms but, implementing the algorithm in the real field is little different and we have to select the best algorithm that is feasible for the project.

8.1.5 Use Of Different Tools

During the course of the internship I came to know about different tools that is used in the web development. While every tool is not easy to begin with, but strong desire and sheer will power has made me to understand many tools that is used.

8.1.6 Monitor Analyze And Test Results

During the course of the testing the analysis of the test result is very important we should analyze the result and make sure that the correct result

should be accepted.

8.2 Challenges

8.2.1 Time Management

Challenging part I face is to manage time, no matter how I try hard I will always feel pressure of deadline at last moments.

9 CHAPTER 6 :CONCLUSION AND LIMITATION

9.1 Limitation

1. These types of ecommerce sites are already available in our markets, but it does not have the feature that we are providing to our company.

2. Technical issues might occur sometimes

3. Here we will provide the high permissions to the admin so he can handle the complete company for better security and maintenance.

4. There will be different permissions to the admin and users.

5. The system doesn't have the separate web page for checking all the customers' enquiry and send reply promptly

6. Ensuring that the products are fully functional and meet quality standards may require extensive testing and quality control measures.

9.2 Recommendation to Organization

API Power Company Limited might be a perfect organization to apply for an intern in development of website application development since the working environment of the organization is very much good. Also, proper guidance is given by the experienced employee. The organization could be better if size of the technical human resource is increased and different methodology is followed for rapid development.

9.3 Conclusion

During my 9 weeks internship program at API Power Company Limited., I had the privilege of working alongside a team of dedicated and experienced professionals. This opportunity provided me with invaluable hands-on experience in various aspects of the company's operations, particularly in the area of teamwork.

Throughout my internship, I was given the opportunity to collaborate and work closely with members of various teams, and I learned the importance of effective communication and coordination. Working with individuals from diverse backgrounds and skill sets helped me develop my ability to adapt and work in a team environment. I am immensely grateful for the guidance and mentorship provided by the API Power Company team. Their willingness to share their knowledge and expertise with me was instrumental in my professional growth and development. Their continuous support and encouragement enabled me to tackle new challenges and expand my skill set.

I am confident that the skills and experiences gained during my internship have prepared me for a career in the tech industry. I look forward to applying these skills in a professional setting and making meaningful contributions to any team that I join. Once again, I want to express my sincere gratitude to the Texas Imaginology team for providing me with an unforgettable internship experience

10 REFERENCES

11 APPENDIX