==Tribhuvan University

==Faculty of Humanities and Social Science

DEVELOPMENT AND DEPLOYMENT OF SAAS-BASED HMS AT SOLVEETECH PVT. LTD.

INTERNSHIP REPORT

Submitted to

Department of Computer Application

==Nepathya College

==Tillottama -5, Rupandehi

In partial fulfillment of the requirements for the Bachelors in Computer Application

Submitted by:

Amrit Paudel

[TU Reg No: ==6-2-1182-36-2020]

==August, 2024

Mentor's Recommendation

Tribhuvan University

Faculty of Humanities & Social Science

Nepathya College

I am delighted to recommend Amrit Paudel for their exceptional performance during the internship. Having had the opportunity to closely observe their work, I can confidently say that their enthusiasm, dedication, and ability to quickly grasp new concepts truly set them apart. Their thoughtful problem-solving and positive attitude have not only contributed significantly to our projects but also created a collaborative work environment. I wholeheartedly endorse Amrit Paudel for any future opportunities and have no doubt that their talent and work ethic will lead to continued success.

…………………..

==Alok Kumar Pandey

==CEO

==Tribhuvan University

==Faculty of Humanities and Social Science

==Nepathya College

Supervisor Recommendation

I hereby recommend that this internship report under my supervision by **Amrit Paudel** entitled *"DEVELOPMENT AND DEPLOYMENT OF SAAS-BASED HMS AT SOLVEETECH PVT. LTD."* in partial fulfillment of the requirement for Bachelor's Degree in Computer Application of Tribhuvan University be processed for the evaluation.

…………………..

==Sameer Gautam

==Supervisor

Lecturer

=Smr=Nepathya College

Tilottama - 5, Manigram

==Tribhuvan University

==Faculty of Humanities and Social Science

==Nepathya College

LETTER OF APPROVAL

This is to certify that this project prepared by **Amrit Paudel** entitled *"DEVELOPMENT AND DEPLOYMENT OF SAAS-BASED HMS AT SOLVEETECH PVT. LTD."* in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

. . . . **==Sameer Gautam** ==Supervisor =Smr=Nepathya College	. . . . **==Sanjeev Bhandari** ==Principal =Sjv=Nepathya College
. . . . **==Shiva Bhattarai** ==Internal Examiner =Shv=Nepathya College	. . . . **==Suresh Sharma** ==External Examiner ==Birendra Multiple Campus

Acknowledgment

We express our sincere gratitude to all those who played a vital role in the realization of the ==*Development and Deployment of SAAS-Based HMS at SolveeTech Pvt. Ltd.*project. This endeavor would not have been possible without the unwavering support and guidance of numerous individuals and institutions.

Foremost, we extend our deepest appreciation to our project supervisor **==Sameer Gautam** and Head of Department **==Shiva Bhattarai** for their invaluable expertise, encouragement, and insightful feedback, which were instrumental in shaping this project's success.

We are grateful to the faculty and staff of **==Nepathya College** for fostering an environment of learning and innovation. Their dedication to academic excellence and commitment to providing the best educational resources have been integral to our journey.

Our heartfelt thanks also go to our family and friends for their unwavering support and motivation. Their encouragement has kept us determined throughout this endeavor.

Lastly, we acknowledge the collaborative spirit of **==Tribhuvan University** and extend our sincere thanks to all who contributed directly or indirectly to this project's success. Your support has been a driving force in this achievement.

With Gratitude

Amrit Paudel

Abstract

This report discusses my internship experience at [Company Name], focusing on [Project Name].

Contents

List of Figures

List of Tables

Abbreviations

- IoT – Internet of Things

- API – Application Programming Interface

Chapter 1:   Introduction

1.1   Overview

This report presents the development and deployment of a SAAS-based Hospital Management System (HMS) at SolveeTech Pvt. Ltd. The project transforms traditional hospital management processes into a modern, cloud-based service model. It encompasses modules for patient management, appointment scheduling, billing, and administrative functions to provide a scalable, secure, and integrated solution for today's healthcare environment.

1.2   Problem Statement

Healthcare providers today face numerous challenges with existing management systems:

- Outdated, manual processes lead to inefficiencies and delays in patient service.

- Current systems lack scalability and struggle to handle growing amounts of patient data.

- Legacy solutions are resource-intensive and do not support remote accessibility or real-time updates.

- Inefficient data handling results in increased operational costs and diminished patient experience.

1.3 Objectives

The primary objectives of this project are:

- To develop a SAAS-based HMS that automates essential hospital operations.

- To ensure the system is scalable to accommodate increasing patient data and demands.

- To design and implement a user-friendly interface for patients, doctors, and administrative staff.

- To integrate robust security measures and ensure compliance with relevant healthcare standards.

- To deploy the system on a cloud platform, ensuring high availability and performance.

1.4 Scope and Limitation

Scope

This project covers:

- The design, development, and deployment of a comprehensive SAAS-based HMS.

- Implementation of core modules including patient registration, appointment scheduling, billing, and reporting.

- Development of a multi-tenant cloud-based solution that supports remote access and real-time data updates.

Limitations

- The project is developed within a constrained timeframe; advanced features may be limited.

- Initial deployment is tailored exclusively for SolveeTech Pvt. Ltd. and may require further customization for broader use.

- Integration with legacy systems is not included in the current scope.

1.5   Report Organization

This report is organized into five main chapters:

- **Chapter 1: Introduction** – Provides an overview, including the background, problem statement, objectives, scope, and report organization.

- **Chapter 2: Background Study and Literature Review** – Reviews relevant literature and existing solutions in museum management and virtual tours.

- **Chapter 3: System Analysis and Design** – Details the analytical and design phases, including requirement analysis, feasibility studies, and system design.

- **Chapter 4: Implementation and Testing** – Describes the implementation process, the technologies used, and the testing methodologies applied.

- **Chapter 5: Conclusion and Future Recommendations** – Summarizes the findings, discusses the outcomes, and provides recommendations for future improvements.

Chapter 2:   Introduction to Organization

Detailed description of tasks performed during the internship.

2.1   Organization Details

SolveeTech Pvt. Ltd. is a forward-thinking technology company dedicated to delivering innovative software solutions. Founded with a mission to revolutionize digital services, the company has grown steadily and earned a reputation for quality, efficiency, and customer focus. At SolveeTech, collaboration and continuous improvement are at the core of its work culture, making it an exciting environment for both professionals and interns.

2.2   Organizational Hierarchy

SolveeTech maintains a well-defined organizational hierarchy which ensures clear communication and efficient decision-making. At the top is the CEO, supported by a team of senior managers and department heads. Each department, such as Software Development, Marketing, and Administration, functions with its own leadership while working together towards common company goals. This structure not only ensures smooth day-to-day operations but also provides clear paths for career development and accountability throughout the organization.

2.3   Working Domains of Organization

SolveeTech operates in several key areas:

- **Software Development:** Creating innovative applications and cloud-based solutions that meet the needs of modern businesses.

- **Technical Support:** Offering reliable maintenance and rapid troubleshooting services

to ensure optimal system performance.

- **Research and Innovation:** Continuously exploring new technologies and improving current solutions to stay ahead in the competitive market.

- **Consulting Services:** Providing expert advice on digital transformation and customized technology strategies.

This diverse range of working domains enables SolveeTech to adapt quickly to market demands and to deliver comprehensive solutions to its clients.

2.4   Description of Intern Department/Unit

Interns at SolveeTech are primarily integrated into the Software Development Department. This unit is organized into small teams, each focused on different aspects of the development life cycle, including front-end design, back-end programming, and quality assurance. Interns work closely with experienced professionals, participate in project meetings, and contribute to real coding tasks. This hands-on experience is designed to develop technical skills, enhance problem-solving abilities, and provide a clear insight into industry best practices. The supportive environment not only accelerates learning but also prepares interns for a successful career in the technology sector.

Chapter 3:   Background Study and Literature Review

3.1   Background Study

In recent years, Software as a Service (SAAS) has transformed various industries, including healthcare. Traditional hospital management systems were often based on on-premise solutions that required significant investment in hardware and maintenance. With the advent of cloud computing, SAAS-based systems now provide a flexible, scalable, and cost-effective alternative.

Key concepts in this domain include:

- **Cloud Computing:** A model that enables on-demand access to computing resources over the internet, allowing hospitals to scale services as needed.

- **Multi-Tenancy:** A software architecture where a single instance of the application serves multiple institutions while keeping their data isolated.

- **Virtualization:** The process of creating virtual versions of hardware or software, which underpins the efficient use of resources in cloud computing.

- **Scalability and High Availability:** Essential features that ensure the system can handle growth in data and user load while remaining reliable.

- **Service-Oriented Architecture (SOA):** An approach to design software where services communicate over a network, providing modularity and reusability.

These theories and concepts not only support the technical design of SAAS-based HMS but also help in addressing the growing challenges in modern healthcare such as cost reduction, improved accessibility, and enhanced patient care.

3.2 Literature Review

A number of studies and projects have examined the benefits and challenges of adopting cloud-based systems in healthcare. For example, research by Hsu et al. demonstrated that moving to a SAAS-based management system can significantly reduce operational costs and improve data accuracy. Other studies have focused on the scalability of cloud solutions, noting that multi-tenancy and high availability are critical for systems that serve large, distributed organizations.

Several key findings from the literature include:

- SAAS-based hospital management systems can lead to increased efficiency by automating routine processes such as patient registration, appointment scheduling, and billing.

- Cloud-based models offer significant cost benefits due to reduced infrastructure requirements and simplified maintenance.

- The implementation of SAAS models comes with challenges, particularly in ensuring data privacy and meeting regulatory standards in healthcare.

- Previous projects in similar domains have successfully deployed cloud-based systems that improved inter-departmental communication and allowed real-time updates of patient records.

Overall, the literature supports the shift towards SAAS models in healthcare. It highlights not only the economic and operational benefits of these systems but also the importance of addressing security, privacy, and compliance issues during development and deployment. The findings from these studies provide a solid foundation for the design and implementation of the SAAS-based HMS at SolveeTech Pvt. Ltd., and they inform the choices made during the project's development.

Chapter 4:   Internship Activities

Discussion on problems encountered and how they were solved.

4.1   Roles and Responsibilities

During my internship at SolveeTech Pvt. Ltd., my role was that of a Junior Software Developer within the hospital management team. I collaborated with senior developers and participated in various aspects of the software development life cycle. My responsibilities included:

- Assisting in the design and coding of the SAAS-based Hospital Management System (HMS).

- Participating in daily team meetings, code reviews, and sprint planning.

- Troubleshooting and resolving software bugs to improve system reliability.

- Documenting technical procedures and contributing to system testing.

This hands-on experience significantly enhanced my technical skills and provided valuable insights into real-world software development practices.

4.2   Weekly Log (Technical Details of Activities)

Below is a summary of my weekly activities during the internship:

Week 1:

I began by familiarizing myself with the company's culture, tools, and the existing codebase. I attended a series of induction sessions and worked on small bug fixes to get a practical sense of the workflow.

Week 2:

I was assigned to the patient registration module. I analyzed the database schema, learned about SQL queries used by the team, and contributed to developing user-friendly data entry forms.

Week 3:

I participated in designing and implementing API endpoints to support core functionalities of the HMS. I collaborated with backend developers to ensure that the endpoints were secure, efficient, and met the project requirements.

Week 4:

My focus shifted towards integrating third-party authentication services and improving server response times. I also wrote and ran unit tests to validate new features and maintain system performance.

4.3   Description of the Project(s) Involved During Internship

The primary project in which I was involved was the development and deployment of a SAAS-based Hospital Management System at SolveeTech Pvt. Ltd. This project aimed to modernize conventional hospital management practices by providing a cloud-based solution that simplifies patient data management and enhances operational efficiency.

Key contributions I made include:

- Implementing a secure user authentication module to protect sensitive patient data.

- Developing scalable data management features that allow for the addition, update, and deletion of patient records.

- Integrating interactive elements to support an enhanced user experience for both healthcare staff and patients.

- Collaborating closely with cross-functional teams to ensure that the final product aligned with industry best practices and customer needs.

Overall, working on this project has provided me with a deeper understanding of modern SAAS architectures, agile methodologies, and the practical challenges involved in deploying critical software systems in a dynamic, real-world environment.

4.4   Tasks / Activities Performed

Throughout my internship, I undertook a variety of tasks that were crucial to the project's success. These tasks included:

- **Requirement Analysis:** Collaborated with the team to gather and analyze system requirements, translating business needs into technical specifications.

- **Development:** Wrote, tested, and debugged code for both frontend interfaces and backend services, contributing to modules like user authentication and data management.

- **Integration:** Integrated third-party tools and services to enhance functionality and ensure seamless connectivity within the system.

- **Testing and Quality Assurance:** Conducted unit testing and participated in system-wide testing to verify the reliability and performance of the application.

- **Documentation:** Assisted in preparing technical documentation, including user manuals and developer guides, to support ongoing maintenance and future enhancements.

- **Team Collaboration:** Actively engaged in daily meetings, code reviews, and brainstorming sessions, which improved both the design and functionality of the final product.

Chapter 5:   Conclusion

5.1   Conclusion

The internship at SolveeTech Pvt. Ltd. has been a transformative experience. Through my involvement in the development and deployment of the SAAS-based HMS project, I gained valuable hands-on exposure to modern software development practices, agile methodologies, and cloud-based solutions. The project successfully addressed key challenges in digital hospital management by streamlining operations and enhancing user engagement. Overall, the internship has not only advanced my technical skills but also honed my ability to work effectively in a collaborative, real-world environment.

5.2   Learning Outcomes

This internship provided me with numerous learning experiences, including:

- **Enhanced Technical Proficiency:** I acquired practical knowledge in full-stack development, cloud integration, and modern programming frameworks.

- **Effective Problem-Solving:** I learned to analyze and resolve complex issues quickly, adapting to emerging challenges during the project lifecycle.

- **Team Collaboration and Communication:** Working closely with a diverse team helped me develop strong interpersonal and project management skills.

- **Understanding of Industry Practices:** Exposure to agile methodologies and real-world deployment strategies provided insight into industry-standard practices.

- **Professional Growth:** The experience bolstered my confidence, preparing me for future challenges in both academic and professional settings.

Appendix

Additional information such as survey results, flowcharts, and specifications.

Source Code

```python
def hello():
    print("Hello, world!")
```

Bibliography

References