



Tribhuvan University

Faculty of Humanities and Social Sciences National College

AN INTERNSHIP REPORT

On

BULK MESSAGING SYSTEM

At

Wolfmatrix Pvt. Ltd.

Submitted to

Department of Computer Application

National College

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

Submitted by

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Under the Supervision of

Mr. Prakash Kafle

Mentors' Recommendation



Tribhuvan University

Faculty of Humanities and Social Sciences

National College

I hereby recommend that this internship project prepared under my supervision by Suyashaa Vaidya entitled “BULK MESSAGING SYSTEM” at “Wolfmatrix Pvt. Ltd.” in partial fulfillment of the requirements for a degree of Bachelor of Computer Application is recommended for the final evaluation. I have thoroughly looked over the works she has done during his internship period. Her work at Wolfmatrix Pvt. Ltd. has satisfied the particulars mentioned in this report.

Signature

Mr. Prakash Kafle

Supervisor

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Letter of Approval

This is to certify that this internship report prepared by Suyashaa Vaidya entitled “BULK MESSAGING SYSTEM” at “Wolfmatrix 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.

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Finally, I would like to thank the senior developers at Wolfmatrix Pvt. Ltd for their support and mentorship. Their dedication to their craft and willingness to share their skills have been an inspiration to me and have helped me to develop my own skills as a developer.

I am grateful for the opportunity to have worked with such a talented and dedicated team and I look forward to continuing to learn and grow as a developer in the future.

Abstract

This internship report details the development and implementation of a bulk messaging system on which I worked on during the three months of my internship period for Wolfmatrix Pvt. Ltd. This report documents the details of my internship in software development for a duration of 3 months which began in August 2022 and ended in November of the same year. The objectives of this internship were to expose students to real-world work experience, deepen our understanding of the course material, and provide relevant work-related training in the field of software development and computer application professions which can definitely be seen by the progress made which is also documented in this report.

This internship report examines the bulk messaging system which can be used for marketing purposes or for sending invitations, messages to multiple contacts at once. The report includes a detailed description of the system's features, as well as its implementation and testing process. The system has been successfully implemented and is currently in use, resulting in efficient and faster message transferring. Overall, the internship provided valuable experience in software development and project management.

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List of Abbreviations

API	Application Programming Interface
BE	Back End
BMS	Bulk Messaging System
CEO	Chief Executive Officer
CSS	Cascading Style Sheet
CTO	Chief Technical Officer
FE	Front End
HTML	Hyper Text Markup Language
ISO	International Organization for Standardization
JS	JavaScript
JSON	JavaScript Object Notation
PC	Personal Computer
SDK	Software Development Kit
UI	User Interface

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Chapter 1: Introduction

1.1 Introduction

An internship is a professional learning experience that offers meaningful, practical work related to a student's field of study or career interest. An internship gives a student the opportunity for career exploration and development, and to learn new skills. It offers the employer the opportunity to bring new ideas and energy into the workplace, develop talent and potentially build a pipeline for future full-time employees. A quality internship:

- Consists of a part-time or full-time work schedule that includes no more than 25% clerical or administrative duties.
- Provides a clear job/project description for the work experience.
- Orients the student to the organization, its culture and proposed work assignment(s).
- Helps the student develop and achieve learning goals.
- Offers regular feedback to the student intern.

This internship report explains about the work flow, learning knowledge and project done during my three months long internship program at Wolfmatrix Pvt. Ltd. In this internship phase, I learned about the real working scenario of the IT company and can expand my learning, working and research skills. I was introduced to the working environment, Information Technology's worldwide markets, different type of development models and techniques.

In the internship phase, I got an opportunity to learn about the application development process of a web application. The technical stack used to develop this web application was react js and node js. React.js was used for the front end, node.js for the back end, and mysql for the database. Using which I built a chrome extension which is used for sending customized bulk messages to multiple contacts.

Along with it, I worked on other projects including creating email templates in HTML and CSS and developing the user interface (UI) of the Office Management System for mobile applications using the cloud-based design tool figma. Additionally, I participated in ongoing office projects where I implemented nest js, typescript, and react redux. Working on these

projects greatly aided my learning about development and methodically utilizing the aforementioned technical stack.

1.2 Problem Statement

Gmail allows us to send a single message to recipients at a time, but we are unable to send several messages that are also customized ones at once. There are other bulk texting programs, but they come with a lot of limitations and can only be used when you pay a set fee. Therefore, the organization decided to develop the extension for bulk messaging and assigned it to me. Some problem statements are:

- The application should be user-friendly, responsive, and easy to navigate.
- The application should also provide real-time updates and notifications to users.
- The project should be developed using the latest technologies and frameworks to ensure scalability and maintainability.
- The application should be tested thoroughly to ensure that it meets the project requirements and is free of errors.
- The project should be completed within the agreed timeline and budget.
- Sending bulk mails to multiple people at the same time.
- Attaching files like images, audio, videos and documents along with the message.
- Creating tokens and sending customized messages.
- Scheduling the messages in batches.
- Saving message template

1.3 Objectives

The general objective of this internship are:

- To build confidence and gain hands-on experience of working in a professional IT environment.
- To familiarize myself with common development tools and frameworks such as Git, React, Nest.
- To get exposure to agile software development.
- To learn designing and developing responsive web applications that work seamlessly across different devices and browsers.
- To learn how to write clean, maintainable code and following software engineering best practices.
- To improve problem-solving skills and troubleshooting code errors in a real-world environment.

- To increase networking with professionals in the field and building relationships with potential future employers.
- To gain valuable industry experience that will help me stand out in the job market and kickstart my career.

The specific objectives of application developed during internship at Wolfmatrix Pvt. Ltd. are:

- To send bulk mails to multiple people at the same time.
- To attach files like images, audio, videos and documents along with the message.
- To send customized messages to people. For example: If we need to wish a group of people with their names included in the message, we can use its customization feature.
- To schedule messages with certain time delays and batching between the messages to be sent.
- To save the message as a template for future use.

1.4 Scope and Limitations

1.4.1 Scope

- Sending bulk mails to multiple people at the same time.
- Integration of features such as scheduling, targeting, and tracking to help users manage and track their messages
- Files like images, audio and documents can be attached along with the message.
- Send customized messages to people.
- Save message template
- Tokens for customize messaging.
- Testing and deployment of the application

1.4.2 Limitations

- Time constraints due to the limited duration of the internship
- Limitations on the resources and technologies due to company policies
- The application will not support all the platforms, it will be limited to the most popular social and communication platforms
- There can be restrictions on how many messages can be sent at once or how many people can be targeted in a single time..
- The application will not be able to handle extremely high volume of data and users at the same time.
- The application will not provide a feature for end-to-end encryption for secure messaging.
- The user can send bulk message only using their gmail account.
- The user cannot send videos.

1.5 Report Organization

The report comprises of five extensive chapters, which are briefly discussed below:

Chapter 1: Introduction

The first chapter of the report is dedicated to providing a comprehensive introduction to the entire system. It encompasses background information regarding the internship, including the project details, duration of the internship, and objectives. The problem statement and scope & limitations of the project are also discussed in this chapter. Moreover, this chapter elucidates on the specific work done during the internship.

Chapter 2: Organization Details

The second chapter of the report is aimed at providing a detailed overview of the organization where the internship was undertaken. It includes the working domains of the organization and talks about the hierarchy and intern department or unit.

Chapter 3: Literature Review

The third chapter of the report is entirely devoted to the literature review and background study related to the project undertaken during the internship. It covers the research work done before the start of the project.

Chapter 4: Roles and Responsibilities

The fourth chapter is all about the roles and responsibilities of the participants who were involved in the project. It outlines the tasks and activities performed during the project and provides a detailed description of the project. It also includes weekly logs of the participants during the internship.

Chapter 5: Conclusion and Learning Outcome

The final chapter of the report focuses on the conclusion and learning outcome of the project. It provides an overall evaluation of the project and summarizes the key findings. This chapter also highlights the skills and knowledge acquired during the internship period and how they will be beneficial in the future. Additionally, this chapter presents recommendations for future work that can be carried out based on the findings of the project.

In conclusion, this report is a comprehensive analysis of the work done during the internship period. It includes a detailed description of the organization and its hierarchy, literature review, and background study. It also highlights the roles and responsibilities of the participants and concludes with the learning outcome and future recommendations.

Chapter 2: Introduction to Organization

2.1. Organization Details



Figure 1 Logo of Wolfmatrix Pvt. Ltd.

Organization Name: Wolfmatrix Pvt. Ltd. Location: Sanepa, Lalitpur

Wolfmatrix Nepal is an offshore software development, web development and mobile application development company. They create cost-effective solutions based on technical expertise to deliver the ultimate customer satisfaction while also helping each business to achieve their unique needs. They provide quality service by implementing agile software development process, solid and realistic planning after analysis of work to meet deadlines. They provide quality service by implementing agile software development process, solid and realistic planning after analysis of work to meet deadlines. The company considers in the use technologies to connect business and society to provide best innovation, enhancing our customers' competitiveness and also to provide best solutions coupled with best practices for customer satisfaction in very cheap price without compromising in quality.

2.2. Organizational Hierarchy

The organizational hierarchy of Wolfmatrix has the following positions, listed in order of highest to lowest authority:

- CEO (Chief Executive Officer) - The highest-ranking executive in the company, responsible for overall strategy and decision-making.
- CDBO (Chief Digital and Business Officer) - The senior executive responsible for overseeing digital strategy and business operations.
- CTO (Chief Technical Officer) - A senior executive responsible for the technical direction of the company and its products or services.

- Accountant - An accountant is a professional who specializes in recording, analyzing, and reporting financial transactions for individuals, businesses, and organizations.
- HR (Human Resource) - HR is the department or function within an organization responsible for managing employee-related activities such as recruitment, training, compensation, benefits, and performance management.
- Senior Software Developer - A highly experienced software developer who typically has several years of experience and leads projects or teams.
- Junior Software Developer - A software developer who is less experienced than a senior developer and may be working on smaller parts of a project or learning from more experienced developers.
- Intern - A student or recent graduate who is working at the company on a temporary basis, typically as part of a training or educational program.

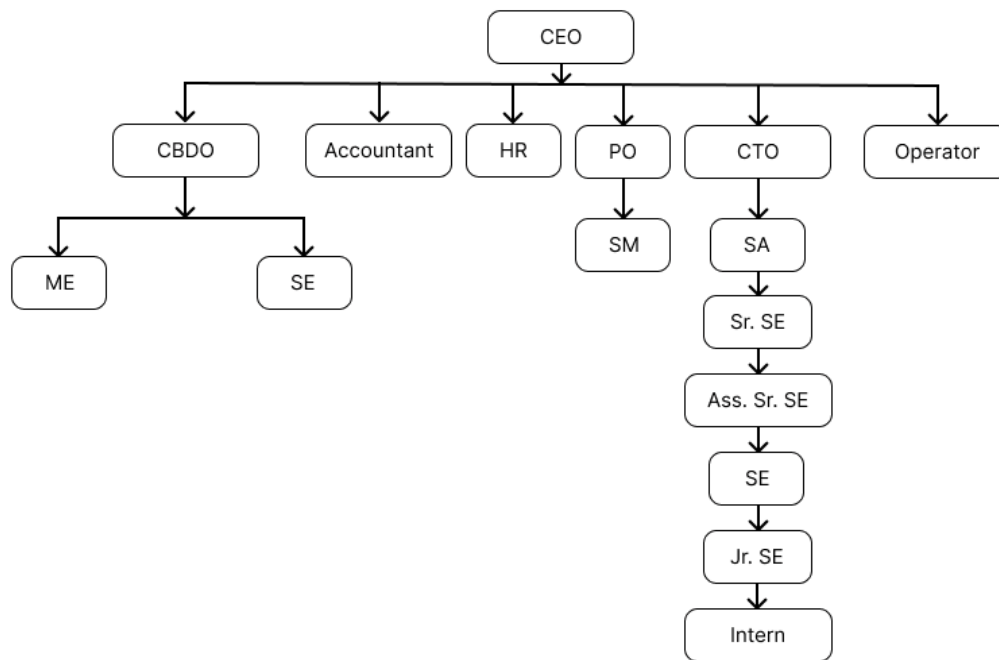


Figure 2 Organizational Hierarchy of Wolfmatrix Pvt. Ltd.

2.3. Working Domains of Organization

During my internship at Wolfmatrix Pvt. Ltd., I had the opportunity to work in several different domains. These included:

- **Software Development:** I was part of the team responsible for designing, developing and maintaining software applications. I learned about different software development methodologies, coding best practices and testing techniques. I was able to work with various programming languages and technologies, and I learned about the software development life cycle and agile methodologies.
- **Research and Development:** I was part of the R&D team and assisted in conducting market research, developing new products and services. I was able to apply the knowledge learned in my coursework to real-world problems and contribute to the organization's growth.
- **Operations:** I assisted the operations team with logistics and supply chain management. I learned about the importance of efficiency and effective communication in ensuring smooth operations.
- **IT Support:** I assisted the IT support team with troubleshooting and resolving technical issues for employees. I learned about the importance of effective communication and problem-solving skills in providing effective IT support.
- **Web Application Development:** I had the opportunity to work in the web application development team. This team is responsible for designing, developing and maintaining web applications for the organization's customers. I learned about the web app development life cycle, user interface and user experience design, and mobile app designing.
- **DevOps Engineer:** I had the opportunity to work with the DevOps team. This team is responsible for managing and automating the software development and deployment process. My tasks included assisting with continuous integration, continuous deployment, and infrastructure as code. I learned about various DevOps tools and methodologies such as Git, Bitbucket & so on.

Overall, my internship experience allowed me to gain hands-on experience in various domains, and helped me to develop a well-rounded understanding of the organization and its operations.

2.4. Description of Intern Department/Unit

During my internship at Wolfmatrix Pvt. Ltd. I was part of the web application development department. The department is responsible for designing, developing, and maintaining web applications for the organization and its clients. The team works with a variety of programming languages and frameworks to create interactive, user-friendly, and responsive applications. I was assigned to work with a mentor, who was a senior developer with several years of experience in the industry.

The mentor provided guidance and support throughout the internship, and helped me to understand the organization's development processes and best practices. I also had the opportunity to work with other senior developers on various projects, which gave me valuable insights into the different aspects of software development.

My responsibilities as an intern included working on both front-end and back-end development tasks. On the front-end, I worked with ReactJs to create the user interface and make sure it's responsive and accessible. On the back-end, I worked with Node Js to develop the server-side logic and connect the front-end with the database. Along with it I also worked with react redux, typescript and nest js.

The department followed Agile methodologies and had daily stand-ups, sprint planning and retrospectives. The team was also using a variety of tools to help with development, testing, and deployment.

In addition to technical skills, I also learned about project management, agile methodologies, and software development life cycle. This internship gave me a comprehensive understanding of the mobile and web development process, and helped me to develop the skills needed to create professional and high-quality applications.

Overall, my internship experience in the software development department was extremely valuable. I was able to learn from experienced professionals and gain hands-on experience in the field. I am grateful for the opportunity to work with such a great team and mentor, and I feel that I have grown both professionally and personally as a result of this experience.

Chapter 3: Background Study & Literature Review

3.1. Background Study

The project is the design and implementation of an interactive web application-based which is a chrome extension for sending bulk messages. The system allows users to send customized bulk messages to other recipients all at once. In a similar manner, one of the main benefits of the system is its ability to create and save templates for future use. Users can therefore create messages only once, save them as templates, and use those templates to deliver messages to a variety of recipients in the future. For businesses that frequently send out a large volume of mail, in particular, this can save a great deal of time and effort. Additionally, utilize pre-made templates. These are pre-made templates for sending messages that were created by the system's developers or other users and are available right away.

This application can be quite useful for businesses who routinely send messages but don't have the time or resources to create their own templates. By introducing the capability to quickly deliver numerous messages to intended recipients with reliability, the bulk messaging system has increased that communications power.

The benefits of bulk messaging can be used at colleges and universities to establish a virtual community as a public relations system and improve classroom engagement. With their students, lecturers can administer mobile tests with a variety of question formats. Also, it has a lot of potential as a marketing tool. The system can be used by companies and organizations to communicate with stakeholders, including customers and clients. Building relationships with customers and clients while promoting goods, services, and events may all be done in this manner.

Therefore, the bulk messaging system is an all-around effective and adaptable technology that may be applied in a range of contexts. It has a number of features that can assist users deliver messages more effectively and is made to be user-friendly and simple to use. The technology can be utilized to enhance communication and foster relationships and is anticipated to be a great asset for corporations, organizations, and individuals.

3.2. Literature Review

I reviewed many bulk messaging systems and best bulk messaging services took references from <https://www.thebalancemoney.com/best-bulk-text-message-services> .It is a web-based application of the Wolfmatrix Pvt Ltd to send customized bulk messages. User can also save any message as template or use any pre saved template. User can send customized messages. The project also involved researching and assessing other bulk messaging tools, such as bulk sms, email and WhatsApp messages.

The goal was to understand the various features and capabilities of different bulk messaging systems and services and use that knowledge to create a powerful yet straightforward application. Various other bulk messaging tools were reviewed like bulk email, WA messages etc. For bulk email I reviewed software like <https://www.sendblaster.com/>. For bulk sms, I reviewed <https://www.bulksms.com/>. For the Whatsapp bulk messaging, first of all I researched about the whats app api and how we can use it about which I got some information from this blog <https://respond.io/blog/whatsapp-bulk-message> along with it I reviewed various pre-existing Whats app bulk messaging like <https://wamessages.com/> and WASelf Sender (<https://chrome.google.com/webstore/detail/wa-self-sender-free-message>) which helped me a lot during the research for building this application.

Therefore, the bulk messaging system is an all-around effective and adaptable technology that may be applied in a range of contexts. This application can be used for a number of things, including marketing, study-related activities like quizzes, delivering notifications or invitations, and other things. It is a chrome plugin that automates the process of sending personalized mass messages with attachments, giving companies, organizations, and people a quick way to connect with numerous recipients at once.

Chapter 4: Internship Activities

4.1. Roles and Responsibilities

In an internship phase in Wolfmatrix Pvt Ltd, I involved in various activities and tasks as per the requirement of the organization and the project. Firstly, I had to learn and research about the basic web-based application structure and then I learned React Js for frontend and Node Js for backend. Then, I had to review the codebase of some projects to understand the structure of react and node applications. But my major task was to learn about the overall usage of the react js library in a systematic way. I was involved in web application development where mentor Mr. Bishal Udash continuously guided and supervised to understand the workflow of the web-based application, structure of android application and other basic concept which is essential for me to complete this project. Also, he helped to analyze and learn about different design, debug and testing tools.

I had to carry out activities listed below:

- Research and review other projects format and libraries.
- Design and develop the user-friendly web application.
- Continuously report to mentor and others in daily standup.
- Take guidelines and workflow from the mentor.
- Learn to identify the errors and debug them.
- Use version and version control tools.
- Work with team with full collaboration.
- Attend daily standup by following agile methodology.
- Learn for designing and maintaining the database required for the application.
- Learn how to write clean, maintainable code and following software engineering best practices.
- Use Trello as a project management system.

4.2. Weekly log (Technical Details of Activities)

A weekly log of internship is a document that records the activities, tasks, and accomplishments of an intern on a weekly basis. It is typically used to document the intern's progress, and to ensure that they are meeting the objectives and expectations of the internship.

Weekly Internship Log

Table 1 First week log sheet

Week: 1	Date: 2022 August 05
Task and Activity to perform	<ul style="list-style-type: none">● Get familiar with the organization and its working.● Understand the tools and technology stack being used.● Setup software and different platforms on working device.
Accomplishments	<ul style="list-style-type: none">● Learned about organization structure.● Setup device for working environment.● Learned about different development tools.
Challenges and Issues	<ul style="list-style-type: none">● Device compatibility issues.● Software compatibility of npm, Node & Ubuntu version.
Goals for the next week	<ul style="list-style-type: none">● Understand the coding conventions and work flow.● Join bitbucket repositories.● Setup projects locally.
Mentor's Comment	Satisfactory

Table 2 Second week log sheet

Week: 2	Date: 2022 August 12
Task and Activity to perform	<ul style="list-style-type: none">● Clone different projects.● Setup projects in local device.● Install and configure different platforms.
Accomplishments	<ul style="list-style-type: none">● Successfully cloned and setup different projects.● Reviewed codes of codebase.
Challenges and Issues	<ul style="list-style-type: none">● Version compatible issue of Node.
Goals for the next week	<ul style="list-style-type: none">● UI design of Office Management System.● Research for Bulk Messaging Apps● Trello board setup and create cards.
Mentor's Comment	<ul style="list-style-type: none">● Satisfactory

Table 3 Third week log sheet

Week: 3	Date: 2022 August 19
Task and Activity to perform	<ul style="list-style-type: none"> ● Trello board and clocify logins. ● Create list, card, activities and subtasks. ● Create UI using references of web-based application. ● Make a system requirement for bulk messaging system.
Accomplishments	<ul style="list-style-type: none"> ● Designed user interface of office management system. ● Made system requirements for bulk messaging system. ● Created a Trello boards with cards, activities and subtasks.
Challenges and Issues	<ul style="list-style-type: none"> ● Design compatible and responsive user interface. ● Find out all the system requirements of BMS
Goals for the next week	<ul style="list-style-type: none"> ● Design a chrome extension for BMS
Mentor's Comment	Satisfactory

Table 4 Fourth week log sheet

Week: 4	Date: 2022 August 26
Task and Activity to perform	<ul style="list-style-type: none">● Design a chrome extension for BMS.● Approve the design and system requirements with a mentor.
Accomplishments	<ul style="list-style-type: none">● Created the design for BMS● Approved the design and system requirements with mentor
Challenges and Issues	<ul style="list-style-type: none">● Learn about the implementation of a chrome extension
Goals for the next week	<ul style="list-style-type: none">● Start the frontend development.
Mentor's Comment	<ul style="list-style-type: none">● You have to complete project in given time frame.

Table 5 Fifth week log sheet

Week: 5	Date: 2022 September 10
Task and Activity to perform	<ul style="list-style-type: none">● Develop the frontend of the BMS.
Accomplishments	<ul style="list-style-type: none">● The frontend was developed according to the design.
Challenges and Issues	<ul style="list-style-type: none">● Could not upload file in a chrome extension when using ubuntu, extension was auto closing whenever tried to upload a file.
Goals for the next week	<ul style="list-style-type: none">● Build the backend for BMS.
Mentor's Comment	Make use of components and built a systematic project structure. Also add comments to code.

Table 6 Sixth week log sheet

Week: 6	Date: 2022 September 17
Task and Activity to perform	<ul style="list-style-type: none">● Build the backend of BMS
Accomplishments	<ul style="list-style-type: none">● Backend built using node express js.
Challenges and Issues	<ul style="list-style-type: none">● Saving the user session and templates in users browser as cookies.
Goals for the next week	<ul style="list-style-type: none">● Testing of BMS
Mentor's Comment	Satisfactory

Table 7 Seventh week log sheet

Week: 7	Date: 2022 September 31
Task and Activity to perform	<ul style="list-style-type: none">● Testing of BMS system.● Publish app for internal testing.
Accomplishments	<ul style="list-style-type: none">● Done final test of BMS.● Publish app in internal testing.● Run application in all devices which are available in organization.
Challenges and Issues	<ul style="list-style-type: none">● Upload file successfully without the extension closing
Goals for the next week	<ul style="list-style-type: none">● Learn Typescript, React redux and Nest Js.
Mentor's Comment	Satisfactory

Table 8 Eighth week log sheet

Week: 8	Date: 2022 October 07
Task and Activity to perform	● R & D Typescript, React redux and Nest Js.
Accomplishments	● R & D Typescript, React redux and Nest Js.
Challenges and Issues	● Build simple applications using these.
Mentor's Comment	Satisfactory

Table 9 Ninth week log sheet

Week: 9	Date: 2022 October 14
Task and Activity to perform	● Build application FE.
Accomplishments	● Build application FE.
Challenges and Issues	● Build the FE with react redux and typescript
Mentor's Comment	Satisfactory

Table 10 Tenth week log sheet

Week: 9	Date: 2022 October 14
Task and Activity to perform	● Build application BE.
Accomplishments	● Build application BE.
Challenges and Issues	● Build the BE with nest js and connect it with MySQL database.
Mentor's Comment	Satisfactory

During the eleventh and twelfth weeks of my internship period, I was assigned to work on a project that was being carried out in the office. To maintain the confidentiality of the project, I am unable to disclose the details of the work that I carried out. However, I can assure that my contributions were aimed at building the project with the team moreover improving the system's overall efficiency.

4.3. Description of the Project(s) Involved During Internship

During my internship as a full stack developer at Wolfmatrix IT company, I had the opportunity to work on a project called "Bulk Messaging System" which was a web-based application. The main purpose of this project was to provide an efficient and user-friendly way for send bulk messages, also customized ones. Here, is a list of the work done by me during the internship period in the project I worked on:

- The application was built using React and Node.js.
- The project aimed to provide a convenient and user-friendly way for users to send bulk messages, including customized ones.
- Users could use pre-existing message templates to save time and effort.
- Users could save new message templates, providing them with the flexibility to create messages that met their specific needs.
- The project allowed users to send customized messages, allowing them to tailor messages to specific audiences.
- The application allowed users to preview messages before sending them, ensuring that they were satisfied with the message's content.
- The project focused on creating an intuitive and user-friendly interface that made sending bulk messages straightforward and hassle-free.
- The application was responsive and worked seamlessly across different devices and platforms.
- Testing and debugging techniques were used throughout the project to ensure that the application was error-free and functioned seamlessly.
- The project required collaborative teamwork, effective communication, and alignment around shared objectives and goals.
- The project provided valuable experience in web development, user experience, testing, debugging, and team collaboration.
- The skills acquired during the project are essential for a successful career in software development and can help you excel in future endeavors.

This project helped me to gain experience in developing a web-based application. I learned about the importance of user experience, and the importance of seamless integration of

different modules in a mobile application. It was a challenging but a great learning experience for me.

4.4. Tasks / Activities Performed

During my internship as a mobile application developer at Wolfmatrix IT company, I was responsible for performing a variety of tasks and activities, including:

- Design and development of web applications, specifically a chrome extension. This included using react js as front end and node js as backend and learn to add extensions in chrome web store.
- Learnt to work with the team and collaborate for the overall development of the project.
- Implementation of various features such as send customizable text messages, save templates etc.
- Testing and debugging of the application to ensure they are free of bugs and perform well on different devices and operating systems.
- Assistance in web-based application development, this included working on the front-end development using technologies such as HTML, CSS and JavaScript.
- Participating in code reviews, and following best practices for software development.
- Assisting in the deployment and publishing of chrome extension in the chrome web store.
- Keeping up to date with the latest trends and best practices in web application development and incorporating them into the development process.

Overall, my internship experience as a full stack developer was challenging and rewarding. I was able to gain hands-on experience in the field, work on various projects and learn from experienced professionals. I am grateful for the opportunity to work on web-based application development and it helped me to have a broader understanding of the application development process

Chapter 5: Conclusion and Learning Outcomes

5.1. Conclusion

In the internship phase, many useful and essential things were learned by me, which are necessary for developers in the IT world. The experience in Wolfmatrix, as an intern, was found to be wonderful and amazing. A lot of things about web application development and the working process in an IT company were learned. Different coding and research techniques for the development process were taught, along with experiencing new ways for dealing with errors and using debug techniques. A chance was given to use a project management system that controlled and traced all of the activities and user stories, which helped in checking the development progress report and time management, among other things. An opportunity was given to learn about the development, management, and controlling process in a development field, which helped in improving my skills, knowledge, and abilities in programming fields. The problems and research techniques were dealt with by my seniors and mentors, who helped me. Working in Wolfmatrix was considered a great experience and opportunity to build my professional developer career.

5.2. Learning Outcomes

In my three-month internship periods, I learned about many professional and easy development techniques. These techniques are helpful for grow my skills and knowledge. Also, I learned many tools and methods to handle the project development. The things that I learned during my internship and this project listed below:

- Working in a group, developing techniques and tools.
- Using developer's community forums for problems solving when encountered.
- Time management tools (clockify).
- Research and problem-solving techniques.
- Communication skills.
- Concept of front-end and back-end for application.
- Working in time and pressure.

- Learn to deal with customer requirements.
- Version and version control system.
- Project management system (Trello).
- Create activities, develop logs, cards and scope point in trello.
- Learn web application development process using react and node.
- Deal with API, JSON data and model classes.
- Use of Postman for API call and get response

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Appendices

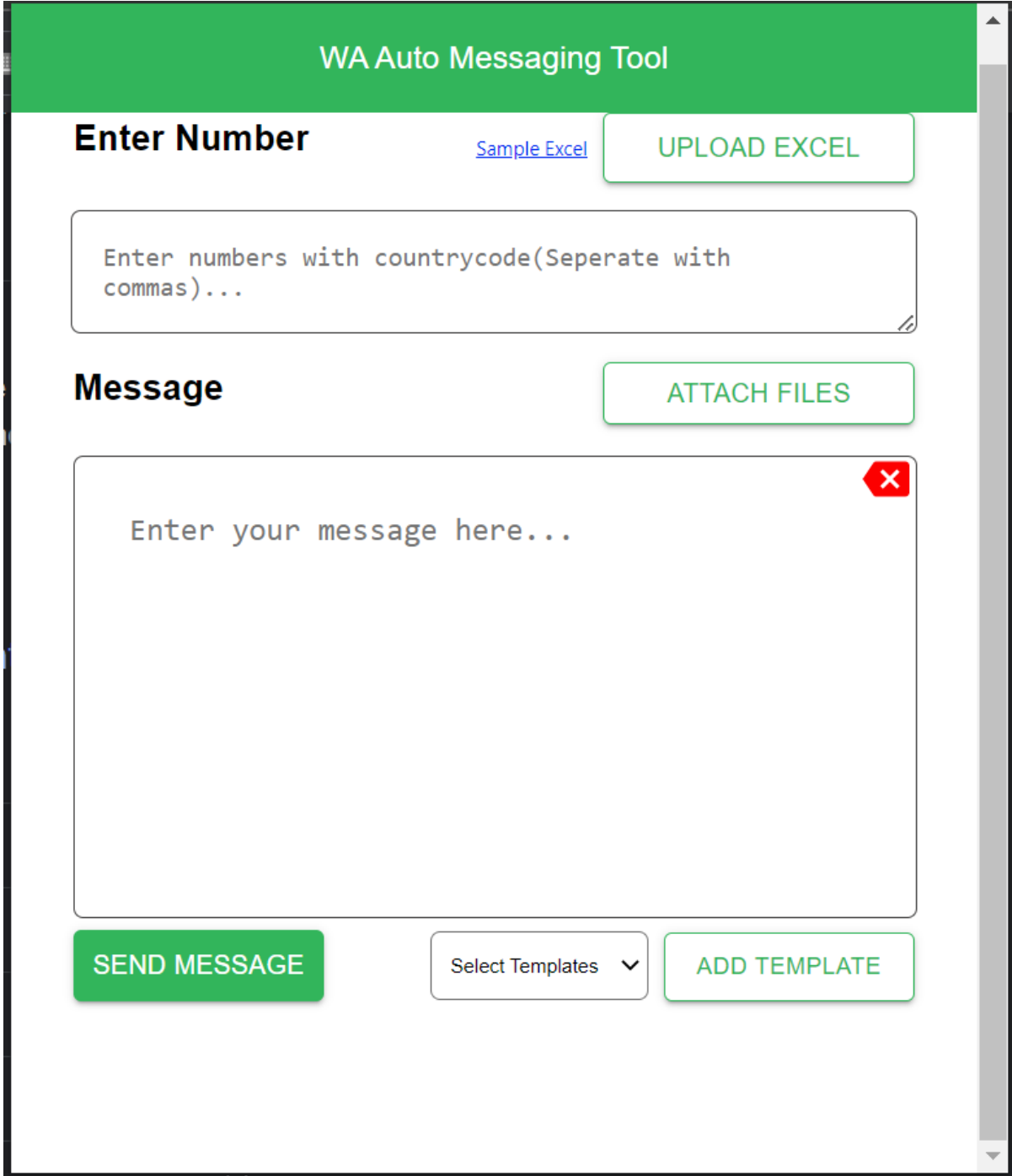


Figure 3 Bulk Messaging System