

A REPORT  
ON

**OPTIMIZING USER ENGAGEMENT WITH  
MODERN WEB AND AI TECHNOLOGIES**

*Submitted by,*

**Mr. ROHIT SHIVANAND MUGALKHOD - 20211CSE0674**

*Under the guidance of,*

**Mr. SYED MOHSIN ABBASI**

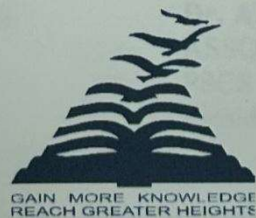
*in partial fulfillment for the award of the degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**

**At**



**PRESIDENCY UNIVERSITY**

**BENGALURU**

**MAY 2025**

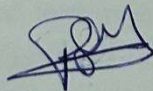
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## **PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

### **DECLARATION**

I hereby declare that the work, which is being presented in the report entitled **“OPTIMIZING USER ENGAGEMENT WITH MODERN WEB AND AI TECHNOLOGIES”** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, is a record of my own investigations carried under the guidance of **Mr. SYED MOHSIN ABBASI, ASSISTANT PROFESSOR, Presidency School of Computer Science and Engineering, Presidency University, Bengaluru.**

I have not submitted the matter presented in this report anywhere for the award of any other Degree.



**ROHIT SHIVANAND MUGALKHOD – 20211CSE0674**

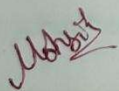


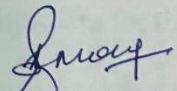
# **PRESIDENCY UNIVERSITY**

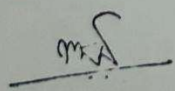
## **PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

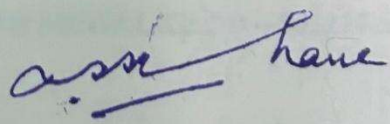
### **CERTIFICATE**

This is to certify that the Internship/Project report **“OPTIMIZING USER ENGAGEMENT WITH MODERN WEB AND AI TECHNOLOGIES”** being submitted by **“ROHIT SHIVANAND MUGALKHOD** bearing roll number **“20211CSE0674”** in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

  
**Mr. SYED MOHISN ABBASI**  
ASSISTANT PROFESSOR  
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Associate Dean  
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**Dr. SAMEERUDDIN KHAN**  
Pro-Vice Chancellor - Engineering  
Dean –PSCS / PSIS  
Presidency University

## ABSTRACT

This project report presents a comprehensive overview of a series of full stack product development projects undertaken during my internship. The objective was to conceptualize, design, develop, and deploy end-to-end web-based solutions tailored to specific business needs. The internship involved three distinct yet thematically aligned projects that demonstrate a progression in technical proficiency, architectural understanding, and user-centric product design.

The first project focused on the complete revamp of the company's existing website, transitioning from a legacy stack (WordPress and PHP) to a modern technology ecosystem. Using React for the frontend, Express.js for the backend, PostgreSQL for data management, and Tailwind CSS for styling, a fully responsive and scalable website was developed and deployed on a cloud platform, enhancing performance, user engagement, and availability.

The second project, titled *Nebula AI*, involved the development of an AI-powered chatbot with integrated knowledge base and source-referencing capabilities. This project leveraged a Retrieval-Augmented Generation (RAG) pipeline to deliver context-aware responses with cited sources. It was deployed on Google Cloud Platform (Cloud Run), and included secure user authentication and robust backend functionality using Express.js.

The third project, *Marketing Mix*, centred on building a data insights platform where users could upload datasets to receive actionable business intelligence. This tool utilized Fast API for backend integration, React for user interaction, and Gemini for AI-driven analytics. It facilitated the generation of custom insights, enhancing the decision-making capabilities for marketing teams.

These projects collectively reflect a strong foundation in full stack product development, with hands-on experience across diverse tech stacks and deployment environments. The outcome of this internship includes scalable, maintainable, and production-ready software solutions that solve real-world problems. The integrated learning from all three projects has significantly enhanced my skills in frontend and backend development, cloud deployment, data analytics, and AI integration—preparing me for future roles in modern product engineering.