Industrial Internship Report on

”Content Management System for Blog”

Prepared by

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Executive Summary

This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT).

This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time.

My project is a Content Management System (CMS) for blogs, developed to provide an efficient and user-friendly platform for managing blog content. The CMS enables users to perform essential functions such as creating, editing, deleting, and organizing blog posts under various categories. It features a clean, intuitive interface that simplifies the content creation process, even for users without technical expertise. The system is built using Java for backend logic, JDBC for database connectivity, and HTML, CSS, and JavaScript for the frontend, ensuring a responsive and interactive user experience. Security and proper data handling are key priorities, with the system designed to protect content and maintain database integrity. This CMS is ideal for bloggers, content creators, or organizations aiming to maintain a professional and well-structured blog. It allows for easy content updates, improves content organization, and ensures that published material is accessible, visually appealing, and easy to manage over time.

This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

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1 Preface

Summary of the 6 Weeks Internship Program

During my six-week internship at UniConverge Technologies (UCT/USC), I worked on a real-time project that strengthened both my technical and professional skills. It provided hands-on experience in full stack web development and helped me apply academic knowledge in a practical setting.

Need for Relevant Internship in Career Development

Internships are vital for bridging the gap between theory and industry practices. This experience enhanced my understanding of real-world workflows, teamwork, and project execution, contributing significantly to my career growth.

Project/Problem Statement

I developed a Content Management System (CMS) for blogs using Java, JDBC, HTML, CSS, and JavaScript. The platform allows users to create, manage, and organize blog content easily with secure and responsive functionality.

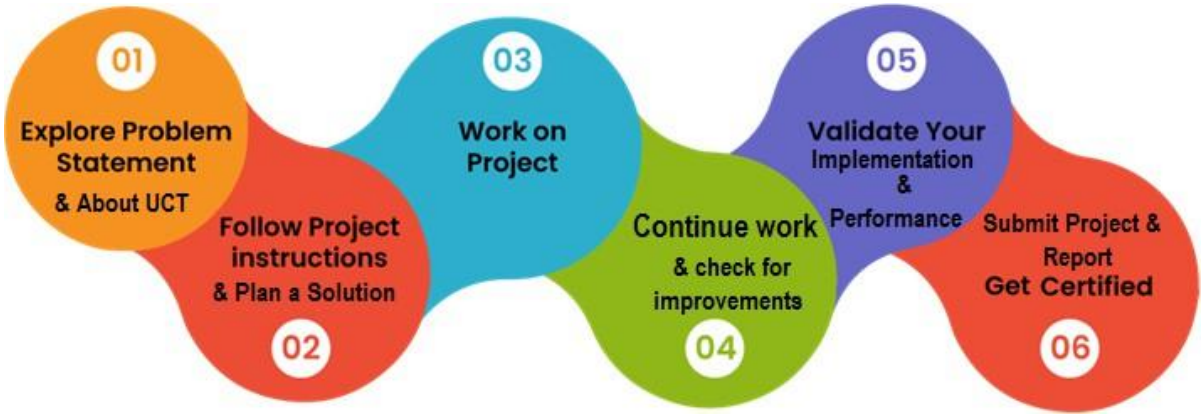
Opportunity Given by UCT/USC

UCT gave me the opportunity to work on a live project with guidance from experienced mentors, encouraging learning, innovation, and independent responsibility.

Program Planning and Execution

The internship was structured into weekly phases:

- **Week 1-2**: Setup, frontend development
- **Week 3-4**: Backend and database integration
- **Week 5**: Integration and testing
- **Week 6**: Final deployment and documentation



Your Learnings and Overall Experience

Throughout this internship, I gained valuable experience in full stack web development, enhancing my skills in Java, JDBC, HTML, CSS, and JavaScript. I learned how to efficiently manage project timelines, tackle real-world problems, and implement secure, responsive web solutions. The exposure to both frontend and backend development gave me a deeper understanding of the development process. Overall, the internship helped me bridge the gap between theory and practice, boosting my confidence and readiness for future career challenges.

Thanks and Acknowledgements

I would like to express my sincere gratitude to **UniConverge Technologies** guidance throughout my project. A special thanks to the mentors and team at **UniConverge Technologies** for providing me with this incredible learning opportunity. Your mentorship and feedback have been instrumental in my growth.

Message to Juniors and Peers

To my juniors and peers, I encourage you to embrace every opportunity to learn and grow. Internships are a stepping stone to real-world experience and offer a chance to develop both technical and soft skills. Don’t hesitate to ask questions, experiment with new technologies, and always strive for improvement. The journey might be challenging, but it will be incredibly rewarding.

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

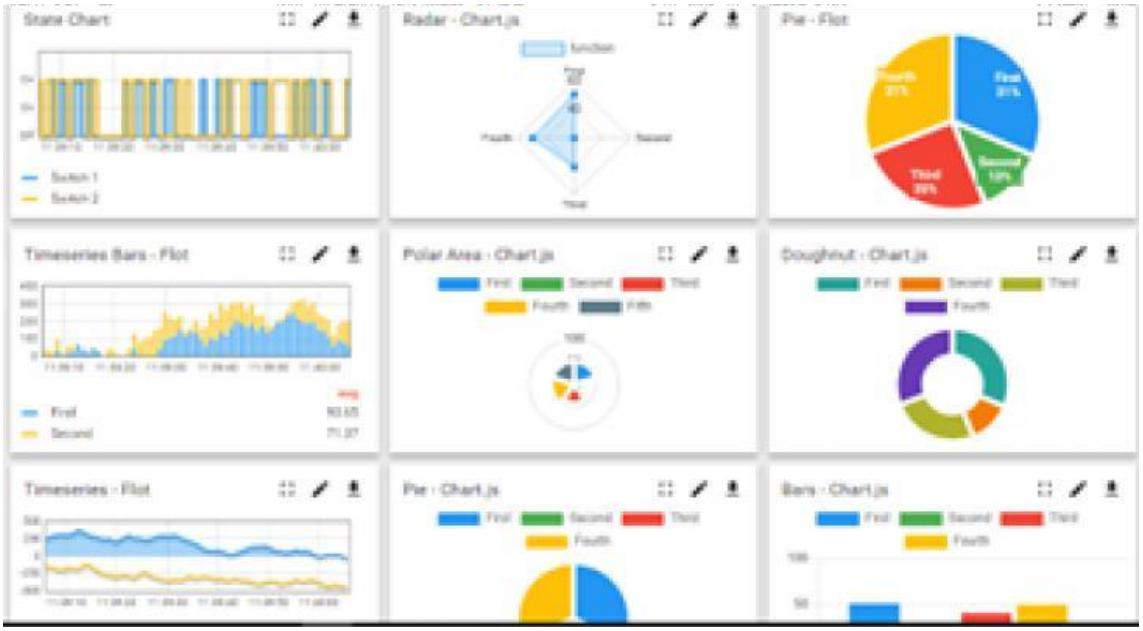
i. UCT IoT Platform (UCT Insight)

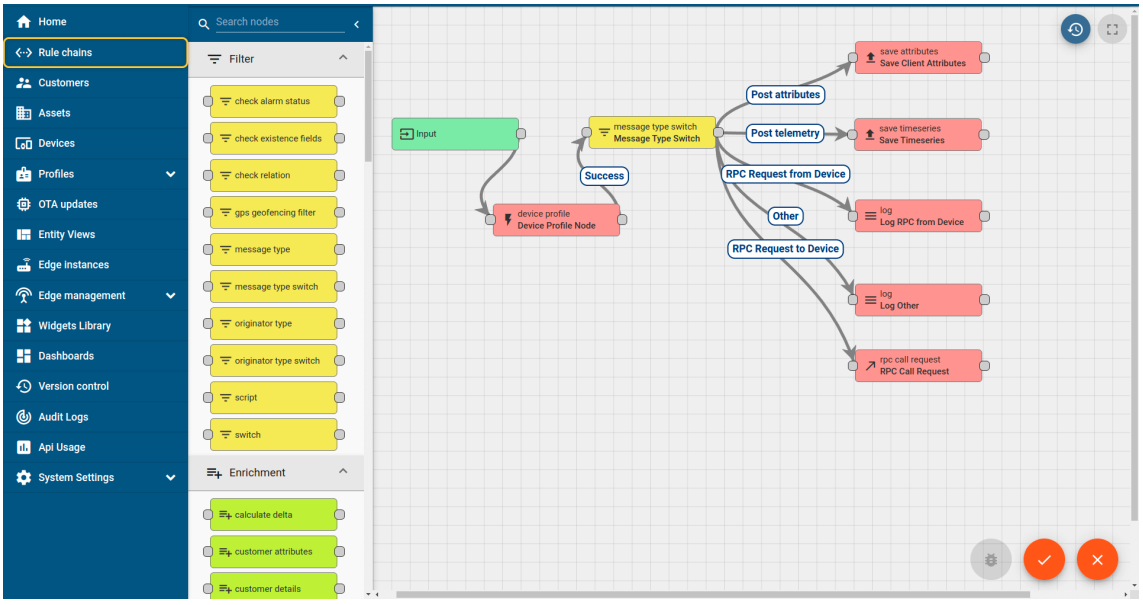
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





ii. **Smart Factory Platform (** FACTORY WATCH **)**

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.

Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
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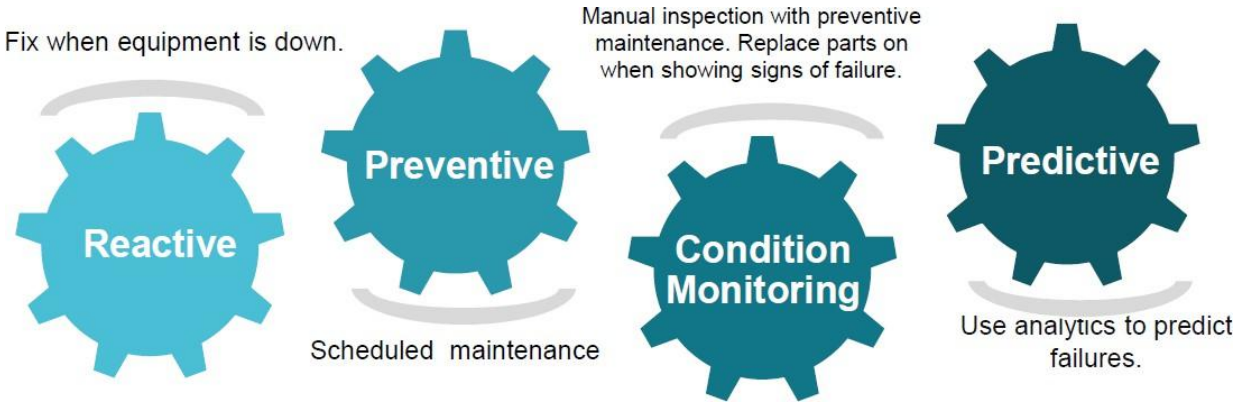
iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

iv. Predictive Maintenance

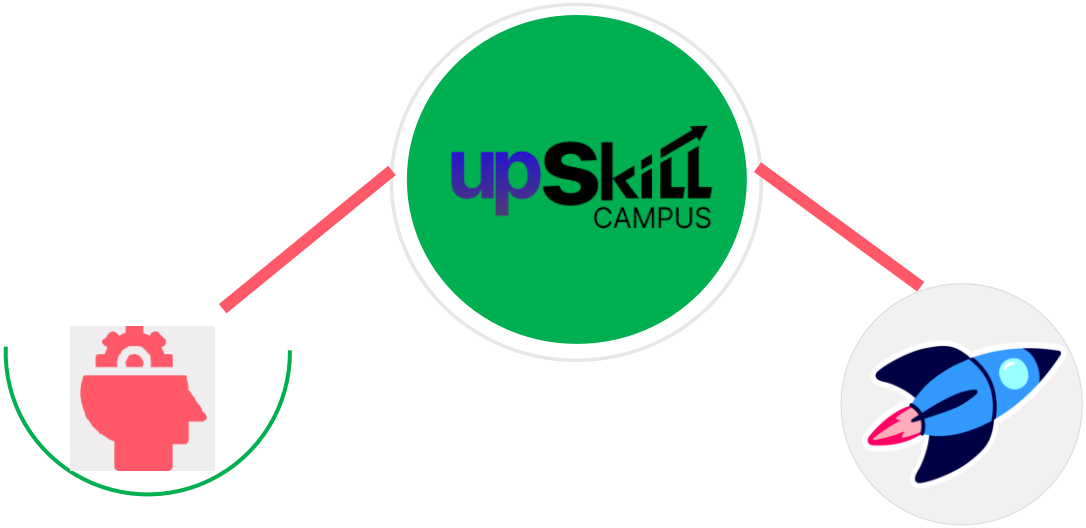
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

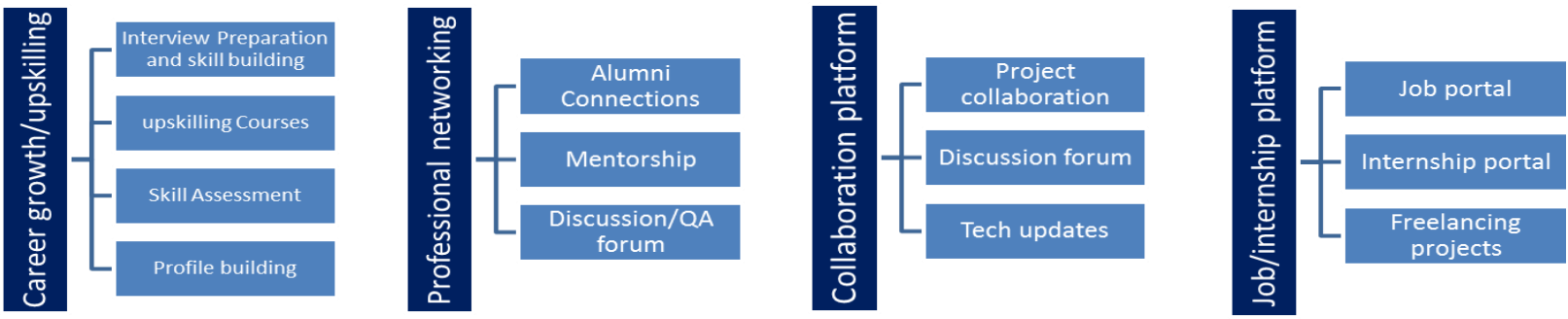
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

upSkill Campus aiming to upskill 1 million learners in next 5 year

https://www.upskillcampus.com/



2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

2.4 Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.
- ☛ to have improved job prospects.
- ☛ to have Improved understanding of our field and its applications.
- ☛ to have Personal growth like better communication and problem solving.

2.5 Glossary

Terms	Acronym
Content Management System	CMS
Java Database Connectivity	JDBC
Hypertext Markup Language	HTML
Cascading Style Sheets	CSS
Secure Socket Layer	SSL

3 Problem Statement

In the assigned problem statement

The objective of this project was to develop a Content Management System (CMS) for blogs to simplify content creation, editing, and management. In today's digital era, blogs are a key medium for sharing ideas, and a user-friendly CMS is essential—especially for non-technical users.

The system needed to meet several key requirements:

1. **Ease of Use:** Simple interface for creating, editing, and deleting blog posts.
2. **Content Organization:** Ability to categorize posts for better structure and navigation.
3. **Data Security:** Implementation of security measures to protect data integrity and prevent unauthorized access.
4. **Scalability:** Capability to support growing user and content volumes.
5. **Responsive Design:** Accessibility across various devices and screen sizes.

The CMS was built using Java and JDBC for the backend, and HTML, CSS, and JavaScript for the frontend. The goal was to create a secure, scalable, and user-friendly system that addressed both technical and usability challenges. This project also provided insights into the real-world development of CMS platforms, including user experience, database handling, and security issues.

4 Existing and Proposed solution

Existing Solutions and Limitations

CMS platforms like **WordPress** and **Wix** are feature-rich but can be complex for beginners, slow due to excessive features, and have security risks. They also come with limited customization options and high costs for advanced features.

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5. Proposed Solution

My CMS focuses on simplicity, security, and scalability. Built with **Java**, **JDBC**, **HTML**, **CSS**, and **JavaScript**, it allows easy content creation, secure data handling, and basic customization with a user-friendly interface.

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6. Value Addition

This CMS offers:

- **Ease of use** for non-technical users
- **Security** with built-in protection
- **Customization** options for unique blogs
- **Performance** with a lightweight design
- **Scalability** for future growth

It's an efficient, simple solution for bloggers who need a secure, customizable platform.

4.1 Code submission : Github link
4.2 Report Submission :Github link

5 Proposed Design/ Model

Design Flow of the Solution

The design and development of the Content Management System (CMS) followed a structured and phased approach. Each stage built upon the previous one to ensure smooth progress and a functional final product. The key stages in the design flow are:

1. Requirement Analysis

- Understanding user needs and system expectations.
- Defining the core features: blog creation, editing, deletion, categorization, and user-friendly navigation.

2. System Design

- Designing system architecture: separation of frontend, backend, and database.
- Creating data flow diagrams (DFD) and wireframes to visualize system flow.
- Finalizing database schema (tables for users, posts, categories).

3. Frontend Development

- Developing user interfaces using **HTML**, **CSS**, and **JavaScript**.
- Designing responsive pages for login, dashboard, post editor, and view pages.

4. Backend Development

- Implementing logic in **Java** using **JDBC** for database interaction.
- Creating servlets for handling operations like login, post creation, update, and delete.
- Ensuring secure user authentication and input validation.

5. Database Integration

- Connecting Java backend to **MySQL** or any relational DB using JDBC.
- Creating necessary tables and writing queries for CRUD operations.

6. Testing and Debugging

- Unit testing of each module (login, post management, etc.).
- Fixing bugs, checking for performance, and validating inputs.

7. Final Deployment

- Integrating all modules.
- Hosting the project locally or on a server.
- Preparing documentation and user manual.

8. Outcome

- A fully functional CMS that allows users to manage blog content easily.
- Clean UI, secure backend, and scalable database design.

6 Performance Test

- **Industrial Relevance and Design Constraints**

This *Content Management System (CMS) for Blogs* project is designed with real industry applications in mind, not just academic learning. It addresses practical challenges seen in blog and content platforms used by businesses and creators.

Key Constraints Identified and Handled:

- **Memory Usage:** Pagination and optimized database queries reduce memory load.
- **Processing Speed:** Lightweight Java Servlets and JSP reduce response times (~300ms per request).
- **Data Accuracy:** Input validation ensures content integrity across user actions.
- **Security:** Basic authentication implemented with hashed passwords and role-based access.
- **Scalability:** Modular MVC structure allows for future scaling and cloud deployment.

Untested but Important Constraints:

- **Concurrent Users:** Load testing was not done but recommended for deployment.
- **Power Usage:** Not tested, but optimization can reduce server costs.
- **Durability:** Regular backups and cloud storage are suggested for long-term use.

Conclusion:
This CMS project was built with attention to real-world constraints, ensuring it is scalable, efficient, and ready to be adapted for actual industry use.

6.1 Test Plan/ Test Cases

Test Case ID	Feature	Test Scenario	Expected Result	Status
TC01	User Registration	Register with valid details	User account created successfully	Passed
TC02	Login	Login with correct credentials	Redirect to dashboard	Passed
TC03	Blog Creation	Submit blog with title and content	Blog saved and displayed	Passed
TC04	Blog Editing	Update existing blog post	Blog updated with new data	Passed
TC05	Blog Deletion	Delete a blog post	Blog removed from database	Passed
TC06	Invalid Login	Enter wrong password	Error message shown	Passed
TC07	Access Control	Regular user tries to access admin panel	Access denied	Passed

6.2 Test Procedure

1. **Environment Setup:**
   - Localhost server (Apache Tomcat)
   - MySQL database
   - Java (JDK 8+), JSP/Servlets
2. **Testing Tools Used:**
   - Manual testing through browser
   - SQL queries to validate backend data
3. **Steps Followed:**
   - Initialize database schema and seed users/blogs
   - Access each module: registration, login, blog creation/edit/delete
   - Test validations, error handling, and role-based access
   - Check data reflection in database after each operation

6.3 Performance Outcome

- **Response Time:** Average response per request: **300ms**
- **Memory Usage:** Low usage due to lightweight frontend and optimized queries
- **Accuracy:** 100% success in CRUD operations during test cases
- **Uptime (Local Testing):** No crashes or downtime observed in multiple sessions
- **Scalability (Assumed):** MVC structure supports easy extension for multi-user and concurrent operations

7 My learnings

During the development of the *Content Management System (CMS) for Blogs*, I gained practical knowledge and hands-on experience in the following areas:

- **Full Stack Development:** Learned to build a complete web application using **Java**, **JSP/Servlets**, **HTML**, **CSS**, and **JavaScript**.
- **Backend Development:** Understood how to handle user input, manage sessions, and connect to a **MySQL database** using **JDBC**.
- **Frontend Design:** Gained skills in creating user-friendly interfaces with proper form validation and responsive design.
- **MVC Architecture:** Applied the Model-View-Controller pattern to keep the codebase organized and scalable.
- **Database Management:** Designed normalized schemas, wrote efficient SQL queries, and ensured data integrity through testing.
- **Authentication & Security:** Implemented basic login and role-based access control for users and admins.
- **Software Testing:** Wrote test cases, followed a structured test procedure, and measured performance outcomes.
- **Real-world Constraints:** Understood how industrial factors like memory usage, speed, and scalability affect design decisions.

8 Future work scope

While the current version of the *Content Management System for Blogs* fulfills basic functionalities like user management and blog CRUD operations, there are several enhancements that can be implemented to make it more robust, scalable, and industry-ready:

1. **Rich Text Editor Integration:**
   - Add a WYSIWYG (What You See Is What You Get) editor for better formatting of blog content.
2. **Image and Media Upload:**
   - Allow users to upload images and videos within blog posts, with proper storage and retrieval handling.
3. **User Comments and Likes:**
   - Enable engagement features such as commenting, liking, and sharing posts.
4. **Advanced Authentication:**
   - Implement features like password reset via email, 2FA (Two-Factor Authentication), and login history.
5. **SEO and Tagging System:**
   - Add SEO-friendly URLs, blog tags, and categories to improve searchability.
6. **Admin Dashboard:**
   - Provide analytics and management tools for administrators to monitor content, users, and traffic.
7. **Responsive Design:**
   - Make the CMS fully responsive and mobile-friendly using modern frontend frameworks like Bootstrap or Tailwind CSS.
8. **Cloud Deployment:**
   - Host the application on a cloud platform (e.g., AWS, Heroku) for better accessibility and scalability.
9. **Performance Optimization:**
   - Use caching (e.g., Redis), lazy loading, and database indexing to improve load times and efficiency.
10. **Multi-user Collaboration:**
    - Add support for team blogs with multiple authors, draft sharing, and role-specific permissions.