

A REPORT FOR ONE MONTH TRAINING

at

Ablore

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD
OF THE DEGREE.

BACHELOR OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

GURU NANAK DEV ENGINEERING COLLEGE LUDHIANA

(An Autonomous College Under UGC ACT)

CERTIFICATE BY COMPANY



CANDIDATE'S DECLARATION

I am Neerabh hereby declare that I have undertaken one month training INFOWIZ during a period from 6th June, 2024 to 18th July, 2024 in partial fulfillment of requirements for the award of degree of B.Tech (Computer Science and Engineering) at GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA. The work which is being presented in the training report submitted to Department of Electronics and Communication Engineering at GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA is an authentic record of training work.

Signature of the Student

The one month industrial training Viva–Voce Examination of _____ has been held _____ on and accepted.

Signature of Internal Examiner

Signature of External Examiner

Abstract

I successfully completed a one-month training at Ambala, Panchkula, Haryana, from June 20 to July 18, 2025, focusing on Full-Stack Web Development with AI integration. The training provided in-depth exposure to modern technologies, including Next.js, React, MongoDB, Tailwind CSS, and Google's Generative AI via Gemini.

As part of the training, I developed a project titled "CropSense AI", a smart farming assistant aimed at empowering Indian farmers with data-driven decision-making tools. The platform

offers seasonal crop recommendations, AI-powered crop image identification, a multilingual AI chatbot, and real-time community chat with voice and text support. This project was designed to support not only experienced farmers but also newcomers to agriculture, helping them access reliable information and connect directly with resources.

This training enhanced my skills in frontend and backend development, API integration, and AI-based solutions, while also strengthening my problem-solving abilities, teamwork, and adaptability in a real-world development environment.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to **Ablore**, Panchkula, Haryana, for providing me with the opportunity to undergo one month of industrial training from **June 20 to July 18, 2025**. This training proved to be a highly enriching experience that not only enhanced my technical skills but also broadened my perspective on real-world software development practices.

I am sincerely thankful to my mentor(s) and the entire Ablore team for their constant support, guidance, and encouragement throughout the training. Their expertise in **Full-Stack Web Development** and **AI integration** helped me gain practical knowledge in technologies such as **Next.js, React, MongoDB, Tailwind CSS**, and **Google's Generative AI via Genkit**. Their willingness to share valuable insights and constructive feedback at every stage of the project

motivated me to push my boundaries and learn beyond the theoretical concepts taught in classrooms.

I am especially grateful for the opportunity to work on my project "**CropSense AI**", a smart farming assistant aimed at providing farmers and new entrants into agriculture with data-driven insights, seasonal crop recommendations, AI-powered crop identification, multilingual chatbot support, and a real-time community chat feature. Working on this project allowed me to understand not only the technical aspects of full-stack development but also the importance of designing user-friendly, impactful, and socially relevant solutions.

This training period has helped me improve my problem-solving abilities, project management skills, and adaptability in a collaborative work environment. I have learned the importance of teamwork, effective communication, and time management while working on a project under deadlines.

Finally, I wish to express my heartfelt thanks to my family and friends for their constant encouragement and moral support, which played an important role in the successful completion of this training. I am confident that the knowledge and experience gained during this period will serve as a strong foundation for my future professional endeavors.

About the Ablore

Ablore is a technology-driven company specializing in providing innovative software solutions and digital services to businesses and individuals. With a focus on Full-Stack Web Development, Artificial Intelligence (AI), and modern cloud-based technologies, Ablore delivers high-quality, scalable, and user-friendly products tailored to meet client requirements.

The company's expertise spans across various domains, including web and mobile application development, AI-powered solutions, UI/UX design, API integration, and data-driven analytics. By leveraging cutting-edge frameworks such as Next.js, React, and Tailwind CSS, along with advanced AI tools like Google's Generative AI via Genkit, Ablore ensures that its solutions are not only technically robust but also future-ready.

Ablore maintains a strong emphasis on innovation, collaboration, and skill development, encouraging trainees and employees to explore emerging technologies and implement creative ideas into practical applications. The organization fosters a professional yet supportive work environment, enabling individuals to grow their technical expertise while gaining real-world project experience.

With a vision to bridge the gap between technology and real-life challenges, Ablore continues to work on projects that have a meaningful impact on society, ranging from agriculture and education to business automation and AI-based solutions. The company's commitment to quality, adaptability, and continuous improvement makes it a trusted name in the software development industry.

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Definitions, Acronyms, and Abbreviations

1. **AI – Artificial Intelligence**
The simulation of human intelligence in machines that are programmed to think, learn, and make decisions.
2. **API – Application Programming Interface**
A set of rules and protocols that allows different software systems to communicate and share data.
3. **CRUD – Create, Read, Update, Delete**
The four basic functions of persistent storage in databases and applications.
4. **CSS – Cascading Style Sheets**
A style sheet language used for describing the presentation of a document written in HTML.
5. **DBMS – Database Management System**
Software that is used to store, retrieve, define, and manage data in a database.
6. **HTML – Hypertext Markup Language**
The standard markup language used for creating and structuring web pages.
7. **JS – JavaScript**
A programming language that enables interactive web pages and is an essential part of web applications.
8. **ML – Machine Learning**
A subset of AI that enables systems to learn from data and improve performance without being explicitly programmed.
9. **NLP – Natural Language Processing**
A field of AI focused on enabling computers to understand, interpret, and respond to human language.
10. **NoSQL – Not Only Structured Query Language**
A type of database design that provides flexible schemas for storing and retrieving data, often used for large-scale data.
11. **UI – User Interface**
The part of a software application that users interact with directly.
12. **UX – User Experience**
The overall experience of a user while interacting with a product or system, focusing on usability and satisfaction.
13. **DB – Database**
An organized collection of structured information or data stored electronically.

14. **RTS – Real-Time System**
A computing system that processes data and provides results instantly or within strict time constraints.
15. **DOM – Document Object Model**
A programming interface for web documents, representing the page so that programs can change the structure, style, and content.
16. **Full-Stack Web Development**
The process of developing both the front-end (client side) and back-end (server side) of a web application, including database integration.
17. **Generative AI**
A branch of AI that creates new content such as text, images, or code using machine learning models.
18. **Real-Time Communication**
The instant exchange of information between users over the internet without noticeable delays.
19. **Multilingual Chatbot**
An AI-based conversational agent capable of interacting in multiple languages.

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Chapter-1 INTRODUCTION

1.1 Background of Training

Industrial training is an integral part of every engineering curriculum, bridging the gap between theoretical concepts taught in classrooms and their practical implementation in real-world environments. For a Computer Science Engineering (CSE) student, it provides an invaluable opportunity to explore modern tools, frameworks, and industry practices that cannot be completely replicated within academic boundaries. The fourth semester marked a crucial stage of my journey, where I got the chance to undertake one-month training in full-stack development and AI integration.

The training helped me move beyond just coding and exposed me to software architecture, project deployment, database management, version control, and collaborative teamwork. It served as a hands-on experience where my understanding of web technologies was tested in real-world scenarios.

1.2 Objectives of Training

The main objectives of the training were:

- To gain practical exposure to industry-level development workflows.
- To learn and implement front-end and back-end technologies effectively.
- To integrate AI-powered features in modern web applications.
- To develop a complete end-to-end project from scratch.
- To understand collaborative coding practices using tools like GitHub.
- To build problem-solving, debugging, and optimization skills.

1.3 Scope of the Training

The training focused on the **MERN (MongoDB, Express.js, React, Node.js) stack** along with **AI model integration**. The scope extended from developing static layouts to deploying interactive, intelligent applications. It included:

- Designing **responsive user interfaces** with React and Tailwind CSS.
- Developing **server-side logic** with Node.js and Express.
- Managing **databases** using MongoDB for structured and unstructured data.

- Integrating **Google Genkit** to enable AI-based interactions.
- Hosting and testing the project to ensure it meets user needs.

Chapter-2 TRAINING WORK UNDERTAKEN

2.1 Technologies Learned

During training, I explored multiple modern technologies essential for full-stack development:

- **Front-End:** React.js, Next.js, Tailwind CSS, Shadcn UI.
- **Back-End:** Node.js, Express.js.
- **Database:** MongoDB (NoSQL database).
- **AI Integration:** Google Genkit, Gemini APIs.
- **Other Tools:** GitHub for version control, Figma for UI design, Postman for API testing, and Vercel/Netlify for deployment.

2.2 Training Methodology

The training followed a structured methodology, divided into phases:

1. Orientation & Setup – Understanding training goals, installing required software, and configuring development environments.
2. Technology Deep Dive – Learning core MERN stack concepts along with AI integration basics.
3. Mini Assignments – Small tasks to practice specific skills like authentication, CRUD operations, and chatbot integration.
4. Project Development – Building a complete project “CropSense AI” under real deadlines.
5. Testing & Deployment – Ensuring the project worked seamlessly across devices and was ready for real-world use.

2.3 Project Undertaken

The project developed during training was CropSense AI – Smart Farming Assistant. Its aim was to assist farmers with intelligent solutions by leveraging AI and web technologies.

2.3.1 Features Implemented

- **Seasonal Crop Recommendations:** Based on season, soil type, and climate.
- **Crop Image Identification:** Farmers could upload plant/crop images, and the system would identify the crop or disease using AI.
- **AI Chatbot (Multilingual):** Enabled farmers to ask questions in different languages.
- **Community Chat:** A real-time chat system for farmers to connect with each other.
- **Voice/Text Input:** Allowed users to interact via typing or speaking, making the system farmer-friendly.

2.3.2 Tools & Frameworks Used

- **Next.js & React** for front-end development.
- **MongoDB** for storing user queries, chat history, and datasets.
- **Node.js & Express.js** for server-side logic.
- **Genkit (Google AI)** for natural language processing and chatbot intelligence.
- **Cloudinary** for image storage.
- **Razorpay** (optional) for payment integration in future scalability.

Chapter-3 RESULTS AND DISCUSSIONS / OBSERVATIONS

3.1 Technical Results

Through the training and project work, I successfully developed a **functional, AI-powered web application**. The results can be categorized as follows:

- **Front-End Output:** Clean, responsive user interface accessible on desktops and mobiles.
- **Back-End Output:** Efficient API routes for data retrieval, storage, and user authentication.

- **AI Integration:** Genkit integration allowed multilingual responses and accurate query handling.
- **Database Efficiency:** MongoDB ensured fast data storage and retrieval for real-time chat and recommendations.

3.2 Observations on Learning

During the training, I observed that:

- The **transition from theory to practice** was challenging but rewarding.
- Debugging and error resolution consumed significant time but improved my problem-solving ability.
- Using **GitHub for collaboration** taught me about version control and project tracking.
- Developing an AI-integrated project required **balancing user needs with technical feasibility**.

3.3 Challenges Faced

Like every real-world project, challenges were encountered.

- **WiFi/Connectivity Issues** – Slowed down deployment testing.
- **Initial AI Model Integration** – Genkit required multiple trials before accurate chatbot responses.
- **Time Constraints** – Completing a large-scale project within one month was demanding.
- **UI/UX Design Balance** – Making the application simple enough for farmers but advanced enough for scalability.

3.4 Skills Acquired

By the end of training, I gained:

- **Technical Skills:** Full-stack development, API integration, AI integration, cloud deployment.
- **Soft Skills:** Team collaboration, communication, adaptability, and time management.
- **Problem-Solving:** Debugging large codebases and handling unexpected runtime errors.

3.5 Overall Discussion

The training was highly impactful in transforming theoretical knowledge into **practical industry skills**. It gave me confidence to approach real-world problems and find solutions through technology.

Chapter-4 CONCLUSION

4.1 Summary of Training

The training experience was both **challenging and rewarding**, exposing me to technologies that are crucial in today's industry. Through a balance of structured learning and project-based implementation, I gained expertise in full-stack development and AI integration.

4.2 Key Takeaways

- Web development is not just about coding, but also about **designing user-friendly experiences**.
- AI integration can significantly **enhance the usefulness** of web platforms.
- Collaboration and version control are as important as individual technical skills.
- Real-world projects demand **adaptability, patience, and innovation**.

4.3 Future Scope

The project can be expanded further by:

- Adding **IoT integration** for real-time soil and weather monitoring.
- Implementing **predictive analytics** to forecast crop yield.
- Expanding **language support** for wider farmer accessibility.
- Adding **mobile application support** for offline usage.

4.4 Final Reflection

Overall, this one-month training was a stepping stone in my journey as a **Computer Science Engineer**. It equipped me with the confidence to work in real-world environments, taught me how to merge creativity with technology, and prepared me for future challenges in software development and AI-driven applications.

