

Internship at Crystaltech Services Private Limited

Internship Report

Submitted for the partial fulfillment of the degree of

Bachelor of Technology

In

Computer Science & Design

Submitted By

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0901CD211006

UNDER THE SUPERVISION AND GUIDANCE OF

Dr. Jaimala Jha

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत

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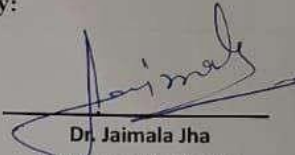
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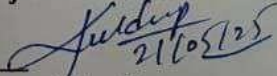


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Departmental Project Coordinator



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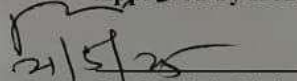
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ABSTRACT

This internship at Crystaltech Services Pvt. Ltd. provided real-world experience in backend and full-stack development, with a focus on building scalable and secure web applications. I worked extensively on developing and refining APIs, optimizing database operations, and implementing modular Django architecture for seamless functionality. The internship also included practical exposure to authentication mechanisms, asynchronous processing, and collaborative software engineering practices. Throughout the project, I followed best coding standards using Python, Django, PostgreSQL, and Git, while participating in code reviews and regular team interactions. This experience significantly strengthened my understanding of backend systems, API integrations, and deployment strategies, and highlighted the importance of clean, maintainable, and scalable web development.

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to **Crystaltech Services Private Limited** for providing me the opportunity to undertake this internship, which has played a pivotal role in enriching my technical knowledge and shaping my skills as a backend developer.

I am especially thankful to my mentor, **Mr. Gourav Mourya**, for his consistent guidance, valuable feedback, and encouragement throughout the internship. His insights helped me gain clarity on real-world development practices and empowered me to apply engineering principles effectively.

I also extend my sincere thanks to my faculty mentor, **Dr. Jaimala Jha**, for her continuous academic support and encouragement during this period.

This internship has been a crucial step in my journey as a developer and has prepared me for future professional challenges. I am truly grateful to everyone who contributed to making this experience successful and meaningful.



Aditya Soni

0901CD211006

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CERTIFICATE OF INTERNSHIP

This certificate awarded to
Aditya Soni

HAS SUCCESSFULLY COMPLETED AN INTERNSHIP AS
Django Developer Intern

Conducted from **01 Feb 2025 – 31 May 2025**

We appreciate your Hard Work & Contributions.

31-MAY-2025

DATE



#startupindia



GOURAV MOURYA

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CHAPTER 1: INTRODUCTION

The internship at Crystaltech Services Pvt. Ltd., which commenced on **15th January 2025**, was undertaken as part of the academic curriculum to gain hands-on experience in the software development lifecycle with a focus on backend and full-stack technologies. This real-world exposure allowed me to bridge the gap between theory and practice by working on live modules using the Django framework.

Purpose of the Internship

The purpose was to strengthen my understanding of software architecture, develop production grade APIs, and explore professional workflows involving source control, testing, and deployment.

Objectives

1. To gain real-time experience in software development using Python and Django.
2. To implement robust database models and optimize queries.
3. To understand API creation, integration, and testing in production-like environments.
4. To follow professional coding standards and team collaboration practices.
5. To improve efficiency in debugging, optimization, and deployment strategies.

Scope of Work

The scope included designing database schemas, building REST APIs, handling authentication, integrating frontend views, and optimizing backend performance. I also worked with asynchronous views, deployment configurations, and Django's admin, signals, and testing tools.

CHAPTER 2: LITERATURE SURVEY

Backend Web Development with Django

Django is a powerful Python-based web framework that promotes clean design and rapid development. It follows the Model View templates and ORM (Object Relational Mapping) , admin panel, and routing. In our project, Django served as the backend foundation, supporting secure user authentication, file handling, and integration with third-party APIs like Google Drive using OAuth 2.0 for authorized file access and operations and also used websockets for real time chat application through users.

ORM & Database Interaction

Django's (ORM) enables features with relational databases like SQLite and PostgreSQL. It simplifies data creation, querying, and manipulation without writing raw SQL. I used Django for database integration using models and file activities and user operations during third-party API interactions.

REST API & DRF

Django Rest Framework (DRF) simplifies building RESTful APIs with authentication, permissions, and serialization layers.

Asynchronous Views

Django now supports async views, which help handle high-concurrency tasks like WebSocket handling and background jobs efficiently.

Modern Deployment Practices

Testing CI/CD and a well designed UI/UX for the perfect user experience.

CHAPTER 3: WORK DONE

Over the course of the internship, I contributed to multiple backend and full-stack modules:

- Designed Django models and database implementation schemas.
- Developed and tested REST APIs for user authentication and data management using restful APIs.
- Integrated login registered signup sign in pages for user authentication.
- Created and tested middleware for secure end to end flow.
- Refactored backend logic for performance optimization using advanced ORM queries.
- Explored asynchronous views and Django Channels for WebSocket functionality.
- Collaborated using GitHub for code reviews, branching, and pull requests.
- Participated in debugging, performance testing, and deployment preparation.
- Documented key modules and followed industry best practices throughout development.

- **Review of work done:**

I contributed to multiple backend and full stack modules and I designed Django models and also access restful APIs which include accessing drive api and also worked on Django Channels for websocket implementation.

CHAPTER 4: OUTCOMES GAINED

- **Strong command over Django** for building scalable APIs.
- **Efficient use of ORM** to create relational models and manage large datasets.
- **Asynchronous programming knowledge**, including Django Channels and WebSocket handling.
- **Improved debugging and optimization skills** using logging and load testing.
- **Experience in version control and collaboration** using Git, GitHub and there app for smooth flow.
- **Understanding of modular and scalable architecture** using Django apps and middleware.

CHAPTER 5: SKILLS GAINED

- **Django Framework Expertise**
 - CRUD operations, ORM, middleware, signals, and session handling.
- **RESTful API Development**
 - Used Django REST Framework for modular and secure API endpoints.
- **Database Optimization**
 - Efficient model structuring, query optimization, and indexing.
- **Testing & Debugging**
 - Wrote unit tests, handled API edge cases, and debugged complex views.
- **Authentication Systems**
 - implementation, password hashing, and session/token-based access control.
- **Team Collaboration**
 - Worked on GitHub, participated in peer reviews, and followed Agile tasks.
- **Performance Enhancement**
 - Used Django caching, async views, and static/media optimization.
- **Documentation & Reporting**
 - Maintained README, API specs, and MPR logs regularly.

CHAPTER 6: SOCIAL RELEVANCE

This internship holds relevance beyond technical learning:

- **Digital Empowerment for SMEs**
Tools and techniques learned here can help build scalable apps for startups or small enterprises.
- **Accessible Web Technologies**
Building secure and efficient APIs enables wider access for applications in education, finance, and public services.
- **Security Awareness**
Implementing proper authentication and validation improves safety in web applications.
- **Bridging Industry-Academia Gap**
Exposure to deployment strategies, testing tools, and code reviews prepares students for real-world roles.

CHAPTER 7: CONCLUSION

The internship at Crystaltech Services Pvt. Ltd. was an enriching journey that solidified my foundation in backend web development. From designing database models to deploying production-ready APIs, the experience exposed me to a real development workflow. The guidance from my mentor, Mr. Gourav Mourya, and faculty, Prof. Smita Parte, was pivotal in shaping this learning.

I gained knowledge on Django base details and learned deep about websockets also , I developed problem-solving ability for secure and scalable software design. This experience has prepared me well for future roles in full-stack development and inspired me to contribute meaningfully to real-world tech challenges.

Aditya Soni

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