**BCSE399J (Summer Industrial Internship)/
CBS1902/CSE1902/ CSI3903 (Industrial Internship)
FALL  SEMESTER 2025-26**

**Type of Intern: Industry offline**

**Title of Intern: Backend Intern**

*Internship completed at :*

H-10B, Sector-98, Noida-201304

*https://paytm.com/*

+91-120- 4770770

**Duration : 44 Days : From 26th May to 8th July, 2025**

Date of Presentation: 30th October, 2025

*by*

UTKARSH GUPTA

22BCT0102

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# Introduction

During my internship, I worked on developing a **Model Context Protocol (MCP) Server** designed to manage and fetch databases of merchant subscriptions efficiently. The project involved creating a modular system integrating multi-query results, dynamic query generation, and graph-based data relationships, along with a remote client SDK and AI integration with Claude. My key responsibilities included contributing to backend development, database design, query optimization, and testing real-time client interactions.

# Aim, Objective(s) and Motivation

**Aim:** To develop a scalable MCP server capable of efficiently managing merchant subscription data.

**Objectives:**

- Implement multi-query execution and dynamic query generation.
- Integrate graph-based data relationships for real-time dependency mapping.
- Design remote client SDK and integrate Claude AI for intelligent query handling.

**Motivation:** To automate and streamline Paytm's merchant data processing with advanced backend and AI-driven insights.

# About Paytm

Paytm is India's leading digital payment and financial services platform headquartered in Noida. It provides a wide range of services such as mobile recharges, bill payments, merchant transactions, and online financial solutions. The company operates in a dynamic fintech ecosystem, offering a great environment for learning backend and data-driven systems.

# Certificate



22-07-2025

Trainee Code: T4312

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Utkarsh Gupta** has completed his/her training at **One97 Communications Limited** from **26-05-2025** to **08-07-2025** and worked on project in **Tech-Dev - Backend**.

Best Wishes

Gaurav Chopra
Vice President

# Skills Acquired During Industrial Internship Period

**Technical Skills:**
- Backend development and database management
- Query optimization and data structuring
- AI and API integration for automated query generation

**Soft Skills:**
- Team collaboration, communication, and documentation
- Problem-solving and analytical thinking

**Domain Knowledge:**
- Merchant subscription systems and intelligent server design

# New Technologies/Frameworks/Real-Time Problems/Analysis Technologies and Tools Used:

**Programming Languages:** Python, JavaScript

**Frameworks:** Node.js, FastAPI

**Databases:** PostgreSQL, Neo4j (for graph implementation)

**Tools:** MCP, Git, API Testing Platforms, Claude AI Integration

**Concepts:** Dynamic Query Generation, Caching, Graph Traversal

**Real-Time Problems and Solutions:**

**Challenge 1:** Multi-query execution led to performance bottlenecks on large datasets.

- **Solution:** Used caching, query batching, and database indexing to optimize performance.

**Challenge 2:** Translating Claude AI natural language queries into structured queries.

- **Solution:** Implemented iterative prompt tuning and query mapping to ensure accuracy and relevance.

# Conclusion

This internship at Paytm provided a comprehensive exposure to real-world backend system development and AI integration. It enhanced both my technical and interpersonal skills while allowing me to contribute to an impactful project. The project improved my understanding of distributed systems, performance tuning, and AI-driven backend automation.