Industrial Internship Report on

"Attendance System"

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. |
| The focus of my project was the development of an Attendance System. This system aimed to automate the process of tracking student attendance within virtual classrooms or educational sessions. Throughout the internship, I engaged in designing, implementing, and documenting the attendance system, ensuring its functionality and usability within the given timeframe. |
| This internship provided me with a valuable opportunity to gain exposure to real-world industrial challenges and to apply my skills in solving them. It was a rewarding experience that contributed significantly to my professional development and enhanced my understanding of practical applications in the field of technology and education. |

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1   Preface

Summary of the whole 6 weeks' work.

About need of relevant Internship in career development.

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Opportunity given by USC/UCT.

How Program was planned
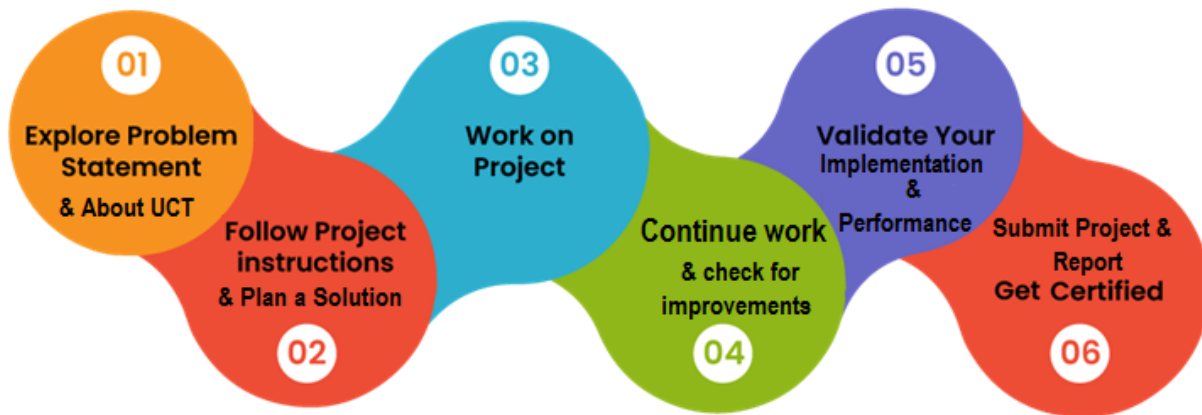
Your Learnings and overall experience.

Thank to all (with names), who have helped you directly or indirectly.

Your message to your juniors and peers.

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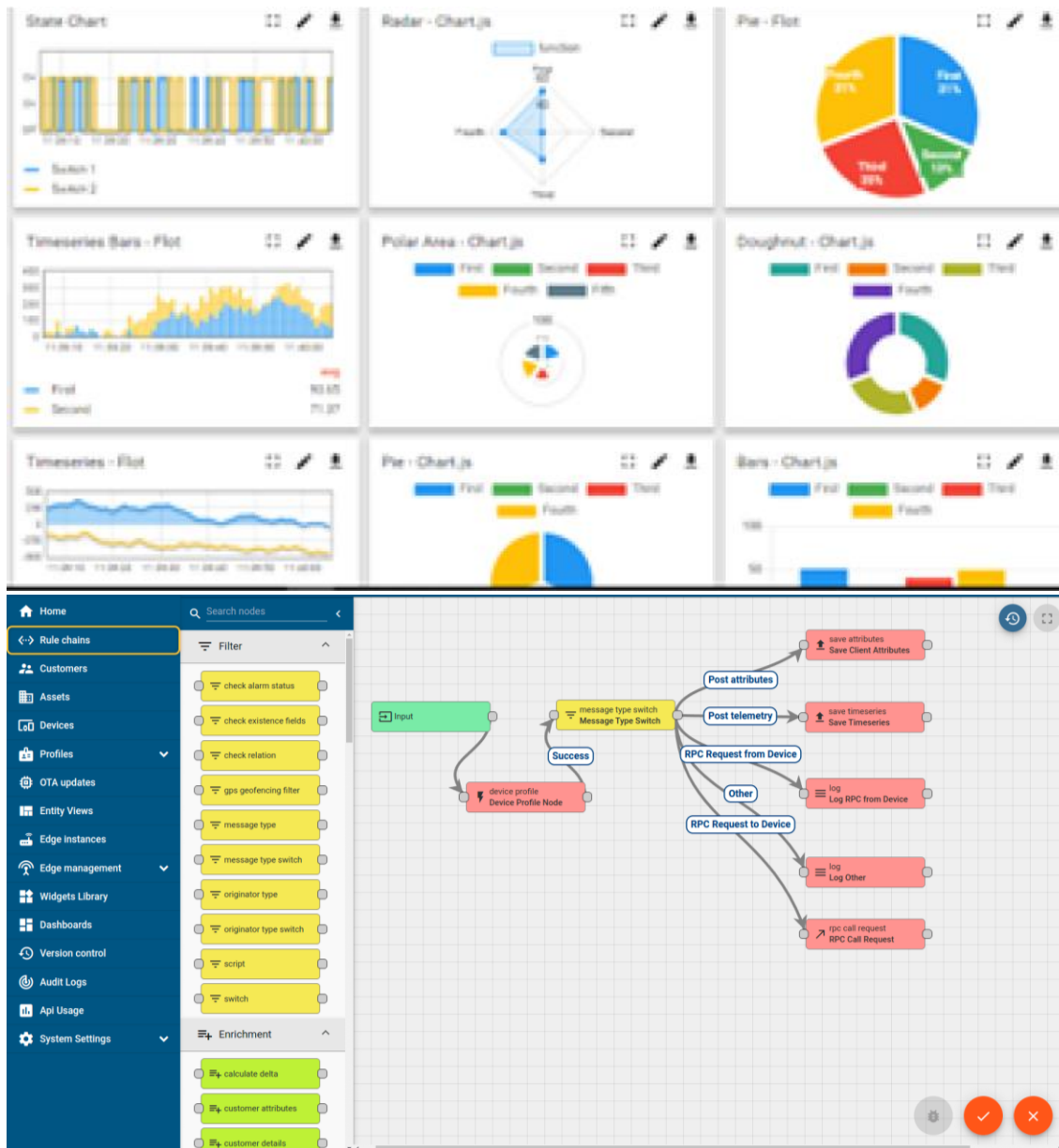
ii. Smart Factory Platform (**FACTORY WATCH**)

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
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i

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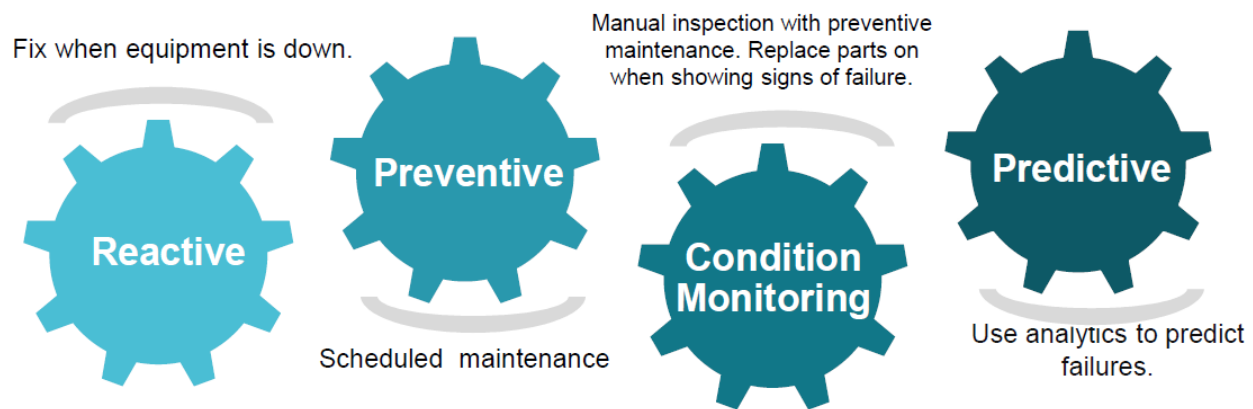
UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

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.

Fix when equipment is down.

Manual inspection with preventive maintenance. Replace parts on when showing signs of failure.

Preventive

Reactive

Condition Monitoring

Predictive

Scheduled maintenance

Use analytics to predict failures.

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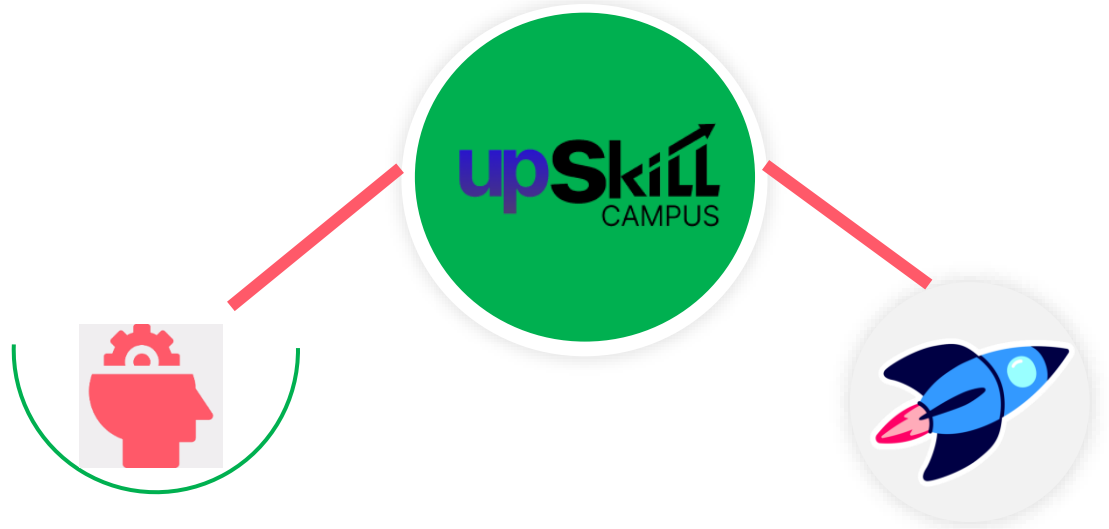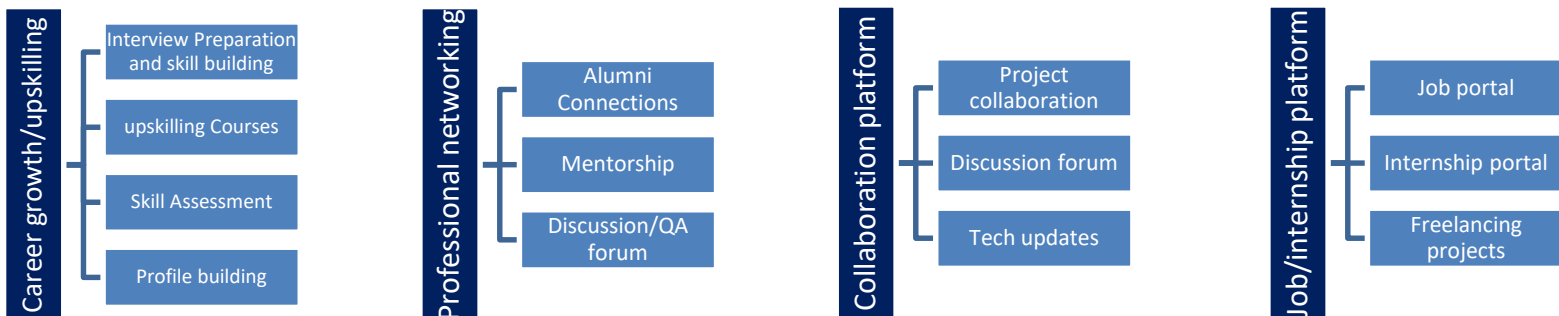
Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

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

https://www.upskillcampus.com/

Career growth/upskilling
- Interview Preparation and skill building
- upskilling Courses
- Skill Assessment
- Profile building

Professional networking
- Alumni Connections
- Mentorship
- Discussion/QA forum

Collaboration platform
- Project collaboration
- Discussion forum
- Tech updates

Job/internship platform
- Job portal
- Internship portal
- Freelancing projects

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 Reference

[1] L. Stanca, "The Effects of Attendance on Academic Performance: Panel Data Evidence for Introductory Microeconomics", *J. Econ. Educ.*, vol. 37, no. 3, pp. 251-266, 2006.

[2] M. Gottfried, "Evaluating the Relationship Between Student Attendance and Achievement in Urban Elementary and Middle Schools: An Instrumental Variables Approach", *American Educational Research Journal*, vol. 47, no. 2, pp. 434-465, June 2010.

[3] S. Kraijak and P. Tuwanut, "A survey on Internet of Things architecture protocols possible applications security privacy real-world implementation and future trends", *International Conference on Computing Technologies[ICCT]*, 2015.

2.6 Glossary

Terms	Acronym
Online Education Platform	OEP
Cloud Computing	
Attendance System	
Real-Time Data	
LMS(Learning Management System)	

3   Problem Statement

In the assigned problem statement

An online education platform is one of the trending cloud computing projects that can provide students with access to high-quality education from anywhere in the world. This project can be built using platforms like AWS or Google Cloud and can include features like virtual classrooms, video through conferencing, and collaboration tools.

Title: Development of an Attendance System for an Online Education Platform

Description: In the context of the broader project aimed at creating an online education platform utilizing cloud computing services like AWS or Google Cloud, one crucial aspect is the implementation of an efficient attendance system. The attendance system serves as a pivotal component in ensuring student engagement and tracking participation within virtual classrooms and educational sessions.

4   Existing and Proposed solution

1. Existing Solutions and Limitations:

1. Manual Attendance Tracking: Instructors manually mark attendance during sessions. This method is prone to errors and can be time-consuming, especially for large classes. It also lacks automation and real-time tracking capabilities.

2. QR Code Scanning: Students scan QR codes to mark their attendance. While this method reduces manual effort, it requires additional setup and may not be feasible for all environments. It also relies on students having access to a device with a camera.

3. Geolocation Tracking: Attendance is tracked based on students' GPS or IP address. This method may raise privacy concerns, as it requires constant tracking of students' locations. It may also be unreliable in cases where students use VPNs or have poor GPS signal.

4. Integration with Learning Management System (LMS): Attendance tracking is integrated into an existing LMS. While this provides a centralized solution, it may be complex to implement and may not be suitable for standalone online education platforms.

2. Proposed Solution:

My proposed solution combines elements of automation, user-friendly interface, and scalability. It involves creating a web-based attendance system using Python with Flask for the backend and HTML/CSS for the frontend.

- Automation: The system allows instructors to mark attendance digitally, reducing manual effort and minimizing errors.
- User-Friendly Interface: Students can easily mark their attendance by providing session IDs and their names through a simple web form.
- Scalability: The system can handle a large number of users and sessions as the platform grows. It can be further extended to include features like automated reminders and integration with existing LMS systems.
- Privacy and Security: While the example provided uses in-memory storage for simplicity, a real-world implementation would ensure compliance with data privacy regulations and secure storage of attendance records.

3. Value Addition:

- Efficiency: By automating attendance tracking, instructors can focus more on teaching rather than administrative tasks.

- Accuracy: Digital attendance tracking reduces the likelihood of errors compared to manual methods.

- Flexibility: The web-based nature of the solution allows for access from anywhere with an internet connection, enhancing the platform's accessibility for both instructors and students.

4.1 Code submission (Github link) : https://github.com/aditya001-42/upskillcampus/blob/main/Attendance_System/app.py

4.2 Report submission (Github link) : https://github.com/aditya001-42/upskillcampus/blob/main/Aditya-Kotame_InternshipReport_USC_UCT

5   Proposed Design/ Model

6 Performance Test

6.1 Test Plan/ Test Cases

- Conduct performance testing in a cloud environment to simulate real-world conditions.
- Use cloud-based load testing tools such as AWS LoadRunner, Google Cloud Load Balancer, or Azure Load Testing to simulate various scenarios.

6.2 Test Procedure

- Set up test environments in the cloud that mimic production conditions.
- Utilize cloud monitoring and logging services to track system performance during testing.

6.3 Performance Outcome

- Evaluate system performance metrics in the cloud environment, ensuring scalability and reliability under load.
- Optimize cloud resources based on performance test results to enhance system efficiency.

7 My learnings

- Gain insights into deploying and managing applications in a cloud environment.

- Learn about cloud-native services and best practices for cloud deployment.

- Understand the importance of scalability, reliability, and performance optimization in cloud-based applications.

8   Future work scope

- Explore advanced cloud services for enhancing system capabilities, such as serverless computing, containers, and AI/ML services.

- Implement auto-scaling mechanisms to dynamically adjust resources based on workload demands.

- Continuously monitor and optimize cloud resources to improve cost-efficiency and performance.