Industrial Internship Report on

"Prediction of Agriculture Crop Production in India"

Prepared by

[Vatsal Chauhan]

| *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 was about predicting the agriculture crop productions in India.

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. |

TABLE OF CONTENTS

1   Preface

This project utilizes historical crop yield data to forecast future yields using time-series forecasting methods like ARIMA models. By training individual models for each crop, it evaluates predictive accuracy using RMSE metrics and iteratively refines the approach for better agricultural planning and decision-making insights

Relevant internships provide practical experience, industry exposure, and networking opportunities crucial for career development.

My project statement consisted of predicting the agriculture crop yields in the country by making use of Machine Learning Algorithms.

Opportunity given by USC/UCT.

How Program was planned
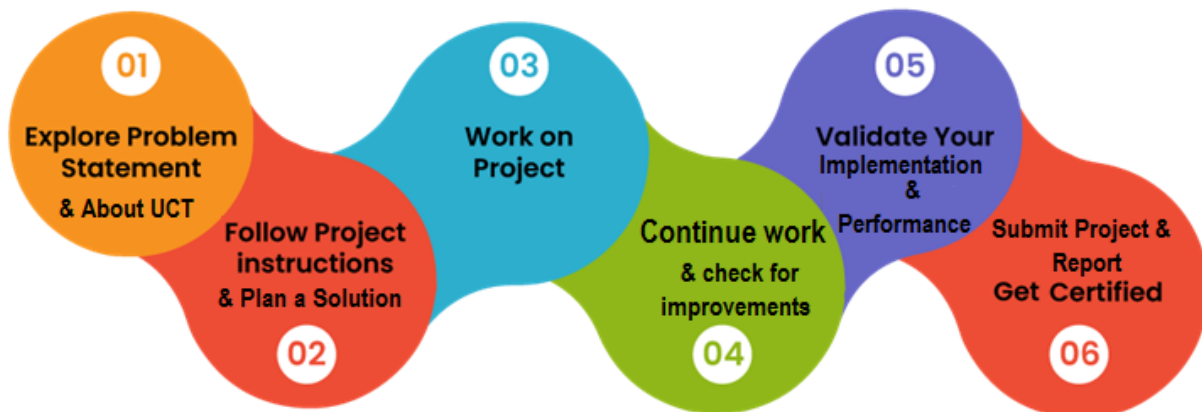
Thank to all, who have helped me directly or indirectly.

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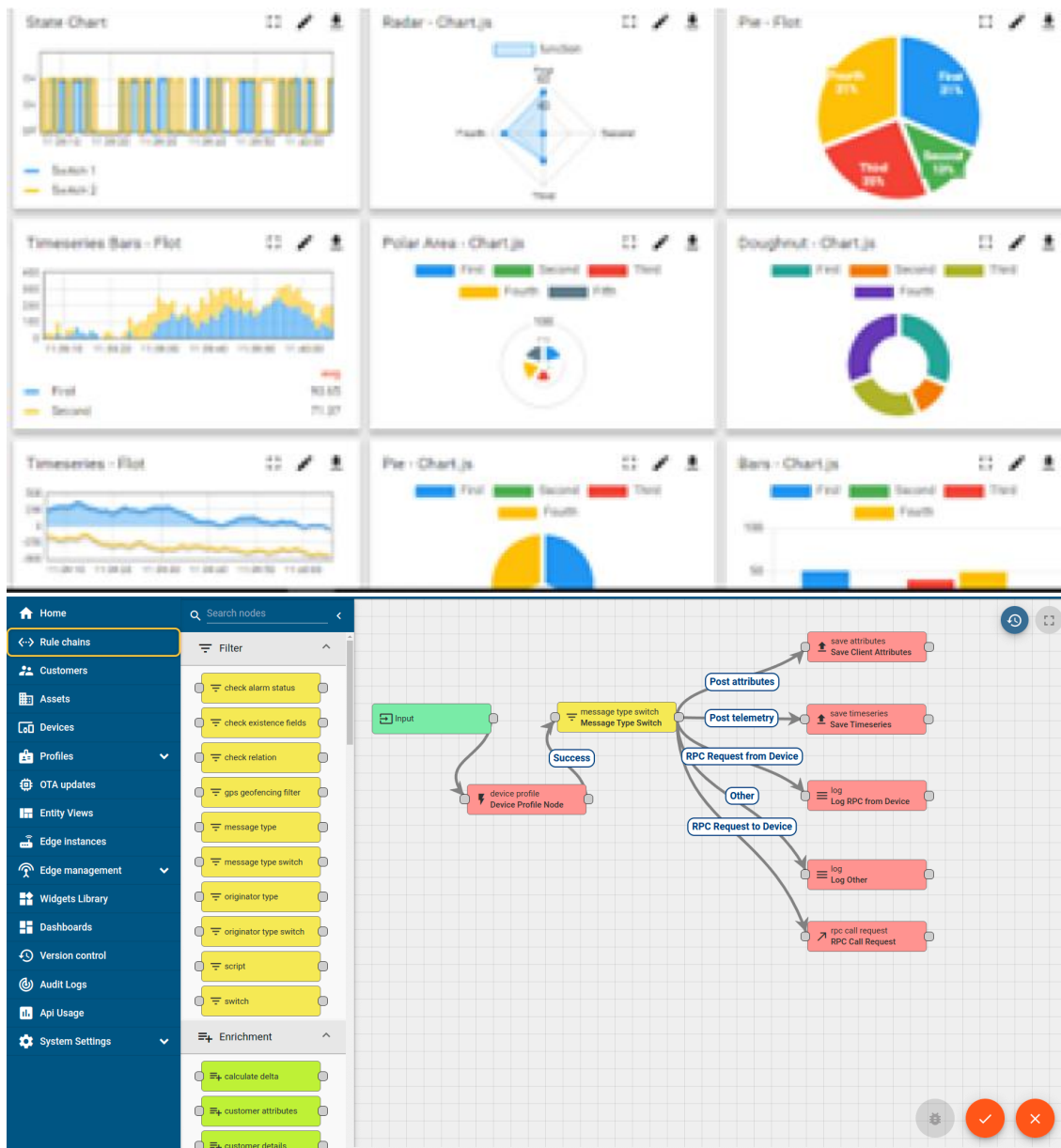
ii. Smart Factory Platform (**FACTORY WATCH**)

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
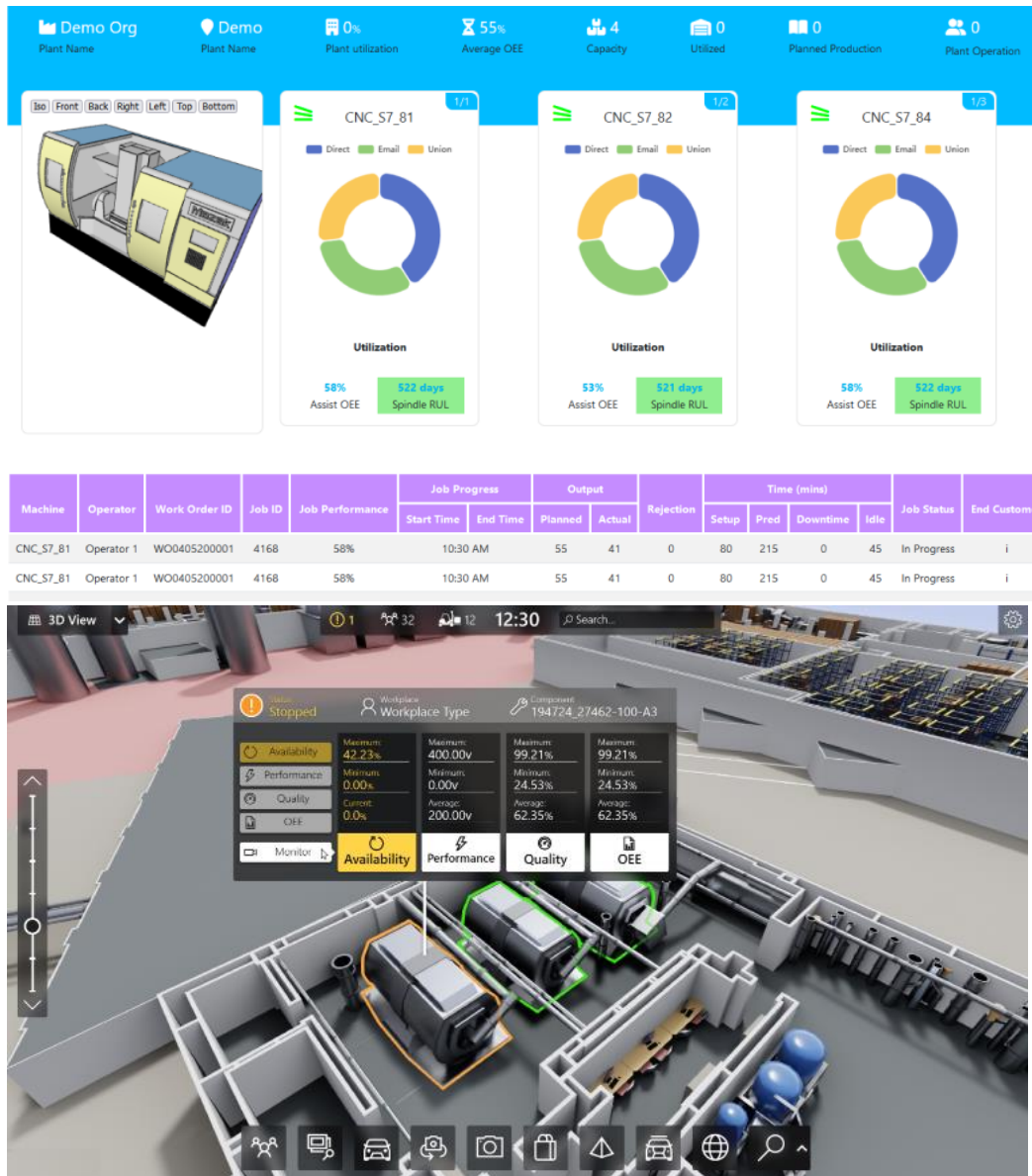
iii. LoRaWAN based Solution

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.
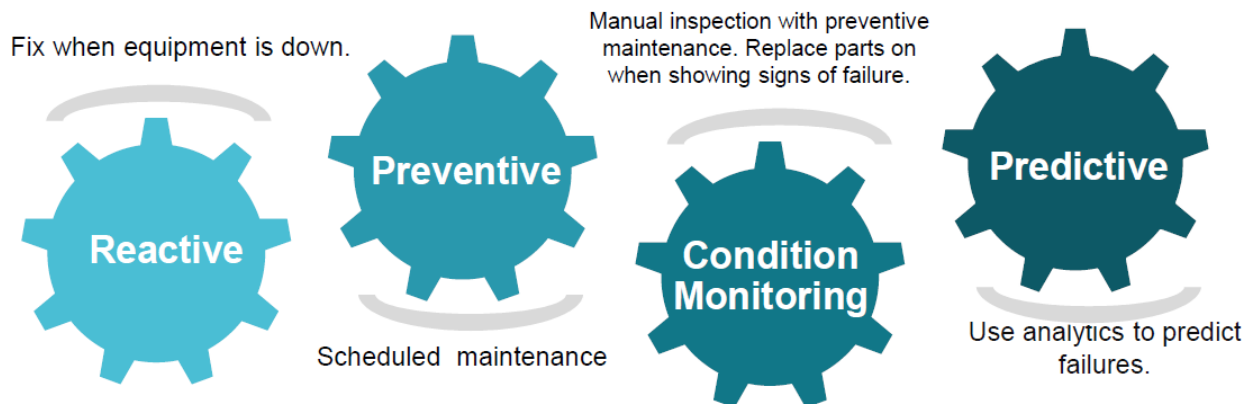
2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.
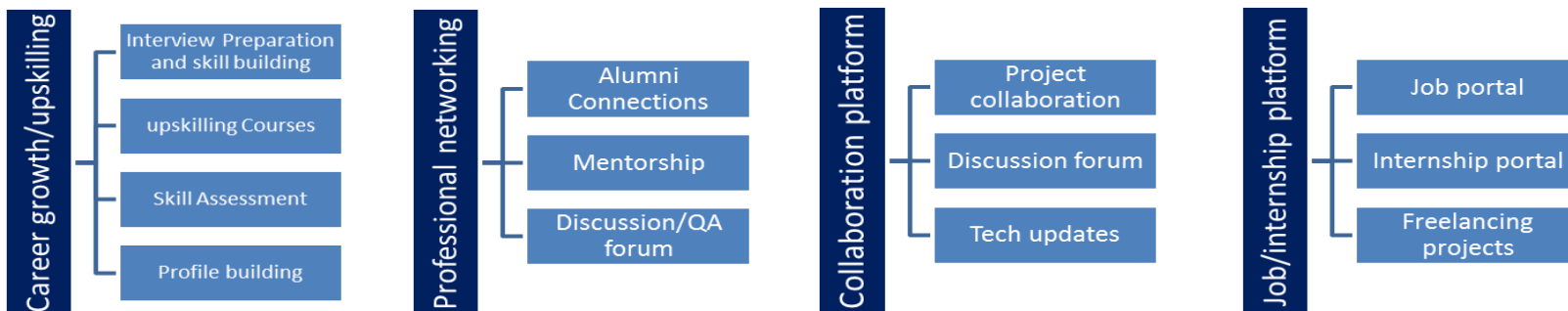
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.
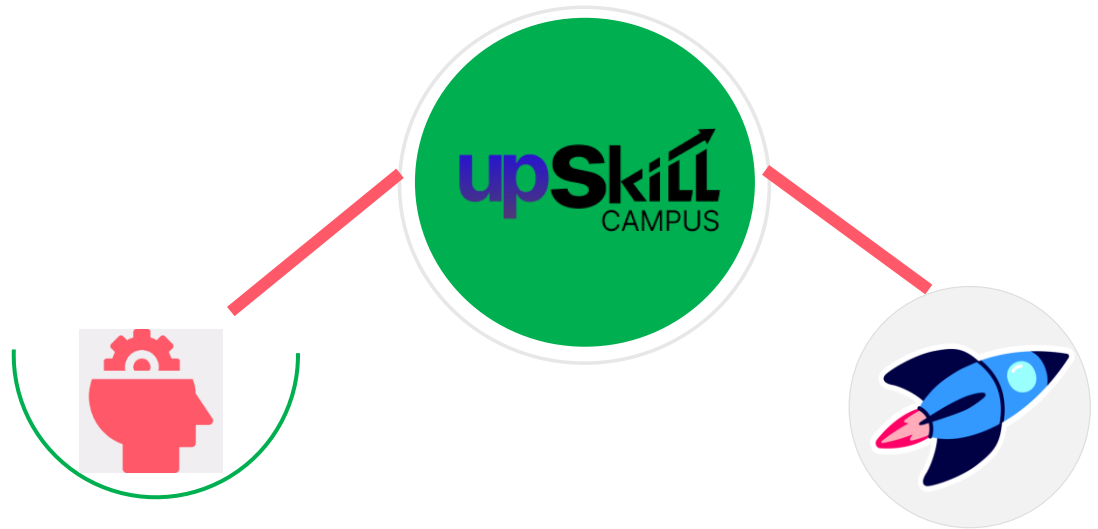
Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

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]   NA

[2]   NA

[3]   NA

2.6 Glossary

Terms	Acronym
NA	NA

3 Problem Statement

The problem statement provided involves utilizing historical crop yield data to develop predictive models for forecasting future crop yields. By implementing ARIMA time-series forecasting models for each crop, the aim is to accurately predict yields and assess the effectiveness of the models through evaluation metrics like Root Mean Squared Error (RMSE). This project seeks to contribute to agricultural planning and decision-making by providing insights into future crop production trends.

4 Existing and Proposed solution

Existing solutions for this problem may not be as accurate and easy to understand enough by everyone.

My proposed solution is comparatively easier to understand and implement in the industry and the code is easier to understand too.

4.1 Code submission (Github link)

https://github.com/footprints-on-the-moon/upskillcampus/blob/main/Agriculturecropprediction.py.py

4.2 Report submission (Github link) : first make placeholder, copy the link.

4.3 https://github.com/footprints-on-the-moon/upskillcampus/blob/main/AgricultureCropPredcition_Vatsal_USC_UCT.pdf

5 Proposed Design/ Model

NA

5.1 High Level Diagram (if applicable)

NA

Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

5.2 Low Level Diagram (if applicable)

NA

5.3 Interfaces (if applicable)

NA

6   Performance Test

NA

6.1   Test Plan/ Test Cases

6.2   Test Procedure

6.3   Performance Outcome

7 My learnings

It was a good work experience with UniConverge Technologies. It was a good opportunity to get an experience of what to expect in the industry and what kind of problem statements are we supposed to face in the job market. Overall it was a nice internship and I hope it satisfies the company.

8   Future work scope

NA