Industrial Internship Report on

Prediction of Agriculture Crop Production In India

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.

My project was Project 1: Prediction of Agriculture Crop Production In India to work on in next coming weeks

Reason: Main reason for selecting this project is that I found this project was interesting that it is useful for all to know about the agriculture sector how the production of agriculture crop in india and also to check the low production countries and what are the measures to take to increase the production in low production cities

Content

This Dataset Describes the Agricuture Crops Cultivation/Production in india. This is from https://data.gov.in/ fully License

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.

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1 Preface

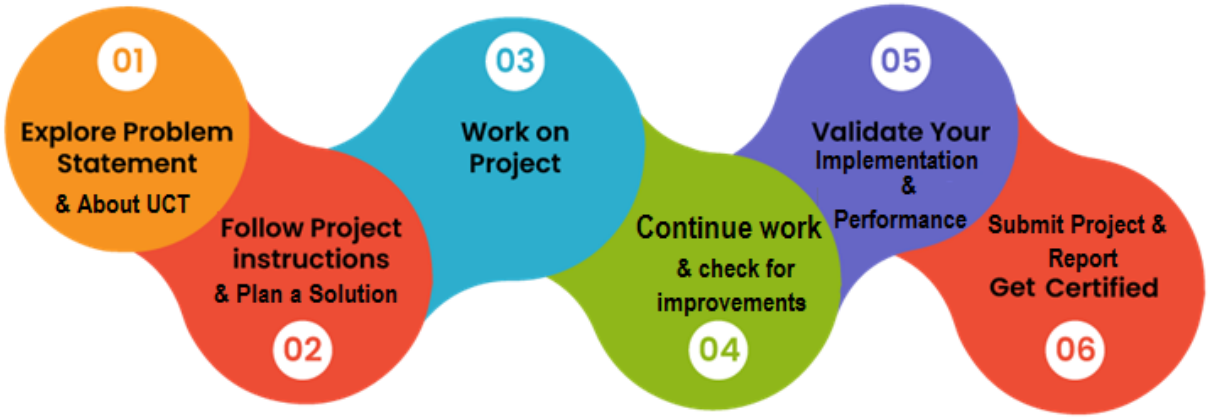
Summary of the whole 6 weeks' work.

About need of relevant Internship in career development.

Brief about Your project/problem statement.

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.

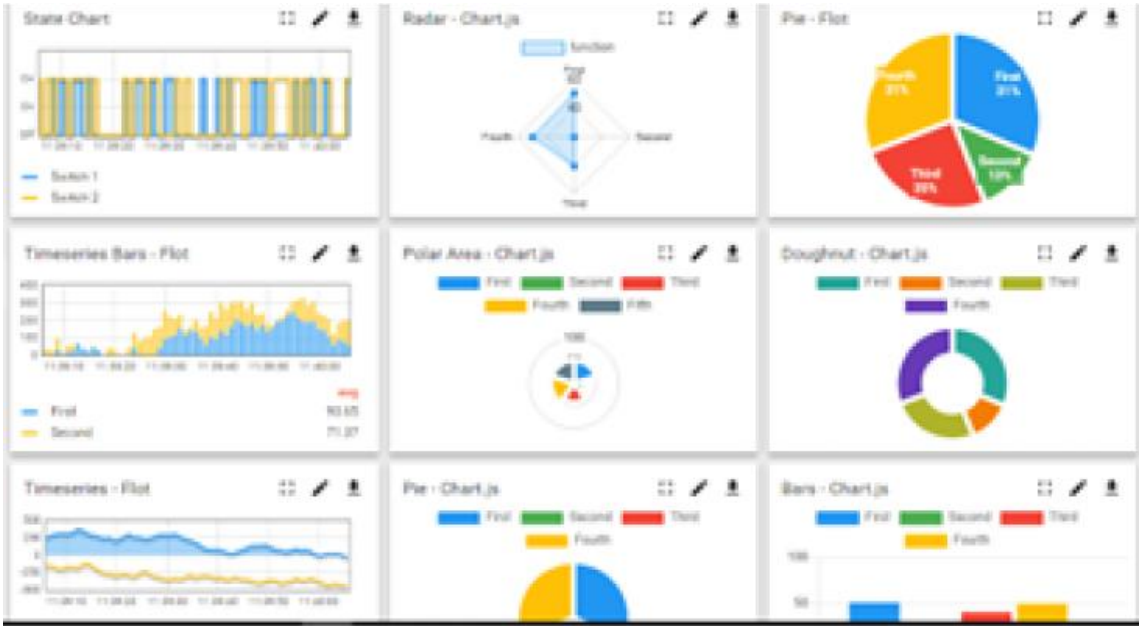
i. UCT IoT Platform (uct Insight)

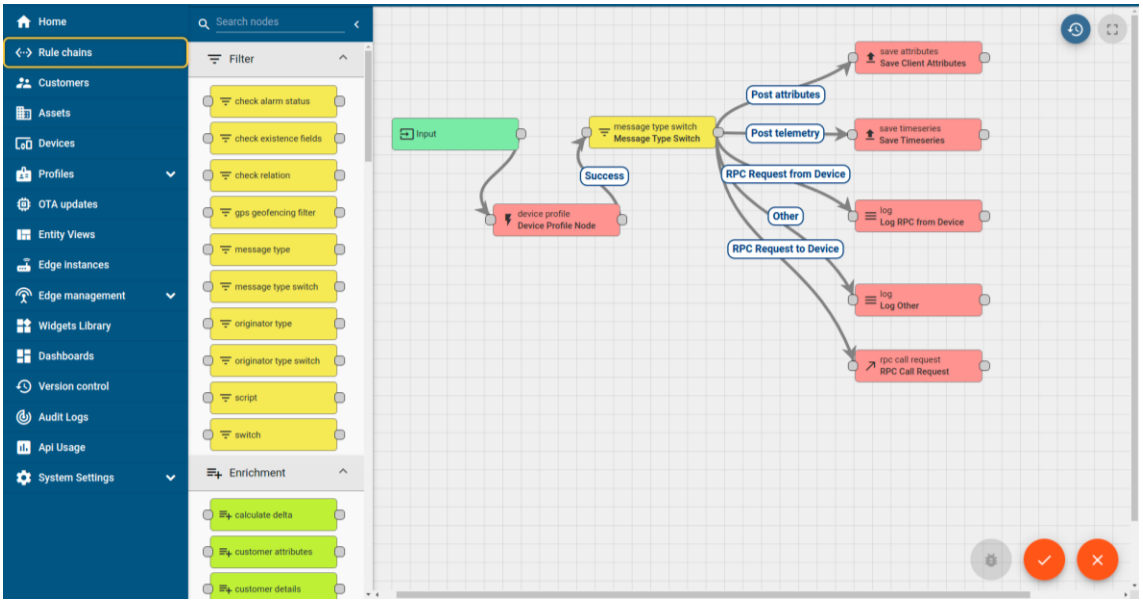
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- 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.

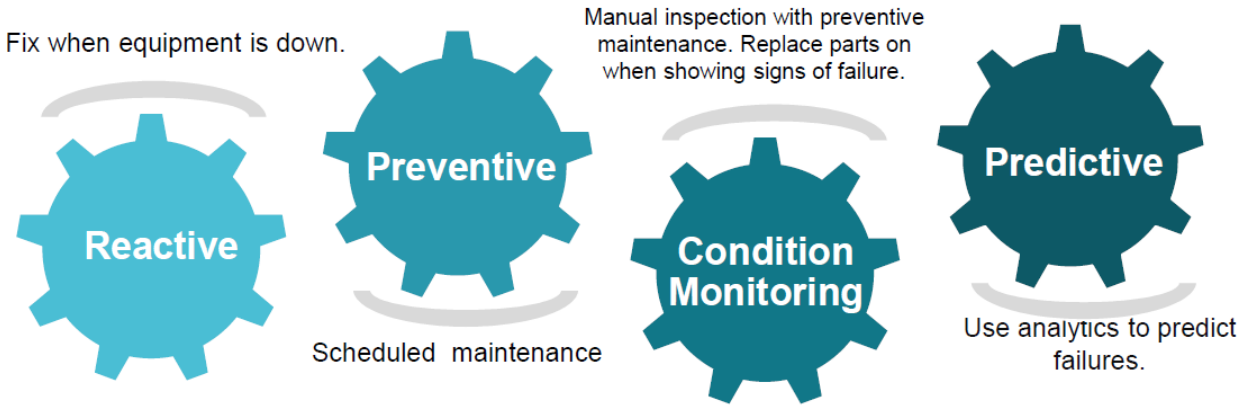
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1	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

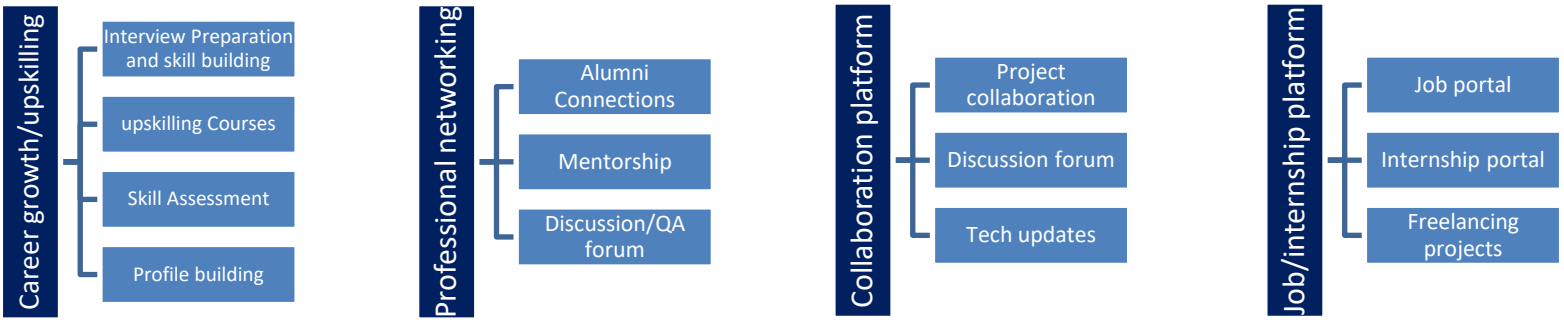
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



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.



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

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[2]

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2.6 Glossary

Terms	Acronym

3 Problem Statement

In Machine Learning Internship Projects: I have selected the **Project 1: Prediction of Agriculture Crop Production In India**

Reason: Main reason for selecting this project is that I found this project was interesting that it is useful for all to know about the agriculture sector how the production of agriculture crop in india and also to check the low production countries and what are the measures to take to increase the production in low production cities

Context

Agricuture Production in India from 2001-2014

This Dataset Describes the Agricuture Crops Cultivation/Production in india. This is from https://data.gov.in/ fully Licensed

Acknowledgements

This Dataset can solves the problems of various crops Cultivation/production in india.

Inspiration

Across The Globe India Is The Second Largest Country having People more than 1.3 Billion.
Many People Are Dependent On The Agricuture And it is the Main Resource.
In Agricuturce Cultivation/Production Having More Problems.
I want to solve the Big problem in india and usefull to many more people

4 Existing and Proposed solution

Provide summary of existing solutions provided by others, what are their limitations?

What is your proposed solution?

Our aim is to get the analysis of crop production in india during the years of 2001-2014 as per given in the project and use of pie charts and bar graphs to visualize the production of different crops in different states and yields of the crops and which have higher growth rate

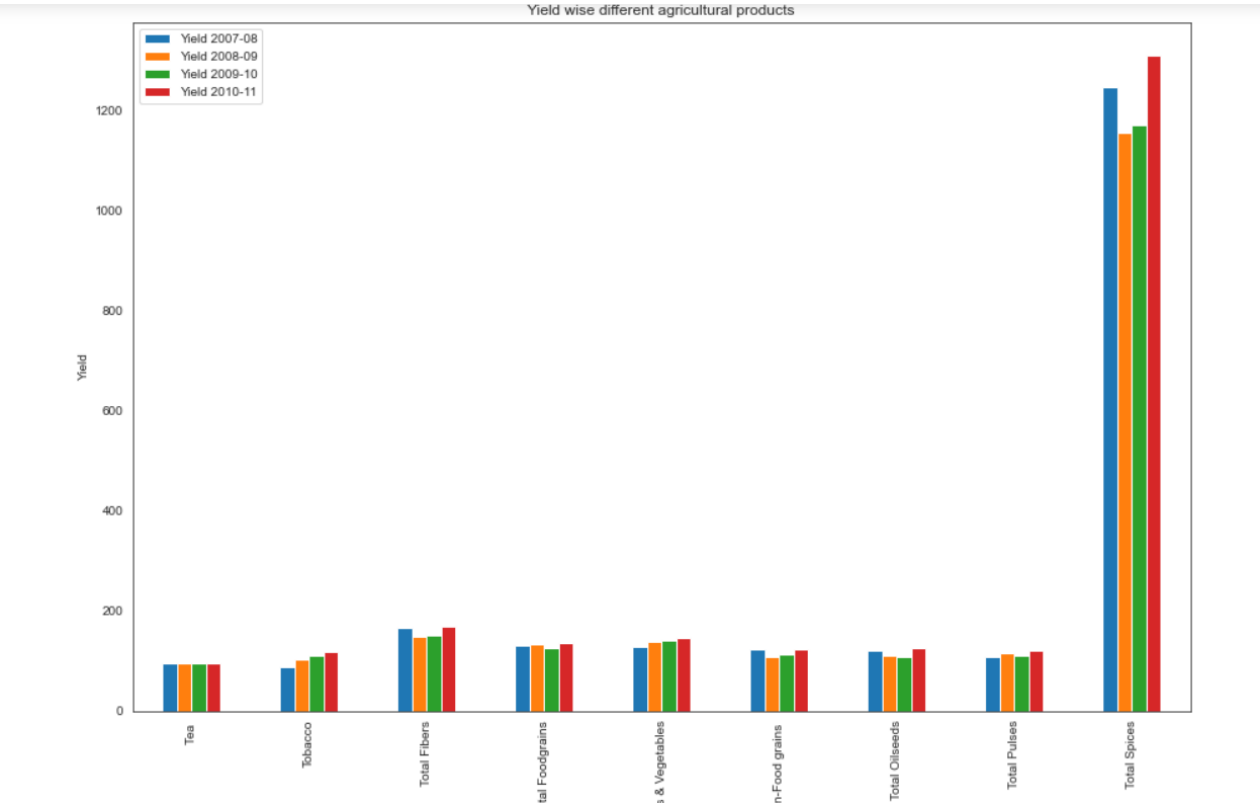
What value addition are you planning?

As per now the data sets consists consist of 2001-2014 years of data in agriculture now I want personally make the data of upto now 2023 as of no one care about agriculture sector and working this addition will add what is current production as per population that will give better for people that how agriculture is more important

4.1 Code submission (Github link): https://github.com/kollurujyothisrinivaspavankumar/upskillcampus

4.2 Report submission (Github link) : https://github.com/kollurujyothisrinivaspavankumar/upskillcampus

5 Proposed Design/ Model



5.1 High Level Diagram (if applicable)

Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

5.2 Low Level Diagram (if applicable)

5.3 Interfaces (if applicable)

Update with Block Diagrams, Data flow, protocols, FLOW Charts, State Machines, Memory Buffer Management.

6 Performance Test

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

Here we need to first find the constraints.

How those constraints were taken care in your design?

What were test results around those constraints?

Constraints can be e.g. memory, MIPS (speed, operations per second), accuracy, durability, power consumption etc.

In case you could not test them, but still you should mention how identified constraints can impact your design, and what are recommendations to handle them.

6.1 Test Plan/ Test Cases

We have worked best with the given data sets and use all the given data for accurate outcome and I want to make further with the remaining years of data about agriculture that will help to know even better about agriculture sector

6.2 Test Procedure

Importing libraries

Importing dataset

Data cleaning

Finding shape of datasets given

Find the null values

Data analysis on agriculture crop production(2001-2014)

Check total number of crops

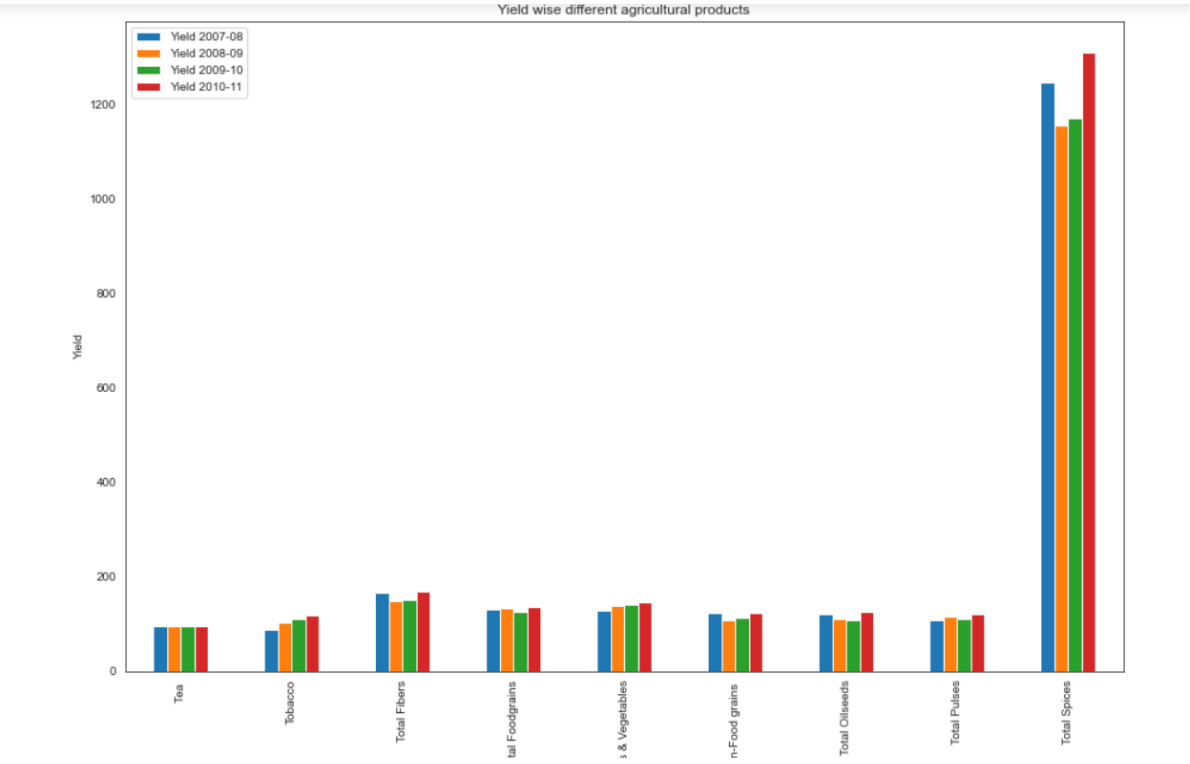
Check production state wise and crop wise

State wise yield

Crop wise yield

Year wise yield of different agriculture products

6.3 Performance Outcome



7 My learnings

1.Basic knowledge of machine learning and data science

2.And production of crops in india by using the datasets and predicting the agriculture crop production.

3.Basic knowledge of about Artificial intelligence vs Data Science and their Jobs and required skills

4.And probability and statistics and Data science skills

5.Basic knowledge of about Artificial intelligence vs Data Science and their Jobs and required skills

6.And probability and statistics and Data science skills

7.Basic knowledge of about machine learning and regressions and basic algorithms

8.And linear function in data science and optimization techniques

9.Basic knowledge of campus interview selection and salary packages for data engineer

10.And what type of questions are asked in the data science interview

8 Future work scope

As per now the data sets consists consist of 2001-2014 years of data in agriculture now I want personally make the data of upto now 2023 as of no one care about agriculture sector and working this addition will add what is current production as per population that will give better for people that how agriculture is more important

And also the weather conditions in the areas and water resources for the crop production is also I want add in my project with the surveyed data sets and make more personalized visual how the india agriculture sector was there year by year .