Industrial Internship Report on

HealthCare Data Managment 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. My project was HealthCare Data Management System 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

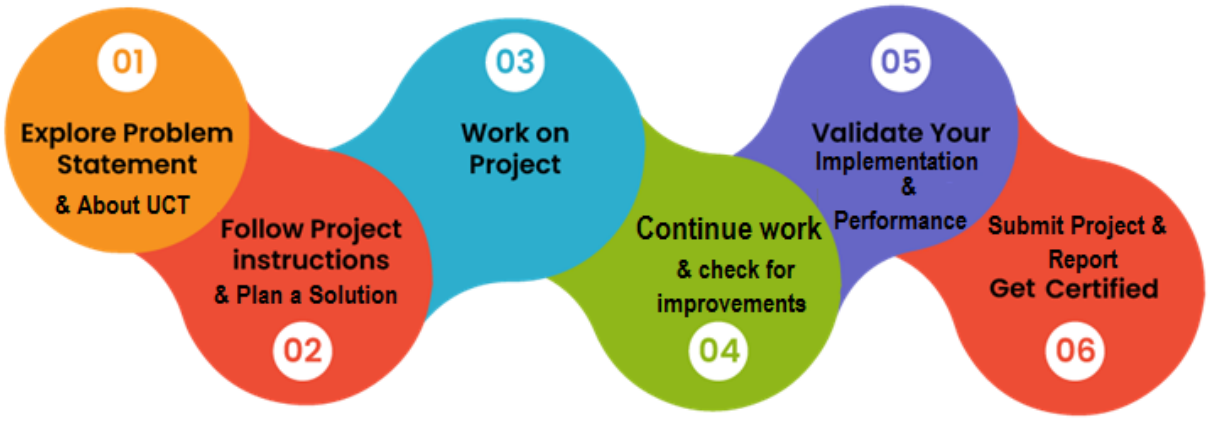
Summary of the whole 6 weeks' work.

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.

Thanks to all

1.Ankit sir

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.

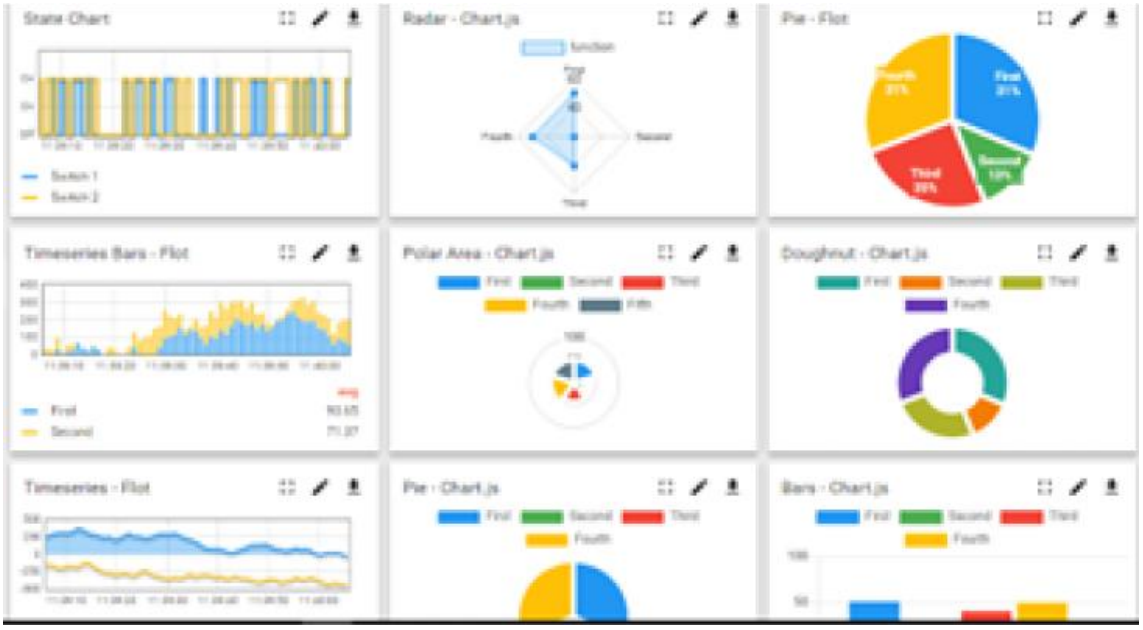
i. UCT IoT Platform

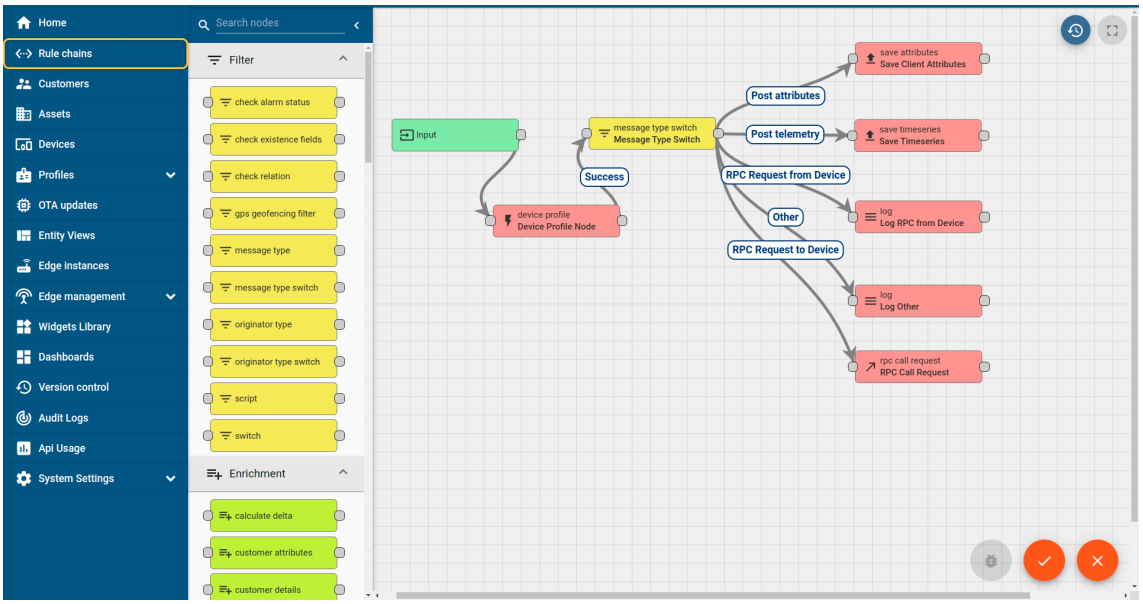
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- 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 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.

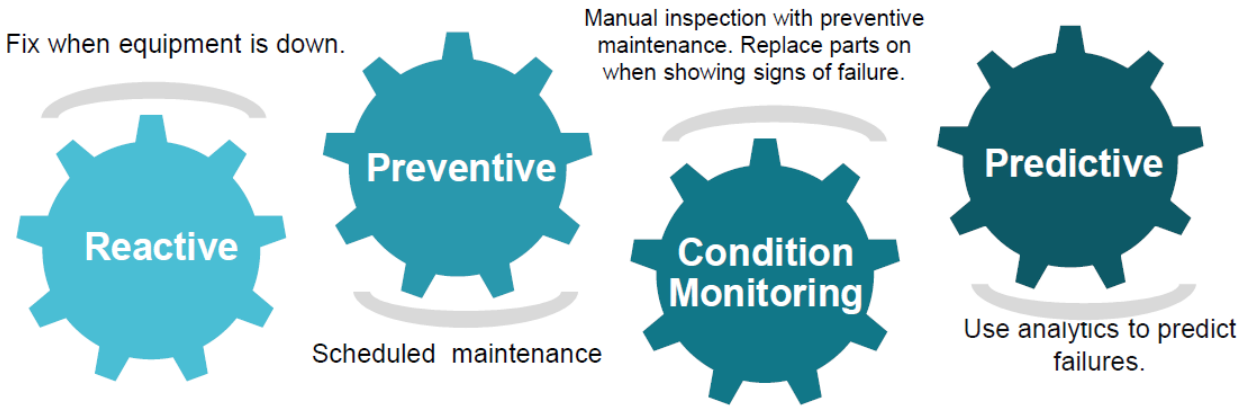
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1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

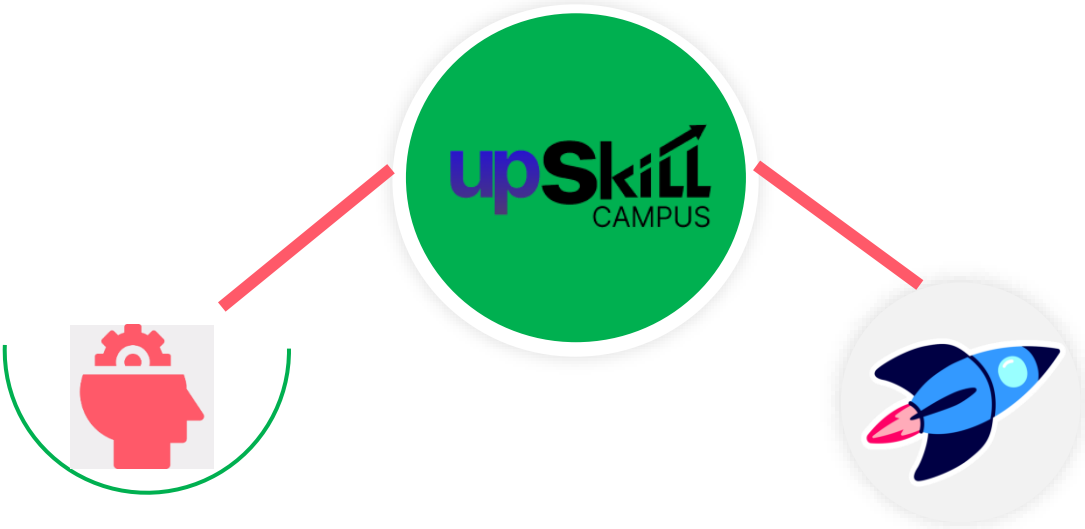
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



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.

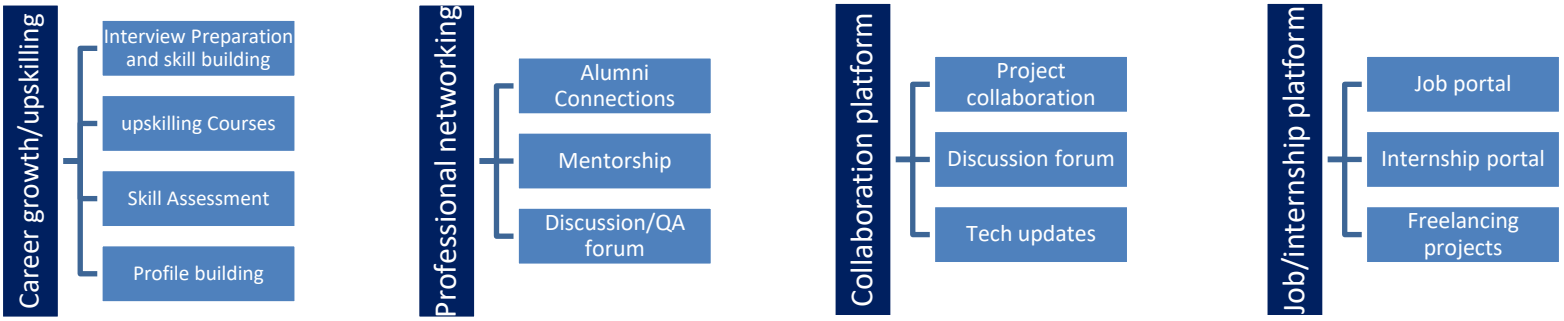
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



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/



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]https://docs.aws.amazon.com/rds/?nc2=h_ql_doc_rds

[2] https://docs.python.org/3/tutorial/index.html

2.6 Glossary

Terms	Acronym
AWS	Amazon Web Services
SQL	Structured Query Language
S3	Simple Secure Storage
API	Application Programming Interface
CLI	Command Line Interface

3 Problem Statement

In the assigned problem statement

- ## Fragmented Data

One of the many challenges in healthcare technology is that health data vulnerabilities include structured data. Structured data can be integrated into healthcare database management systems or saved as image and video files, stored in specialized formats (DICOM for MRI scans), scanned paper documents, and more. Data in healthcare is widely duplicated, stored, and collected multiple times in various versions across public health organizations, providers, pharmacies, patients, ad insurance bodies.

- ## Data Changes

One of the many organizational problems in healthcare is that health data is constantly changing including the names, locations, professions, and conditions of patients and providers. Patients constantly undergo numerous tests and are administered various treatment types over the years. Accordingly, the treatments and medication types change in the course as well. New types of health data management solutions include telehealth modules creating new data types.

- ## Regulatory Compliances

Health data are sensitive material and very prone to health data breach. Healthcare organizations are required to adhere to government compliance and regulatory rules like HIPAA and ADA. Data management for healthcare like data discovery faces challenges due to poor data quality making it difficult to perform during audits and regulatory requirement meets. This limits the resources from including diverse data of providers that may be beneficial for patient health.

- **Inadequate Data Integration Across Systems**

This continues to be one of the ongoing challenges in healthcare technology as various health data management systems can talk to one another to receive a comprehensive overview of the patient data.

- **Overload of Data**

Healthcare data can be overwhelming on healthcare data management software. Organizations and enterprises are required to invest in healthcare IT security infrastructure more effectively. Without adequate ecosystems and data governance, healthcare enterprises risk facing serious reputational and financial consequences.

4 Existing and Proposed solution

Solution:

- **Technologies for Data Entry**

Healthcare enterprises that use technologies for data entries to aggregate and collect data from various systems and resources in different formats. This helios in storing the data in a central repository. Providers are using IoT to remotely monitor patients through smart and wearable devices. Providers can collect and monitor data from their homes.

Providers are using customer-relationship management (CRM) tools and platforms to understand patient needs and improve their holistic experience. OCR technologies enable providers to digitize the texts and minimize manual errors.

- ## Access to Technologies and Data Storage

Providers use data storage and have access to technologies like automated tasks, HIPAA compliance, improved access, and security. In place of using traditional on-premise geolocations, they are now towards safer and cloud-based solutions.

Cloud data storage offers flexible information storage capacity and it comes with low maintenance cost. It also allows providers, stakeholders, and organizations to have easy access to adopting hybrid and remote work policies and mobile apps. Providers are allowed to increase or reduce this healthcare data management software space as needed instead of investing in on-premise platforms or servers. Coud-based technologies and other hosting solutions have a lower risk of health data breaches than on-premise servers as this data is stored in various other locations and is more secure.

- ## Data Security, Fraud Technology Detection, and Security

Process data in real-time is crucial to providers and healthcare organizations. Healthcare data management allows them to adopt newer technologies and healthcare database management systems as a lot of data needs to be collected and can be too much for traditional systems. This data stored comes in various resources and formats.

AI and ML ate allowing providing to diagnose patients more accurately and forecast medical concerns and their progress. This helps in working in real-time, improving the overall efficacy of providers, doctors, and nurses, and helps in providing better health results for patients. For

ensuring data management in healthcare, providers also need to ensure optimum data security. Implementing security technologies helps in controlling access and integrating encryption during storage or transmission.

Providers can now also use fraud detection and prevention systems for monitoring any suspicious activities that can be inspected more closely. Data-driven fraud prevention is now aided by artificial intelligence as it offers higher fraud prevention and detection power that is more cost-efficient for organizations.

- ## Optimum Scalability for Data Architectures

Healthcare data management enables providers to generate an exponential amount of data every second to mine it for valuable patient insights. With digital innovation and new technologies making headway toward availability, data output will grow further.

Healthcare professionals are adopting cloud storage and computing to predict inevitable future growth. On-premise storage methods are now limited as healthcare organizations and enterprises are investing more in provider data management solutions. Cloud-based solutions will provide optimum output for data architectures and scale up the business when new hardware is invested in.

- **Predictive Modeling and Data Intelligence**

Healthcare professionals incorporate and employ a wide range of analytical tools and methods to understand the data that has been collected. It helps in deriving the right value. Through assistance from data intelligence, providers will improve treatment outcomes, recognize threats early, and personalize their treatment when it comes to taking preventive and cautious actions.

With predictive modeling technologies using AI, providers can utilize patient records and other health information and data to proactively detect any chronic conditions or high-risk medical events. Hence, preventing them from happening. The predictive modeling lowers internal healthcare process expenditures and tailors treatment plans according to the patient's medical requirements.

4.1 Code submission (Github link)

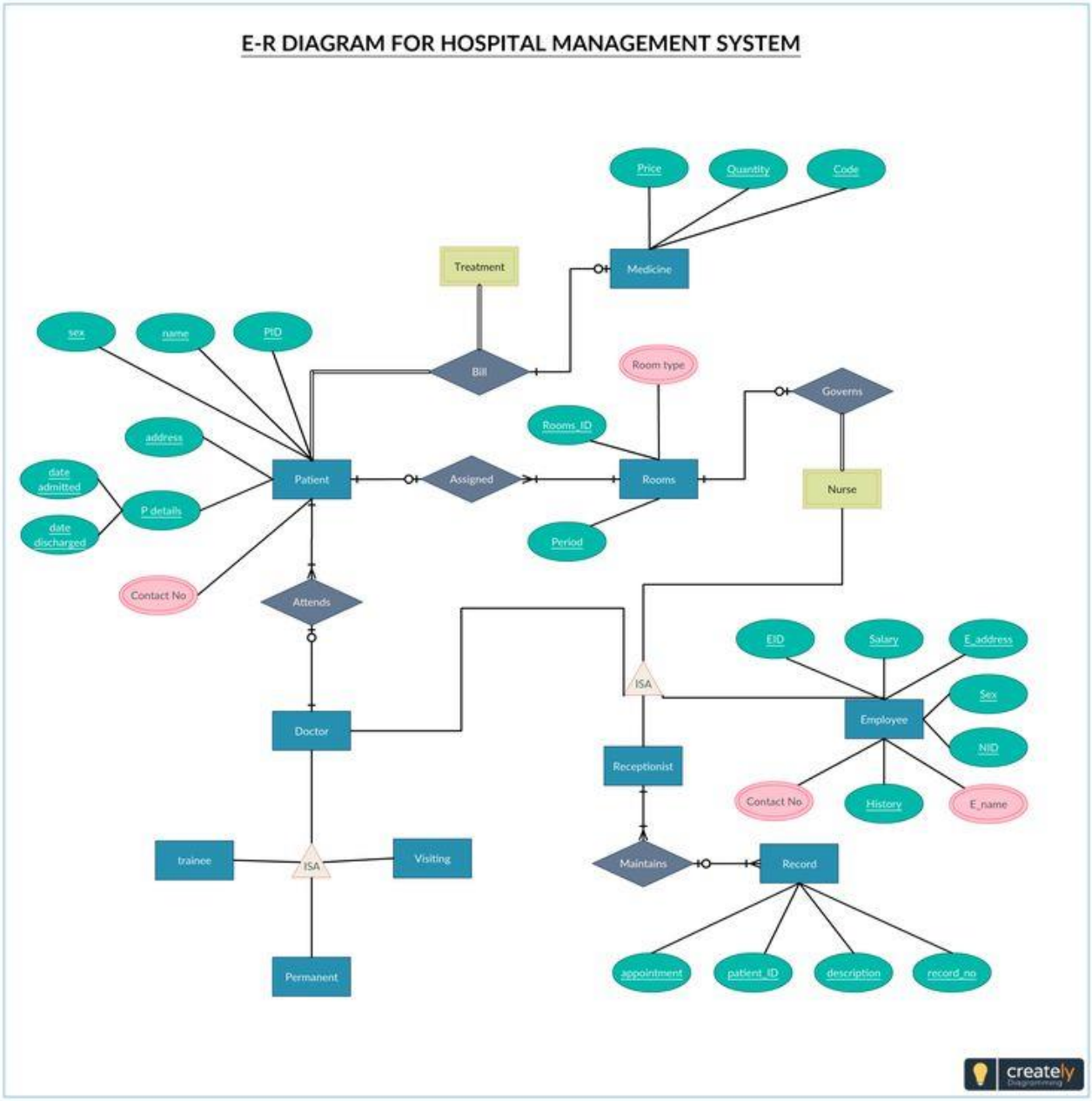
https://github.com/chathrika123/upskillcampus/tree/main/HealthCare-Management-System-codes-python

4.2 Report submission (Github link) :

https://github.com/chathrika123/upskillcampus/tree/main

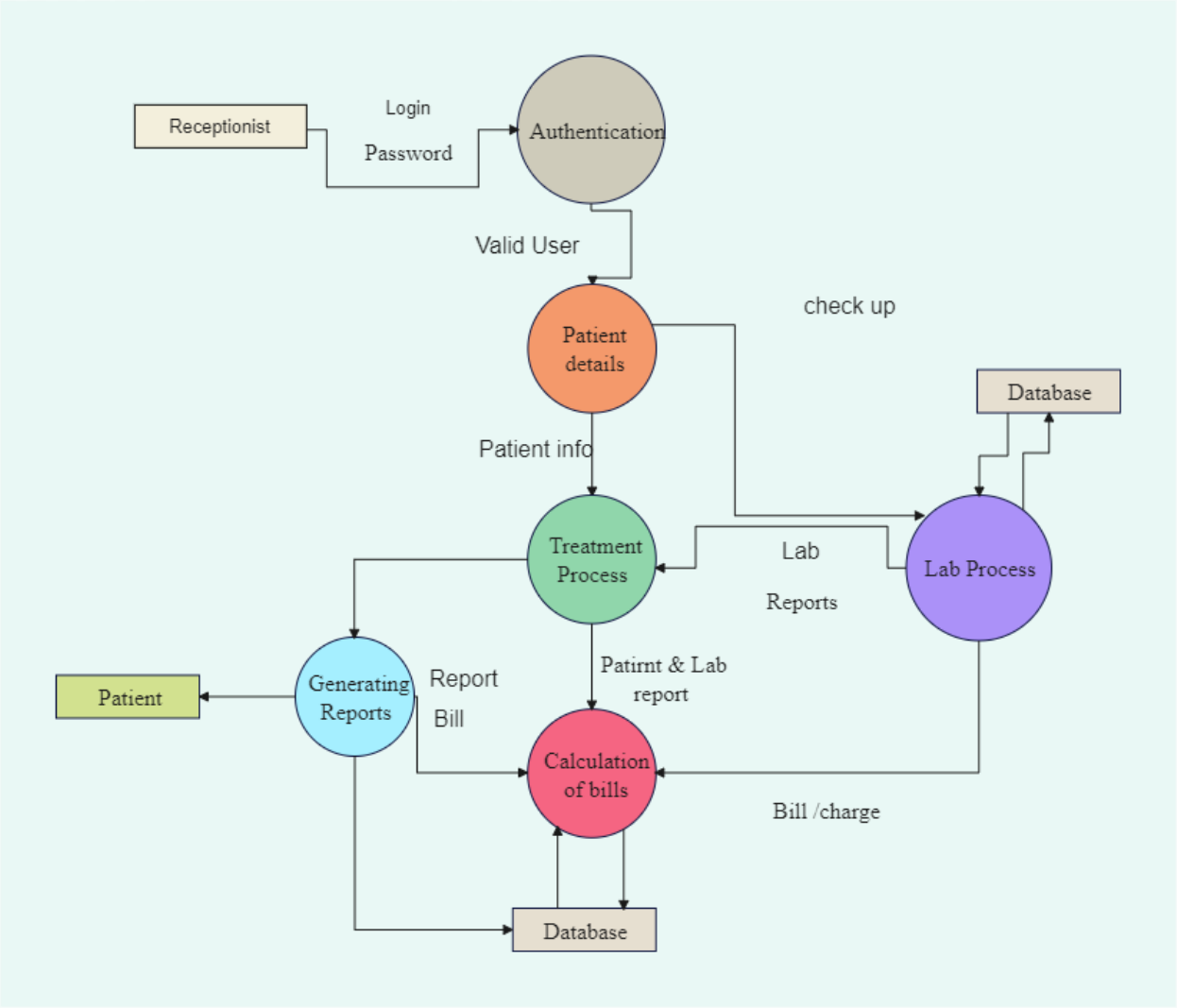
5 Proposed Design/ Model

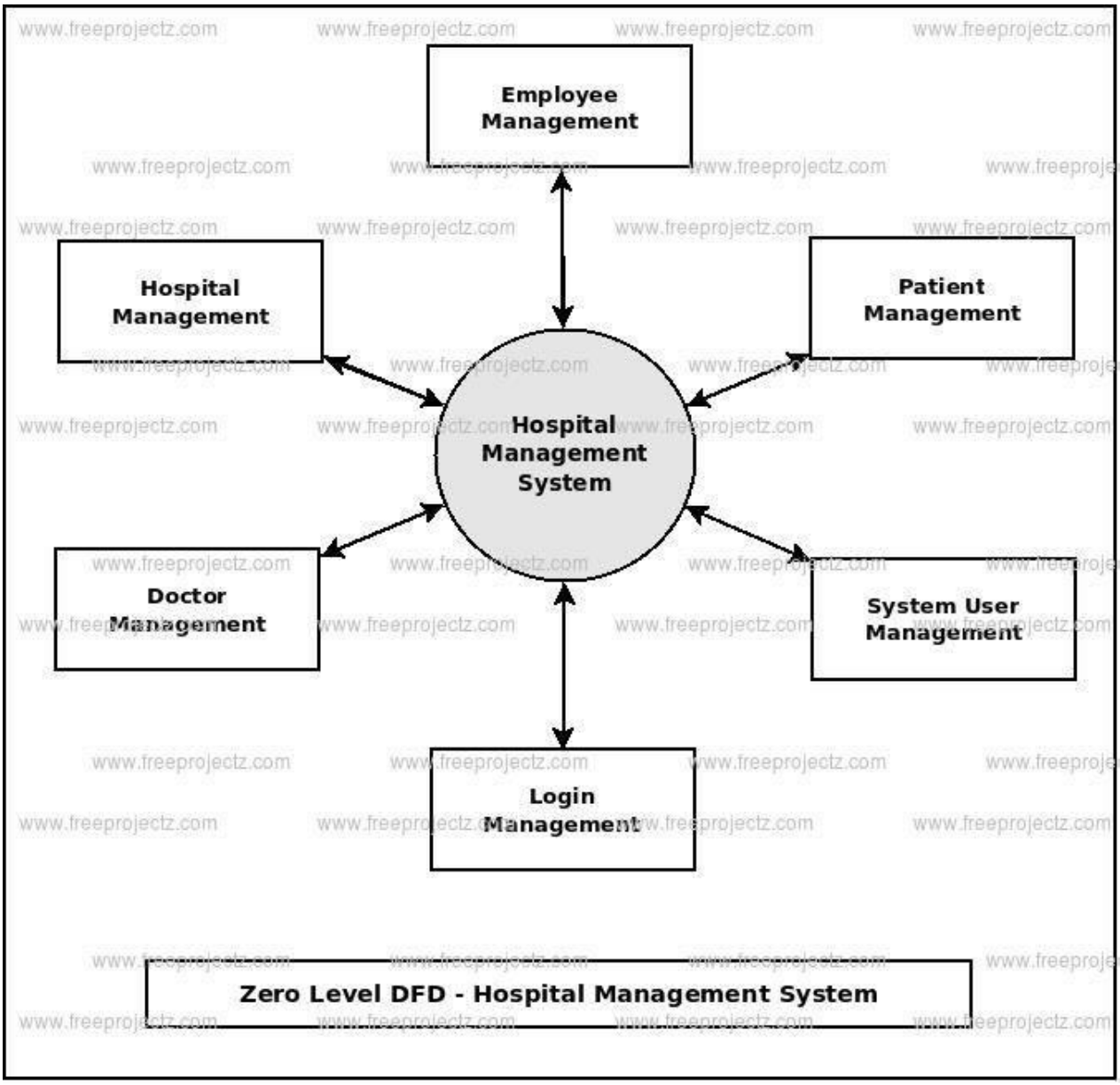
Given more details about design flow of your solution. This is applicable for all domains. DS/ML Students can cover it after they have their algorithm implementation. There is always a start, intermediate stages and then final outcomes.

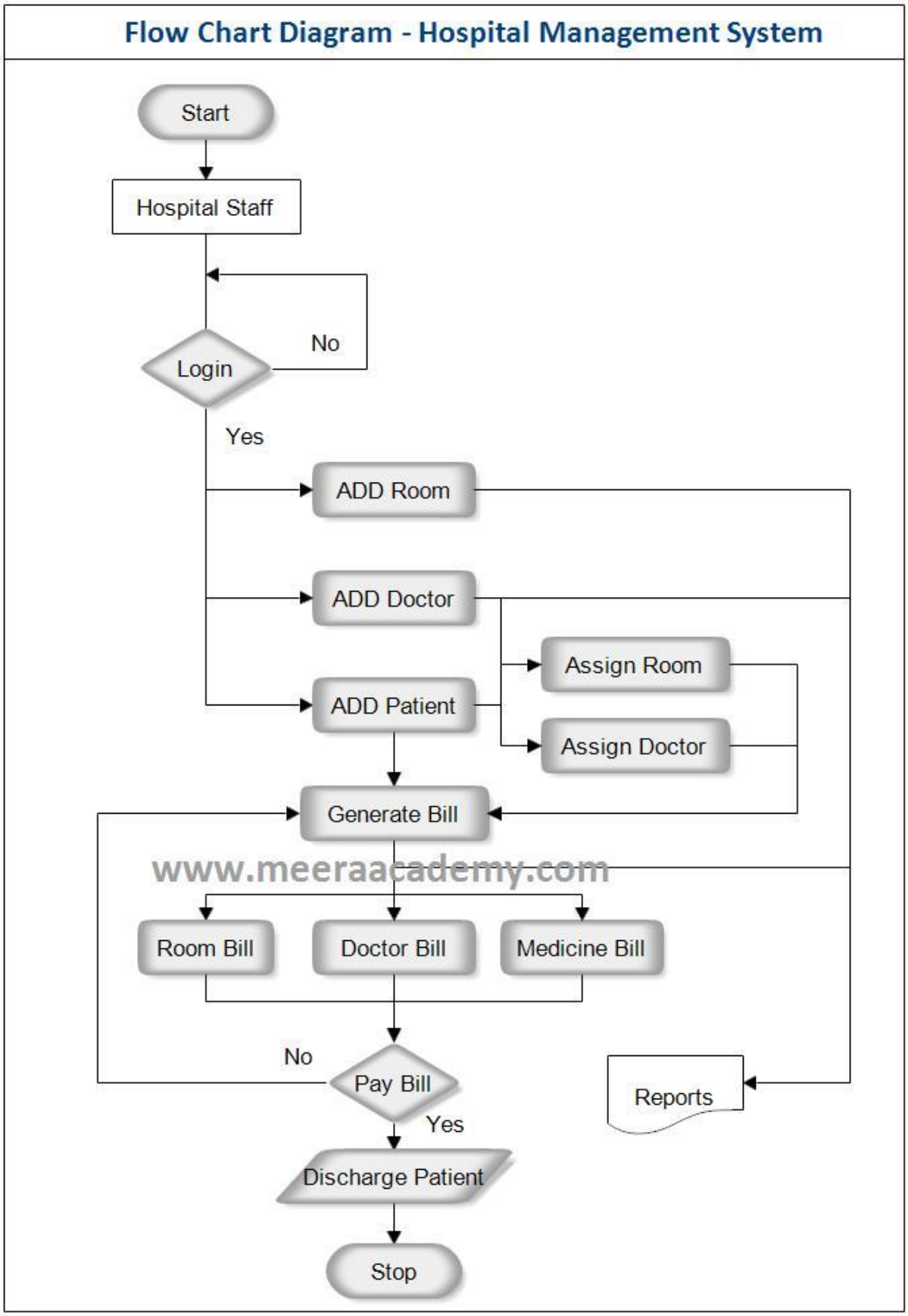


5.1 Interfaces (if applicable)

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




Employee Management
Hospital Management
Patient Management
Hospital Management System
Doctor Management
System User Management
Login Management
Zero Level DFD - Hospital Management System


Flow Chart Diagram - Hospital Management System
Start
Hospital Staff
Login
No
Yes
ADD Room
ADD Doctor
ADD Patient
Assign Room
Assign Doctor
Generate Bill
www.meeraacademy.com
Room Bill
Doctor Bill
Medicine Bill
No
Pay Bill
Yes
Reports
Discharge Patient
Stop

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

6.2 Test Procedure

6.3 Performance Outcome

7 My learnings

In these project basically I learnt about if we create basic web system how it we can make feature
I upgraded some new FRONT END skills and BACK END skills at time of hospital management system development
In this I also learn about how we can manage data storing on cloud in specific location and give more flexibility to website or system it make system easy to work.
And understand more helpful feature about cloud services of AWS.

8 Future work scope

New advancements will soon be introduced in the constantly evolving field of cloud computing. These days, there are more opportunities than ever for people to learn about cloud architecture, DevOps, and cybersecurity. Here are a few of the fascinating breakthroughs that will influence the direction of cloud computing in the future:

- Edge computing: This lowers latency, improves real-time processing, and is essential for IoT applications, driverless vehicles, and remote medical care.
- Serverless Computing: Serverless Computing: By abstracting server management, serverless architecture enables developers to concentrate entirely on building code.
- Quantum Computing: Cloud services driven by quantum technology are expected to revolutionise industries like drug discovery, optimisation, and cryptography