

Industrial Internship Report on "Health Care Data Management System"

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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 (Health Care Data Management System Using Cloud Services)

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

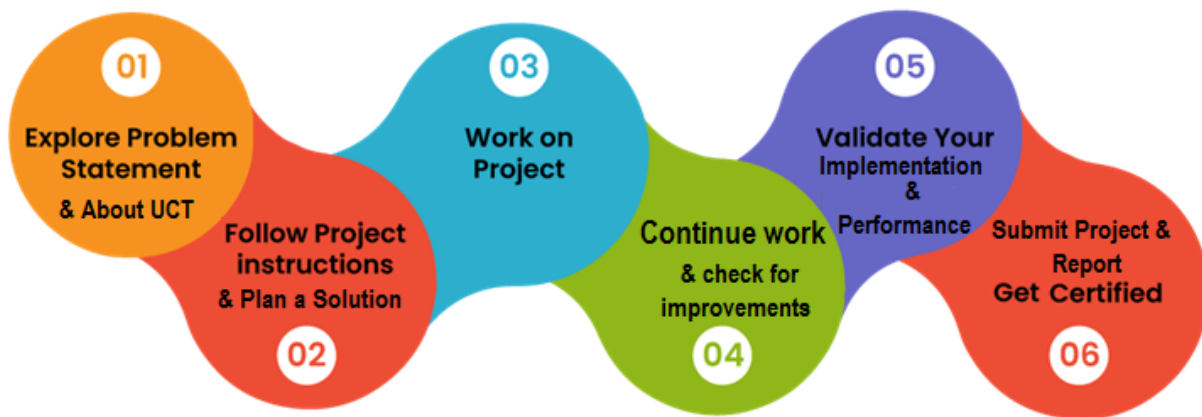
Summary of the whole 6 weeks' work.

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

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 technologiesTechnologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.



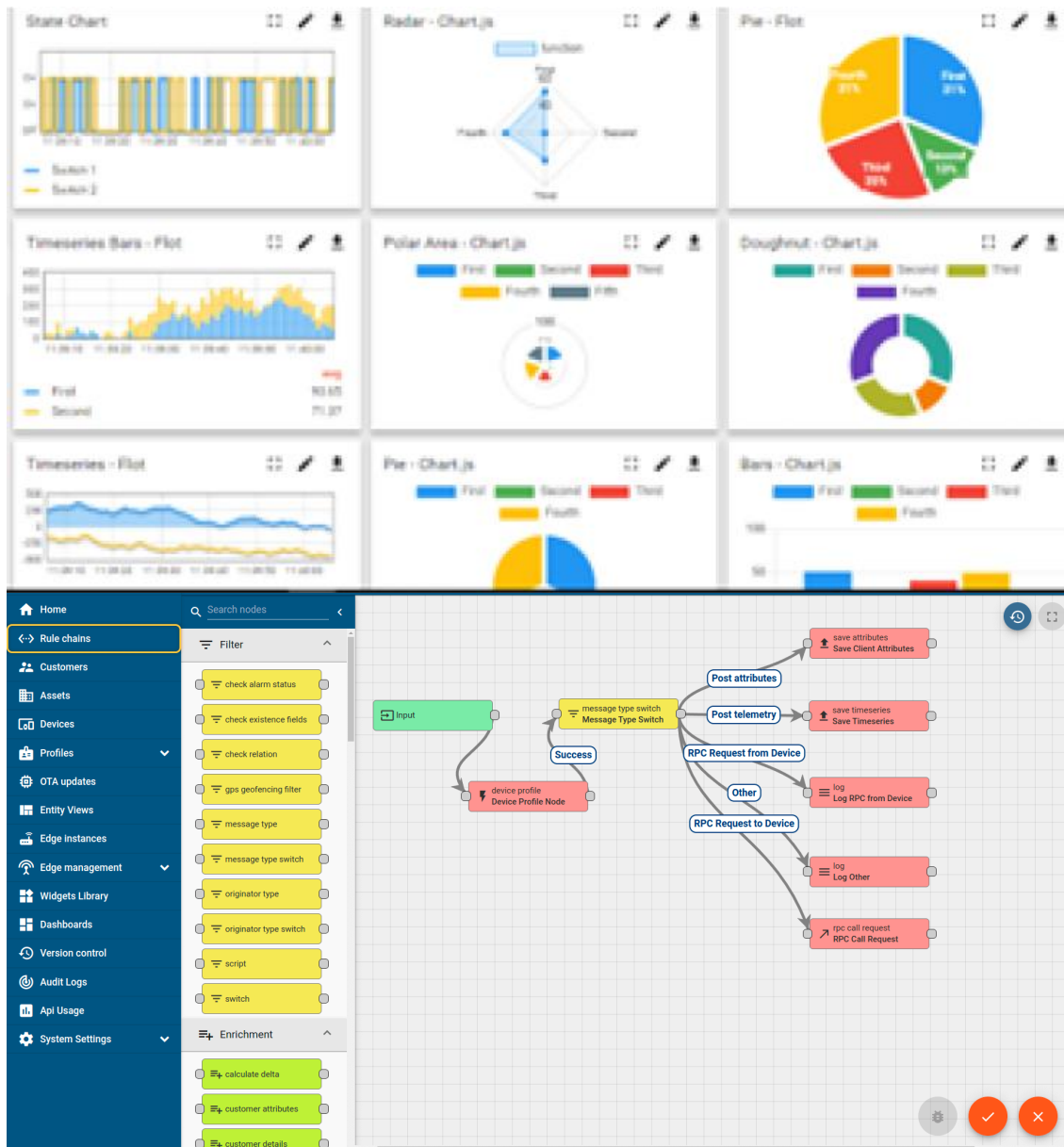
i. UCT IoT Platform()

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



FACTORY **WATCH**

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 unleashed 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
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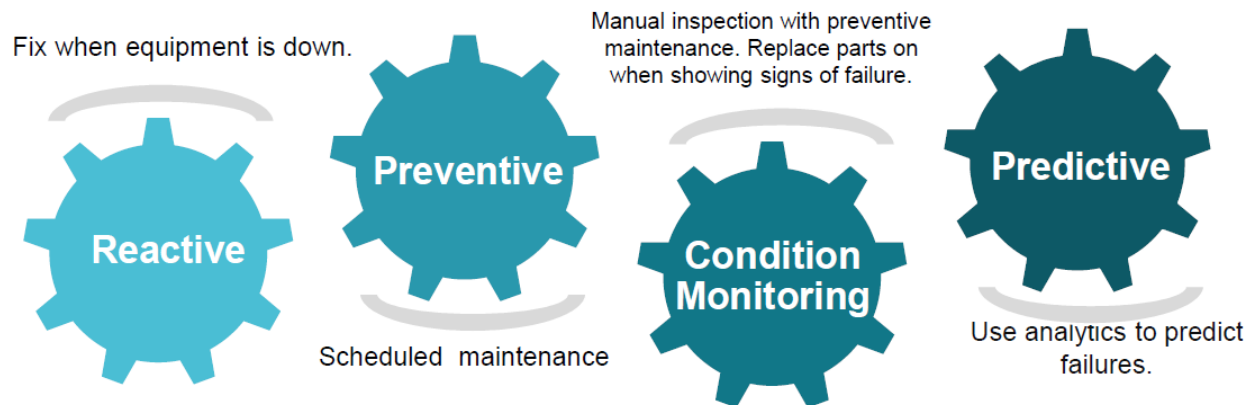


iii. based Solution

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

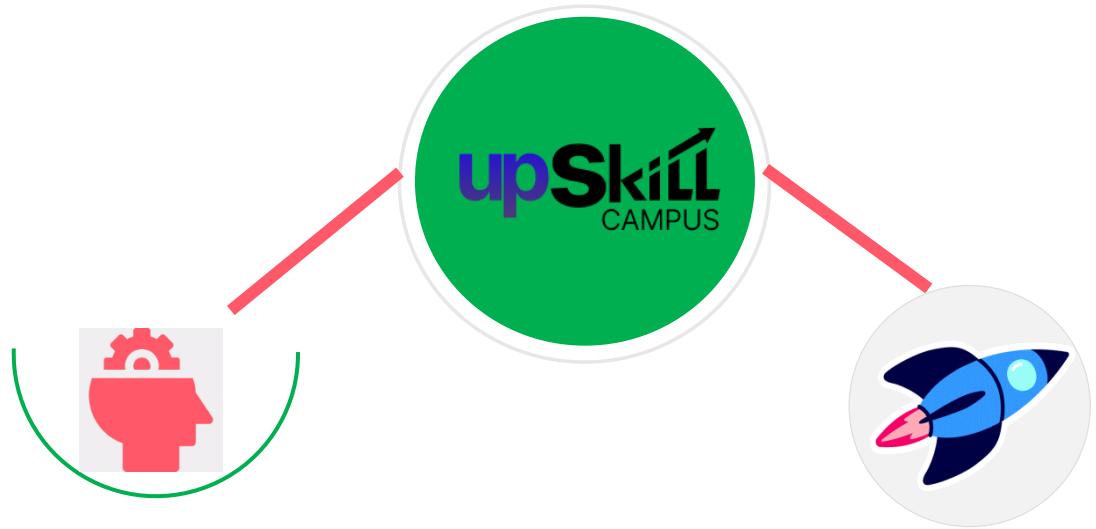
UCT isproviding Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



2.1 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.

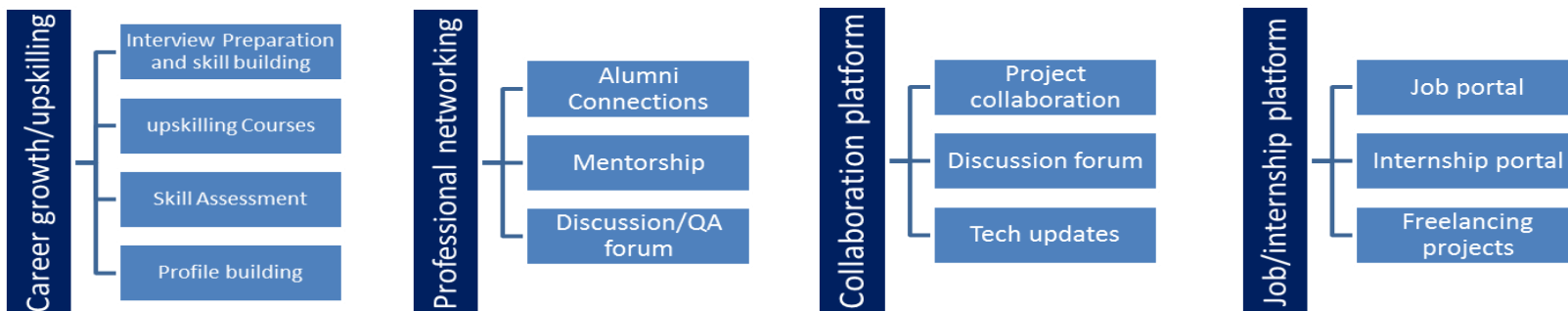
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



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/>



2.2 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.

2.3 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.

Reference

- [1] Binstock, Andrew(May 20,2015)."Java's 20 Years of Innovation". Forbes, Archived from the originally on March 14,2016. Retrieved March 18, 2016
- [2] Herbert Scheldt, Java Complete Reference, Fifth Edition, Tata McGraw Hill Edition
- [3] "The Java Language Specification, 2nd Edition "Archived from original on August 5, 2011.
Retrieved February 8,2009

2.4 Glossary

ACE	The Patient Protection and Affordable Care Act
ACC	Accountable Care Collaborative
ACI	Advancing Care Information
ACO	Accountable Care Organization
AI	Artificial Intelligence
AIU	Adopt, Implement, Upgrade (certified EHR technology)
ANPRM	Advance Notice of Proposed Rulemaking
ANSI	American National Standards Institute
API	Application Programming Interface
APM	Alternative Payment Model
ARRA	American Recovery and Reinvestment Act of 2009
ASC	Ambulatory Surgical Center
ASP	Application Service Provider
ATCB	Authorized Testing and Certification Body
ATL	Accredited Testing Laboratory
ATNA	Audit Trail and Node Authentication
BAA	Business Associate Agreement
BHIE	Bidirectional Health Information Exchange
BPCI	Bundled Payments for Care Improvement
BYOD	Bring Your Own Device
BYOP	Bring Your Own Phone
BYOPC	Bring Your Own PC
BYOT	Bring Your Own Technology
CAH	Critical Access Hospital
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CBO	Community-Based Organization
CBSA	Non-Core Based Statistical Area
CCD	Continuity of Care Document (CCR + CDA became CCD)
C-CDA	Consolidated Clinical Document Architecture
CCN	CMS Certification Number
CCR	Continuity of Care Record
CDA	Clinical Document Architecture
CDO	care delivery organization
CDR	Clinical Data Repository
CDS	clinical decision support
CDSS	clinical decision support system
CEHRT	Certified Electronic Health Record Technology
CER	Comparative Effectiveness Research
CFR	Code of Federal Regulations
CHC	Community Health Centers
CHIPRA	Children's Health Insurance Program Reauthorization Act
CHIP	Children's Health Insurance Program
CHPL	Certified Health IT Product List
CHR	Community Health Records

CJR	Comprehensive Care for Joint Replacement
CLIA	Clinical Laboratory Improvement Amendments
CPOE	Computerized physician order entry
CPRS	Computerized Patient Record System
CPS	Composite Performance Score
CPT	Current Procedural Terminology
CQM	Clinical Quality Measure
CTE	Conditions for Trusted Exchange
CY/FY	Calendar Year / Fiscal Year (Federal)

3 Problem Statement

In the assigned problem statement

First problem is it is some complex to manage the patient data, medical records, and analyzing imaging that can help healthcare organizations to store, access, and share critical information securely and efficiently.

4 Existing and Proposed solution

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

In the provided code of others Health Care Data Management system I found that there limitations like notprepared for AI and ML based model and some time they give server problem

What is your proposed solution?

These prepared solution is much better when it work with AI and ML and it is compatible and well prepared formany sever issue and low cost solution and easy handling solution

What value addition are you planning?

I am seeing about adding AI technique in this model and adding some smart feature like connecting with ABHA card directly giving facility and billing info while entering in web

4.1 Code submission ()

https://github.com/Lucky032/upskillcampus/tree/main/HealthCare_Management-System-codes-python

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

<https://github.com/Lucky032/upskillcampus>

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 outcome.

5.1 High Level Diagram (if applicable)

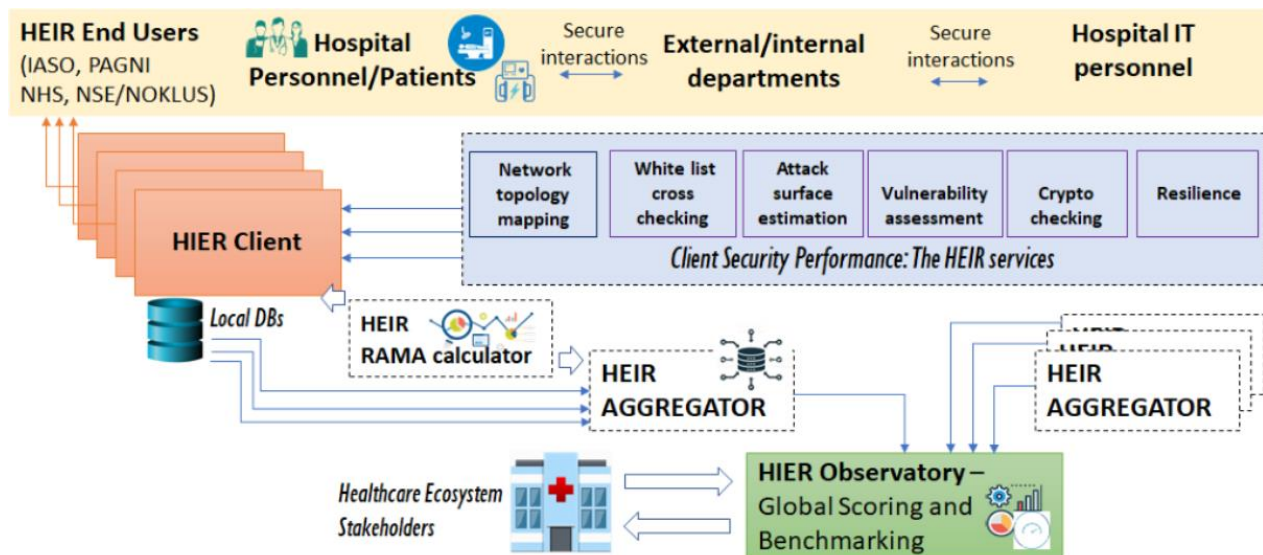
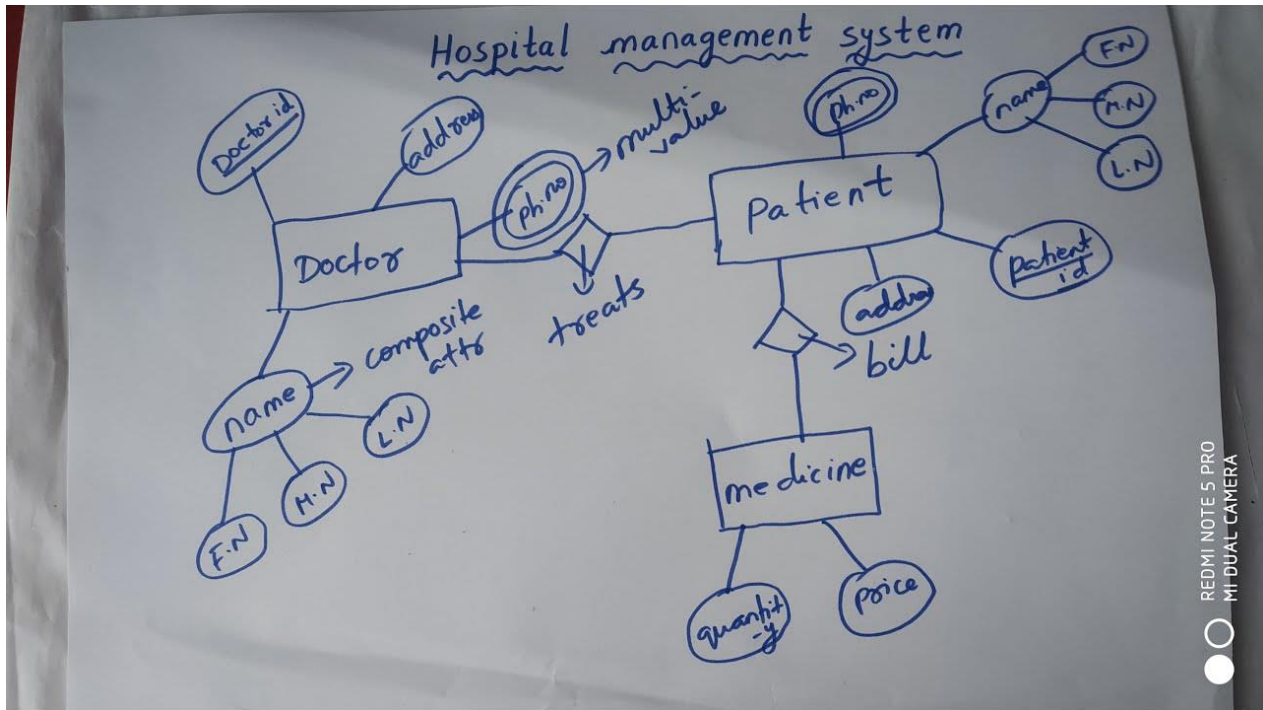


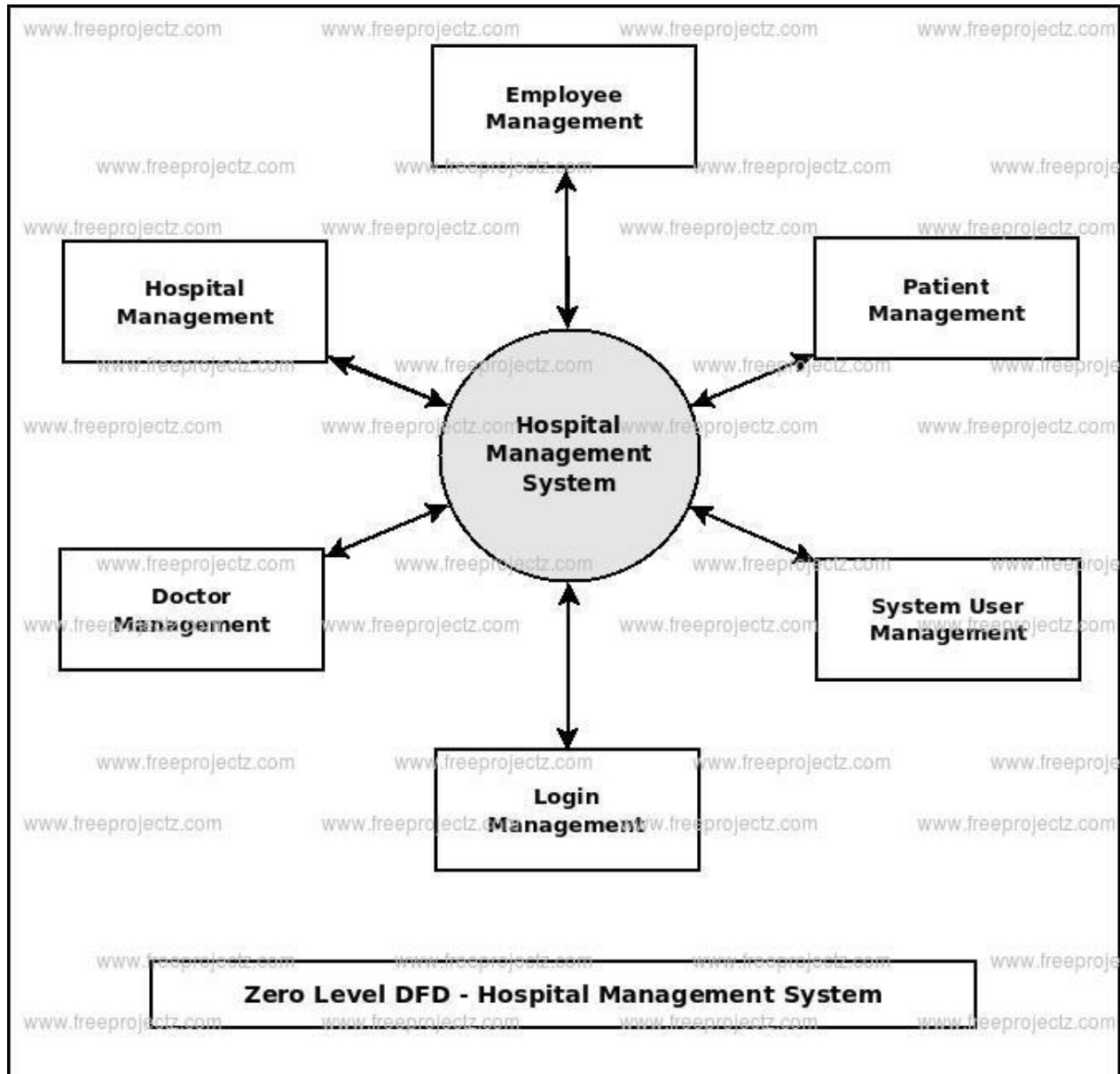
Figure 1: HIGH LEVEL DIAGRAM OF THE SYSTEM

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

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 featural

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.

6.1.1 SQL Revision and Cloud Computing Exploration:

- Days 01-06: Engaged in SQL revision covering database fundamentals, advanced commands, and cloud computing concepts.
- Utilized Learning Resources: Leveraged USC_TIA documentation, attended webinars, and participated in cloud computing challenges to deepen understanding.
- Project Research and Decision-Making: Conducted thorough research on project requirements, including hardware, software, and cloud platforms. Opted for AWS after evaluating different options.
- Hands-on Practice: Created AWS Cloud Platform Account, installed necessary libraries, and explored cloud platform basics.

6.1.2 Integration of IoT Platforms:

- Learning about IoT Platforms: Explored ThingSpeak and AWS IoT Core platforms for IoT data collection, analysis, and visualization.
- Key Features: Learned about ThingSpeak's data collection and analysis capabilities and AWS IoT Core's managed cloud platform for secure device connectivity.
- Integration with IBM Bluemix: Investigated data upload capabilities to IBM Bluemix for storage, processing, and analysis in the cloud platform.

6.1.3 Learning Resources Utilized:

- USC_TIA Documentation: Utilized official documentation for reference and troubleshooting, supplemented by webinars and online tutorials.

- Cloud Computing Resources: Engaged with AWS Fundamentals and completed a short-term course on MSSQL DBMS to strengthen cloud computing skills.
- IoT Platform Exploration: Learned about ThingSpeak and AWS IoT Core features and functionality to enable IoT integration.

6.1.4 Conclusion:

This project demonstrates a proactive approach to learning and project implementation, combining SQL revision, cloud computing exploration, and IoT integration. By leveraging a diverse range of resources and platforms, the participant has acquired valuable knowledge and skills, laying a solid foundation for future projects and career development in relevant domains.

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8 Future work scope

Certainly! Here are some additional ideas that could not be implemented due to time limitations but could be considered for future exploration:

1. **Advanced SQL Topics:** Delve deeper into advanced SQL topics such as stored procedures, triggers, and views for more comprehensive database management skills.
2. **Cloud Services Comparison:** Conduct a detailed comparison between different cloud service providers (e.g., AWS, Azure, Google Cloud) to understand their strengths, weaknesses, and suitability for various project requirements.
3. **IoT Platform Integration:** Explore additional IoT platforms beyond ThingSpeak and AWS IoT Core, such as Google Cloud IoT or Microsoft Azure IoT Hub, to broaden understanding and skillset in IoT integration.
4. **Machine Learning Integration:** Investigate the integration of machine learning models with IoT data for predictive analytics and anomaly detection, enhancing the project's data analysis capabilities.
5. **Advanced AWS Services:** Dive deeper into advanced AWS services such as AWS Lambda, AWS S3, or AWS DynamoDB to expand knowledge and skillset in cloud computing.
6. **DevOps Practices:** Learn and implement DevOps practices for automated deployment, monitoring, and management of cloud-based applications, enhancing project scalability and reliability.
7. **Data Visualization Techniques:** Explore advanced data visualization techniques and tools beyond MATLAB for more insightful analysis and presentation of IoT data.
8. **Security and Compliance:** Gain a deeper understanding of cloud security best practices and compliance requirements, ensuring robust security measures are in place for the project's cloud infrastructure.
9. **Continuous Learning:** Continue to engage with online courses, webinars, and forums to stay updated with the latest developments in SQL, cloud computing, and IoT technologies, fostering continuous learning and skill enhancement.

By considering these ideas for future exploration, you can further enrich your learning journey and broaden your expertise in relevant domains.

