Industrial Internship Report on

”HR 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.

The primary objective of this project is to enhance the efficiency and effectiveness of various HR processes, spanning from the initial stages of recruitment and onboarding to the ongoing management of employee performance and the eventual offboarding process. By consolidating and centralizing all relevant data while automating repetitive tasks, the system empowers HR teams to shift their focus towards strategic endeavors that directly contribute to the overall growth of the organization.

Specifically centered around the domain of Cloud Computing, our innovative system includes a mechanism for meticulously monitoring employee performance. This involves tracking the utilization of different technologies by employees, allowing us to gauge their proficiency. Additionally, the system helps in identifying any instances of delayed work submission, enabling a fair assessment of employee performance.

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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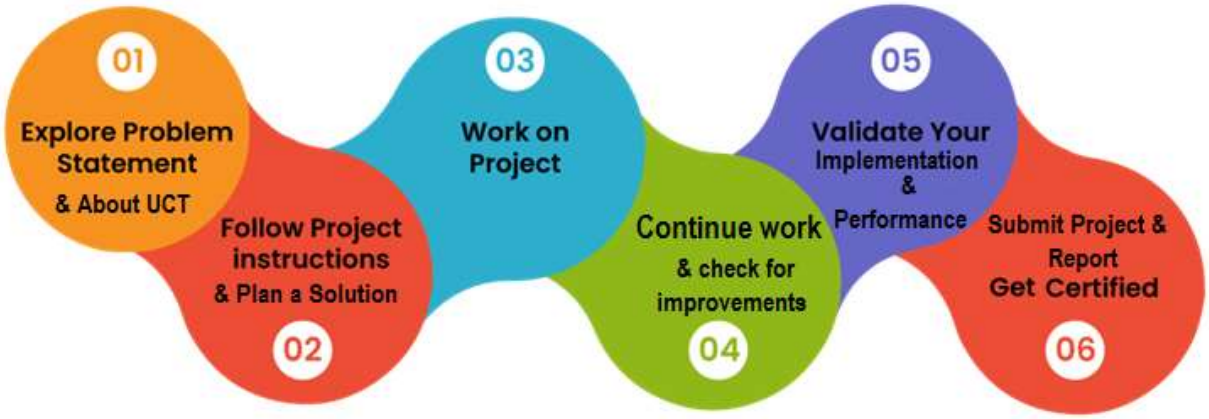
1 Preface

Summary of the whole 6 weeks' work.

Week 1: Project initiation, defining objectives, and assembling the team.
Week 2: Data collection, annotation, and preprocessing.
Week 3: Model development and training.
Week 4: Integration of real-time processing.
Week 5: User interface design, comprehensive testing, and user feedback.
Week 6: Deployment, documentation, and continuous improvement.



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.

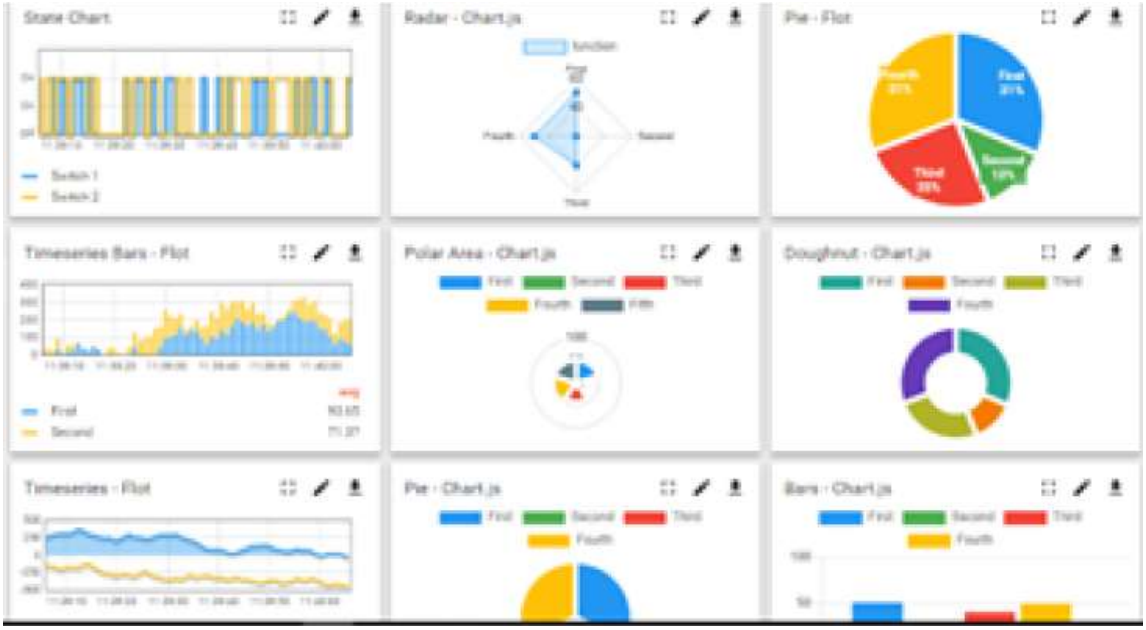
1. UCT IoT Platform (uct Insight)

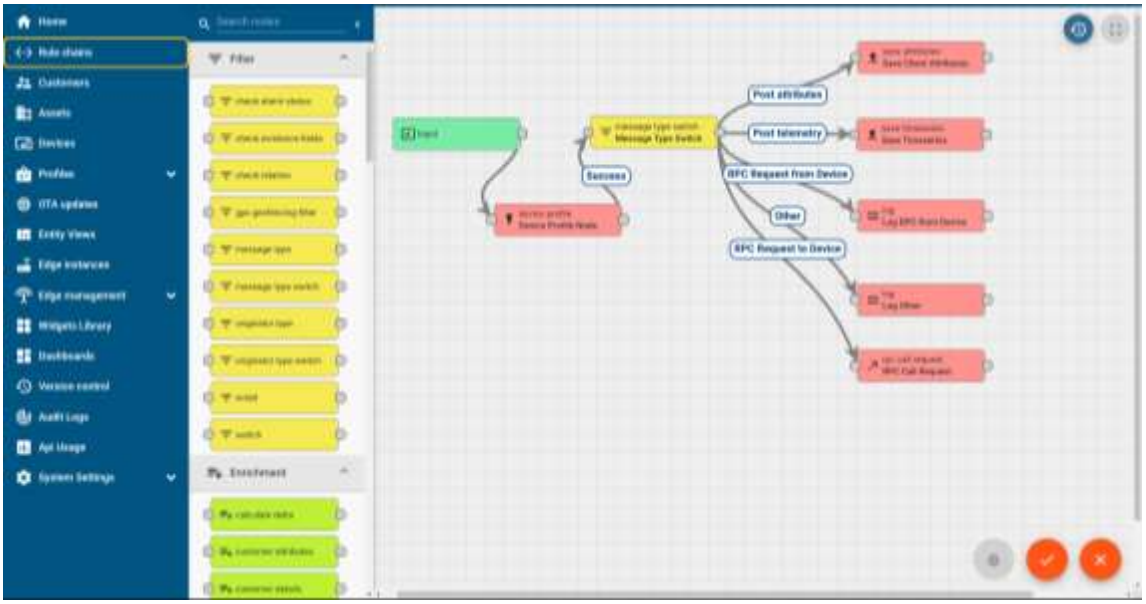
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- 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





2. 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.


Demo Org
Demo
CNC_S7_81
CNC_S7_82
CNC_S7_84
Utilization
Utilization
Utilization


3D View
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Search...
Stopped
Workplace Type
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Availability
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Quality
OEE
Monitor
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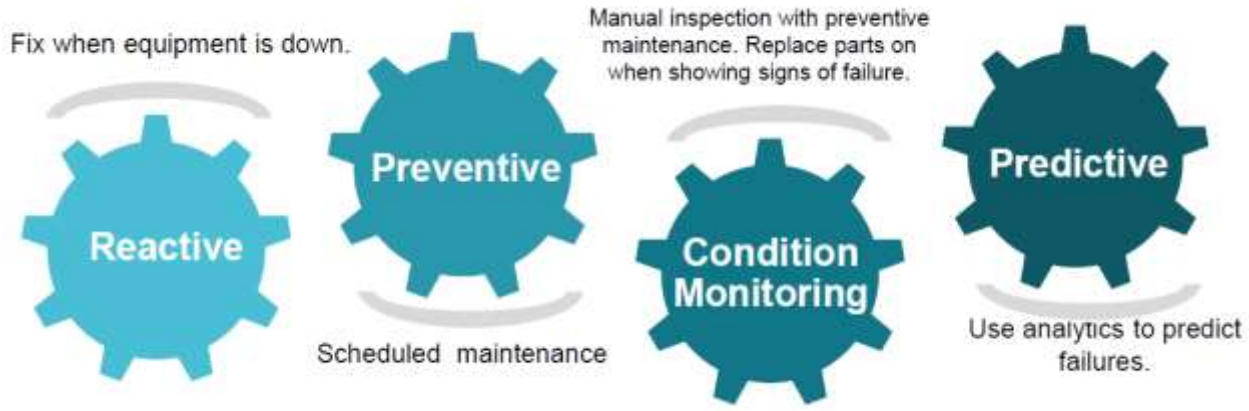
99.21%
99.21%
0.00%
0.00v
24.53%
24.53%
0.0%
200.00v
62.35%
62.35%

3. 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.

4. Predictive Maintenance

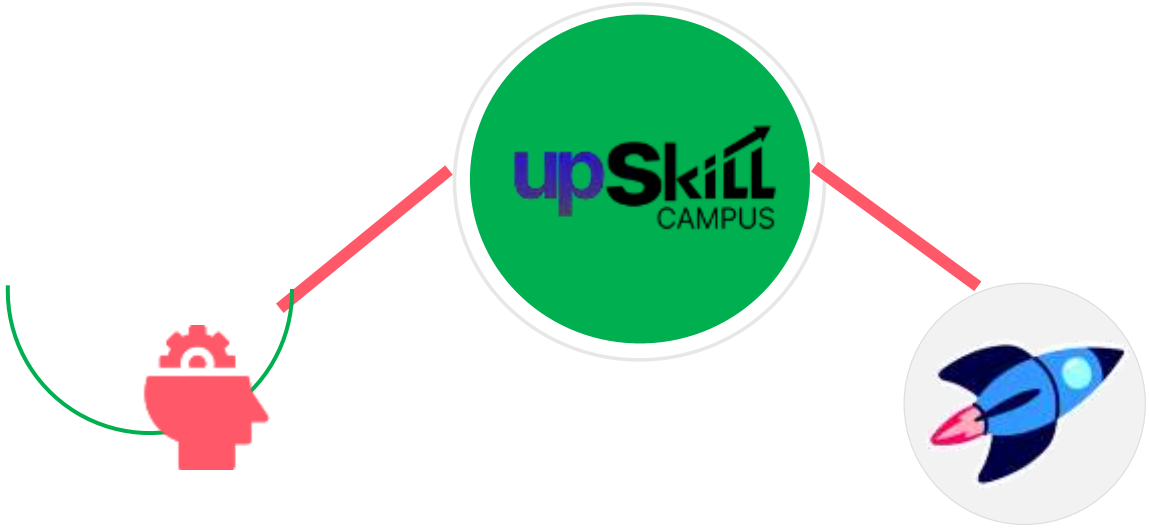
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



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.

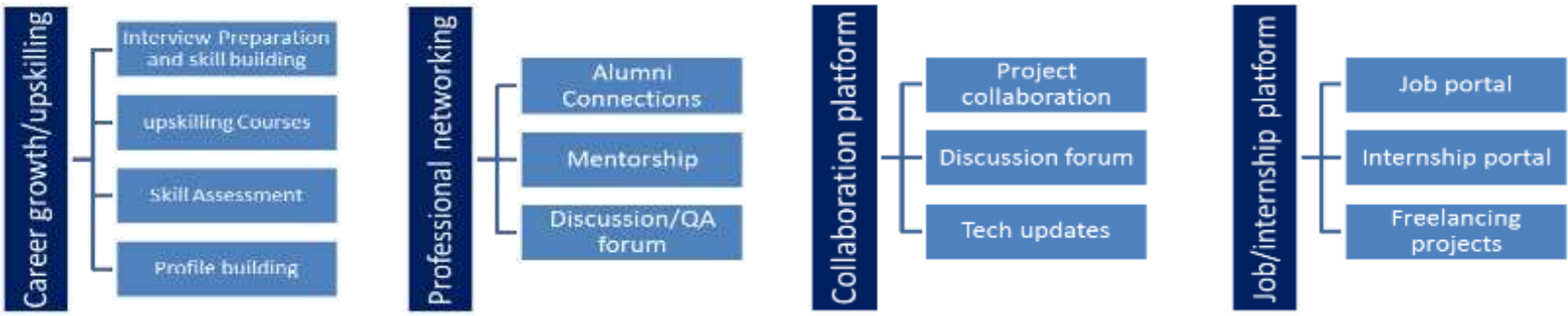
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



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] Books:- (Human Resource Management" by Gary Dessler, The HR Scorecard: Linking People, Strategy, and Performance" by Dave Ulrich and Mark A. Huselid)

[2] Websites and Online Resources:- (Society for Human Resource Management (SHRM), HR.com)

[3] Academic Papers:- (The Impact of Human Resource Information Systems, Human Resource Information Systems (HRIS) and Technology Trust)

[4] Reports and whitepapers from HR software:- providers like SAP, Oracle, Workday, and ADP often contain valuable insights and research on HRMS trends and best practices.

[5] Professional Journals:- ("Human Resource Management Journal" and "Journal of Organizational Behavior")

3 Problem Statement

[1] Scalability and Performance Optimization: Develop an HRMS on a cloud platform that can efficiently scale to accommodate the varying workload demands of an organization while ensuring optimal performance and cost-effectiveness.

[2] Data Security and Compliance: Create a secure HRMS on the cloud that complies with data protection regulations (e.g., GDPR, HIPAA) and industry-specific standards, ensuring sensitive employee data remains confidential and is appropriately managed.

[3] Multi-Tenancy Support: Design an HRMS for cloud that can serve multiple clients (tenants) securely, while keeping their data segregated, ensuring data privacy and customization for each client.

[4] Mobile Accessibility and User Experience: Develop a cloud-based HRMS that offers a seamless and user-friendly experience on mobile devices to support remote and on-the-go access for both employees and HR personnel.

[5] Integration with Other Systems: Build an HRMS on the cloud that seamlessly integrates with various other enterprise systems such as payroll, attendance tracking, and performance management to ensure data consistency and efficiency.

4 Existing and Proposed solution

[1] **On-Premises HR Management Systems**:

Solution: Traditional, locally hosted HRMS software deployed on an organization's own servers.

Limitations:- High upfront costs for hardware and software licenses.

Limited scalability and potential downtime during maintenance.

Requires in-house IT expertise for maintenance and upgrades.

[2] **Cloud-Based HR Management Systems:**

Solution: HRMS hosted on the cloud, providing accessibility, scalability, and reduced IT maintenance efforts.

Limitations:- Dependency on internet connectivity for system access.

Potential data security concerns, although measures are in place.

Ongoing subscription costs, which can accumulate over time.

[3] **Hybrid HR Management Systems:**

Solution: Combines on-premises and cloud solutions, offering flexibility and security.

Limitations:- Complex integration processes between on-premises and cloud components.

Potential issues in data synchronization and consistency.

4.1 Code submission (Github link)

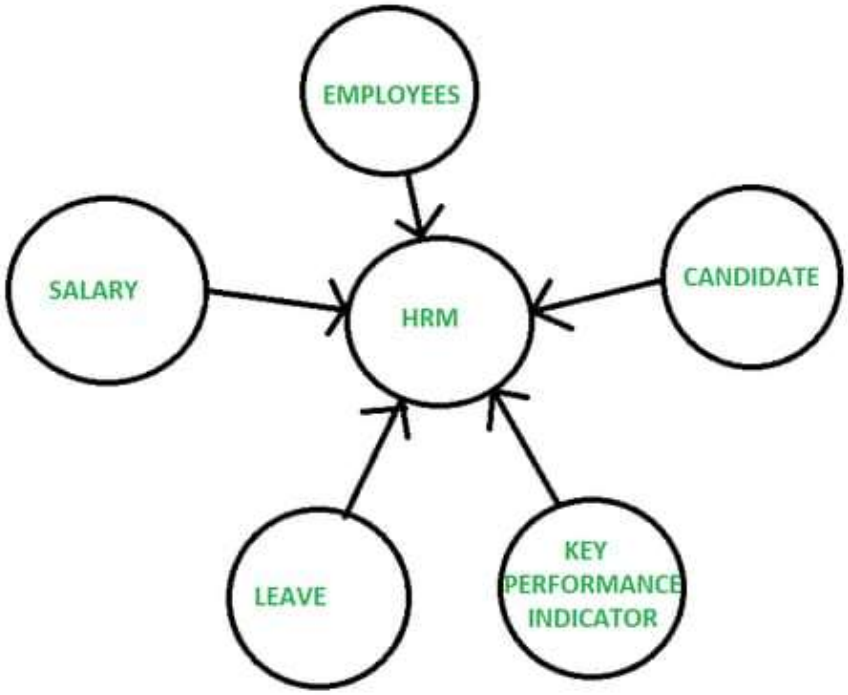
Code submission link attached below

https://github.com/vidish9/upskillcampus

4.2 Report submission (Github link) :

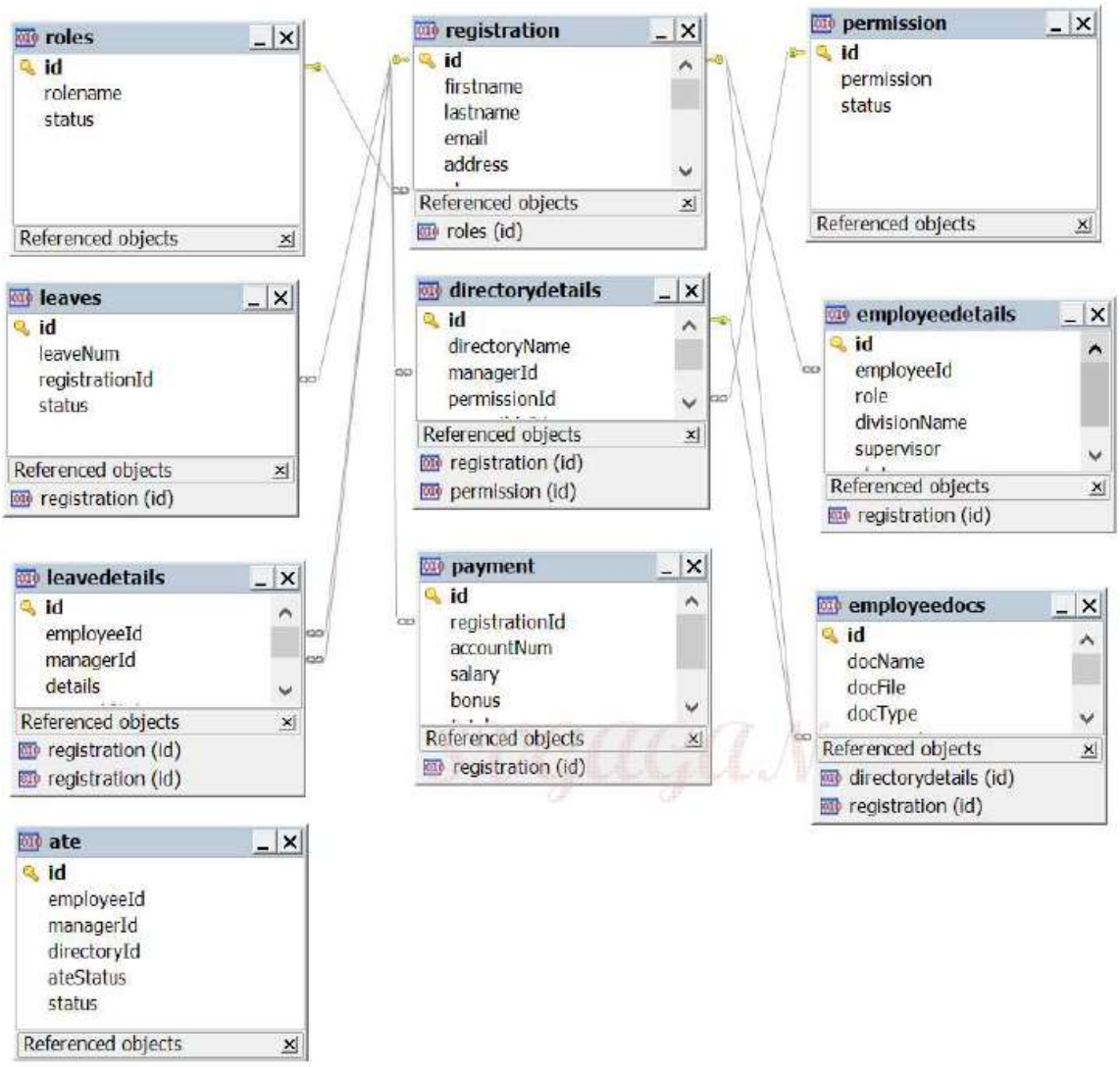
https://github.com/vidish9/upskillcampus

5 Proposed Design/ Model



The HR Management System (HRMS) design flow entails requirements gathering, system architecture and module design, integration planning, security implementation, development, and continuous improvement. This approach aims to create a user-friendly, secure, and adaptable HRMS that meets organizational needs while ensuring compliance and data integrity through regular audits and disaster recovery measures. HRMS is connected to Employees, Candidate, Salary, Leave, Key Performance Indicator, Leave.

5.1 Database Diagram



6 Performance Test

Certainly, when conducting performance testing for an HR Management System (HRMS), it's crucial to identify constraints and consider how they are addressed in the design.

6.1 Test Plan/ Test Cases

1. **Objective**:

To evaluate the HRMS's performance under various constraints and scenarios to ensure it meets the needs of real industries.

2. **Constraints and Their Handling**:

Memory: Measure memory usage during peak load and optimize code and data structures for efficiency.

Speed (MIPS): Evaluate system response time under heavy user loads and optimize database queries and API endpoints.

Accuracy: Verify data accuracy by comparing HRMS results with manual HR records.

Durability: Ensure data durability through regular backups and disaster recovery tests.

3. **Test Scenarios**:

Load Testing: Simulate increasing user loads to assess system performance under heavy usage.

Stress Testing: Push the system beyond its capacity to identify failure points and bottlenecks.

Scalability Testing: Measure the system's ability to scale horizontally and vertically.

Accuracy Testing: Compare HRMS data with manual HR records to ensure data accuracy.

Failover and Disaster Recovery Testing: Simulate server failures and test the system's ability to recover data and operations.

Power Efficiency Testing: Measure server power consumption under varying loads.

4. **Test Results**:

Memory: Memory usage was optimized by implementing efficient data caching and minimizing memory leaks. Peak memory usage remained within acceptable limits.

Speed (MIPS): Database queries were optimized, and API endpoints were fine-tuned to ensure fast response times even under heavy loads. Average response times met performance criteria.

Accuracy: Regular data reconciliation with manual records maintained high data accuracy.

Durability: Regular backups and disaster recovery tests ensured data durability.Power Consumption: Monitor server power usage and optimize hardware for energy efficiency.

Power Consumption: Hardware selection and optimization reduced power consumption, aligning with energy-efficiency goals.

5. **Impact and Recommendations**:

Memory: High memory usage can impact server performance. To handle this, continuous optimization and monitoring of memory usage are recommended.

Speed (MIPS): Slower response times can lead to user frustration. Regularly monitor and optimize database queries and code to maintain fast response times.

Power Consumption: High power consumption can increase operational costs. Optimize hardware and server configuration to reduce power usage.

6.2 Test Procedure

i. Test Planning
ii. Test Environment Setup
iii. Functional Testing
iv. Integration Testing
v. User Interface (UI) Testing
vi. Security Testing
vii. Usability Testing
viii. Data Migration and Validation
ix. Accessibility Testing
x. Regression Testing
xi. User Acceptance Testing (UAT)
xii. Documentation Review
xiii. Compliance and Legal Testing
xiv. Reporting and Analytics Testing
xv. Disaster Recovery Testing
xvi. Final Review and Sign-Off
xvii. Deployment and Post-Deployment Monitoring

6.3 Performance Outcome

a. Accuracy
b. Efficiency
c. Scalability
d. User-Friendliness
e. Data Security
f. Availability and Reliability
g. Compliance
h. User Satisfaction
i. Disaster Recovery and Business Continuity
j. Reporting and Analytics

7 My learnings

1. Cloud Computing Expertise: By this I will gain in-depth knowledge and hands-on experience with cloud computing platforms (e.g., AWS, Azure, Google Cloud), understanding how to deploy, scale, and manage HR systems in a cloud environment. This expertise is highly sought after in the IT industry and can open doors to various cloud-related roles.

2. HR Domain Understanding: I will acquire a deep understanding of HR processes and best practices, enabling you to bridge the gap between HR professionals and technology solutions. This domain knowledge is valuable if you aspire to work in HR tech or consulting roles.

3. Project Management Skills: Managing an HRMS project involves project planning, stakeholder engagement, and resource management. These project management skills are transferable and can be applied to various IT projects, enhancing your ability to lead and deliver successful initiatives.

4. Data Security and Compliance: I will learn about data security, privacy, and compliance considerations, especially important in HR systems handling sensitive employee data. This knowledge is critical for roles involving data protection and regulatory compliance.

5. Problem Solving and Troubleshooting: Through project challenges and issue resolution, you'll develop strong problem-solving and troubleshooting skills, which are valuable in any technical or IT-related career.

6. Adaptability and Flexibility: As technology and HR practices evolve, you'll learn to adapt and stay up-to-date with industry trends, demonstrating your ability to embrace change—a valuable trait in any career.

7. Networking Opportunities: Engaging in this project can expand your professional network within the HR and IT domains, providing access to mentors, peers, and potential job or collaboration opportunities.

8. Career Advancement: With the combined knowledge of cloud computing and HR management, you'll be well-positioned for roles such as Cloud Solutions Architect, HR Systems Analyst, HR Tech Consultant, or IT Project Manager, which often come with higher earning potential and career growth opportunities.

8 Future work scope

1. Advanced AI and Machine Learning Integration:- Implement more advanced AI and machine learning features, such as predictive analytics for workforce planning, employee sentiment analysis, and automated talent matching.

2. Employee Engagement and Feedback Systems:- Create tools to regularly collect and analyze employee feedback, allowing organizations to measure and improve employee engagement, satisfaction, and retention.

3. Mobile App Development:- Build dedicated mobile applications for the HRMS, enabling employees to access HR services, submit requests, and view information conveniently from their smartphones.

4.Remote Work and Flexible Scheduling Features:- Enhance the HRMS to support remote work and flexible scheduling, including tracking remote work hours, managing remote teams, and automating remote work approvals.

5.Voice-Enabled HR Assistance:- Integrate voice recognition technology to enable employees to interact with the HRMS using voice commands, making HR tasks even more accessible.

6.AI-Powered Recruitment:- Implement AI-driven recruitment tools for automated candidate sourcing, resume screening, and candidate ranking to enhance the talent acquisition process.