

HUMAN RESOURCE PORTAL

Powered By
Tardigrade Soft

*A Project Report Presented to CMPE272, Fall 2023.
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ABSTRACT

HUMAN RESOURCE PORTAL

In the modern era where digital transformation reigns supreme, businesses are in dire need of optimizing their operations, ensuring data integrity, and delivering unparalleled user experiences. Recognizing this pressing need, Team Tardigrade Soft has embarked on a journey to craft a cutting-edge Enterprise HR Portal. This solution, designed as a course project, will seamlessly integrate contemporary HR needs with the assurance of data security and a user-friendly interface.

At the heart of this project lies the vision of a robust HR Portal, equipped with an intuitive interface and fortified by Single Sign-on (SSO) capabilities. Such an architecture underscores encrypted, secure communication, leveraging SSL/TLS protocols. Serving as the hub for all HR interactions, the portal will empower both employees and HR administrators to manage and view enterprise employee data. Role-based access, powered by SSO, will ensure restricted and appropriate access levels, emphasizing our unwavering commitment to data privacy.

While the portal is conceptualized to be comprehensive, its integration with third-party platforms, such as Github, will offer an avenue for streamlined code management, ensuring all developmental changes are meticulously tracked.

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Chapter-1

INTRODUCTION

In the rapidly evolving landscape of organizational management, the integration of technology into human resources (HR) functions has become a pivotal aspect of enhancing efficiency and effectiveness. The "HR Portal Application," as presented by Team Late, comprising Joash Muganda, Alexis Ambriz, and Suresh Ravuri, is a testament to this technological integration. This report delves into the intricacies of the HR Portal, a comprehensive web-based platform designed to streamline various HR operations within an organization.

The HR Portal emerges as a central hub, bridging the gap between employees, managers, and HR professionals. It stands out as a versatile tool, facilitating easy access to information, simplifying request submissions, and efficiently managing numerous HR processes. The essence of this portal lies in its ability to integrate several critical HR functions into a single, user-friendly interface, thereby promoting operational efficiency and employee engagement.

This report will provide an in-depth analysis of the key features of the HR Portal Application, including but not limited to Employee Self-Service (ESS), Recruitment and Onboarding, Training and Development, Performance Reviews, and Benefits Administration. Each of these features is crafted to address specific needs within the HR spectrum, ranging from personal employee management to more complex HR tasks like recruitment and performance appraisal.

In essence, the HR Portal Application stands as a revolutionary step in the realm of human resource management, embodying the synergy between technology and HR functionalities. This report aims to unravel the potential of the HR Portal in revolutionizing the way organizations manage their most valuable asset – their employees.

1.1 Project Goals:

We proposed and accomplished our goals of creating an HR App using Single Sign On (SSO) authentication, AWS S3 database, and an analytics visualization dashboard. Further, we implemented a CI/CD pipeline with Jenkins and Github.

1.2 Problem and Motivation:

Problem

The traditional human resource management systems are often plagued by inefficiencies due to fragmented processes, leading to inaccuracies in information management, cumbersome recruitment and onboarding, inadequate employee development, and complex benefits administration. These challenges hinder operational efficiency, employee engagement, and overall organizational effectiveness.

Motivation:

The HR Portal Application is motivated by the need to centralize HR functions into a unified platform, enhancing efficiency and coordination. It aims to empower employees through self-service options, streamline recruitment and onboarding processes, foster employee development with accessible resources and clear performance evaluations, and simplify benefits administration, thereby improving employee satisfaction and organizational health.

1.3 Project Results and Expected Deliverables:

Project Results:

The HR Portal Application project has successfully developed an integrated, web-based HR management system that centralizes various HR functions. This innovative platform includes features like Employee Self-Service, streamlined Recruitment and Onboarding, comprehensive Training and Development modules, efficient Performance Reviews, and simplified Benefits Administration. The result is a multifaceted tool that significantly enhances HR operational efficiency and employee engagement within the organization.

Project Deliverables:

The key deliverables of this project include a fully functional prototype of the HR Portal Application, comprehensive documentation detailing its design and functionalities, and the source code for the system. Additionally, a detailed report outlining the development process,

user testing results, and recommendations for future enhancements has been prepared to guide the ongoing evolution of the portal.

1.4 Project Architecture:

Physical Data Model:

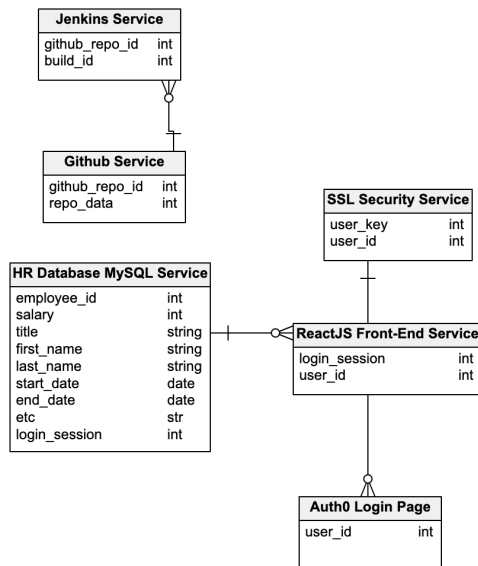


Fig 1

Logical Data Model:

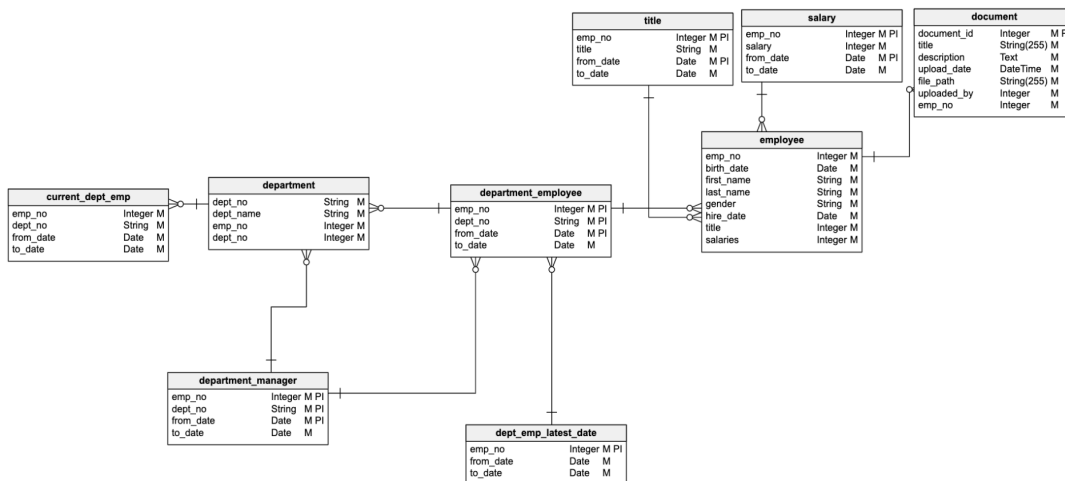


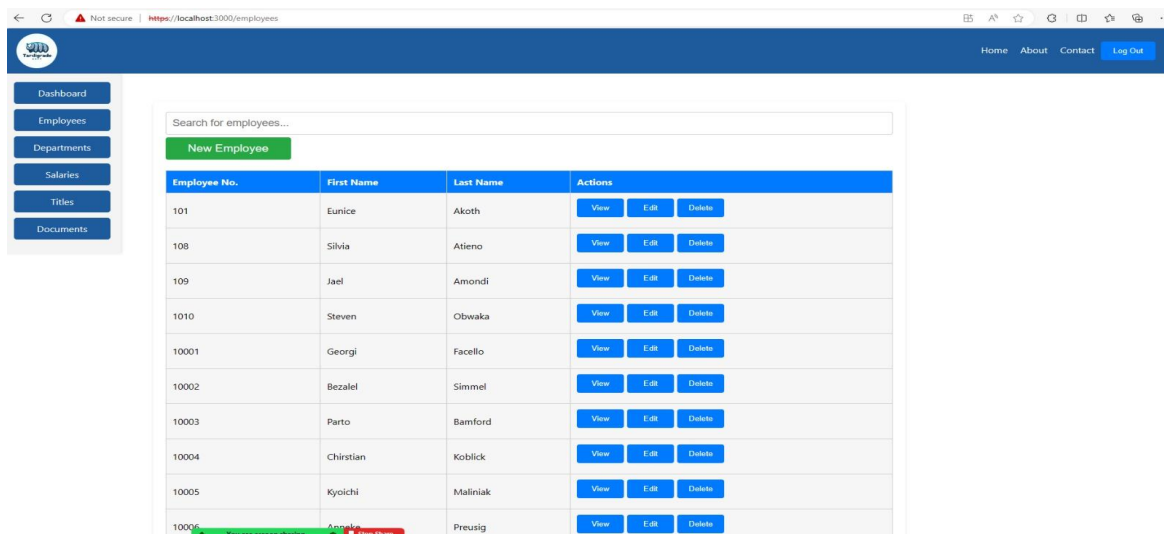
Fig 2

Chapter 2

HR PORTAL APPLICATION IMPLEMENTATION

Employees Page

The Add Employee Form (ID, DOB, first/last name, gender, and hire date). The department field is added later on the department's page using employee ID as the primary key to add to a new table.



The screenshot shows a web application interface for managing employees. On the left is a sidebar with navigation links: Dashboard, Employees, Departments, Salaries, Titles, and Documents. The main content area has a search bar labeled 'Search for employees...' and a green 'New Employee' button. Below this is a table listing employees with columns for Employee No., First Name, Last Name, and Actions. Each row has 'View', 'Edit', and 'Delete' buttons. A green toast message at the bottom left says 'You are not authorized to perform this action'.

Employee No.	First Name	Last Name	Actions
101	Eunice	Akoth	View Edit Delete
108	Silvia	Atieno	View Edit Delete
109	Jael	Amondi	View Edit Delete
1010	Steven	Obwaka	View Edit Delete
10001	Georgi	Facello	View Edit Delete
10002	Bezalel	Simmel	View Edit Delete
10003	Parto	Bamford	View Edit Delete
10004	Chirstian	Koblick	View Edit Delete
10005	Kyoichi	Maliniak	View Edit Delete
10006	Angela	Preusig	View Edit Delete

Fig 3

Data Analytics and Visualization Dashboard

The Visualization Dashboard (talk about Gender, Salary, and Company Department views) - a subset of the larger overall dataset.

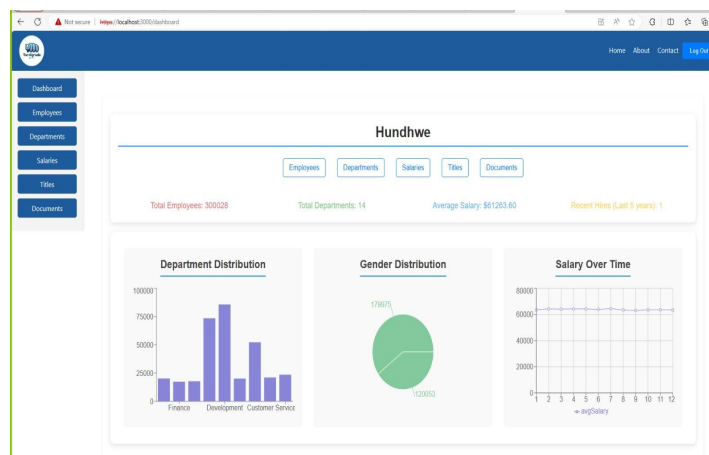
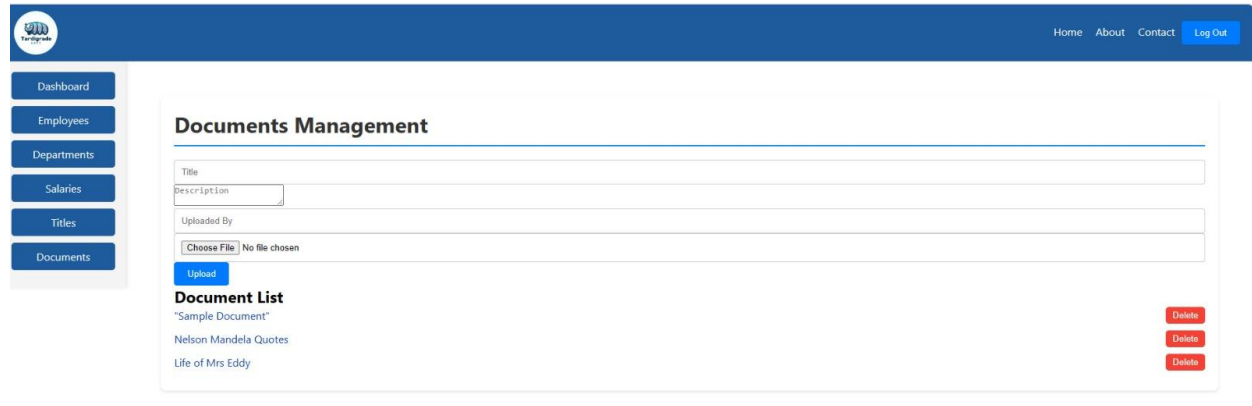


Fig 4

Documents Management Page

The documents that are uploaded are transmitted to S3. Required fields for submission include title, document description, and the name of the user uploading the file. The “upload file button” prompts the user to upload data directly from their local filesystem.

The files that are uploaded are accessible over the HR application and can be accessed on S3 for later use. We can configure the bucket policy later to make the database completely secure using end-to-end encryption - however our application is not end-to-end secured, but that could be implemented by extending the S3 configuration.



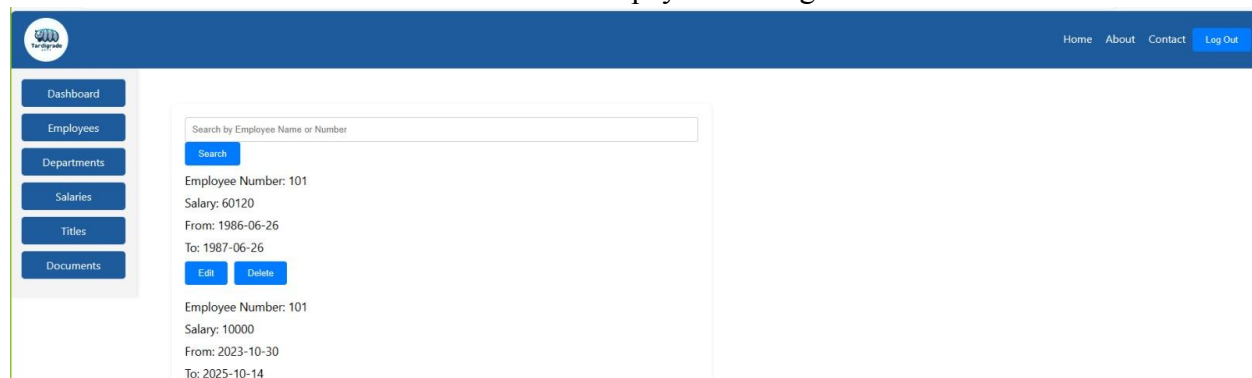
The screenshot shows the 'Documents Management' page. It features a sidebar with navigation links: Dashboard, Employees, Departments, Salaries, Titles, and Documents. The main content area has a header 'Documents Management' and a form for uploading documents. The form includes fields for 'Title', 'Description', and 'Uploaded By'. Below these is a file selection area with a 'Choose File' button and a 'No file chosen' status. An 'Upload' button is located below the file selection area. Below the form is a 'Document List' table with three entries: 'Sample Document', 'Nelson Mandela Quotes', and 'Life of Mrs Eddy'. Each entry has a 'Delete' button next to it.

Document List	Delete
"Sample Document"	Delete
Nelson Mandela Quotes	Delete
Life of Mrs Eddy	Delete

Fig 5

Salaries

The Employee Salary Management Page is a dynamic and secure platform designed for managing and accessing employee salary information. It allows users to search for employees using their unique employee numbers, displaying detailed salary data, including the salary amount, and the effective dates of the current salary. The page features robust options to edit or delete salary records, ensuring that the database is always current and accurate. Its user-friendly interface is tailored for HR professionals, payroll administrators, and managers, prioritizing ease of use and data security. This tool streamlines the process of salary management, making it an essential asset for efficient human resources and payroll management.



The screenshot shows the 'Salaries' page. It features a sidebar with navigation links: Dashboard, Employees, Departments, Salaries, Titles, and Documents. The main content area has a search bar with the placeholder text 'Search by Employee Name or Number' and a 'Search' button. Below the search bar, there are two salary records displayed. Each record shows the 'Employee Number', 'Salary', and the 'From' and 'To' dates. Below each record are 'Edit' and 'Delete' buttons.

Employee Number	Salary	From	To	Edit	Delete
101	60120	1986-06-26	1987-06-26	Edit	Delete
101	10000	2023-10-30	2025-10-14	Edit	Delete

Fig 6

Titles

Add, search, and view titles for employees. Many employees can be given the same title, and although it is recommended that a single employee only hold a single title in the dataset, the titles ui form allows for the application to submit another title entry for the same employee. It is recommended to end the current title end date for the employee when adding a new title, and making the start date for the new title for the employee to be the end date for the employee's previous title

List of Titles

Employee No.	Title	From Date	To Date	Actions	
10002	Staff	1996-08-03	9999-01-01	Edit	Delete
10003	Senior Engineer	1995-12-03	9999-01-01	Edit	Delete
10004	Engineer	1986-12-01	1995-12-01	Edit	Delete
10004	Senior Engineer	1995-12-01	9999-01-01	Edit	Delete
10005	Senior Staff	1996-09-12	9999-01-01	Edit	Delete
10005	Staff	1989-09-12	1996-09-12	Edit	Delete
10006	Senior Engineer	1990-08-05	9999-01-01	Edit	Delete
10007	Senior Staff	1996-02-11	9999-01-01	Edit	Delete
10007	Staff	1989-02-10	1996-02-11	Edit	Delete
10008	Assistant Engineer	1998-03-11	2000-07-31	Edit	Delete

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Fig 7

Departments

The Departments Page is an integral component of our organizational management system, designed to provide a comprehensive overview of the various departments within the company. It features a detailed list of departments, including Marketing, Finance, Human Resources, Production, Development, Quality Management, Sales, Research, and Customer Service. Upon selecting a specific department, the page instantly displays the total number of employees working in that department, along with their respective employee numbers. This feature not only enhances the visibility of departmental staffing but also facilitates efficient resource management and inter-departmental coordination. The page is user-friendly and a valuable tool for managers and HR personnel, aiding in workforce planning and organizational analysis.

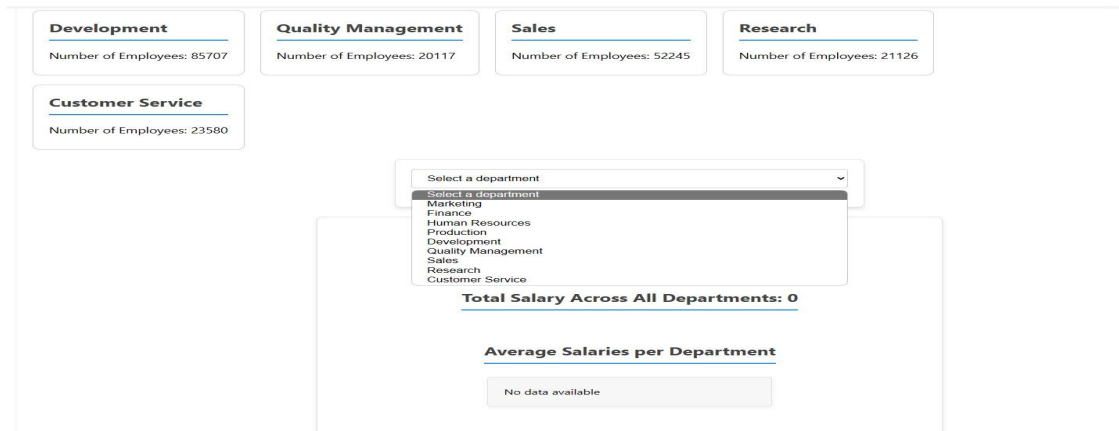


Fig 8

SSO (Single Sign-on) Page

The Single Sign-On (SSO) Login Page is a sophisticated and secure gateway designed to streamline user access across various platforms within our system. By implementing SSO, users can conveniently log in using their email address and password, allowing for a seamless and unified authentication process. Additionally, for enhanced user convenience, the page includes a "Login with Google" button, providing an alternative, quick, and secure login method linked to Google accounts. This dual-option approach not only fortifies security but also offers flexibility in login preferences, catering to diverse user needs. The integration of SSO significantly reduces password fatigue and simplifies the user experience, making it an essential feature for a modern and efficient digital environment.

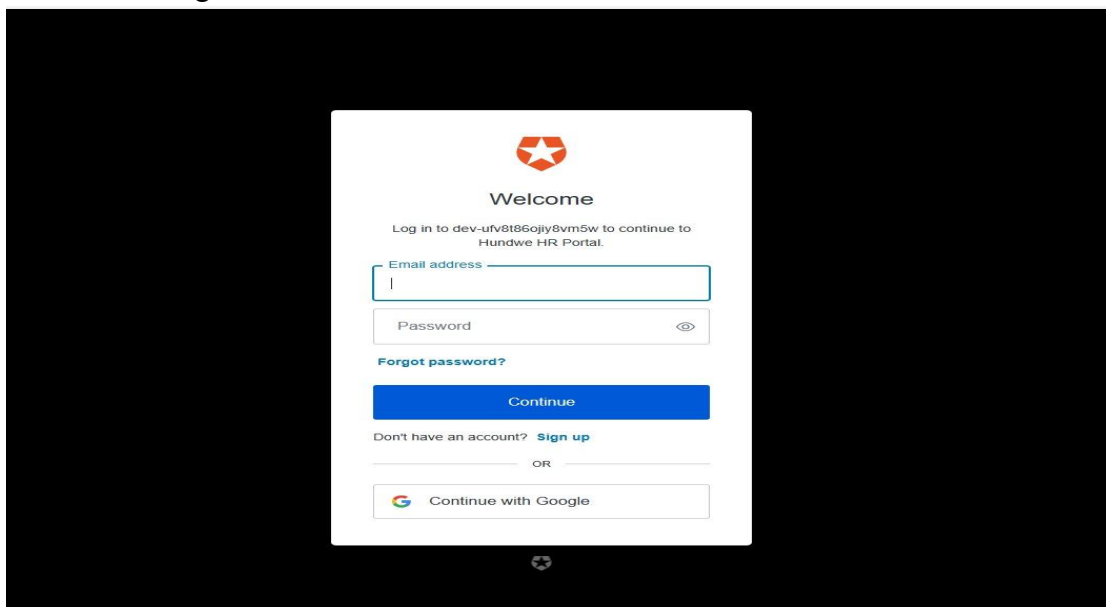


Fig 9

Homepage

The homepage of our platform is thoughtfully designed to serve as a central dashboard, providing instant access to a range of organizational insights and functionalities. Key features include a Dashboard button that offers data analytics and visualizations on aspects like department and gender distribution, salary trends, and recent hires. Users can easily navigate to detailed sections for employee profiles, departments, salaries, titles, and essential documents, all conveniently located on the left side of the homepage. This layout ensures efficient and streamlined access to crucial information, aiding in effective management and decision-making. Overall, the homepage is a user-friendly and comprehensive portal, essential for daily operational oversight and strategic planning.

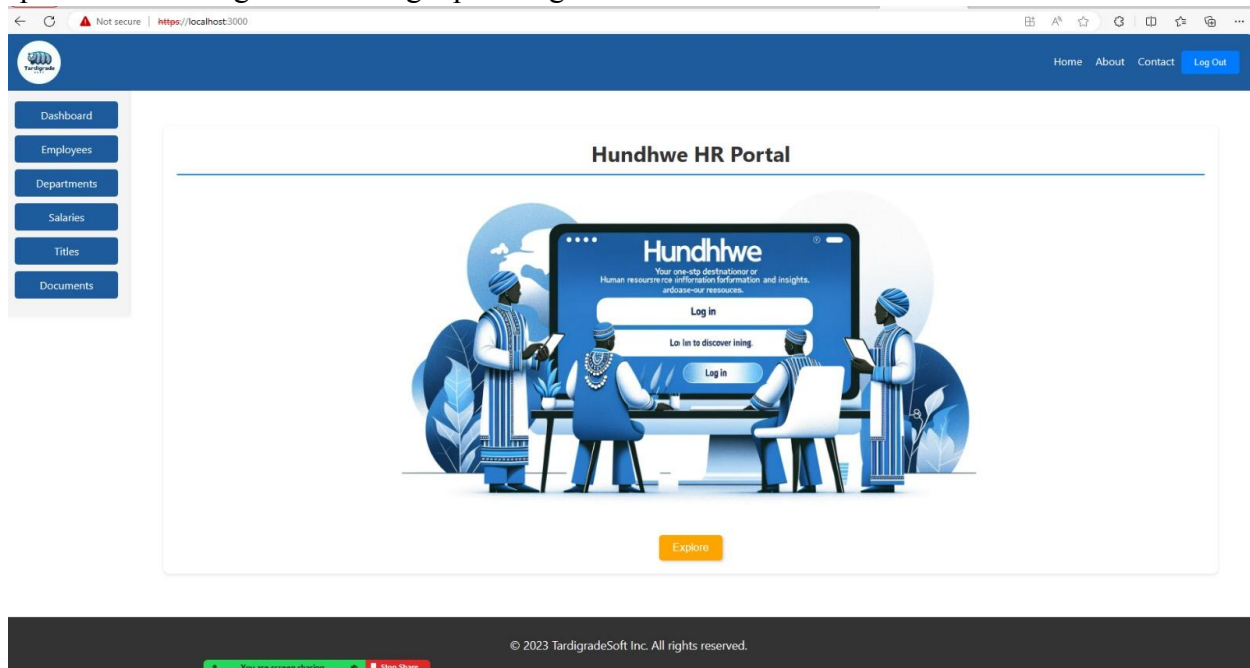


Fig 10

Jenkins + Github Integration

Jenkins-GitHub integration automates the build and test process. During local development, changes pushed to a GitHub repository trigger Jenkins to run predefined tests, ensuring code commits meet quality standards. This streamlines development by providing immediate feedback on each change.

INITIAL ROADMAP:

Stage 1 - Creating a boilerplate back-end and front-end

- **October 10th:** Backend Development Completion, ensuring our system's robust foundation.
 - Containerization using Docker
- **October 20th:** Completion of Frontend Development, integrated with the backend, to guarantee a cohesive user experience.
 - React J.S Front End

Stage 2 - Security and Authentication

- **October 30th:** Emphasis on implementing SSO and bolstering security features, championing data safety.
 - SSO: Taken care of by J.S (there is an SSO package)

Stage 3 - Creating a CI/CD pipeline

- **November 10th:** While a full integration with platforms like GitHub and Jenkins isn't envisaged, the period will focus on codebase synchronization and management.

Stage 4 - Testing and further development

- **November 20th:** A crucial phase dedicated to rigorous Testing and Debugging, ensuring system reliability.

Stage 5 - Expanding the front-end functionality

- **November 30th:** User Acceptance Testing, gathering insights into user experience and system functionality.

Stage 6 - Final Presentation

- **December 5th:** Commencement of final presentation preparations, encapsulating our developmental journey.
- **December 10th:** The grand finale - Project Submission and Presentation.

Chapter 3

PROJECT REQUIREMENTS

Single Sign-On (SSO)

- Auth0 Implementation: Utilize Auth0 for authentication across the HR Portal to enable Single Sign-On, ensuring seamless and secure user access.

Security and Encryption

- TLS with SSL: Implement TLS (Transport Layer Security) encrypted with SSL (Secure Sockets Layer) on a local server to secure data transmission.
- Self-Signed Certificate: Use a self-signed certificate for local staging and development environments to test SSL implementation.

Continuous Integration and Version Control

- Jenkins Integration: Set up Jenkins-GitHub integration to automate the build and test processes, ensuring continuous integration and delivery.
- GitHub Repository: Maintain an online repository on GitHub for code-base tracking and management, facilitating version control and collaboration.

Frontend Development

- ReactJS: Use ReactJS, a JavaScript-based library, for developing the responsive and dynamic user interface of the HR Portal.

Database Management

- MySQL: Implement a local MySQL database for storing and managing the HR database, including employee records, performance reviews, and other HR-related data.

Storage and Document Management

- AWS S3: Leverage Amazon Web Services (AWS) S3 for remote storage of documents uploaded to the HR application's Document Management page, with a focus on security and scalability.

EQUIPMENT:

- Personal computer/laptop for development

RISKS:

The journey, albeit exciting, isn't devoid of challenges. Anticipated risks encompass time constraints, intricacies in third-party integrations, and the steep learning curve associated with mastering the myriad programming languages and tools essential for the project. Coordinating meeting times that cater to each member's availability, balancing the workload from other academic courses, and navigating unforeseen circumstances further add to the list of potential challenges. However, with resilience and collaboration, Team "Late" is poised to surmount these hurdles, delivering an HR Portal that stands as a testament to innovation and dedication.

Chapter 4

CONCLUSION

The HR Portal is designed to revolutionize how HR functions are executed within an organization. It places a significant emphasis on three core aspects:

- ❖ **User-Friendliness:** The portal is developed to be easily accessible and intuitive for users. This focus ensures that employees, managers, and HR professionals can navigate and utilize the portal with ease, enhancing their experience and interaction with HR-related tasks.
- ❖ **Efficiency:** The portal is tailored to streamline various HR processes. This efficiency is likely achieved through automation of routine tasks, simplified workflows, and improved data management, which collectively contribute to a more productive HR environment.
- ❖ **Security:** Given the sensitive nature of HR data, the portal prioritizes security to safeguard employee information. This involves implementing robust security measures to protect against unauthorized access and ensure data privacy.

Overall, the HR Portal is positioned as an essential tool within the organization, providing comprehensive support to employees, managers, and HR professionals. It aims to enhance the overall HR function by making it more user-friendly, efficient, and secure

REFERENCES:

- https://github.com/datacharmer/test_db