**Cleveland State University HRM**

**DEVELOPER GUIDE**

VERSION 1.0

# 1.0 Introduction and Background

The Human Resource Management Panel (HRM) project for Cleveland State University represents a pivotal initiative aimed at modernizing and enhancing the university's human resources management system. In an era of increasing complexity and innovation, the need for an efficient and streamlined HR system has become imperative. This project seeks to address this need by developing a cutting-edge software solution that will revolutionize HR processes, elevate data management, and ultimately contribute to the university's operational excellence.

The primary goals of the HRM panel software encompass streamlining Cleveland State University’s HR processes, enhancing employee management, optimizing talent acquisition and retention, facilitating data-driven decision-making, ensuring compliance with legal regulations, and fostering a positive organizational culture. Objectives include the development of an intuitive user interface, efficient data management, real-time analytics, and seamless integration with existing HR systems.

# 1.2 Objectives

The objective of the Human Resource Management Panel project is to develop a comprehensive and user-friendly software solution to streamline HR operations, enhance employee data management, and improve overall efficiency within Cleveland State University's HR department. The panel will serve as a centralized platform to facilitate professional development, leadership training, team development, and provide access to critical HR services and information. It focuses more on a subset of the functionality provided by a product like HRM from Cleveland State Universities explicitly provides the following functionality:

* Professional Development:
* User-friendly interface for employees to access professional development opportunities.
* Integration with event calendars to promote and track training sessions, workshops, and seminars.
* Online registration and tracking of employee participation in professional development programs.
* Scenario: Employees can access training materials and resources for ongoing professional development.
* Leadership Training:
* Access to leadership training resources and materials.
* Enrollment and tracking of employees in leadership development programs.
* Interactive modules for leadership skill development.
* Scenario: Leaders can monitor the progress of their team members and provide necessary support.
* Team Development:
* Collaboration tools for teams within the university.
* Access to team-building resources and activities.
* Integration with HR processes to support team development initiatives.
* Scenario: Team members can communicate and share resources through the platform.
* About Page:
* Mission statement and overview of HRM's role within the university.
* Information about HR departments, units, and their functions.
* Details on HR services and programs offered.
* Scenario: A new university employee visits the HRM About Page to read the mission statement, understand HRM's role, explore department functions, and learn about the services and programs provided by the HR department.
* Benefits:
* Access to comprehensive employee benefits information.
* Online enrollment and management of benefits programs.
* Information on medical plans, dental plans, reimbursement accounts, retirement plans, life insurance, disability programs, and tuition reimbursement.
* Scenario: Employees can easily access and manage their comprehensive benefits information, including the HRM Panel's user-friendly online platform.
* Compensation:
* Access to information on compensation policies and structures.
* Salary range details and performance appraisal programs.
* Support for job design related to reorganization and restructuring.
* HR Partners:
* Information on HR Business Partners and Talent Acquisition Partners.
* Services related to change management, organizational design, employee engagement, strategic workforce planning, and performance management.
* Learning and Organizational Development:
* Access to professional development opportunities, management, and leadership programs.
* Information on university-wide New Hire Orientation program.
* Integration with event calendars for training scheduling.
* Careers:

Job posting and application functionality for career opportunities within the university.

* Resume submission and tracking for applicants.
* Integration with HR processes for efficient hiring.
* Event Calendars:
* Comprehensive event calendars for HR-related events, workshops, and training sessions.
* Registration and attendance tracking for events.
* Search Engine:
* Robust search functionality to quickly locate HR information, policies, forms, and resources.
* Facilitates easy navigation and retrieval of relevant content.
* All users can manage their account: o Change their email o Change their password

# 1.3 Risks

This section details the risks faced by the current implementation of the software.

The goal is to detail potential issues with the software and potential risks it faces.

• HRM panel for csuohio is exception heavy. What I mean by that is that whenever an issue occurs at the Logical layer and below, that exception is passed all the way up to the presentation layer where it is then caught. This may not be the best way to handle issues under-the-hood, however it was the best method I could think of. This of course comes with some caveats:

* Exceptions are memory intensive. Each time one is thrown the run time must allocate space to store information on that exception. The maintainer should be aware of this fact when working with the code.
* The better model is to follow what I have implemented in the JavaScript error handling in the various Validate files in the JS folder. In this model, one would have their method return true or false depending on the status of the method. C# fortunately allows the return of multiple values form a method using the ‘out’ keyword. If we use the out keyword to signify we are passing out a string from a method alongside the Boolean value, then we have essentially replicated the current error handling system without the overhead of using Exceptions.

# 2.0 Architecture

Figure 1, illustrates the architectural design of Cleveland State University's Human Resource Management Panel and following are the description of each layer:

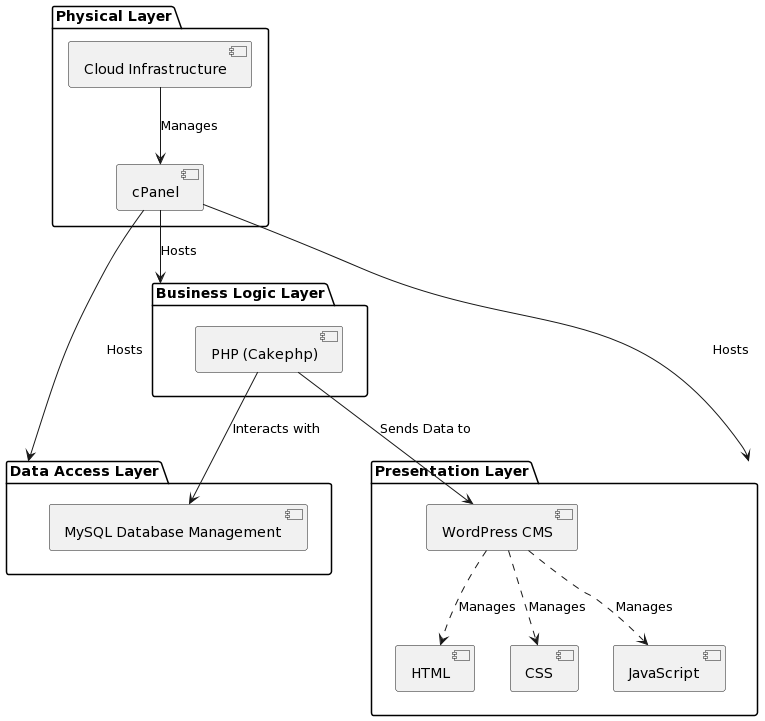
Presentation Layer: This layer will be implemented using HTML, CSS, and JavaScript. WordPress will serve as the Content Management System (CMS), allowing easy content updates and ensuring a cohesive user interface. The Presentation Layer is intricately designed using a combination of HTML coding, Multiple CSS styling, and JavaScript. These technologies synergize to deliver a dynamic, responsive, and visually appealing interface for users. To further enhance content management and ensure a consistent user experience, WordPress has been adopted as the preferred Content Management System (CMS). Its user-friendly dashboard and extensive customization options empower administrators to effortlessly update content and maintain the visual integrity of the platform.

Business Logic Layer: This layer takes care of the operational logic and rules. It will be primarily coded in PHP (Cakephp), which will interact with both the Presentation and Data Access layers. Through this layer, the application can dynamically respond to user inputs, process requests, and relay information between the front-end and the back-end with precision and efficiency. This will also be responsible to connect presentation layer and Data Access layer.

Data Access Layer: MySQL is chosen as the database management system to handle data storage, retrieval, and manipulation. This layer serves as an interface between the Business Logic Layer and the database. Acting as a pivotal interface, the Data Access Layer seamlessly bridges the gap between the Business Logic Layer and the database. This ensures a streamlined flow of information, allowing the application's logic to interact with stored data without direct exposure to underlying database complexities. Furthermore, this layer provides a level of abstraction, ensuring that any changes or optimizations to the database can be carried out without impacting the business logic or presentation layers, thus fostering system maintainability and flexibility.

Physical Layer: The application will be hosted on a cloud infrastructure, leveraging cPanel for web hosting management. This cloud-based approach guarantees enhanced scalability, allowing the system to handle increased loads or expanded functionalities without significant infrastructure changes. Furthermore, the cloud infrastructure provides robustness, ensuring high availability and minimal downtime. By opting to rent space on this cloud infrastructure, Cleveland State University can benefit from state-of-the-art physical and cyber security measures. These measures not only protect the data from unauthorized access but also safeguard against potential physical threats like natural disasters, ensuring that the university's Human Resource Management Panel remains operational and the data remains intact.

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**Figure 1:** Architectural Design

# 2.1 Database Design

The Human Resource Management Panel (HRM) project for Cleveland State University will manage a wide range of data objects related to human resource functions. These data objects include employee profiles, professional development records, leadership training data, team development metrics, compensation details, benefits enrollments, and more. The relationships among these data objects help in understanding the flow of HR processes and interdependencies among various modules.

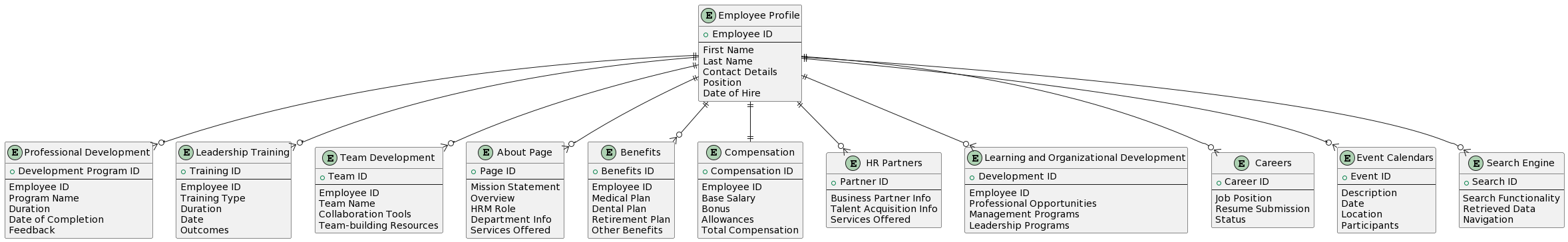
### 2.1.1 Data objects

The HRM software will manage and manipulate several data objects, essential for HR processes. These objects are described in detail below:

* Employee Profile: This data object includes attributes such as Employee ID, First Name, Last Name, Contact Details, Position, Date of Hire, etc.
* Professional Development: Contains attributes like Development Program ID, Employee ID, Program Name, Duration, Date of Completion, and Feedback.
* Leadership Training: Attributes include Training ID, Employee ID, Training Type, Duration, Date, and Outcomes.
* Compensation: Consists of attributes like Employee ID, Base Salary, Bonus, Allowances, and Total Compensation.
* Benefits: Includes Benefits ID, Employee ID, Type of Benefit (medical, dental, retirement, etc.), and Enrollment Status.
* Job Application: Contains attributes like Application ID, Position Applied For, Resume Submission Date, Status, and Interview Date.
* Events: Attributes include Event ID, Description, Date, Location, and Participants.

### 2.1.2 Relationships

Relationships without an actual Entity-Relationship Diagram (ERD) visualization, the relationships are described in natural language format in the following:

* Each Employee can enroll in multiple Professional Development programs, but each program enrollment relates to only one employee.
* Each Employee can undergo multiple Leadership Training sessions, but each training session relates to only one employee.
* Each Employee can be part of multiple Team Development initiatives, but each team development entry relates to only one employee.
* Each Employee has one About Page entry, which provides details related to them.
* An Employee can have multiple Benefits, indicating a one-to-many relationship.
* An Employee may have one Compensation record, indicating the relationship as one-to-one.
* Each Employee can be associated with multiple HR Partners, but each HR Partner entry relates to only one employee.
* Each Employee can be part of multiple Learning and Organizational Development initiatives, but each entry relates to only one employee.
* Each Employee can have multiple Career entries or job positions.
* Each Employee can be associated with multiple Event Calendars, indicating their participation or interest in various events.
* Each Employee can have multiple Search Engine functionalities associated with them.
* Following is the Entity-Relationship Diagram (ERD) visualization:

Following is a description of the tables in presented in the ERD as well as their relations:

|  |  |  |
| --- | --- | --- |
| Table Name | Related To | Description |
| *Professional Development* | Employees | Holds records of each employee's enrollment in various professional development programs. Each program enrollment is tied to one employee. |
| ***Leadership Training*** | Employees | Contains details of leadership training sessions each employee undergoes, with each session relating to only one employee. |
| ***Team Development*** | Employees | Records the involvement of employees in different team development initiatives, each entry corresponding to one employee. |
| ***About*** | N/A | Holds detailed information about HRM Cleveland state university. |
| ***Benefits*** | Employees | Stores information about multiple benefits each employee might have, showing a one-to-many relationship. |
| ***Compensation*** | Employees | Contains compensation records for employees, with a one-to-one relationship indicating one record per employee. |
| ***HR Partners*** | Employees | Holds records of associations between employees and HR partners, with each HR Partner entry relating to only one employee. |
| ***Contact Us*** | N/A | Holds Information from guests if any requested is created by visiting this page |
| ***Careers*** | Employees | Contains records of multiple career entries or job positions held by each employee. |
| ***Event Calendars*** | Employees | Stores information about various event calendars an employee is associated with, indicating participation or interest in different events. |

Following is a presentation of HRM for Cleveland State University data dictionary:

|  |  |  |  |
| --- | --- | --- | --- |
| Entity | Attribute | Description | Data Type |
| Employee Profile | Employee ID | Unique identifier for each employee | Number |
|  | First Name | Employee's first name | String |
|  | Last Name | Employee's last name | String |
|  | Contact Details | Employee's contact information | String |
|  | Position | Job position of the employee | String |
|  | Date of Hire | The date when the employee was hired | Date |
| Professional Development | Development Program ID | Unique identifier for each development program | Number |
|  | Employee ID | Identifier linking to the Employee Profile | Number |
|  | Program Name | Name of the development program | String |
|  | Duration | Duration of the program | String |
|  | Date of Completion | Date when the program was completed | Date |
|  | Feedback | Feedback provided by the employee for the program | String |
| Leadership Training | Training ID | Unique identifier for each leadership training | Number |
|  | Employee ID | Identifier linking to the Employee Profile | Number |
|  | Training Type | Type of leadership training | String |
|  | Duration | Duration of the training | String |
|  | Date | Date of the training | Date |
|  | Outcomes | Results or outcomes of the training | String |
| Compensation | Employee ID | Identifier linking to the Employee Profile | Number |
|  | Base Salary | Basic salary of the employee | Number |
|  | Bonus | Bonus amount | Number |
|  | Allowances | Other allowances given to the employee | Number |
|  | Total Compensation | Sum of base salary, bonus, and allowances | Number |
| Benefits | Benefits ID | Unique identifier for each benefit | Number |
|  | Employee ID | Identifier linking to the Employee Profile | Number |
|  | Type of Benefit | Type or category of the benefit | String |
|  | Enrollment Status | Status indicating if the benefit is enrolled or not | String |
| Job Application | Application ID | Unique identifier for each job application | Number |
|  | Position Applied For | Position for which the application was made | String |
|  | Resume Submission Date | Date when the resume was submitted | Date |
|  | Status | Status of the job application | String |
|  | Interview Date | Date of the interview, if scheduled | Date |
| Events | Event ID | Unique identifier for each event | Number |
|  | Description | Description or details about the event | String |
|  | Date | Date of the event | Date |
|  | Location | Venue or location of the event | String |
|  | Participants | Number of participants or attendees for the event | Number |

# 2.2 Class Level Design

This section explains every class present in HRM panel for csuohio, as well as the interactions between them. I will also provide the rationale behind the design of several of the more complicated classes in the system. The classes listed below are organized as they appear in the JetBrains solution: First by folder, then by class.

## 2.2.1 htdocs

This folder (“htdocs”) contains is a commonly used directory name in web development, particularly in the context of web servers like Apache. It stands for "HyperText Documents," and it's typically the root directory for a website or web application.

*2.2.1.1 Wordpress*: This is likely the main folder containing the WordPress installation files, backup files, plugins, themes, and content management system libraries which is necessary for the function of our HRM panel.

*2.2.1.2 wp-admin:* This folder contains all the administrative files for the WordPress backend, where site administration, user and management occur.

*2.2.1.3 wp-includes:* This is a core folder that contains many of the necessary system files like themes, forms, pages, and posts that WordPress requires to function properly.

*2.2.1.4 wp-content:* This is perhaps the most important folder for WordPress users, as it contains themes, plugins, and uploaded media. It's where much of the website's customization takes place through additional content.

### 2.2.2 Classes

The classes listed below are utilized to ensure the Human Resource Management (HRM) panel operates correctly.

*2.2.2.1 index.php:* The main entry file for the WordPress site which initializes the WordPress environment.

*2.2.2.2 index2.html:* A secondary index file, an alternative version of the main page used as a maintenance webpage when being updated.

*2.2.2.3 license.txt:* Contains the licensing agreement text. It is likely for WordPress under the GPL.

*2.2.2.4 readme.html:* It contains information about the WordPress installation, version details, and update notes.

*2.2.2.5 wp-activate.php:* A script to activate a new site in a WordPress multisite network.

*2.2.2.6 wp-admin.php:* A class that contains all the administrative files and different user privileges for the WordPress backend.

*2.2.2.7 wp-blog-header.php:* The class file that loads the WordPress environment and template.

*2.2.2.8 wp-comments-post.php:* This class file handles the posting of comments to a WordPress site.

*2.2.2.9* wp-config-sample.php: A default sample configuration class file that needs to be renamed to wp-config.php and populated with database details to configure WordPress.

*2.2.2.10 wp-config.php:* The main configuration class file for WordPress, contains database connection details and other settings.

*2.2.2.11 wp-content.php:* A class file that contains themes, plugins, and uploads.

*2.2.2.12 wp-cron.php:* A class file that handles scheduled events in WordPress.

*2.2.2.3 wp-includes.php:* A class file that contains most of the WordPress core software functionalities like smooth scrolling, redirecting and resizing the images.

*2.2.2.14 wp-links-opml.php:* A class file that generates an OPML list of blogroll links.

*2.2.2.15 wp-load.php:* A class file that loads the WordPress environment and template.

*2.2.2.16 wp-login.php:* A class file that provides login page for the WordPress dashboard.

*2.2.2.17 wp-mail.php:* A class file that handles email reception and posting content via email.

*2.2.2.18 wp-settings.php:* A class file that sets up the WordPress environment with the configured settings.

*2.2.2.19 wp-signup.php:* A class file that provides signup file for creating a new user or site on a WordPress multisite installation.

*2.2.2.20 wp-trackback.php:* A class file that handles trackbacks and pingbacks to WordPress posts.

*2.2.2.21 xmlrpc.php:* A class file that enables XML-RPC functionality in WordPress, allowing remote connections.

These class files and folders are standard components of a WordPress installation, each serving specific roles from website presentation to administrative functions.

# 2.3 Software Interfaces

HRM panel for Cleveland State University utilizes several outside software packages to accomplish its objectives. When installing HRM for csuohio, the maintainer must be certain (in most cases) that the following software packages are installed on the hosting system:

* Jet Brains: Official Jet Brains IDE for PHP. HRM was implemented inside JetBrains 2017. It is recommended that the maintainer utilize at least 2017 version of the software.
* PHP Storm: HRM targets PHP Storm version 4.6.1. The maintainer must have at least this version of the PHP Storm Framework installed on their machine if they want to work with the HRM for CSU software.
* MySQL Database: This software ships with JetBrains(if the proper packages are installed with it). MySQL Database was used during development as the database provider for HRM panel for csuohio. It is highly suggested that the maintainer transfers the database schema to a full-fledged SQL Server or Azure instance on dedicated hardware. It is not recommended to run HRM panel for csuohio on the same physical hardware that the database exists on.
* JQuery\*: Provides advanced JavaScript functionality to the system and supports the bootstrap theming system.
* Bootstrap\*: Provides basic theming capabilities to the system. It is recommended to use a minimal version of Bootstrap that incorporates packages links in the webpage.
* Apache Server: This specific software can be installed and configured when installing JetBrains(if testing/developing the software) or installed separately on a server (if hosting the software). In the former case, it is as easy as opening

the JetBrainsinstaller and selecting the APACHE SERVER option under manager components.

* Visio Editor tool: All of the models for the system were built using DIA.

Visio is not free software and is distributed by the Microsoft. It is available on both Windows. In order to work with the models and physically alter them, you will need Visio Editor tool installed on your system.

* Github Version Control: Available at https://github.com/dipenbhuva/HRMCSU, this web service hosts the project. The maintainer must be familiar with its operation.

\*Note: JQuery and Bootstrap are currently set to pull from official Content Distribution Networks for the respective software systems. It is not necessary to do anything during installation of the HRM panel for csuohio software to ensure either system will function.

# 3.0 Conclusion

In summary, this HRM project for Cleveland State University is a comprehensive solution designed to efficiently manage and manipulate a wide range of HR-related data objects. It offers a practical framework for handling employee profiles, professional development records, compensation details, and more, all while maintaining clear relationships between these data elements. The system caters to various user profiles, allowing HR managers, employees, and administrators to perform their respective tasks effectively. Moreover, it places a strong emphasis on data security, compliance with HR regulations, and customization to adapt to the university's specific HR needs, ensuring it aligns with the university's goals for efficient and compliant HR management.

Nevertheless, the HRM project is poised to not only streamline HR processes but also provide a robust foundation for data-driven decision-making within the university's HR department. Its versatility, user-friendly design, and commitment to data security and compliance make it a valuable asset for enhancing the overall HR management experience at Cleveland State University.

# 3.1 Remarks on Implementation

This section contains my remarks regarding the current implementation of HRM panel for csuohio, available at: https://tinyurl.com/csuohiohrm. This implementation is nearly complete (I estimate that ~91% of the functionality outlined in the Requirements Spec. is met). For instance, the careers page is directly integrated with the current system held by csuohio, so implementation of it is not done on our panel. But the page is already made, and further changes can be made by the developer to add a career listing from the Csuohio database.

Also, due to the time constraints and limited time I personally had to work on this project, I made some implementation decisions that were not optimal from a performance standpoint. Images held by the pages are high-resolution images. Functionalities of compressed images on the entire panel can boost performance by 38%.

There are a few test accounts that I have left intact in the system. These accounts are listed below and may be accessed via the system ‘HR Login’ or ‘/admin’ page:

|  |  |  |
| --- | --- | --- |
| Username | Password | Role |
| dipen | dipen@123 | Administrator |
| ryhan | ryhan@321123 | Instructor |
| test | test@123 | Student |
| epiz\_25689729 | dipen@123 | Database Admin |

Note that if you recreate the database, you must manually enter an administrator account to be able to configure the system. This must be done through your databases interface from MySQL panel, it can be done through the HRM panel for csuohio by installing WP-DB plugin in the wordpress to add the functionalities.

# 3.2 Possible Future Improvements

HRM panel for csuohio was hastily implemented by 3 person in a ~2 and ½ month timeframe. As I have emphasized throughout this document, there are some minor issues with the current implementation of HRM panel for csuohio. The CSU Ohio Human Resource Management Panel website plays a pivotal role in facilitating effective HR management across the university's diverse workforce. To ensure that the website continues to meet the evolving needs of the CSU community, it is imperative to outline future work improvements that can enhance its functionality, user experience, and overall effectiveness. This section highlights some key areas for improvement and outlines strategies to achieve these goals.

1. Enhanced User Experience:
   * Mobile Optimization: Ensure the website is fully responsive to accommodate users accessing it with compressed images for high-performance delivery of web content.
   * Accessibility: Prioritize accessibility by adhering to WCAG guidelines to make the website more inclusive and user-friendly for individuals with disabilities.
2. Personalized User Accounts:
   * User Profiles: Develop a feature that allows employees to create personalized profiles to access HR-related information, track their progress, and receive personalized recommendations.
   * Notifications: Implement notification systems to alert users about important HR updates, deadlines, and events relevant to their profile.
3. Data Analytics and Reporting:
   * Dashboard for HR Metrics: Create a user-friendly dashboard for HR professionals to access real-time analytics, providing insights into employee engagement, turnover rates, and other key HR metrics.
   * Predictive Analytics: Incorporate predictive analytics tools to help HR teams make informed decisions and proactively address potential HR challenges.
4. Self-Service Options:
   * Employee Self-Service: Expand self-service options for employees to update personal information, access pay stubs, and request time off, reducing the administrative burden on HR staff.
   * Manager Self-Service: Provide managers with tools to streamline tasks such as performance evaluations, staffing, and team management.
5. Feedback Mechanism:
   * User Feedback: Establish a feedback mechanism to gather user input and suggestions, allowing continuous improvement based on user insights.
   * Surveys and Polls: Conduct periodic surveys and polls to gauge user satisfaction and identify areas in need of improvement.
6. Security and Data Privacy:
   * Data Security: Ensure robust data encryption, access controls, and regular security audits to protect sensitive HR information.
   * Compliance: Stay updated with evolving data privacy regulations and ensure compliance with applicable laws.