HEAVY VEHICLES FACTORY

A Unit of Armoured Vehicles Nigam Limited,

Government of India Enterprise,

Ministry Of Defence

Internship/In-plant Training

HVF e-Leave

by

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Submitted

In partial fulfillment of the requirements for the degree of

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in

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INFORMATION TECHNOLOGY CENTER

INTERNSHIP / INPLANT TRAINING REPORT

This report is prepared by V S SANTHOSH (B.Tech. in COMPUTER SCIENCE AND ENGINEERING - ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING) from Bennett University (Greater Noida), as a part of Internship/In-plant Training from 09-06-2025 to 21-06-2025. He have completed a Basic Project titled “HVF e-Leave”.

Place: Avadi
Date: 21-06-2025

Shri. V SEKAR
JWM(SG)/T, ITC

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I would like to take this opportunity to express my sincere gratitude to everyone who supported me throughout this in-plant training. It gives me immense pleasure to acknowledge all those who extended their encouragement and assistance, contributing to the successful completion of this work.

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Furthermore, I would like to express my deep gratitude to the Apprentices at ITC, HVF Avadi, whose support and willingness to share their knowledge greatly enriched my learning experience.

Lastly, I extend my heartfelt thanks to all the employees of ITC, HVF Avadi, who were directly or indirectly involved in this project. Their constant support and cooperation played a vital role in the successful completion of my training.

- V S SANTHOSH

ABSTRACT

HVF e-Leave – A Web-Based Leave Management System for Defence Sector

This project reports outlines the development of **HVF e-Leave,** a web-based Leave Management System designed specifically for the **Heavy Vehicles Factory (HVF)** as part of an in-plant training initiative. The system addresses the need for a streamlined, transparent, and efficient method to handle employee leave requests and approvals within a high-security defence manufacturing environment.

HVF e-Leave is built using **HTML, CSS, JavaScript, PHP**, and **MySQL**, and operates on a local server environment using **XAMPP**. It provides a user-friendly interface for employees to apply for leave, track the status of their requests, and view leave history. Administrative users can review, approve, or reject applications, manage employee data, and generate reports for internal planning and compliance.

Key features of the system include secure user authentication, role-based access control, automated notifications, and a centralized database for storing leave records. By digitizing and automating the leave process, **HVF e-Leave** reduces administrative workload, minimizes errors, and enhances operational efficiency.

This project reflects the application of practical web development skills in solving real-world problems in industrial settings and demonstrates the potential for digital transformation in the defence sector's internal processes.

The report structuring and preparation are meticulously conducted using LaTeX, adhering to *Doctoral research methodology* standards, ensuring a *professional, organized,* and *academically rigorous* presentation of the project.

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Table for Progress

Table 1: Daily Progress Sheet:

DATE	PROGRESS
09-06-2025	Observed the section and the programming languages they use for the task management.
10-06-2025	Project and the problem-solving discussion.
11-06-2025	Study of PHP and allied programming languages and implementation using XAMPP.
12-06-2025	Learned about LaTeX and its significance, and decided to use LaTeX for report.
13-06-2025	Designed the algorithm for the project “HVF e-Leave”.
14-06-2024 17-06-2025	Completion of login page creation and creation of the database using the XAMPP.
18-06-2025	Started with the backend and created a connection object between the database and the backend.
19-06-2025	Completed the whole project and completed the debugging.
20-06-2025	Successfully completed report using LaTeX.
21-06-2025	Report Submission

Chapter 1

Introduction

1.1 Factory Profile

Heavy Vehicles Factory is a Heavy Engineering Industry having core competency in the manufacture of Armoured Combat Vehicles viz. T-72 (Ajeya), T-90S (Bhishma), MBT Arjun Tanks and their variants. The Factory makes use of all the latest state-of-art heavy duty CNC machine technology to a large extent in the manufacture of tanks. Heavy Duty Forging, Heat Treatment Facilities, Quality Assurance Laboratories are some of the other infrastructures and facilities available and it is being fully utilised in the factory for tank production. Also competency exists in specialised trades like Armour Welding. Further, HVF is also equipped with facilities of overhauling of T-72 (Ajeya) Tanks and manufacturing of connected assemblies and sub-assemblies. Available Technical personnel are highly knowledged, experienced and many of them were trained by the Original Equipment Manufacturer and Suppliers. By virtue of high experience and knowledge the factory is ready to accept any challenge put forward in accordance with the need of the customer. To achieve the reliability of the production, stringent quality parameters are adopted so as to establish perfection during the production of various components required for assembly of the Tanks

1.2 Factory Mission and Vision

- To equip the Armoured forces with modern defence battlefield equipments.
- To equip ourselves with technology through acquisition, synergy, and in-house RSD.
- To achieve the highest level of customer satisfaction.

- To increase customer base in Defence, non-Defence, and Export market and establish global presence.
- The objectives are in line with objectives of Ordnance Factory Board as external and internal.

1.3 Factory Services

HVF was initially set up at an outlay of Rs.16 crores for the licensed manufacture of VIJAYANTA TANKs. The capacity was doubled with a total capital outlay of Rs.27 crores. The augmentation capacity was completed in 1976-77. Over the years, HVF has played a crucial role in strengthening the defense capabilities of the nation by continually upgrading its production facilities and introducing advanced technologies. It has also expanded its product range to include various types of armored vehicles and military equipment. The factory's consistent efforts have contributed significantly to India's self-reliance in defense manufacturing. HVF continues to innovate and collaborate with international defense organizations to stay at the forefront of military technology advancements.

Table 1.1: Products of Heavy Vehicle Factory:

S No.	Product Name
1	VIJAYANTA
2	AJEYA (T-72)
3	T-72 OVERHAUL
4	ARJUN MK-I
5	BHISHMA (T-90)
6	BLT T-72
7	T-72 Tanks for TRAWL

1.3.1 Ajeya (T-72)

The Ajeya T-72, a main battle tank, stands as a testament to India's indigenous military prowess. Developed in response to the nation's strategic needs, this formidable

machine embodies strength and innovation. With its robust design and advanced capabilities, the Ajeya T-72 ensures battlefield dominance, offering unmatched protection and firepower. Its agile maneuverability and technological sophistication make it a formidable force on any terrain, securing India's position as a leader in modern warfare.

Figure 1.1: AJEYA(T72)

1.3.2 Bhishma (T-90)

An Indian version of the Russian T90S tank is called the T90 Bhishma. With cooperation from Russia and France, it is specifically designed for the terrain of India. It is comparable to the T90 line of main combat tanks, with a few exceptions.

Figure 1.2: BHISHMA (T-90)

1.3.3 Arjun (MBT)

The Arjun Main Battle Tank (MBT), an advanced variant of the T-72, represents a significant achievement in India's defense manufacturing. Equipped with upgraded armor, improved fire control systems, and enhanced mobility, the Arjun MBT is designed for superior performance in modern combat scenarios. Its sophisticated targeting and defensive capabilities provide robust protection and precise firepower, ensuring operational effectiveness on diverse terrains. As a symbol of India's commitment to self-reliance in defense, the Arjun MBT fortifies the nation's military strength and strategic capabilities.

Figure 1.3: ARJUN (MBT)

Chapter 2

Literature review

2.1 Host section overview

2.1.1 About ITC

The Information Technology Centre (ITC) at the Heavy Vehicles Factory (HVF) in Avadi plays a crucial role in managing and supporting the factory's information technology infrastructure. It serves as the nerve center for all IT-related operations, including network management, software development, database administration, and user support. The ITC ensures that the factory's IT systems are running smoothly, efficiently, and securely to support the production of heavy vehicles. It also plays a vital role in implementing and maintaining digital solutions to enhance productivity, streamline processes, and improve overall operational effectiveness within the factory.

2.1.2 Hardware

Hardware refers to the physical components of a computer system. These include devices such as the central processing unit (CPU), memory (RAM), storage devices (hard drives, solid-state drives), input/output devices (keyboard, mouse, monitor, printer), and peripheral devices (scanners, external drives, etc.). Hardware components interact with each other through electrical signals and pathways on the circuit boards. These components are tangible and can be physically touched and manipulated.

2.1.3 Software

Software encompasses the programs, applications, and data that instruct hardware on what tasks to perform and how to perform them. There are two primary types of software: system software and application software. System software includes operating systems (e.g., Windows, macOS, Linux), device drivers, utilities, and firmware. It manages hardware resources and provides a platform for running application software. Application software includes programs designed for particular needs, such as word processors, web browsers, games, and productivity tools.

2.2 Website Requirement

a) **User Authentication:**
   - Secure login functionality to ensure only authorized personnel can access the website.
   - User roles and permissions management to control access levels.

b) **User-Friendly Interface:**
   - Intuitive and user-friendly interface design to enhance usability and facilitate efficient navigation.
   - Clear categorization and search functionality for quick access to specific product details.

c) **Integration with XAMPP:**
   - Utilization of XAMPP stack for local development and testing environment.
   - Compatibility with Apache, MySQL, PHP, and other components provided by XAMPP for seamless deployment.

d) **Compatibility and Responsiveness:**
   - Compatibility with various devices and web browsers to ensure seamless access using desktops, laptops, or mobile devices.
   - Responsive design for optimal viewing and interaction across different screen sizes and resolutions.

2.3 Existing System

Currently, within the in-plant training environment, there is no dedicated web page specifically designed to provide employees and workers with streamlined access to comprehensive product details.

2.4 Technical Challenges

2.4.1 Challenges with the Current System

a) **Fragmented Information:** Product details are scattered across various sources, including paper documents, spreadsheets, and verbal communication, making it challenging for employees to find accurate and up-to-date information.

b) **Manual Retrieval Process:** Employees rely on manual methods such as searching through physical files or contacting multiple departments to obtain the necessary product details, resulting in time-consuming and error-prone processes.

c) **Lack of Centralization:** The absence of a centralized digital platform means that employees do not have a single, reliable source for accessing comprehensive product information. This decentralized approach leads to inconsistencies and discrepancies in the information obtained.

d) **Limited Accessibility:** Without a dedicated web page, access to product details may be restricted to certain individuals or departments, limiting collaboration and hindering overall efficiency in manufacturing operations.

2.4.2 Need for a Centralized Webpage

(a) **Accessibility and Convenience:** Employees often struggle with accessing scattered information across various platforms or documents. A centralized web page offers a single point of access where all relevant product details, updates, and documentation are stored. This accessibility ensures that employees can quickly find what they need without wasting time navigating multiple systems.

(b) **Accuracy and Consistency:** By centralizing product information on a single web page, organizations can ensure that all employees have access to the most accurate and up-to-date data. This reduces the risk of errors caused by outdated information or conflicting details from different sources. Consistency in information also promotes better decision-making and customer interactions.

(c) **Enhanced Productivity:** When employees can easily find information they need, they spend less time searching and more time focused on their tasks. A user-friendly interface further enhances productivity by minimizing the learning curve and allowing employees to navigate the web page efficiently.

(d) **Improved Collaboration:** Centralized web pages often include collaborative features such as commenting, version control, and notifications. These features facilitate teamwork by enabling employees to share insights, updates, and feed- back in real-time. This collaborative environment fosters better communication and alignment across departments or teams working on product-related tasks.

(e) **Security and Control:** Centralized web pages can be designed with robust security measures to protect sensitive information. Access controls ensure that only authorized personnel can view or modify specific content, safeguarding proprietary data and maintaining compliance with privacy regulations.

(f) **Analytics and Insights:** Many centralized web pages incorporate analytics tools that provide insights into how employees interact with the information. This data can help organizations identify trends, areas for improvement, and employee training needs, enabling continuous optimization of the platform.

(g) **Scalability and Adaptability:** As organizations grow or introduce new products, a centralized web page can easily scale to accommodate additional information and functionalities. It can be adapted to suit evolving business needs and technological advancements, ensuring long-term relevance and usability.

Chapter 3

Early Development Phase

3.1 Design Phase

During the design phase of the website development process, the focus will be on conceptualizing and creating a user-friendly interface that facilitates streamlined access to comprehensive product details.

3.1.1 User Interface Design

Objective: Create a visually appealing and user-friendly interface for the Leave Management System.

Tasks:

- Design UI elements such as navigation menus, buttons, forms, and layout structures.
- Define color schemes, typography, and iconography.
- Use tools like Adobe XD, Figma, or Sketch for prototyping and refining UI designs.

3.1.2 Information Architecture

Objective: Organize content and structure to ensure intuitive navigation and usability.

Tasks:

- Define information hierarchy and categorize content (e.g., questions, answers, user profiles).

- Create sitemaps and flowcharts to visualize user journeys and interactions.
- Ensure logical navigation paths for users to easily find and contribute to content.

3.1.3 Responsive Design

Objective: Ensure Leave Management System is accessible and functional across various devices and screen sizes.

Tasks:

- Implement responsive web design principles using CSS media queries.
- Test and optimize layouts for desktops, tablets, and mobile devices.
- Consider touch-friendly elements and interactions for mobile users.

3.2 Development Phase

In the development phase, the focus will be on translating the design concepts into functional features and implementing the necessary backend infrastructure.

3.2.1 Frontend

Development Tasks:

- Using HTML, CSS, and JavaScript to develop the frontend interface of the website, ensuring that it aligns with the design specifications and is responsive across different devices.
- Testing the frontend components to ensure compatibility with various web browsers and screen sizes.

3.2.2 Backend Development with

XAMPP Tasks:

- Leveraging XAMPP for local development and testing of the website's backend functionality.

- Setting up Apache as the web server, MySQL as the database server, and PHP as the server-side scripting language within the XAMPP environment.
- Developing backend features such as user authentication, data storage, and retrieval using PHP and MySQL.

3.2.3 Database Design

Tasks:

- Designing and implementing a database schema using MySQL to store comprehensive product details, including specifications, components, and assembly instructions.
- Establishing relationships between different database tables to enable efficient data retrieval and management.

3.3 Challenges

Throughout the design and development phases, several challenges may arise that need to be addressed to ensure the successful completion of the website project. Here are some potential challenges:

3.3.1 XAMPP Integration

Challenges:

- Ensuring seamless integration of the website with the XAMPP environment, including configuring Apache, MySQL, and PHP to work together effectively.
- Resolving any compatibility issues or configuration errors that may arise during the development process.

3.3.2 Security Concerns

Challenges:

- Implementing robust security measures to protect sensitive product information and prevent unauthorized access or data breaches within the XAMPP environment.

3.3.3 Resource

Constraints Challenges:

- Limited availability of development resources, such as time, budget, and skilled personnel, may impact the project timeline and scope.

3.3.4 User Training

and Adoption

Challenges:

- Ensuring that employees are adequately trained on how to use the website effectively within the XAMPP environment and promoting user adoption to maximize the benefits of the new system.

Chapter 4

Late Development Phase

4.1 Testing and Debugging

During the testing and debugging phase, the website underwent comprehensive testing to ensure seamless functionality. Various testing methods were employed to validate the website's performance, security, and user experience.

a) **Functional Testing:**

- Functional testing was conducted to verify that all website features, including user authentication, worked as intended.
- Different user scenarios were tested to ensure that the website performed reliably under various usage conditions.

b) **Compatibility Testing:**

- Compatibility testing was performed to ensure that the website was compatible with different web browsers, devices, and screen sizes.
- Issues related to layout and rendering were identified and resolved to ensure a consistent user experience across platforms.

c) **Performance Testing:**

- Performance testing was carried out to assess the website's speed and responsiveness.
- Optimizations were made to improve page load times and overall performance, enhancing the user experience.

d) **Security Testing:**

- Security testing was conducted to identify and address any vulnerabilities or potential security threats.

- Measures were implemented to safeguard sensitive product information and protect against cyber threats such as SQL injection and cross-site scripting (XSS).

4.2 Iterative Improvements

Throughout the development process, iterative improvements were made to the website based on user feedback and testing results. These enhancements aimed to optimize functionality and enhance user satisfaction.

a) **User Feedback Analysis:**
   - User feedback collected during testing was analyzed to identify areas for improvement and address user concerns.
   - Priority was given to addressing feedback that directly impacted the user experience and overall usability of the website.

b) **Feature Enhancements:**
   - Additional features were implemented based on user feedback and project requirements.
   - Existing features were iteratively improved to enhance usability and meet the evolving needs of users.

4.3 Test Results

The results of testing conducted during the development process were documented to provide insights into the website's performance and functionality.

a) **Summary of Test Findings:**
   - Testing results were summarized to highlight any issues or bugs discovered during the testing phase.
   - Details were provided on the severity of each issue and the actions taken to address them.

b) **Actions Taken:**

- Actions taken to resolve identified issues were documented, including code fixes, configuration changes, and security patches.
- Challenges encountered during the resolution process were addressed, and solutions were implemented to ensure the smooth functioning of the website.

4.4 Refinement and Finalization

In the final phase of the development process, the website underwent refinement and finalization to prepare for deployment.

a) **Final Testing and Validation:**

- A final round of testing was conducted to validate that all identified issues had been resolved and that the website met project requirements.
- Validation tests ensured that the website was fully functional, secure, and user-friendly.

b) **Documentation and Training:**

- Comprehensive documentation was prepared to assist users in understanding the website's features and functionality.
- Training sessions were conducted to educate employees on how to use the website effectively and maximize its benefits.

c) **Deployment Preparation:**

- The website was prepared for deployment to the production environment, including configuring servers, setting up backups, and finalizing domain set- tings.
- Deployment procedures were documented to ensure a smooth transition to the live environment.

Chapter 5

HVF e-Leave

5.1 Introduction

The **HVF e-Leave System** is a web-based application developed to streamline and digitize the leave application and approval process at the **Heavy Vehicles Factory (HVF), Avadi**. Designed for use within a secure defence environment, the system operates on a local intranet using technologies such as **HTML, CSS, JavaScript (frontend)** and **PHP with MySQL (backend)**.

The core goal of HVF e-Leave is to simplify employee leave management while ensuring **role-based access, secure authentication, accurate leave tracking**, and administrative oversight. The system supports multiple types of leaves, automates calculations, and enforces rules such as leave eligibility and combination restrictions.

Login/Registration Module

- The **Login and Registration** pages act as the entry point of the HVF e-Leave System. Both are designed using HTML and CSS for a clean, responsive interface. These pages connect to a PHP backend with a MySQL database to validate and store user information securely.

Key Components of the Registration Page:

* **User ID Field:** A unique identifier assigned to each employee for system access.
* **Password Field:** A secure field where users create their login password.
* **Name Field:** Captures the employee's full name for display and communication purposes.
* **Department Field:** Indicates the employee's assigned department within HVF.
* **Register Button:** On clicking, the system validates the inputs and registers the user in the database.

Key Components of the Login Page

* **Username Field:** Users input their registered user ID to gain access.
* **Password Field:** The corresponding password is used for secure authentication.
* **Login Button:** Validates credentials and grants access to the user dashboard based on their role (employee or admin).

Supported Leave Types in HVF e-Leave (Table 5.2)

The system incorporates the following types of leaves, each with annual limits and specific conditions as applicable:

Leave Type	Code	Annual Limit	Notes
Causal Leave	CL	10 days	Cannot be combined with other leave types
Earned Leave	EL	30 days	Can be combined with other leaves
Half Pay Leave	HPL	20 days	Deducted at half pay
Special Casual Leave	SCL	3 days	For special purposes like exams or events
Paternity Leave	PL	15 days	For male employees during childbirth
Maternity Leave	ML	180 days	For female employees, per child
Injury Leave	IL	As per rules	Applicable on verification by medical board
Child Care Leave	CCL	730 days total	**Only for female employees**, throughout service (not annually reset)

The system is designed to enforce leave rules, such as the **non-combinability of Casual Leave (CL)** with any other type, and limits are tracked per user annually (except for CCL which is cumulative over service years).

5.2 Database Connection

The **HVF e-Leave System** utilizes a **PHP-MySQL** backend to securely manage user authentication, leave data, and role-based access control. Using **XAMPP** as the local development and hosting environment, the system connects to a **MySQL database** through the **MySQLi extension** in PHP.

This section explains how the system establishes a connection to the database and handles login validation securely through user sessions and backend processing.

Database Connection Process – Step by Step

1. **Session Initialization:** The PHP script begins by initializing a session using `session_start();`. This is essential for maintaining the user's login state across different pages and for storing session variables that determine user access and role.
2. **Handling User Login Attempt:** The login script checks if the request method is `POST`, indicating that the login form has been submitted. It then retrieves user inputs from the `$_POST` array:

   ```
   $username = $_POST['userid'];
   $password = $_POST['password']
   ```

3. **Establishing a Database Connection:** Once Using the **MySQLi** extension, the script connects to the database using the following parameters:
   - **Server Name:** `localhost` (used in local XAMPP environments)
   - **Username:** Typically `root` (default for XAMPP)
   - **Password:** Usually empty (`""` for default XAMPP setup)
   - **Database Name:** Example: `hvf_leave_system`
4. **Session Variables and Redirection:** Upon successful authentication, the system sets session variables to store user details and their role (`employee` or `admin`).
5. **Handling Invalid Login Attempts:** If no matching credentials are found, the system stores an error message and redirects the user back to the login page.

5.3 Results

5.3.1 Sign Up Page

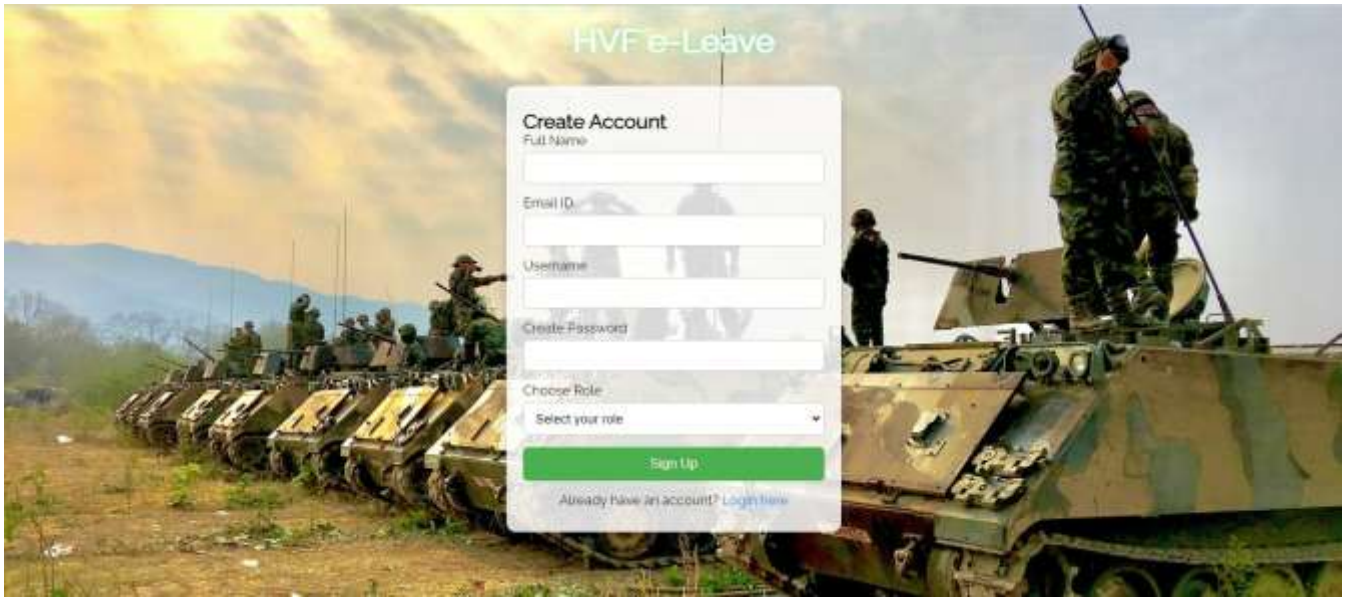

Figure 5.1: Sign up Page

5.3.2 Login Page

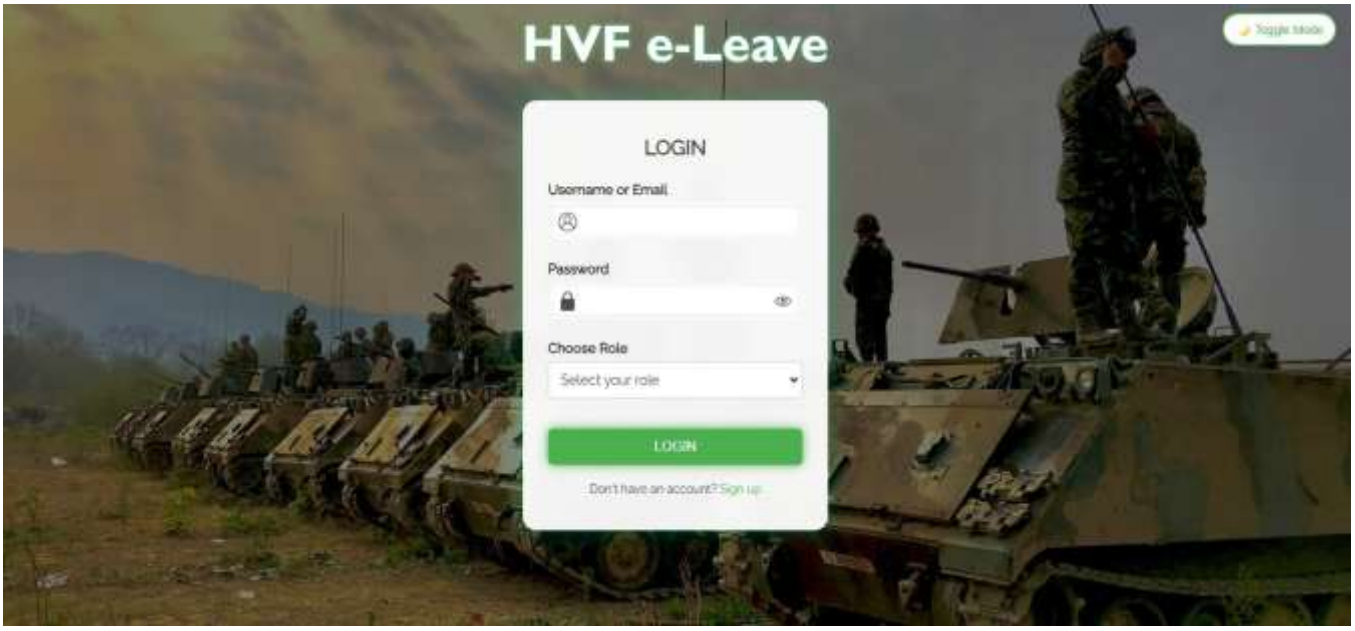

Figure 5.2: Login Page

5.3.3 Employee Info Page

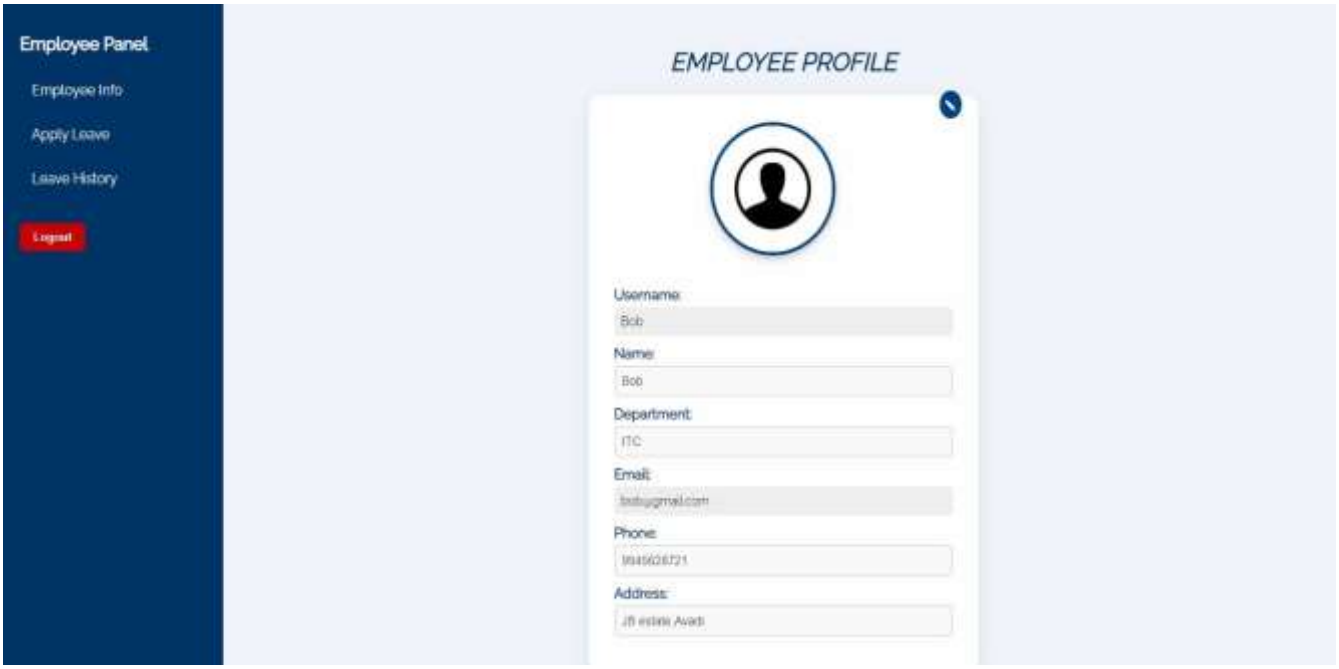

Figure 5.3: Employee Info Page

5.3.4 Employee Apply Leave Page

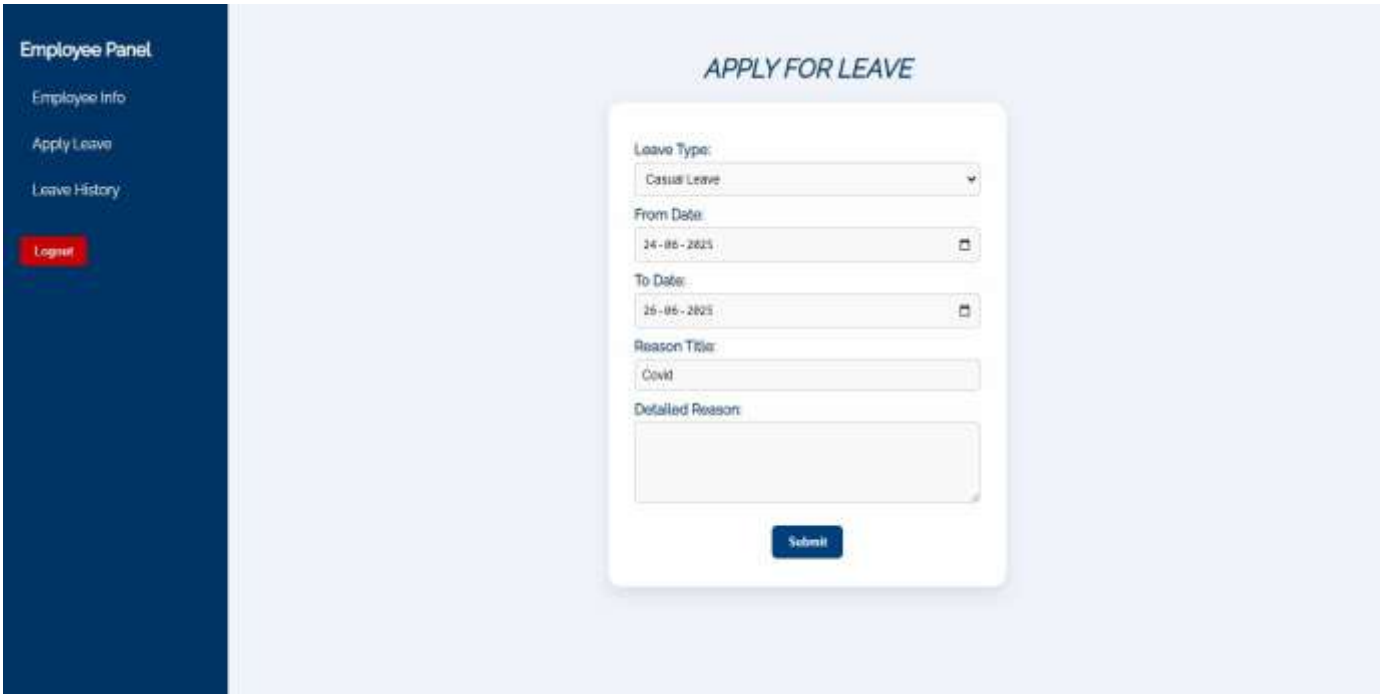

Figure 5.4: Employee Apply Leave Page

5.3.5 Officer Info Page

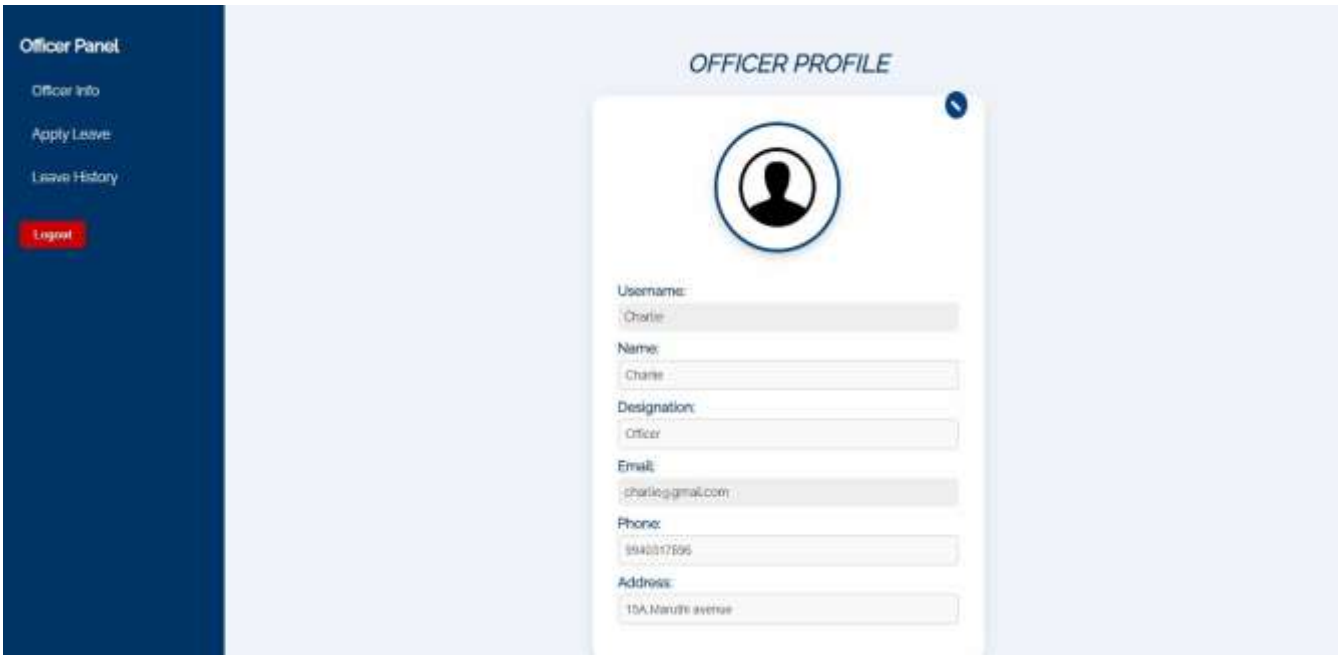

Figure 5.5:Officer Info Page

5.3.6 Officer Apply Leave Page

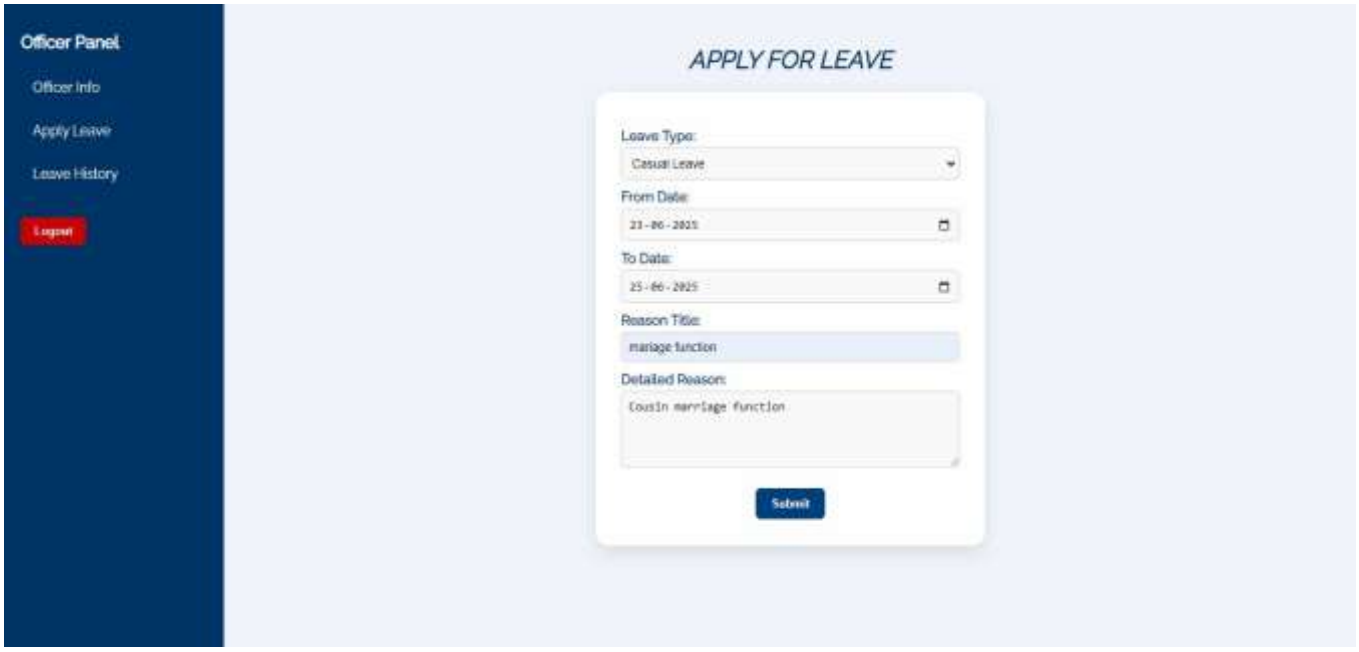

Figure 5.6: Officer Apply Leave Page

5.3.7 Officer Leave History

Figure 5.7: Officer Leave History Page

5.3.8 Admin Dashboard Page

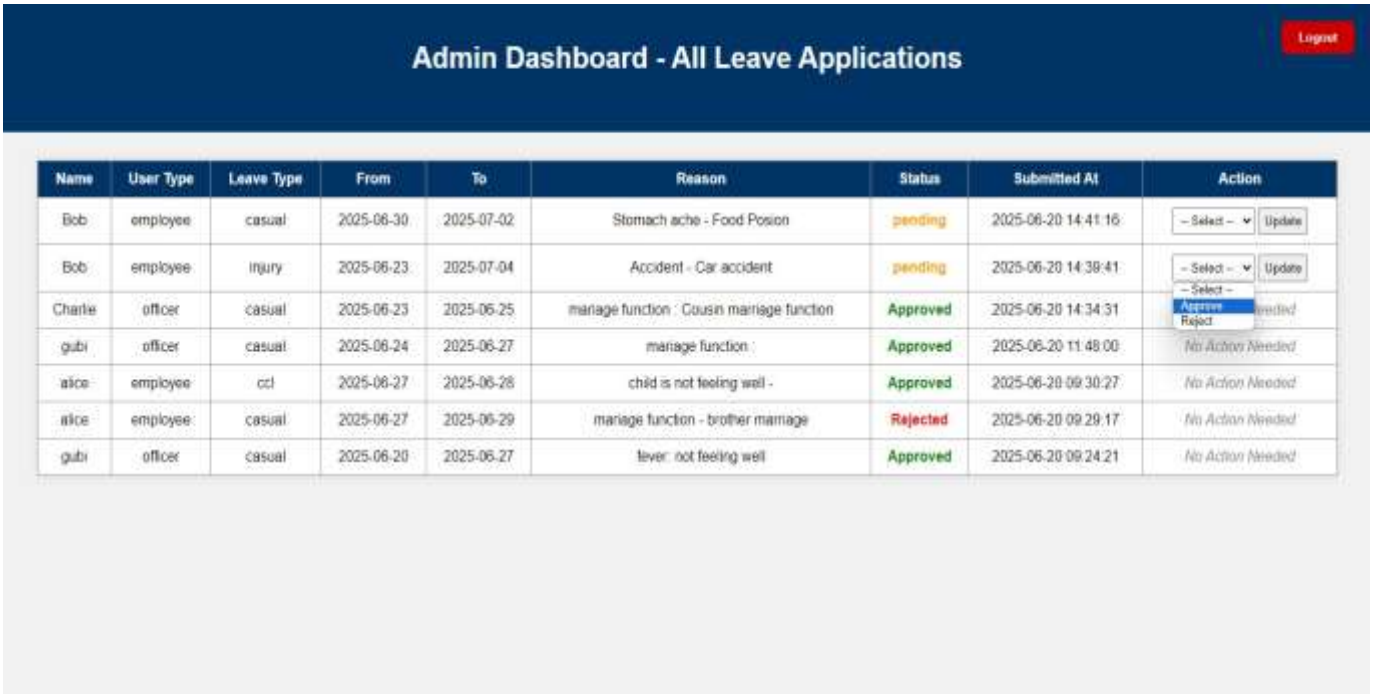

Figure 5.8: Admin Dashboard Page

5.3.9 After Admin Approval Officer Page

Figure 5.9: After Admin Approval Officer Page

5.3.10 Database

1. HVF_Leave Database Structure

Table	Action	Rows	Type	Collation	Size	Overhead
admins	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
employees	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	32.0 KiB	-
leaves	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
leave_applications	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8mb4_general_ci	32.0 KiB	-
officers	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8mb4_general_ci	32.0 KiB	-
users	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	48.0 KiB	-
6 tables	Sum	13	InnoDB	utf8mb4_general_ci	208.0 KiB	0 B

2. Employee Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	department	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
4	email	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
5	username	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
6	password	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
7	phone	varchar(20)	utf8mb4_general_ci		Yes	NULL			Change Drop More
8	address	varchar(255)	utf8mb4_general_ci		Yes	NULL			Change Drop More
9	role	varchar(50)	utf8mb4_general_ci		Yes	NULL			Change Drop More
10	designation	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More

3. Officer Table

	id	name	designation	email	username	password	role	phone	address
Edit Copy Delete	1	admin	Admin	test@gmail.com	admin	123	admin	NULL	NULL
Edit Copy Delete	2	gubi	Officer	bitopandas.cse10@gmail.com	gubi	123	officer	999999999	15A,Maruthi avenue
Edit Copy Delete	3	Santhosh	Officer	mss@gmail.com	sandy	123	officer	NULL	NULL
Edit Copy Delete	4	Charlie	Officer	charlie@gmail.com	Charlie	123	officer	9940317896	15A,Maruthi avenue

4. User Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	fullname	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	email	varchar(100)	utf8mb4_general_ci		Yes	NULL			Change Drop More
4	username	varchar(50)	utf8mb4_general_ci		Yes	NULL			Change Drop More
5	password	varchar(255)	utf8mb4_general_ci		Yes	NULL			Change Drop More
6	role	varchar(20)	utf8mb4_general_ci		Yes	NULL			Change Drop More

5. Leave_Application Table

	id	user_id	leave_type	from_date	to_date	reason	status	submitted_at	user_type
Edit Copy Delete	1	2	casual	2025-06-20	2025-06-27	fever: not feeling well	Approved	2025-06-20 09:24:21	officer
Edit Copy Delete	2	1	casual	2025-06-27	2025-06-29	mariage function - brother marriage	Rejected	2025-06-20 09:29:17	employee
Edit Copy Delete	3	1	ccl	2025-06-27	2025-06-28	child is not feeling well -	Approved	2025-06-20 09:30:27	employee
Edit Copy Delete	4	2	casual	2025-06-24	2025-06-27	marriage function	Approved	2025-06-20 11:48:00	officer
Edit Copy Delete	5	4	casual	2025-06-23	2025-06-25	marriage function : Cousin marriage function	Approved	2025-06-20 14:34:31	officer
Edit Copy Delete	6	2	injury	2025-06-23	2025-07-04	Accident - Car accident	Approved	2025-06-20 14:39:41	employee
Edit Copy Delete	7	2	casual	2025-06-30	2025-07-02	Stomach ache - Food Posion	Rejected	2025-06-20 14:41:16	employee

6. Leaves Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	officer_id	int(11)			No	None			Change Drop More
3	from_date	date			No	None			Change Drop More
4	to_date	date			No	None			Change Drop More
5	reason_title	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
6	reason_detail	text	utf8mb4_general_ci		No	None			Change Drop More
7	leave_type	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More

7. Admin Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	username	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
3	password	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

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Chapter 6

Conclusion and Future Aspects

6.1 Conclusion

The development of the web project "HVF e-Leave – A Web-Based Leave Management System for Defence Sector," built using HTML, CSS, JavaScript, PHP, and MySQL on the XAMPP platform, has successfully digitized and streamlined the leave application and approval process within Heavy Vehicles Factory (HVF), Avadi. The system provides secure login and registration modules, a role-based dashboard for employees and administrators, and robust leave tracking functionalities. By enforcing leave policies, automating calculations, and offering features like leave history, real-time status updates, and centralized data storage, the system enhances operational efficiency, reduces paperwork, and ensures transparency in leave management. This project demonstrates the effective application of web development technologies to solve real-world administrative challenges in a high-security, industrial environment.

6.2 Future Enhancement

While the current version of the website has brought significant improvements, several future enhancements can be considered to further increase its effectiveness and user satisfaction:

6.2.1 Mobile Application Development:

6.2.1.1 Developing a mobile application version of the website to provide people with even greater flexibility.

6.2.2 Enhanced Security Measures:

– Continuously updating and enhancing security protocols to protect against emerging threats and ensure the integrity and confidentiality of product data.

6.2.3 User Analytics and Reporting:

6.2.3.1 Implementing analytics and reporting features to track user interactions with the website, providing insight and identifying areas for further improvement.

6.2.4 Integration with Other Systems:

6.2.4.1 Exploring opportunities to integrate the website with other enterprise sys- tems such as ERP (Enterprise Resource Planning) to streamline workflows and enhance data consistency.

6.2.5 Enhanced User Interface:

6.2.5.1 Continuously improving the user interface based on feedback to make it even more intuitive and user-friendly, thereby improving the overall user experience.

References

The development of the **HVF e-Leave System** involved utilizing a wide range of web technologies, tools, and resources to ensure a secure, efficient, and user-friendly platform for leave management. Below are the key technologies and references used during the project:

1. *HTML & CSS*: For structuring and styling the web pages.
   - *MDN Web Docs - HTML*
   - *MDN Web Docs - CSS*
2. *JavaScript*: For adding interactivity and handling client-side operations.
   - *MDN Web Docs - JavaScript*
   - *W3Schools - JavaScript Tutorial*
3. *PHP*: For server-side scripting and handling backend logic.
   - *PHP.net Documentation*
   - *W3Schools - PHP Tutorial*
4. *MySQL*: For database management and storing user data, questions, and answers.
   - *MySQL Official Documentation*
   - *W3Schools - SQL Tutorial*
5. *Bootstrap*: For responsive design and UI components.
   - *Bootstrap Documentation*
6. *AJAX*: For asynchronous data fetching without reloading the page.
   - *MDN Web Docs - Using Fetch*
   - *W3Schools - AJAX Tutorial*
7. *Stack Overflow*: For troubleshooting and finding solutions to coding challenges.
   - *Stack Overflow*
8. *GitHub*: For version control and collaboration.
   - *GitHub Documentation*