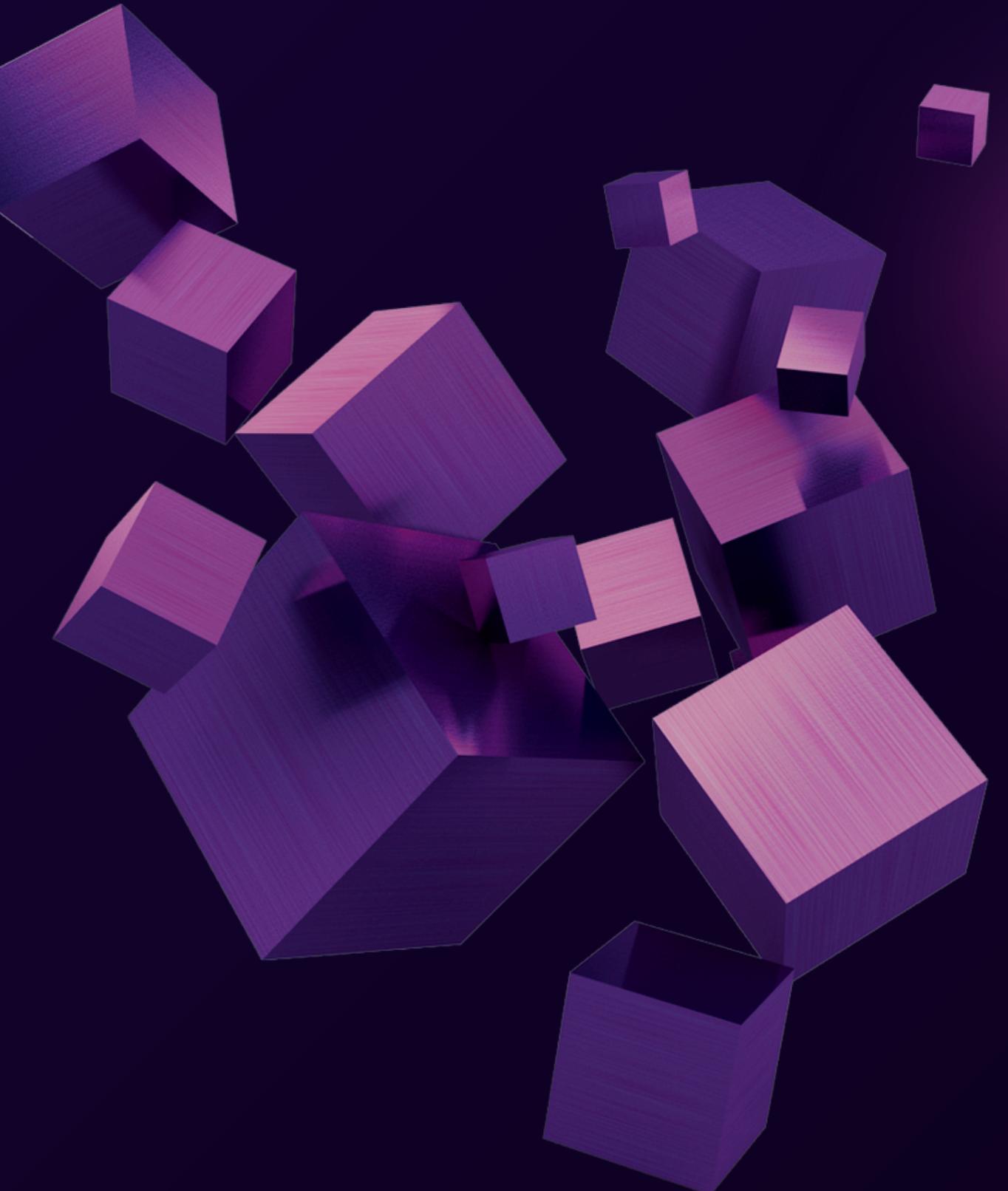


STUDY & PARTIAL IMPLEMENTATION OF E-PERMIT SYSTEM

A presentation on the industrial internship project submitted in
partial fulfillment for the award of the degree of
“B.Tech Computer Science and Engineering”
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PROBLEM STATEMENT

Certain industries with hazardous operations, especially refineries, face numerous safety risks due to the handling of flammable materials, high-temperature processes and toxic chemicals. Potential dangers like fire and explosions from volatile substances, exposure to harmful gases, equipment failures under high pressure and chemical spills can pose a threat to the safety of workers and cause extensive property damage and disrupt operations. Such industries require stringent safety protocols to carefully control and monitor all high risk activities by ensuring the preventive measures are in place to protect the people, assets and the surrounding area.

SOLUTION

To address the safety risks inherent in high-risk industries like refineries, the e-Permit system offers a structured, digital approach to managing hazardous activities with precision. By providing a real-time monitoring and an automatic permit issuance as well as approvals, this system ensures that only authorized personnel carry out activities under safe conditions.

OVERVIEW OF E-PERMIT SYSTEM

The e-Permit system, following the OISD guidelines, is a safety tool that automates and manages the approval process for high-risk tasks, ensuring that all safety protocols are followed. It handles permit requests, checks active permits, verifies work orders, and authenticates users through training. Work in industries is categorized under:

- **Cold Work (non-ignition activities)**
- **Hot Work (ignition-risk activities)**

Based on the nature of the work, our e-Permit system can issue either a cold permit or a hot permit.

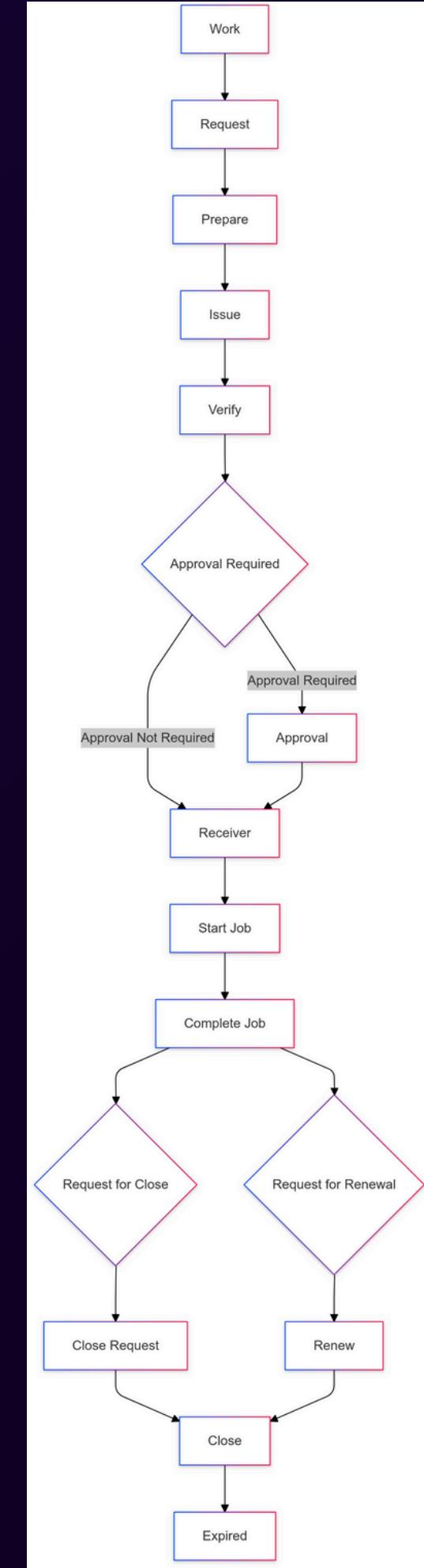
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SYSTEM MODULES & SYSTEM FLOW

A system module is a distinct component within a larger software system, designed to perform specific functions. Each module focuses on a particular part of the system's functionality, enabling users to perform defined tasks within that scope. Modules work together to create a complete, integrated system, helping to provide a seamless experience for users. This project focuses on implementing two essential modules of the e-Permit system:

- **PERMIT ISSUE MODULE:** allows issuers to create permit based on area and time that directly opens to the permit issue page upon login.
- **PERMIT RECEIVE MODULE:** shows the issued permits to the logged-in receiver, who can mark them as received or pending and activates them in the system

The e-Permit system starts with a request, checking for all the active permits and verifying the checklists. The request is sent to the issuer, who reviews and issues the permit. The recipient then begins the job and upon completion, requests permit closure. For jobs exceeding the time limit, a renewal is requested, or for permits over 7 days old, a new request is made.



TECHNOLOGY STACK

01

FRONT-END : HTML, CSS, JavaScript, Bootstrap5, jQuery

02

DATABASE DESIGN : Microsoft SQL Server Management Studio

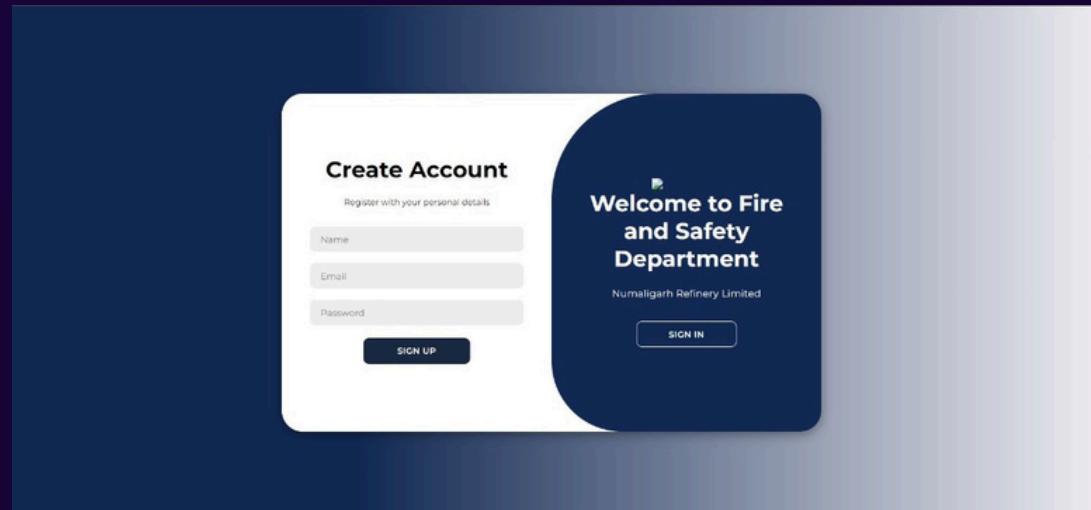
03

BACK-END : C#, ASP.NET Framework, MVC (Model-View-Controller) Architecture



FRONT-END OF E-PERMIT SYSTEM

LOGIN PAGE



PERMIT ISSUE PAGE

PERMIT RECEIVE PAGE

SI No.	Permit No.	Job Description	Issued Type	Receive Status	Action
1	NRL-REF-PTW-1632	replace gas pipes	Cold Permit	Pending Receive	<button>Permit Receive</button> <button>View Details</button>
2	NRL-REF-PTW-1388	DEBUGGING	Cold Permit	Permit Received	<button>Received</button> <button>View Details</button>
3	NRL-REF-PTW-8341	JOB1	Cold Permit	Permit Received	<button>Received</button> <button>View Details</button>
4	NRL-REF-PTW-6235	asdadas	Cold Permit	Permit Received	<button>Received</button> <button>View Details</button>

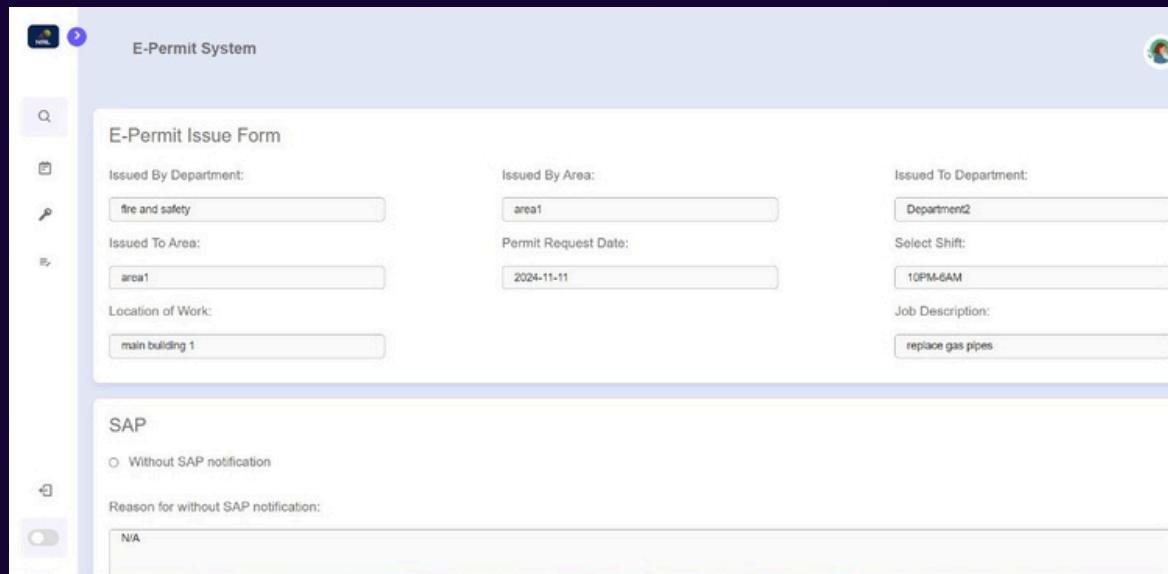
- Dual sections for Sign In (existing users) and Create Account (new users).
- Clean, welcoming design with a focus on ease of access.

- Allows users to create and issue new permits with fields for department, location, and job type etc.
- Simple interface with options for Cold/Hot Permit selection and form reset.

- Displays permit details with options to confirm or receive.
- Organized with search and filter capabilities for quick permit tracking.

FRONT-END OF E-PERMIT SYSTEM

PERMIT CONFIRMATION PAGE



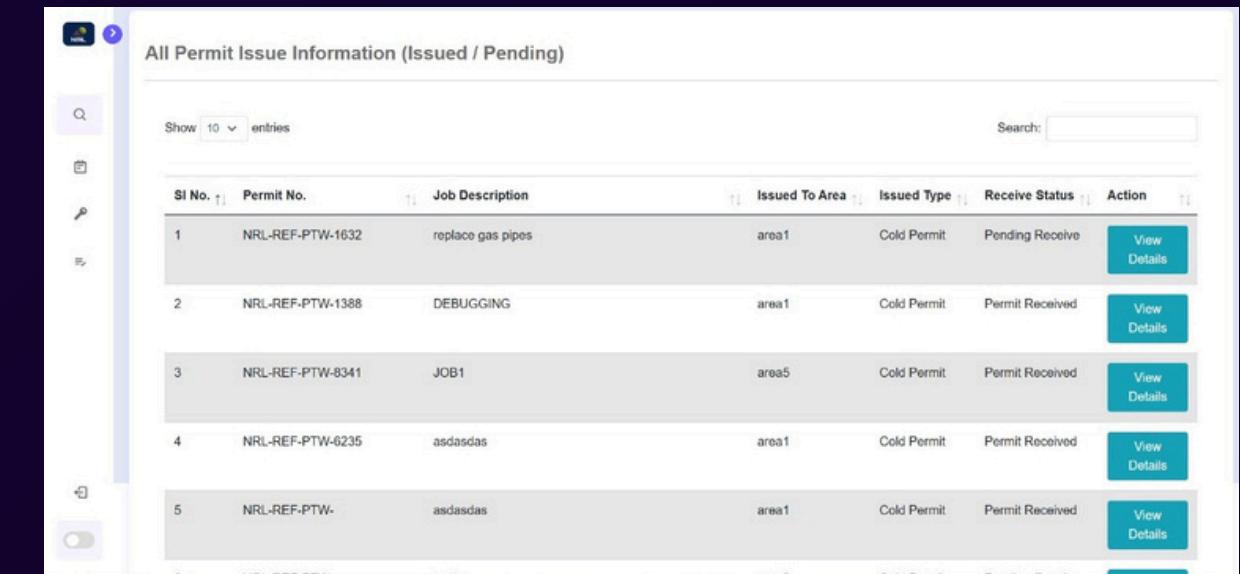
E-Permit Issue Form

Issued By Department: fire and safety
Issued To Area: area1
Issued To Department: Department2
Issued To Area: area1
Permit Request Date: 2024-11-11
Select Shift: 10PM-6AM
Job Description: replace gas pipes

SAP

Without SAP notification
Reason for without SAP notification:
N/A

ALL PERMIT ISSUED INFORMATION PAGE

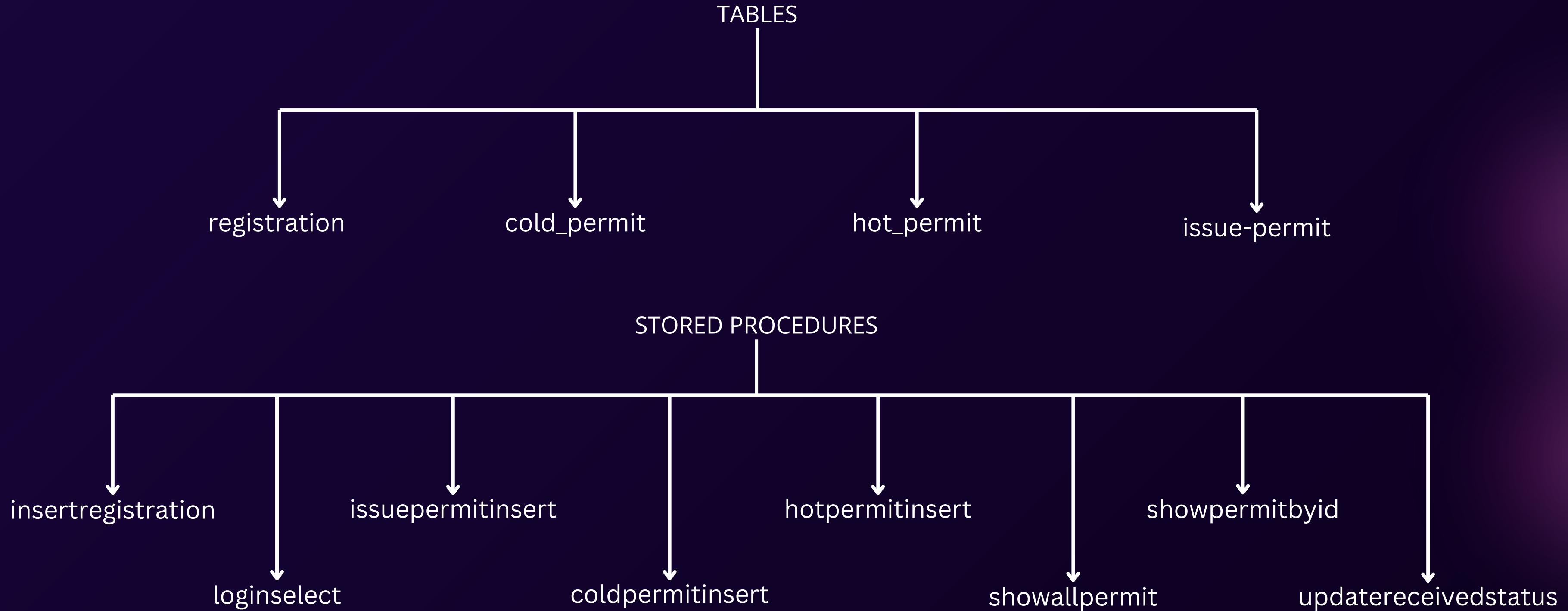


All Permit Issue Information (Issued / Pending)

SI No.	Permit No.	Job Description	Issued To Area	Issued Type	Receive Status	Action
1	NRL-REF-PTW-1632	replace gas pipes	area1	Cold Permit	Pending Receive	<button>View Details</button>
2	NRL-REF-PTW-1388	DEBUGGING	area1	Cold Permit	Permit Received	<button>View Details</button>
3	NRL-REF-PTW-8341	JOB1	area5	Cold Permit	Permit Received	<button>View Details</button>
4	NRL-REF-PTW-6235	asdasdas	area1	Cold Permit	Permit Received	<button>View Details</button>
5	NRL-REF-PTW-	asdasdas	area1	Cold Permit	Permit Received	<button>View Details</button>

- Shows permit details like department, location, and job type etc.
- Confirm button to acknowledge receipt of the permit.
- Comprehensive list of all permits issued with search and filter options.
- Provides an overview of permit history for easy monitoring and reference.

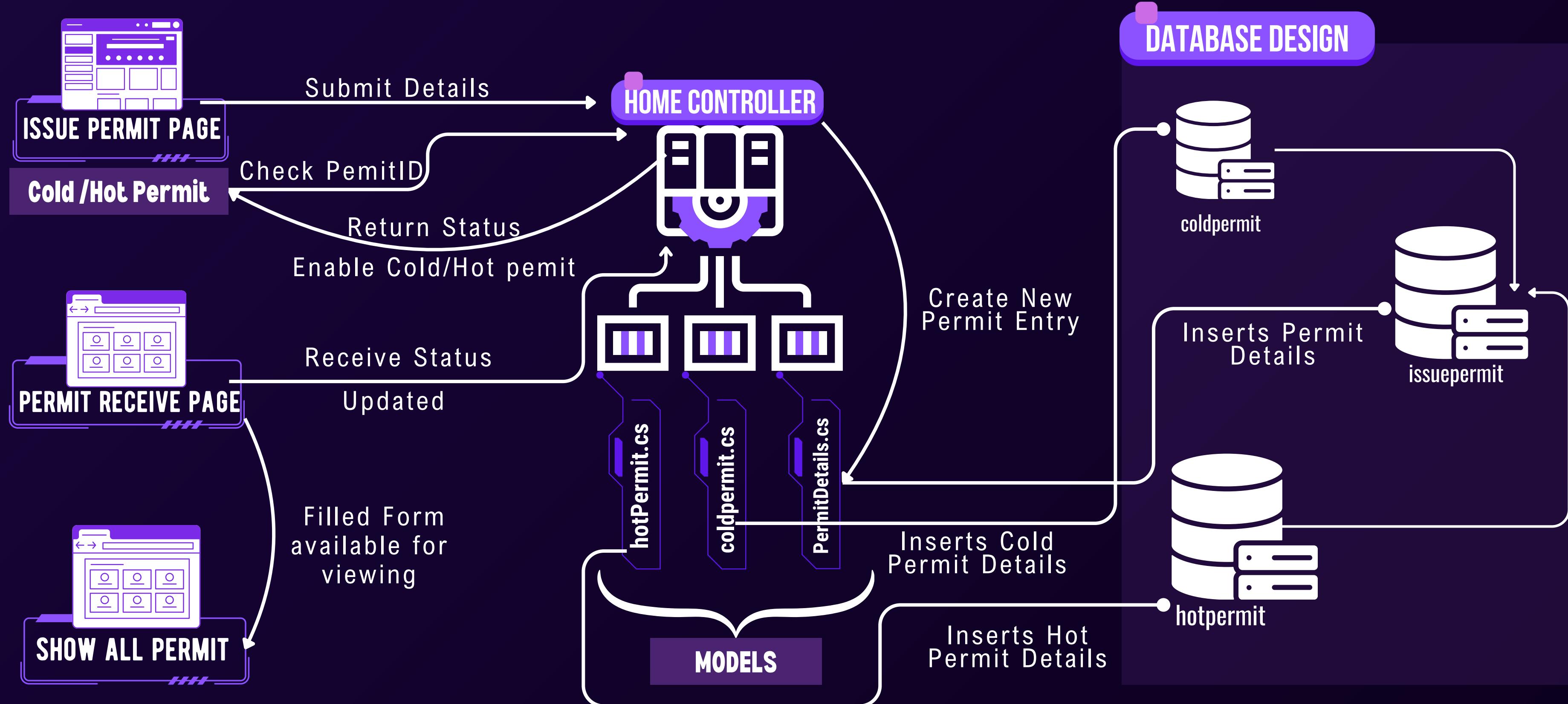
DATABASE DESIGN OF E-PERMIT SYSTEM (E_PERMIT)



BACK-END OF E-PERMIT SYSTEM

- **ASP.NET Framework:** An open-source web application framework developed by Microsoft that helps in building dynamic websites, web applications and web services. It operates on the .NET platform, allowing the use of multiple languages like C#. It provides a robust infrastructure for building scalable applications by offering features like server-side rendering, rich libraries, authentication system, database connectivity and session management.
- **Model-View-Controller (MVC) Architecture:** An architecture/design pattern that separates an application into three interconnected components:
 - **Model:** represents the data and logic of the application, manages data and responds to requests for information.
 - **View:** the user interface that displays data in the form of HTML and handles what the user sees.
 - **Controller:** an intermediary handling user input from view, processing it and updating the Model as necessary.
- **C# :** An object-oriented programming language developed by Microsoft as a part of .NET framework. Designed for simplicity and efficiency, it is versatile and widely used for building web applications (using ASP.NET). It supports inheritance and polymorphism which promotes a structured and reusable code, suitable for high performance applications.

MVC ARCHITECTURE OF E-PERMIT SYSTEM



BENEFITS OF E-PERMIT SYSTEM

- **Enhanced Safety Compliance:** Automates permit verification and checklist procedures to meet industry safety standards.
- **Improved Efficiency:** Reduces time for permit issuance and tracking, minimizing delays in work process.
- **Error Reduction:** Digital records reduce paperwork errors and ensure accurate, real-time data.
- **User-Friendly Access:** Simplified user interface allows easy permit request, approval, and tracking.

CONCLUSION

The e-permit system streamlines the work permit process, ensuring safety compliance and operational efficiency. By automating permit management, the system reduces errors, enhances productivity, and supports a safer work environment. Future scope includes expanding features for comprehensive permit handling.