PROJECT DOCUMENTATION

Search Tool Application(HELP-HUB)

**Submitted To:**  
Bharat Electronics Limited (BEL)

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**1. Introduction**

This report outlines the development and functionality of a search tool application designed for BEL (Bharat Electronics Limited). The primary objective of this application is to allow users to register, log in, and create posts consisting of problem statements, descriptions, and relevant keywords. Additionally, the application enables users to search for posts created by others without the need for login. This project was developed using Java Server Pages (JSP) with MySQL as the backend database and is hosted on a locally configured Tomcat server, ensuring it operates offline without requiring internet connectivity.  
  
  
  
  
**2. Project Overview**

**2.1 Purpose**

The purpose of this search tool application is to facilitate the sharing and discovery of problem statements within a community of users. Registered users can contribute by posting their problem statements, which include descriptions and keywords, and provide valid contact information. These posts can then be searched by anyone using relevant keywords, promoting collaboration and problem-solving within the community.

**2.2 Scope**

* User Registration: Users can create an account by providing their credentials. These credentials are securely stored in a MySQL database table called users.
* User Login: Registered users can log in to the application using their credentials. This authentication is necessary for post creation and deletion.
* Post Creation: Once logged in, users can create posts that contain problem statements, descriptions, keywords, and contact information. These posts are stored in a MySQL database table called posts.
* Post Search: Users can search for posts using keywords. This feature is available to all users, regardless of whether they are logged in or not.
* Post Deletion: Users have the ability to delete posts they have created, ensuring they maintain control over their content.

**3. System Architecture**

**3.1 Technologies Used**

* JavaServer Pages (JSP): The application was developed using JSP for building dynamic web pages.
* MySQL Database: MySQL is used to store user credentials in the users table and post information in the posts table.
* Tomcat Server: The application is hosted on a Tomcat server, configured locally to run offline, eliminating the need for an internet connection.
* Client-Side Validation: JavaScript is used to ensure that all forms are validated before being submitted, enhancing the user experience and ensuring data integrity.

**3.2 Database Design**

* **Users Table:**
  + **Stores user credentials such as username and password and contact details.**
  + **Primary key: user\_id.**
* **Posts Table:**
  + **Stores information about posts, including the problem statement, description, keywords, and contact details.**
  + **Foreign key: user\_id links each post to the user who created it.**
  + **Primary key: post\_id.**

**4. Functionality**

**4.1 User Registration**

Users register by providing a unique username, department, contact number and password. This information is stored in the users table, ensuring secure storage of credentials.

**4.2 User Login**

Registered users log in using their username and password. Upon successful login, users gain access to post creation and management features.

**4.3 Post Creation**

Logged-in users can create posts by entering a problem statement, description, keywords, and their contact information. This data is stored in the posts table, enabling others to search and view the post.

**4.4 Post Search**

Users can search for posts by entering keywords. The search function queries the posts table to return relevant results based on the provided keywords. This feature is accessible without logging in, encouraging open access to information.

**4.5 Post Deletion**

Users can delete posts they have created. This functionality is restricted to the original creator of the post, ensuring that users retain control over their contributions.

**5. Implementation Details  
  
  
Database Creation:**

* The MySQL database was created with two primary tables: users and posts.
  + Users Table: This table was designed to store user credentials securely. Fields include user\_id, username, and password. The user\_id is the primary key.
  + Posts Table: This table stores posts created by users. Fields include post\_id, user\_id, problem\_statement, description, keywords, and contact\_number. The post\_id serves as the primary key, while the user\_id serves as a foreign key linking each post to its creator.

**Dependency Files:**

* The project requires several dependency files, including JDBC drivers to facilitate communication between the JSP application and the MySQL database. These files are stored in the lib directory of the Tomcat server.
* Configuration files such as web.xml were created to define servlet mappings and session management settings.
* It requires dependency jar files in certain paths. It also requires mysql connector jar file for connecting to the database.

**5.2 Tomcat Server Configuration**

The application is hosted on a Tomcat server that has been set up locally. This configuration ensures that the application can run offline, making it ideal for environments where internet access is limited or unavailable.

**5.3 Security Considerations**

* Password Encryption: User passwords are encrypted before being stored in the users table to ensure security.
* Session Management: The application uses session management to maintain user state after login, preventing unauthorized access to post creation and deletion features.

**5.4 Validation**

Client-side validation is implemented using JavaScript to ensure that all necessary fields are filled out correctly before form submission. This reduces the risk of errors and improves the overall user experience.

**6. Conclusion**

The search tool application developed for BEL is a robust platform that facilitates the sharing and discovery of problem statements within a user community. With secure user registration, login, post creation, and search capabilities, the application is designed to be both user-friendly and functional. The local configuration on a Tomcat server ensures that the application can operate efficiently in offline environments, making it a suitable solution for BEL's requirements.