

PROJECT REPORT

**Report 4 – Software Design Document**

– Da Nang, April 2023–

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# Record of Changes

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **A\*, M, D** | **In charge** | **Change Description** |
| 09/06/2023 | A | All | Add initial version |

\*A - Added M - Modified D - Deleted

# Software Design Document

## Overall Description

### Assumptions

* + - * Operating System: The Dormitory system will be running on Windows Operating system.
      * Hardware: The Dormitory system will be running on at least 1 core processor, 1GB RAM, and 20GB disk space.
      * Network Connectivity: The Dormitory system assumes that an internet connection is available for communication with external services or databases.
      * Network Connectivity: The Dormitory system assumes that an internet connection is available for communication with external services or databases.
      * Third-party libraries: The Dormitory system assumes the availability and compatibility of third- party libraries or APIs that Dormitory system relies on are quite good.

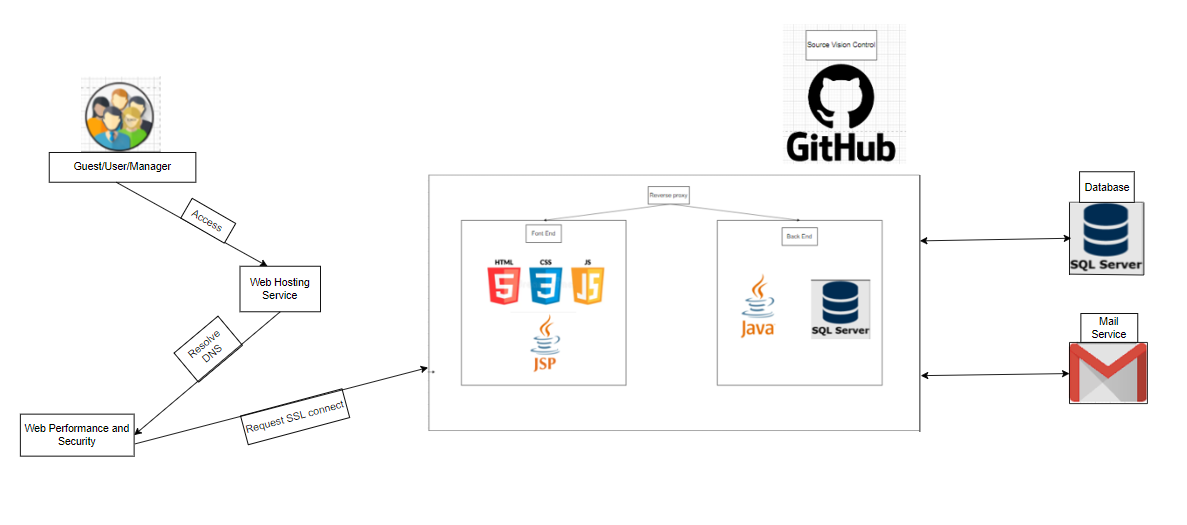
### Design Constraints

* + - * Websites must be designed to handle high traffic, as multiple users can access the site at the same time.
      * The website must be accessible on different devices, including desktops, laptops, tablets, and smartphones.
      * The website must be designed with security in mind, to protect user data and prevent unauthorized access to the website.
      * Websites should be designed to load quickly, ensure a smooth user experience, and minimize frustration.
      * The website must be designed to be extensible, so that it can accommodate future growth and expansion.

## System Design

### System Architecture

##### System Architecture Diagram



**Figure 1. System Architecture Diagram**

##### System Architecture Explanation

#### HTML

The different elements and tags used by HTML to define a webpage's headings, paragraphs, links, pictures, tables, and forms. These tags give browsers guidance on how to format and display the information.

#### CSS

CSS gives site designers control over a webpage's visual elements, including its layout, colors, fonts, and other elements. CSS gives users more freedom and control over how web pages look by separating display from document structure and content..

#### JS

Form validation, DOM manipulation (changing the content and structure of a webpage), event handling (responding to user actions like clicks and keystrokes), making asynchronous server requests (AJAX), and creating animations and effects are just a few of the many tasks that can be carried out using JavaScript.

#### JSP

In-built Java support, access to Java objects and libraries, session management, and integration with Java servlets and other Java EE technologies are just a few of the advantages offered by JSP. It makes it possible to create dynamic web pages that can communicate with databases, handle user input, and produce information that is tailored to the individual.

#### Java-Java Servlet

The request-response model is how servlets operate. A client sends a request to the server, which the servlet then processes and provides back to the client. Servlets can operate with many data formats including HTML, XML, JSON, and others and can handle a variety of request types like GET, POST, PUT, and DELETE.

#### SQL server

SQL Server manages and processes data using the Structured Query Language (SQL). It offers strong features for data storage, retrieval, and manipulation while supporting a wide range of data types. Through compliance with ACID (Atomicity, Consistency, Isolation, Durability), SQL Server offers transactional integrity, data consistency, and reliability.

### Package Diagram

##### Package Descriptions

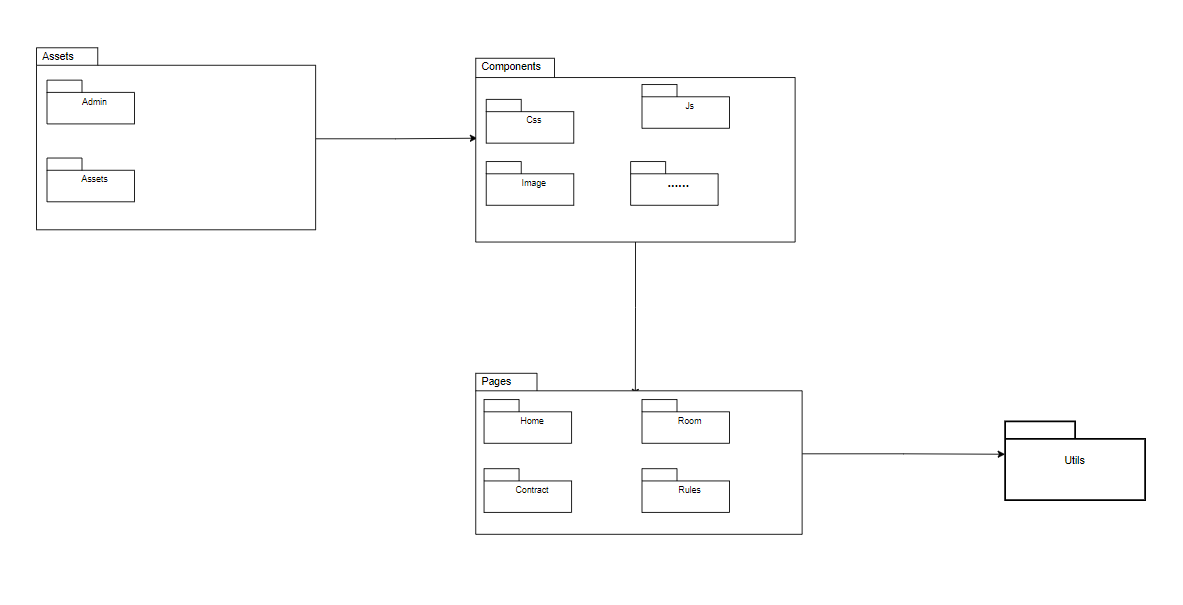
|  |  |  |
| --- | --- | --- |
| **No** | **Package** | **Description** |
| 01 | Dormitory System -client | All package for Dormitory System-client project |
| 02 | Dormitory System -web-app | All package for Dormitory System -web-app project |

**Table 1. Package Descriptions**

##### Package Diagram

1. **Dormitory System-front end**

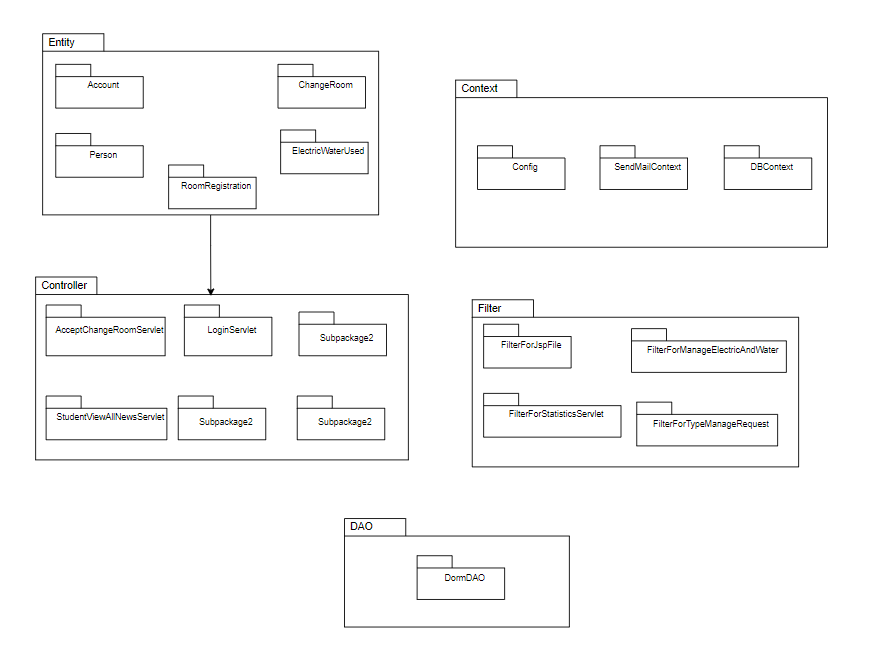
Below is the directory organization of the Dormitory System project's front-end consists of a structured arrangement of files and folders that organize and manage the project's user interface components. This organization allows for efficient management and easy navigation within the project.



**Figure 2. Dormitory System-client Package Diagram**

1. **Dormitory System-back end**

Below is the directory organization of the Dormitory System project's back-end is a structured system of files and folders that organize and manage the project's server-side components. This organization facilitates efficient management and easy navigation within the project, ensuring that developers can quickly find and modify the necessary files.

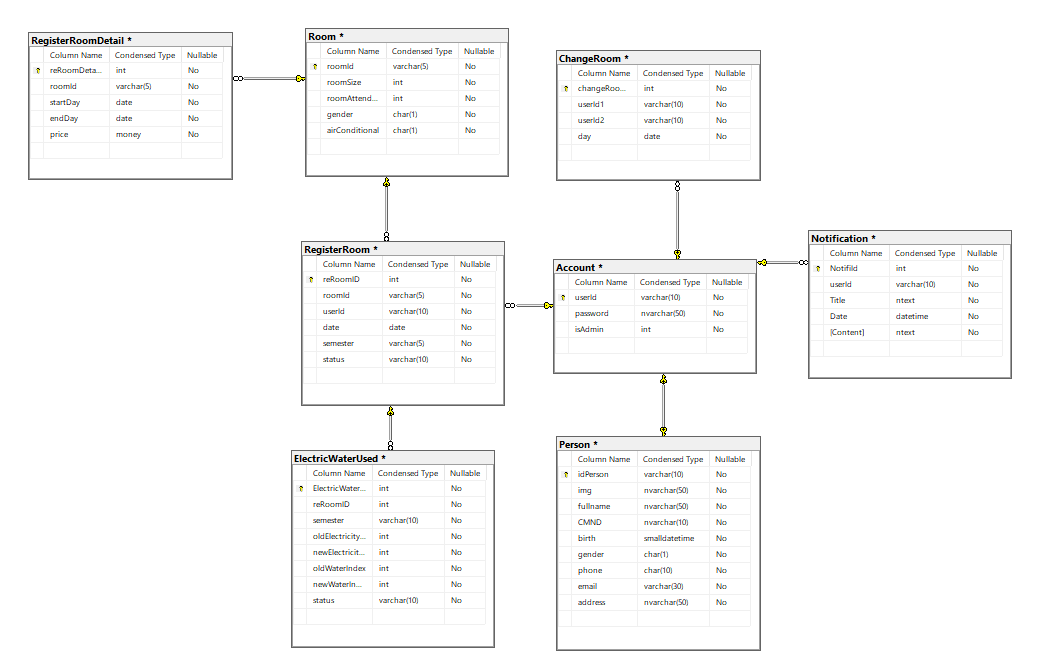


**Figure 3. Dormitory System-web-app Package Diagram**

## Database Design

### Database diagram

Our project's database is a comprehensive system designed to store and manage all the data related to our project. It consists of 8 tables that hold different types of information such as: person, account, RegisterRoom, ... We use SQL server in this project, below is the database schema we describe:



**Figure 4. FLearning’s platform database diagram**

### Schema Descriptions

|  |  |  |
| --- | --- | --- |
| **No** | **Schema** | **Description** |
| 01 | Account | This schema stores all information of User, Admin which contains fields such as userID, password. |
| 02 | Person | This schema stores user and admin information which contains fields such asid, image, full name, and other related information. |
| 03 | RegisterRoom | This schema stores information about room booking including: room registrant id, roomId, registration date, … |
| 04 | Room | This schema stores information about the requirements of the registered room |

|  |  |  |
| --- | --- | --- |
| 05 | RegisterRoomDetail | This schema stores information about room booking details including registration date, price, etc. |
| 06 | ChangeRoom | This schema stores information about the information of room change requester and room changer. |
| 07 | Notification | This schema stores information about dormitory messages to students. |
| 08 | ElectricWaterUsed | This schema stores information about electricity and water usage. |

**Table 2. Schema Descriptions**

## Detailed Design