MEet and You

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Table of Contents

Overview

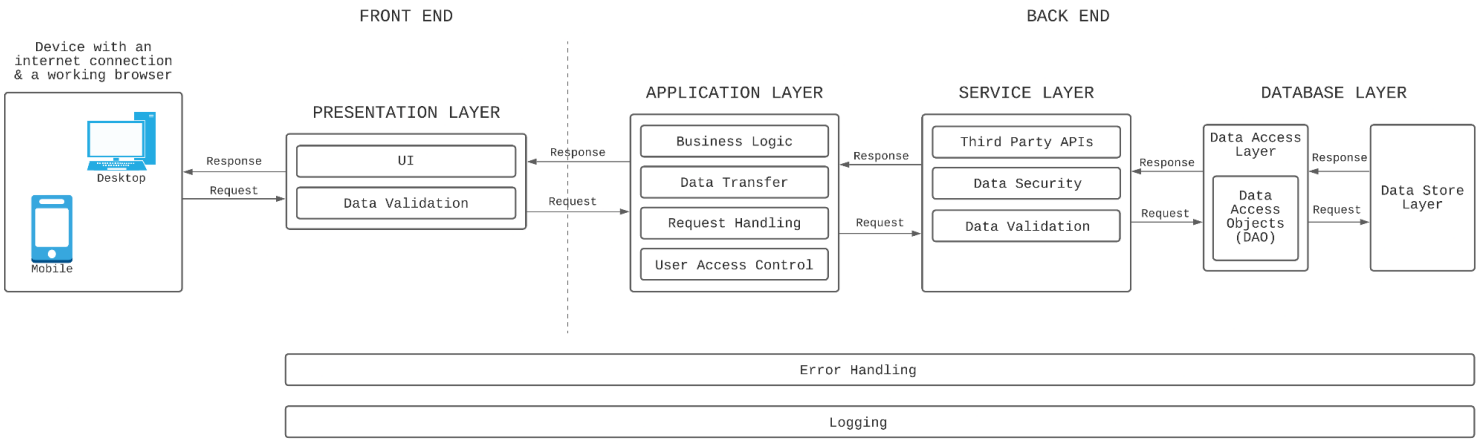
Purpose

The purpose of this high level design (HLD) document is to provide an overview of the MEet & You application. This document also gauges insight into the structure of our application.

Scope

MEet & You is intended to be a web application. In order to use MEet & You, a sufficient internet connection and access to a web browser are necessary. MEet & You will function as a single-page application (SPA), dynamically loading the content as the user navigates the website. It will also support the MVVM software architecture.

System Architecture



General Overview

Our system will be split into our front end, consisting of our User Interface (UI), back end, consisting of application implementation code, web server, and database management.

Front end architecture: MVVM
Back end architecture: SOA

Presentation Layer

The presentation layer will house the front end of our application. This is the place where the user will be able to interact with and carry out functions like creating an itinerary or accessing

their user dashboard. The presentation layer will also take any user input, send that input through our system, and receive a corresponding output.

User Interface (UI)

The user interface is the visual component shown to the user as they interact with our application. It displays the different functionalities of our application in a simple way for the user to understand.

Data Validation in the Presentation Layer

Any input provided by the user in the presentation layer will be checked before sending it to the other layers in our system. This ensures proper formatting of the input, which will maintain the integrity of the data going into the back end. If misformatted data is entered by the user, our presentation layer will communicate to the error handling layer, provide the user with a user input error, and allow them to re-enter their input.

Application Layer

Our application layer is the entry point of our web application. It contains the business logic, data transfer, request handling, and user access control components of our system. The application layer is responsible for managing the business requests originating from and gathering all the information business requests require.

Business Logic

Business logic is the custom rules utilized in handling the exchange of data between both a database as well as the user interface. Business logic is an essential part of defining the constraints in regards to how the application operates. The business logic of our application will be maintained in our application layer which will notify the service layer to perform the necessary services to validate the business requirements stated in our Business Requirements Document.

Data Transfer

The purpose of data transfer inside our application layer is to dispatch any data requests from the presentation layer to the service layer. It will also return data responses from the service layer to the presentation layer.

Request Handling

The purpose of our request handling functionality is to process business requests. It will accomplish this by first consuming the request from the presentation layer. Once our request handler receives the request, it then gathers the appropriate information necessary

to fulfill the request. After that information is collected, the fulfilled request is sent back to the presentation layer.

User Access Control

Adding user access control functionality is necessary to issue limitations to users using our system. We want to ensure that only certain users have access to certain data and functionalities of our application.

Service Layer

The service layer of our application provides access to the microservices required to run our application. Data that has been processed is sent to the service layer in order to get both authorized and validated to ensure that the user is allowed access to specific information, as to ensure that what the user does is not an invalid action. If access is unauthorized then this particular session will be recorded.

Third-Party APIs

Any third-party APIs utilized in our application will be called in our service layer.

Data Security

The purpose of data security in the service layer is to provide additional protection of the data before utilizing an API or a microservice. We intend to accomplish this through the authorization of the user and their session, ensuring they are both valid before permitting the user to perform a microservice.

Data Validation

If a certain business request requires database access, the data inside the request must be validated before giving database access. This is to ensure the data's integrity before entering the data access layer. Data returned from API calls would also be validated to ensure correctness and completeness.

Web Server?

Data Access Layer

The data access layer would process any request from the user which requires information to be accessed via a database. It will act as a liaison between our data requests and the data store layer and administer the transfer of data. Our application will utilize Data Access Objects to retrieve and manipulate database entities. Any requests passing through this layer will need to be authenticated by our system to confirm the request sender's identity and if they have a valid user session.

Data Access Objects (DAOs)

Our application will utilize DAOs to enable business requests to perform data manipulation without revealing database details. The DAOs are intended to create more abstraction and protect our databases from releasing unauthorized information.

Input Validation in the Data Access Layer

The data inputted into the data access layer will be checked and compared to the user's initial input to ensure that no modifications were made through the transfer of data.

Data Store Layer

This layer of our architecture contains all the database tables and entities required for our application. It can only be accessed through the data access layer using a data access object.

Security Layer

Security features will be located throughout the MEet & You application. It will take fo

- Having Data Access Objects (DAOs) to access the database rather than interacting with the tables directly
- Two-Factor Authentication (2FA)

Error Handling Layer

Error handling layers will be implemented throughout our entire system. This is because exceptions can be thrown in a handful of locations. Errors would be handled and logged where they originated. Potential errors in our system include:

- Server Request Timeouts
- Invalid Server Request
- Server Error
- Invalid User Input
- Unauthorized Access
- Required Contact Administrator

Our system supports multiple server-side errors. These include:

- Invalid Server Request
- Server Error
- Unauthorized Access
- Required Contact Administrator

Logging Layer

Our logging layer will note specific events which occur in our system. Events in our application which we intend to log are:

- User logins/logouts
- User registration is successful
- User itinerary registration is successful
- Security breaches
- Errors in our system
- Usage of application features by users

Logs can be created anywhere in our system. When the system needs to create a log, it will be created in the exact location where the log function was called. Once the log is completely written, it is then transported to a log database, located in our data store layer.