

# Chapter– 17

## VISA MANAGEMENT APP & THE ROYAL INN

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### **THE ROYAL INN**

*We provide consulting and consultancy services to investors or individuals interested in entering the hospitality industry, as well as helping hotels, resorts, restaurants, etc., generally independent, which are already operating. The most important aspect of a good hotel consulting agency consists of the years of experience it has related to both hotel operations and business in general, greatly valuing international experience, so we try to handle the core operations of an entity. In the same way, a wide academic background is essential if we want to hire the best professional to help us be successful, by making more effective decisions at the right time. An experienced and well-trained consultant is an excellent investment to obtain the desired results for your business. We at FCCM always try to fulfill our clients' requirements by providing various products like Website Designing & Deployment, App Development, Hosting Services, E – Mail Solutions & SEO, Pre-opening projects, Equipment's etc.*

We are serving our diversified customers from office locations at Gurgaon and Pune. Few of our successful projects are The Royal Inn , Hotel the Meridien etc. We are team of well qualified technology enthusiast, who have rich experiences in their fields, and we aim to provide comprehensive solutionsto the industries starting from scratch to a well finished entity. We understand the business needs of our customers and foster seamless information exchange and best practices, to deliver the best final product.

## **COMPANY WORK SCOPE**

We have various specialized team members to handle various task, and work on an agile development model, also all engineers have their own respective experience and specialty in their fields, that is why we are able to work in large diversity of things.

To establish and maintain the quality benchmarks that we set in our domain, we have two high performance quality teams: 1. Consulting Team 2. Technical Team. In our pursuit of excellence. Generally, we have named these two teams in such a way that for consulting team we called them as CT team and for Technical Team wecalled them as TT team. CT teams are very much responsible for taking suggestion from the clients and creating a documentation regarding that, and according to those requirements are passed to the TT teams to implement those requirements.

Company works in large diversity of things. Many of them are listed below in which company works significantly in past 5 years.

1. Pre-Opening Project
2. Website Development
3. SEO Solution
4. App Development
5. Hosting Services
6. Menu Designing
7. Restaurant Planning etc.

In this chapter, we will discuss the area of work being undertaken by me in the technical department. And show the current level of progress on the project specific area of learning. We will list the type of methodology to be used along with the significance of possible result. Then we will list out the main objectives of the project with its impact on general commercial environment.

As company deals with Web development, most of the company clients demands more responsive UI that can be easy for navigating, including various features like payment integration, site analytics, search console etc. We as a developer has to

deliver a responsive UI that is user friendly, which is comprised of various tasks like planning, designing, gather content, building, testing, upload to server and maintenance.

End goal is to make a responsive UI that is user friendly. We will discuss this manipulation later in this report.

## **OBJECTIVE**

- Our objective is to satisfy the clients requirements and create a responsive and user-friendly UI with an integrated payment gateway system that can make them t accept payments.
- **UI:** First, we need to create a structure for the UI , like what will be the color scheme that is suitable for client, what are the features they want in their website etc.
- **Payment Integration:** Integrating a payment gateway for the purchase of the products.
- **Booking Management System:** Creating a successful booking management system for booking a product etc.
- **Deploying:** Setting up all the website files and deploying it on a hosting server.
- **SEO:** Optimizing the website so that it appears in the web result etc. Indexing the website etc. Keyword targeting etc.

## **REQUIREMENT ANALYSIS**

This is the set of activities that lead to the production of requirements definition and requirement specification. In requirement engineering first all try to find out the need and requirements of the customer. This helps us to go ahead with our project. Requirement definition is the most crucial part of the project. Incorrect, inaccurate, or excessive definition of requirements must necessarily result in schedule delays, wasted resources, or customer dissatisfaction. This section will discuss indetail the underlying the requirements for the development of our project.

### **UI Requirements**

We must take requirements from the clients in such a way that the budget constraints should be kept in mind and the client gets all the requirements fulfilled accordingly. Some of the major points that are kept in mind while taking requirements are :

- Security

- Reliability
- Maintainability
- Portability
- Extensibility
- Reusability
- Compatibility
- Resource Utilization

## SYSTEM REQUIREMENTS

### Software Requirements:

1. **Hostinger:** Hostinger is a hosting service that lets you host your websites including features like cronjobs, mailing list, MySQL database , some famous web development CMS like WordPress , Moodle , WooCommerce. It is the most reliable hosting services in the world as it provides 99.99% active time.
2. **JavaScript:** JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. As of 2022, 98% of websites use JavaScript on the client side for web page behavior, often incorporating third-party libraries is an appropriate language or technology to build a real time dashboard with single page behavior. This JavaScript library is developed and maintained by Facebook.
3. **Visual Studio:** Visual Studio is the official integrated development environment (IDE) for Window's operating System built by Microsoft Corporation.
4. **Google Search Console:** Google Search Console is a web service by Google which allows webmasters to check indexing status, search queries, crawling errors and optimize visibility of their websites. Until 20 May 2015, the service was called Google Webmaster Tools.
5. **Git:** Git is a distributed version control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files.
6. **Sublime Text Editor:** Sublime Text is a shareware cross-platform source code editor. It natively supports many programming languages and markup languages. Users can expand its functionality with plugins, typically community-built and maintained under free-software licenses. To facilitate plugins, Sublime Text features a Python API.
7. **WAMP Server:** WampServer refers to a solution stack for the Microsoft Windows

operating system, created by Romain Bourdon and consisting of the Apache web server, OpenSSL for SSL support, MySQL database and PHP programming language

### **Booking Management System**

Here in this section, we have created a booking management system where , a user can book a room using the website directly from the website. This is a simple php written code integrated with the UI that sends a mail to the client and a system generated invoice to the user. Below you can find the sample of the reservation. In this section we will be implementing the payment gateway. For payment gateway we have selected Razorpay for accepting the payment because of its supports various types of payments, like using UPI, cards, net banking, international merchants like American Express etc. For Implementing we have to first verify as a merchant then, afterwards we have to generate a API key and a secret key from the Razorpay dashboard, after that we need to create an API for that and merge some files with the website ,which are necessary for accepting the payments. After completing of this we can test the payments in demo mode, if successful in demo mode, then we can start accepting the payments in live mode. Below is the snippets of the payments page.

### **DEPLOYING: OVERVIEW**

For hosting our website, we have selected HOSTINGER, because it has the highest uptime in the market until now, and it gives more features than existing competitors.

### **IMPLEMENTATION**

First, we had to setup a ftp client so in order to keep everything in sync. After this all the files were safely uploaded to the public folder, we had to check the various API whether they are working, or not. We also had to verify this domain as a property in the Google Site Analytics, in order to view the analytics of this website and search engine optimization. Below is the snippet of the dashboard of the Hostinger.

### **Testing the Speed & Load Time**

After successfully deploying and testing API , we have to check the speed of the website and load time using the inbuilt tool provided by the hosting. We tested speeds for both mobile and desktop. Below are the snippets of the test results:

### **SEO: OVERVIEW**

The main use of SEO is to optimize the website so that the website gets noticed and gets filtered in the search results and get traffic. For SEO we used Google Search

Console and Bing Webmaster Tools , because it has various features and tools to view the analytics of the website. Some of the features of Google Search Console is that it can show you the number of backlinks , pagespeed, insights according to demography, user, device etc., page experience, webpage core vitals, sitemaps , indexing, etc. Below are the performance of the website:

### **Indexing**

Indexing is very important to get filtered and appear on search results, commonly used indexing providers are Google Site Indexing and Bing Instant Indexing. So, for indexing the website, we used both Google's site indexing and Bing's instant indexing, both supports indexing using sitemaps and manually. Below is the indexing report from both the Bing and Google

### **PERFORMANCE**

Performance tells the actual health of the website, in performance various attributes comes like the pagespeed, load time, insights of the website, search queries, search appearance etc., below are some analytics of the performance from Google Search Console and Bing Webmaster Tools:

### **Generating Report**

After successfully development and deployment a brief report was generated and sent to the client, specifying them what was the performance in last month and the visitors to the website along with the keywords which were most searched Visa Management Application) LinkedIn Technologies is a team of enthusiastic professionals who offer one stop solution to all computing needs with high quality of services. They are focused on development of android apps, iOS apps and web applications. They have worked with numerous national and international clients across the industries. Company is a client-friendly service provider who have delivered products in domains like EdTech, FinTech, HealthTech, CRM, CRP, ERP and many more. They always focus on the work towards client satisfaction by delivering high quality standard. We are serving our diversified customers from office locations at Gurgaon. Few of our successful projects are Rozanna, Lucky Money, Liem, Tpm World Services, etc.N We are team of well qualified technology enthusiast, who have rich experiences in their fields, and we aim to provide comprehensive solutions to the industries starting from scratch to a well finished entity. We understand the business needs of our customers and foster seamless information exchange and best practices, to deliver the best final product.

## **COMPANY WORK SCOPE**

We have various specialized team members to handle various task, and work on a agile development model, also all engineers have their own respective experience and specialty in their particular fields, that is why we are able to work in large diversity of things.

To establish and maintain the quality benchmarks that we set in our domain, we have various team to handle all requirements.

Company works in large diversity of things. Many of them are listed below in which company works significantly, in recent years.

- Android App&iOS Apps
- Web Applications
- ERP Application
- EdTech Solution
- FinTech
- HealthTech
- CRM
- etc.

## **INTRODUCTION**

In this chapter, we will discuss the area of work being undertaken by me as a Backend Developer. And show the current level of progress on the project specific area of learning. We will list the type of methodology to be used along with the significance of possible result. Then we will list out the main objectives of the project with its impact on general commercial environment.

## **ABSTRACT**

Backend involves in helping user to get things done through the various tools and services developed by the programmers. The backend of an application is responsible for things like calculations, business logic, database interactions, and performance. Most of the code that is required to make an application work will be done on the backend. Backend code is run on the server, as opposed to the client. As the company deals with various kinds of software solutions, first we have to take the requirements of the clients and then we have to work on various tasks like planning, designing, gather content, building, testing, upload to server and maintenance. In project we were assigned to develop an application named “Visa Management App” ,

which can track the status of the visa application. It has various components like first sign in, sign up, logout, check user, generating qr from invoice. I will be explaining all the steps in this report. End goal is to make an application that can show all the information or the status of the application. We will discuss this manipulation of the application in this report.

## **OBJECTIVE**

Our objective is to satisfy the clients requirements and create an application that can keep track of the visa application. I was assigned to develop API for the application and connect it with the UI.

- **UI:** First, we need to create a structure for the UI , like what components will be required for the application like dashboard, help, status, content etc.
- **About Spring Security:** In this section we will try to discuss more about spring security and its features and more.
- **Creating the API:** Various REST API were created that can do the CRUD operations, like login, logout, using spring security.
- **Routing API:** We will be routing our API on the web for testing and integration purpose.
- **Testing API:** After successful creation of API, we need to check it before connecting to the UI.

## **Technology Used: Overview**

There are various technologies used in creating API, in my case I have been working on Spring Boot it's a framework built on top of Spring, it supports various features like dependency injection, annotation-based configurations, xml-based configuration, spring initializer, POM, logging, security, which can lead to production ready applications. Some more technology that was used in development of the applications are:

### **Software Requirements**

Some more technology that was used in the rapid development of the applications are:

1. **IntelliJ Idea:** IntelliJ IDEA is an integrated development environment written in Java for developing computer software written in Java, Kotlin, Groovy, and other JAR based languages. It is developed by JetBrains and is available as an Apache 2 Licensed community edition, and in a proprietary commercial edition. It is the best IDE as of now as it supports vast library of plugins and more.
2. **Postman:** Postman is an API client that makes it easy for developers to create,



share, test, and document APIs. This is done by allowing users to create and save simple and complex HTTP/s requests, as well as read their responses.

3. **GitHub:** GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere. This tutorial teaches you GitHub essentials like repositories, branches, commits, and pull requests and many more features.
4. **Ngrok:** Ngrok is a cross-platform application that exposes local server ports to the Internet. Ngrok is a globally distributed reverse proxy fronting your web services running in any cloud or private network, or your machine. In simple words it allows to share your localhost ports on web.
5. **Java:** Java is a programming language and computing platform first released by Sun Microsystems in 1995. It has evolved from humble beginnings to power a large share of today's digital world, by providing the reliable platform upon which many services and applications are built. New, innovative products and digital services designed for the future continue to rely on Java, as well.
6. While most modern Java applications combine the Java runtime and application together, there are still many applications and even some websites that will not function unless you have a desktop Java installed. Java.com, this website, is intended for consumers who may still require Java for their desktop applications - specifically applications targeting Java 8.
7. **Spring Boot:** Spring Boot is an open source, microservice-based Java web framework. The Spring Boot framework creates a fully production-ready environment that is completely configurable using its prebuilt code within its codebase. The microservice architecture provides developers with a fully enclosed application, including embedded application servers.

## **Features**

- Create stand-alone Spring applications
- Embed Tomcat, Jetty or Undertow directly (no need to deploy WAR files)
- Provide opinionated 'starter' dependencies to simplify your build configuration
- Automatically configure Spring and 3rd party libraries whenever possible
- Provide production-ready features such as metrics, health checks, and externalized configuration
- Absolutely no code generation and no requirement for XML configuration
- **MySQL Workbench:** MySQL Workbench is a visual database design tool that integrates SQL development, administration, database design, creation and

maintenance into a single integrated development environment for the MySQL database system.

### **Why Spring Boot ?**

Spring Boot is just extension of the already existing and expansive Spring frameworks, but it has some specific features that make the application easier for working within the developer ecosystem. Some of the features are embedded Tomcat servers, Autoconfiguration, POM, starter dependencies.

Some benefits of Spring Boot are:

- Spring is everywhere: Spring's flexible libraries are trusted by developers all over the world. Spring delivers delightful experiences to millions of end-users every day – whether that's streaming TV, online shopping, or countless other innovative solutions. Spring also has contributions from all the big names in tech, including Alibaba, Amazon, Google, Microsoft, and more.
- Spring is flexible: Spring's flexible and comprehensive set of extensions and third-party libraries let developers build almost any application imaginable. At its core, Spring Framework's Inversion of Control (IoC) and Dependency Injection (DI) features provide the foundation for a wide-ranging set of features and functionality. Whether you're building secure, reactive, cloud-based microservices for the web, or complex streaming data flows for the enterprise, Spring has the tools to help.
- Spring is productive: Spring Boot transforms how you approach Java programming tasks, radically streamlining your experience. Spring Boot combines necessities such as an application context and an auto-configured, embedded web server to make microservice development a cinch. To go even faster, you can combine Spring Boot with Spring Cloud's rich set of supporting libraries, servers, patterns, and templates, to safely deploy entire microservices-based architectures into the cloud, in record time.
- Spring is fast: Spring provides fast startup, fast shutdown, and optimized execution, by default. Increasingly, Spring projects also support the reactive (nonblocking) programming model for even greater efficiency.
- Spring is secure: Spring has a proven track record of dealing with security issues quickly and responsibly. The Spring committers work with security professionals to patch and test any reported vulnerabilities.
- Spring is supportive: The Spring community is enormous, global, diverse, and spans folks of all ages and capabilities, from complete beginners to seasoned pros. No matter where you are on your journey, you can find the support and resources

you need.

## **About Spring Security**

Simply said, Spring security uses straightforward servlet filters to authenticate and authorize users for our application. Because they are open to anybody who uses the internet, web apps are vulnerable to security risks and assaults. Some REST endpoints, such as those used for changing records or admin-related tasks, may only be accessible to certain users. To protect URLs, we may employ spring security. By offering strong, customizable security features like authentication and authorization, Spring Security is a security framework that protects J2EE-based corporate applications. It has become the accepted practices for protecting Spring-based applications.

Spring security works on the following three core concepts

1.Authentication. 2.Authorization 3.Password Storage 4.Servlet Filters

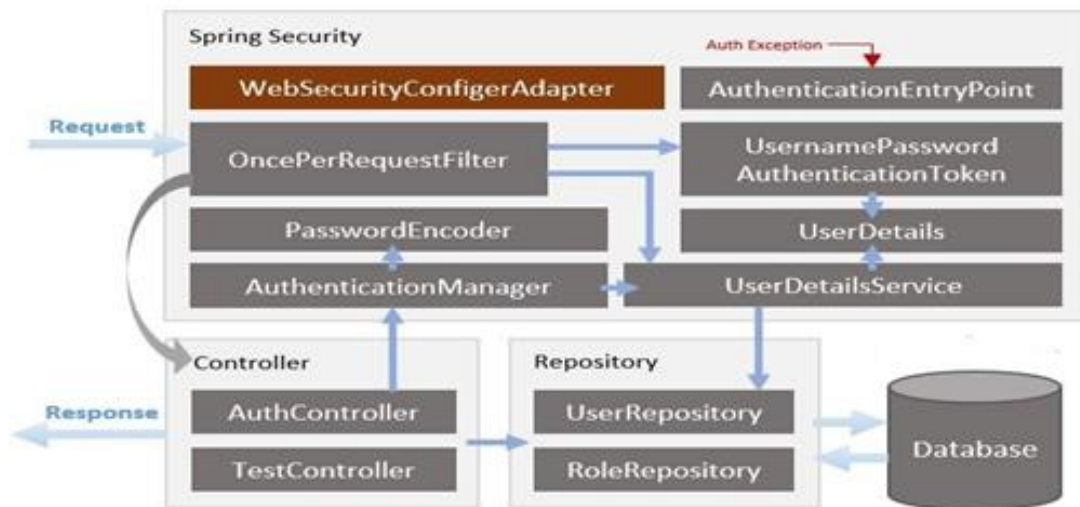
1. Authentication - utilized to confirm whether a user is utilizing an application by supplying legitimate credentials utilized to confirm who you are! Establishing a principal's identification through authentication (user, system, that can perform an action in an application).
2. Authorization - Simple authentication prevents us from restricting logged-in users since we lack knowledge about their rights or permissions. Before a user tries to access a resource, authorization enables the provision of this information. It is an access control procedure that determines whether or not a principal may carry out an activity (access-control admin, user, leader, manager, contractor, anonymous, etc.).
3. Password Storage - Another important objective of any security architecture is to ensure that our passwords are protected and challenging to crack. The PasswordEncoder interface in Spring Security performs a one-way transformation on the password (passwords cannot be decrypted). Here is a list of the PasswordEncoders that Spring Security offers for your reference:
  1. BCryptPasswordEncoder.
  2. Argon2PasswordEncoder.
  3. Pbkdf2PasswordEncoder
  4. SCryptPasswordEncoder.

**Servlet Filters** - Spring security uses the Java servlet filters to start the security check for our web application.

## Creating API

For sign in and sign up I have created an API that accepts username email and password to register, when a user enters the data, this data is sent to the API in json format using POST method and further fetched by the spring application. When the application fetches the json string it checks in the database if the email is already linked to another account or not, if linked it gives an error saying, "Email address already in use!". If the email doesn't exist in the database, then it saves it with the password in encrypted format, thus giving a response "User Registered Successfully".

So, the main packages of the project are , controller , filter, model, payloads, repository, security & services. Each package has a specific task.



### Work-flow diagram of the application:

#### Working of the application:

1. Web Security Configure Adapter is the crux of our security implementation. It provides Http Security configurations to configure CORS, CSRF, session management, rules for protected resources. We can also extend and customize the default configuration that contains the elements below.
2. My User Details Service interface has a method to load User by username and returns a User Details object that Spring Security can use for authentication and validation.
3. User Details contains necessary information (such as: username, password, authorities) to build an Authentication object.
4. Username Password Authentication Token gets {username, password} from login Request, Authentication Manager will use it to authenticate a login account.

5. Authentication Manager has a Dao Authentication Provider (with help of My User Details Service & Password Encoder) to validate Username Password Authentication Token object. If successful, Authentication Manager returns a fully populated Authentication object (including granted authorities).
6. Once Per Request Filter makes a single execution for each request to our API. It provides a do Filter Internal() method that we will implement parsing & validating JWT, loading User details (using My User Details Service), checking Authorizaion (using Username Password Authentication Token).
7. Authentication Entry Point will catch authentication error.
8. Repository contains User Repository & Role Repository to work with Database, will be imported into Controller.
9. Controller receives and handles request after it was filtered by Once Per Request Filter.
10. Auth Controller handles signup/login requests

## **Routing API**

Routing refers to determining how an application responds to a client request to a particular endpoint, which is a URI (or path) and a specific HTTP request method (GET, POST, PUT, PATCH, DELETE etc). These routing methods specify a callback function (sometimes called “handler functions”) called when the application receives a request to the specified route (endpoint) and HTTP method. In other words, the application “listens” for requests that match the specified route(s) and method(s), and when it detects a match, it calls the specified callback function. In order to test these API’s with the front end developer we have to route this API on the web.

## **CONCLUSION**

In an nutshell, I have had a fantastic and fulfilling time throughout this internship. I can confidently say that I have gained a great deal of knowledge through my work. Since I had no prior experience with spring security, postman, Github, hosting providers, ngrok, etc., I feel the time I invested in research and learning new languages was well worth it and helped solve a significant problem in backend development. The value of time management and maintaining self-motivation in all circumstances are the two most important lessons I’ve learned in the sector. Even though there were moments when I felt trapped, my industry mentor in the field helped me stay focused in these circumstances. All in all, it was a good experience.

## **BIBLIOGRAPHY**

- JavaScript fundamentals training: <https://www.javascript.com/>
- Google Search Console: <https://search.google.com/search-console/about>
- Bing Webmaster Tools: <https://www.bing.com/webmasters>
- Hostinger: <https://hpanel.hostinger.com/hosting/>
- GitHub <https://github.com/>
- Sublime Text Editor: <https://www.sublimetext.com/>
- Visual Studio Code: <https://code.visualstudio.com/>
- Wamp Server: <https://www.wampserver.com/en/>
- Spring Security <https://spring.io/projects/spring-security>
- MySql Workbench <https://www.mysql.com/products/workbench>
- Postman <https://www.postman.com/>
- IntelliJ Idea <https://www.jetbrains.com/idea/>
- Ngrok <https://ngrok.com/>
- Java <https://www.java.com/en/>