**1. Introduction**

• **React**:

React is a free and open-source JavaScript front-end library for building user interfaces based on individual UI components.

Its main purpose is to provide us with a fast, efficient and scalable way to create interactive user interface components in this web application. React's declarative and component-based approach simplifies the process of building complex user interfaces by breaking them into reusable, encapsulated components.

• **Spring Boot:**

Spring Boot is an open-source Java-based framework used to program production-grade, standalone Spring-based applications with minimal effort.

It aims to provide us with a powerful and consistent framework for building Java applications with minimal configuration overhead.

It provides a “perspective programming” that reduces the work required to start an application. Spring Boot helps create an efficient, flexible and easily scalable hotel management system.

**2. Components and Usage**

A Hotel Management Web project may include the following main components and features (components):

**React:**

• Header: This component contains the logo, name of the hotel and the main navigation bar to switch between different pages.

• Home page: The home page can display hotel overview information, featured services and special offers.

• Rooms: This page lists all the room types the hotel offers. Each room type can be represented by a Room Card component containing an image, description, and price.

• Room details: When users click on a room card, they will be taken to a room details page containing more detailed information about that room.

• Booking: This page allows receptionists to book rooms. It may include a form for users to enter room information and a booking summary component to review room information.

• User: This page manages personal information of room tenants. It displays personal information and booking history to view booking history.

• Footer: This element often contains contact information, address and links to the hotel's social network page.

• SignIn/SignUp: This page allows users to log in or register a new account.

• Admin: This page is only for administrators to manage the hotel, including updating room information, viewing rooms, and managing users.

**Spring Boot:**

• Spring MVC: allows building web and RESTful applications easily. In the project use it to build APIs for operations like booking, canceling, customer management, etc.

• Spring Data JPA: Spring Data JPA simplifies accessing data in the database. We use it to perform CRUD operations on data tables like `Customers`, `Rooms`, `Bookings`, etc.

• Spring Security: This is a framework that allows authentication and authorization of applications. We use it to secure APIs and manage access rights of different users (receptionist, hotel manager).

• Spring Boot Actuator: Spring Boot Actuator provides application monitoring and management features, such as checking configuration information and more.

• Spring Boot DevTool: Spring Boot DevTools provides some useful development utilities, such as automatically reloading the application when there are changes in the source code.

• Embedded Servers: Spring Boot provides embedded servers such as Tomcat, Jetty, etc., making it easy to deploy and run your applications.

**3. Benefits**

• **React**:

- React uses Virtual DOM to optimize the rendering process, which improves application performance. Change updates the entire DOM every time there is a change, React only updates the changed parts in the Virtual DOM, then compares with the actual DOM to only update the necessary parts. This helps minimize the impact on application performance, especially in applications with many user interface changes.

- React is based on the concept of components, allowing users to divide the interface into independent, reusable components. This increases coding reuse, reduces coding source complexity, and eases application maintenance.

- JSX helps make React source code easier to read and write. By combining HTML with JavaScript, JSX helps reduce syntax and increase coding consistency.

• **Spring Boot:**

- Easy integration: Spring Boot supports many technologies and frameworks, making it easy to integrate with other services such as databases, authentication systems, and more.

- Fast deployment: With Spring Boot, you can create a complete web application with just a few lines of code. This helps reduce development and deployment time.

- Configuration management: Spring Boot automatically configures the application based on the libraries you have added to the project. This reduces configuration work and helps focus on feature development.

- With these features, Spring Boot can help create an efficient, flexible and easily scalable hotel management system.

**4. Limitations**

• **React**:

- In a multi-page application (multi-page application), the work for the content to be rendered using JavaScript can make SEO work more difficult than in the application delivery system.

- Managing state and thread data in React can get complicated

- The combination of HTML and JavaScript in JSX makes learning React JS much more complicated.

• **Spring Boot:**

- Autoconfiguration: While Spring Boot's autoconfiguration feature helps minimize configuration work, it can also create inaccuracies in understanding how it works. This makes it difficult to customize the configuration.

- Application size: Spring Boot application is large in size because it includes libraries required for the application. This increases boot time and uses more resources.

- Dependencies: Spring Boot uses automatic dependency management, which leads to using incompatible or buggy versions.

**5. Conclusion**

The benefits of using React are huge in our project development, especially for the front-end. React makes building web interactions significantly easier. Additionally, with the help of virtual DOM and JSX performance issues are clearly improved. Not only that, React also interacts easily with Spring Boot so we can build the backend without too many problems. Spring Boot provides us with a powerful and streamlined framework to build robust, scalable, and production-ready applications. With its comprehensive feature set, Spring Boot can significantly accelerate our software development process.