**WEEK-6: 1. REACT JS – HOL**

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* **Define SPA and its benefits**

SPA is Single Page Application is a web app that loads a single HTML page and dynamically updates according to the user inputs.

The main difference between the traditional web application design and the SPAs are that SPAs do no reload the whole page every time the user interacts or performs an action. It only partially loads the data wherever necessary.

**Ex:**

Gmail, Netflix and Facebook

**Benefits:**

1. Speed
2. Responsiveness
3. Stable Offline behavior

* **Define React and identify its working**

React aka ReactJS or React.js is an open source JavaScript library used to build user interfaces and Single Page Applications. It is mainly used to create light weight applications, which have less content.

**Working:**

1. React constructs a Virtual DOM (an imitation of the real DOM), that tracks changes in application, compares with the previous state and applies minimal updates to the real DOM via reconciliation process.
2. And only the components to which changes are made are re-rendered.
3. This boosts performance by avoiding full page reloads, and only partially reloading.

* **Identify the differences between SPA and MPA**

|  |  |
| --- | --- |
| **SPA** | **MPA** |
| Single page load/ Partial page load | Full page reloads in each navigation |
| Frontend and Backend are decoupled | Tightly coupled of pages |
| Preferred for light weight applications | Preferred for heavy-content complex applications |
| Ex: Gmail, Spotify | Ex: Wikepedia, Amazon |

* **Explain Pros & Cons of Single-Page Application**

**Pros:**

1. Fast and Responsive UI
2. Less server load and reusable code
3. Easy debugging
4. Reusable components making light weight architecture
5. Smooth User interaction

**Cons:**

1. Analytics in single page context can be tricky
2. Routing in SPAs can need much attention to handle
3. Tough to handle heavy-content
4. Not scalable everytime

* **Explain about React**

React is also known as React.js or simple ReactJS. It is an open-source JavaScript library that is used to develop UI interfaces and single page applications. React is declarative and component-based.

It uses libraries like react-router-dom, redux etc. It also supports hooks in functional components.

There are two types of components in react: Class components and Functional components.

* **Define virtual DOM**

A Virtual Dom is a lightweight copy of the real DOM (Document Object Model). React maintains the VDOM to optimize UI updates.

Implementation of VDOM:

1. When a state or prop changes, react generates a new Virtual DOM tree.
2. It compares it with the previous tree with the help of “diffing”.
3. It only updates the necessary parts in the real Dom using the method of “reconciliation”.

This minimizes unnecessary DOM manipulations and results in faster rendering.

* **Explain Features of React**

Features of react include:

1. Declarative UI: Defines what UI will look like
2. Component based architecture: Supports building of isolated building components which are reusable.
3. Efficient rendering: By the use of Virtual DOM.
4. Faster Performance
5. Supports Cross Platform