

# Industrial Training Daily Diary

## MERN Stack Training

**Company:** Sensation Software Solutions

**Student Name:** Gurvinder Singh

**Training Duration:** 6 Months

**Day:** 10

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## Day 10 – Introduction to React.js, SPA & JSX Basics

### Objective of the Day

The objective of Day 10 was to begin frontend development with **React.js**. The session focused on understanding what React is, why it is used, how it works internally (Virtual DOM), and how **Single Page Applications (SPA)** differ from traditional websites. We were also introduced to **JSX**, which is a core concept in React.

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### What is React.js?

The trainer explained that **React.js** is a JavaScript library developed by Facebook for building **fast, interactive, and component-based user interfaces**. React allows developers to create reusable UI components and efficiently update the UI when data changes.

Key points discussed:

- React is a **library**, not a full framework
  - Used mainly for **frontend development**
  - Follows **component-based architecture**
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### Motivation for Using React

The trainer discussed problems with traditional JavaScript-based DOM manipulation:

- Slow performance due to direct DOM updates
- Difficult code maintenance
- Reusability issues

React solves these problems by:

- Using **Virtual DOM**

- Breaking UI into reusable components
  - Providing one-way data flow
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## Single Page Applications (SPA)

We learned about **Single Page Applications**, where the entire application loads once and updates content dynamically without refreshing the page.

### Advantages of SPA:

- Faster user experience
- Smooth navigation
- Reduced server load

Examples of SPA include Gmail, Facebook, and Instagram.

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## Virtual DOM Concept

The trainer explained the **Virtual DOM**, which is a lightweight copy of the real DOM. React compares the Virtual DOM with the previous state and updates only the changed parts in the real DOM.

This process improves performance and makes applications faster and more efficient.

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## React Component Model

React applications are built using **components**.

### Component Characteristics:

- Reusable
- Independent
- Maintainable

We discussed how components help in structuring large applications into smaller manageable pieces.

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## Introduction to JSX

The trainer introduced **JSX (JavaScript XML)**, which allows writing HTML-like syntax inside JavaScript.

Key points:

- JSX makes code more readable
  - JSX is transpiled to JavaScript
  - JSX expressions can include JavaScript logic
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## Creating a React Project (Overview)

The trainer explained how React projects are created using tools like:

- `create-react-app`
- Node.js and NPM

We were shown the basic structure of a React project and important folders like `src` and `public`.

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## Practical Work Done

During the practical session, we:

- Installed Node.js (if not already installed)
- Created a basic React application
- Explored project folder structure
- Ran the React development server

This practical exposure helped us understand how React applications start and run.

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## Importance of React in MERN Stack

The trainer explained that React is the frontend pillar of the MERN Stack. It communicates with backend APIs built using Node.js and Express and displays data fetched from MongoDB.

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## Conclusion of Day 10

Day 10 marked the beginning of React development. I gained a clear understanding of why React is used, how it improves performance, and how modern web applications are built using components and SPA architecture.

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**Outcome of the Day:**

- Understanding of React fundamentals
- Knowledge of SPA and Virtual DOM
- Introduction to JSX
- Familiarity with React project setup