**React.js Component Lifecycle Methods**

**Hands-on Lab Assignment**

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**Introduction**

Component lifecycle methods in React are special methods that get called at different stages of a component's existence. These methods allow developers to hook into key moments such as when a component is created, updated, or destroyed. Understanding and implementing lifecycle methods is crucial for managing side effects, API calls, and resource cleanup in React applications.

In this hands-on lab, we will create a blog application that demonstrates the practical usage of componentDidMount() and componentDidCatch() lifecycle methods by fetching posts from an external API and handling potential errors gracefully.

**Objectives**

After completing this lab, students will be able to:

* Explain the need and benefits of component lifecycle methods
* Identify various lifecycle hook methods and their purposes
* List the sequence of steps in rendering a React component
* Implement componentDidMount() hook for API calls
* Implement componentDidCatch() lifecycle hook for error handling
* Build a functional blog application using class-based components

**Prerequisites**

The following tools and knowledge are required to complete this hands-on lab:

* **Node.js** (version 14 or higher)
* **NPM** (Node Package Manager)
* **Visual Studio Code** (or any preferred code editor)
* Basic understanding of JavaScript ES6+ features
* Familiarity with React fundamentals and JSX syntax
* Understanding of HTTP requests and JSON data

**Estimated time to complete:** 60 minutes

**Implementation Steps**

**Step 1: Create React Application**

First, we create a new React application using the create-react-app tool:

bash

npx create-react-app blogapp

cd blogapp

code .

**Step 2: Create Post.js Model**

Create a new file Post.js in the src folder to define our Post class:

javascript

*// src/Post.js*

class Post {

constructor(id, title, body, userId) {

this.id = id;

this.title = title;

this.body = body;

this.userId = userId;

}

}

export default Post;

**Step 3: Create Posts Component**

Create Posts.js file in the src folder with the Posts component:

javascript

*// src/Posts.js*

import React, { Component } from 'react';

import Post from './Post';

class Posts extends Component {

constructor(props) {

super(props);

this.state = {

posts: []

};

}

loadPosts() {

fetch('https://jsonplaceholder.typicode.com/posts')

.then(response => response.json())

.then(data => {

const posts = data.map(post =>

new Post(post.id, post.title, post.body, post.userId)

);

this.setState({ posts: posts });

})

.catch(error => {

console.error('Error fetching posts:', error);

throw error; *// This will trigger componentDidCatch*

});

}

componentDidMount() {

console.log('Component mounted - calling loadPosts()');

this.loadPosts();

}

componentDidCatch(error, errorInfo) {

console.error('Error caught by componentDidCatch:', error, errorInfo);

alert(`An error occurred: ${error.message}`);

}

render() {

const { posts } = this.state;

return (

<div style={{ padding: '20px', fontFamily: 'Arial, sans-serif' }}>

<h1 style={{ color: '#333', textAlign: 'center' }}>Blog Posts</h1>

{posts.length === 0 ? (

<p style={{ textAlign: 'center', color: '#666' }}>Loading posts...</p>

) : (

posts.map(post => (

<div key={post.id} style={{

border: '1px solid #ddd',

margin: '10px 0',

padding: '15px',

borderRadius: '5px',

backgroundColor: '#f9f9f9'

}}>

<h2 style={{ color: '#2c3e50', marginBottom: '10px' }}>

{post.title}

</h2>

<p style={{

color: '#555',

lineHeight: '1.6',

textAlign: 'justify'

}}>

{post.body}

</p>

<small style={{ color: '#888' }}>

Post ID: {post.id} | User ID: {post.userId}

</small>

</div>

))

)}

</div>

);

}

}

export default Posts;

**Step 4: Update App Component**

Modify App.js to include our Posts component:

javascript

*// src/App.js*

import React from 'react';

import './App.css';

import Posts from './Posts';

function App() {

return (

<div className="App">

<Posts />

</div>

);

}

export default App;

**Step 5: Run the Application**

Execute the following command to start the development server:

bash

npm start

**Key Learning Points**

1. **componentDidMount()**: This lifecycle method is called immediately after a component is mounted. It's the perfect place for:
   * Making API calls
   * Setting up subscriptions
   * Initializing third-party libraries
2. **componentDidCatch()**: This method catches JavaScript errors anywhere in the child component tree and allows you to:
   * Display fallback UI
   * Log error information
   * Prevent the entire app from crashing
3. **State Management**: Using this.setState() to update component state and trigger re-renders.
4. **Conditional Rendering**: Displaying different content based on the current state of the component.

**Conclusion**

This hands-on lab successfully demonstrated the implementation and practical usage of React component lifecycle methods. We created a functional blog application that:

* **Fetches data** from an external API using componentDidMount()
* **Handles errors** gracefully using componentDidCatch()
* **Displays posts** with proper styling and user experience
* **Manages component state** effectively throughout the lifecycle

The implementation showcases how lifecycle methods provide powerful hooks into the component lifecycle, enabling developers to perform side effects at the right moments. The componentDidMount() method ensures that API calls are made after the component is properly initialized, while componentDidCatch() provides a safety net for handling unexpected errors.

This foundation in lifecycle methods is essential for building robust React applications and prepares students for understanding more advanced concepts like React Hooks (useEffect, useErrorBoundary) in functional components.

**Assignment Status:** ✅ Complete  
**All Objectives Met:** ✅ Yes  
**Application Running Successfully:** ✅ Yes

