Steps to Start Writing the Code from Scratch

Here's how you can systematically approach building your User Management System with the JavaScript functionality you've outlined.

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1. Understand the Core Requirements

- **Fetch and Display Users**: Retrieve user data from an API and render it dynamically.
- **Input Validation**: Validate user inputs for adding new users.
- **Metadata with Symbols**: Use a `Symbol` to store unique, private metadata for each user.
- **User Operations**: Add, update, and delete users.
- **Dynamic Rendering**: Update the UI whenever the user list changes.

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2. Plan the Code Structure

Divide your functionality into these core modules:

- **API Integration**: Fetch user data from an external API.
- **Validation Functions**: Validate username and email inputs.
- **User Operations**: Add, update, and delete user functionality.
- **Dynamic Rendering**: Display users dynamically and update the DOM when the user list changes.

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3. Start with Initialization

- Define variables for:
    - The `users` array to store user data.
    - A `Symbol` for user metadata.
- Set up the initial structure for the user list container in your HTML.

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4. Fetch and Display Users

- Write an `async` function to fetch user data from an API.
- Map the fetched data to include metadata stored using a `Symbol`.

- Render the fetched users dynamically using the `renderUsers` function.

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5. Validate Input Fields

- Write a `validateInput` function to check:
  - Username: 3-20 characters, no special characters.
  - Email: Valid email format.
- Display appropriate error messages for invalid inputs.

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6. Add a New User

- Attach an event listener to the "Add User" button.
- Validate the input fields before adding a new user.
- Push the new user object to the `users` array with:
  - A unique ID.
  - Metadata including the creation timestamp.
- Re-render the user list.

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7. Update User Role

- Write an `updateUserRole` function to:
  - Find the user by their ID.
  - Update their `role` property.
- Re-render the user list after the update.

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8. Delete a User

- Write a `deleteUser` function to:
  - Filter the `users` array to exclude the user with the specified ID.
- Re-render the user list after deletion.

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9. Render Users Dynamically

- Create a `renderUsers` function to:

    - Clear the current DOM content.
    - Dynamically create and append elements for each user in the `users` array.
- Include buttons for updating the user role and deleting the user.

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10. Test and Debug

- Test the following scenarios:
    - Fetching and displaying users.
    - Adding a new user with valid and invalid inputs.
    - Updating a user's role.
    - Deleting a user.
- Debug issues using `console.log` and browser dev tools.

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11. Optimize Code

- Ensure modularity by dividing logic into reusable functions.
- Add meaningful comments for better readability.
- Handle edge cases, such as duplicate usernames or invalid API responses.

Suggested Order to Write the Code

1. **Initialize User Data**
2. **Set Up Input Validation**
3. **Fetch and Display Users**
4. **Implement Add User Functionality**
5. **Update User Role**
6. **Delete User Functionality**
7. **Test and Debug**

Tools to Assist

- **Console Logs**: Debug user operations and API calls.
- **Browser DevTools**: Monitor DOM updates and network requests.

By following this structured approach, you'll create a robust User Management System that handles dynamic user operations effectively. Let me know if you need assistance with any specific part!