

# TESTING REACT COMPONENTS (MMT-M2020)

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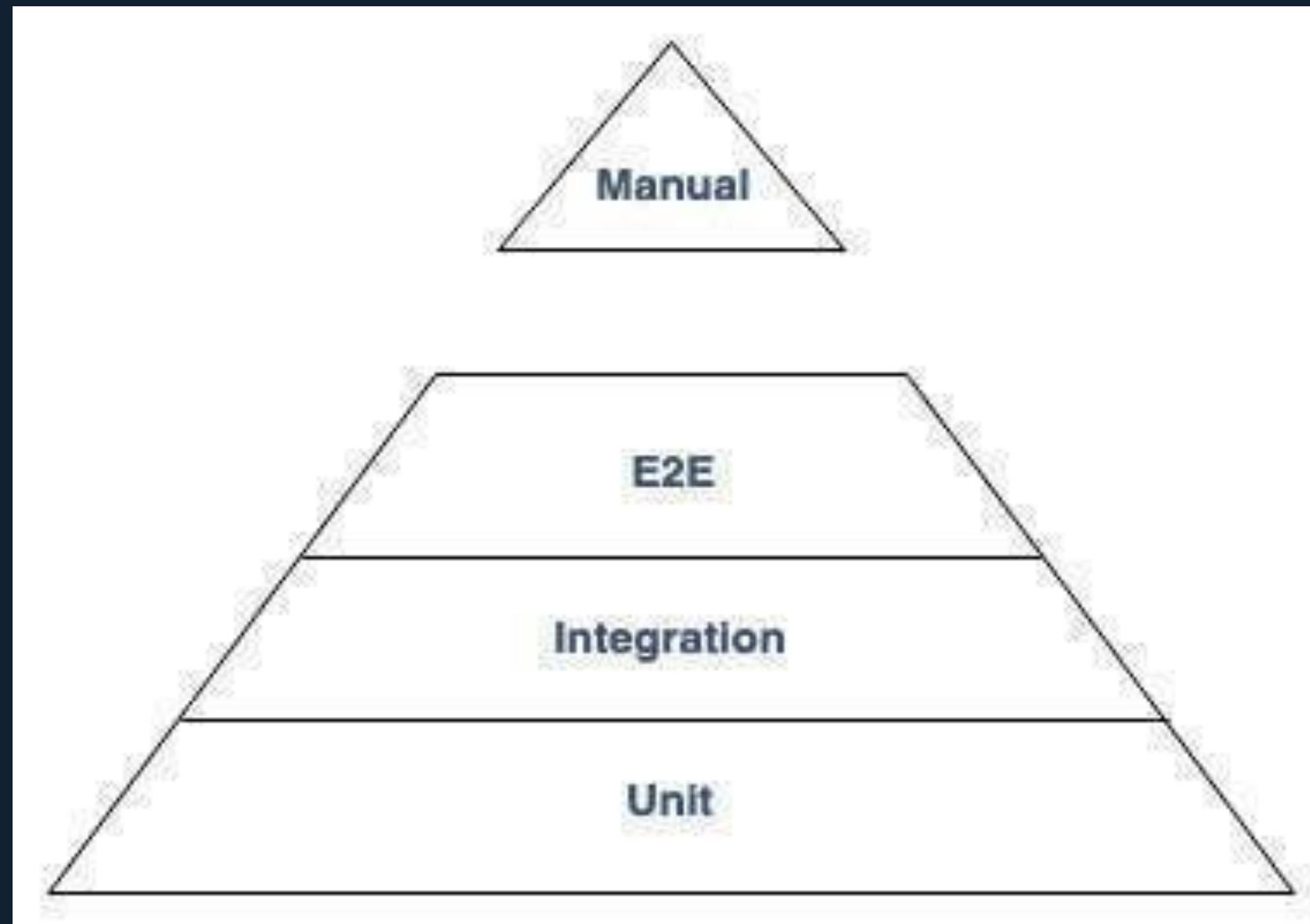
# TESTING REACT COMPONENTS

## TOOLS

- » Cypress (e2e testing "Software Quality Assurance")
- » React Test Utils (Facebook, low level)
- » Enzyme (AirBnB, more high level)
- » React Testing Library (best of both worlds)

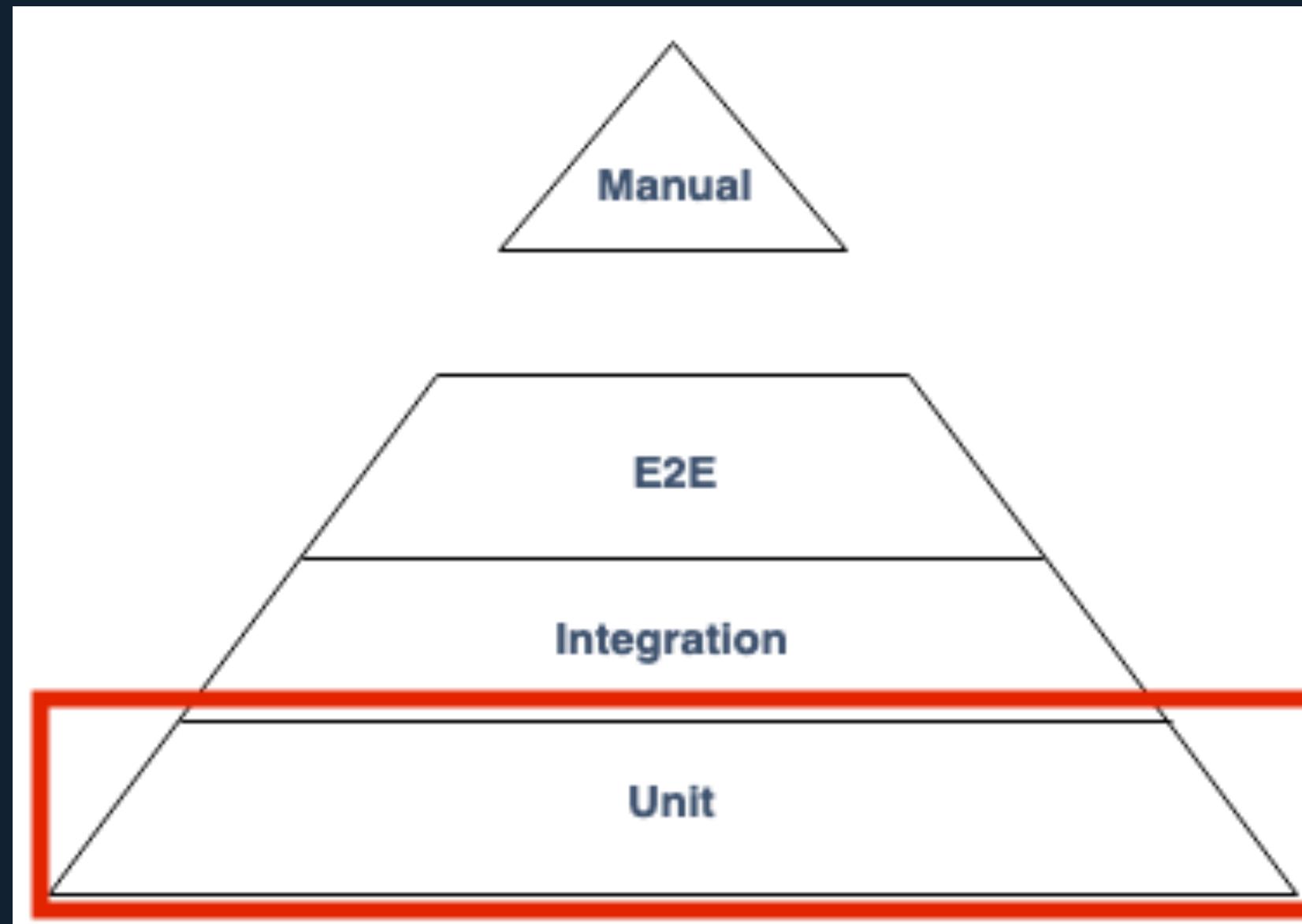
# TESTING REACT COMPONENTS

## TESTING PYRAMID



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# TESTING COMPONENTS

## VERIFY THAT SOME TEXT IS RENDERED

```
// button.spec.js
import React from 'react'
import { render, cleanup, queryByText } from '@testing-library/react'
import { Button } from './Button'

afterEach(cleanup)
describe('Button', () => {
  it('renders given text', () => {
    // Arrange
    const givenText = 'A Button'

    // Act
    const { container } = render(<Button>{givenText}</Button>)

    // Assert
    expect(queryByText(container, givenText)).toBeTruthy()
  })
})
```

# TESTING COMPONENTS

## VERIFY THAT SOME TEXT IS RENDERED

- » Run the test and watch it fail
- » The test will guide you towards the implementation

# TESTING COMPONENTS

## VERIFY THAT SOME TEXT IS RENDERED

```
// button.js
import React from 'react'

const Button = ({ children }) => {
  return <>{children}</>
}

}
```

# TESTING COMPONENTS

## VERIFY THAT AN HTML TAG IS RENDERED

```
// button.spec.js
import React from 'react'
import { render, cleanup, queryByText } from '@testing-library/react'
import { Button } from './Button'

afterEach(cleanup)
describe('Button', () => {
  // ... other tests

  it('renders a button html tag', () => {
    const givenText = 'A Button'
    const { container } = render(<Button>{givenText}</Button>)

    expect(container.querySelectorAll('button'))
    // 1) ^^^^^^^^^^^^^^^^^^
      .toHaveLength(1)
    // 2) ^^^^^^^^^^^^^^

    // 1) get all button HTML tags from the rendered container
    // 2) verify that there is exactly one button HTML tag
  })
})
```

# TESTING COMPONENTS

## VERIFY THAT AN HTML TAG IS RENDERED

```
import React from 'react'

export const Button = ({ children }) => (
  <button> /* render a Button instead of a fragment */
  {children}
</button>
)
```

# TESTING USER INTERACTIONS

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- » How can we test user interactions?
- » eg. when the button was clicked?

```
import React from 'react'

const Button = ({ onClick, children }) => {
  // ^^^^^^
  // How can we verify that the onClick handler is
  // called when the button is clicked?
  return <button>{children}</button>
}
```

# TESTING USER INTERACTIONS

## SPY OBJECTS

- » Spy objects are stubs that also record the way they were called
- » Useful when:
  - » A hard to verify side effect is triggered (eg. E-Mail sending)

```
it('sends an email on sign up', () => {  
  const sendEmail = jest.fn()  
  const signUp = signUp({ sendEmail }, username, password)  
  expect(sendEmail).toHaveBeenCalledWith({ username, password })  
})
```

# TESTING USER INTERACTIONS

## SPY OBJECTS

- » Spy objects can be used to verify user interactions in react components

```
// button.spec.js

it('when button was clicked, calls given onClick handler', () => {
  const onClick = jest.fn() // create function spy
  const { container } = render(<Button onClick={onClick}>My Button</Button>)
  fireEvent.click(container.querySelector('button'))
// 1)                                     ^^^^^^^^^^^^^^^^^^^^^^^^^^
// 2)           ^
// 1) select the DOM element to be clicked
// 2) fire the click event

  expect(onClick).toHaveBeenCalled()
// verify that the onClick spy has been called at least once
})
```

# TESTING USER INTERACTIONS

## SPY OBJECTS

```
import React from 'react'

const Button = ({ onClick, children }) => (
  <button onClick={onClick}>
    /* 1)                                     ^^^^^^ * */
    {children}
  </button>
)
// 1) set click handler on the button DOM element
```

# EXERCISE 1

- » You're building an issue tracking system
- » Build a component which displays the names of assignees
  - » eg. <Assignees assignees={['Mike', 'Sepp', 'David']} />
  - » build a simple ul

# EXERCISE 2

- » WITH more than 3 assignees,
- » only display 3 assignees
- » display a show more button

# EXERCISE 3

- » WHEN the show more button was clicked
- » display all assignees
- » a show less button is displayed instead of a show more button
- » AND the show less button was clicked, only displays 3 assignees

# EXERCISE 4

- » WITH less than 4 assignees,
- » don't display a "show more" button

# FEEDBACK

- » Questions: [tmayrhofer.lba@fh-salzburg.ac.at](mailto:tmayrhofer.lba@fh-salzburg.ac.at)
- » <https://de.surveymonkey.com/r/8TW92LL>