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Unit & Component Tests

Jest, Puppeteer & Storybook

Alex Thalhammer

Outline

- Motivation
- Jest Unit Tests & Component Tests
- Jest Unit Test Lab
- Component Tests with Puppeteer
- Component Tests with Storybook



Motivation Testing

- Enforce Code Quality / prevent bugs / find bugs quickly
- No issues with code coverage
- Documentation
- But
 - Writing Tests needs to be learned
 - Must be backed by Devs (require discipline)
 - Tests must run fast, each has its own universe



Unit tests vs. E2E tests

- Unit tests
 - Isolated component tests
 - Should be the majority of the tests
 - Quickly executable
- E2E tests
 - Cross-component tests
 - Simulation of user inputs



Testing pyramid

End-to-End (E2E) Tests

Component Tests
(Functional & Visual)

Unit Tests



Official version (until NG 11)

End-to-End (E2E) Tests



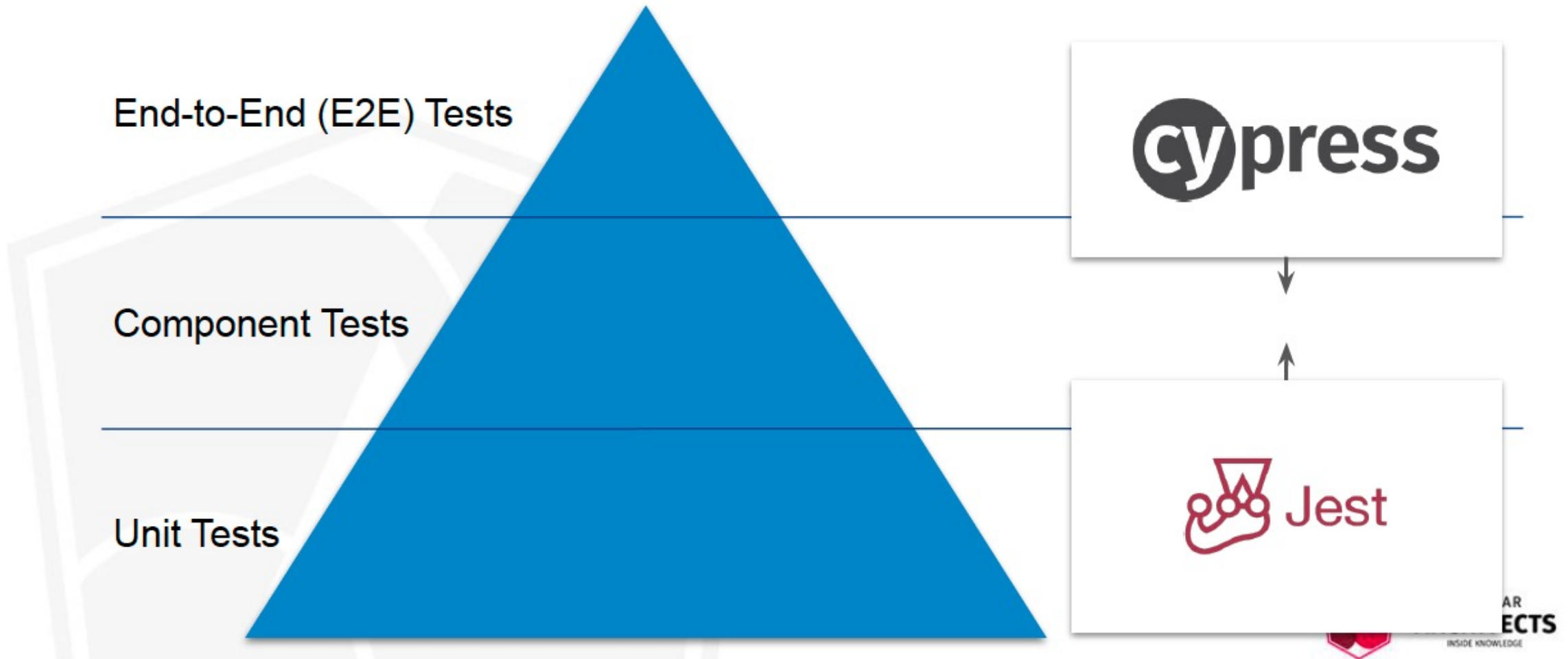
Component Tests



Unit Tests



Our recommendation



jasmine vs jest

Enter an npm package...

jasmine x

jest x

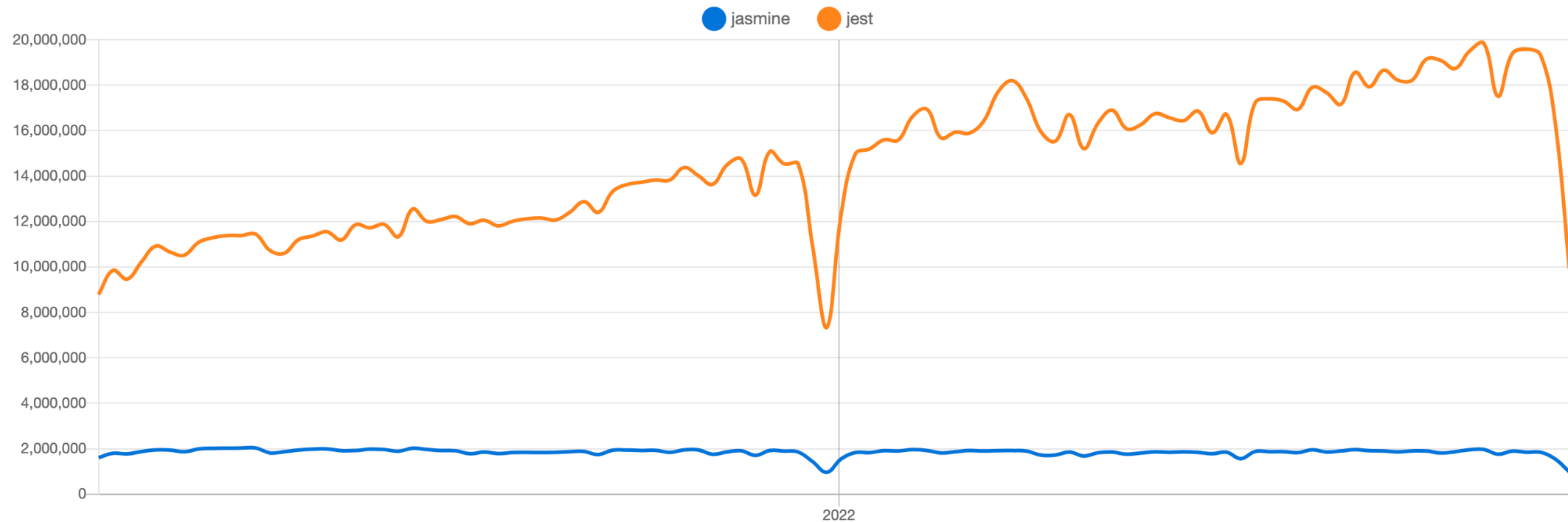
+ mocha

+ qunit

+ ava

+ chai

Downloads in past 2 Years ▾



Unit Tests



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Testdriven development process (ideal world)

- Start with a Test
- Define how you would like to use the functionality
- Make sure it fails
- Implement it
- For next use case, define test



Setup

- Angular CLI
 - `ng add @bribug/jest-schematic`
 - Remove all karma, jasmine, protractor deps
 - Make sure tsconfig(s) & angular.json (project.json) are using jest
- NX
 - Support out-of-the-box

Running Tests

- Running all tests
 - `jest` or `ng / nx test`
- Running specific ones
 - `jest -t [namePattern]`
- Running interactively (Developer Mode)
 - `jest --watch`



A basic test

```
describe('Initial Tests', () => {  
    it('should work', () => {  
        expect(true).toBe(true);  
    });  
});
```



Basic Expects

- `expect(true).not.toBe(false);`
- `expect(true).toBeTruthy();`
- `expect({}).toBeTruthy();`
- `expect('').toBeFalsy();`
- `expect('').toBeDefined();`
- `expect(null).toBeNull();`
- `expect(null).toBeDefined();`



Data-Type Expects

- string & number
 - `expect('hallo').toMatch(/l/);`
 - `expect(5).toBeGreaterThan(2);`
 - `expect(0.2 + 0.1).toBeCloseTo(0.3);`
- arrays
 - `expect([]).toHaveLength(0);`
 - `expect([1, 2, 3]).toContain(1);`
- types
 - `expect(new Date()).toBeInstanceOf(Date);`
 - `expect(new A()).toBeInstanceOf(A);`
 - `expect(() => true).toBeInstanceOf(Function);`



Object Expects

```
const address = {  
  street: 'Domgasse',  
  streetNumber: '5',  
  zip: '1010',  
  city: 'Vienna'  
};
```

```
const clone = { ...address };
```

- `expect(address).toBe(clone); // fails`
- `expect(address).toEqual(clone); // succeeds`
- `expect(address).toMatchObject({ street: 'Domgasse', city: 'Vienna' }); // succeeds`
- `expect(address).toMatchObject({ city: expect.stringMatching(/Vienna|Wien/) }); // succeeds`



Expect Exceptions

```
const fn = () => {  
    throw new Error('nothing works');  
};
```

- `expect(fn).toThrowError();`
- `expect(fn).toThrowError('nothing works');`



DEMO



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LAB



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Component Tests



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Test Specs



Application Code



JSDom

@angular/testing



Component Tests powered by Angular

- TestBed
 - Configures & initializes environment for unit testing
 - Provides methods for creating components and services in unit tests.

- TestModule

```
const fixture = TestBed.configureTestingModule({
  declarations: [AddressComponent],
  imports: [ReactiveFormsModule],
  providers: [{ provide: AddressLookuper, useValue: null }]
}).createComponent(AddressComponent);
```

```
const component = fixture.componentInstance;
```

Component Tests - Puppeteer



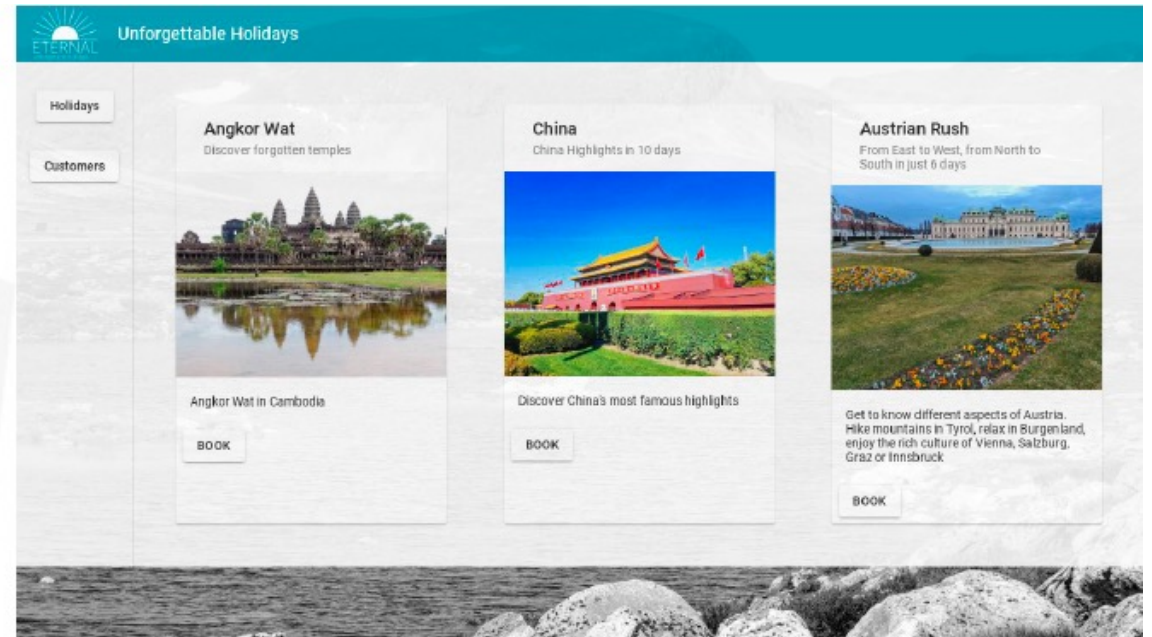
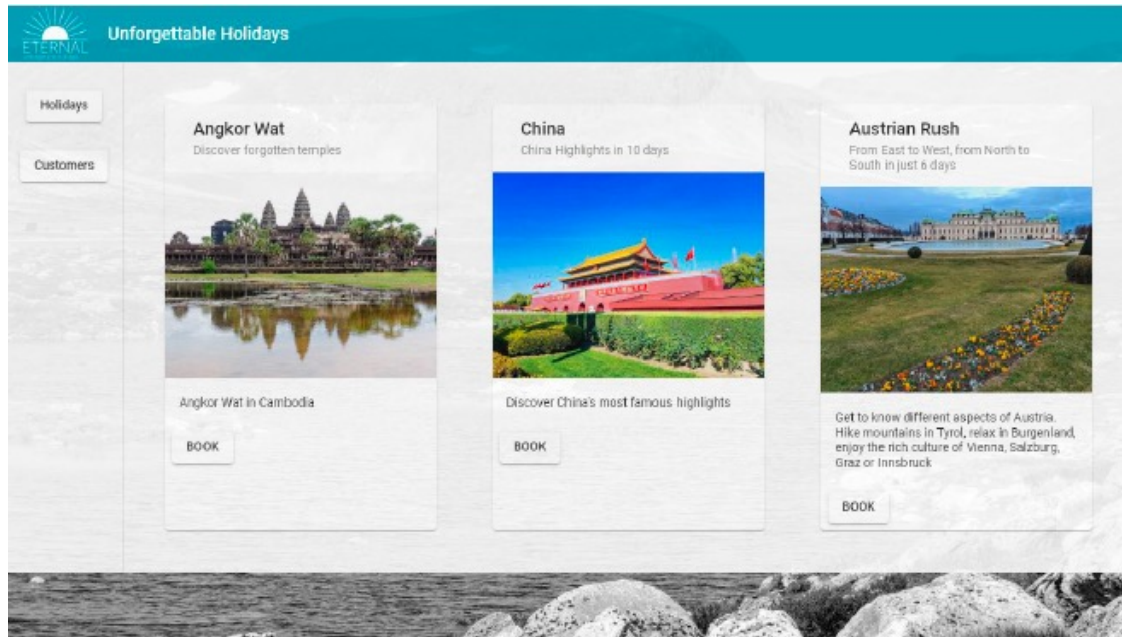
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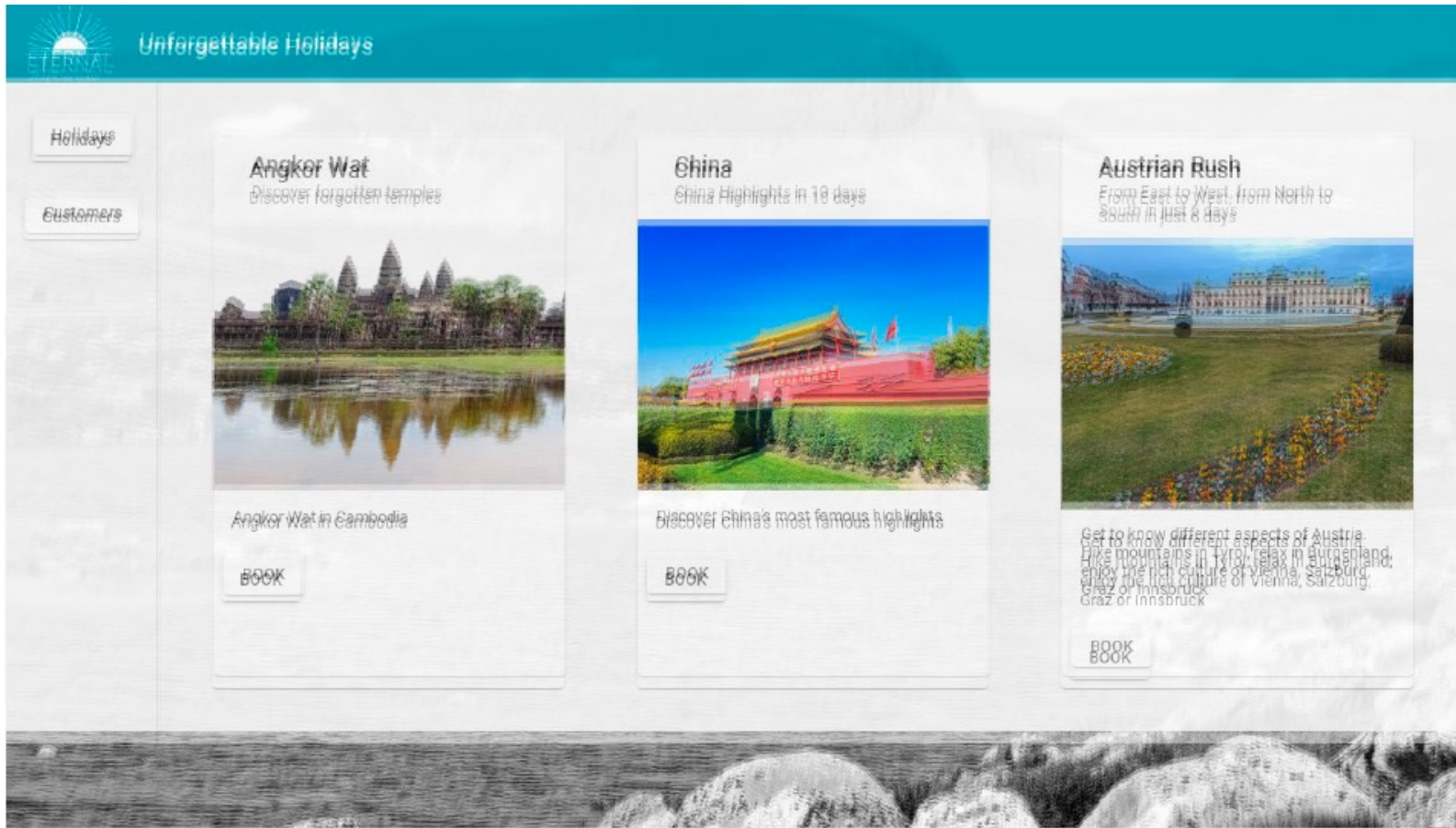
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Component Tests - Puppeteer I

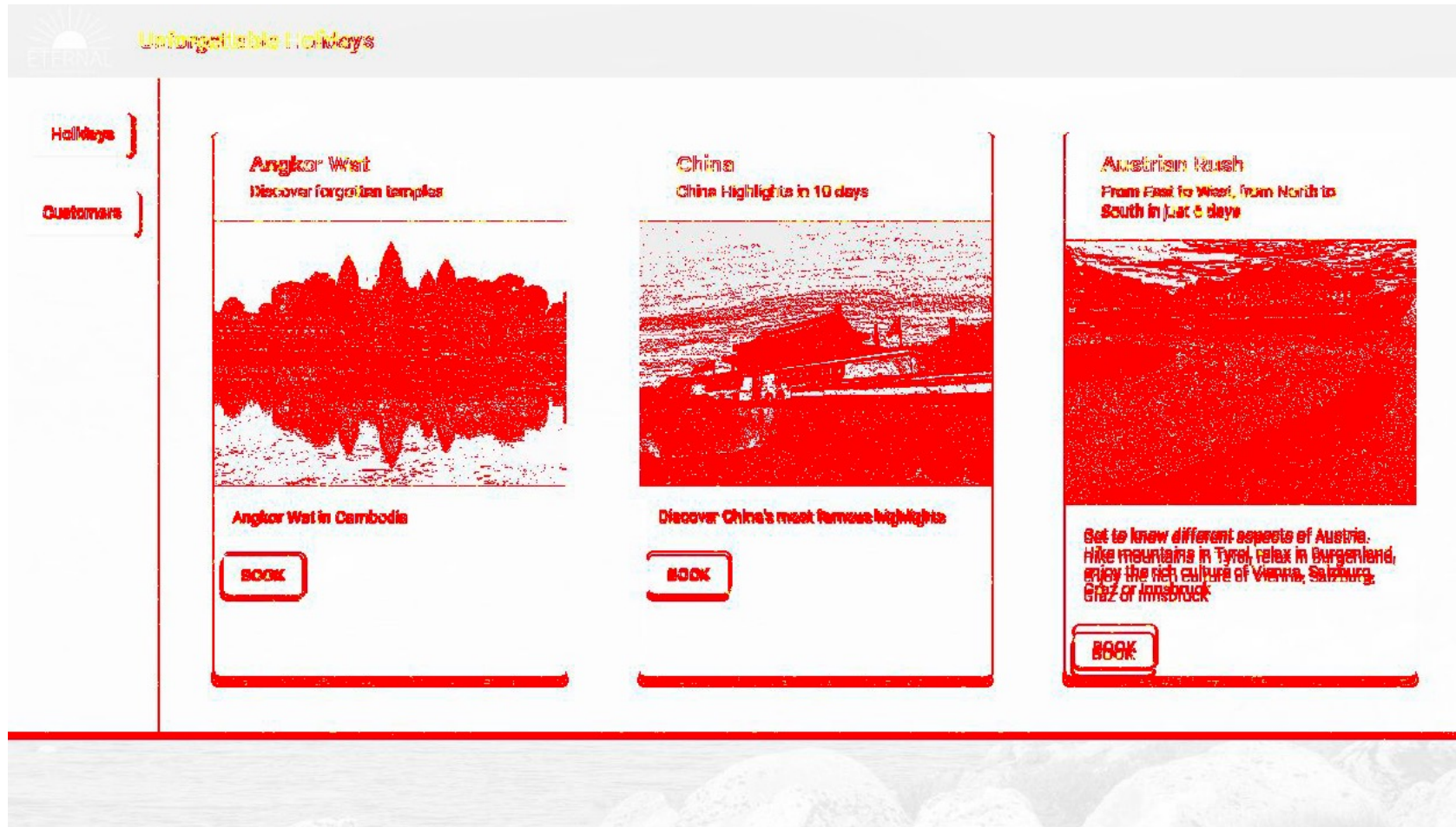
- Puppeteer
 - Headless Browser
 - Spot the difference



Component Tests - Puppeteer II



Component Tests - Puppeteer III



Component Tests - Storybook



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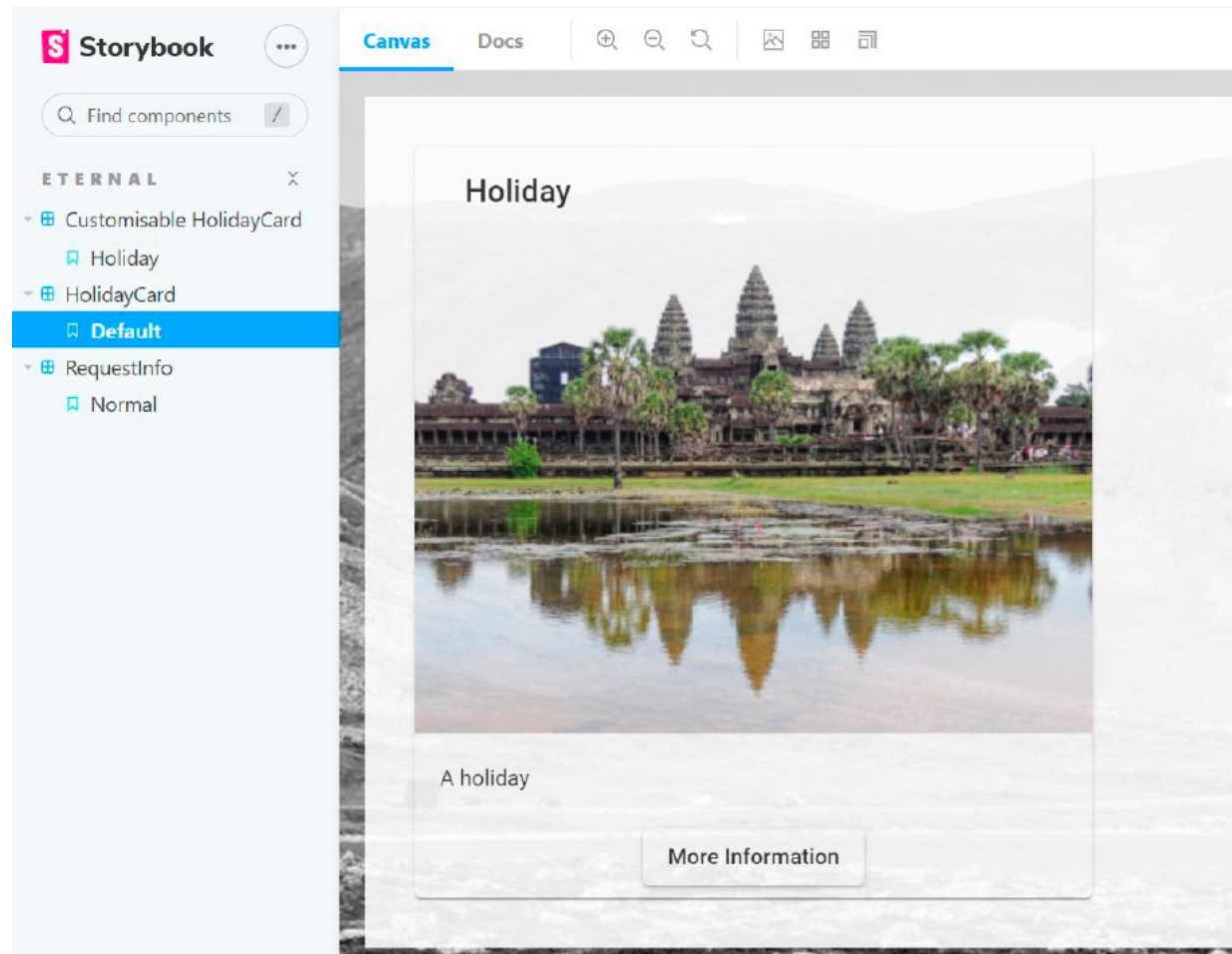
Component Tests – Storybook I

- Allows to isolate Components
- Not Angular Specific
- Configure a Component for various states
- Can also used for visual widget library (not just testing)

Component Tests – Storybook II

- Easy to setup in Storybook
- Decoupled from business logic
- No Dependency Injection
- If possible only primitive types as @Input

Component Tests – Storybook III



Storybook – Get Started

- `npx sb init`
- will auto generate examples
- `yarn storybook`

Storybook – Conclusion

- most popular tool for UI component development & documentation
- used by GitHub, Airbnb, and Stripe
- but it has issues with not using default webpack

That's it for unit & component testing!

- What are your questions?