ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Unit & Component Tests

Jest, Puppetteer & Storybook

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Outline

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

Motivation Testing

- Enforce Code Quality / prevent bugs / find bugs quickly

- No issues with code coverage

- Documentation

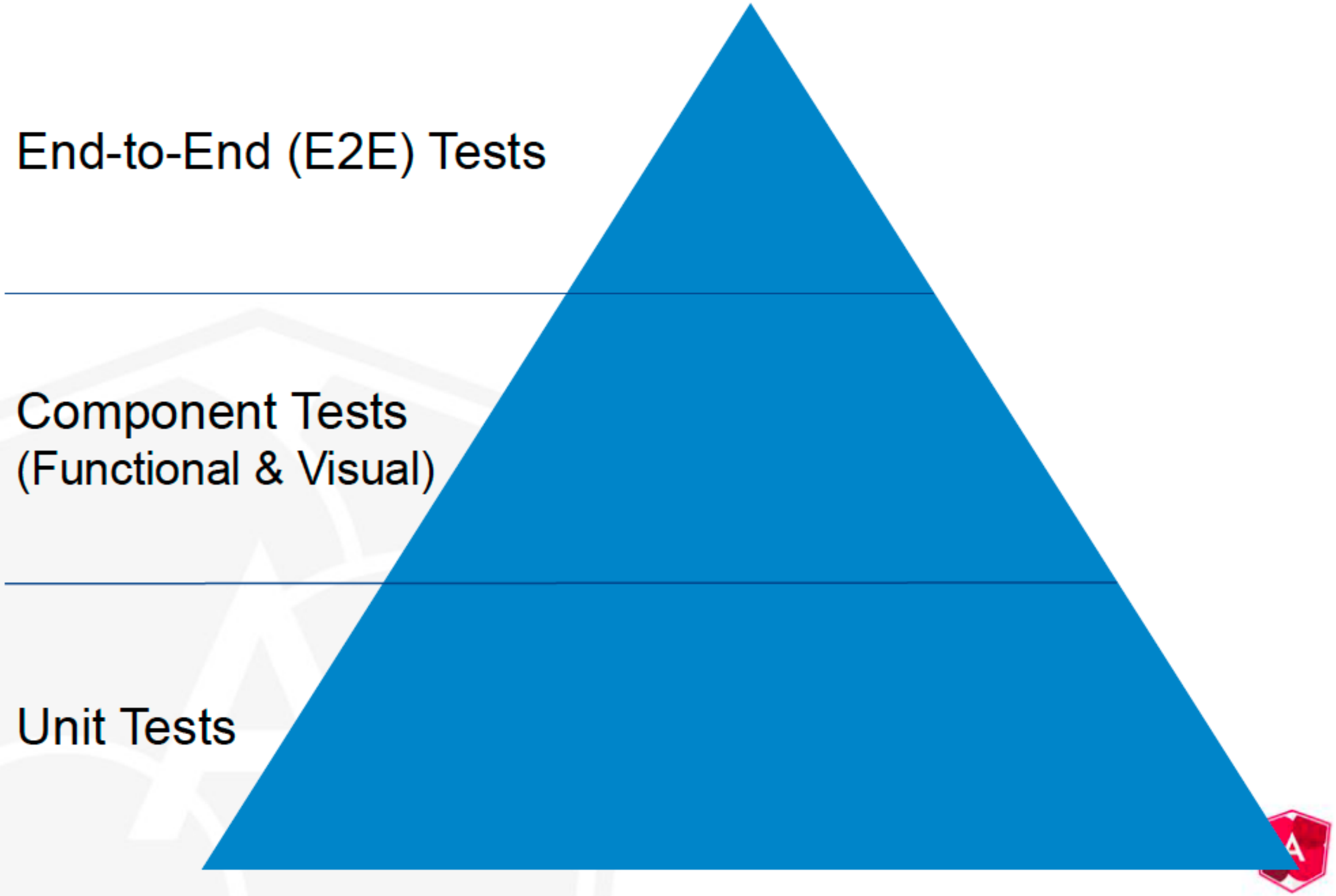
- But
  - Writing Tests needs to be learned
  - Must be backed by Devs (require discipline)
  - Tests must run fast, each has its own universe

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

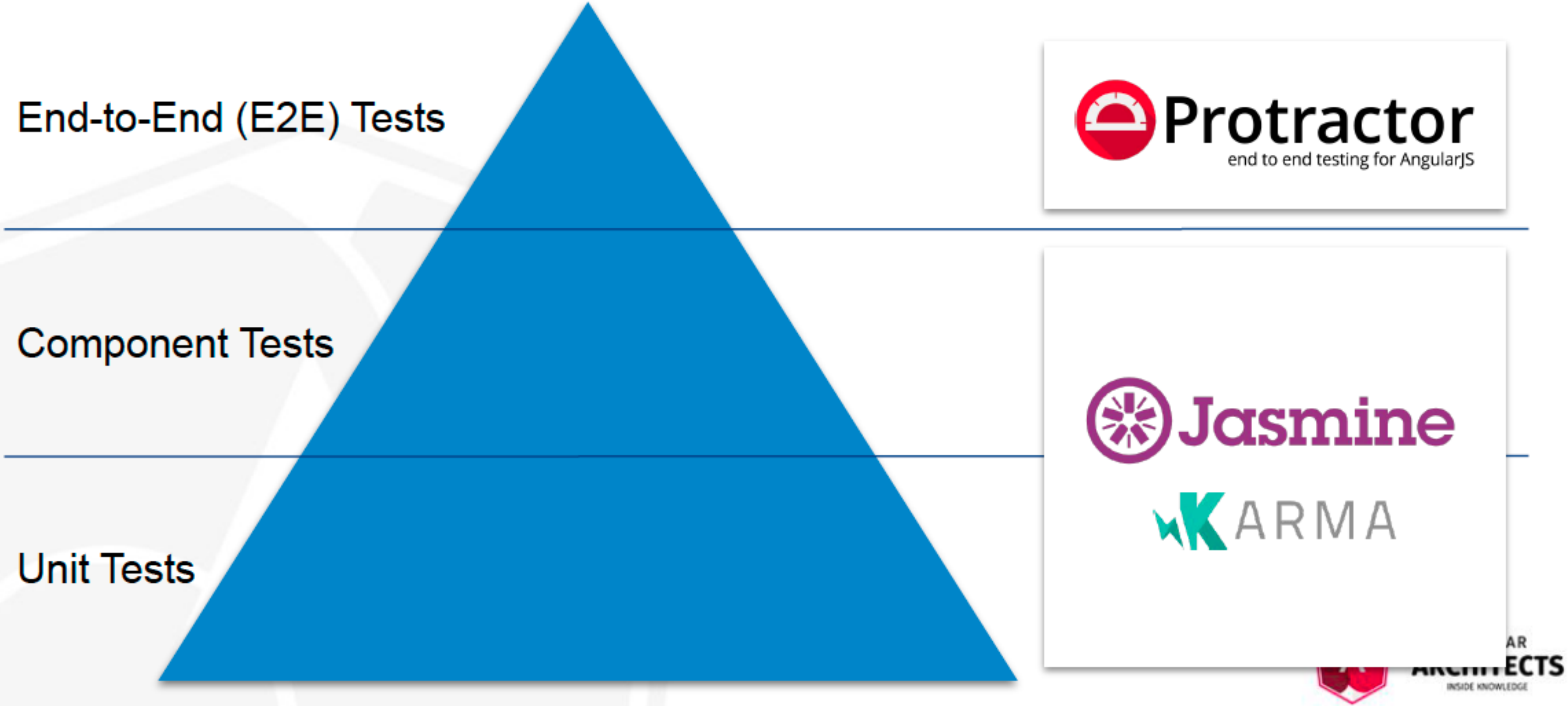


End-to-End (E2E) Tests

Component Tests
(Functional & Visual)

Unit Tests

Official version (until NG 11)



End-to-End (E2E) Tests

Component Tests

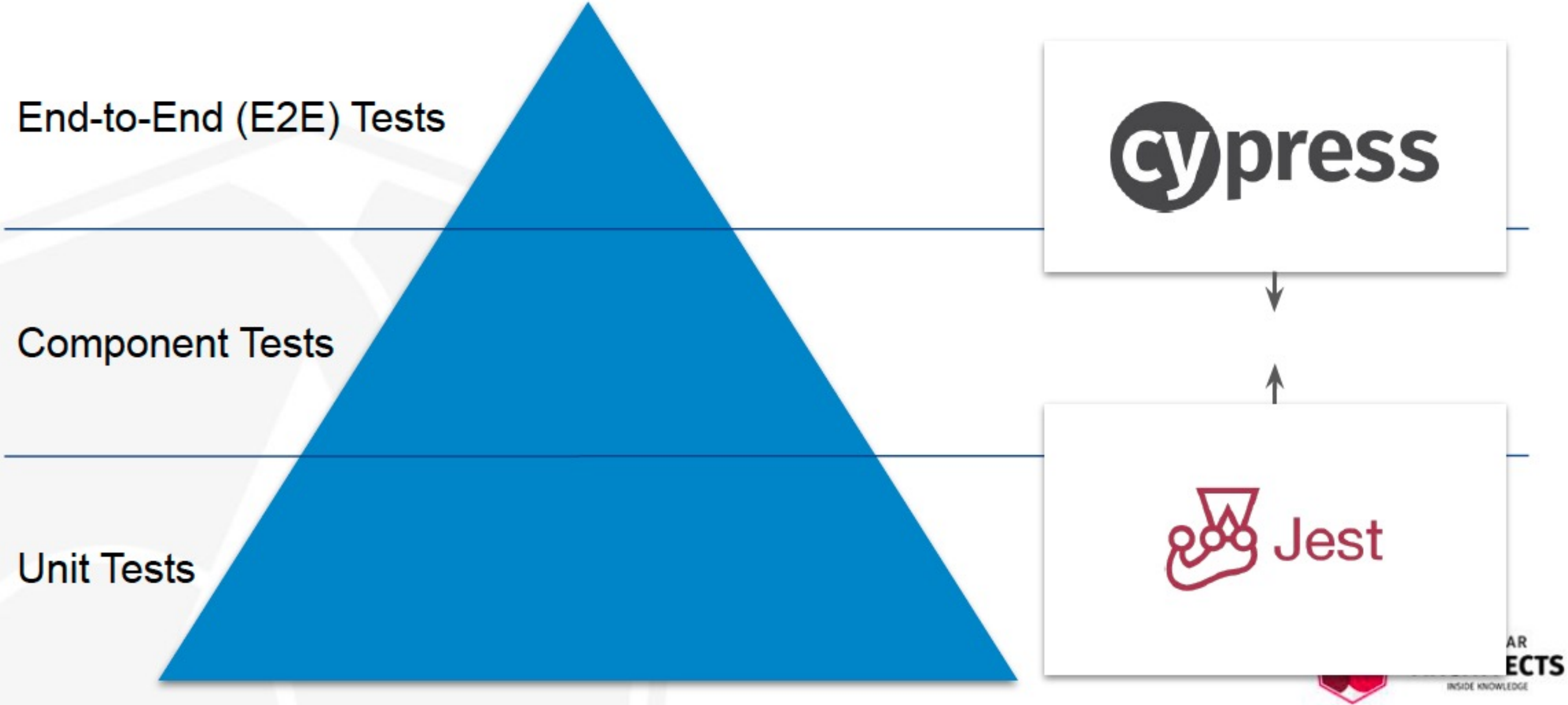
Unit Tests

Protractor
end to end testing for AngularJS

Jasmine

KARMA

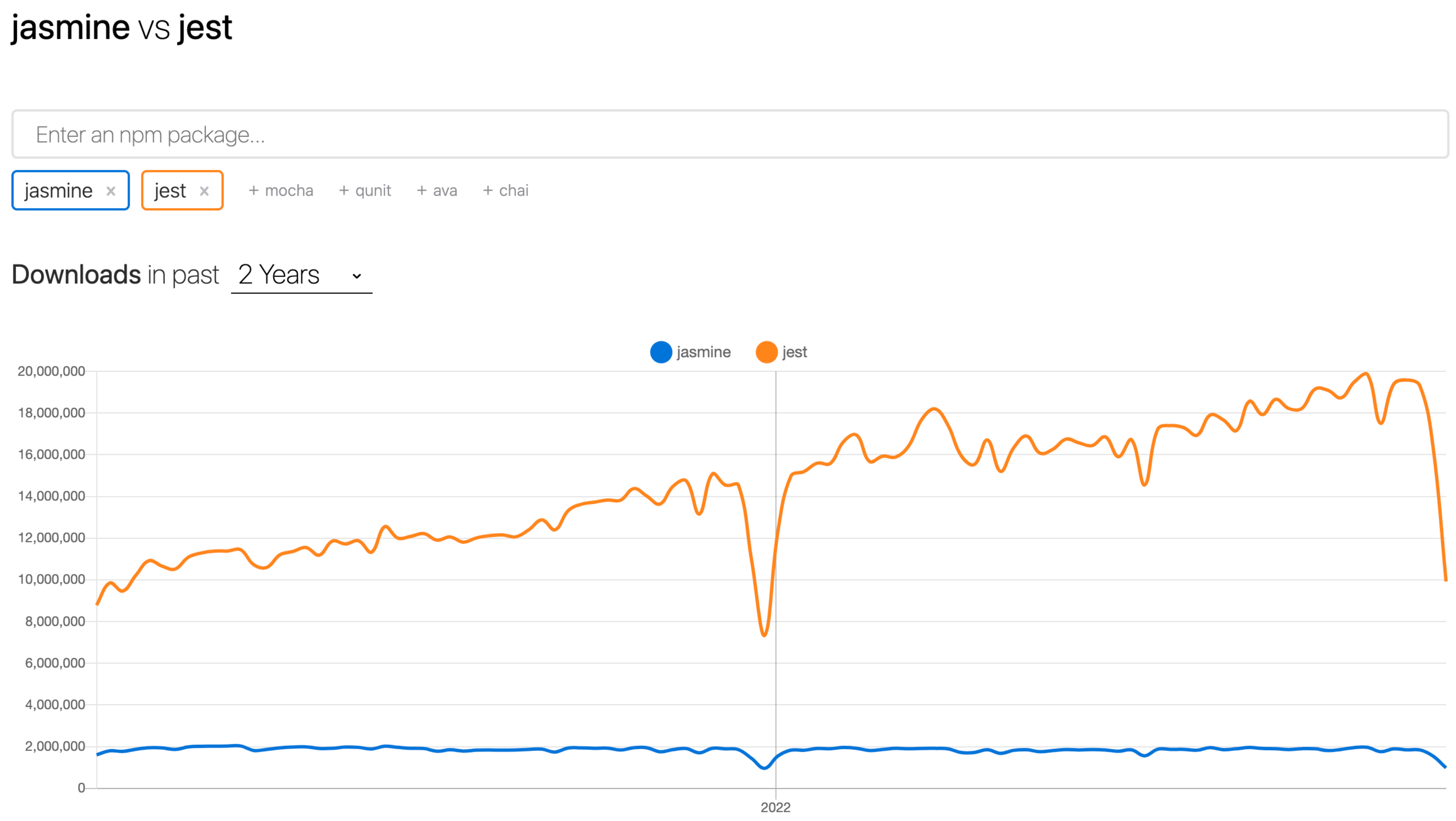
Our recommendation



End-to-End (E2E) Tests

Component Tests

Unit Tests



jasmine vs jest

Enter an npm package...

Downloads in past 2 Years

Unit Tests

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 @briebug/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');
};
```

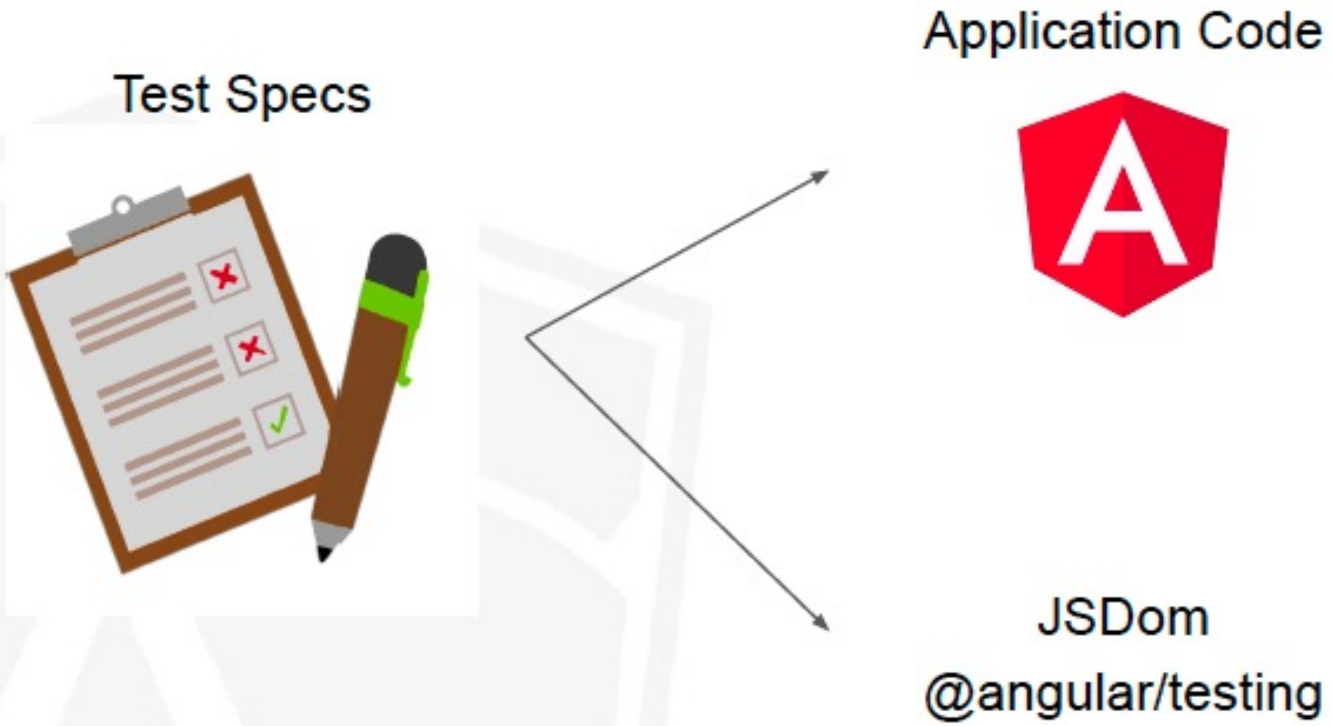
- expect(fn).toThrowError();
- expect(fn).toThrowError('nothing works');

DEMO

LAB

Component Tests

Jest



Component Tests powered by Angular

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

- TestModule

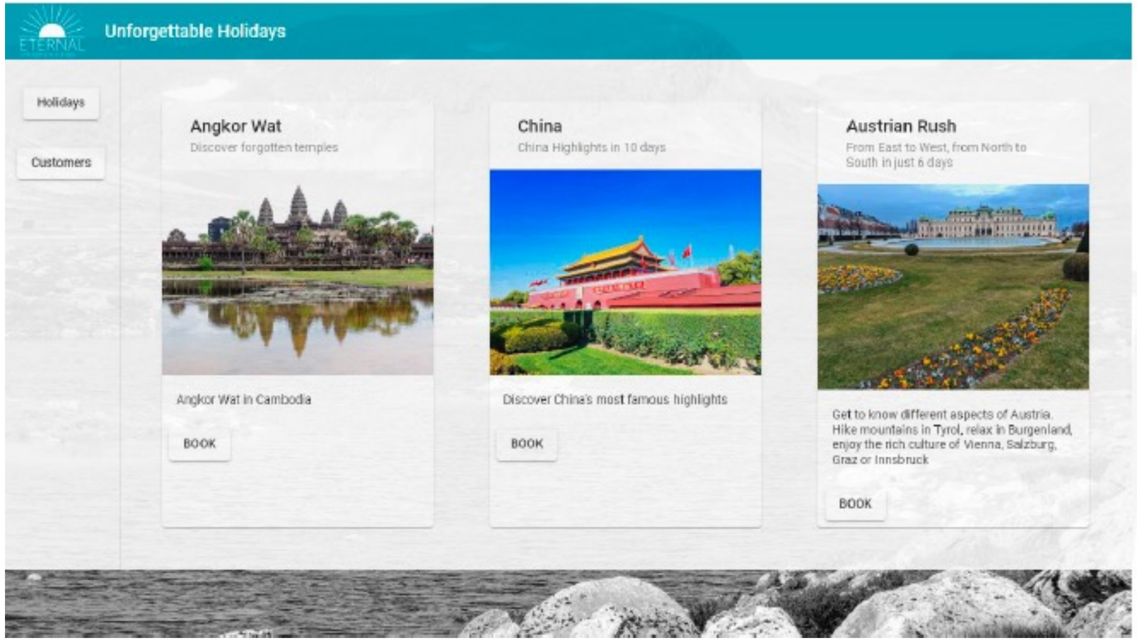
```
const fixture = TestBed.configureTestingModule({
        declarations: [AddressComponent],
        imports: [ReactiveFormsModule],
        providers: [{ provide: AddressLookuper, useValue: null }]
}).createComponent(AddressComponent);

const component = fixture.componentInstance;
```

Component Tests - Puppetteer

Component Tests - Puppetteer I

- Puppetteer
  - Headless Browser
  - Spot the difference



Unforgettable Holidays

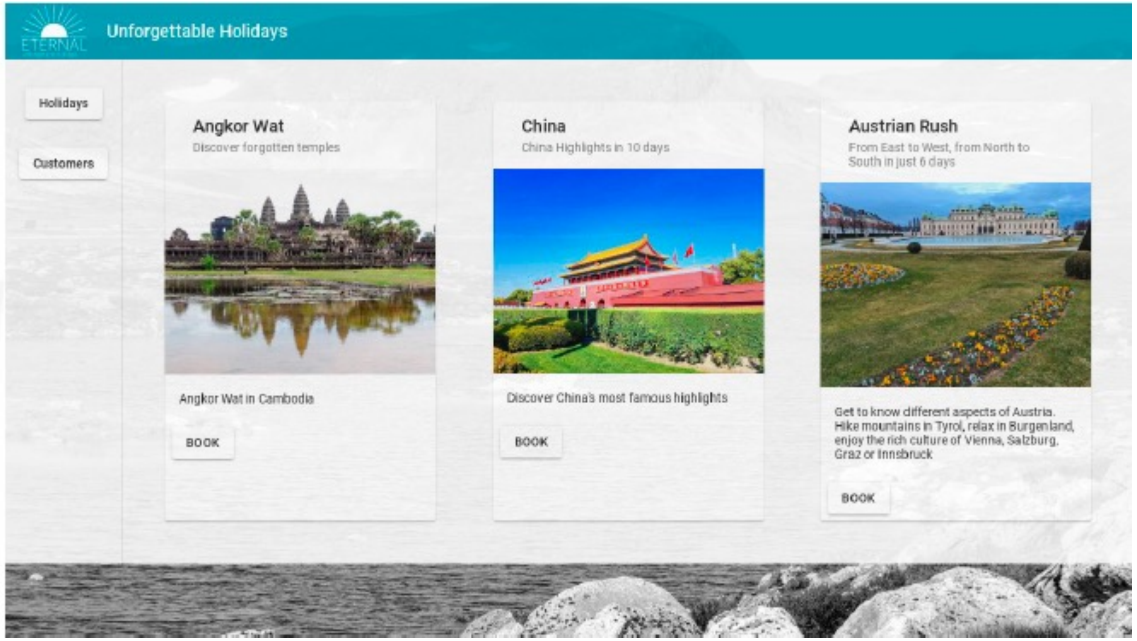
Holidays

Customers

Angkor Wat
Discover forgotten temples
Angkor Wat in Cambodia
BOOK

China
China Highlights in 10 days
Discover China's most famous highlights
BOOK

Austrian Rush
From East to West, from North to South in just 6 days
Get to know different aspects of Austria. Hike mountains in Tyrol, relax in Burgenland, enjoy the rich culture of Vienna, Salzburg, Graz or Innsbruck
BOOK



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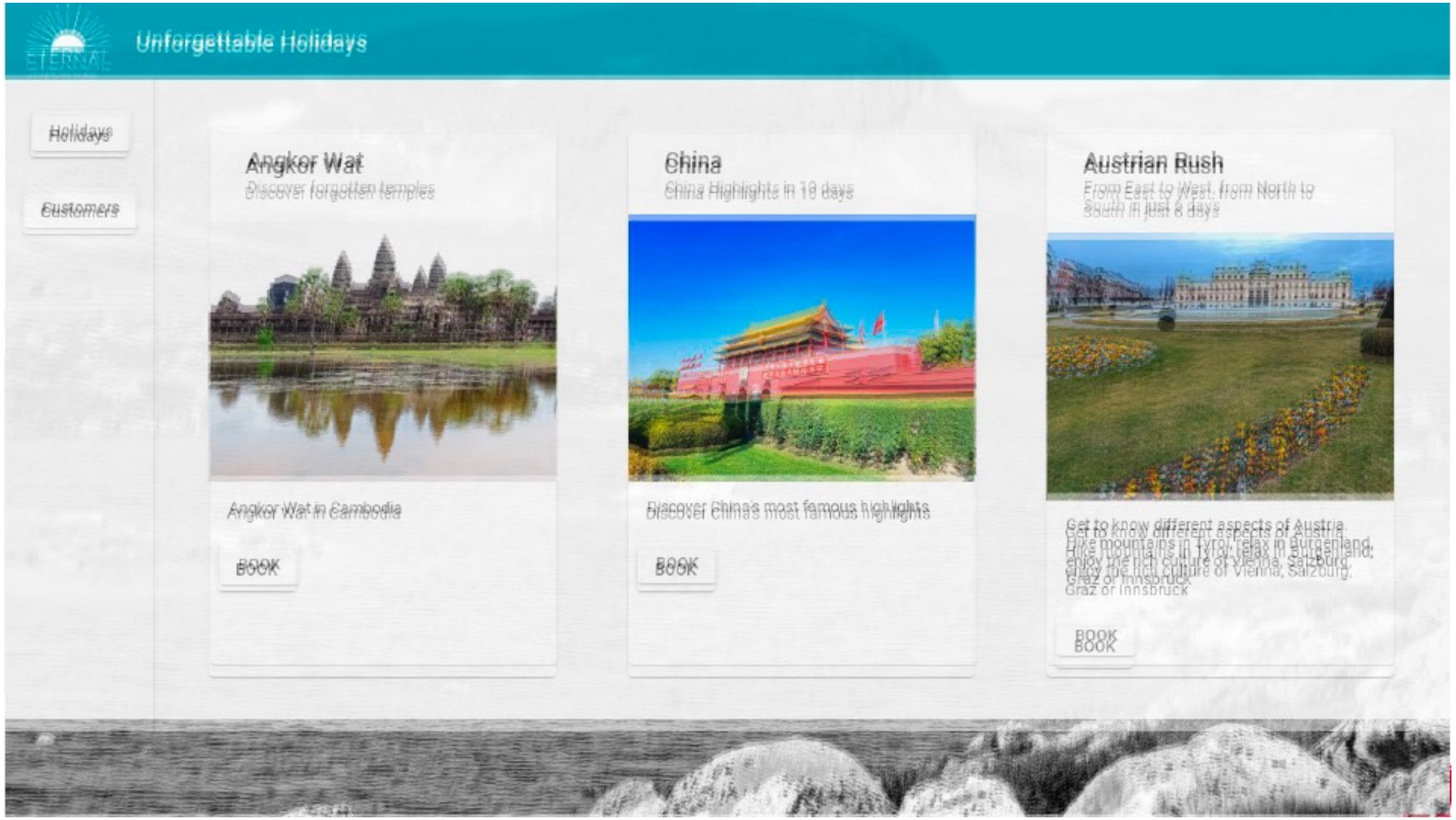
Component Tests - Puppetteer II



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Discover forgotten temples

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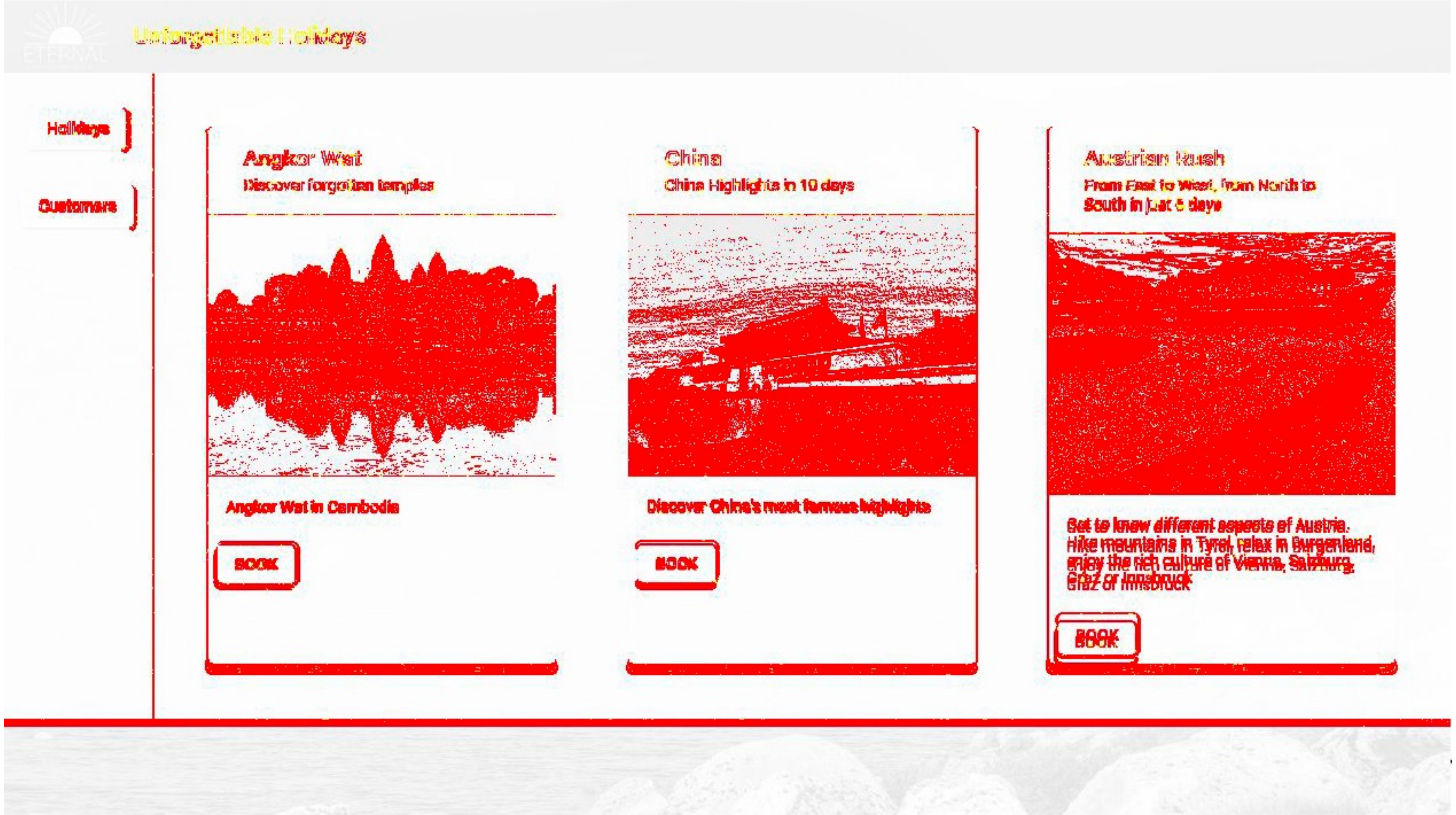
Component Tests - Puppetteer III



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Component Tests - Storybook

Component Tests – Storybook I

- Allows to isolate Components

- Not Angular Specific

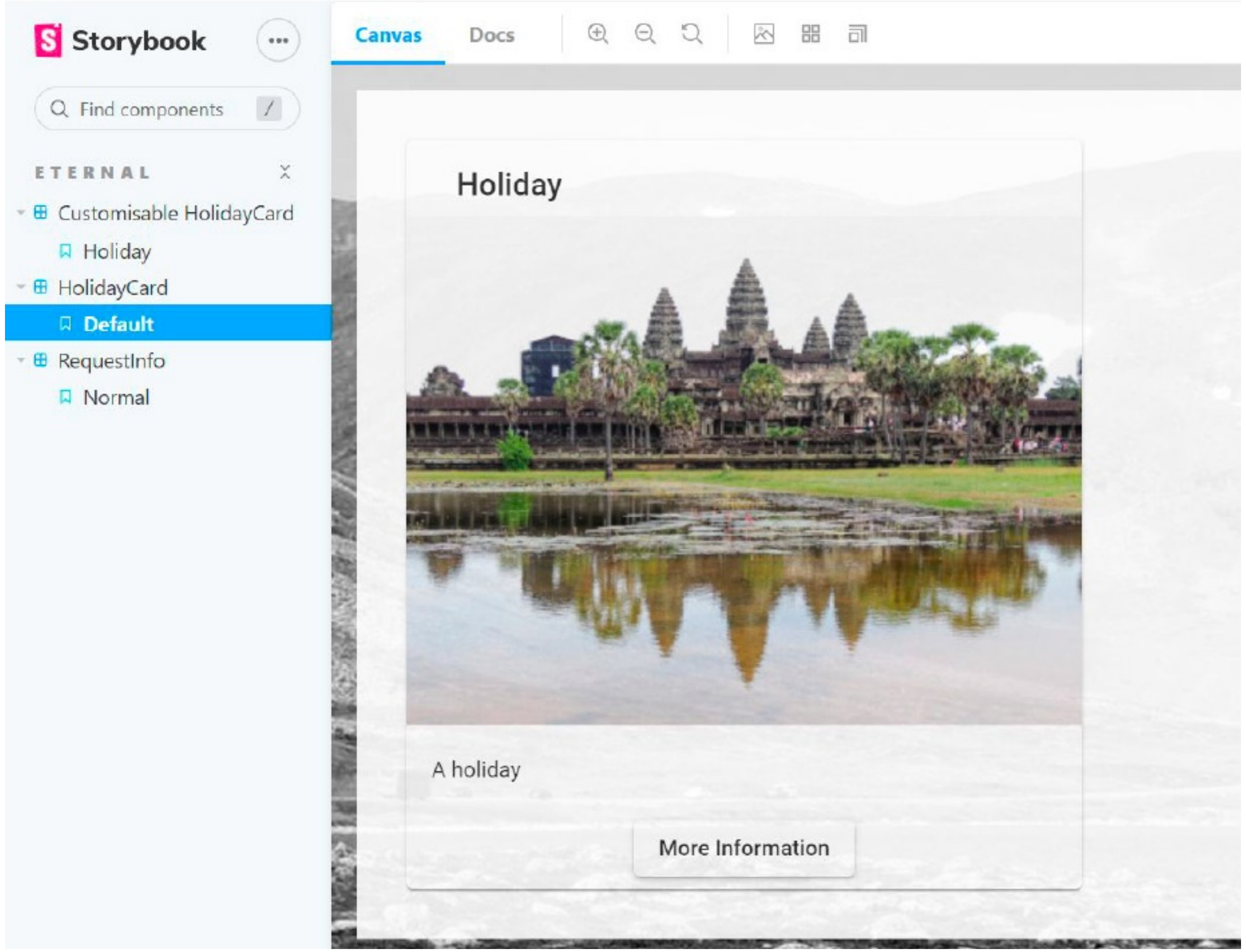
- Configure a Component for various states

- 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?