ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Playwright Workshop

4 - Beyond E2E

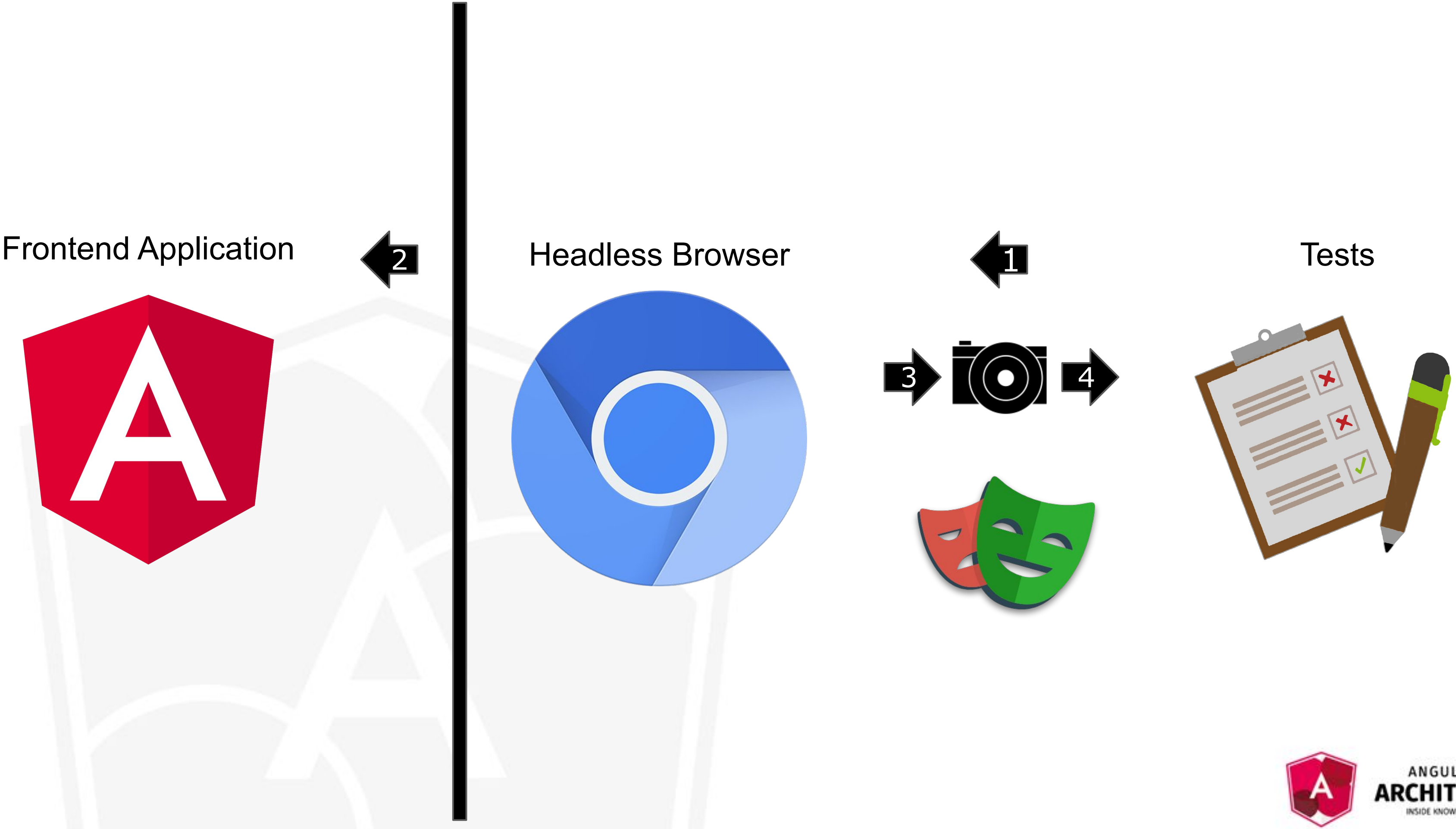
Agenda

- Visual Regression
- Component tests
- API tests
- Isolated tests with database

Main Challenges

1. Pixel Matching
2. Component Isolation

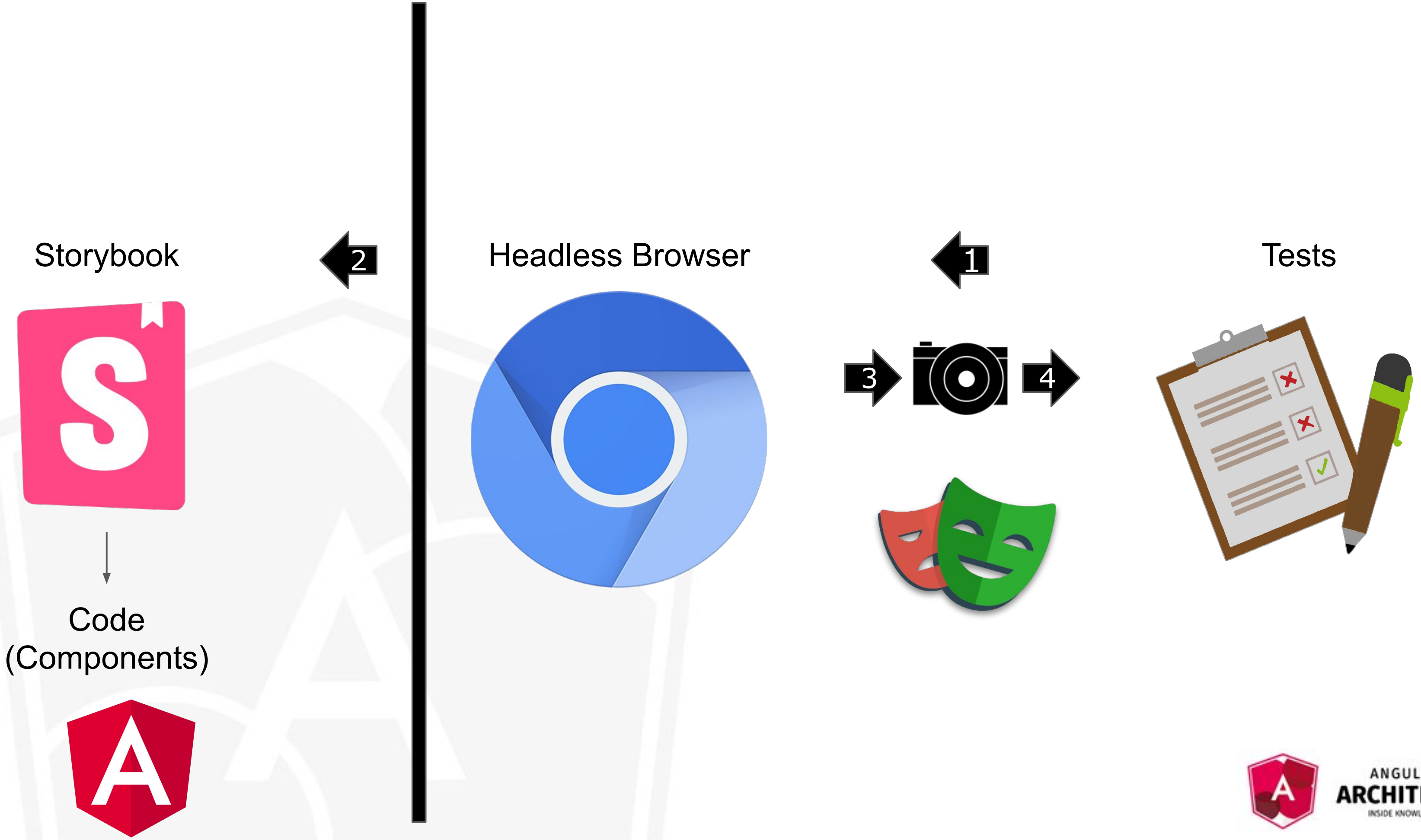
Introducing Storybook



Frontend Application

Headless Browser

Tests



Storybook

Code (Components)

Headless Browser

Tests

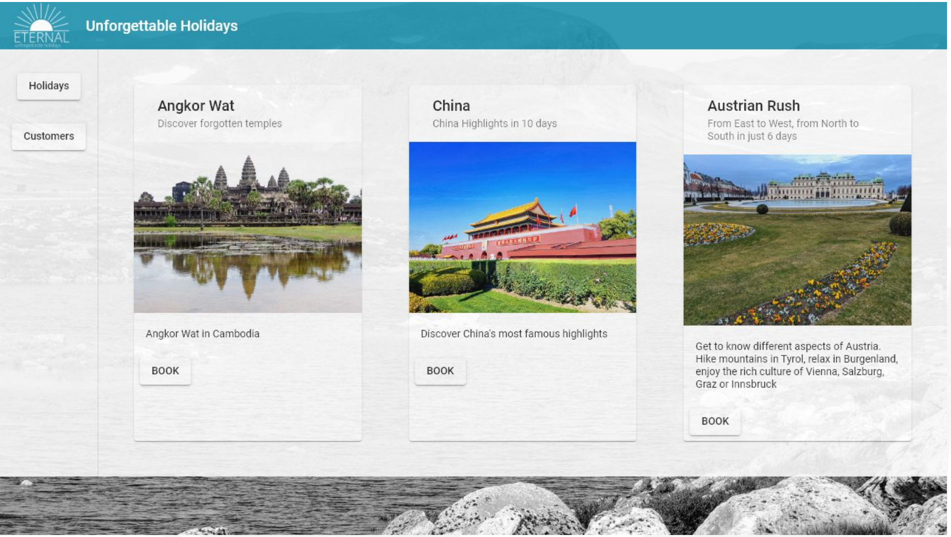
Storybook

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

What about Pixel Matching???

ANGULAR ARCHITECTS
INSIDE KNOWLEDGE

Spot the difference



Unforgettable Holidays

Angkor Wat

Discover forgotten temples

Angkor Wat in Cambodia

China

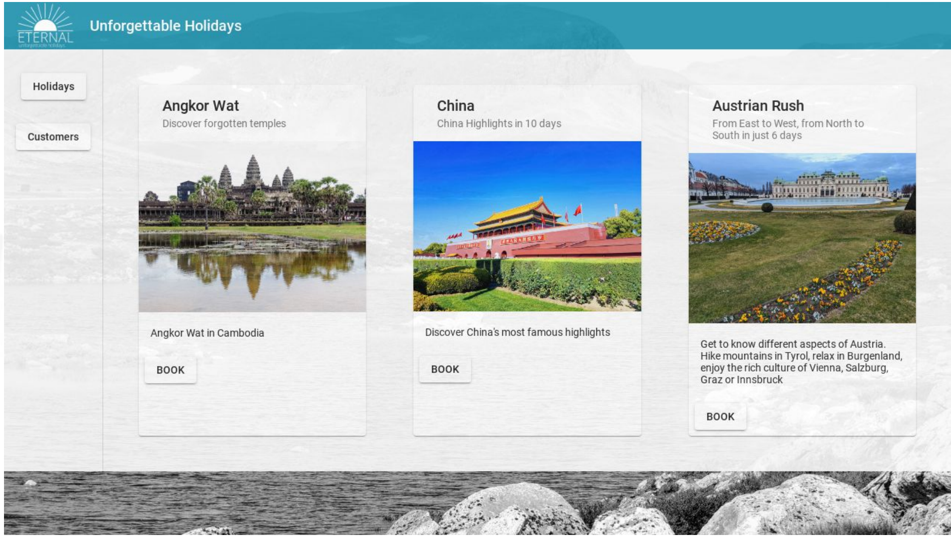
China Highlights in 10 days

Discover China's most famous highlights

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



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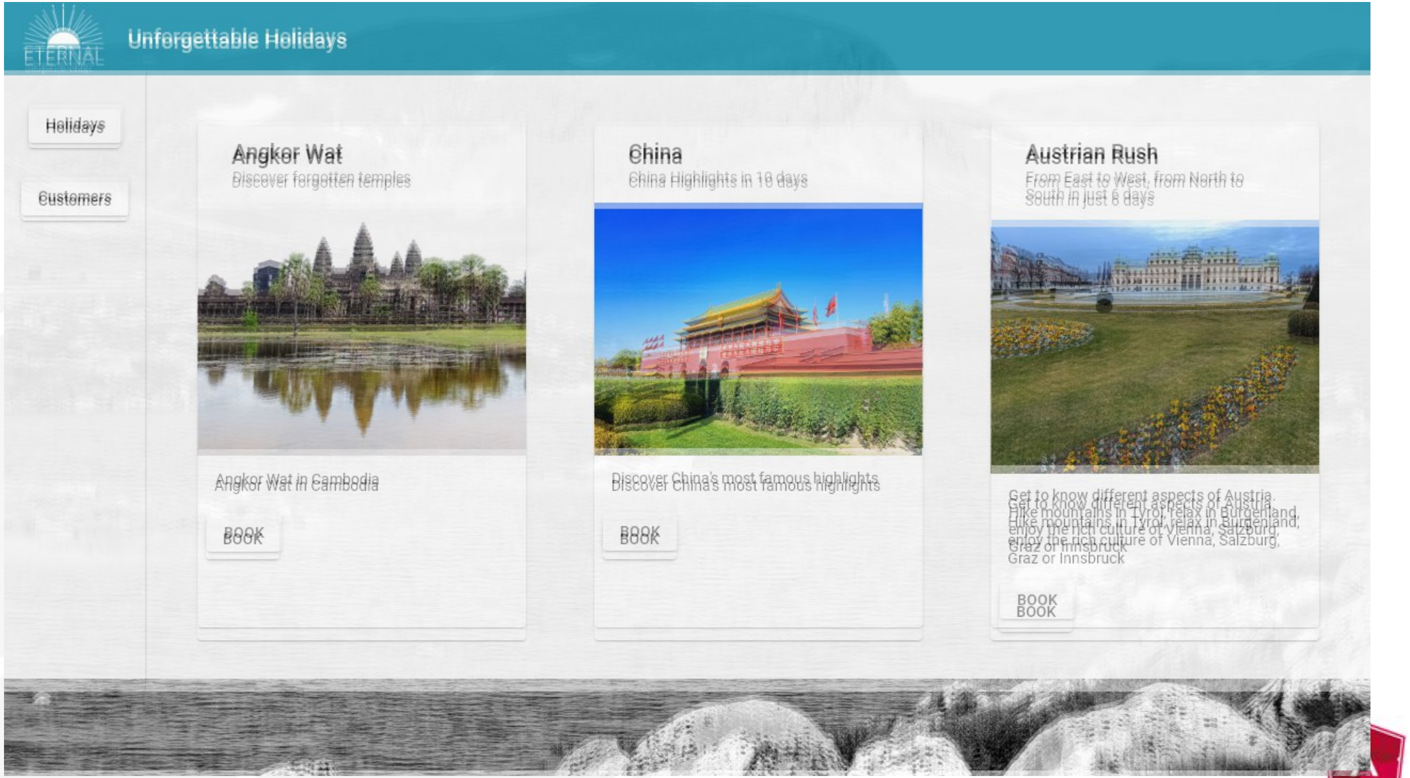

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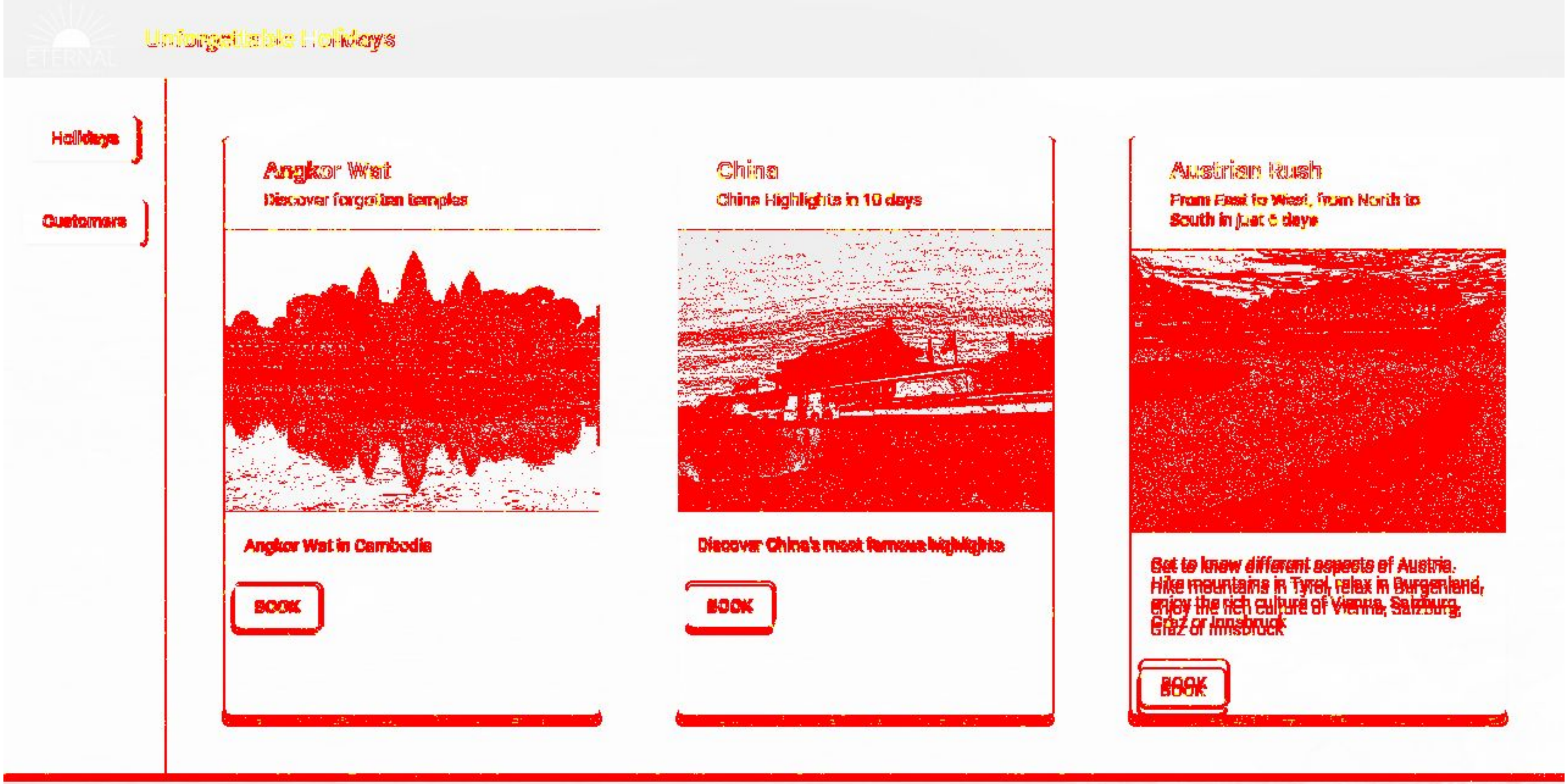

ETERNAL

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 5 days

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BOOK

BOOK

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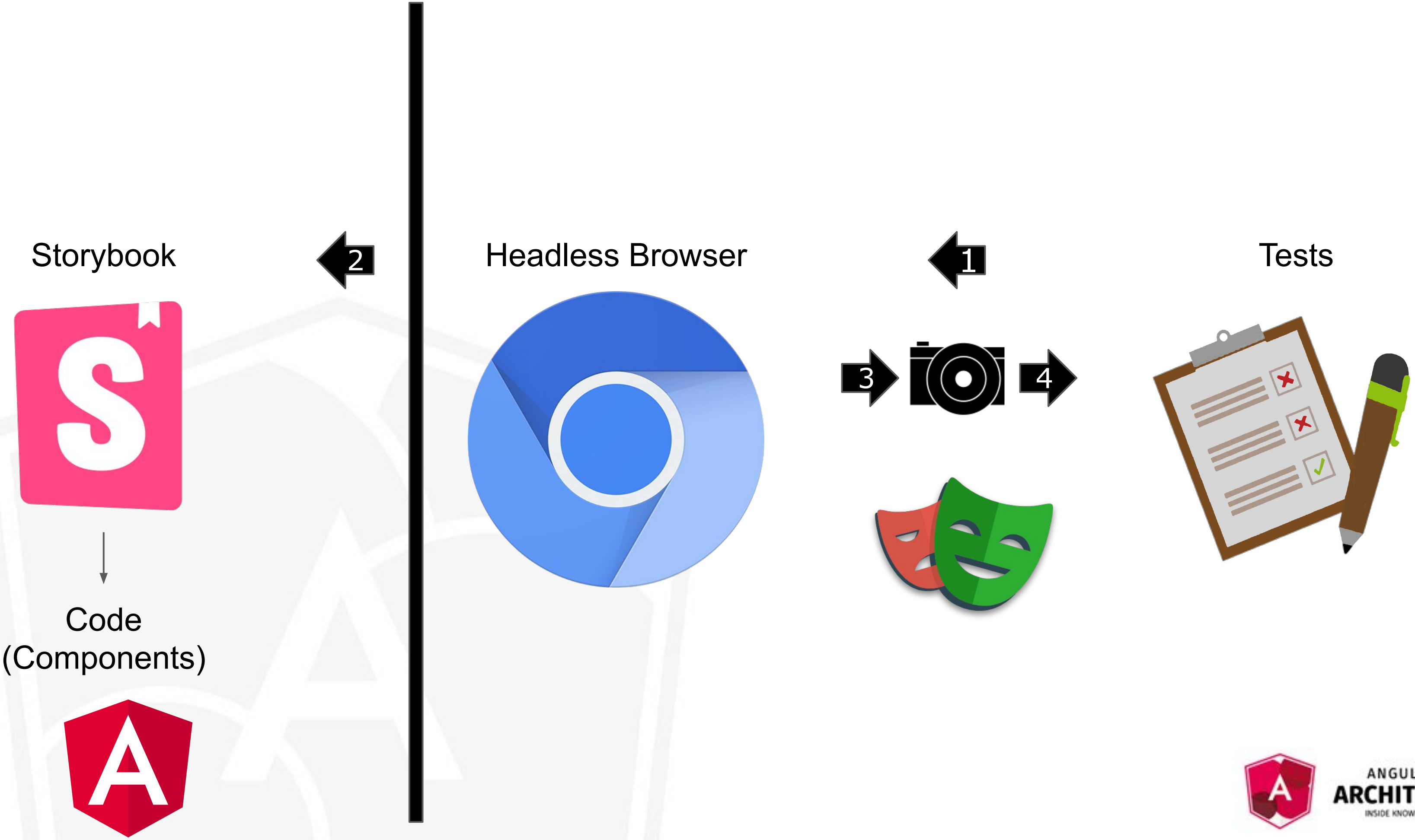
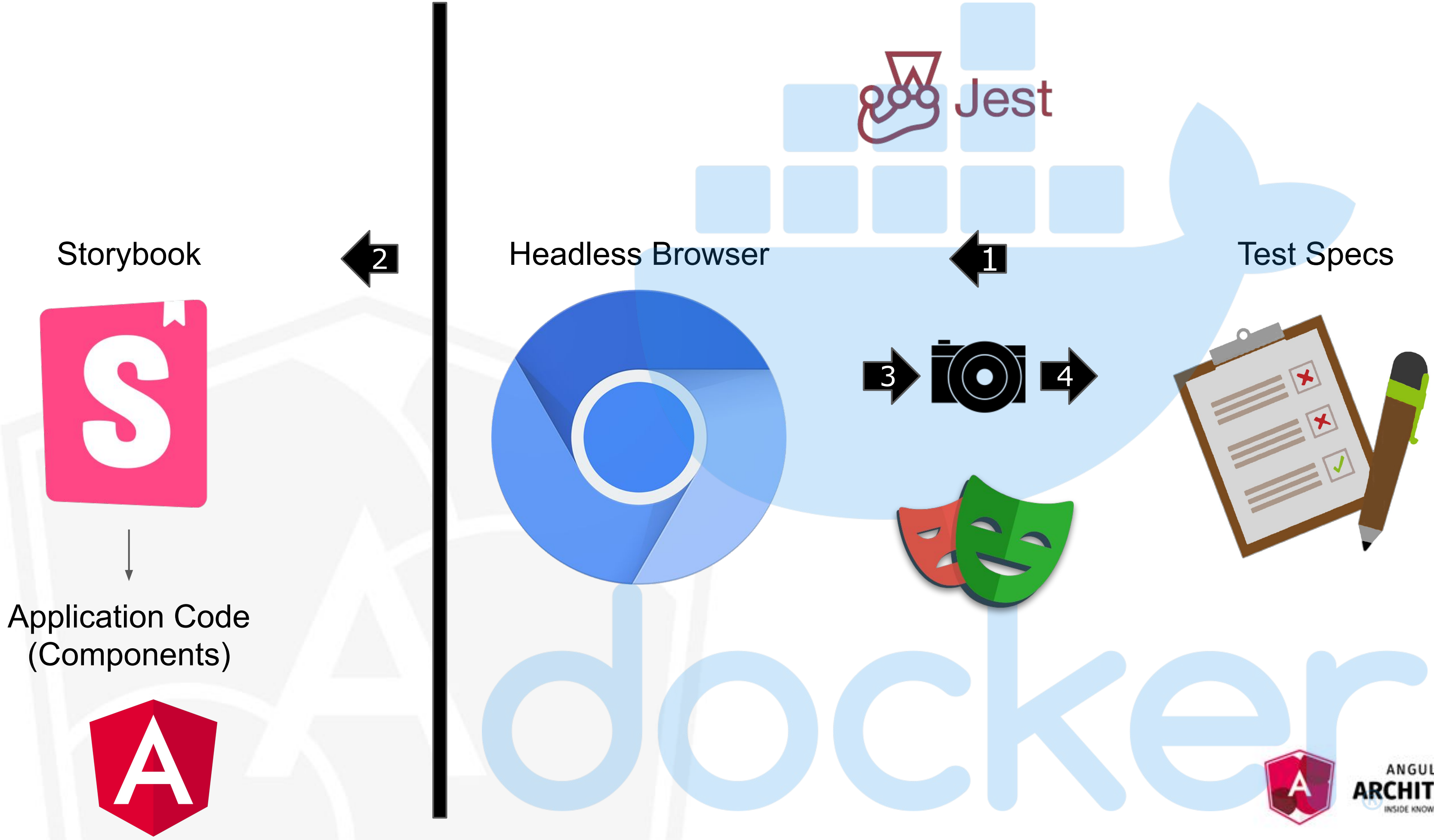


Storybook

Code
(Components)

Headless Browser

Tests



Storybook

Application Code
(Components)

Headless Browser

Test Specs

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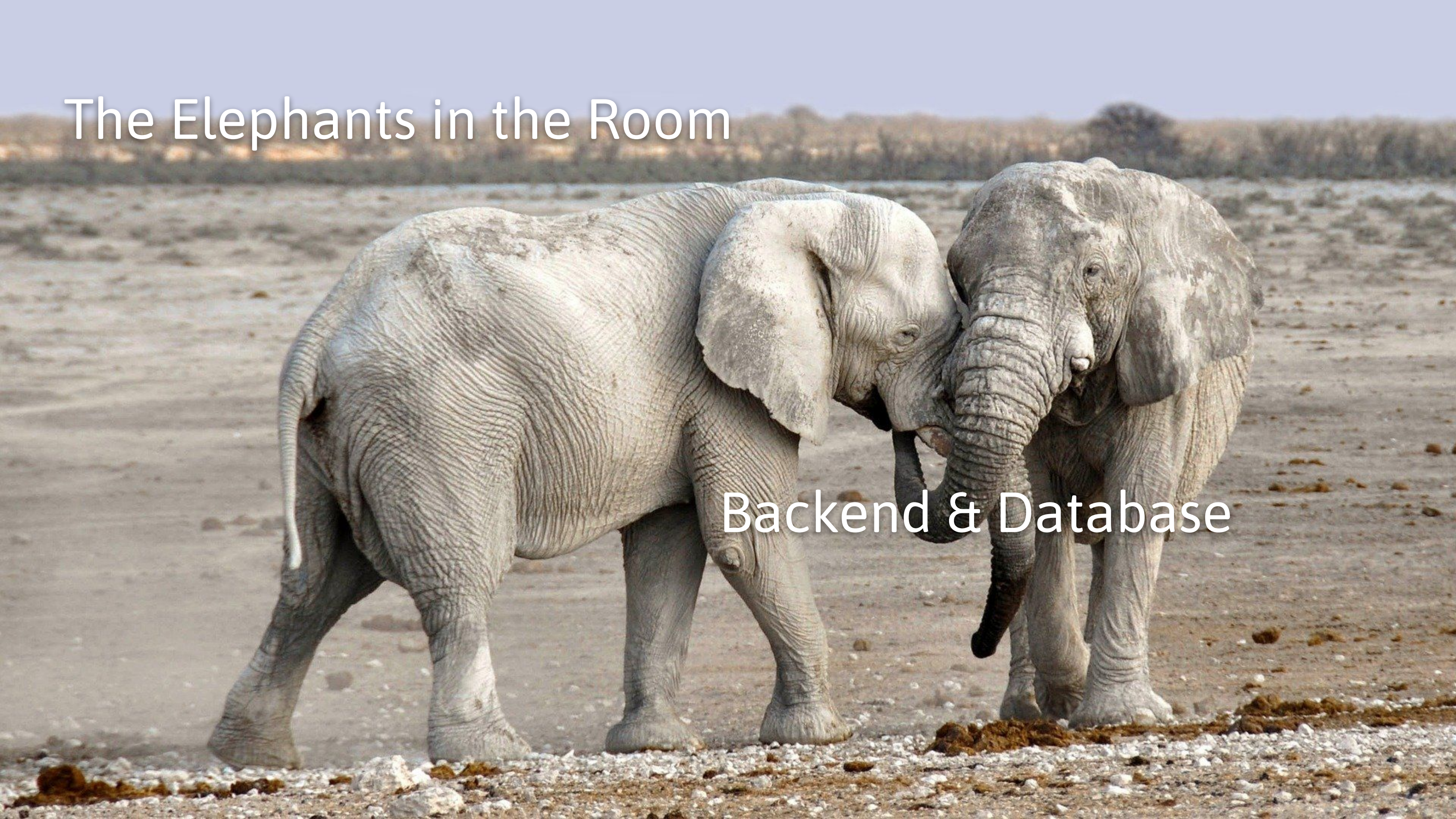
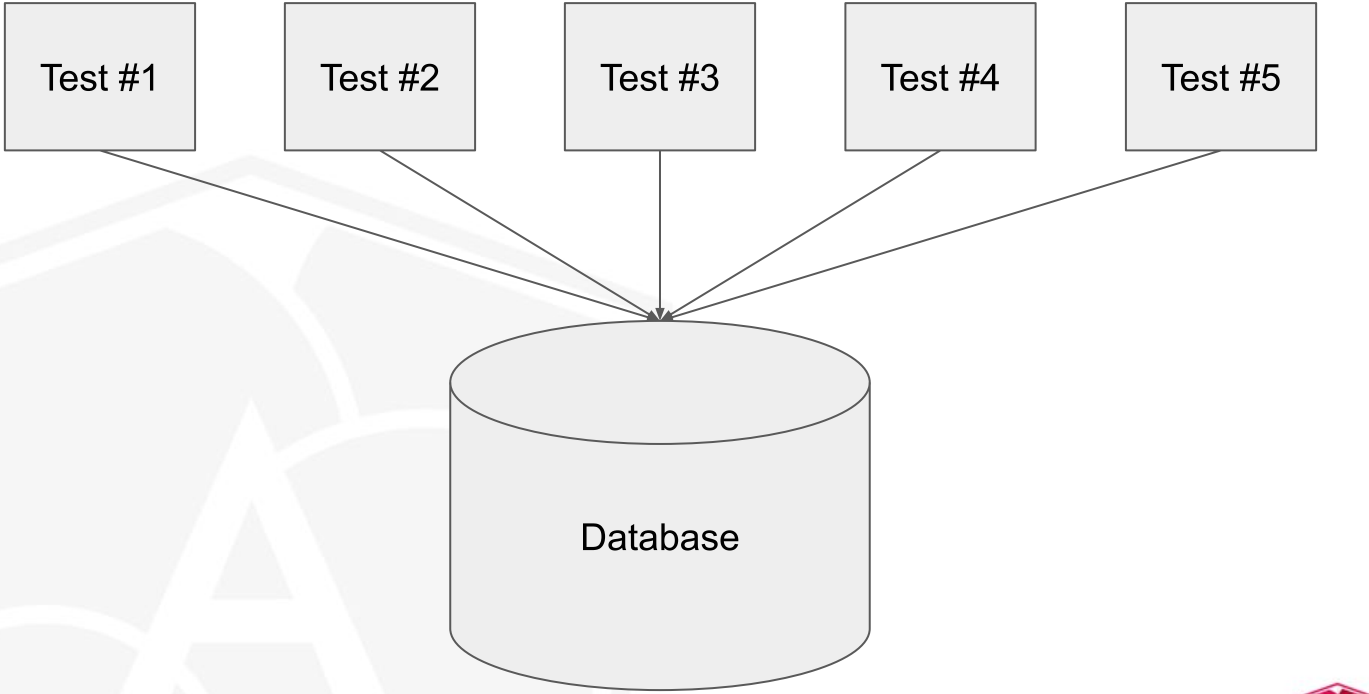
Summary

- Visual Regression is an important testing technique
- Special Requirements for Infrastructure
    - Docker
    - Cloudprovider

The Elephants in the Room



Backend & Database



Test #1

Test #2

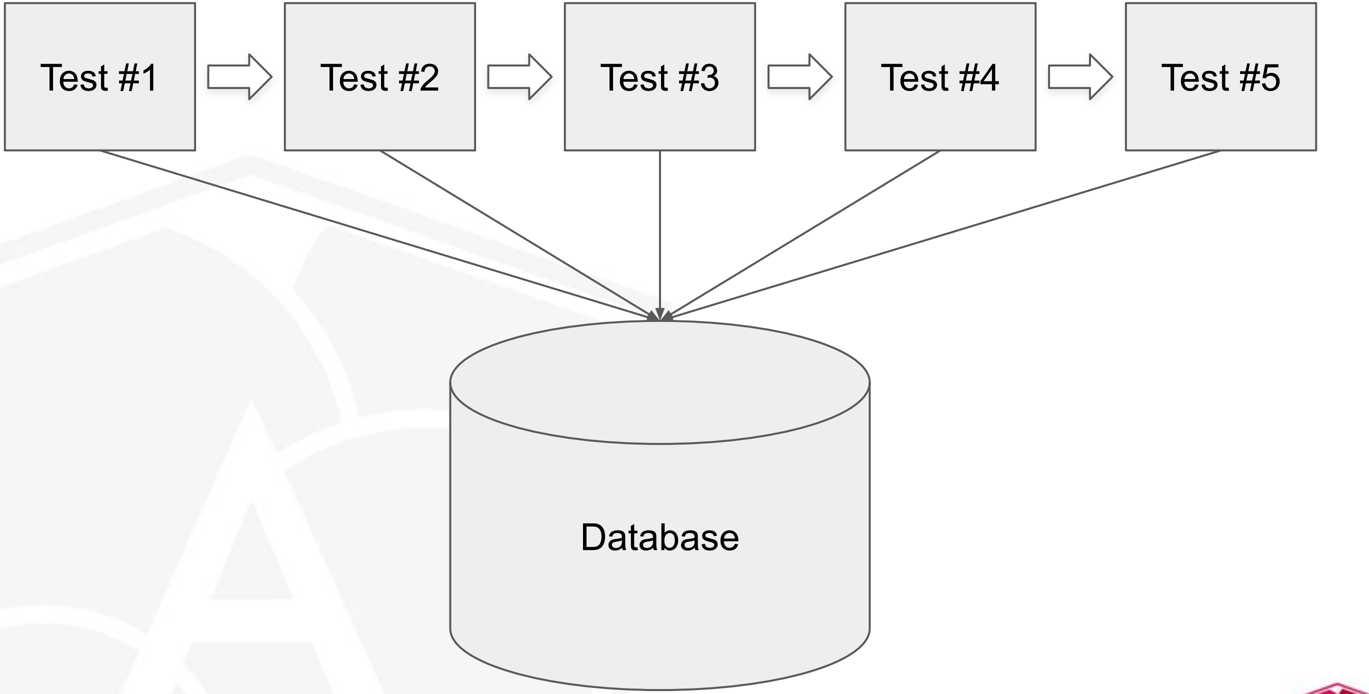
Test #3

Test #4

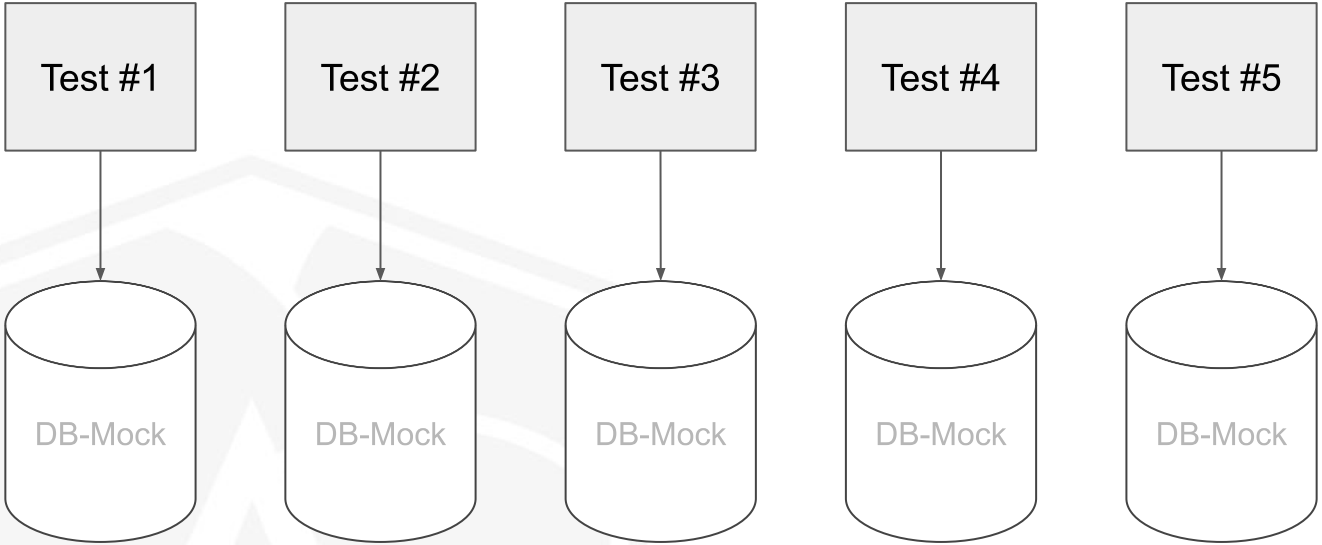
Test #5

Database

Indirect "Transitive" Coupling



Copy Strategy from non-E2E???



Database in E2E Tests

Database in Non-E2E Tests

Test Seeded Database & done???

Issues with Test Seed

- "One size fits all" approach
- Tight Coupling → Not scalable
- Fast Reseeding not always possible
- Multiple Databases
- Data from External Systems → no Seeding possible

Individual Scope - Best Case Scenario

- Data is referenced to a particular entity
  - User
  - Product
  - …
- Multi-Tenant Systems
- Customer-Centric Systems
  - Insurances
  - Banks

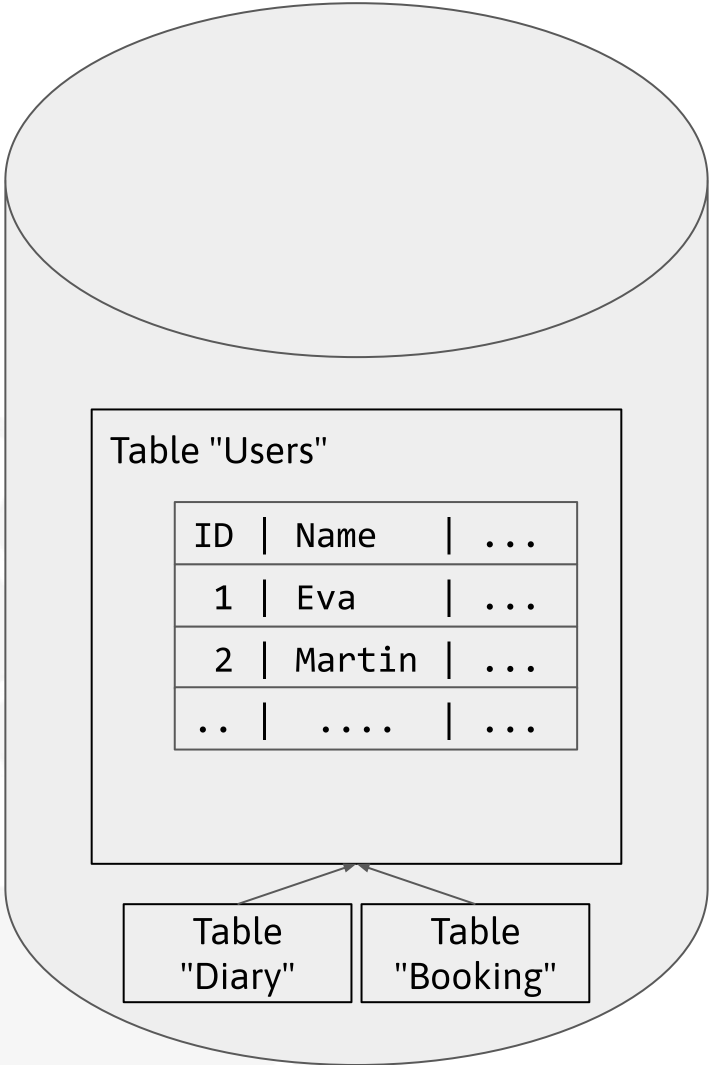
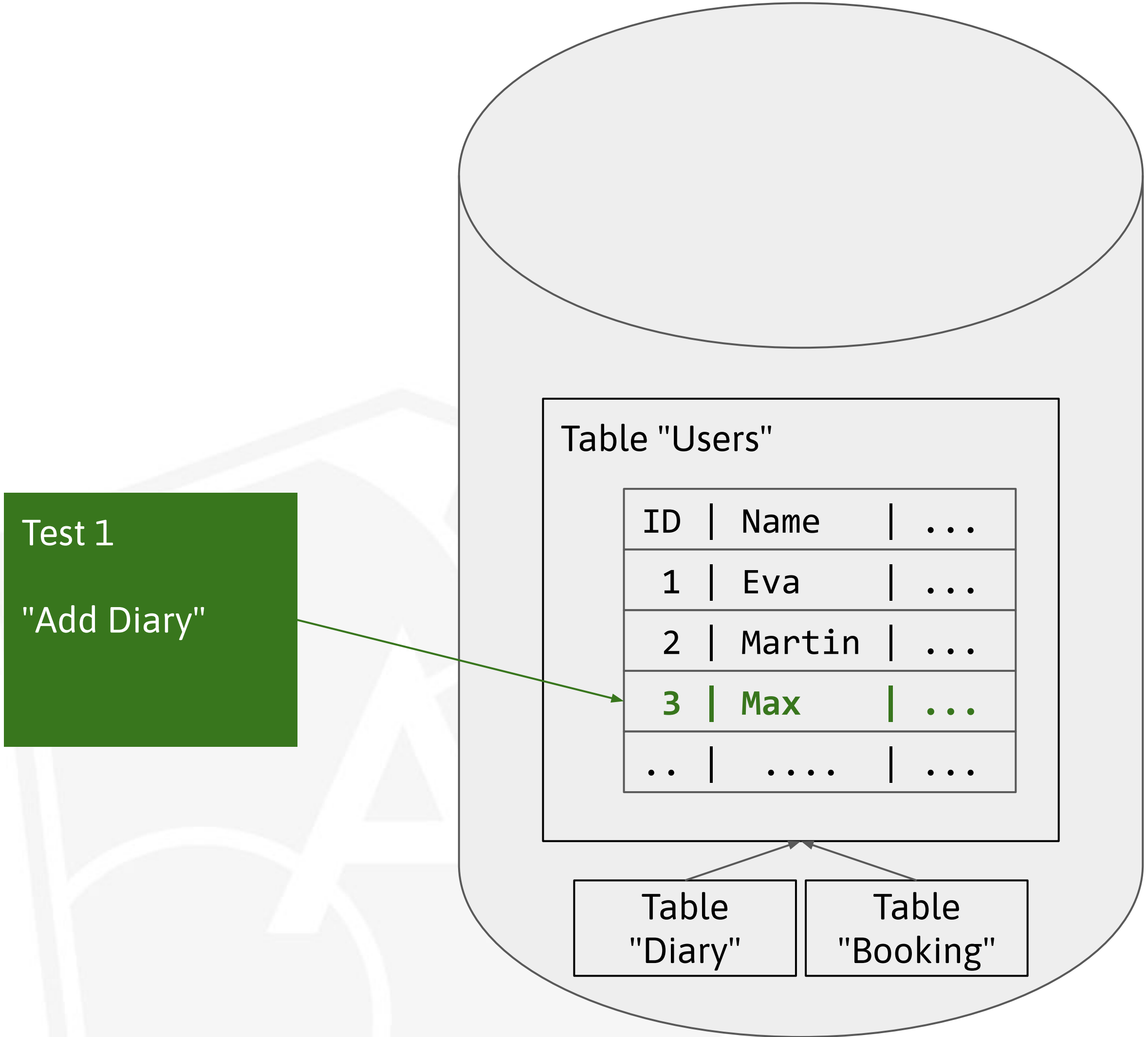


Table "Users"

ID	Name	...
1	Eva	...
2	Martin	...
..	....	...

Table "Diary"

Table "Booking"



Test 1

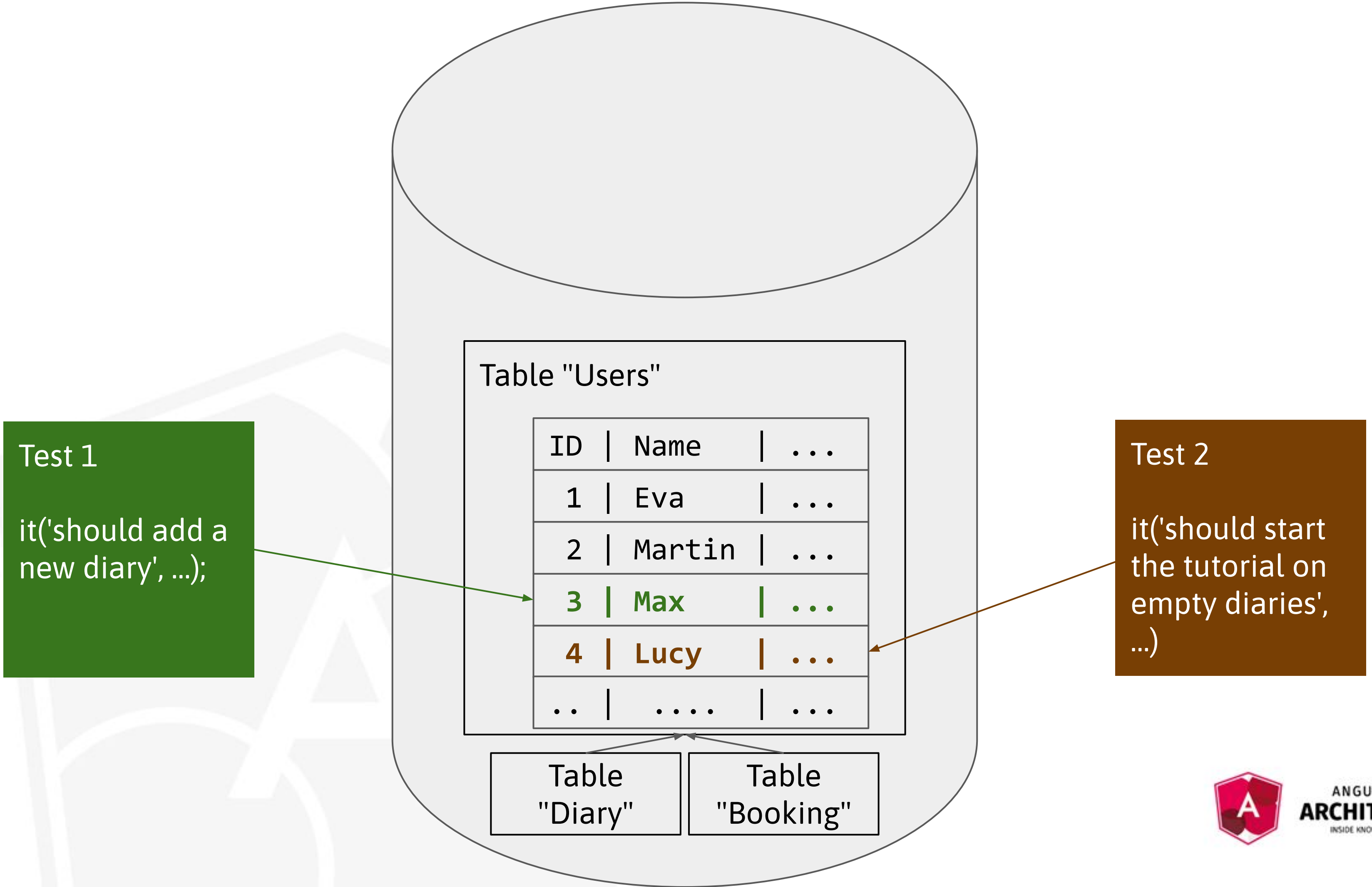
"Add Diary"

Table "Users"

ID	Name	...
1	Eva	...
2	Martin	...
3	Max	...
..	....	...

Table "Diary"

Table "Booking"



Test 1

it('should add a new diary', ...);

Table "Users"

ID	Name	...
1	Eva	...
2	Martin	...
3	Max	...
4	Lucy	...
..	....	...

Table "Diary"

Table "Booking"

Test 2

it('should start the tutorial on empty diaries', ...)

Test Setup !== Test

API Arrange Possibilities: Normal Requests

- Default Case
- Call same endpoints as the Frontend
- Don't use the frontend directly!
- use `request.[get|post|...]()`

API Arrange Possibilities: Dedicated Test API

- Backend provides special API for test mode
- Shortcuts possible, e.g.
  - merge chain of requests into one
  - Overcome Security Issues
- Best Option

Testing Scopes

- Individual Scope
  - All data depends on a certain ID
  - e.g. Personalised Data
  - Best Option in Combination with Test API (Sign Up & In)
- Global Scope
  - Tests Affect each other
  - Challenging Parallel Runs
  - Not so easy to solve...

Global Pattern I: Independent Tests

- Read-Only Character
- No Arranging required
- Rely on Test Seed
- Smoke Tests
- Tests for Static Elements

Global Pattern II: Intelligent Tests

- "I'll create and find it"
- Flexible
- Requires more code

Global Pattern III: Dependent Test Group

- Default Group
- Logical Group of Unit Tests
- Internal knowledge about other tests
- Order is important
- Database Reset after each Group Run

Global Scope IV: Simulated Individual Context

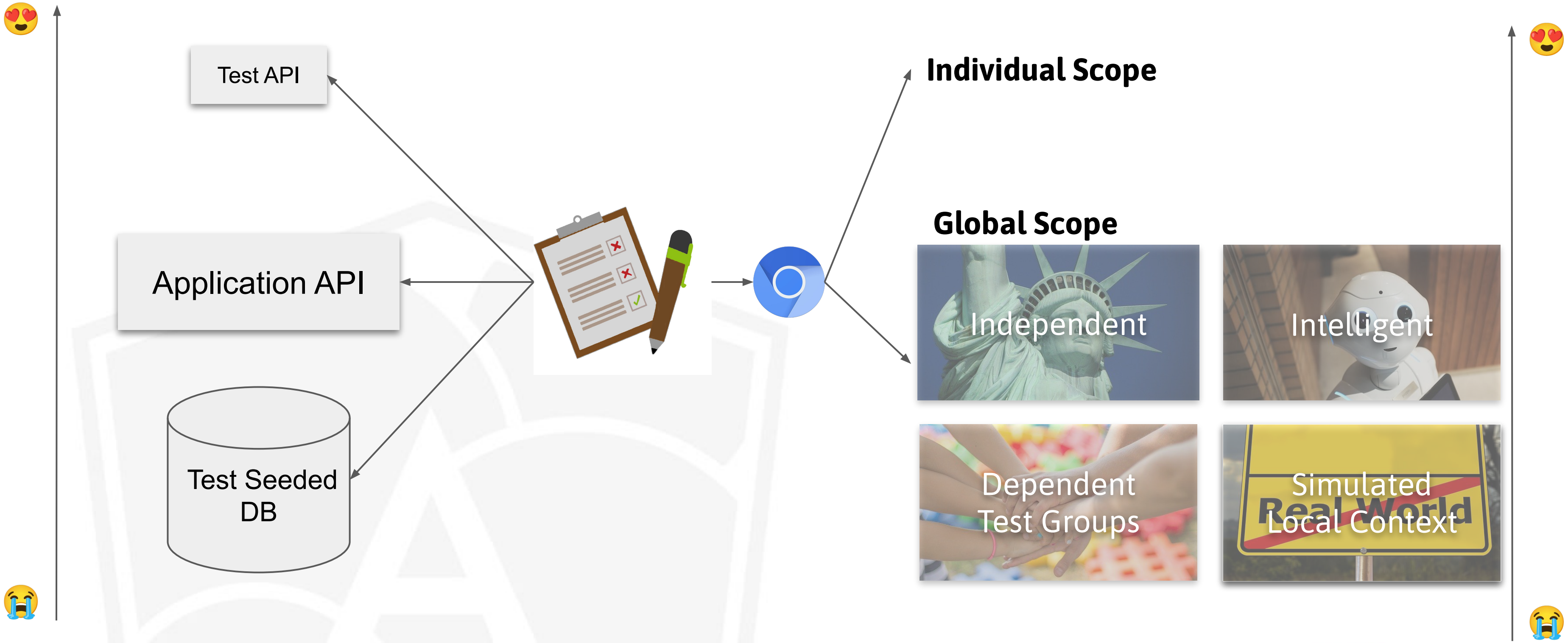
- Mock all APIs
- Transforms a global into an individual context

Global Scope V: Integration Tests

- Don't test it all and rely on integration tests

Arrange

Act & Assert



Test API

Application API

Test Seeded DB

Individual Scope

Global Scope

Independent

Intelligent

Dependent Test Groups

Simulated Local Context

Summary

- You will not have completely isolated tests
- Try to minimize loose coupling
- Always prefer Backend API over Test Seed
- Look out for opportunities with individual scope