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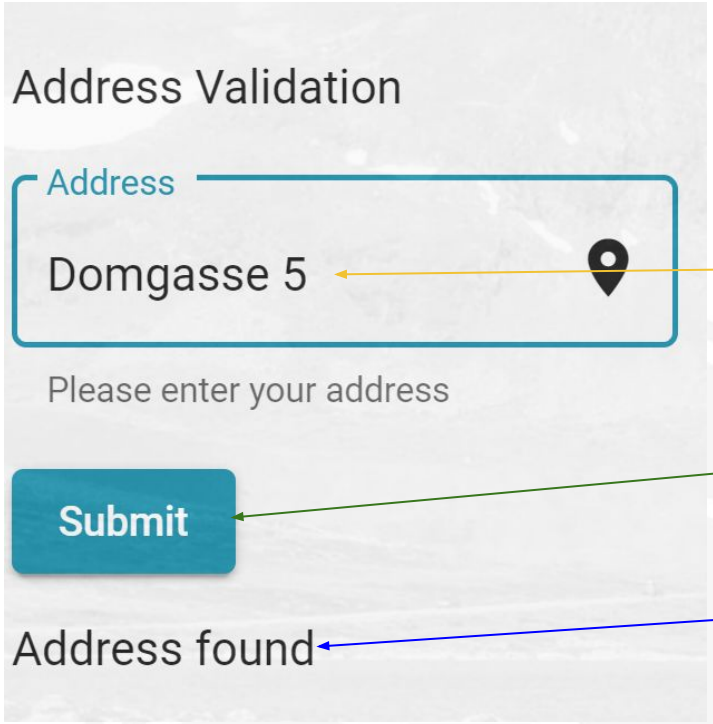
Angular Testing

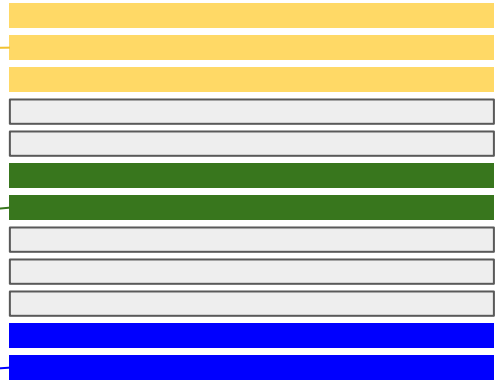
6 - Component & Integration: Fallback

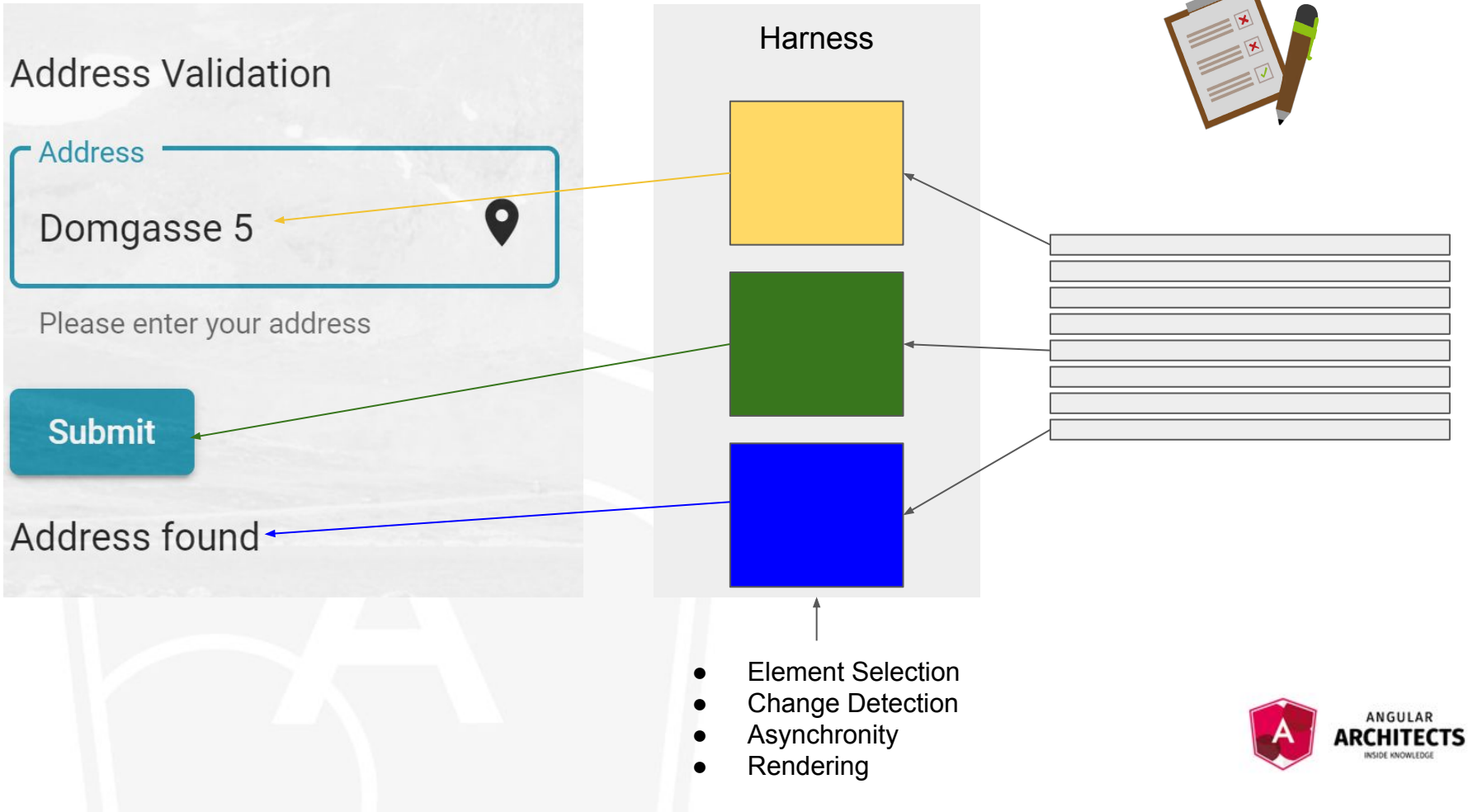
Harnesses

Test Harnesses

- Page Object Models for Component Tests
- Available since Angular v9
- Provide a test abstraction for components
- Developed by @angular/material
- Full coverage for material since v11
- Reduces code size significantly
  - Better Readability
  - Better Maintainability






Address Validation
Address
Domgasse 5
Please enter your address
Submit
Address found
Harness
Element Selection
Change Detection
Asynchronity
Rendering
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Creating a Harness

```
export class RequestInfoComponentHarness extends ComponentHarness {

  static hostSelector = "eternal-request-info";

  protected getButton = this.locatorFor("[data-testid=ri-search]");


  async submit(): Promise<void> {

    const button = await this.getButton();

    return button.click();

  }

}
```

Using a Harness

```
it("should use the harness", async () => {
  // setup TestModule...

  const harness = await TestbedHarnessEnvironment.harnessForFixture(
    fixture,
    RequestInfoComponentHarness
  );
  await harness.submit();
  // expect something
});
```

When to use it?

- Shared UI Components
- In Combination with Testing Library or Spectator
- "Page Objects" in E2E

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Spectator

Spectator

- Unopinionated TestBed Wrapper
- Great Support for Mocking
- Applicable for various testing types
- Very popular in Angular
- Powered by ngneat

Setup

```
const createComponent = createComponentFactory({
  component: RequestInfoComponent,
  mocks: [AddressLookuper]
});

const setup = () => {
 return { spectator: createComponent() };
};
```

Tests

```
it(`should show ${message} for ${address}`, fakeAsync(() => {
  const { spectator } = setup();
  spectator
    .inject(AddressLookuper)
    .lookup.mockImplementation((query: string) =>
      scheduled([query === 'Domgasse 5'], asyncScheduler)
    );
  spectator.typeInElement(address, byTestId('ri-address'));
  spectator.click(byTestId('ri-search'));
  spectator.tick();

  expect(spectator.query(byTestId('ri-message'))).toHaveText(message);
}));
```

When to use it?

- If Cypress or Testing Library is not an option
- If you have already Spectator-based tests

Testing Library

Testing Library

- Huge ecosystem
- Enforces a Testing Philosophy
- Superior UI Debugging Tools
- find* removes (most) Asynchrony and Change Detection
- userEvent with real-world behaviour
- Common API for multiple frameworks (Cypress,....)
- Host Components very easy

Configuring the TestingModule

Classic

```
TestBed.configureTestingModule({
  declarations: [NewsletterComponent],
  imports: [ReactiveFormsModule],
  providers: [
    { provide: NewsletterService,
      useValue: MockedNewsletterService },
  ],
});

const fixture = TestBed
  .createComponent(NewsletterComponent);
const component = fixture.componentInstance;
fixture.detectChanges()
```

Testing Library

```
render(NewsletterComponent, {
  declarations: [NewsletterComponent],
  imports: [ReactiveFormsModule],
  providers: [
    { provide: NewsletterService,
      useValue: MockedNewsletterService },
  ],
});
```

No component creation and detectChanges() needed

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Configuration with static HTML

```
render(`<eternal-newsletter email="user@host.com"></eternal-newsletter>`, {
  declarations: [NewsletterComponent],
  imports: [ReactiveFormsModule],
  providers: [
    { provide: NewsletterService, useValue: MockedNewsletterService },
  ],
});
```

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Selecting DOM Elements

Classic

```
const button = fixture.debugElement.query(
  By.css("[data-testid=btn-submit]")
);
```

Testing Library

```
const button = screen.getByTestId("btn-search");

// Alternatives

// can also be null
const button = screen.queryByTestId("btn-search");

 // internally triggers asynchronous tasks and CD
const button = await screen.findByTestId("btn-search");  // 👍
```

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Actions

Classic

```
button.click();
fixture.detectChanges();
```

Testing Library

```
fireEvent.click(button);
```

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Extension userEvent - real DOM Events

@testing-library/user-event

```
// v1
await user.click(screen.getByTestId("btn-submit"));

// v2
await user.click(await
screen.findByTestId("btn-submit"));
```

- Dispatches Events like an end-user
- Works best with 3rd party components
- Provides support for
  - **Writing to inputs**
  - Mouse movements
  - Clipboard interaction
  - ...

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Extension selectors: "mini page objects"

`testing-library-selector`

Before

```
screen.getByTestId<HTMLButtonElement>('btn-submit');

screen.queryByTestId<HTMLButtonElement>('btn-submit');

await screen

  .findByTestId<HTMLButtonElement>('btn-submit');
```

After

```
const ui = {
  button: byTestId<HTMLButtonElement>('btn-submit')
};


ui.button.get()

ui.button.query()

await ui.button.find()
```

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Setup

```
const ui = {
  address: byTestId("ri-address"),
  search: byTestId("ri-search"),
  message: byTestId("ri-message"),
};
const setup = async () => {
  const lookuper = createMock(AddressLookuper);
  const renderResult = await render(RequestInfoComponent, {
    providers: [{ provide: AddressLookuper, useValue: lookuper }],
  });
  const user = userEvent.setup();

  return { ...renderResult, lookuper, user };
};
```

Tests

```
it(`should show ${message} for ${address}`, async () => {
  const { lookuper, user } = await setup();
  lookuper.lookup.mockImplementation((query: string) =>
    scheduled([query === "Domgasse 5"], asyncScheduler)
  );

  await user.type(ui.address.get(), address);
  await user.click(screen.getByTestId("ri-search"));
  const messageEl = await screen.findByTestId("ri-message");
  expect(messageEl.textContent).toBe(message);
});
```

When to use it?

- For all tests where DOM interaction is required
- If Cypress is not an option