

FORMS

Ori Calvo, 2017

oric@trainologic.com

<https://trainologic.com>

Introduction

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- Handling forms inside SPA is considered challenging
- In general it breaks the unidirectional data flow principle
- Angular provides a dedicated package named **@angular/forms** for handling forms
- Two approaches
 - ▣ Template Driven
 - ▣ Reactive Form

Template Driven vs. Reactive Form

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- **Template driven** approach simply infers the form structure directly from the DOM
 - ▣ Therefore less testable
- **Reactive form** approach allows you to programmatically define the form and synchronize it with the DOM
 - ▣ More testable

Template Driven

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- Start by installing **@angular/forms** and add **FormModule** to imports list
- Continue with attaching ngModel directive to inputs

```
<div>  
  <input [(ngModel)]="name">  
  
  <button (click)="add()">Add</button>  
</div>
```

The [(ngModel)] syntax

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- When specifying the following

```
<input [(ngModel)]="name">
```

- Angular converts it to

```
<input [ngModel]="name" (ngModelChange)="name = $event">
```

- It means that two way data binding can be used only when the directive supports that convention

CSS classes

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- **ngModel** tracks the status of the input and changes its CSS classes

```
<input class="ng-pristine ng-valid ng-touched">
```

- Once the end user type something the CSS classes change

```
<input class="ng-valid ng-touched ng-dirty">
```

- You should use those CSS classes and give the correct UI feedback

Validation

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- Is achieved using standard HTML5 attributes

```
<input [(ngModel)]="name" required>
```

- ngModel sets the ng-invalid/ng-valid classes

```
<input class="ng-pristine ng-invalid ng-touched">
```

- Once typing something

```
<input class="ng-valid ng-touched ng-dirty">
```

Display Validation Messages

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- Do not use CSS classes for conditional display
- ngModel offers a simple API for querying validation flags

```
<input [(ngModel)]="name" #nameNgModel="ngModel" required>
```

- Inside code

```
export class AppComponent {  
  name: string;  
  @ViewChild("nameNgModel") nameNgModel: NgModel;  
  
  save() {  
    if(!this.nameNgModel.valid) {  
      return;  
    }  
  }  
}
```


Display Validation Messages

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- Validation bits can be used directly inside the template

```
<input [(ngModel)]="name" #nameNgModel="ngModel" required>
```

```
<span class="validation-message" *ngIf="nameNgModel.invalid && nameNgModel.touched">  
  Name is required  
</span>
```

Multiple Validation Messages

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□ Use the **errors** bag

```
<div *ngIf="nameNgModel.errors && (nameNgModel.dirty || nameNgModel.touched)">  
  <span class="validation-message" *ngIf="nameNgModel.errors.required">  
    Name is required  
  </span>  
  
  <span class="validation-message" *ngIf="nameNgModel.errors.maxlength">  
    Too long  
  </span>  
</div>
```

errors is null when
there are no
errors

Display error
messages only
after the user
typed something

Grouping

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- ❑ A “common” form contains multiple inputs
- ❑ Each input has its own validation logic
- ❑ Once submit button is clicked need to validate all inputs
- ❑ Angular allows you to group multiple inputs under a single form tag
- ❑ The form can be queried
 - ▣ It holds aggregation of all inputs

Form

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```
<form #form="ngForm">
  <input [(ngModel)]="name" name="name" #nameNgModel="ngModel" required maxlength="5">

  <button type="submit" (click)="add()">Add</button>

  <div *ngIf="nameNgModel.errors && (nameNgModel.dirty || nameNgModel.touched)">
    <span class="validation-message" *ngIf="nameNgModel.errors.required">
      Name is required
    </span>

    <span class="validation-message" *ngIf="nameNgModel.errors.maxlength">
      Too long
    </span>
  </div>
</form>
```

Import the ngForm
directive and use
its API

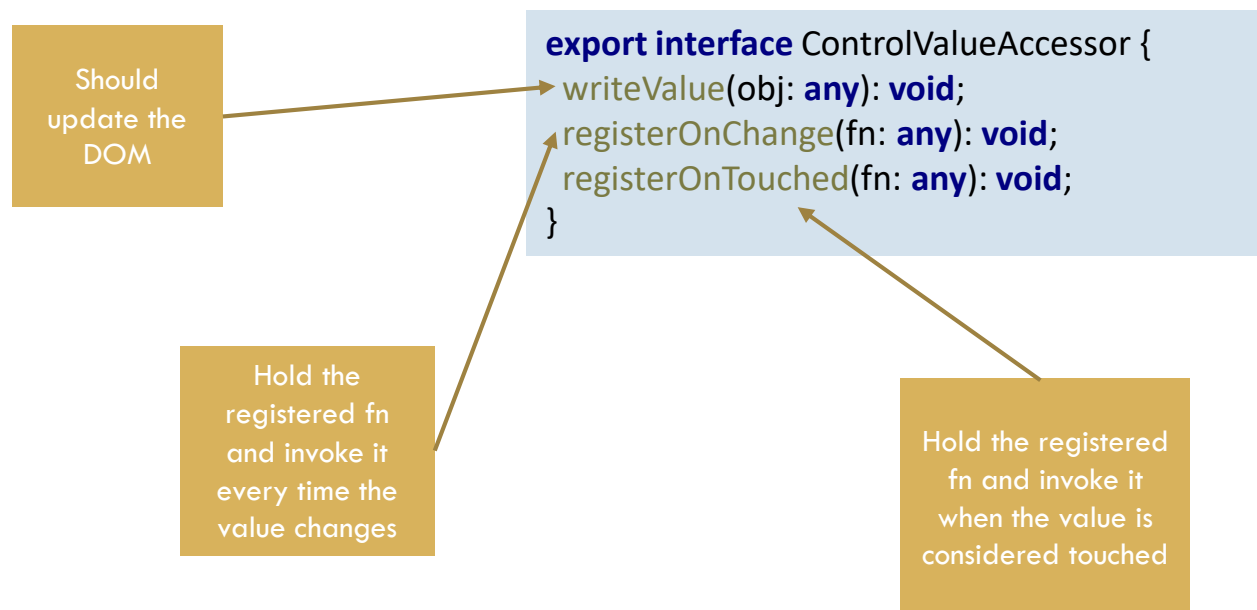
```
export class AppComponent {
  @ViewChild("form") form: NgForm;

  add() {
    if(!this.form.invalid) {
      return;
    }
  }
}
```

Custom component & ngModel

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- By default ngModel cannot be attached to a custom component
- A component should implement **ControlValueAccessor**

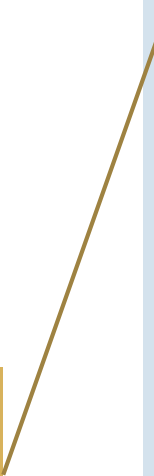


Implement Value Accessor

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```
export const VALUE_ACCESSOR = {  
  provide: NG_VALUE_ACCESSOR,  
  useExisting: forwardRef(() => EmailComponent),  
  multi: true  
};  
  
@Component({  
  providers: [VALUE_ACCESSOR]  
})  
export class EmailComponent implements ControlValueAccessor {  
  writeValue(obj: any): void {...  
  }  
  
  registerOnChange(fn: any): void {...  
  }  
  
  registerOnTouched(fn: any): void {...  
  }  
}
```

Must register the
value accessor
and point it to self



Grouping Inputs

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- Use **ngModelGroup** to group multiple inputs into single value and single valid flag

```
<form #f="ngForm" (ngSubmit)="onSubmit(f)">
  <p *ngIf="nameCtrl.invalid">Name is invalid.</p>
```

```
  <div ngModelGroup="name" #nameCtrl="ngModelGroup">
    <input name="first" [ngModel]="name.first" minlength="2">
    <input name="last" [ngModel]="name.last" required>
  </div>
```

```
  <input name="email" ngModel>
```

```
  <button>Submit</button>
```

```
</form>
```

```
export class NgModelGroupComp {
  name = {first: 'Nancy', last: 'Drew'};

  onSubmit(f: NgForm) {
    console.log(f.value); // {name: {first: 'Nancy', last: 'Drew'}, email: ''}
    console.log(f.valid); // true
  }

  setValue() { this.name = {first: 'Bess', last: 'Marvin'}; }
}
```

Reactive Forms

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- ❑ You create the form control model in code
- ❑ Angular binds the model to template elements
- ❑ Offers the following
 - ▣ No two way data binding
 - ▣ Change validation functions on the fly
 - ▣ Manipulate the control model
 - ▣ Test easily
 - ▣ HTML is cleaner

Reactive Forms – Getting Started

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- Import **ReactiveFormsModule**
- form element is bound to **[formGroup]**
 - ▣ No ngForm
- Inputs are bound to **formControlName**
 - ▣ No ngModel
- Validation metadata moves into code

Reactive Forms

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```
export class AppComponent {  
  formGroup: FormGroup;  
  
  constructor(builder: FormBuilder) {  
    this.formGroup = builder.group({  
      name: ['', [  
        Validators.required  
      ]  
    }]);  
  }  
  
  add() {  
    if(!this.formGroup.valid) {  
      console.log("Not valid");  
  
      return;  
    }  
  
    console.log("Saving ...");  
  }  
}
```

```
<form [formGroup]="formGroup">  
  <input formControlName="name">  
  
  <button (click)="add()">Add</button>  
</form>
```

No Two way data binding

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- Latest form value is stored inside the FormGroup
- It is updated automatically when DOM changes
- Use **setValue** in order to change value from code

Does the same
thing

```
change() {  
  this.formGroup.setValue({  
    name: "XXX"  
  });  
  this.formGroup.controls.name.setValue("XXX");  
}
```

Change Control Model

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- ❑ formGroup creates a live binding
- ❑ We can recreate the formGroup at runtime and all settings are reapplied

```
export class AppComponent {  
  formGroup: FormGroup;  
  
  constructor(private builder: FormBuilder) {  
    this.formGroup = builder.group({  
      name: ['', [  
        Validators.required,  
        Validators.maxLength(5)]]]);  
  }  
  
  change() {  
    this.formGroup = this.builder.group({  
      name: ['', [  
        Validators.required]]]);  
  }  
}
```

Validation is easier

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- Each **FormControl** has a list of validators
- Each validator is a simple function
- You can easily define and reuse validators

```
function range(from: number, to: number): ValidatorFn {  
  return function(control: AbstractControl): ValidationErrors | null {  
    if(control.value < from || control.value >= to) {  
      return {  
        range: true,  
      }  
    }  
  }  
}
```

```
constructor(builder: FormBuilder) {  
  this.formGroup = builder.group({  
    userName: ["", [  
      Validators.required,  
      range(10, 100),  
    ]]  
  });  
}
```

Async Validator

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- Just like sync validator
- Returns a promise/observable


Subscribe

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- You can subscribe to any change inside a FormGroup

```
export class AppComponent {  
  formGroup: FormGroup;  
  
  constructor(private builder: FormBuilder) {  
  
    this.formGroup.valueChanges.subscribe(value => {  
      console.log("valueChanges", value);  
    });  
  }  
  
  add() {  
    if (!this.formGroup.valid) {  
      console.log("Not valid", this.formGroup.value);  
      return;  
    }  
  
    console.log(this.formGroup.value);  
  }  
}
```

Subscribe to any
change



Retrieve latest
value



Summary

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- Forms & Validation is based around the concept for control model
- Template driven creates the model from HTML
- Reactive driven creates the models from code
 - ▣ More effort
 - ▣ More flexible