

Angular JS

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Abstract— Science gateways provide user-centric views to cyber infrastructure resources, simplifying usage and enabling a richer user experience. To enable the goals of a science gateway and the communities of scientists it supports, gateway developers need to be able to spend more time on designing and developing the user experience and less time on wrestling with the underlying technology (such as HTML5, CSS, and JavaScript). In this seminar, we describe our experiences using Twitter Bootstrap and Angular JS frameworks to address this balance between design and implementation, empowering developers to create better styled and easily maintainable websites.

1. INTRODUCTION

Angular JS is framework manage by Google, it help build responsive sites. Angular JS use to make a smooth web performance. Angular JS is a toolset for building the framework most suited to your application development. It is fully extensible and works well with other libraries. Every feature can be modified or replaced to suit your unique development workflow and feature needs.

Angular JS is a **JavaScript framework**. It can be added to an HTML page with a `<script>` tag. Angular JS extends HTML attributes with **Directives**, and binds data to HTML with **Expressions**.

AngularJS extends HTML with new attributes. AngularJS is perfect for Single Page Applications (SPAs). AngularJS is easy to learn. The idea turned out very well, and the project is now officially supported by Google

AngularJS is a structural framework for dynamic web applications. It lets you use HTML as your template language and lets you extend HTML's syntax to express your application components clearly and succinctly. Its data binding and dependency injection eliminate much of the code you currently have to write. And it all happens within the browser, making it an ideal partner with any server technology. It was originally developed by Misko Hevery and Adam Abrons.

HTML is great for declaring static documents, but it falters when we try to use it for declaring dynamic views in web-applications. AngularJS lets you extend HTML vocabulary for your application. The resulting environment is extraordinarily expressive, readable, and quick to develop.

2. IMPORTANT PARTS OF ANGULARJS

The diagram shows the various parts of angular JS.

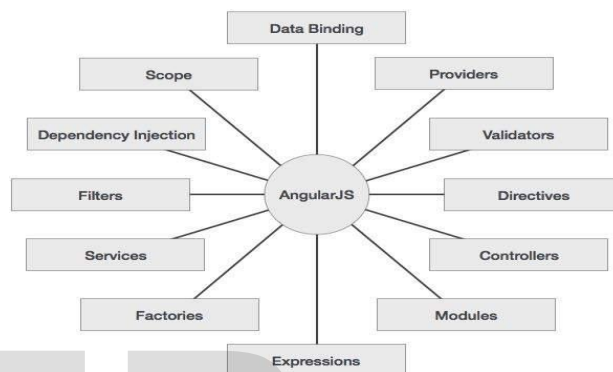


Fig. Parts of Angular JS

- **Data-binding:**-It is the automatic synchronization of data between model and view components.
- **Scope:**-These are objects that refer to the model. They act as a glue between controller and view.
- **Controller:**-These are JavaScript functions bound to a particular scope.
- **Services:**-AngularJS comes with several built-in services such as `$http` to make a XMLHttpRequests. These are singleton objects which are instantiated only once in app.
- **Filters:**-These select a subset of items from an array and returns a new array.
- **Directives:**-Directives are markers on DOM elements such as elements, attributes, css, and more. These can be used to create custom HTML tags that serve as new, custom widgets. AngularJS has built-in directives such as `ngBind`, `ngModel` etc.
- **Templates:**-These are the rendered view with information from the controller and model. These can be a single file (such as `index.html`) or multiple views in one page using *partials*.
 - **Routing:**-It is concept of switching views.
 - **Model View Whatever:**-MVW is a design pattern for dividing an application into different parts called Model, View, and Controller, each with distinct responsibilities. AngularJS does not implement MVC in

the traditional sense, but rather something closer to MVVM (Model-View-ViewModel). The Angular JS team refers it humorously as Model View Whatever.

- **Deep Linking:** Deep linking allows you to encode the state of application in the URL so that it can be bookmarked. The application can then be restored from the URL to the same state.

- **Dependency Injection:** AngularJS has a built-in dependency injection subsystem that helps the developer to create, understand, and test the applications easily.

3. ANGULAR JS DIRECTIVES

AngularJS directives allow the developer to specify custom and reusable HTML-like elements and attributes that define data bindings and the behavior of presentation components. Some of the most commonly used directives are:

- **ng-app:-**

This directive starts an AngularJS Application.

- **ng-bind:-**

This directive binds the AngularJS application data to HTML tags.

- **ng-model:-**

This directive binds the values of AngularJS application data to HTML input controls.

- **ng-model-options:-**

Provides tuning for how model updates are done.

- **ng-class:-**

Lets class attributes be dynamically loaded.

- **ng-controller:-**

Specifies a JavaScript controller class that evaluates HTML expressions.

- **ng-repeat:-**

This directive repeats HTML elements for each item in a collection.

- **ng-show & ng-hide:-**

Conditionally show or hide an element, depending on the value of a boolean expression. Show and hide is achieved by setting the CSS display style.

- **ng-switch:-**

Conditionally instantiate one template from a set of choices, depending on the value of a selection expression.

- **ng-view:-**

The base directive responsible for handling routes that resolve JSON before rendering templates driven by specified controllers.

- **ng-if:-**

Basic if statement directive that allow to show the following element if the conditions are true. When the condition is false, the element is removed from the DOM. When true, a clone of the compiled element is re-inserted

- **ng-aria:-**

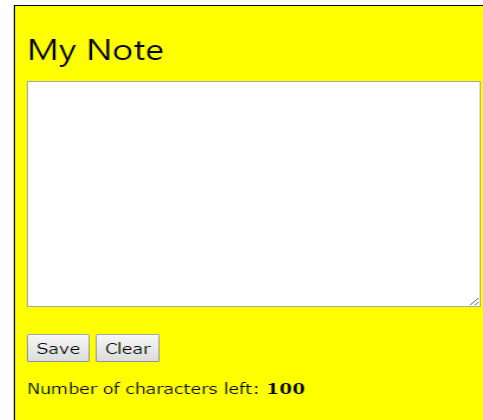
A module for accessibility support of common ARIA attributes.

- **ng-animate:-**

A module provides support for JavaScript, CSS3 transition and CSS3 keyframe animation hooks within existing core and custom directives.

Since **ng-*** attributes are not valid in HTML specifications, **data-ng-*** can also be used as a prefix. For example, both **ng-app** and **data-ng-app** are valid in AngularJS.

4. APPLICATIONS OF ANGULAR JS



This is the simple example of Angular Js

4.1 AngularJS is a JavaScript Framework

AngularJS is a JavaScript framework. It is a library written in JavaScript. AngularJS is distributed as a JavaScript file, and can be added to a web page with a script tag:

```
<script src="http://ajax.googleapis.com/ajax/libs/angularjs/1.4.8/angular.min.js"></script>
```

4.2 AngularJS Extends HTML

AngularJS extends HTML with **ng-directives**. The **ng-app** directive defines an Angular JS application. The **ng-model** directive binds the value of HTML controls (input, select, textarea) to application data. The **ng-bind** directive binds application data to the HTML view.

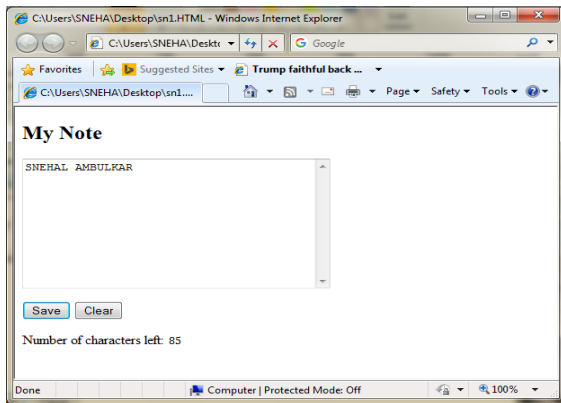
5. Angular JS Example

Following is the simple Example of Angular JS with source code

```
<html ng-app="myNoteApp">
<script src="http://ajax.googleapis.com/ajax/libs/angularjs/1.4.8/angular.min.js">
</script>
<body>
  <div ng-controller="myNoteCtrl">
    <h2>MyNote</h2>
    <p><textarea ng-
```

```
model="message" cols="40" rows="10"></textarea></p>
<p>
<button ng-click="save()">Save</button>
<button ng-click="clear()">Clear</button>
</p>
<p>Number of characters left: <span ng-bind="left()">
</span>
</p>
</div>
```

Result:



6. ADVANTAGES

6.1. Advantages of Angular JS

The advantages of AngularJS are:

- Angular JS provides capability to create Single Page Application in a very clean and maintainable way.
- Angular JS provides data binding capability to HTML. Thus, it gives user a rich and responsive experience.
- Angular JS code is unit testable.
- Angular JS uses dependency injection and make use of separation of concerns.
- Angular JS provides reusable components.
- With Angular JS, the developers can achieve more functionality with short code.
- In Angular JS, views are pure html pages, and controllers written in JavaScript do the business processing.

On the top of everything, Angular JS applications can run on all major browsers and smart phones, including Android and iOS based phones/tablets.

6.2 General Features

The most important general features of AngularJS are:

- AngularJS is a efficient framework that can create Rich Internet Applications (RIA).

- AngularJS provides developers an options to write client side applications using JavaScript in a clean Model View Controller (MVC) way.
- Applications written in AngularJS are cross-browser compliant. AngularJS automatically handles JavaScript code suitable for each browser.
- AngularJS is open source, completely free, and used by thousands of developers around the world. It is licensed under the Apache license version 2.0.

6.3 ANGULARJS TOOLSET

AngularJS is a toolset for building the framework most suited to your application development. - angularjs.org

- Unit Testing

Unit testing is an important component for maintaining quality over time and aid in refactoring. AngularJS was built from the very beginning to be testable. That means the AngularJS team set out to remove every possible excuse for *not* testing an AngularJS application. As an example, AngularJS uses the dependency injection design pattern so you can easily swap out your production code for mocks.

- End-to-end testing

Protractor is a powerful tool built on top of [WebDriverJS](http://webdriver.io). It executes your tests in real browsers, ensuring your application is exercised just like a user would. By using both Karma and Protractor, *all* of your tests can be written in JavaScript with a single testing framework (such as Jasmine). This means you can use the same assertion patterns and mocking strategies whether you are writing unit tests for your features or end-to-end tests for web interactions, thereby improving test writing efficiency and reducing cognitive load, a considerable benefit over other available solutions.

- Integration

As with many powerful tools, I have found that configuration can be cumbersome and inflexible when integrating into your software development lifecycle. To streamline this process, I created an open source project called [AQUA](http://aqua.io) or "Automated QQuality Analysis". AQUA raises the visibility of code quality and increases awareness within teams by giving instant feedback about code smells before they become technical debt.

- Template Data-Binding

jQuery is great for adding interactivity to a website, but it does not supply us with tools for data-binding a model

to dynamic template views. AngularJS, however, provides us with declarative (vs. imperative) two-way data-binding.

- **Dependency Management**

The difficulty in managing dependencies grows with the size of an application, especially if you are following good design patterns such as the single responsibility principle and are writing your code in a modular fashion.

While other libraries like the Google Closure Library configure dependencies with explicit calls to `goog.require`, in its simplest form, AngularJS uses an elegant and intuitive annotation style by simply using the arguments of the function declaration.

- **Learning Curve**

It takes time to master all that AngularJS has to offer. There is a longer learning curve involved with AngularJS than with jQuery. Fortunately, AirPair can help you, with access to many top-shelf AngularJS experts.

- **Two Way Data-Binding**

Data-binding is probably the coolest and most useful feature in AngularJS. It will save you from writing a considerable amount of boilerplate code. A typical web application may contain up to 80% of its code base, dedicated to traversing, manipulating, and listening to the

DOM. Data-binding makes this code disappear, so you can focus on your application.

7. CONCLUSIONS

AngularJS can do everything that jQuery does and much more, yet is roughly equivalent in download size. It is easy to both write and run unit tests and end-to-end tests for AngularJS applications. Dependency management is effortless and intuitive. Binding dynamic data to your views is straightforward and powerful. directives, routing, services, validation, resources, animation and localization - are equally thought out and useful tools. AngularJS is a solid foundation for building testable web applications that scale.

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