

AngularJS 101

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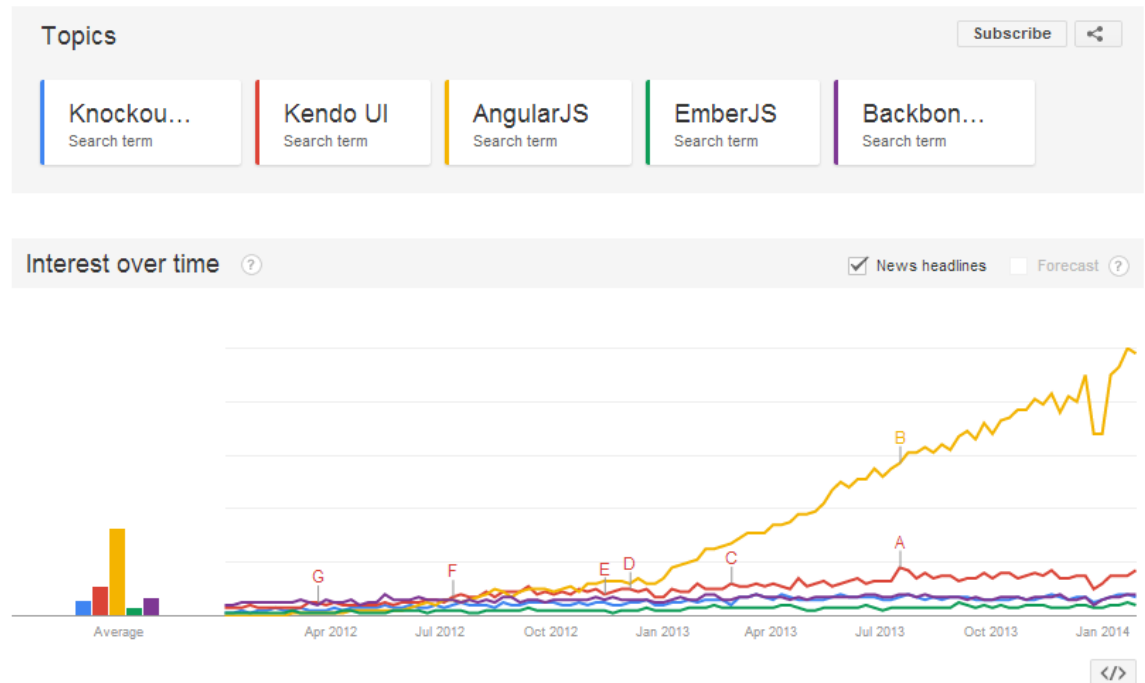


Introduction



Angular is a powerful, rapidly growing, client-side development framework

- Maintained by Google
 - open source
- Huge development community



[Google trends search](#)

Why JavaScript frameworks?

- Modern browsers & REST APIs
 - Browser JS engines
 - HTML5 and CSS3
 - Mobile browsers on par with desktop
- Base JavaScript & jQuery are too low level
 - jQuery is great for DOM manipulation, doesn't scale with app complexity
- Modularity, abstraction, testability
- Need for cross-platform
- Single-page application architecture
 - Gmail (Mail.google.com) great example of this

Core Concepts



Like many frameworks, two-way data-binding is a core concept of Angular

- Data is shared between the DOM and JavaScript
- Keeps view-related logic out of JavaScript



Like many frameworks, two-way data-binding is a core concept of Angular

jQuery

HTML

```
<input id="myInput"></input>
<h1 id="myInputTitle"></h1>
```

Javascript

```
function watch(obj, prop, handler) {
    var currval = obj[prop];
    function callback() {
        if (obj[prop] !== currval)
        {
            var temp = currval; currval = obj[prop];
            handler(temp, currval);
        }
    }
    return callback;
}

var myhandler = function (oldval, newval) {
    //do something
};

var intervalH = setInterval(watch(myobj, "a", myhandler), 100);

myobj.set_a(2);
```


Like many frameworks, two-way data-binding is a core concept of Angular

AngularJS

HTML

```
<input ng-model="myInput"></input>  
<h1 ng-bind="myInput"></h1>
```

Javascript

None.

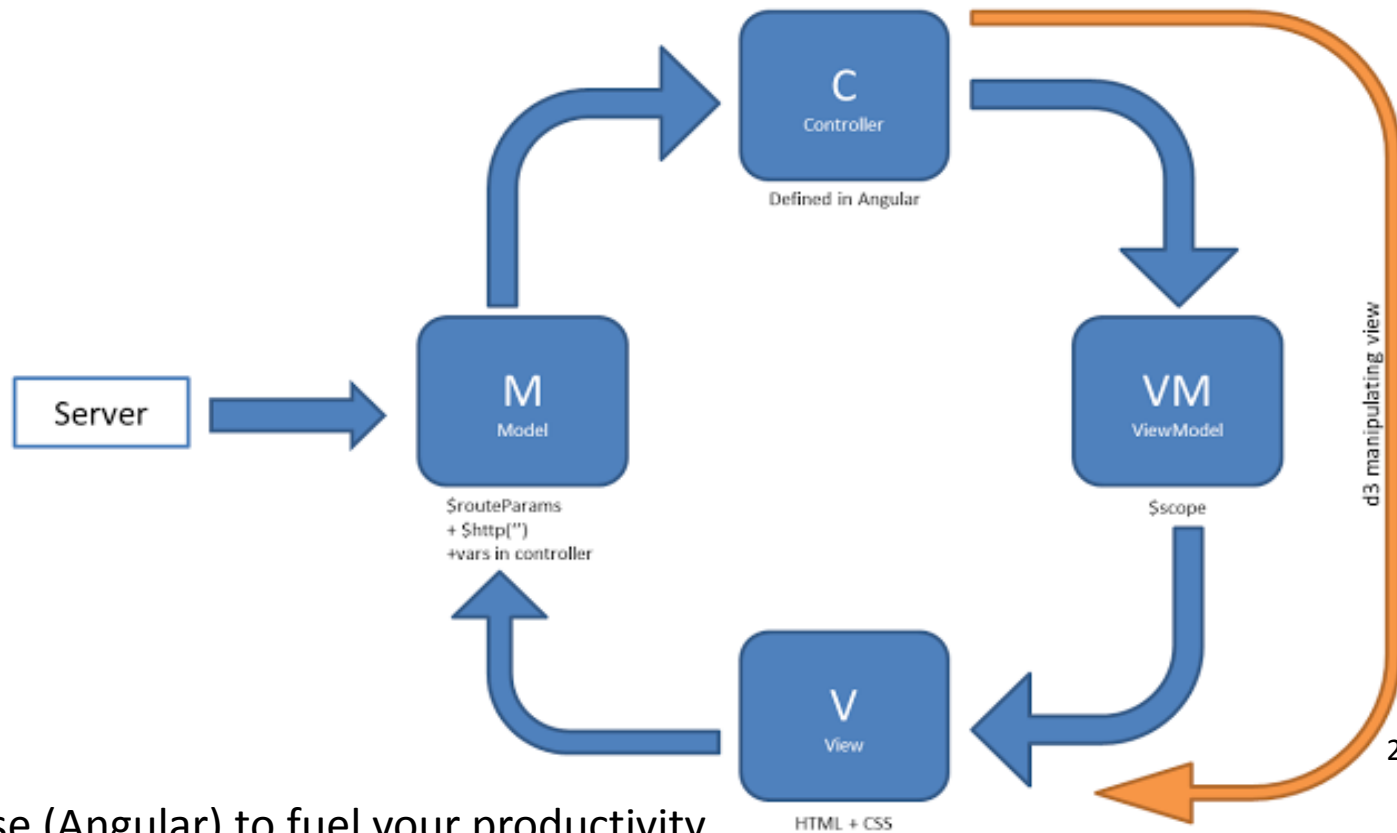
DEMO

Examples:

<http://jsfiddle.net/az7r88za/>

<http://jsfiddle.net/w9yt1r61/3/>

Angular considers itself a “Model-View-Whatever” framework



“Please use (Angular) to fuel your productivity and application maintainability rather than heated discussions about things that at the end of the day don't matter that much.”¹

1. <https://plus.google.com/+AngularJS/posts/aZNVhj355G2>
2. <http://chuckstangledweb.blogspot.com/>

Dependency injection is provided out-of-the-box

- Simple Definition: Easily include references to other helpers, modules, interfaces, etc.
 - Has been around in “older” languages like Java
- Lays the Angular framework
- Simplifies adding/removing of modules
 - At run-time or compile-time
- **Provides for easily testable code**

(Boring definition from Wikipedia)

Dependency injection is a [software design pattern](#) in which one or more [dependencies](#) (or services) are injected, or passed by [reference](#), into a dependent [object](#) (or client) and are made part of the client's state. The pattern separates the creation of a client's dependencies from its own behavior, which allows program designs to be [loosely coupled](#)...

DEMO

Directives (the best part)



Directives are Angular's way of defining reusable web components

- Arguably Angular's most powerful feature
- Markers on a DOM element that grant new behaviors
- Modularizes HTML

```
<div ng-repeat="customComp in getCustomCompetencies()">
  <custom-competency-slider
    color-group-id="colorGroupId"
    custom-competency="customComp"
    delete-competency="deleteCustom">
  </custom-competency-slider>
</div>
```

Angular comes with many useful directives already defined

- ng-show & ng-hide

```
<div ng-show="user.IsManager">
```

- ng-click

```
<div class="skills-charts" ng-click="magnify()">
```

- ng-bind & ng-model

```
<input type="text" ng-model="user.FirstName" placeholder="First Name">
```

```
<h1 class="inline"><span ng-bind="user.FirstName"></span>'s Profile</h1>
```


Developers can also create their own!

Directive Usage

```
<div has-role="Resources" itacademy-skill-detail-resources></div>
```

Directive Definition

```
.directive('hasRole', function (securityRoles) {  
  return { restrict: 'A',  
    link: function (scope, element, attrs) {  
      var value = attrs.hasRole.trim();  
      function toggleVisibilityBasedOnPermission() {  
        if (!securityRoles.hasPermission(value)) {  
          element.remove();  
        }  
      }  
      toggleVisibilityBasedOnPermission();  
    }  
  };  
});
```

Security Role Service Definition

```
.factory('securityRoles', function () {  
  var rolesList;  
  return {  
    setRoles: function (roles) {  
      rolesList = roles;  
    },  
    hasPermission: function (role) {  
      var permission = false;  
      if (rolesList != null) {  
        for (var i = 0; i < rolesList.length; i++) {  
          if (rolesList[i].Name === role) {  
            permission = true;  
          }  
        }  
      }  
      return permission;  
    }  
  };  
});
```

DEMO

Testing

- Angular provides for unit-testable code through dependency injection.
- This means that our controllers, services, factories, and directives can be unit tested.
- Many libraries are available to assist in this task:
 - JasmineJS – A unit testing framework
 - KarmaJS – A unit test runner
 - PhantomJS – A headless browser

```
describe("myFunction", function() {  
    var myfunc = NS.myFunction;  
  
    beforeEach(function(){  
        spyOn(myfunc, 'init').andCallThrough();  
    });  
  
    afterEach(function() {  
        myfunc.reset();  
    });  
  
    it("should be able to initialize", function() {  
        expect(myfunc.init).toBeDefined();  
        myfunc.init();  
        expect(myfunc.init).toHaveBeenCalled();  
    });  
  
    it("should populate stuff during initialization", function(){  
        myfunc.init();  
        expect(myfunc.stuff.length).toEqual(1);  
        expect(myfunc.stuff[0]).toEqual('Testing');  
    });  
    //will insert additional tests here later  
});
```

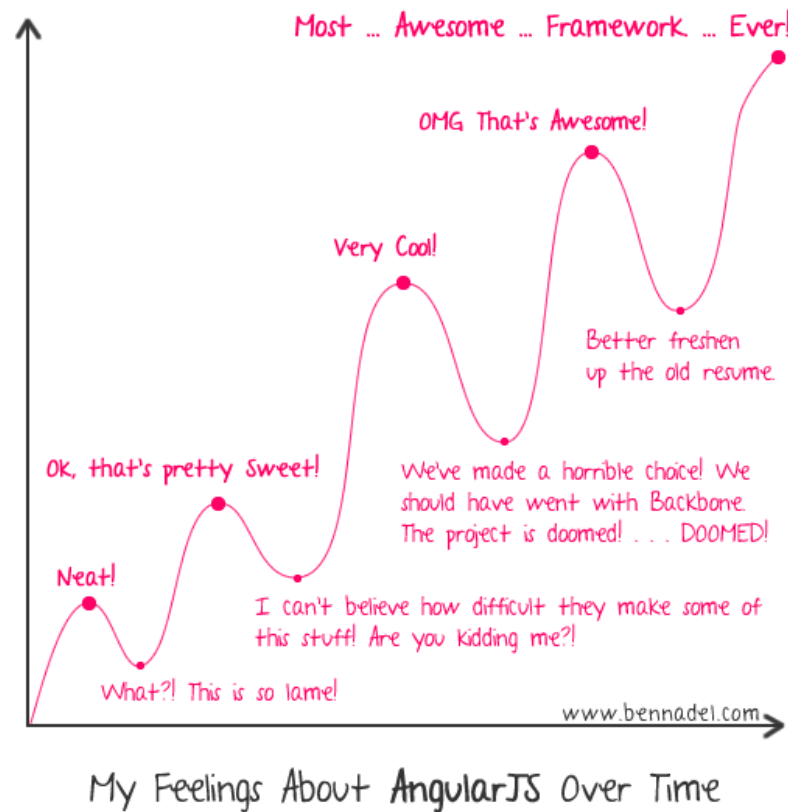
DEMO

Conclusions



While powerful, there have been gotchas and problems encountered

- There is a learning curve
- Error messages are not always clear
- Lack of support for IE8 (in newer versions)
- Bugs



Practical experience: Lessons learned

- Learn, understand, and use directives from the get-go
 - No matter how intimidating they seem, and how easy it might seem to build your app without them, you will thank yourself later!
- Pick a unit testing library and do TDD
 - Again, this will pay big dividends later.
- Determine a good way to manage your data interactions
 - This could mean picking a library to manage it for you (BreezeJS) or architecting your own leveraging Angular's built-in components

Questions?

Appendix



References

- <http://www.egghead.io/> - Excellent Angular JS video course by John Lindquist
- <http://angularjs.org/> - Angular JS official web-site
- <http://docs.angularjs.org/api/> - Angular JS API reference
- <https://groups.google.com/group/angular/> - Angular JS Google Group
- <http://angular-ui.github.io/bootstrap/> - Twitter Bootstrap Angular plugins
- <http://joshdmiller.github.io/ng-boilerplate/> - Angular Boilerplate

References

- <https://github.com/simmons6/angular-demo> - Demo application used in presentation