AngularJS

REVISION HISTORY

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Problem Statement

- Our company is developing a new augmented reality product
- For developing this product, there has to be an effective communication
- To achieve this effective sharing is required
- An app to overcome this problem is required

HISTORY

History

- AngularJS was created in 2009 by two developers, Misko Hevery and Adam Abrons. They envisioned their project, Get AngularJS, to be an end-to-end tool that allowed web designers that allowed web designers to interact with both the frontend and backend

INTRODUCTION

What is AngularJS

- AngularJS is a structural framework for dynamic web apps.
  - It lets you use HTML as your template language
  - It lets you extend HTML's syntax to express your application's components clearly and succinctly
  - AngularJS's data binding and dependency injection eliminates code

What is AngularJS

- AngularJS is a toolset for building the framework
  - Most suited to 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
- AngularJS is what HTML would have been, had it been designed for applications
  - It is a great declarative language for static documents

Who is Behind AngularJS

- Google
  - One the one of the original creators,Adam Abrons stopped working on it
  - Misko Hevery and Brad Green, spun the original “GetAngular” project and later named it AngularJS
  - Google acquired DoubleClick and started rewriting part of their application using AngularJS

Why do we recommend AngularJS

- AngularJS lets you extend HTML vocabulary for your application
- As a result we get environment that is extraordinarily expressive, readable, and quick to develop

HTML, CSS & JAVASCRIPT

- HTML is a markup language for describing web documents (web pages)
- Each HTML tag describes different document content
- CSS gives you total control of style & layout, without messing up the document content
- JavaScript makes your web site more dynamic

Technical Objectives

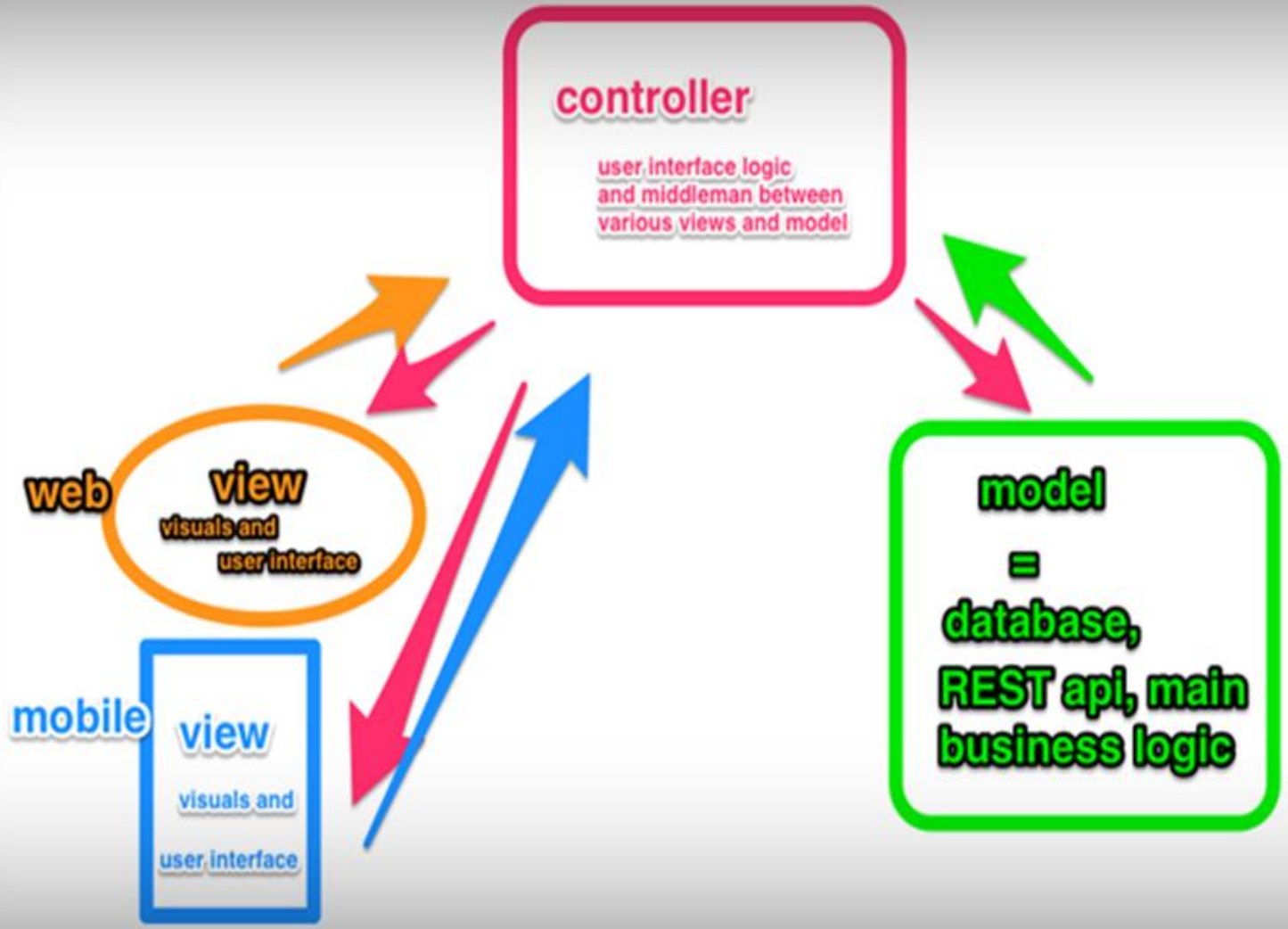
Data Binding | MVC | Routing | Testing

jqLite | Templates | History | Factories

ngularJS is a full-featured SPA framework

ViewModel | Controllers | Views | Directives

Services | Dependency Injection | Validation


controller
user interface logic
and middleman between
various views and model
web
view
visuals and
user interface
mobile
view
visuals and
user interface
model
=
database,
REST api, main
business logic

Objectives

- Talk to the server easily
  - In one line you can talk to the server using REST API and get data
- Communication is automatic
  - Everything in MVVM is communicated automatically across the UI whenever anything changes.
- Makes the Software more maintainable
  - AngularJS encourages Object Oriented Model for client side
  - This allows you to keep Object Oriented Design which makes software maintainable
- AngularJS manages components for you
  - Most frameworks implement MVC by asking you to split your app

Objectives

- This requires you to write code and string them up together again
- AngularJS asks you to split your app into MVC
- AngularJS manages components for you
- Filters are so resourceful that we can create table in HTML without using JS
- It does not manage templates as strings
- It’s all done by the browser
- This makes AngularJS faster

Objectives

- AngularJS enables parallel development
- AngularJS supports single page Applications
    - It provides all necessary infrastructure for doing so
    - From routing templates to journaling needed to stand up a functional SPA application

Uses of AngularJS

Uses of AngularJS

- AngularJS uses HTML to define App’s user interface, which makes it easier for programmers
  - You don't have to define how program flows
  - What gets loaded first is not programmer’s worry
  - AngularJS will take care of all the dependencies

Uses of AngularJS

- Code looks much more intuitive and cleaner
  - Data models in AngularJS are JS objects
  - Hence you don’t need to use getter and setter functions
- It is easy to design user Interface with AngularJS
  - It has directives which bring additional functionality to HTML

Uses of AngularJS

- You have to write less code
  - Maximum things are managed by libraries
- AngularJS is context aware
  - AngularJS has PubSub system
  - It allows us to declare which child will read the message and which will not

jQuery
vs
AngularJs

How AngularJS is better than JQuery

- AngularJS can do anything JQuery does
    - Infact it can do much more than JQuery
    - Even then it’s package size is smaller than JQuery
- Help is always there around the corner
    - AngularJS has a very large community
    - Since it is being maintained by Google engineers

jQuery

Abstracts the DOM
Unit Test Runner
Deferred Promises
Cross Module Communication
Animation Support
Ajax
File size 32kb

AngularJs

Abstracts the DOM
Unit Test runner
Deferred Promises
Cross Module Communication
Animation Support
Ajax
RESTful API
Integration Test Runner
MVC Pattern Support
Templating
Two-way Data Binding
Dependency Management
Deep-Link Routing
Form Validation
Localization
File size 38kb

Security

Security

- Expression Sandboxing
  - Expressions are sandboxed to maintain a separation of an application responsibilities
  - For example, access to window is disallowed because it makes it easy to introduce brittle global state into your application
  - This sandbox is not intended to stop attackers who can edit the template before it’s processed by AngularJS. But if an attacker can change arbitrary HTML templates, there’s nothing stopping them from doing:
  - <script>somethingEvil() ; </script>

Security

- Better to design your application in such a way that users cannot change client-side templates.For instance:
  - Do not mix client server templates
  - Do not use user input to generate templates dynamically
  - Do not run user input through $scope.$eval

Testing

Testing

- Unit Testing: Testing individual units of code
    - Answers Questions such as : “Did I think about the logic correctly?” ; “Does the sort function order the list in the right order?”
- AngularJS comes with dependency injection built-in, which makes testing components much easier

Testing Tools

- KARMA
  - It is a Javascript command line tool that can be used to spawn a web server which loads the application source code and execute your tests
- JASMINE
  - It is a behavior driven development framework for Javascript which is used for testing AngularJS applications
  - It provides functions to help with structuring your tests and also making assertions

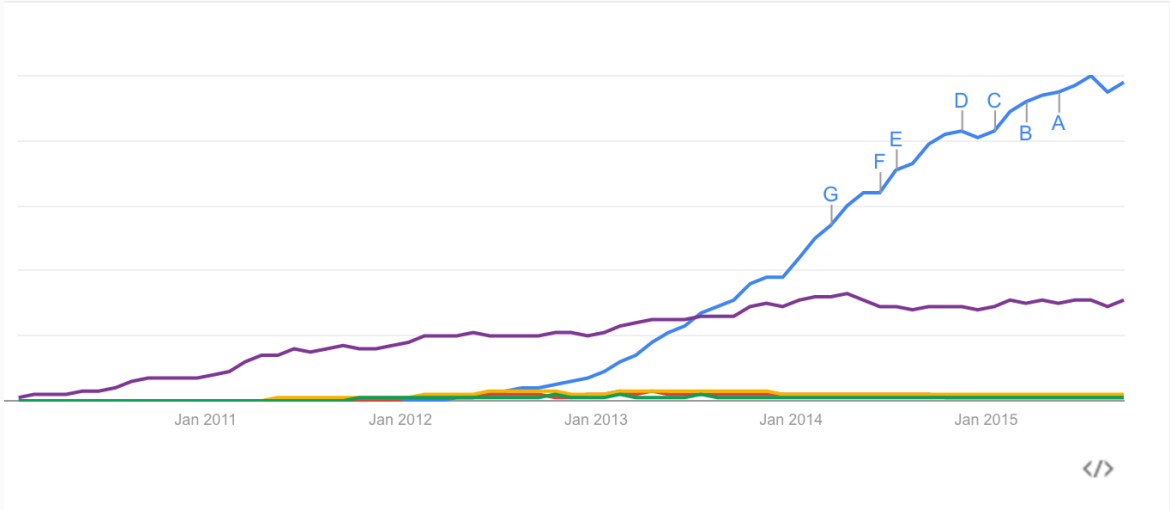
Cost

Open Source

- AngularJS is open source.
  - It is maintained by Google and they wanted to keep it free
  - Downloading AngularJS does not cost anyone anything
  - It is a very light frame work. Since it is open source anyone can download it and make applications using it’s platform

AngularJS - The Winner

angularjs	ember.js	knockoutjs	backbonejs	node.js
Search term	Search term	Search term	Search term	Search term



- Clear winner
- Maintained by Google
- Developers Network
- Rich GUI

AngularJS - Advantages

- Declarative Markup Language
  - XAML - Extensible Application Markup Language
    - Creating complex UI layouts is easy with XAML
- Handling Dependencies
  - Single Page Applications
  - Testing scenarios
  - Rendering UI - same time embracing the ability to create end-to-end tests

AngularJS - Advantages

- Parallel Development
  - Solves most encountered problem today
  - Eliminates dependencies
  - Splitting various actions has never been easier
- Enables Design Development workflow
  - Adding markup without breaking up the application
  - Rearranging portion of code is easier

AngularJS - Advantages

- Developer Controlled
- MVC - Model View Controller framework
- Templates
    - Creates a tight workflow between developers and designers
- Context aware communication
- Unit testing ready
- Increases testability
- Behaviours with directives
- Less code

End Users


The
Weather
Channel


NETFLIX


P
Posse
The Best Places on Earth


freelancer.com


Upwork

Back up slides

HTML

- HTML stands for Hypertext Markup Language
- A markup language is a set of markup tags
- HTML documents are described by HTML tags
- HTML is great for declaring static documents, but it falters when we try to use it for declaring dynamic views in web-applications

HTML

- Other frameworks deal with HTML's shortcomings by
  - either abstracting away HTML, CSS, and/or JavaScript
  - or by providing an imperative way for manipulating the DOM
  - Neither of these address the root problem that - HTML was not designed for dynamic views
- HTML is the universal markup language for the Web
- It lets you format text, add graphics, create links, input forms, frames and tables, etc.
- The key to HTML is the tags, which indicates what content is coming up

HTML

- HTML is a **markup** language for **describing** web documents (web pages)
- HTML stands for **H**yper **T**ext **M**arkup **L**anguage
- A markup language is a set of **markup tags**
- HTML documents are described by **HTML tags**
- Each HTML tag **describes** different document content

HTML

- HTML is great for declaring static documents, but it falters when we try to use it for declaring dynamic views in web-applications
- Other frameworks deal with HTML's shortcomings by either abstracting away HTML, CSS, and/or JavaScript or by providing an imperative way for manipulating the DOM. Neither of these address the root problem that HTML was not designed for dynamic views
- HTML is the universal markup language for the Web. HTML lets you format text, add graphics, create links, input forms, frames and tables, etc., and save it all in a text file that any browser can read and display

CSS

- CSS is used to control the style and layout of multiple Web pages all at once
- With CSS, all formatting can be removed from the HTML document and stored in a separate file

CSS

- Stands for Cascading Style Sheets
- Describes how HTML elements are to be displayed on screen, paper, or in
- other media
- Saves a lot of work by controlling the layout of multiple Web pages all at once
- CSS is used to control the style and layout of multiple Web pages all at once
- All formatting can be removed from the HTML document and stored in a separate file
- It gives total control of the layout, without messing up the document content

JavaScript

- To make a dynamic website that can react to events and allow user interaction
- JavaScript is the most popular scripting language on the internet

What is AngularJS?

- AngularJS is a structural framework for dynamic web apps. It lets you use HTML as your template language and lets you extend HTML's syntax to express your application's components clearly and succinctly. Angular's data binding and dependency injection eliminate much of the code you would otherwise have to write. And it all happens within the browser, making it an ideal partner with any server technology
- AngularJS 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

Unit Testing-Tools

- Karma is a JavaScript command line tool that can be used to spawn a web server which loads your application's source code and executes your tests. You can configure Karma to run against a number of browsers, which is useful for being confident that your application works on all browsers you need to support. Karma is executed on the command line and will display the results of your tests on the command line once they have run in the browser
- Karma is a NodeJS application, and should be installed through npm

Unit Testing Tools

- Jasmine is a behavior driven development framework for JavaScript that has become the most popular choice for testing Angular applications. Jasmine provides functions to help with structuring your tests and also making assertions. As your tests grow, keeping them well structured and documented is vital, and Jasmine helps achieve this
- In Jasmine we use the describe function to group our tests together:
- describe("sorting the list of users", function() {// individual tests go here});

Uses of AngularJS

- Angular uses HTML to define the app’s user interface. HTML is a declarative language which is more intuitive and less convoluted than defining the interface procedurally in JavaScript.
- HTML is also less brittle to reorganize than an interface written in JavaScript, meaning things are less likely to break. Plus you can bring in many more UI developers when the view is written in HTML.

Uses of AngularJS

- Data models in Angular are plain old JavaScript objects (POJO) and don’t require extraneous getter and setter functions. You can add and change properties directly on it and loop over objects and arrays at will. Your code will look much cleaner and more intuitive, the way mother nature intended

Uses of AngularJS

- AngularJS has directives which brings additional functionality to HTML, which makes it easy to design user interface
- You have to write less code because maximum of the things are managed by the libraries

Uses of AngularJS

- All the points up till now mean that you get to write less code. You don’t have to write your own MVC pipeline. The view is defined using HTML, which is more concise. Data models are simpler to write without getters/setters. Data-binding means you don’t have to put data into the view manually. Since directives are separate from app code, they can be written by another team in parallel with minimal integration issues. Filters allow you to manipulate data on the view level without changing your controllers. Yes, this is sort of a summary bullet point, but writing less code is a big deal!

Uses of AngularJS

- The whole Angularjs is linked together by dependency injection. It manages all the controllers and scopes. It’s what it uses to manage your controllers and scopes. Because all your controllers depend on DI to pass it information, Angular’s unit tests are able to usurp DI to perform unit testing by injecting mock data into your controller and measuring the output and behavior. In fact, Angular already has a mock HTTP provider to inject fake server responses into controllers.

How AngularJS is better than JQuery?

- The AngularJS team has gone above and beyond by open sourcing an end-to-end test framework called Protractor. It executes the test in real time browsers.
- AngularJS can do anything JQuery does and much much more, even then its download size is smaller than Jquery.
- AngularJS is being maintained by google engineers and this means that it has a very large community. So if developers need any help, it would always be available.

Technical Functionality

- In one line of AngularJS you can talk to the server using REST API and get data.
- Everything in MVVM is communicated automatically across the UI whenever anything changes.
- AngularJS encourages using the OOM for the client side. This allows you to keep same OODesign which makes software more maintainable.

Technical Functionality

- Most frameworks implement MVC by asking you to split your app into MVC components, then require you to write code to string them up together again. That's a lot of work. Angular implements MVC by asking you to split your app into MVC components, then just let Angular do the rest. Angular manages your components for you and also serves as the pipeline that connects them.
- Because Angular acts as the mediator, developers also won't feel tempted to write shortcuts between components that break abstractions just to make them fit easier.

Technical Functionality

- Filters in AngularJS are very flexible and they are so resourceful that we can create a table in html without using JS.
- Two way data binding is possible in AngularJS

Issues and Risks

- Two way Data Binding
  - Fundamental Rule in programming
    - It is always explicit than implicit
  - Imposing Restrictions
    - Limited $watch functions

Issues and Risks

- Dependency Injection
  - Five different Entities
    - Can be easily replaced
  - Name of an argument
    - Dependencies are injected by the name of argument

Issues and Risks

- Dependency Injection
  - Minification of code

Stops working since, variables are injected by name

```
someModule.controller('MyController', ['$scope', function($scope) { }]);
or
MyController.$inject = ['$scope', '$window'];
```

Issues and Risks

- Scope Inheritance
  - Extremely not Intuitive - common error every developer faces
  - Testing becomes hard
  - Logic is more complicated and explicit
  - Inherited variables become global variables , which are evil

Issues and Risks

- Debugging
  - It’s complicated and in AngularJS it's more complicated
  - Errors in binding don’t fire at all
  - Error caused by changing variable names, will never show up in the debugger
- Directives

Issues and Risks

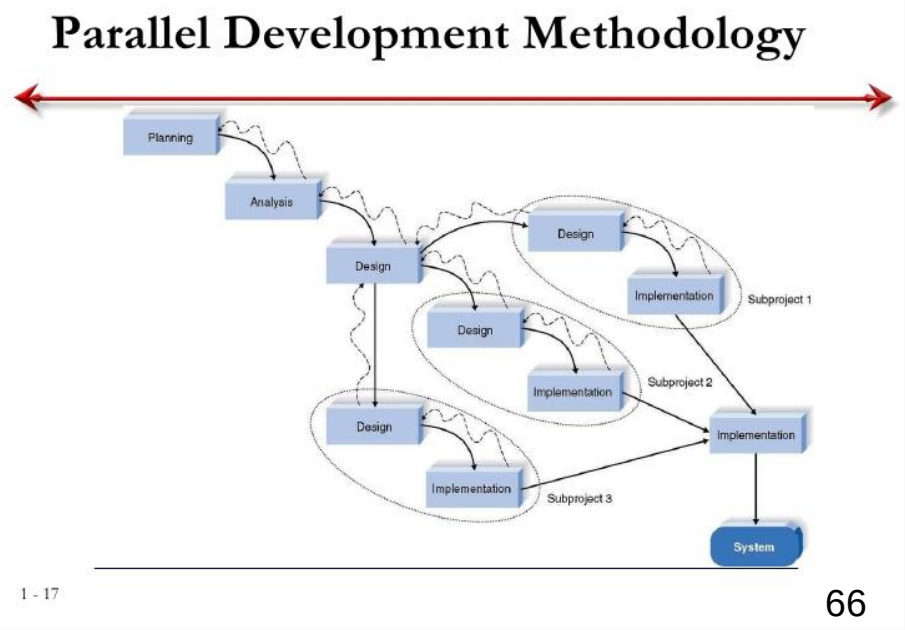
- Problems with people
  - Not many developers
  - Server developers have no clue about what’s going on in front end

What browsers AngularJS supports?

- Chrome
- Firefox
- Safari
- IE 8+

Software Development Methodology

- **Parallel Development**
  - Effectively Implemented
  - Lack of Dependencies makes it easy
  - Tasks are partitionable



Software Development Methodology

- Easy Integration of modules
- Testability

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