Angular Unit Testing

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**Current State Of Our Project**

We are using angular controller, directives and services on front end development and apex for backend. Currently we are writing test cases only to test our apex code and functionality and not to test front end functionality. So if a developer update his code on front end side then he has to manually verify all the functionality on the browser using DOM.

**End To End Test (Browser Automation)**

End-to-end testing involves using a browser automation tool like ROR to interact with your application's interface and verify high level details like URLs, text, and HTML attributes. End-to-end tests are a useful insurance policy and sanity-check. If something is badly broken in your code, a failed end-to-end test will only tell you that something is wrong.

**Unit Testing**

**What is Unit Test?**

Unit Test is a piece of code which tests behaviour of a function or class. Unit Tests are written by the developers.

**Why Unit Test ?**

Unit Testing reduces the level of bugs in production code. Unit Testing saves you development time. With Unit Test Cases we can test our functionality without using any DOM. If we change the functionality of our filter, controller, directive or service in the future then we can reduce the risk of failing any functionality using those test cases.

**What is Jasmine?**

Jasmine is a Behavior Driven Development testing framework for JavaScript does not rely on browsers, DOM, or any JavaScript framework Thus it's suited for websites, NodeJS projects, or anywhere that JavaScript can run.

Thus Jasmine is dependency free and doesn’t require a DOM.

**What is Karma?**

Karma is a JavaScript test runner which is a direct product of the [AngularJS team](https://googletesting.blogspot.com/2012/11/testacular-spectacular-test-runner-for.html) from struggling to test their own framework features with existing tools that make it easier to us to call our Jasmine tests while we are writing code. Karma is a JavaScript command line tool which loads your application's source code and executes your tests.

Karma can be configured to run against various browsers and devices such as phones, tablets etc. 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

**What is ngMock?**

The ngmock module provides support to inject and mock Angular services into unit tests. The ngMock also extends various core ng services such that they can be inspected and controlled in a synchronous manner within test code.

**Advantages Of Using Unit Tests**

Unit tests are distinct from end-to-end (E2E) tests. If something is badly broken in your code, a failed end-to-end test will only alert you to the need for deep investigation.

Unit tests span a much broader range of functionality. If approached and written properly, unit tests can be a major enhancer of productivity. End-to-end tests (or worse, manually verifying new behavior) only tell you that something is wrong. Unit tests give you more direct information about the nature of failures. There's no need to adhere to a strict test-driven development (TDD) style. However, **keeping your test suite relatively in sync with new code is always a good idea.**

Tests are the best way to prevent software defects. When a small piece of code is updated and the developer manually opens their browser or Postman to verify that it still works. This approach (manual QA) is begging for a disaster.

The reason we test our code is to verify that it behaves as we expect it to. As a result of this process you'll find you have better feature documentation for yourself and other developers as well as a design aid for your APIs.