COGNITIVE DEFUSION MOBILE APPLICATION

Developing a single page application for cognitive defusion exercises

Bachelorthesis
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1 Technologies

1.1 Ionic

Ionic is a framework to build mobile apps with HTML5. Ionic heavily depends on AngularJS. By its developer it is called "a powerful HTML5 native app development framework that helps you build native-feeling mobile apps all with web technologies like HTML, CSS, and Javascript." (Ionic, n.d.) and its goal is "to make it easier to develop native mobile apps with HTML5, also known as Hybrid apps" (Adam, 2013).

A big advantage of the Ionic Framework is that is firstly provides a large set of prebuild css styles which make your app immediately look good. And implements concepts widely used in mobile applications like side menus and header menus.

1.2 AngularJS

AngularJS is a JavaScript Framework developed by Google™. It enhances static HTML to create dynamic websites.

Key features of AngularJS

- Declarative HTML approach
- Two way data binding
- Encourages MVC Design Pattern
- Easy unit testing
- Templating
- Routing

Slightly altered from (Shekhawat, 2013, p. 5)

AngularJS creates a highly dynamic html webpage. At page startup it waits for the DOM content loaded event. As soon as this events is emitted an injector is created. Then the webpage is compiled and displayed in the browser.

(Startup UML image) (Eyal, 2013, p. 2)

1.2.1 Injector

The injector provides a lookup for services and objects. Dependencies are resolved by the injector when using the invoke method on it.

```
//create a module
var myModule = angular.module('myModule', [])

//create a factory in that module
myModule.factory('serviceA', function() {
      return "Hello World!"
});

//write a function
function hello(serviceA) {
      console.log(serviceA)
}

//retrieve injector
```

```
var $injector = angular.injector(['myModule']);

//let angularjs do the work
angular.invoke(hello)
```

altered from (Eyal, 2013, pp. 8-10)

1.2.2   Double binding

In AngularJS variables are watched. If a change happen to a variable in the model those changes are reflected in the view and vice versa. To make AngularJS clear that such a change happened one uses the $apply method.

(example from my code)

($apply, $digest life cyle from) (Eyal, 2013, p. 28)

As soon the $apply method is called. The $digest cycles begins. It means that all watched variables are reevaluated and associated functions are called. One $apply cycle may consist multiple $digest cycles. (Eyal, 2013, pp. 28-33)

Bindings in the view are denoted by the double curly brakets

```
{{name}}
```

Name refers here to the name variable in the $scope variable of the controller. (AngularJS, n.d.)

```
$scope.name = "Pantalaimon"
```

1.2.3   Scope

A crucial part of AngularJS is the concept of the scope. It lets model, controller and view talk with each other without binding them to strongly together. A scope can be inherited. (AngularJS, n.d.)

1.2.4   Directives

One of the most important concepts is that of a directive. Directives are added as tags to the html code. AngularJS has many build-in directives for example the ng-repeat directive which lets you iterate over a list an repeat parts of your html code

```
<html ng-app="myApp">
<head>
  <script src="angular.js"></script>
</head>
<body ng-controller="PhoneListCtrl">
  <ul>
    <li ng-repeat="number in [3, 2, 1, "take off!"]">
      <p>{{number}}</p>
    </li>
  </ul>
</body>
</html>
```

altered from (AngularJS, n.d.)

The above example results in something similar as

```
<html ng-app="myApp">
<head>
```

```
    <script src="angular.js"></script>
</head>
<body ng-controller="PhoneListCtrl">
  <ul>
    <li>
      <p>3</p>
    </li>
    <li>
      <p>2</p>
    </li>
    <li>
      <p>1</p>
    </li>

    <li>
      <p>take off!</p>
    </li>
  </ul>
</body>
</html>
```

In this project AngularJS was used internally by the Ionic Framework. The Ionic framework used it to create his own directives.

1.3   calabash-android

Calabash allows readable tests written in Gherkin

(example from one of my tests)

This allows customer and developer to develop an ubiquitous language and to exchange requirements in a way both sides understand. Gherkin can be described as a DSL to describe a requirement and scenario of the application. Because this is a high level of abstraction gherkin is then bootstrapped to ruby. Each step in gherkin is then processed in ruby where it is wired to the model.

(example of a step definition of my tests)

What calabash does is providing possibilities to communicate through gestures (touch, double-tab, pinch, etc.) with the application. It also provides a way to inject java-script code into the mobile application which allows one to manipulate runtime java-script objects.

(illustration „calabash in android) from (Xamarin, kein Datum))

2 Literature

AngularJS. (n.d.). *AngularJS Tutorial 2 - Angular Templates*. Retrieved 5 5, 2015, from https://docs.angularjs.org/tutorial/step_02

AngularJS. (n.d.). *AngularJS: API: $rootScope.Scope*. Retrieved 5 6, 2015, from https://docs.angularjs.org/api/ng/type/$rootScope.Scope

Eyal, V. (2013, 5 12). *AngularJS architecture.* Retrieved 5 4, 2015, from http://de.slideshare.net/EyalV/angularjs-architecture

Ionic. (n.d.). *Ionic Documentation Overview - Ionic Framework*. Retrieved 5 6, 2015, from http://ionicframework.com/docs/overview/

Shekhawat, M. (2013, 6 14). *Introduction to Angularjs.* Retrieved 5 4, 2015, from http://de.slideshare.net/manishekhawat/angularjs-22960631

[Unattributed] : https://angularjs.org/ [4.5.2015]