

**MASTER'S PROJECT (FALL 2015)****TOPIC:** *Development of Advanced Web Applications with Modern Technologies and Workflows***PRESENTER:** Surya Kiran Juthuka**ADVISOR:** Dr. Haiping Xu**DATE & TIME:** Friday, December 4, 2015, 3:30 PM**LOCATION:** LARTS 117**COMMITTEE MEMBERS:** Dr. David Koop and Dr. Firas Khatib**ABSTRACT**

As the web-based technologies are constantly changing, advancing and innovating, we have seen the advent of dozens of new tools, methods and workflows for web and User Interface (UI) / User Experience (UX) design over the past few years. Examples of such modern technologies include AngularJS and Polymer. AngularJS is a front-end framework based on the Model-View-Controller (MVC) software architecture, which can manage web components and support seamless communications between them. Polymer allows developing reusable web components that are supported by modern web browsers. In this project, we provide a systematic approach to developing advanced web applications using AngularJS and Polymer-like techniques, as well as traditional tools such as HTML5, CSS3 and JavaScript. For the backend design, we adopt a non-traditional database system, namely ElasticSearch, to store data as objects or documents using RESTful web services, so the rich formatting and structure of the data is retained rather than being broken up into a restricted table format. For the server-side programming, PHP programming language is used to access the ElasticSearch database for data store and retrieval. Finally, the Sass (Syntactically Awesome Stylesheets) technique is adopted to extend CSS with extra abilities such as variables, nesting and partials. The aforementioned techniques are tied together using efficient and streamlined workflow with tools such as Node JS, Bower, Grunt JS, Yeoman and GIT. To demonstrate the feasibility of the proposed approach, we provide a case study of developing a website for the Concurrent Software Engineering Laboratory (CSEL) at University of Massachusetts Dartmouth. The case study shows that, with the recent web-based technologies, we can efficiently and effectively develop modern and advanced web-based applications.