EC601 Project 1

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Problem Statement

Nowadays, people are able to gain access to the internet without any difficulty. The appearance of software technologies has changed people's way of living in a broad range of areas such as academics, communication, business, travel, etc. And among all software development technologies, web development technologies have become a necessity in people's lives. Therefore, how to build web pages that can achieve high responsiveness and diverse functions to meet users requirements has become a key topic. The topic of project 1 covers the area of software and web development technologies. It usually means the client-side technologies, which are used to build and display everything that the end-user interacts with [1].

Applications

One of the most significant web development technologies is web application development. It means the creation of application programs that reside on remote servers and are delivered to the user's device over the Internet. A web application (web app) does not need to be downloaded and is instead accessed through a network. An end user can access a web application through a web browser such as Google Chrome, Safari, or Mozilla Firefox [2]. A majority of web applications can be written in JavaScript, Cascading Style Sheets (CSS), and HTML for the frontend, Java for the backend, MySQL and MongoDB for the web application database.

There are huge demands of building fully functional web applications. A well designed web application can bring huge benefits to both company and their clients. For the company, it means higher business operation efficiency and having a more user friendly interface to retain existing cumsters and attract potential customers. For the clients, it means they can browse only the content they want to see and save their precious time. Successful examples of well designed web applications includes amazon, airbnb, yelp and youtube.

Area of focus

The focus area of project 1 is to build a fully functional and well designed campground review web application. It allows registered users to search all campground in the United States, share their own favorite campgrounds, and comment on others. The application also has a cluster map showing all campgrounds and allow users to see key information of the campground on the map. Other functions include image upload, authentication, authorization, and security.

Relevant Literature and Research

There are a lot of relevant literature and research that focus on we application development. These references have a crucial inspiration for my research. In "A framework for effective commercial Web application development" written by Lu and Yeung, they proposed a framework for effective commercial web application development based on prior research in hypermedia and human-computer interface. The framework regards web application development as a special type of software development projects. Key research in hypermedia and human-computer interface which may be helpful to web application

development and design includes system acceptability, structural analysis, software quality model, EOS interface design, international human-computer interface, social acceptability, system feasibility, and usefulness.

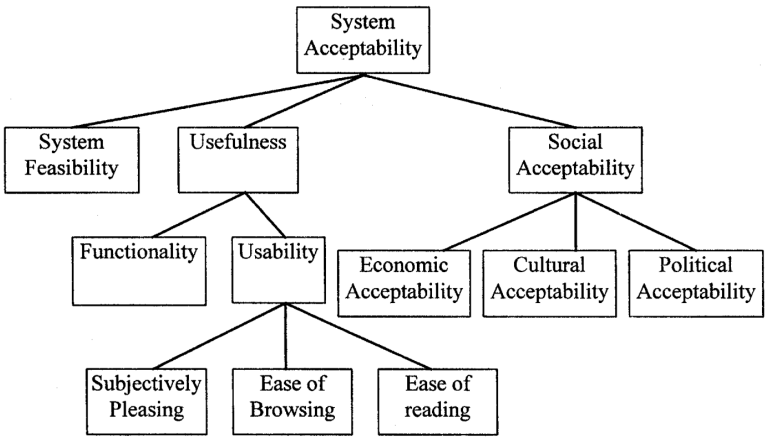

Figure 1: A framework for effective web application development.
by Lu, M., and Yeung, W.

In addition to the web application framework, modeling methods for web application verification and testing are also important. According to Alalfi, M.H., Cordy, J.R., and Dean, T.R., during their study, they surveyed 24 different modeling methods used in website verification and testing.

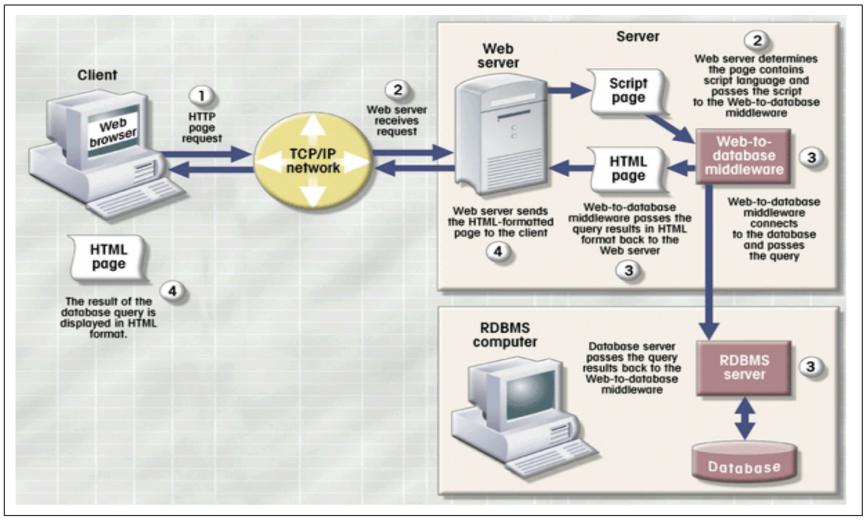

Figure 2: web application components,
by Rob P, Coronel C.

Based on a short catalogue of desirable properties of web applications that require analysis, two different views of the methods are presented: a general categorization by modeling level, and a detailed comparison based on property coverage. In general, desirable properties for website modeling involve web navigation, web content, and web behavior, and a book written by Voran Pawan in 2009 talks about details of web application design patterns. Ideally, people are looking for a model that is able to capture all the desirable features of web applications at all modeling levels, as well as being able to validate the

model using model checking. However, currently, there is no such model yet exists, but perhaps it may be obtained by integrating some of the existing modeling techniques.

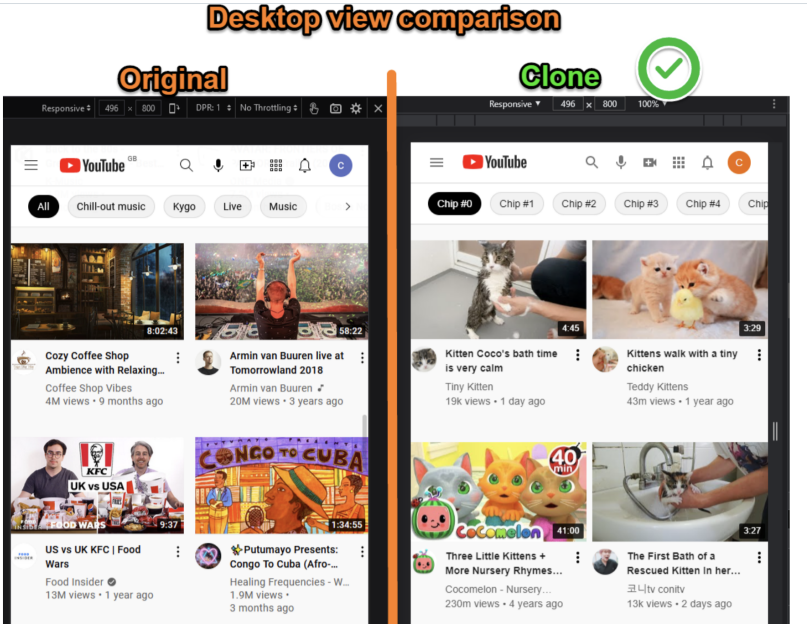

Figure 3: youtube clone vs. youtube,
by 1codingguy

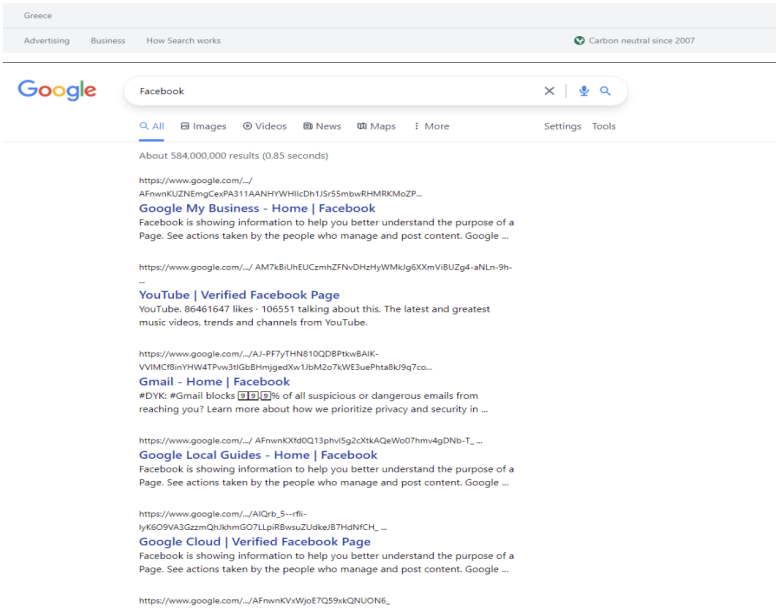

Figure4: Zoogle
by KonstantinosAng

There are many web application development projects that are relevant to my focus area such as youtube and zoogle(google clone). Zoogle is a Google clone using Next JS, Tailwind CSS & Heroicons for the front-end and the Google Programmable Search Engine. It realizes the function of searching and displaying real-time results for the user. Youtube clone builds a video posting and watching web application that shares some key features with youtube. It is a clone of YouTube HomePage and

SearchPage. HomePage displays the most popular videos of the selected country by querying data from the YouTube API. HomePage utilizes infinite-scroll feature, so new videos thumbnails will load when the user keeps scrolling down the page. Typing a word and clicking on search does a real search on YouTube API, 25 results are displayed on the SearchPage. The technologies used include react.js (create-react-app), react-router, Axios, styled-components, Material-UI v4, and jotai. Other relevant web development technologies such as HTML, CSS, Javascript, Node, React, Express, MongoDB, etc. will also be used for my own project in the future.

Resource

- Lu, M. and Yeung, W. (1998), "A framework for effective commercial Web application development", Internet Research, Vol. 8 No. 2, pp. 166-173.
- Alalfi, M.H., Cordy, J.R. and Dean, T.R. (2009), Modelling methods for web application verification and testing: state of the art. Softw. Test. Verif. Reliab., 19: 265-296.
- Vora, Pawan. Web application design patterns. Morgan Kaufmann, 2009.
- Jablonski, Stefan, et al. Guide to web application and platform architectures. Heidelberg: Springer, 2004.
- Youtube clone, 1codingguy, source code: https://github.com/1codingguy/react-youtube-clone
- Zoogle, KonstantinosAng, source code: https://github.com/KonstantinosAng/google-clone

Reference

[1] Web Development Technologies orientsoftware.com/technologies/web-technologies
[2] web application development
techtarget.com/searchcloudcomputing/definition/web-application-development