

Build a Single-Page Web Application Using React

The Making of FriendsBook Web Application Project

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Abstract—Single-page application (SPA) is new way to presenting a website or web application. React (and also known as react.js or ReactJS) is one of the most used JavaScript library for building a single webpage application. Developed by Facebook, React become one of well-known and most used JavaScript library nowadays. For a web developer, learning a new tools and technology was a lifetime journey because of the rapid innovation in this field. This paper will explain about how to build a single-page web application using React. The web application that will be made in this paper named FriendsBook, a web application where the user can store their friend's data and see them, all in one page.

Keywords—React; JavaScript; website, web application, userinterface, SPA

I. INTRODUCTION

The rapid innovation of developing a web programming tools is making a new way to present a website or web application. Nowadays, a website or web application might not be as a complement application beside native application anymore, but far more used that native application itself. That's why web developers are challenged to make the website or web application more and more powerful than ever. User expectation about a website or web application is also increased. Now, users expect a website or web application should be fast, with interactive user interface, low memory used, and soon. In this kind of situation, there is a new trend to present a website or web application, it's called single-page application (SPA).

Single-page application (SPA) is new way to present a website or web application. Different from the old way to presenting a website or web application that every page is in each different physical file instead, SPA make the whole website or web application as a one page only. The goals of this method is to make the website or web application have the user experience just like a native desktop application, which is fast and very interactive. One of the most used tools to build a SPA is React, or also known as React.js.

This paper will explain about React and how to use it to build a single-page web application project named FriendsBook, a web application to store data of user's friend. In the making of the application is also need other tools like Node.js and Redux, but those tool will not be explained here, the main topic that will be explained is React itself.

II. ABOUT REACT

React is one of open-source JavaScript library out there. It is developed by Facebook and first released in 2013. React's specialty is to build user interface (UI), which is allowed web developer to make a single-page web. React, now, is one of most used and well-known JavaScript library. Three main advantages that offered by React are it's declarative, component-based, and "learn one, write anywhere" kind of things approach. Those advantages are make UI development more easy and convenient. Beside that, what makes React developer's favorite is the features that it is offered. Some of notable features in React are :

- **Provide Virtual DOM**
A JavaScript application that plays a lot with DOM usually become slower. In React, the usual DOM represented in its lightweight copy called virtual DOM that makes the DOM manipulation much faster. ^[18]
- **JSX Extension**
JSX is React's extension for JavaScript. This extension allow to write HTML code inside JavaScript code that why it is more convenient to work with. ^[1]
- **React Native**
React Native is React that instead of using web components for its building block, it uses native component. That's why React Native allow developer to build a native mobile apps using JavaScript only. ^[7]

III. LEARNING PROCESS

The process that I took to learn about React is full from the internet. I don't read from any book or take any physical course at all because Facebook as the main developer already provide a convenient information about it on its website and other resource information is enough for me to learn the basic.

A. Get to Know React

First, I went to the React official website at address <https://facebook.github.io/react/>^[1], which is part of Facebook's GitHub page. This website contain basic information about React and also links to another further steps like how to getting started and tutorials.

B. Getting Started Using React

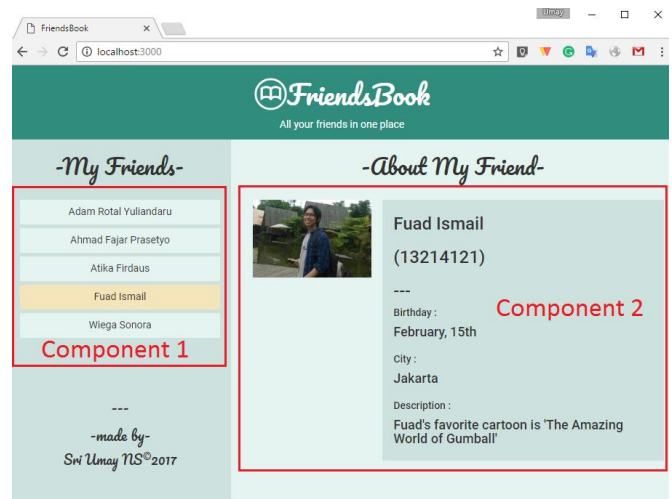
While learn about the concept, I get to start using it by download it, add to the project, set what needed, and try some getting started tips like to make your very first "Hello, world!" application.

C. Learn From Video Tutorials

One of most effective way to learn about new things for me is by seeing tutorials video. Tutorials video usually explained by more expert one, so I get a better explanation. I usually search tutorials video from YouTube or from free online course. [4] [5]

D. Build the Application

After learned about React and have enough knowledge, I started to develop the application.



Picture 1

IV. BUILDING APPLICATION PROCESS

The application that will be built here is a simple application named FriendsBook that will allow user to store data of their friend, and see them in list and see the detail information of each friend whenever they click on a friend name. As mentioned before, this application will be built in one page only. The process of building this application will be mentioned below.

A. Design the User Interface

The design process includes what the application can do, what user can do, where to put them in the page, and how the design presented (fonts, color, position, etc.). The final result of this process is a website layout that is ready to be implemented.

B. Build the Application

Before build the application, we should add React library to the project and configure it. There are several ways to do it and all the instruction is available at React download website at <http://reactjs.cn/downloads.html>. [2]

The first thing that will be build is the front-end, which is the layout page that build in HTML and CSS based on the design. After that build the entire application using React. The most used approach provides by React that will be used a lot is the component-based approach. That's why we have to know which one is should be the component.

In this application, the two section inside the red rectangle is the component that will be made. These two part build as components because they are can change by the time the user use this application, so to make the application a single-page web application, these two part should be built as component.

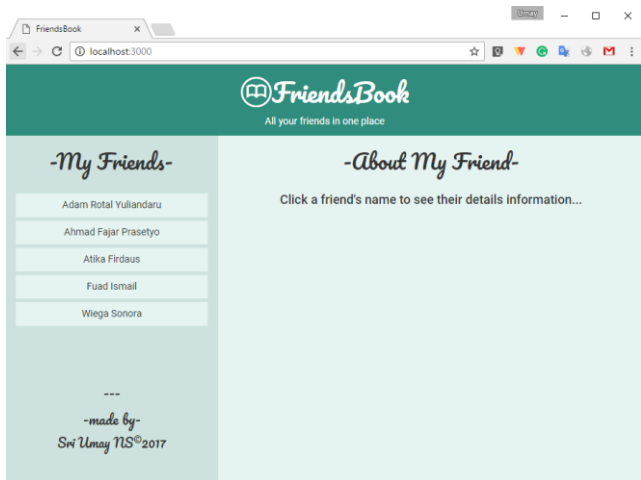


Picture 2

When the component are implemented, the HTML structure of the page is like in the Picture 2. Those two component is the dynamic component in the page.

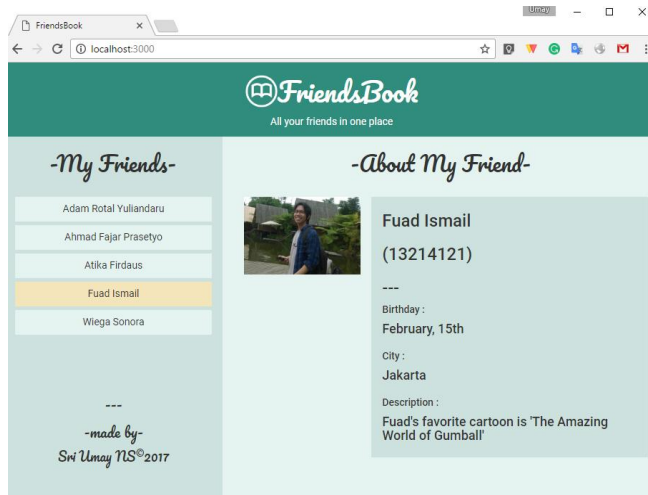
C. Test the Application

The last process of the development process is to make sure that the application works correctly by testing it. For testing this application, it will be run at the localhost at port 3000, the server is made using Node.js so it can run wherever locally.

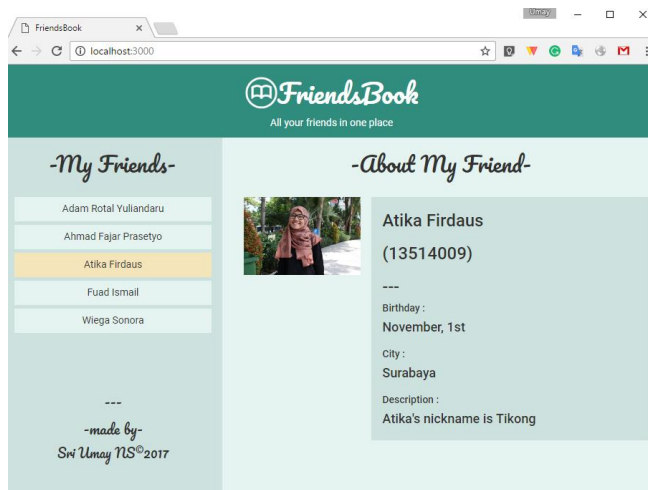


Picture 3

As seen in the Picture 1, when user go to address localhost:3000, user will lands on this page. In this page user can see the list of their friend that already stored. To see the detail information about a friend user can simply click on their friend's name.



Picture 4



Picture 5

When user click on a friend's name in the left section, the page will shows their detail information in the right section. But to be mentioned in this two picture, the page in the Picture 3, Picture 4, and Picture 5 have the same address, which is localhost:3000. It means these two 'page' is actually one page. So the application is built successfully as single-page web application using React.

V. CONCLUSION

A single-page web application is a new way to present a traditional web site or web application in only one page to make user experience just as good as native desktop application. React is a JavaScript library that can help developer to build a single-page web application. It also provide features than make the development a lot easier and more convenient. There are sufficient information about React provided by Facebook as the main developer and also from many source, so everyone can learn how to build application using it.

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This paper is still far from perfect, so suggestion and critique are very welcome for the future learning.

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STATEMENT

I hereby declare that the paper I am writing is my own, not an adaptation, or a translation of someone else's paper, and not plagiarism.

Bandung, May 5th 2017

A handwritten signature in black ink, appearing to be 'Sri Umay N.S.', written in a cursive style.

(Sri Umay N.S.)