MONASH University

FIT 2101
Assignment 1
Analysis of Alternatives

Team Members
Jacky Foo
Kuan Wai Shuet
Arvind Chandran
Hou Ruiqian
Joshua Ee Xian Zhen
Jordan Poon Kee Liang

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Analysis of Alternatives

Programming Languages

As every implementation of a program does, our team has come out with a list of criteria for choosing the programming language used for this program.

1. Speed - it is supposed to be fast and can be run immediately by the client-side
2. Popularity - it is supposed to be popular so most of the browsers can run iit
3. Interoperability - it can be pair with other languages like the two common web page design languages, HyperText Markup Language (HTML) and Cascading Style Sheets (CSS)
4. Experience - every member of the team should have some or more experience on the chosen programming language

With all four criteria above, we have come out with three options for our main programming language which are Python, Java and JavaScript.

Alternative Languages

Python

A familiar language which the majority of computer science students would understand, at least at the base level. Simple to understand and implement due to the similarity it has with the English language.

Advantages of Python

- Simplicity. Python is also a relatively easy language to learn.
- Popularity. Python is also a popular language.
- Interoperability. Python also works nicely with other languages and is flexible enough to do so.
- Experience. Our team members also have experience using Python (although not for web development).

Disadvantages of Python

- Speed. For web development, its speed is still not as fast as JavaScript (not by a large margin)

Java

An object-oriented language which is generally used for server-side development. This general-purpose language can be used as an alternative also due to its similarity with JavaScript.

Advantages of Java

- Java is platform independent. Programs written on one platform can be ported from one system to another.
- Popularity. Java is also quite popular for web development
- Interoperability. Java can also be paired with other tools and frameworks to enhance its performance

Disadvantages of Java

- Speed. Speed of Java for web development is considered to be slower than JavaScript
- Not all team members have experience working with Java

JavaScript[11]

A commonly used programming language for web page development. Most of the web development team will have experience with this language. It allows you to implement complex features on web pages or applications.

Advantages of JavaScript

- Speed. JavaScript is lightweight and allows client-side scripting to interact with users fast. It also runs in the browser while most other languages are backend server-side languages.
- Popularity. JavaScript is used widely.
- Interoperability. JavaScript has the ability to pair with other languages nicely.
- Experience. All of our team members have experience using JavaScript for web application development.

Disadvantages of JavaScript

- Simplicity. JavaScript is relatively hard to learn compared to Python but easier than Java.

Final Decision for Programming Language

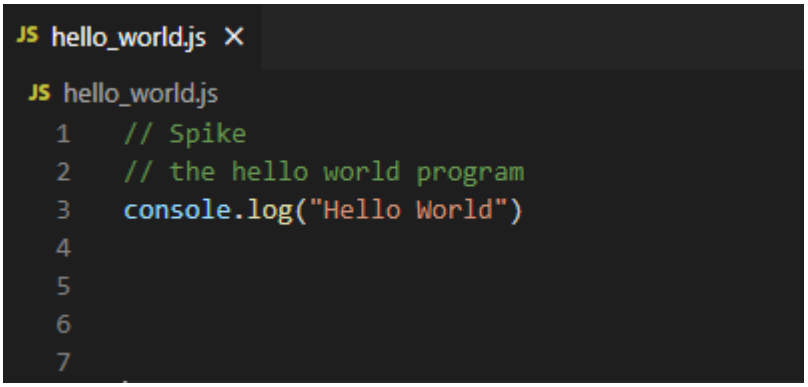
In the end, our team has decided on using JavaScript (JS) as the main programming language for our program. JS is chosen as it is very fast and can be run in most of the browsers especially Chrome without further compilation. Alongside with the popularity of JavaScript currently ranking top 3 in its popularity, it is also highly capable to pair with other programming languages such as the two other design languages we chose, HTML and CSS. Last and most importantly of choosing JS is every member of the team has at least done 1 or more JavaScript based projects.

Essentially, while JavaScript is used to be the one that provides interactive elements to improve user experience, then HTML is used to create the structure of our web application and at last CSS is used to style the structures.

In addition to ensuring everyone knows how to use the JavaScript programming language. Our team has built a spike where as everyone will be at least writing a simple “Hello World” program using JS.

Spike

To get our team used to the programming language of choice which is JavaScript, our team members have written a simple “Hello, World” program using JavaScript. The spike is shown below:



Development tools (GITHUB and VS CODE)

We have decided to use Visual Studio Code (VS Code) as the development tools to develop the widget. There are a few reasons for choosing VS Code. First, everything in VS Code is simple and straightforward. If there is a new team member joining our team and he or she has never used it before, he or she can easily install and set up the VS Code with all the extensions required. Most importantly, all the team members have experience working with VS Code.

We have also decided to use GITHUB to share our codes for this group project. It is easy to push code and pull any updates which will be useful when collaborating with others online. Monash University has always utilised GITHUB for student projects throughout our studies and thus it will be a familiar platform for us to work on. It is also widely used in the working field among programmers. Because of this, it will be easier for us to troubleshoot any problems we might encounter during the process of our project.

Platform

Client requirement :

- Use the widget through laptop and phone
- Collaboration with others
- Update the data constantly
- Robust enough to change the data displayed

Web application

As the requirement of the client, we decided to develop a web application. This web application will be able to run on the most updated browsers such as Google Chrome, Mozilla Firefox, Opera, Safari, etc. Users will be able to login from any device such as mobile phone, laptop, desktop, tablet as long as they have downloaded an updated internet browser.

When analysing the feasibility of developing our application as a web application. We have considered the advantages and disadvantages of web application.

Advantages of web application:

- Platform independent and portable
- Updates are automatic
- Deployment is easier as you only need a browser and account

Disadvantages of web application:

- Performance can be slower compared to native applications
- Access to hardware is more limited
- Considered to be less secure

Alternative platforms

We have also analysed different alternatives such as mobile application and desktop application. After considering their pros and cons, we still believe that web application as requested by the client is the best option as the platform.

- **Mobile application**[2]

  Pros:

  1. Mobile apps are downloaded onto the mobile device itself. This way we do not need to access the internet to view the base app, excluding the online functionalities.
  2. Greater functionality as they have access to system resources
  3. Faster than web apps
  4. Can work offline

  Cons:

  1. More expensive to build than web apps
  2. Compatibility with different platforms (i.e. iOS and Android) usually means designing and building the app from scratch
  3. Expensive to maintain and update

- **Desktop application**[3]

  Pros:

  1. A more consistent user experience
  2. Faster than web apps
  3. Better system integration as it is designed for that specific device
  4. Functionalities are easier to access once we installed the app

  Cons:

  1. Limited by the hardware on which they are run
  2. Must be developed for and installed on a particular operating system
  3. Updates to the applications must be applied by the user directly to their installation

Reference

[1] Rose, S., 2019. *Java vs JavaScript: Everything You Need To Know!*. [online] Scarlett Rose. Available at: <https://medium.com/@scarlett8285/java-vs-javascript-everything-you-need-to-know-3362b5fa4128> [Accessed 24 August 2021].
[2] Stevens, E., 2021. *Mobile Apps vs. Web Apps — What's The Difference?*. [online] CareerFoundry. Available at: <https://careerfoundry.com/en/blog/web-development/what-is-the-difference-between-a-mobile-app-and-a-web-app/> [Accessed 24 August 2021].
[3] Bychkov, D., 2013. *Desktop vs. Web Applications: A Deeper Look and Comparison*. [online] Segue Technologies. Available at: <https://www.seguetech.com/desktop-vs-web-applications/> [Accessed 24 August 2021].