Technical Specifications Document: Dbate

Prepared By: Red Team

Group Members:

Christian Flores-Rogel 013924454 (Team Leader)
Deivis Leung Liang 014110497
Luis Meza 014325959
Keanna Mae Vitug 014699514
John Cayton 014108690

Professor: Vatanak Vong

Date: October 9, 2018

Table of Contents

1. Introduction……2

1.1. Purpose……3

1.2. Overview of Document……3

2. System Design ……

2.1. Developer Environment……3

2.1.1. PC……3

2.1.2. OS: Windows 10……3

2.1.3. IDE……3

2.1.4. Text Editor ……4

2.1.5. Browser……5

2.1.6. Relational Database Management System……6

2.1.7. Web Server……7

2.2. Programming Languages ……8

2.2.1. HTML ……8

2.2.2. CSS ……8

2.2.3. JavaScript……8

2.2.4. Backend Languages ……9

2.3. Framework ……10

2.3.1. Backend ……10

2.3.2. Frontend ……11

2.3.3. CSS ……12

2.4. Deployment……13

2.4.1. Cloud Platform……13

2.4.2. Domain……14

2.5. Miscellaneous Tools ……15

2.5.1. Version Control Repository ……15

2.5.2. Version Control System……16

2.5.3. File Transfer Protocol (FTP) Application……16

2.5.4. Icon Designs……17

2.5.5. CSS Preprocessors ……18

2.5.6. Javascript Packet Manager……19

2.5.7. Module Bundler ……19

3. Requirements for Web App to Run (Software Related)…….20

3.1. Web Browsers……20

3.1.1. Google Chrome (Version 68 and 69), Mozilla Firefox (Version 62) ……20

3.2. Internet Connection……20

3.3. PC……20

4. References……21

1. Introduction

1.1. Purpose

The purpose of this document is to clearly provide an overview detailing the technical aspects of the Dbate web application. A majority of this document covers the potential tools and technologies that can be used along with recommendations of which technologies would best to work with.

1.2. Overview of Document

This document includes details on the system design and the requirements for the web app to run. In the system design, technologies are divided into technologies used for the developer environment, languages, frameworks, and deployment. Each section includes a breakdown of three potential tools that can be used as well as a recommendation of which technology appears to be the best fit in the development of this web application. The requirements for the web app to run detail the specifics on the browser, internet connection, and PC needed to ensure that the web app runs optimally.

2. System Design

2.1. Developer Environment

2.1.1. PC

PC is where all the development for our project will be done. We'll be using PC because it supports all the tools that we'll be using for our project.

2.1.2. OS: Windows 10

Windows is the operating system we will be used while doing the project. It will be our default operating system because it supports most of the tools we are using and also because it's the operating system all of our computers have.

2.1.3. IDE

Name	**Microsoft Visual Studio 2017 (Free Community License)**	**Eclipse(Free Community License**	**Intellij Idea(Free Community License)**
Version	15.8.4	Photon 4.8	2018.2.4
Pros	Visual Studio is currently the most used IDE to collaborate with teams. It has a diverse amount of extensions and is regularly updated.	Have various add-ons and good environment tools. Not a lot of noticeable updates. Eclipse is also open source which makes it free to everyone.	Intellij Idea has customizations that you can do, live templates and is really good at auto-refactoring which is good for testing.
Cons	Hardware consumption the IDE is quite heavy, hence computers may run slower.	Not a lot of language support besided Java.	Uses more memory Can be limited compared to the other 2 IDE community edition doesn't have much flexibility
Recommendation: Due to its various plugins, visual studio can support many languages and have great collaboration features. Because of this, Visual Studio would be our first choice. We would use the github plugin so we can collaborate by allowing us to share our code more efficiently to github. We also prefer this IDE because it can support all the popular front end and back end languages. This would prove useful because we don't have to switch from one code editor/IDE to another in order to run/test our program.			

2.1.4. Text Editor

Name	**Visual Studio Code**	**Sublime Text**	**Vim**
Version	1.27.12	3.1.1	8.1.0000
Pros	Built-in debugging tools for Node, TypeScript, JavaScript. Also has Markdown features and edit live preview	Sublime Text is beginner friendly and is consistent. It's compatible with Windows, OS X, Linux	Uses a small amount of system memory. Vim also loads instantly and has a command line editor
Cons	No multi-line search like Sublime Text. It has partial Git support and it's not an IDE	Full version costs money. Slower loading of big files	It is tedious to learn all commands and modes. New users will have trouble finding features
Recommendation: Visual Studio Code will be our first choice for text editor because it is free and also offers pretty good performance. It's also our preferred choice because in text editor because it also has various plugins available for download that can make our coding experience better. Plugins such as auto close tag and auto rename tag will make it faster to code without sacrificing performance. This text editor would be perfect for the front end development side because it simple but also powerful enough without being too slow.			

2.1.5. Browser

Name	**Google Chrome (Free)**	**Firefox (Free)**	**Opera Web Browser(Free)**
Version	Windows 69.0.3497.100	Firefox 62.0.2	15.0 and above
Pros	It is the most used browser worldwide. Great addons, plugins, extensions, and development tools.	Firefox has better performance than chrome and adequate amount of useful addons for development.	Opera Web Browser can be used to test the web app compatibility. Good at protecting privacy Integrated plugins
Cons	Heavy ram usage. More data collection.	Not as many users as Chrome. Not a lot of plugins.	Not a lot of users. Not a lot of plugins.
Recommendation: Chrome will the best out of all suggested browser because it is the most used browser by far hence we can test it for a better core audience and also having the most variety of plugins. The feature we would use the most would be the debugger extension that chrome has because it would prove useful in debugging a web app while in the testing phase. The development tools that chrome offers far outweighs the features that the other browsers have because it has the better debugging tool which will make it great to see if our code has any errors before we deploy it live.			

2.1.6. Relational Database Management System

Name	**Microsoft SQL Server (Free Community License)**	**Oracle 12c(Free Community License)**	**MySQL(Free Community License)**
Version	Developer Edition 2016	18.1c	8.0.12
Pros	SQL Server is flexible in exporting data from a wide range of files. Good in managing large volumes of data such as bulk loading. It is fast and stable.	Oracle has many extensions and great management tools for managing a database.	MySQL is free and has a lot of functionalities. It was also made to work with other databases without any second errors.
Cons	May have issues with rendering and import files problem	The tools may be kind of pricey. This database management system is also ideal for large organizations mostly. It also a little slow on run time.	No built-in support for XML OLAP. Has limited stuff with free option.
Recommendation: Microsoft SQL Server would be our first choice because even though it may have an import files problem, it still the best in managing large volumes of data and is really stable and fast. The fact that it gets updated frequently appeals to us and also that it would mesh well with the other Microsoft based tools we recommended is the reason why we would want Microsoft SQL Server as our preferred database management system.			

2.1.7. Web Server

Name	**Microsoft Internet Information Services (Free)**	**LiteSpeed (Free)**	**Apache HTTP Server (Free)**
Version	10	5.2.8	2.4.35
Pros	Internet Information Services is an organized management system. It also supported by Microsoft which is good because it gets frequent updates in security. Guided installation and documentation.	LiteSpeed is free and open source. It's also pretty fast performance wise for being a reverse proxy server. It is also potentially better for a VPS.	It is a very popular web server which has lots of documentation about it. It also has the ability to pick and choose various modules. The server runs in most OS's and it is free.
Cons	It has problems configuring with node js. Extensions are also limited and it does not have as much customization as other web servers.	It's a very obscure web server in comparison to IIS and Apache. It has less documentation about it. There is also limited customization.	It has greater security risks to the ability to modify easier than other servers. It also has heavy ram consumption.
Recommendation: Microsoft Internet Information Services would be our first choice because it would run great with our other recommendations which are microsoft based and also because it has greater security than Apache. Security is very important to us and that is why we pick IIS because it has the best security out of all the competing web servers that exist.			

2.2. Programming Languages

2.2.1. HTML

HTML is the foundation for defining the structure of our content and for our overall basic layout. There is no alternative to HTML because it is an Internet standard and supported by all major web browsers. Any other markup language does not have this kind of support and will just end up having to compile to HTML anyways.

2.2.2. CSS

CSS describes the presentation of a markup language document in order to affect the style and presentation of our content. The reason that there is no alternative for it is because it is also an Internet standard and is supported by all major web browsers. No other stylesheet language has anywhere near to this kind of support.

2.2.3. JavaScript

JavaScript is important in defining the behavior of our content. There are no alternatives to JavaScript because it is one of the standards of the Internet, meaning that it is supported by all major browsers. Other scripting languages do not have this kind of universal support.

2.2.4. Backend Languages

Name	**C#**	**PHP**	**JavaScript**
Version	7.3	7.2.10	ECMAScript 2017
Pros	C# has good official documentation, has great error handling, good performance run time, and is a structured organized language.	PHP is compatible with most servers, is cross-platform compatible, outputs of the language can be shown through multiple formats and has great documentation.	JavaScript is quicker than the other languages due to it being a client side language. It also has a lot of documentation online that can be used as a reference.
Cons	A con to the language is that it has limiting cross-platform development in comparison to the other languages.	Error handling in php is bad compared to other languages. It is also slower in performance than Javascript and C#.	Some cons about JavaScript is that it lacks security in comparison to the other languages.
Recommendation: Our recommended language for the backend would be either C# or PHP. We would choose those over JavaScript for the main reason that it is more secure than JavaScript. Overall we would slightly favor C# because it has better error handling features than PHP. It would improve our ability to find and check for errors in our code and also it has faster performance.			

2.3. Framework

2.3.1. Backend

Name	**ASP.NET Web (.Net 2018)Application (Free)**	**Laravel (Free)**	**Nodejs (Free)**
Version	4.7.1	5.7.2	10.11.0
Pros	ASP.NET Web is open source, high in performance, and has multiple libraries that help in programming, supports Javascript, offers great security features, and excellent documentation.	Laravel has a clean architecture and it is also open source. It also offer excellent documentation on the framework.	Nodejs has a tight integration with visual studio. It also is a stable in regards to framework, reliable and a strong typed language.
Cons	It is bound to a single cpu and is tied to other microsoft based tools.	Laravel is fairly new and have been tested to have slower performance than other frameworks.	Does not provide scalability, has bad relational database design and is the least secured out of the three.
Recommendation: In our opinion, both ASP.NET Web and Laravel are fine frameworks and we would be fine with either one. For the Laravel framework, we like the fact that it offers a clean organized structured format while at the same time we like the fact that ASP.NET offers one of the highest web performances in web app frameworks. Even though we would be happy with either one of them, ASP.NET would be our first pick because of its fast performance and also because of its greater security functions that it offers.			

2.3.2. Frontend

Name	Angular (Free)	Vue.js (Free)	React (Free)
Version	6.1.7 / 6	2.5.17	16.5
Pros	Angular has constant New features due to its frequent updates. It also has detailed documentation which could help us in implementing the framework.	Vue.js has detailed documentation and can be upscaled in larger projects. It is also lightweight and is really responsive as well as offering good performance..	React has a nice UI and simpler syntax in comparison to other frameworks. It has a high level of flexibility and is really responsive.
Cons	It still contains the complex syntax that comes from the first version of Angular and migration issues	It lacks a few resources due it being lightweight & and it's documentation could be better. It might also be harder to upscale with it.	React lacks an official documentation and may have too much options which may make it bloated and slow.
Recommendation: In our opinion either Angular, Vue.js, and React would be good front end frameworks. They are good choices because they both would run good with our recommendations for backend frameworks due to these frameworks being preinstalled in them already. Out of three frameworks we would pick Vue.js because of it's decent documentation and the fact that it's a lightweight framework making the app quicker to run but powerful enough to add many features/designs to the project.			

2.3.3. CSS

Name	**Bootstrap 4**	**Semantic UI**	**Bulma**
Version	4.1.3	2.4.0	0.7.1
Pros	Bootstrap 4 has a variety of add-ons, design features, fixes CSS compatibility issues, and has a great great documentation.	Semantic UI does not require much customization work when it is used, and contains concise HTML and intuitive JavaScript.	Because it does not use JavaScript, it is faster, lightweight and highly customizable.
Cons	Bootstrap depends heavily on JQuery and has similar website UI designs due to people not customizing it much. Can be excessive space.	The framework has large packages files and many features uses JavaScript customizations.	Bulma is a new CSS framework, so the documentation may be a little lacking in comparison to Bootstrap. It also doesn't use any Javascript functionalities if one wants to use a framework with js functionalities.
Recommendation: Bulma is the CSS framework we have chosen to use because of it being lightweight, making it much faster in performance than Bootstrap and Semantic UI. It is also not as bloated as the other frameworks due to it not using any javascript functionality in many of its functionalities. For this reason, bulma is our preferred framework that we would like to use because it will be fast in performance and let us customize our own js functionalities unlike the other frameworks.			

2.4. Deployment

2.4.1. Cloud Platform

Name	**Microsoft Azure (Trial 12 months)**	**Amazon Web Services (Trial 12 months)**	**Google Cloud Platform (Trial 6 months)**
Version	N/A	N/A	N/A
Pros	It has a high availability, security, and scalability, and is free for 1 year.	Additional storage is inexpensive if needed, and its extremely versatile. It's also free as long it doesn't surpass it's limits.	There is more flexibility than competitors. It is also cheaper than AWS and offers a 6 month free trial. Offers big data storage if needed
Cons	Requires constant management.	Retrieval may be slow. Transactions may be high-priced.	May have downtime when it needs to be maintained. Still has a lot of production service to be made.
Recommendation: Microsoft Azure or AWS would be our main choice due to it's 1 year free trial. Microsoft Azure would be our recommendation because this option would reduce our expenses for the project, offers great security features, and also because it would work well with our Microsoft based recommendations, making it an efficient environment.			

2.4.2. Domain

Name	**GoDaddy**	**Namecheap**	**BlueHost**
Version	N/A	N/A	N/A
Price (yearly)	$11.99	$10.98	$11.99
Domain Name	DbateOnline	DbateOnline	DbateOnline
Domain Type	.com	.com	.com
Pros	GoDaddy has reliable security.	It offers good prices on domains.	BlueHost has lots of addons which could prove helpful.
Cons	It may be kind of pricey.	Namecheap can have problems with performance and allocation	Has a very slow performance. Has strict rules with storage.
Recommendation: We have no preference. Whichever offers the best prices on domain names would be our choice. Currently all three hosts offer similar prices to the domain name although with different domain types. Although Namecheap has a slightly cheaper price, as of right now we recommend GoDaddy because it has the most reliable security and because it offers the .com domain type.			

2.5. Miscellaneous Tools

2.5.1. Version Control Repository

Name	**Github**	**Bitbucket**	**Sourceforge**
Version	N/A	N/A	N/A
Pros	Free open source and also allows to make contributions to code in a group. It also offers great documentation on how to perform many of their features.	Allows users to import an existing repository and to make contributions to code in a small group. Offers free private repositories.	It also offers the ability to make contributions of code in a repository. Makes it effective for groups to contribute together.
Cons	Recently bought by Microsoft and it isn't private.	Only has free private repositories to teams with 5 members or less	Downloads come with closed-source installer that attempts to install third-party software
Recommendation: As chosen by the client, we will be using Github. Using github will help us in keeping track of the changes of our code as well as sharing the progress in our code. This will surely also improve our workflow because we will be able to use many of the github functions such as branching which lets use many copies of the same code to not mess up the original code.			

2.5.2. Version Control System

Name	**Git**	**Apache Subversion**	**AWS CodeCommit**
Version	2.19.0	1.10.2	N/A
Pros	Git is free and completely open source. Also allows to create branches in existing coding files.	Apache is free and also allows to create branches in code files.	AWS is free if group is less than 5 people and allows to create branches in code files
Cons	Difficult to link repositories to one another	Difficult to merge code from one branch to another	Smaller user base compared to competitor and also has to pay if a group is bigger than 5 people
Recommendation: Git will be the best software to use for the VCS because it goes really well with GitHub. Using git to push new updates GitHub much more efficient than the other two other alternatives.			

2.5.3. File Transfer Protocol (FTP) Application

Name	**FileZilla**	**FireFTP**	**Cyberduck**
Version	3.37.3	2.0.31	6.8.0
Pros	It is free and open source. Also has site manager functions. It is also compatible on most platforms.	Supports server to server transfer and is compatible to most on most platforms.	It's very user friendly, decent transfer speed, and also free.
Cons	Installs adware by default. Passwords saved in plain text	Limited to 4GB download. Recommended mostly for Firefox browser.	Only compatible on Windows and Mac platforms. Slower than other FTP applications.
Recommendation: FileZilla will be our preferred FTP because it will help us in uploading our files to our server in the cloud. It's also our prefered option because it is free and it has extensive documentation on how to use it and also solutions whenever one runs into problems.			

2.5.4. Icon Designs

Name	**Font Awesome**	**Line Awesome**	**Feather Icons**
Version	4.7.0	5.3.1	4.7.3
Pros	It is Open Source. Toolkit also uses Web Font + CSS and new SVG + JS Framework.	Has Flat line styled icons as opposed to filled icons on Font Awesome. Line Awesome is also free	Can be used through client-side JavaScript, Node, and SVG Sprite.
Cons	Premium version is $60 per year.	Not as many options as Font Awesome.	Has the least amount of options.
Recommendation: Line Awesome is our preferred icon design framework because it offers plenty of icon designs at a price of zero dollars. This appeals to us because we don't have to spend money on it and also because the designs look interesting.			

2.5.5. CSS Preprocessors

Name	**Sass**	**Less**	**Stylus**
Version	3.5.6	3.7.1	0.53.0
Pros	Makes CSS more modular and code reusable. StyleSheet organization is cleaner than vanilla css. Sass offers great documentation.	Less syntax is simple and is compatible with BootStrap framework. Decent documentation.	Stylus offers a variety of mixin libraries Awesome error reporting. Offers good documentation.
Cons	Ruby has to be installed so Sass can work.	Software support is more fragmented and has no debugging feature.	Development has stagnated, so there are many known bugs
Recommendation: Sass is the recommended CSS preprocessor because it will make it more efficient than just writing pure CSS. Even though all the preprocessors offer almost the same functionalities Sass is better because it is more stable than the other preprocessors and has fewer bugs.			

2.5.6. Javascript Packet Manager

Name	**NPM**	**Bower**	**Gulp**
Version	6.4.1	1.8.4	4.0
Pros	It is open source and it has a big community that offers many resources to solutions to problems. It also offers great documentation	It is open source and the learning curve isn't as big as the other packet managers.	It has a variety plugins and utilities that can be helpful.
Cons	Some scripts can be lengthy to implement	Doesn't support multiple libraries unlike npm.	Many of the gulp plugins don't offer long term support and are out of date soon. Documentation is also lacking. Debugging gulp errors are a hazle as well.
Recommendation: Npm will be the best for this project because of how efficient it is to link with JavaScript. Npm will be more compatible with NodeJS in the case we use NodeJS as our backend option. It also offers an extensive amount of libraries that can be installed for JavaScript that could be useful whenever we need it for the construction of our web app.			

2.5.7. Module Bundler

Name	**WebPack**
Version	4.20.2
Pros	Webpack makes the process of splitting code smoother and also cleans the project by eliminating dead assets. Webpack also offers a great range that doesn't have to be installed unlike other module bundlers.
Cons	Webpack is pretty difficult to configure.
Recommendation: WebPack is our recommended module bundler because it will help put all of our assets such as js, images, fonts, and CSS in a dependency graph. This will help us in managing our files efficiently and also helps run tasks when it is loaded. It is	

also the only true module bundler that exists currently.

3. Requirements for Web App to Run (Software Related)

3.1. Web Browsers

3.1.1. Google Chrome (Version 68 and 69), Mozilla Firefox (Version 62)

3.2. Internet Connection

3.3. PC

4. References

1) https://stackshare.io/stackups/eclipse-vs-intellij-idea-vs-visual-studio
2) https://www.exede.com/blog/pros-cons-internet-browser/
3) https://www.keycdn.com/blog/popular-databases/#1-Oracle-12c
4) https://lunarpages.com/apache-vs-iis-which-web-server-should-you-choose/
5) https://www.keycdn.com/support/nginx-vs-apache/#Overview_of_Nginx
6) https://stackshare.io/stackups/dot-net-vs-laravel-vs-nodejs
7) http://voidcanvas.com/describing-node-js/
8) https://lunarpages.com/apache-vs-iis-which-web-server-should-you-choose/
9) https://medium.com/@TechMagic/reactjs-vs-angular5-vs-vue-js-what-to-choose-in-2018-b91e028fa91d
10) https://dev.to/sambenskin/bootstrap-vs-semantic-ui-vs-bulma-for-vuejs-3dam
11) https://codeburst.io/evaluating-css-frameworks-bulma-vs-foundation-vs-milligram-vs-pure-vs-semantic-vs-uikit-503883bd25a3
12) https://www.techtalko.com/2018/05/29/css-framework-which-is-better-bulma-vs-bootstrap-vs-foundation/
13) https://www.slant.co/topics/150/~best-css-framework
14) https://blog.icorps.com/pros-and-cons-microsoft-azure
15) https://www.quora.com/What-are-the-pros-and-cons-of-using-Amazon-Web-Services-AWS
16) https://www.quora.com/What-are-the-pros-and-cons-of-Google-Cloud-Platform
17) https://www.trustradius.com/products/iis/reviews
18) https://www.shivarweb.com/8875/namecheap-shared-hosting-review/
19) https://opensourceforu.com/2016/11/pros-cons-open-source-programming-languages/
20) https://medium.com/the-mission/new-to-coding-which-programming-language-is-right-for-you-f506638aa36e
21) https://www.thebalancecareers.com/sass-vs-less-2071912
22) https://www.slant.co/versus/762/764/~stylus_vs_sass

23) https://www.slant.co/topics/12/viewpoints/34/~best-programming-text-editors~visual-studio-code
24) https://www.slant.co/topics/12/viewpoints/3/~best-programming-text-editors~vim
25) https://www.slant.co/topics/12/viewpoints/1/~best-programming-text-editors~sublime-text
26) https://alternative.me/font-awesome
27) https://www.techsupportalert.com/content/filezilla.htm-0
28) https://www.techsupportalert.com/content/fireftp.htm-0
29) http://perfectgeeks.com/cyberduck-review/
30) https://www.slant.co/versus/1711/5954/~cyberduck_vs_filezilla
31) https://fontawesome.com/free
32) https://icons8.com/articles/line-awesome/
33) https://github.com/feathericons/feather
34) https://searchaws.techtarget.com/tip/Weigh-the-pros-cons-of-AWS-CodeCommit-for-source-control