# Technical Specification: BitOHealth

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# Table of Contents

Purpose:

A layout of various technologies that will be utilized for the development of the project. This includes versioning of technologies for product development. Each technology contains features that will benefit us during the overall development process.

Operating System (Windows 10)

For our project, a Windows 10 operating system is essential. As a group, we feel most comfortable with this technology because we have worked with it constantly.  Moreover, Windows 10 supports all of the technologies we are going to use for this project which will be highlighted later. We plan on using a Microsoft technology stack which favors the use of a Windows operating system because it will provide familiarity, corporate support, and consistency. Below are some other features Windows offers that express its usefulness.

| Windows |
| --- |
| - Low price |
| - Can run virtual machines in windows, linux, etc. |
| - Lots of manufacturers |
| - Support for IIS web server |

References:

- https://www.youtube.com/watch?v=wOHq8iq-AzM

- .

Programming Languages

Backend (C# 9.0)

We are choosing to use C# for our backend product development. Little of us have worked with this language, but its features will be most beneficial for our product. Being similar to Java, a language all of us are very familiar with, it will prove to be a simple learning curve. To add, this language showcases some valuable features like automatic garbage collection and operator overloading. This will help drastically with memory management and full custom data type integration to ensure our product is as efficient as possible. Other C# benefits are shown here:

| C# |
| --- |
| - Microsoft backing and support |
| - Compiled language, so more security |
| - Object oriented language |
| - Strict variable types |
| - Full .NET integration |

References:

- https://medium.com/sololearn/why-is-c-among-the-most-popular-programming-languages-in-the-world-ccf26824ffcb#:~:text=C%23%20has%20many%20features%20that,have%20to%20worry%20about%20them.&text=C%23%20is%20a%20complex%20language,simpler%20languages%20such%20as%20Python.

Frontend (ECMAScript 11+)

ECMAScript is a key ingredient in developing the frontend of our product. We will be able to follow the guidelines laid out by ECMAScript that would provide structure as our product grows in complexity. The Javascript language is highly compliant with the guidelines set out by ECMAScript. We will implement Javascript due to the key features it offers:

| Javascript |
| --- |
| - Speed<br><br>- Simplicity of language<br><br>- Popularity<br><br>- Constant ECMAScript updates |

References:

- https://www.freecodecamp.org/news/the-advantages-and-disadvantages-of-javascript/

IDE

Frontend and Backend (Visual Studio Code 1.59+)

We feel Visual Studio Code (VSC) is an obvious environment to write our product in. This IDE is a part of the Microsoft tech stack, so it provides complete .NET integration. This will provide ease of access that is simply not rivaled by any other IDEs. To add, it is completely free to use. This is valuable to us because any potential cost elimination is crucial as those resources may be used elsewhere. Most importantly, VSC is an IDE that can support both our frontend and backend needs, providing an interface that will be consistent throughout the development of our product. This will eliminate the use of key storage and acquaintance to different IDEs. Below is a list of other features VSC can provide:

| Visual Studio Code |
| --- |
| - Support |
| - Stability with larger products |
| - Scalability |
| - Strict variable types |
| - Full .NET integration |

References:

- https://www.jetbrains.com/rider/compare/rider-vs-visual-studio/

- https://www.educba.com/monodevelop-vs-visual-studio/

Web Server (IIS 10+)

A reliable web server is a vital component of a successful product, so we are choosing Internet Information Services (IIS). As mentioned previously, we will be using a Windows 10 OS for the development of this product. Having said that, IIS is free with a Windows 10 license. Some may have little to no experience using IIS, but the GUI it provides makes the transition to using IIS much easier. Other web servers can offer much more customization than what ISS can provide. However, what IIS lacks in customization can be made up for in its ease of access to the .NET framework. Other popular web servers have access to the .NET framework, but a reverse proxy is mandatory to access it. We are eliminating this headache altogether by using a web server that is fully integrated with .NET. Below are other compelling features offered by IIS.

| IIS |
| --- |
| - Corporate support/backing |
| - Security |
| - Simple interface |

References:

- https://www.upguard.com/blog/iis-apache#toc-3

- http://www.differencebetween.net/technology/difference-between-iis-and-apache/

Database (SQL Server Management Studio & SQL Server 2019 Developer/ExpressEdition)

The use of the SQL Server Management Studio (SSMS) and SQL Server will be crucial technologies for the database aspect of our product. SSMS and SQL Server offer increased security when compared to other database services due the ability to manipulate tables and data through GUI. This promotes data integrity which is an important aspect in database design. These two database technologies can be criticized for not offering much compatibility to non-Microsoft infrastructures. However we will utilize Microsoft infrastructure throughout the development of our product, so the use of these technologies will provide exceptional compatibility with the rest of our infrastructure.

| SSMS & SQL Server |
| --- |
| - Simple configuration |
| - Optimization of data storage |
| - Free |

References:

- https://www.rothmobot.com/the-advantages-and-disadvantages-of-microsoft-sql-server/

Frameworks

Backend (.NET 5+)

An appropriate backend framework ensures efficiency and structure throughout backend development, so we will be working with .NET. The most important aspect of .NET is the scalability it offers. It has the ability to support many platforms if we would like to expand

our product to, like Android and iOS. In addition, this framework is easy to maintain and can support complex web applications. This will promote efficiency and security as we continue to grow. Lastly, it is highly compatible with other technologies we are using.

| .NET |
| --- |
| - Fast<br><br>- Reliable<br><br>- Large community support |

References:

- https://medium.com/dataseries/reason-why-net-framework-is-the-most-desirable-framework-in-2020-29fe5554f4ac

Frontend (React 17+)

A frontend framework will provide scalability when developing our product. We will be working with React, pending approval. React is the most popular frontend framework, so there is great community support.  It is open source, allowing us to use custom tools developed by different users. The one directional data flow that React implements will also be beneficial to our product as it will facilitate stable code.

| React |
| --- |
|  |

- Reusable code

- Easy to learn

- Saves time

References:

- https://existek.com/blog/top-front-end-frameworks-2021/
- https://www.koombea.com/blog/react-pros-and-cons-what-are-the-advantages-and-disadvantages-of-reactjs/

APIs

GoodRx

GoodRx is a prescription price comparison API. It allows clients to call prices of over 6,000 FDA-approved prescription medications, sourcing data from 70,000 different pharmacies. This will allow our medication lookup feature to provide accurate information to the user. It can also output valuable data to the consumer like the maximum price they should pay, with or without insurance, for a drug at a local pharmacy. We are in the process of gaining approval for this technology

GoodRx

| |
|---|
| - Data interaction |
| - Research source |
| - Free to use |

References:

- https://www.goodrx.com/research

- https://www.programmableweb.com/api/goodrx

Google Maps

This API is a well known resource for major companies like Uber, TripAdvisor, etc. It will allow us to facilitate our health locator feature within our product, pending approval for its use. Google Maps can allow us to filter through various locations we need like hospitals, parks, gyms, etc. It can also output location information like address, phone number, etc. Google is well-known and trusted, ensuring that the information provided will be accurate. Most importantly, the API provides routing to various locations that will be most beneficial to our users that want to interact with these locations.

| Google Maps |
|---|
| - Free usage |
| - Large database |

| |
|---|
| - Street view |

References:

- https://www.uptech.team/blog/mapbox-vs-google-maps-vs-openstreetmap

Bing News

This API will allow us to integrate a global hot topics component in our product. We will be able to explicitly acquire trending health topics from their database and relay it to our users.This will permit us to constantly show accurate and update information on a daily basis. We are still in the process of gaining approval for this technology

| Bing News |
|---|
| - 100 free requests |
| - Easy to use |
| - Cheap premium price |

References:

- https://blog.api.rakuten.net/top-10-best-news-apis/

Spoonacular

This API contains many aspects that will be of use like menu items from American restaurant chains, ingredients, recipes, and products. All the data the API provides also lists the nutritional data. This will be most beneficial for our users because they will be able to track calories with meal suggestions we provide.

| Spoonacular |
|---|
| - Price data |
| - Cooking tips |
| - Nutrition visualization |

References:

- https://spoonacular.com/food-api

Domain Registrar (Namecheap)

We will be using Namecheap for our domain registration. They are a trusted and widely used registar. They offer countless domains, SSL certificates, and even DDoS protection for low prices. Additionally, they offer domain hosting which will make the whole process of making the domain live quicker. All of our necessary tools will be in one place, eliminating the hassle compatibility to other services.

References:

- https://www.forbes.com/advisor/business/software/best-domain-registrar/

Communication Services

Email (Outlook)

We are utilizing Outlook for our communication through email. Outlook lets us send emails to various people and we can all be CC'd to email contents and to track responses. We feel this is the best option because we all have premium access to it with our school accounts. Lastly, Outlook offers a desktop app, letting us see email notifications within seconds on our desktop rather than when periodically signing into email.

References:

- https://tryshift.com/blog/apps-hub/gmail-vs-outlook/

Discord

We are going to be using discord for a non formal method of communication. We all have prior experience with this technology, so using it will not be a hassle at all. Discord has features like text chat, voice communication, and screen sharing. We have the ability to make unique text chats for more structure to our conversations, and even a general chat for more casual conversation. We can all join a voice call where we can hear each other in real time which can make meetings quick and easy. Lastly, the screen share feature allows the group to be on the same page when working on tasks together.This will help us in the development in the project as a whole

Trello

Trello is a visual tool that helps organize our thoughts for working on the overall project. The interface of Trello has loads of customization to keep up with our needs. We are

going to use Trello specifically for formal communication, keeping track of due dates, and current state of assignments. Utilizing Trello will eliminate confusion and facilitate an organized working environment.

Version Control (GitHub using Git 2.33.0)

Github will allow everyone within the group to work collaboratively on the product. We will be able to make changes through pull requests that are approved by the repository owner. Also, we will be able to see each other's changes to the repository through fetch and pull requests. Any unwanted changes to the repository can be quickly reverted by the repository owner. Github will allow us to keep our code organized and easily maintainable. It is free and has large community support, potentially eliminating issues we may come across.

Collaborative Sites

Google Docs

We will be utilizing the Google Docs platform to draft up important text documents. This technology allows us to work collaboratively in real time and track each other's changes in a little amount of time. It autosaves, removing the headache of losing work due to not properly saving. All of the work is saved on the Google cloud, so it does not take any hard drive space. Lastly, Docs is free to use.

Google Sheets

Similar to Google Docs, Sheets is a spreadsheet technology that allows data to be analyzed, organized, and manipulated. It shares all of the collaborative and autosave features that Google Docs offers. This is the best option moving forward because it's simple to use and can be accessed/worked on by multiple people at once.

Google Drive

We need one place to store all of our important documents, Google Drive allows us to do so. Drive permits various folders to be created, shared to multiple people. All of these documents can be backed up via Google cloud. This creates a stable work environment, eliminating the possibility of our work being lost or deleted. Google Drive is extremely compatible with Sheets and Docs, so this was an obvious choice. This will be essential in the development of our project by keeping everything in one place