MEet and You

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Purpose

The purpose of this documentation is to provide an overview in regards to the technical aspects related to our MEet and You web application. The bulk of this document covers the potential tools as well technologies that will be utilised. Our technologies will include the accompanying programming languages, the development environment, and the frameworks(frontend and backend).

Programming Languages

C#

- C# is a general-purpose language that is used across a variety of tasks and objectives. It is used in conjunction with the Window .NET framework and can be applied to an open source platform. Due to being object oriented it is easily scalable and easy to maintain.

JavaScript

- JavaScript will be useful in helping us define the behavior of our content. JavaScript has no other alternatives since it is a standard of the Internet and is supported by all the major browsers.

HTML

- HTML lays the foundation for the structuring of our content and it's basic layout. HTML does not have any other alternatives and is also supported by the major web browsers. As a result compared to other markup languages it has more support and the other languages end up compiling to HTML in the end.

CSS

- CSS is how the presentation of our markup language is, more specifically the style and presentation of our content. Much like HTML and JavaScript it is also an Internet standard and has more support compared to other stylesheet languages.

SQL

- SQL is how we can define the data in our database and manipulate that data when needed. Many popular websites utilise SQL databases in order to pull user-specific data

as people navigate the website. It is an industry standard as it is very flexible and scalable.

Communication Software

- **Discord Desktop Application** - Minimum Version Stable 103839
  - Used for immediate communication in-between team members:
    - Channels for setting up meetings, voice meeting communications, check deadlines, helpful learning resources.
- **Trello Web Application**
  - Used as a kanban board for our project.
- **Zoom Desktop Application** - Minimum Version 5.8.3
  - Used to communicate with our client where meetings will be discussed about partial expectations and deadlines as well as answering questions in online meetings.

Documenting Software

- Google Documents
  - Used to document all notes for meetings with our client and also used to quickly jot down any information we have regarding research that is conducted.
- Google Drive - No Version Number Applicable
  - Used by team members to work on documents collaboratively and see edits in real-time before submitting final drafts.
- Google Sheets
  - Used by the team to log hours worked throughout the week.
  - Used to create team BurnDown Charts for sprints.

Software Requirements

IDE

Name	Intellij Idea: Free Community Edition	Eclipse: Free Community License	Microsoft Visual Studio 2019: Free Community Edition
Version	2021.2.2	4.21.0	16.11
Pros	Intellij has live templates, is easily customizable and is good at auto-refactoring which is a plus for testing.	Eclipse is open source with a variety of various add-ons and great environmental tools	Most utilised IDE for team collaboration. Has a diversity of extensions and is updated regularly.
Cons	Utilises more memory without much flexibility in the community edition.	Does not have a lot of noticeable updates. Not much language support aside from Java	Hardware intensive, may cause computers to run slower.

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Browser

Name	Google Chrome(Windows)	Firefox(Windows)	Microsoft Edge(Windows)
Version	94.0.4606.61	92.0.1	94.0.992.31
Pros	Has a lot of addons, plugins, development tools and extensions. It is the most used browser in the world	Adequate addons for development. It tends to have better performance than Chrome.	Full hardware acceleration for graphics, texts, and videos.
Cons	Resource intensive since it uses a large portion of memory in order to run.	Smaller user base with limited number of plugins.	Large memory utility as well as a small extensions library.

Web Server

Name	Apache HTTP Server: Free	Microsoft Internet Information Service (IIS): Free	NGINX
Version	2.4.49	10.0.17763.1	1.20.0
Pros	It runs on most OS and is a very popular web server with a lot of documentation. Various modules can be utilised along with it	Microsoft IIS is a very organized management system. Due to it being supported by Microsoft, it receives updates frequently.	NGINX is scalable and it works well with other web servers. It is lightweight and is capable of serving a large number of users using an event-driven asynchronous architecture.
Cons	It has a high ram consumption and a greater security risk since it is much easier to modify compared to the other servers.	It has limited extensions and is lacking customizability. It also has problems being configured to run with Node js.	It has a small number of extensions and requires third party web servers which can lead to complications.

Database Management System

Name	MySQL: Free Community License	Microsoft SQL Server: Free Community License	Netbeans
Version	8.0.26	SQL Server 2019	12.5
Pros	Unlimited size for each database/table and is fully-manage SBaaS through Google or Azure	It is capped at 542,272 TB and allows us to store each data once without duplicates	It supports a large number of Java applications and is able to indicate edited code as well as files based on GIT commits.
Cons	It requires a third party in order to work with .NET.

Data restoration also ends up being time consuming due to the need of multiple SQL statements | It supports only Linux and Windows platforms and is also more costly than MySQL since it requires the purchase of licenses to use/run multiple databases. | It takes time to load and utilises a lot of memory. It also has outdated framework support. |

Front-End Languages

Name	JavaScript	TypeScript	PHP
Version	ECMAScript 2021	4.2.4	8.0.11
Pros	It allows for both client and the server side runtime. The client side can be fast as it can be run within the client-side browser. It is also ideal for dealing with JSON.	In terms of larger projects it will result in a more robust software and allows for better collaboration and static typing.	It's easier to maintain due to being loosely coupled with little repetition. It has extensive database support with SQL.
Cons	Its interpretation can differ depending on the specific browser. However it can be difficult to debug with more complex projects.	It requires compilation before providing an output and is not easily manipulated with a Content Management System.	It can be utilised with JSON and is more situational than other languages. However it does have slower execution.

Back-End Languages

Name	C#	Java	Python
Version	9.0	SE 17	3.9.7
Pros	It's object oriented programming and integrates well with Windows . It can also read and write files when the Silverlight version allows it.	It has excellent documentation to reference. Using multithreading we can switch efficiently between threads. It has a significant amount of libraries and APIs.	Cost efficient in terms of resources and takes much less time to build things compared to other languages. It has easy scalability and is dynamic enough to be used for the most simple to the most complex agile based programming.
Cons	Requires a specific IDE to code it with and also requires a plugin like Silverlight in order to run on a browser.	The code can become bloated and more complex in comparison to a language like Python.	It is not a useful choice for memory intensive tasks and has it's restrictions when it comes to database access.

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Framework

- Frontend

Name	React.js	Angular	Vue.js
Version	17.0.2	12.2.0-rc.0	3.2.1
Pros	Compared to other frameworks, React has a simpler syntactical form as well as a nice UI. It is also flexible and highly responsive.	It constantly has newer features due to its frequent updates. It's detailed documentation helps in utilising and implementing the framework.	It can be upscaled with larger projects and is also lightweight as well as offering excellent performance.
Cons	React can often be bloated as a result of having too many options. It also lacks official documentation.	Contains complex syntax inherited from the first generation of Angular and comes with migration issues.	Due to being lightweight it lacks a few resources and it might be harder to upscale your projects as a result.

- Backend

Name	ASP .NET Framework	Express.js	Flask
Version	4.8	4.17.1	2.0.1
Pros	Integrates naturally with a SQL server. It is also a framework with huge extensibility and third-party components. It is a mainstream standard that has many developers actively working on it. This means it comes with a lot of support and documentation.	It supports many third party plugins and happens to be a very simple and fast framework with a large library. It happens to be one of the first frameworks that worked with node.js and maintained its popularity.	It has a very simple and clean implementation and is lightweight as well. It is a flexible framework that upscales with larger products.
Cons	Scalability of your projects becomes costly as they become larger.	There is no default method of arranging things and as a result it becomes harder to manage in the long term.	Has a smaller library in comparison to the others and has nothing in the form of a database.

Version Control Repository

Name	Github	Sourceforge	Bitbucket
Version	N/A	N/A	N/A
Pros	A free and open source repository that allows collaboration across the board. There is a great number of documentation in order to better utilise its features.

Offers unlimited private repositories. | Allows users to make contributions to code within a repository and is effective in allowing groups to contribute together. | It offers free private repositories and also allows users to import existing repositories. |
| **Cons** | Private repositories do not necessarily mean that data is private.

Its project management could be more robust. | Its free private repositories are limited to a group of five or less. | Its download installer attempts to install third-party software. |

Version Control

Name	Apache Subversion	Git	AWS CodeCommit
Version	1.14.1	2.33.0	N/A
Pros	It is also another free repository that allows the creation of branches within code files.	It is an open source repository and allows the creation of branches in any existing code files.	As long as less than 5 people utilise it, then it is free to utilise its capabilities such as creating branches in code files.
Cons	Merging code from one branch to another is difficult.	Difficult to integrate different repositories to one another.	Much smaller user base compared to its competitors. Users pay if the group limit is exceeded.

Diagrams/Modeling

Name	LucidCharts	Draw.io	Figma
Version	N/A	N/A	N/A
Pros	It contains an online repository for both diagrams and for collaboration. It is also able to import and export different file types.	Has great accessibility to the specific features. The diagrams also revert with their pages	Allows for a simultaneous collaboration . Files can be accessed anywhere and anytime.
Cons	Certain features are locked behind a paywall and there is a lack of customizability when it comes to its options.	It is only available as a web application. It is not well optimized in terms of team collaboration.	Requires online connections at all times to utilise collaboration features as well as some of its other features.

Wireframe Tools

Name	Figma	Balsamiq Cloud	Sketch
Version	N/A	4.3.1	79
Pros	Multiple real-time team collaboration features: Liveshare, Dev Handoff, and Version Control. Can be used directly from the browser.	Intuitive interface, with an easy way for text customization. Large and extensible UI element library.	Designed specifically for web and mobile UI design and workflow. "Mirror" makes it easy to test designs on multiple devices Full offline editing
Cons	Workflow slows down with a lot of components	The application is fully functional for 30 days, but you'll need a license in order to save your work after the evaluation period is over.	No Windows and Linux support Buggy and lack of quality assurance

Automated Testing

Name	Fiddler	Postman	Assertible
Version	5.0.20204	9.1.3	N/A
Pros	Logging and capturing services for HTTP and HTTPS based traffic. Offers decryption of HTTPS traffic. Isolate performance bottlenecks with rules feature. Compose your own HTTP requests to run.	Allows users to easily share experience and knowledge with other team members, as it allows you to pack all requests and expected answers and send them to colleagues. Has run,test, document and monitoring functions.	Specifically designed for web service test automation. Codeless web service testing. Provides automatic testing of the API at every stage of the process of integration and delivery of software
Cons	It can run only on Windows.	All testing must be done using custom Javascript code snippets. Automated testing features requires Postman Pro account.	Limited web services and tests for free plan.