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| WIUT Student IDs | 00010023 |
| Deadline Date | December 1, 2020 |
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# Introduction

This report aims to guide a new start-up company to construct a remote environment for a web development due to the recent outbreak of COVID-19. In this report, there will be explained all required software and hardwares that all employees should be equipped with. Also, additional parameters of all sets (softwares and hardwares) will be indicated in the report.

The company will be focusing on only web development. Therefore, it’s highly recommended to stick to the latest JavaScript frameworks as it’s getting it’s popularity day by day. There are 2 layers in the web development area which are frontend and backend. Frontend part will serve as an interface of the application and there should be used optimised CSS frameworks such as Materialize, Tailwind CSS or Semantic UI. In order to make web surfing experience dynamic and beefy, it’s highly recommended to use the latest Javascript technologies as React.js, Vue.js or Svelte. By combining a CSS framework with a Javascript framework, a fully responsive web application can be reproduced. It’s recommended to combine Next.js framework which is known for its speed and production ready optimisation with Tailwind CSS which is also known for packing css classes into tags. As regards to the backend part of the application, it should be chosen whether what kind of sphere is the application going to cover. As an example, if the company is going to build a video hosting website, it’s recommended to use the Phoenix framework on Elixir programming language, if it is a data exchanging application, then frameworks such as asynchronous Express on Node.js will be more efficient compared to other frameworks or programming languages. There might be some doubts about using programming languages as PHP or Python. However, both programming languages that are indicated below might be popular due to the mass usage on the net, but it’s not speedy and efficient enough to respond to requests fast. It will just overkill the performance and efficiency of a project.

On the other hand, it’s relevant to know how every member of the company is experienced. It’s suggested to group people by summarizing its experience ranking of every staff member. Normally, it’s recommended to have a group with a senior rated developer and 2 middle developers and optionally a junior developer. Neither, you can replace 2 middle developers with a master developer.

Speaking up the budget part of the company, there should be signed a few contracts with local sponsors and investors at the initial stage.

# Hardware Review

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name and Price** | **Characteristics** | **Short Description** | **Benefits** | **Limitations** |
| **Designers** | | | | |
| Apple Mac Mini 2020  USD ~$1299 | Apple M1 chip with 8-core CPU, 8-core GPU, and 16-core Neural Engine.  RAM: 16 GB  Storage: 1 TB SSD | Apple’s first self made silicon that provides builtin motherboard with included CPU, GPU and Neural Engine that helps to preprocess rendering faster. | 10x Efficient than Intel  Compatible  Renders 2x faster than AMD  Cheap and Apple Silicon  Best softwares for designers  Apple Care+ Support | Windows Applications support via third party  Formation might differ for other platforms  Should be used only for graphic stuffs |
| **Developers** | | | | |
| USD $800~1000 | CPU: Intel Core i5-11300, 6 Cores up to 4.3 GHz  RAM: 16 GB  GPU: Built-in Intel’s is enough  Storage: 128GB SSD & 512 GB HDD | Customized PC that’s capable to run latest x64\_86 bit apps including memory draining Electron.js applications. such as Visual Studio Code, Atom, Github Desktop, Figma Desktop, etc... | Budget Friendly  Actual Service for the next 2 years  Customizable  (Windows | Linux) go with whatever you want | Needs change or repair in the future  Should be modified depending on the future environment  Requires special treatment |
| **Testers** | | | | |
| USD $600~800 | CPU: Intel Core i5-10400, 6 Cores up to 4.3 GHz  RAM: 8-12 GB  GPU: Built-in Intel’s is enough  Storage: 128 GB SSD & 128 GB HDD | Customized PC that’s capable to run x64\_86 bit apps and has ability to run various tests as an example, jest, pytest, etc. Has capability to run browser and speed bench. | Budget Friendly  Actual Service for the next 2 years  Customizable  (Windows | Linux) go with whatever you want | Needs change or repair in the future  Should be modified depending on the future environment  Requires special treatment |
| **Project Managers** | | | | |
| USD $600~800 | CPU: Intel Core i3-10100 Processor 4 Cores up to 4.3 GHz  RAM: 8 GB  GPU: Built-in Intel’s is enough  Storage: 128 GB SSD or 256 GB HDD | Customized PC that’s capable to run x64\_86 bit apps and has ability to run various tests as an example, jest, pytest, etc. Has capability to run browser and speed bench. | Budget Friendly  Service for the next 2 years  Customizable  Windows | Linux go with whatever you want | Needs change or repair in the future  Should be modified depending on the future environment  Requires special treatment |
| **Server** | | | | |
| USD $1100~1200 | CPU: AMD EPYC™ 7351P, S SP3, Zen, 16 Core, 32 Thread, 2.4GHz, 2.9GHz Turbo, 64MB Cache, 155W/170W, CPU, Retail  RAM: 64 GB  GPU: \*not necessary\*  Storage: 128 GB SSD & 5-10 TB SSD | Reloaded Server with AMD CPU that has the ability to get things done with lightning fast speed thanks for AMD Multithreading. Capable to run stress heavy tasks thanks for 64 GB of operating RAM. | Multithreading  Heavy Stress Capability  (Windows Server | Linux Server) go with whatever you want | Needs change or repair in the future  Should be modified depending on the future environment  Requires **very very** **special** treatment  Needs experienced sysadmin to manage |

# Software Review

3.1 Basic

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name and Price** | **Minimum System / Browser Requirements** | **Short description** | **Benefits** | **Limitations** |
| **Designing and Prototyping** | | | | |
| **GIMP** *(FOSS)* | Operating System: Windows XP/Vista or Windows 7/8/8.1/10  RAM: Minimum 1GB of RAM for smooth run  Free Hard Disk Space: Minimum 100MB of free space for installation  Processor: Multi-core processor for best performance (dual core processor can also run this software) | GIMP is a cross-platform image editor available for GNU/Linux, OS X, Windows and more operating systems. It is free software. Whether you are a graphic designer, photographer, illustrator, or scientist, GIMP provides you with sophisticated tools to get your job done. | Open Source  Free  High Quality Photo Manipulation  Original Artwork Creation  Plugin Extensible & Flexible  Graphic Design Elements  Cross-Platform | Support (Limited with Discussion Board)  Doesn’t implement AI Assisting Features |
| **Inkscape** *(FOSS)* | Operating System: Windows 7/8/8.1/10  RAM: Minimum 8GB of RAM for smooth run  Free Hard Disk Space: Minimum 560MB of free space for installation  Processor: Multi-core processor for best performance (dual core processor can also run this software) | The design process may begin by doodles on a napkin, a sketched mindmap, a photo of a memorable object, or a mockup in software which really wouldn't work to complete the project. Inkscape can take you from this stage to a final, professional-grade design format which is ready for publication on the web or in physical form. | Open Source  Free  Actively Contributed  Extensible via Plugins & Modifications  Professional Publishing  Cross-Platform | Support (Limited with Discussion Board)  Need to be updated all time. |
| **Development** | | | | |
| **VSCode** *(FOSS)* | Operating System: Windows 7 / Linux 14.0.0 / OSX Yosemite  RAM: Minimum 1GB of RAM for smooth run  Free Hard Disk Space: Minimum 100MB of free space for installation  Processor: Multi-core processor for best performance (dual core processor can also run this software) | With Hackable text editor Go beyond syntax highlighting and autocomplete with IntelliSense, which provides smart completions based on variable types, function definitions, and imported modules. | Open Source  Free  Highly Customizable  IDE Manipulation  Cross-Platform | Built on top of Electron.js  (Not native solution) |
| **GitHub Desktop** *(FOSS)* | Operating System: Windows 7 / Linux 14.0.0 / OSX Yosemite  RAM: Minimum 1GB of RAM for smooth run  Free Hard Disk Space: Minimum 100MB of free space for installation  Processor: Multi-core processor for best performance (dual core processor can also run this software) | Focus on what matters instead of fighting with Git. Whether you're new to Git or a seasoned user, GitHub Desktop simplifies your development workflow. | Open Source  Free  Expanded image diff support  Extensive editor & shell integrations  Community supported  Cross-Platform | Not fully integrated with API  Built on top of Electron.js (Not native solution) |
| **Project Management** | | | | |
| **JetBrains Space** *(FOSS Beta)* | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Cloud hosted team management application that helps organizations to keep tracking, CI testing and messaging. All in one solution by JetBrains. | Free  Open Source  Active Support  Lots of features | Beta Release |
| **Testing** | | | | |
| **GitHub Actions** *(Free)* | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Test your projects with built-in GitHub Workflow that lets you use various types of environment. | Free at initial stage  Variety of choices | Needs to be paid as organization grows |
| **Team Communication** | | | | |
| **JetBrains Space Messenger** *(FOSS Beta)* | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Cloud hosted team management application that helps organizations to keep tracking, CI testing and messaging. All in one solution by JetBrains. | Free  Open Source  Active Support  Lots of features | Beta Release |
| **Google Meet** *(Freemium)* | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Video Conferencing and Screen Sharing service that lets you get connected with your friends, family and organizations for free. | Free  Community Support  Stable | Limited with community support  Can’t stream hi-rate videos & streamings |

3.2 Premium

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name and Price** | **Minimum System / Browser Requirements** | **Short description** | **Benefits** | **Limitations** |
| **Designing and Prototyping** | | | | |
| **Adobe Photoshop**  (USD 20.99 / monthly billed) | Processor: Intel® or AMD processor with 64-bit support; 2 GHz or faster processor  RAM: 2 GB  Hard disk space: 3.1 GB or more of available hard-disk space  Monitor resolution: 1024 x 768 display (1280×800 recommended) with  Graphics processor acceleration requirements: OpenGL 2.0-capable system | From photo editing and compositing to digital painting, animation, and graphic design — you can do it all in Photoshop. Bring ideas to life across desktop and iPad. Magically transform images with the power of AI. | Active and Good Hotline Support  AI Integrations with auto sketchup & assistance  Natively developer for every platform on top of lowest programming language | Might be hardcore for newbiews  Very heavy to bootstrap  Quite Expensive |
| **Adobe Illustrator**  (USD 20.99 / monthly billed) | Processor: Intel® or AMD processor with 64-bit support; 2 GHz or faster processor  RAM: 2 GB  Hard disk space: 3.1 GB or more of available hard-disk space  Monitor resolution: 1024 x 768 display (1280×800 recommended) with  Graphics processor acceleration requirements: OpenGL 2.0-capable system | The industry-standard vector graphics software lets you create everything from web and mobile graphics to logos, icons, book illustrations, product packaging, and billboards. And now, experience the freedom and flexibility of Illustrator across desktop and iPad. | Active and Good Hotline Support  AI Integrations with auto sketchup & assistance  Natively developer for every platform on top of lowest programming language | Might be hardcore for newbiews  Very heavy to bootstrap  Quite Expensive |
| **Development** | | | | |
| **JetBrains WebStorm IDE**  (USD 130 / yearly billed) | OS: 64-bit versions of Microsoft Windows 10, 8  RAM: 2 GB RAM minimum, 8 GB RAM recommended  HD: 2.5 GB hard disk space, SSD recommended  DP: 1024x768 minimum screen resolution | Full power of the modern JavaScript ecosystem. Intelligent code completion, on-the-fly error detection, powerful navigation and refactoring for JavaScript, TypeScript, stylesheet languages. | Debugger  Extensible Plugins  Unit Testing  Integration with VCS  Seamless tool integration  Server, Web, Mobile and Desktop implementation | Built on top of JVM  Includes free learning courses to get started in |
| **Project Management** | | | | |
| **JetBrains Space Organization**  (USD 20 per active user / monthly billed) | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Cloud hosted team management application that helps organizations to keep tracking, CI testing and messaging. All in one solution by JetBrains. | Cloud Hosted Solution  All-In-One Solution | Cloud Hosted  No native application provided, only Electron.js port |
| **GitHub Projects**  (USD 4 per month) | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | On GitHub, project managers and developers coordinate, track, and update their work in one place, so projects stay transparent and on schedule. | Tasks  Assignments  Labels  Milestones  Task Planner | There are no native application to integrate with |
| **Testing** | | | | |
| **Travis**  (USD 69 / monthly billed) | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Test and Deploy with Confidence. Easily sync your projects with Travis CI and you’ll be testing your code in minutes! | Git ready  Free to get started in  Recommendation & Suggestion | Need to integrate over Git Hosting system |
| **Team Communication** | | | | |
| **JetBrains Space Organization**  (USD 20 per active user / monthly billed) | **As possible as latest version of browsers:**  Google Chrome  Mozilla Firefox  Microsoft Edge  Apple Safari | Cloud hosted team management application that helps organizations to keep tracking, CI testing and messaging. All in one solution by JetBrains. | Cloud Hosted Solution  All-In-One Solution | Cloud Hosted  No native application provided, only Electron |

# Justifications and Recommendations

All suggestions and recommendations for hardware equipment have been provided on the table below. As it can be seen, the first three columns describe the details and price of hardwares and the rest compares the pros and cons of those provided hardwares. It has been decided that every type of employer should have their own PC that suits them with its requirements. As an example, designers will be using the latest Apple iDevices, because Apple’s products support various types of gestures and accessibility that will make the working process more convenient for graphic designers. In order to let those iDevices render high quality pictures, textures, and animations, also to be avoided full capacity issues, it has been provided to purchase 16 GB of ram with at least a TB of hard disk option. Also, for other member types as Developers and Testers, it has been suggested to build a customized PC with it’s given characteristics in the table below. Nowadays, Electron JS applications have been actively used in the development process and as an implement for that, it has been said to store the latest 10th generation of Intel Core i5 to run those Electron apps smoothly. In order to be avoided from memory draining issues, it has been recommended to get 16 GBs of random access memories. For testers, it is preferable to store 8 GB of random access memories with a little less powerful CPU than Developer’s. Project Managers are the people who will be using document editors and testing runtimes such as pytest for python apps, jest and node-test for Node.js applications and they are not high specs required applications. In that case, they are ok to use Intel’s latest Core-i3 generation processors with 8 GB of random access memories.

# Conclusion

By concluding the report, It’s recommended to stick to the premium plan recommendation provided below in order to let the company employers to reproduce applications efficiently and fast. In cases such as lack of financial support, it’s recommended to get started with the basic plan as soon as the company recovers its initial state and finance.

**Google Docs Link:**

[**https://docs.google.com/document/d/1kD0Al5PxmLUhdpTVMeh\_oGMv\_qQJBAzBJ0jQsDJggVk**](https://docs.google.com/document/d/1kD0Al5PxmLUhdpTVMeh_oGMv_qQJBAzBJ0jQsDJggVk/edit#)

**GitHub Repository:**

[**https://github.com/00010023/csf.coursework**](https://github.com/00010023/csf.coursework)

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