**Tools & Technologies**

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**Software:**

The software required for this project would include 3d modelling software for asset creation, a game engine to build and publish the project, audio production software to produce the in-game audio and soundtracks, and an Integrated Development Environment (IDE) to develop the code to manage the game itself and the entities within it. Other programs of use could include illustration software to create textures and texture maps, and 2D artwork for the project. In the scenario that our group is to create our project with our desired programs and licenses, the software we would use is as follows:

**3D** **Artwork** – [Autodesk 3ds Max](https://www.autodesk.com.au/products/3ds-max/overview)

**2D** **Artwork** – [Adobe Substance](https://www.allegorithmic.com/substance) / [Substance Painter](https://www.allegorithmic.com/products/substance-painter)

**Game** **Engine** – [Unreal Engine 4](https://www.unrealengine.com/en-US/what-is-unreal-engine-4)

**Audio** **Production** – [Avid Pro Tools](https://www.avid.com/pro-tools)

**Programming** – [Microsoft Visual Studio](https://visualstudio.microsoft.com/vs/)

These programs would be essential to complete this project. However, most of the tools here are not free to use.

Autodesk’s 3ds Max is a subscription-based software with a hefty monthly/annual fee but given the extensive documentation and the flexibility of the program itself - once the user becomes more knowledgeable - it’s clear this program would benefit greatly in the creation and animation of 3D artwork.

Adobe Substance / Substance Painter is another piece of software that is subscription-based but it’s carved itself into the game development industry as one of the easiest programs to design textures from scratch and can be implemented into any workflow. It’s a must for 2D artwork and asset creation.

Avid’s Pro Tools will be the powerhouse behind the production of audio assets for this project. Any in game sound effects, voice acting, and music will be composed/created within Pro Tools and because it is an industry standard software, the plugins and documentation available will be liberal to say the least.

As for building and compiling the game, Unreal Engine 4 fits the bill. We had initially considered Unity for it’s ease of use, and gentle learning curve for those who have not used engines before. However, we found that plugins are expensive if you do not have the time or experience to develop them yourself and the time it takes to polish a game in Unity is vastly greater. UE4 out of the box offers a greater polish using default settings and with only minor tweaks through blueprints or C++ code, obtaining visual fidelity close to that of a AAA game is relatively straight-forward.

Lastly, Microsoft’s Visual Studio is the go-to for the bulk of code development; it’s extensive range in plugins and seamless integration with Unreal Engine 4 makes it a no brainer with the remaining of back end development completed using the blueprints feature available in UE4.

Of course, this goes without saying that all software used will be the latest version released.

Updates will be necessary during the process, though not a deal breaker, as the licenses for the paid software listed can be updated for a small fee if not for free.

**Hardware:**

An important thing to note is that a project like this will need more powerful computers for the creation of high polygon count 3D assets and the actual build process of the game. Baking scene lighting, rendering large quantities of objects on screen and compiling the finished project or experimental builds can be strenuous and require the appropriate hardware.

For any voice acting and in-house sound effect creation, recording equipment such as microphone(s), audio interface(s), headphones, and any stands will also be needed.

Another area that will also need specific hardware will be 2D production. Concept art is an important factor of developing a video game. Without it, artists are left to blindly create assets without guidance. To help design concept art creative tablets, such as Wacom, can be plugged into the artist’s computer so they may draw digitally; aiding the process of producing object/character vectors and transferring those to a 3D artist so that models can be created from them. Keeping all content digital also helps streamline everything during the project.

Lastly animation will need to be handled through dedicated hardware. Given the scope and potential production size, motion capture tracking hardware and mocap suits will be necessary to maximise the quality of animations for the project.