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Figure 1, Game Engine Logos

Game Engines for Mobile

CMP6187-A-S1-21/22 MOBILE GAME DEVELOPMENT

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Contents

Abstract

There are many innovative Game engines available, each introducing and applying new ways of development, useful features tailoring to a user's ability and experience. However, despite the many available Game Engines only a minority of them provide users with benefits when developing on a Mobile platform. This report derives from articles and studies completed, presenting the research to best conclude the best solution for mobile game development. The research indicates a range of development platforms that best suit the developer position based the financial and features required by the developer.

Introduction

There are many Game Engine solutions available most notably, Unity, Unreal Engine, Godot, and GameMaker each provide adequate solutions for development. Primary differences between these platforms include financial, Programming Language support, tutorial accessibility.

The publishing license required under the user of Unreal Engine requires 5% royalties after exceeding $1 million USD of lifetime gross sales (1, UnrealEngine). Unity offering a fair licensing agreement for small developers that generate less than 100k, lowest subscription starting at $399 if revenue is greater than $200k, and finally $4000 per month for enterprise (including 20 seats) staying with the $200k generated revenue (2, Unity). Godot is 100% opensource, providing users with entire ownership of anything they develop. This provides flexible and great opportunity for Indie developers, unlike Unity, and Unreal it doesn't provide much documentation with a small community, making it a weak option for an inexperienced mobile game developer (3, EngineG). GameMaker studio utilises a monthly subscription service providing Free, Indie (£7.19 pm), and Enterprise (£62.99 pm) development packages, publishing on mobile requires the indie developer package, setting this back from other free options. GameMaker claims to have a large community with spread resources, which is demonstrated on the YoYo Games webpage (4, YoYo Games).

Body

Unity offers wide platform support with easy tools and tutorials supporting IOS and Android development. With a powerful 2D and 3D graphics engine its suitable for developing an AR arcade game, with the benefit of C# programming language making it a strong option for development; has a large community with great user experience.

Unreal engine 4 an extremely popular game engine provides cross-platform, and development across IOS, Android and other platforms. Unreal engine provides an immaculate 2D and 3D graphics engine, and Community asset store with tons of templates to choose from; most recently providing Quixel (5, Quixel) integration an 3D assets library. Unreal engine utilises Visual scripting, making it an excellent choice for beginners as there are plenty of tutorials available, alongside with C++ programming.

Godot provides a very flexible 2D/3D game development platform, opensource providing a great opportunity for Indie developers. This is a game engine that is actively developed by the community, with new features and integration regularly been built (6, Godot). With an excellent built-in debugger, it provides full C# support, and GDscript a python line language, "designed to make games with zero hassle" (6, Script with full freedom, Godot).

GameMaker studio works with the idea of providing you with everything you need to develop from concept to finished game. GameMaker is a high end 2D game engine, providing useful range of 2D asset creation tools, tileset creation, image editor for creating sprites and 2D animations (7, GameMaker). Offers direct export to different platforms IOS, Android, with Github integration allowing developers to easily maintain projects, easy implementation and support for in-app purchases, push notifications and networking.

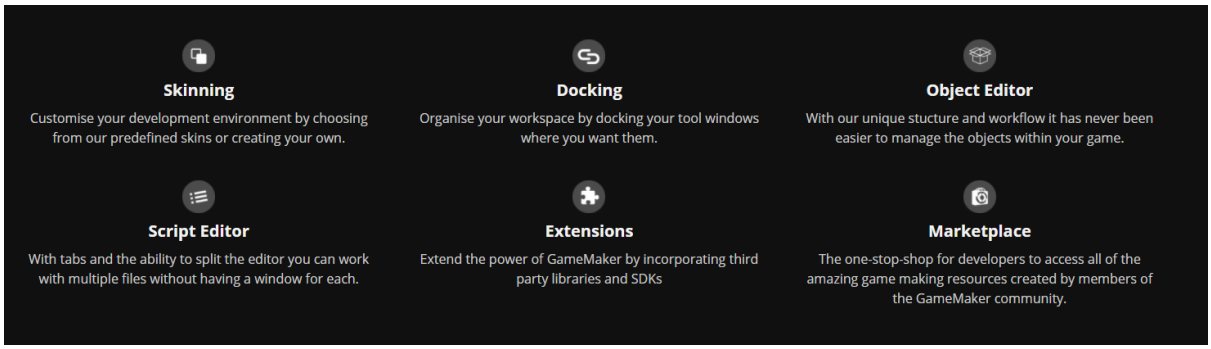

Figure 2, screenshot from GameMaker Webpage (GameMaker, 2021).

Conclusion

Based on the development engine available for a 3D AR project of which I will be developing, Unity has the best solution to my problem. The user interface is familiar, I have experience programming with C# and it allows me to easily integrate models and assets created in blender, or externally acquired. The project will be releasing for free with MTX and Advertisements, under unity licensing I will be exempt from fees up to $100k USD, which isn't a goal the project will reach Annually.

With exceptions from my own project development, Unity provides a great platform for beginner users in game development with access to a student license, bundles of educational resources that are frequently updated. Godot that provides excellent experience for somewhat experienced Indie developers that are troubled by Licensing fees.

Unreal Engine, another popular solution, provides excellent solutions to 3D, tutorials, and an easy to learn Visual scripting language, using C++ and a wide range of assets available on the community store. However, unlike Unity it has difficulty and limitations with implementing custom API, personal experience with Unreal is lacking compared to Unity making it a weaker option for developing 3D AR games. Lack of experience with GameMaker also makes it a weak solution, for a developer focusing on 2D games it's an excellent solution, it provides many tutorials for beginners, and tools for creating 2D games easily.

In conclusion there's no definitive answer to which game engine should be used it depends on the user's circumstances, the game they want to develop, financial prospects and general experience.

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