

Vision & Scope Document

Assignment 4 – Final Project Documentation

INFT575 Preparation of Final Business Case

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Business Requirements

Background

The major reason why this project was chosen is that I've recently become interested in the development of shaders and other visual effects after creating some basic retro shaders for a personal project. As such, I decided that a retro 3D visual FX pack for Unity (the primary engine that I've been using for development) would be an excellent opportunity for learning about and increasing my skills within this area. Alongside this, I'll be developing a tool that will be useful for both myself and other developers in the future.

Business Opportunity

The target demographic for this product is indie developers, particularly developers of lo-fi and retro-inspired horror games. Personal experience working in the lo-fi/retro indie horror scene has shown that it is a rapidly growing niche market, especially within the indie-targeted PC platform itch.io. Well-regarded games showcasing this style include *Paratopic* and *Devil Daggers*, and there are many successful solo developers who use this style exclusively such as Kitty Horrorshow, Puppet Combo, and Colorfiction.

A sign that this product fills an untapped gap in the market is that there is currently only a single competing product on the Unity Asset store – a package used to implement the visual style of the original PlayStation called *PSXEffects* which is priced at \$20AUD.

Business Objectives & Success Metrics

1. Get a good mark – at least a Distinction (≥ 75)
2. Release the product onto the Unity Asset Store
3. Break even on total development costs (including cost of personal work hours)
4. Maintain support for the product for one year after initial release

Customer or Market Needs

Going with a retro-3D visual style is useful for smaller development teams because low-res and low-poly assets are relatively quicker and easier to produce than most other 3D visual styles. It's also useful for horror games where fear is often evoked using indistinct shapes and figures, as well as evoking nostalgia for highly regarded classics such as the original *Resident Evil* and *Silent Hill* titles.

This product will be more useful to developers than *PSXEffects* because most of them aren't seeking to implement an 'accurate' retro-3D look – instead, they usually handpick several retro effects and build a custom, faux-retro look by combining these effects with modern visuals to create a unique and striking style. The *Retro-3D Visual FX Pack* caters specifically to this need by including effects which are completely modular and scalable, allowing the dev to quickly handpick, implement, and modify only the desired effects while discarding the rest.

Business Risks

1. Project files are deleted/lost:

- Probability: *Moderate* – Impact: *Extreme* – Risk: *High*
- Mitigation strategy: Use source control and maintain an external backup

2. Project isn't finished on time:

- Probability: *Unlikely* – Impact: *Major* – Risk: *Medium*
- Mitigation strategy: Develop a project timetable which includes a two-week gap before the due date to provide an emergency buffer if milestones slip

3. Product is overly buggy:

- Probability: *Unlikely* – Impact: *Moderate* – Risk: *Medium*
- Mitigation strategy: Create a test plan to ensure that testing is a core component of the development process

4. Product is not explained/tutorialised effectively for new users:

- Probability: *Moderate* – Impact: *Moderate* – Risk: *Medium*
- Mitigation strategy: Assign specific time within the development plan to creating documentation and tutorials for the user

5. Market is too niche for product to make a profit:

- Probability: *Unlikely* – Impact: *Major* – Risk: *Medium*
- Mitigation strategy: Could try to advertise product, but with almost non-existent budget this isn't really feasible

6. Product is copied and resold by someone else:

- Probability: *Rare* – Impact: *Major* – Risk: *Medium*
- Mitigation strategies:
 - Include copyright information in the headers of all written code
 - Contact Unity Asset Store support and file a takedown notice for any copyright infringements that occur

7. Product doesn't work on low-end hardware:

- Probability: *Unlikely* – Impact: *Major* – Risk: *Medium*
- Mitigation strategy: Acquire low-end computers and use these for testing throughout project as well as on development machine

8. Product doesn't work on non-Windows versions of Unity:

- Probability: *Unlikely* – Impact: *Major* – Risk: *Medium*
- Mitigation strategy: Acquire computers which run non-Windows operating systems and use these for testing throughout project as well as on development machine

9. Product isn't accepted for submission to the Unity Asset Store:

- Probability: *Rare* – Impact: *Major* – Risk: *Medium*
- Mitigation strategy: Read through submission requirements and ensure product complies before submitting for review

10. Development hardware breaks during project:

- Probability: *Rare* – Impact: *Moderate* – Risk: *Low*
- Mitigation strategy: Take care of computer/s during development

Vision of the Solution

Vision Statement

The *Retro 3D Visual FX Pack* will allow the user to quickly and easily implement and adjust a comprehensive array of visual effects within the Unity editor to create either a retro-3D or retro-3D-inspired look for their game with no programming knowledge required. It will enable solo developers and small indie teams without the capability to program shaders and visual effects to create a unique and striking visual style for their game. In addition, the included documentation will allow any programmers to quickly and easily modify the effects within the pack for their own specific needs.

Major Features

Functional requirements:

- **Lighting:**
 - Support for Unity's default lighting system
 - Flat shading
 - Gouraud shading
 - Phong shading
- **Shaders:**
 - Vertex jitter/snapping
 - Affine texture mapping
 - Transparency-enabled
 - Fog-enabled
 - Animated materials
 - Sprite shader
- **Post-processing shaders:**
 - Pixelation
 - Posterization/colour depth
 - Chromatic aberration
 - Vignetting
 - Blur (likely Gaussian)
 - Dithering
- Camera prefab with post-processing shaders and dynamic screen resolution script attached
- An example scene to demonstrate how to build different visual styles using the tools

provided

- Extensive documentation:
 - Descriptions of in-editor use of features for non-programmers
 - Extensively-commented and readable code so that programmers can easily understand and modify the code for their own needs

Non-functional requirements:

- Operates effectively on all platforms on which the Unity editor is available
- When implemented properly by the user, the effects won't effect performance to the point that games cannot be played on low-end hardware
- Can be used effectively without any programming knowledge required
 - All effects can be assigned and adjusted within the Unity editor

Assumptions & Dependencies

The product is to be developed for Unity 2019 using C# and the variant of HLSL (High Level Shading Language) used by Unity. Code will be written using Visual Studio Community 2017.

Scope & Limitations

Scope of Initial Release

The initial release will be sometime in the last quarter of 2019. This version will contain all of the planned features, as there are no concrete plans for any subsequent releases as of the time of this document being written – see 'Major Features' for more details.

The modular nature of this product means that if all the planned features are completed before the due date there is the possibility of developing and including extra effects during any spare time.

The project will be developed by a single person using personal hardware.

Pre-release work breakdown structure with estimated durations:

1. Retro Visual FX Pack for Unity – 107 hours
 - 1.0 Project management – 14 hours
 - 1.0.1. Vision & Scope document – 6 hours
 - 1.0.2. Test Plan document – 4 hours
 - 1.0.3. Project Timeline document – 4 hours
 - 1.1 Assets – 52 hours
 - 1.1.1. Retro shaders – 27 hours
 - 1.1.1.1. Flat shading – 2 hours
 - 1.1.1.2. Gouraud shading – 3 hours
 - 1.1.1.3. Phong shading – 4 hours
 - 1.1.1.4. Unity lighting support – 2 hours
 - 1.1.1.5. Vertex snapping – 2 hours
 - 1.1.1.6. Affine texture mapping – 4 hours
 - 1.1.1.7. Transparency – 4 hours
 - 1.1.1.8. Fog support – 1 hour
 - 1.1.1.9. Animated materials – 2 hours
 - 1.1.1.10. Sprite shader – 3 hours
 - 1.1.2. Retro post-processing shaders – 21 hours
 - 1.1.2.1. Pixelation – 4 hours
 - 1.1.2.2. Posterization – 2 hours
 - 1.1.2.3. Chromatic aberration – 3 hours
 - 1.1.2.4. Vignetting – 2 hours
 - 1.1.2.5. Blur – 4 hours
 - 1.1.2.6. Dithering – 6 hours

- 1.1.3. Camera prefab – 4 hours
 - 1.1.3.1. Low-res camera script – 2 hours
- 1.2 Documentation – 20 hours
 - 1.2.1. Tutorial documentation for package – 8 hours
 - 1.2.2. External documentation of code – 12 hours
- 1.3 Example scene – 11 hours
 - 1.3.1. Models – 6 hours
 - 1.3.1.1. Rigged and animated model – 2 hours
 - 1.3.2. Textures – 3 hours
 - 1.3.2.1. Animated texture – 1 hour
 - 1.3.3. Sprites – 2 hours

Scope of Subsequent Releases

No subsequent releases have been planned at this point.

Limitations & Exclusions

There are no notable limitations or exclusions in terms of product features.

Business Context

Stakeholder Profiles

Stakeholder	Major Value	Attitude	Major Interest	Constraints
Developer	Development experience	Wants to create a useful product for indie devs	Timely completion of product with all intended features	Time and financial costs
Customer	Additional visual options for projects	Desire a product that is intuitive, customisable, and affordable	Software is simple to use and provides value for money	Unpredictability of use case
Teacher	Educational value	Wants to help dev learn and create an effective product	Timely completion of product which also meets assessment criteria	Product meets assessment criteria

Project Priorities

Dimension	Driver	Constraint	Degree of Freedom
Schedule	Release in final quarter of 2019		
Features			All functional requirements must be implemented by release date
Cost			Up to \$100 for research, tools, and misc needs
Adaptability	Must be modular and support the future addition of extra effects		
Maintainability		Must be developed to be easily maintained by solo developer	
Staff		Single developer	
Assessment	Aiming for at least a distinction mark (≥ 75)		

Operating Environment

The product will operate within the Windows, Mac, and Linux versions of Unity 2019.

References

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