

Project Proposal

by Nathan Willis

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Project Proposal

IMPLEMENTING ROGUELIKE PROCEDURAL GENERATION WITHIN THE CITY BUILDER

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Introduction

As this project will be long term, I would like to work on something that inspires me and as a life long fan of the roguelikes, I think a fusion between this genre and the city builder genre would not only be an interesting problem for me to tackle, as it would add more procedural elements to the city builder genre than even semi roguelikes like Rimworld and Dwarf Fortress do and I would like to implement more standard city builder mechanics too a la Cities: Skylines and SimCity, it would also allow me to work on a game that I would seek out to play in a genre that I am very well acquainted with.

One of the major things that attracts me to this project is the problems that arise from balancing the difficulty of a game that involves procedural generation and permadeath, both defining features of the roguelike genre, with the staples of a city builder whose main draws are long term investment in the city that you build. Balancing these mechanics is a unique problem and I am not currently aware of any game that tackles it.

Another draw for this project is implementing real world systems, such as famine, disease outbreaks and other problems that might arise[1]. There have been many articles written about the usefulness of preexisting city builder games in terms of their usefulness in the realm of urban planning. Cities: Skylines is a game that gets brought up a lot in the practical implementation of city builder games in the terms of its usefulness in urban planning[2], however in my opinion it lacks many real-world systems and is very deterministic this is what I would like to address with my project.

Project Background

The proposed project is a combination of 2 prominent genres in the gaming space, the roguelike genre and city builder genre. Both of these genres have a massive catalogue of games and there are even some games that step into this intersection, games like Rimworld, Dwarf Fortress and Ultimate Cultivation Simulator do have elements of both, however they all tackle the problem in a very similar way they focus on procedural generation and individual citizens there is no game currently that tackles the roguelike genre from a more traditional city sim perspective, with no individual focus on citizens and a much larger scale.

Roguelike

Roguelike games get their name from the 1980s cult classic game Rogue, known for its procedurally generated dungeons and permadeath gameplay, the appeal of such mechanics being in the replayability and difficulty[3]. Over time the roguelike genre has evolved in the late 2000s with Spelunky which kept the procedural generation and permadeath but with 2d platforming mechanics and real time combat the 2011 hit The Binding of Isaac continues this trend with real time combat but as a top down dungeon crawler more in line with Rogue, Isaac adds to the formula by introducing unlocks and progression mechanics that persist outside the individual “runs”, this formula is closely replicated in the 2020 game Hades which borrows a lot from Isaac, it is an isometric dungeon crawler with procedurally generated dungeons and unlocks borrowing even from the games visual language with the floor layouts, what Hades includes that Isaac does not is a large focus on upgrades that you can buy with a currency that exists outside of the run.[4]

These innovations on the genre are geared towards mitigating the setback of losing the run, one game I haven't talked about because it doesn't quite fit into this genre is Dwarf fortress which I have referenced earlier. Dwarf Fortress is a game that started development in 2003[5] and relies heavily on procedural generation and nightmarish difficulty, the game's main gameplay mode however is not permadeath allowing for saving and reloading at any point. This distinction places this game in an uncomfortable place just outside of the genre[6], the reason I bring it up then is because of its stated thesis "Losing is fun"[7] which I think is core to understanding the roguelike genre, games that are fun to lose at.[8] I also broach this game because it might be considered to belong to the city builder genre, it is a look at one potential merger of the 2 genres

City Builder

City-building games have been a popular genre since the release of the 1989 game SimCity, where players create, manage, and grow urban environments[9]. This genre emphasises resource management, strategic planning, and long-term development, allowing players to build functional cities while managing elements such as population growth, resource distribution, and disaster mitigation.[10] SimCity's success paved the way for other titles such as the Hearts of Iron series and Cities: Skylines, which have refined the genre's mechanics with more complex systems of economics, transportation, and infrastructure.

A key trend in modern city-building games is the incorporation of more dynamic systems. Games like Frostpunk and Banished add survival elements, where players must balance the needs of their population against harsh environmental conditions, limited resources, and moral dilemmas. These games add a layer of urgency to the genre, reflecting real-world challenges in urban planning such as climate change and resource scarcity. However, city-building games often lack the unpredictability and immediacy of action present in roguelikes, focusing instead on long-term stability and gradual growth.

Real world applications

Beyond the gaming context, this hybrid game could have real-world applications in city planning and disaster management. City planners increasingly face the challenge of balancing short-term crises such as natural disasters[11] with long-term sustainability[12]. This game's procedural generation and resource management mechanics can simulate how cities respond to unpredictable events, providing an interactive tool for exploring urban resilience and disaster preparedness, much like how Cities: Skylines has been used.

Problem statement

This project addresses the challenge of balancing short-term crisis management with long-term strategic planning, both in gaming and city planning. In roguelike games, there's often, by design, a lack of sustained progression, while city builders miss the reality of unpredictable threats. Similarly, urban planners face sudden crises, such as natural disasters or resource shortages, while trying to ensure sustainable growth. This project blends these two genres, modelling the complexities of resource allocation, disaster response, and infrastructure resilience in dynamic environments. By combining roguelike unpredictability with city-building strategy, it offers an innovative way to explore the balance between crisis response and long-term urban sustainability.

Aim & Objectives

The aim of this project is to develop a game that combines roguelike procedural exploration with city-building strategy, addressing the challenge of balancing short-term crisis management with long-term urban planning. Specific objectives include developing a dynamic procedural generation system, implementing permadeath, designing a robust city-building simulation, and integrating random events that impact both gameplay modes. The project also aims to model real-world urban challenges, such as resource scarcity and disaster events, while ensuring high replay value. The outcome is a game in both genres that contains elements of both procedural generation and long-term investment.

Methodology

Methods

The methodology for this project is based on software development, using an iterative development cycle to create, test, and refine the game's roguelike and city-building mechanics. This will involve building core features, such as procedurally generated exploration and resource-based city management, followed by continuous testing to ensure a balanced and engaging gameplay experience.

The project will use an agile development approach, which breaks the development process into manageable sprints. This approach allows for flexibility, enabling regular adjustments based on player feedback and playtesting results. Agile is well-suited for game development as it encourages frequent iterations and incremental improvements, ensuring both systems are effectively integrated and balanced.[13]

Evaluation methods will include in-game metrics, such as play testers success rate and length of survival. and qualitative feedback from play testers to measure player satisfaction, gameplay depth, and balance between the two game modes.

Materials

The game will most likely be developed in Unreal Engine, known for its strong support for high-quality visuals, complex game systems, and procedural generation. However, I am also considering using Godot or Unity, depending on access and performance requirements.

Data collection will include in-game logging to track player interactions, as well as feedback from play testers through surveys or interviews. Ethical considerations will ensure voluntary participation and anonymity in feedback collection.

Hardware requirements will include a development PC with an adequate GPU for rendering and performance testing, along with external storage for saving game builds and logs.

Project Plan

1. Game design document 2-3 weeks.

2. Agile development step 3 as steps 1 and 2 have been taken care of (scope and design) here it is decided how the ideas from the previous step (in this case the GDD) are implemented.[13]
3. Then agile step 4, testing. This would involve me bug testing along with potential play testers checking for balance problems
4. Iterate on steps 2 and 3 for several months until my game is complete
5. Make sure game is ready for deployment.

At every step of this I will be sure to document my progress.

References

References

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- [5] J. Cartlidge, "Interpreting Dwarf Fortress: Finitude, Absurdity, and Narrative," *Games and Culture*, vol. 19, no. 2, pp.218–236, 2024.
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Project Proposal

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

60/100

PROJECT PROPOSAL – ACCA6020 INDEPENDENT PROJECT

Student Nathan Willis
Mark

Intro / A&O (400 words)		
Project title; Identification of a specific problem to be investigated; Well-defined aims and SMART objectives; Explaining why this project is worth doing; Discussion of what the project needs to do in order to be a success; Description any deliverables that will be produced at the end of the project	20	18

Background to the Project / Literature Review (400 words)		
Description of how the work to be done by in the project relates to the work identified in the literature review; Discussion of any ethical issues raised by the project Identifying what has already been done within the field; Topic familiarity; Brief literature review using appropriate sources – 6-8 journal papers and book chapters rather than just websites; Selection of relevant models & concepts To align your project more closely with the academic standards, I'd recommend engaging more deeply with relevant scientific research. This will add a necessary layer of rigour, helping to ground your ideas in existing literature and methodologies while also highlighting how your work builds upon or extends current knowledge. Integrating more research will not only strengthen the academic nature of your proposal but also enhance its overall credibility and impact. I'm happy to discuss	20	15

resources or specific research areas that may be beneficial as you refine your approach.		
Ideally you want to research real-world problems that relate to your topic.		
Project Design (500 words)		
Clear statement of which development methods are to be used and why they are appropriate; Clear statement of which tools are to be used and why they are appropriate; Clear description of how data collected will be analysed	30	10
A strong candidate for further research.		
Resources / Planning (200 words)		
List of any deliverables; Clear diagram showing both timing and resource use; Completed ethics form; Limited and relevant appendices	15	12

A visual aid could have been used to more clearly convey your plan		
Document Presentation		
Correct spelling, grammar and punctuation; Flow of narrative/fluency; Coherence; Word processed ; Correct use of referencing with bibliography; Strict word limit In IEEE referencing, the numerical citation typically appears at the end of the sentence, after the relevant information, and <i>before</i> the full stop. For example: <i>The results showed a significant improvement in performance [1].</i> In your proposal you could have done this instead: City planners increasingly face the challenge of balancing short-term crises such as natural disasters with long-term sustainability [11] [12]. At this level, the use of first-person	15	5

language is not acceptable, as it detracts from the formal, objective tone required in academic writing. The emphasis should remain on the research itself rather than on the researcher, so use passive or third-person constructions to maintain appropriate academic standards going forward.		
TOTAL	100	60

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