# AWIKAGE ODYSSEY: A 2D ROGUE-LIKE DUNGEON CRAWLER GAME USING PROCEDURAL CONTENT GENERATION

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## INTRODUCTION

The research focuses on procedural content generation in 2D games, specifically dungeon crawling games. The researchers plan to formulate a simple 2-dimensional arcade game (with roguelike elements) using the Unity game engine and C# programming language for scripting. The research includes the introduction of dynamic game mechanics, such as enemies spawning across the map, and the random distribution of potions within the game. If successful, the researchers should be able to introduce this research to video game developers and platforms, as well as companies. Awikage Odyssey is a dungeon crawling game. It uses a genetic algorithm to generate maps, levels, textures, and other in-game elements with algorithms and randomization. The player can use the skills unlocked based on the skill tree. The Unity game engine using C# as its programming language was used in this study. The findings may not be immediately relevant to other game engines or other game development platforms. The study may inspire further research into the optimization of genetic algorithms for content generation in different applications. PCG plays a key role in elevating the gaming experience. It allows game developers to create vast and diverse game worlds. PCG is particularly valuable in open-world, roguelikes, and other genres that can change or be changed. It provides players with different experiences, challenges, or situations during each playthrough. It is also valuable in games that can be played in multiple ways. It can be used to create a variety of different types of content for different players. It also allows for more realistic, dynamic, and engaging gameplay.

## METHOD

The test case below has gathered the summary of the outcome of the test, as well as the guidelines to properly check the functionalities accordingly. The following are the most important script in the Awikage Odyssey: DNA script, level generator, player manager, equipment selection, skill tree, and game settings. The test case ID is the combination of the abbreviation of the game name and the number which corresponds to the chronological order of the tests. The researchers used theUnity Game Engine and Visual Studio Code to implement all the necessary algorithms. The thesis describes the development and testing of the game. The player should be able to download and run the game without booting problems. The researchers were able to incorporate all the methods relating to Genetic Algorithm to different Game objects in the Unity Engine. The sound effects used in the thesis are accessible to the public. The game was tested on a Predator PHN16-71 with a Windows 11 operating system. The results are expected to be similar to the results of the original thesis. The next step is to design the architecture and identify key components such as the genetic algorithm integration. The game elements for objects are integral to the exploration, strategy, and survival aspects of "Awikage Odyssey" The flow of the game diverges based on the battle and status effects inflicted. The Unity version contains necessary tools such as the Physics engine, Scripting method, and Sprites system. The game is designed to be played on a variety of devices. It is intended to be a fun and engaging experience for the player. It was designed to provide players with different ways to engage with the game and improve their characters. Awikage Odyssey was evaluated by 30 respondents (15 professional game developers and 15 non-professional) The conducted evaluation procedure is presented below. The developed features, including sprites, maps, and the procedural content generation system, are thoroughly tested to ensure they meet the specified requirements. The researchers conducted a test of their game application on different respondents by sending them a link that can be downloaded and installed on their computers. The deployment phase ensures that the game is ready for use and can be accessed by end-users. The game uses a cave-like theme for the buttons and uses stone colors for the button buttons. Testing is

an integral part of each sprint. The data were computed to determine the all weighted mean rating for each criterion and the overall weighted mean. was done to counter check the assumed functionalities and technicalities of thegame. Regular collaboration and communication within the team is essential to address any challenges or modifications needed during development. The game uses genetic algorithms to enhance the creation of a 2D game.

## RESULTS

Awikage Odyssey is made possible using Unity Game Engine and has been developed using C# as the main programming language. The spirit will guide the player on how to play the game. Different devices have different specifications which allow the game?s capability to run on multiple devices, as well asto observe the behavior of the system with each device. On the 30 devices tested to run the game, all of them were able to run smoothly. The results indicate that the respondents were satisfied with the functionalities of the game and its portability. The game was tested by various users or players from students or ordinary people. It was also tested by a group of professionals in the field. The game is device-friendly and if it is tested it is playable by a vast number of players. It has been designed to provide a new experience each time the player starts the game. It features unique level design as the map layout changes each time a player starts it. It also has a skill tree with the right number of souls to unlock skills. The application is not available for mobile devices and can only be played on desktop computers and laptops. All devices were able to install and properly uninstall the game which alsoatisfied the qualification under ISO 25010. The game features different monstersthat can be found inside each room and can be challenging to players especially if they reach the final room. The application is compatible with Windows 10 Operating System and newer. The evaluation process used ISO 25000 standard criteria for evaluating the quality of the software. The player?s adventure will encounter a lot of adversities including, but not limited to, zombies, slimes, and wizards, and a mystery ?boss? afterachieving a certain milestone in the game.

## DISCUSSION

Awikage Odyssey was comprehensively evaluated using criteria of ISO 25010. The game received an overall weighted mean of 3.65 with a descriptive rating of Highly Acceptable. Recommendations are stated for future development of the game, based on the suggestions of respondents, findings, and conclusions of the study. The recommendations are stated based on findings, conclusions, and recommendations of theStudy. The study produced the following results based on evaluations and testing to measure the performance capability of the application: The game underwent successful testing to evaluate its functionality, performance, and portability.