CHAPTER I

THE PROJECT AND ITS BACKGROUND

This chapter includes the introduction, statement of the problem, scope and limitations, rationale of the study, current state of technology, and the definition of terms.

Introduction

The gaming industry is rapidly evolving, with technology playing a significant role in creating new games. Unfortunately, most of these games are designed for entertainment purposes only, with first-person shooter (FPS) games being the most popular choice. However, "The Veil of Secrets: Caves of Mystery" is a game that can develop cognitive capabilities, enhance problem-solving skills, and improve critical thinking abilities. The game is categorized into three levels. First is the easy level, which consists of six stages. The second is the medium level; this level was divided into four stages. Last is the hard level, which consists of only two stages.

The development of video games has come a long way since its beginning. The early years of video games were introduced by arcade machines. Nowadays, the rise of technological advancement plays an important role in game development. Technological advancements allowed games to improve graphics and the high-definition display of the game. Games can achieve a more realistic and visually stunning environment using 3D graphics. The realism of the game enhances the overall gaming experience for the players. Games are primarily created to entertain players by providing interactive experiences that allow players to escape reality and experience a new world. The effectiveness of game development in terms of popularity and

adaptation across different platforms, including personal computers, involves playing video games on a desktop computer or laptop. Mobile gaming refers to the playing of video games on mobile phones or tablets. Unlike other gaming platforms that use physical buttons, mobile games utilize touchscreen interaction, including swipes and taps. The console platform used a physical controller that connected to the TV or monitor.

From this viewpoint, the proponent of this study focused on developing a game that aims to provide individuals to be creative and have analytical skills while having entertainment. The study has full optimism that it will contribute to any organizations to attain the best. In affiliation with the program, Bachelor of Science in Information Technology, the researcher believe that this will help to individuals to think critically and enjoyment.

Objectives of the Study

The main objective of this study is to develop an offline adventure-strategy game that enables users to enhance their critical thinking and problem-solving skills. For this project, the researchers proposed this study with the following objectives:

1. To create a game that enables users to develop and enhance their cognitive skills through analyzing complex situations, solving problems, and decision-making
2. To design and develop a game with (3) different level of difficulties.

3. To design the game with three-dimensional graphics with a third-person point of view.

4. To immerse players in the game world, create an immersive environment that draws players into the game's universe, making them feel like an integral part of the story.

Scope and Limitations

This study focused on the development of "The Veil of Secrets: Caves of Mystery", an offline adventure strategy game. The game aims to provide a fun and entertaining gaming experience while learning through analyzing complex situations. The target users of this game are the senior high school students of Westmead International School. The game focused on overcoming different challenges using skills and critical thinking. Each player's main goal is to defeat different living creatures, complete tasks, and escape every cave.

However, one of the limitations is that the device compatibility of the game with different devices and operating systems could be limited, leading to varied levels of performance and responsiveness for players depending on their device's hardware and software specifications. This means that players with low-end gaming systems may not be able to enjoy the game to their full potential. Excessive time spent playing games may affect the responsibility of the player in performing important tasks. Video games can be addictive, affecting academic performance, work productivity, and health issues.

Rationale of the Study

The main goal of this study is to develop "The Veil of Secrets: Caves of Mystery", an offline strategy game for senior high school students of Westmead International School. Players will benefit from this game, it provides an interactive and engaging gaming experience that challenges players to think, analyze situations and find solutions to various problems. Video games are a

form of entertainment for individuals of all ages. Video games can be used as educational tools to teach different subjects and fields, develop problem-solving skills, and improve memory and concentration.

The game captivates players in a world of mystery and adventure, where they navigate through every stage, overcome challenging obstacles, and encounter mysterious creatures. By conducting a thorough analysis of these gameplay elements, this study aims to provide valuable insights into their impact on player immersion, sense of adventure, and overall gameplay experience. The study will also examine the mechanics and interactions among players in the game, evaluating their impact on the gaming experience. This research will provide insights to game developers, helping them identify the strengths and weaknesses of this gameplay and enhance the game design to create a captivating and enjoyable experience for players.

Video games often requires player to develop skills, such as decision making, strategic thinking, decision-making, and problem-solving skills. This study helps to open opportunity to the proponents in the game development industry. Development of game involves a lot of knowledge in programming, graphics and art designing, project management, creativity, and problem solving. The process of developing a game will develop the proponent's skills. Continuous skills development will help the proponents to grow in game development industry. This study will open up the opportunity for the proponents in career advancement.

Current State of Technology

There is no denying that the mobile gaming sector is expanding quickly and elevating itself to the top of the most alluring and lucrative sectors. In summary, the industry has outperformed all standards, both technically and financially. Given that there are more than 3 billion gamers online worldwide, it is simple to anticipate the potential of mobile game creation in the future. Therefore, it is simple to wish that mobile gaming would have an inventive and promising future.

According to Pipaliya (2022), over time, game development has changed. Humans have traditionally placed a high value on entertainment. Therefore, it should come as no surprise to anyone who felt that game development would be a brilliant idea. Nowadays, it is incredibly difficult to go without technology for even a few hours. Either your laptop, tablet, or phone (always in your pocket) will do. The technology found in today's smartphones has transformed them from simple communication tools into entertainment hubs with a ton of punch.

Esports have existed for a while. It has long been a common trend in the mobile gaming sector. It can be viewed as a competitive game for seasoned players and video game fans. Numerous individuals follow and watch these games all over the world, whether they do so directly on TV, at various live events, or by exploring online resources. Users can watch and play their favorite games live with the aid of live streaming services. The industry is growing both financially and popularly. The worldwide eSports market was estimated by Statista to be worth little over $1.38 billion in 2022. Furthermore, it is anticipated that by 2025, the worldwide esports market would generate US$1.87 billion in revenue.

A new generation of gamers has entered the market thanks to the recent boom in mobile technology, which has also changed the sector. Indeed, gaming has assimilated into contemporary popular culture to the point where even grandparents are familiar with titles like Angry Birds, more than 42% of Americans are gamers, and 4 out of 5 U.S. families have a console. Since the introduction of smartphones and app stores in 2007, gaming has experienced yet another rapid development that has altered not only how people play games but has also taken gaming into the mainstream of pop culture in a level that has never been seen before. Mobile gaming has exploded in recent years thanks to the quick advancements in mobile technology, and it is expected to eventually outperform console gaming in terms of revenue (Chikhani, 2015).

As stated by Beck (2019), there seems to be agreement that this period, which is on the cusp of 2020 and an unbounded future of invention and creativity, is exciting for developers and players because so much in the business is expanding and evolving. The term "crunch" refers to an intense period of development typified by long hours and few days off. Around 2010, Brenda Romero was working on a game for a company that has since gone out of business when the subject came up in the workplace.

Prior to the invention of smartphones, gaming was only known to be done on computers or televisions, but now mobile gaming is hugely popular. Due to the widespread use of smartphones during the past ten years, it has become an ever-growing trend and will continue to do so. It was predicted that the global market for mobile gaming would include more than 1.5 billion users by 2021. This phenomenon may be found on the list of the most downloaded games from the App Store and Google Play Store.

Definition of Terms

The following terms are defined theoretically and operationally for clarity of thoughts among readers.

Characters- A game character refers to the entity that is controlled by the player.

Programming- Programming is used to implement the whole mechanics of the game including movements of character, user input, and interactive environment and objects inside the game.

User Interface - The user interface (UI) refers to all the visual elements and controls that allow players to interact with the game. These include menus, buttons, HUD (heads-up display), and other on-screen elements that enable communication between the player and the game.

Input devices - Input devices include game controllers, keyboards and mouse, and touchscreens, which are hardware or peripherals that players use to interact with the game. These devices are essential for transmitting player commands to the game, enabling players to navigate, make decisions, and control in-game characters, depending on the platform.

Game assets - Game assets refer to all the digital components that make up the visual and auditory elements of the game. These assets include audio (background music, sound effects), models of characters and objects, textures, and the design of game stages or levels. Game assets are crucial for creating the game world, characters, and overall visual and auditory experience for players.

Game Engine - A game engine serves as a software framework or platform employed in the creation and development of video games. It encompasses a set of tools and features designed for rendering graphics, managing in-game

physics, handling audio, and more. Game engines stand as the foundational technology that drives video games and streamlines the game development process.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter discusses the gathered information to support the content of the study. This includes the conceptual literature, related literature, synthesis, and conceptual framework.

Conceptual Literature

Gaze Interaction in 3D Action-Adventure Games played in Different View Modes. Interactive technologies have been increasingly integrated into computer games, impacting gaming habits and players' perception of the game. Gaze-based interactions in a specific genre of games have sparked research on their effects on players' sense of presence in the game world. Different view modes, such as dynamic camera angles that follow the player's gaze and alternative perspectives prioritizing important game elements, aim to provide players with a more immersive experience. Gaze-based gadgets, such as eye-tracking technology, allow players to interact with the game world solely through their gaze, enhancing their sense of presence. Empirical investigation shows that players report feeling more engaged, immersed, and empowered when using gaze-based gadgets compared to traditional input methods. Monika Minichberger(2017). Eye tracking, also known as gaze interaction, is the study of eye movement to determine what attracts people's attention, particularly in advertisements. It uses infrared corneal reflection to record and analyze gaze direction during human-computer interaction. Eye movement data can be used to select items or gather specific information from users. Eye tracking is useful for improving interfaces and enabling hands-free interaction via gaze. It can also guide systems faster than traditional input devices like a computer mouse or

keyboard. Eye tracking technology has evolved since its first use in reading research in the early 19th century, when simple objects like mirrors and lenses were used to observe eye movement. Today, eye tracking is used to improve websites, apps, marketing, education, art, psychology, neuroscience, and even games.

3D Virtual environments as effective learning contexts for cultural heritage. 3D technology can be a valid support to cultural heritage not only for visual presentation and documentation, but also for communication and educational purposes. In this paper, we will discuss the potential of 3D virtual environments as effective learning contexts for Cultural Heritage. This encompasses various disciplines such as history, art, and languages, and includes both tangible and intangible content like myths, beliefs and social values. We will analyse virtual and augmented reality and innovative interfaces, highlighting their affordances for successfully triggering learning experiences. A number of digital environments and serious games will be also analysed with respect to their potential for supporting immersion, presence and motivation. In the literature, these factors are considered key in raising learner interest, making 3D worlds a direct and engaging setting for informal learning in Cultural Heritage. Mortara, M. & Catalano, C. (2018).

Cognitive Development. Cognitive consequences research addresses the impacts of playing games to gain particular cognitive skills. The study focused on how to train cognitive skills that can be used in different aspects, such as academic settings. The main focus is the executive function skills, which is a subset of cognitive skills. It is a set of cognitive processes used for goal-directed thinking and behavior. (Banich, 2009; Best, 2012; Miyake, Friedman, Emerson, Witzki, & Howerter, 2000). Given that there are some difficulties in finding off-the-shell games that have a strong impact on helping students to develop executive function skills, constructing a computer game that

is based on cognitive principles of skill learning and is focused on specific executive skills. Anderson and Bavelier (2011) and Bediou et al. (2018) have pointed in the effectiveness of first-person shooter games in training perceptual attention skills.

Research Literature

The proponents also gathered information from local and foreign published and unpublished research to compare differences and similarities between the collected studies.

According to Karen Nicole B. Francisco, Jerico D. Concepcion, Azenith R. Mojica, Shenny Angela B. Montes (2019), Educational entertainment is the process by which people enjoy and are entertained while being taught something educational. An application with entertainment and educational value can be categorized as Edutainment. It is not about just playing games, it captures and retain player's attention, challenges them, and entertain them while teaching them. Combining the aspect of mobile 3d games and edutainment to create a game that aims to provide interesting information about the Philippines tourist spot. Based on the conclusion of the study, the project is a functioning and effective 3d edutainment game. Students who play the game discovered new information, as the game promotes the different tourist spot in the Philippines.

According to the project study entitled" Using Strategy Video Games to Improve Problem Solving and Communication Skills": A Systematic Literature Review" of Alvin (2022). Video games have often faced societal criticism as they are mainly considered a source of entertainment, especially among children and young adults. Many people believe that playing video games offers no real-life benefits. The study findings establish that engaging in challenging video games, such as strategy games, has the potential to enhance a player's problem-solving

skills (p 1-5). Additionally, games with collaborative features can lead to improved communication skills over time.

According to P. Rohlfshagen, D. Robles, and S. M. Lucas. (2011). Considering the success of Ms. Pac-Man, much of the challenge found in the game is the ability to not only react to local threats, such as nearby ghosts, but also strategically navigate the maze so that pills are consumed as quickly as possible, as well as fully utilizing power pills to maximize score. Spelunk has similar characteristics in that the player must dodge adjacent enemies using a variety of unique behaviors, some passive and others focused on attacking the spelunker. Furthermore, players are expected to devise methods for their navigation as well as the destruction they cause to the environment, allowing them to access more coveted items and possibly the exit itself. The fundamental challenge of Spelunk is the necessity to manage resources wisely, maneuver in the environment, dodge and attack enemies, and finally design a plan of action that optimizes score while reducing time taken. Given the breadth of challenges that may already be created using the fundamental mechanics, the addition of a variety of adversary kinds and items significantly expands the problem-space.

According to the study entitled "Colossal Cave Adventure" of Dickey, Michael D. (2006). The player has a variety of options, including exploring the game world, killing anything that appears dangerous, and picking up various items throughout the way in order to find invaluable treasures. A serious game, on the other hand, as described by the Serious Games Initiative, is a simulation that has the appearance and feel of a game but correlates to non-game events or processes. As more people become interested in computer games, and as it becomes more culturally and socially acceptable, the responsibility is on the designers to give a little attention to the content of those games.

The study conducted by Charles Reynaldo et al. (2021) titled "Using Video Games to Improve Decision Making and Cognitive Skills: A Literature Review" reveals that video games can be useful tools for developing cognitive and time management skills, according to previous studies. It has been proven that playing video games is more effective than watching videos in reducing biases. However, video games can have both positive and negative effects. They can train players to be disciplined and improve their skills, but they can also lead to addiction and social isolation. Although not everyone enjoys video games, even casual players can benefit from them. Future research should focus on developing video games that can be controlled by teachers to improve cognitive learning. Experimental studies utilize pre- and post-test methods to measure improvement. Studies include literature reviews and experiments. Video games can be educational and improve skills despite negative stigma. Playing video games forces people to learn and can improve problem-solving and time-management skills

Also, The Hollow Knight of Larkin, C. (2017) is a playable character who explores the forgotten bugs' Kingdom of Hallow nest underground. In terms of spatiality, Hollow Knight adheres to the characteristics that define the Metroidvania genre to which it belongs: an unexplored interconnected map with obstacles that must be overcome with the assistance of some items/abilities in order to open the doors that connect the rooms together. The results of this game analysis reveal that Hollow Knight is a game with enough depth to be worth playing. Evaluated from a phenomenological standpoint and addressing the "spatial paradigm". In some cases, it would be interesting to do a rhetoricalprocedural analysis of Hollow Knight, as it would uncover the meaning of this game with such a strong visual identity. Storytelling and characterization are important aspects of every work.

Synthesis

Research Literature added some past studies some which also related to the present project study using books, journals, published and unpublished theses. With this, the proponents related some points of ideas that came from different project studies and compared it to the proponents' own project proposal.

The study emphasizes the effectiveness of combining mobile 3D games and edutainment to promote underutilized tourist attractions in the Philippines. The game successfully engaged students, provided them with new knowledge, and helped the researchers achieve their goal of increasing awareness of these lesser-known destinations.

Furthermore, according to the project study entitled" Using Strategy Video Games to Improve Problem Solving and Communication Skills". The project study emphasizes that playing challenging video games, particularly strategy games, can have real-life benefits by improving problem-solving abilities. Video games that encourage collaboration and effective communication can contribute to the development of communication skills.

In games like Spelunk, the need for players to design navigation strategies, evaluate environmental effects, and make strategic decisions is accurately addressed. Ms. Pac-Man and Spelunk both require players to navigate their surroundings wisely, manage resources, and optimize the results they achieve. The addition of many enemy types and equipment increases the complexity and depth of the challenges that players encounter.

The game "Colosssal Cave Adventure" was originally developed by Willie Crowther as a text-based game for mainframe computers, the study emphasizes the importance of game designers considering the content and message

conveyed in their games, particularly as more people engage with computer games and as gaming becomes more culturally and socially acceptable.

The studies of X, Chen (2019), and Lamb et al. (2019) are mostly connected to the proposed topic because both of the studies suggest that video games and educational games have the potential to enhance cognitive and problem-solving skills, as well as improve academic performance. The first study specifically focuses on the benefits for IT students, while the second study emphasizes the positive impact of Serious Educational Games and how they can be integrated into the classroom to facilitate learning.

The study Hollow Knight has similarity to the project study in order to explore the cave you need to overcome different obstacles. The difference of it from the project study is that you need to use some items/abilities to allows the player to navigate through the interconnected map and explore new rooms. The game is a captivating and engaging gaming experience that combines spatial exploration, challenging gameplay, and a distinct visual identity. It offers sufficient depth to keep players interested and deserves further study from both phenomenological and rhetorical-procedural perspectives

Conceptual Framework

The conceptual framework of the study entitled “Veil of Secrets: Caves of Mystery” is shown in Figure 1, it illustrates the steps to be undertaken to achieve the desired outcome of the study. Figure 1 shows the model of how the game will work which consists of input, process, and output.

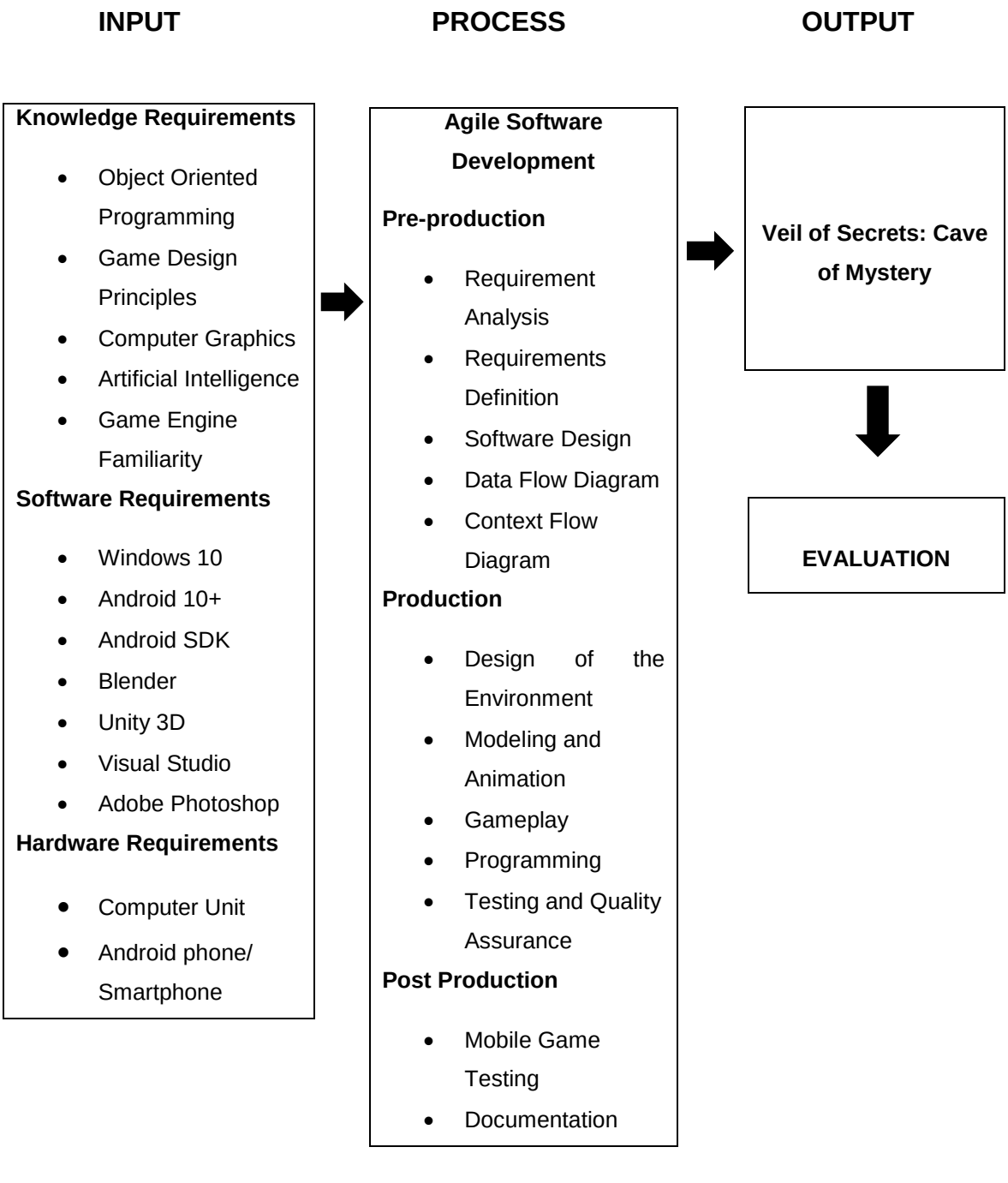
INPUT
PROCESS
OUTPUT
Knowledge Requirements
Object Oriented Programming
Game Design Principles
Computer Graphics
Artificial Intelligence
Game Engine Familiarity
Software Requirements
Windows 10
Android 10+
Android SDK
Blender
Unity 3D
Visual Studio
Adobe Photoshop
Hardware Requirements
Computer Unit
Android phone/ Smartphone
Agile Software Development
Pre-production
Requirement Analysis
Requirements Definition
Software Design
Data Flow Diagram
Context Flow Diagram
Production
Design of the Environment
Modeling and Animation
Gameplay
Programming
Testing and Quality Assurance
Post Production
Mobile Game Testing
Documentation
Veil of Secrets: Cave of Mystery
EVALUATION

Figure 1

Conceptual Paradigm

The requirements that are necessary for the construction of the game are presented in the input box, which can be seen in Figure 1. This encompasses ideas pertaining to the Gaming industry in the Philippines, Mobile Games Benefit for Academic Institutions, 3D gaming, and Mobile Game Storylines. In addition, the Computer Unit and Smartphone or Android Phone are necessary pieces of the hardware requirements that will be the tools for developing the desired results. Also taken into considerations as inputs were major prerequisites for software development, such as Windows 10 plus for PC's, while Android 10 plus for Android, along with the Android SDK, Blender, Unity 3D, Visual Studio and Adobe Photoshop.

The process box shows the steps in obtaining significant information prior to software development. This includes Pre-Production, Production, and Post Production. It incorporates the Requirement Analysis, Requirements Definition, Software Design, Data Flow Diagram, Context Flow Diagram, Modeling and Animation, the development of testing, coding, debugging and documenting.

The output of the study is "The Veil of Secrets" which as then subjected to evaluation based on presentation, fun-factor, functionality, reliability and user-friendliness.

CHAPTER III

METHODOLOGY AND SOFTWARE DESIGN AND DEVELOPMENT

This chapter discusses the research design, research methodology, target user of the study, sampling procedure, methods of data gathering, methods of software development, and system design specification.

Research Design

The study commenced by defining the research objectives, which aimed at developing a game application. The research paper included the scope, limitations, statement of the problem, and significance of the research. To analyze the situation and draw conclusions from the collected data, the researchers utilized the descriptive analysis method, a commonly used technique to gain an overall understanding of the research subject.

Research Methodology

The study of "The Veil of Secrets: Caves of Mystery" employs a methodical approach to investigating the impact of game mechanics on player engagement. The first stage is to develop a specific research question, such as how specific game mechanics affect player engagement in the game. A thorough literature analysis is then carried out to investigate existing studies on game mechanics, player engagement, and similar immersive narrative games, identifying any gaps in current knowledge.

The methodology of the research could focus on observation methods to gather data. As the game is played, researchers will be able to monitor participants' behavior, reaction and engagement level in real time. That could include recording play sessions, taking note of the player's actions and decisions as well as documenting any apparent indicators of involvement such as excitement, focus or immersion.

The research methodology also involves selecting a suitable sample of participants, considering factors such as age, gaming experience, and preferences. It is important to obtain informed consent from participants and ensure that ethical considerations are followed throughout the research process.

Target user of the study

The target users of the study are gamers among senior high school students at Westmead International School. The players can gain benefits that they can enjoy by playing our interactive and engaging adventure-strategy game. In today's diverse gaming landscape, it is crucial to understand why our game stands out for individuals of all ages within this target user group.

Statistical Treatment of Data

The goal of most evaluations is to provide useful feedback to a variety of audiences. An evaluation survey was conducted by the respondents using an evaluation questionnaire.

The following scale was used to interpret and analyze the result:

Scale	Option	Verbal Interpretation
4.50-5.00	5	Excellent
3.50-4.49	4	Very Good
2.50-3.49	3	Good

1.50-2.49	2	Fair
0.1-1.49	1	Poor

Afterwards, the proponents computed for the weighted mean of each category using the formula:

$$\mathbf{Wm=\sum^{fw}/N}$$

Where:

Wm= weighted mean

N= number of respondents

W= assigned weight

f= frequency

∑**=** summation

Weighted mean is an average computed by giving different weights to some of the individual value. It is the collection of tools employed in the study of methods and procedures used for gathering, organizing, and analyzing data based on the theory of probability and statistics. It is also a set of ideas that is intended to offer the way for scientific implication from the resulting data. In

many applications it is necessary to calculate the weighted mean for a set of data with different individual errors.

The proponents used the following scale in determining and comparing the ranking of responses based on the weighted mean result: 1 is equivalent to poor, 2 for fair, 3 for good, 4 for very good, 5 for excellent.

Data Gathering Instrument

The researchers will conduct and create a survey questionnaire to answer the questions raised in this study. To gather the information needed for the system's development, the proponents have created a questionnaire checklist. Readings from the study's Proponents, previous studies, literature, and published and unpublished thesis were used to create the draft questionnaire. As far as data collection tools are concerned, the conduction of the research involves the use of a semi-structured questionnaire, which is used as an interview guide for the researcher. Certain questions are prepared for the researcher to guide the interview towards the satisfaction of the research objective, but additional questions are encountered during the interviews. In addition, in-depth research in libraries and consultation with experts are being conducted by the proponents. Further, the internet is being utilized in gathering technological information for the hardware and software assembly.

Data Gathering Procedure

This research included the survey questionnaire that aims to know the perspective of the respondents regarding to their satisfaction on the effectiveness of the study.

Upon the validation of the research instrument, the researchers will formally request permission from the professor to conduct the study with a validation questionnaire checklist that will be distributed personally to the senior high school students of Westmead International School. The researcher used purposeful sampling judgment. Also known as selective techniques, it is a technique where the researchers rely on judgment based on the objective of the study.

In addition, conducting a survey questionnaire among the respondents has some limitations due to various reasons. Due to the misunderstanding of the questions, participants may provide inaccurate or incomplete responses, which can lead to response bias. The researchers distributed the survey questionnaire personally to the respondents and chose gamers specifically to be the respondents to the study. The researchers collected the questionnaire once it was done and collected all the tallied data using an appropriate statistical tool.

Sampling Method

This study entitled “Vein of Secrets: Caves of Mystery’ focused on how playing games will enhance critical thinking and what are the benefits of playing games. To gather the population of gamers, the researchers used sample that will be the respondents of the study. The sample of a study refers to the group of individuals or subjects that are selected from a larger population to participate in the research. The sample of a study refers to the group of individuals or subjects that are selected from a larger population to participate in the research.

The sample is a subset of the population and represents the individuals who will be studied and whose data will be analyzed to draw conclusions about the larger population. The proponents of this study used non-probability sampling method, also known as subjective sampling. Non-probability sampling is a sample technique where subjects are chosen for a study based on a subjective assessment rather than a random selection. In non-probability sampling, there is no known probability or chance that a particular individual will be chosen from the population.

Methods of Software Development

The development process for "The Veil of Secrets: Caves of Mystery" game involved a systematic analysis and design approach to create an immersive Windows game application. The proponents utilized system analysis and design techniques to ensure the successful development of the PC application game.

The first phase was the planning phase, where careful consideration was given to coordinate activities and manage project risks effectively. This phase involved defining the target user group, determining the desired game layout, and addressing technical aspects to ensure the successful achievement of the desired game design. The next phase was the analysis phase, which involved gathering relevant materials and designing the project's structure. This phase served as a guide in designing the game and helped establish the necessary system requirements for development.

The next phase was the design phase, in this phase involved identifying the requirements of the game's functionalities and designing an interface that promotes seamless interaction between players and the game.

System Design Specifications

The system design specifications are divided into two main sections: the requirements for both hardware and software and the design tools. The design tools are further divided into context-free diagrams and data flow diagrams. All of these components served as the foundational building blocks for this study.

The SDS outlined software and hardware requirements, as well as design tools such as Context Flow Content (CFD) and Data Flow Diagram (DFD).

Software Requirements. These are the intangible requirements for the overall game development. Table 1 displays the necessary software requirements for the proposed program, which include both the minimum and suggested software requirements.

Table 1

Software Requirements

SOFTWARE	MINIMUM	SUGGESTED
Operating System (OS)	Windows 10	Windows 10
Programming Language	C++	C#
Game Engine	Unity	Unity

Graphics Editor Animation Software	Adobe Photoshop Mixamo	Adobe Photoshop Blender

Table 1 shows the list of the system requirements for the proposed game. The proponents used Windows 10 as their operating system because it is compatible with the game. They used C++ and C# programming languages for development and Adobe Photoshop for designing the game.

Operating System: Windows 10. Developers can create games that are stable and compatible gaming experiences for users by setting Windows 10 as the minimum requirement. It offers a user-friendly interface that is familiar to gamers, which can result in a more positive gaming experience. Windows 10's compatibility with a wide range of hardware and software reduces the chances of encountering crashes and compatibility issues.

Programming Language. C#. Unity game engine is an extensively used platform for creating games, with C# as its primary programming language. C# is the preferred language for controlling game functions, actions, and interactions in Unity, making it easier for researchers and developers to write code. Unity simplifies the process of creating games that can run on various devices, which enhances the efficiency of game development.

Game Engine. Unity. Unity's user-friendly versatility streamlines game development, making it a popular choice for both independent developers and professional studios, contributing to its widespread industry adoption.

Graphics Editor. Adobe Photoshop. Adobe Photoshop is a crucial tool in the game development process, as it facilitates the creation, editing, and

optimization of graphical assets and contributes to the visual design, user interface, and overall aesthetics of games. Game developers frequently choose it due to its versatility and powerful feature set, which allow them to create visually stunning and engaging gaming experiences. The proponents used Adobe Photoshop to create visual concepts and designs for characters, environments, and game worlds. These concepts serve as a foundation for the game's visual style and direction.

Animation Software. Blender. Blender is a versatile 3D graphics toolset used for modeling, animation, and asset creation in game development. Its open-source nature, robust features, and community support make it an attractive choice for those looking to create 3D content and prototypes for games.

Hardware Requirements. These devices constitute the tangible prerequisites for the proposed study. The table displays the necessary hardware requirements for the program, encompassing both the minimum and recommended hardware configurations.

Table 2

Hardware Requirements (Development Phase)

HARDWARE	MINIMUM	SUGGESTED
Processor	Intel Core i3 or Ryzen 3	Intel core i7 or Ryzen 7 or Higher
Memory	8gb RAM	16gb Ram
Monitor	IPS 1280 x 720	IPS 1980 x 1080

Mouse/Keyboard	PS2	USB
Solid State Drives	500gb	1tb
GPU	GTX 1050 Ti	GTX 1660 Ti

Table 2 shows the computer requirements that went into creating The Veil of Secrets: Caves of Mystery. In order to understand performance based on CPU type and speed, memory, storage, and peripherals compatibility, the presentation primarily focuses on hardware specifications.

The proponents used in computer with the following minimum requirements: An Intel Core i3 or Ryzen 3 processor to ensure optimal processing power, 8GB of memory (RAM) for smooth performance, and a monitor with a resolution of IPS 1280x720 for a clear display. These specifications were chosen for effective game development on Windows. Basic input devices, such as a keyboard and mouse, were also included in the requirements. However, the proponents recommend that future developers consider using hardware with higher specifications or capacity for even better performance.

Table 3

Hardware Requirements for the Android Device

HARDWARE	MINIMUM	SUGGESTED
Processor	Snapdragon 400-500 series	Snapdragon 700-800 series

Memory Storage	6gb Ram 64gb	8gb ram 128gb

Table 3 outlines the hardware specifications needed for an android device. The specifications for the Android device are displayed in the table. With an improved GPU processor, the Snapdragon could provide more graphics processing power to meet the demands of gaming applications in terms of processing speed and 3D graphics support. For android devices, 8GB RAM is advised in order to enable faster and lag-free game application performance. Additionally, adding 128GB to a storage device is the easiest and most efficient way to increase the storage space available for a game application.

Table 4

Hardware Performance Specifications

Hardware	Performance Specifications
Processor	An Intel Core i3 or Ryzen 3 processor is the minimum requirement to ensure efficient processing power.
Memory	A minimum of 6GB of RAM is essential for smooth and responsive system performance.
Monitor	A monitor with a resolution of IPS 1280X720 is required for clear and visually effective display.
Mouse/Keyboard	Basic input devices such as a mouse and keyboard are essential for system interaction and control.
Solid State Drive	A solid-state drive's storage capacity should be at least 500GB. Higher storage is determined by greater capacity.

Graphics Card	High-quality graphics are essential for improving the game development process. More so than their predecessors, graphics cards like the GTX 1660 Ti and GTX 1050 Ti are essential.

Hardware performance specifications were stated in Table 4 which shows the suggested hardware in the study. The proposed project study required An Intel Core i3 or Ryzen 3 processor is the minimum requirement to ensure efficient processing power. Second, A minimum of 8GB of RAM is essential for smooth and responsive system performance. Third, A monitor display resolution of at least IPS 1280x720 is recommended for optimal visual clarity. And lastly, Basic input devices such as a mouse and keyboard are essential for system interaction and control. These hardware specifications were carefully chosen to facilitate the successful development and operation of the project.

Design Tools

Design Tools: A design tool is employed to visually represent data. The proponents utilized various design tools, including Context Free Diagram (CFD) and Data Flow Diagram (DFD), to illustrate the information flow within the game. These design tools facilitated the proponents' comprehension and awareness of the game.

Context-Free Diagram. Context Free Diagram is a top-level view of the system that shows its boundaries and scope that interacts with the different entities. It is a graphic design that clarifies the interfaces and boundaries of the proposed study. Shown in Figure 2 is the CFD of the android game.

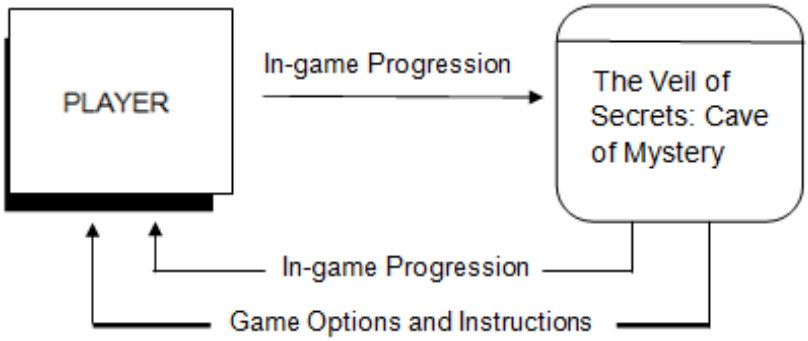

Figure 2

Context Free Diagram (CFD) of the proposed Application

As shown in Figure 2, the context-free diagram of "The Veil of Secrets: Caves of Mystery" - a Android game proposal. The game revolves around a single entity, the player, who interacts with the game interface. The player begins the game in Stage 1 Cave and must navigate through various challenges, puzzles, and secrets to progress. The game comes with several settings that players can customize to enhance their gaming experience. Lastly, the game provides feedback to the player when they complete the game or fail.

Data Flow Diagram. A data flow diagram (DFD) shows the logical model of the system. It shows how the data moves through the system. It shows what kinds of data will be input to and output from the system, where the data will come from and go to, and where the data will be stored. Shown in Figure 3 is the detailed data flow diagram of the proposed study

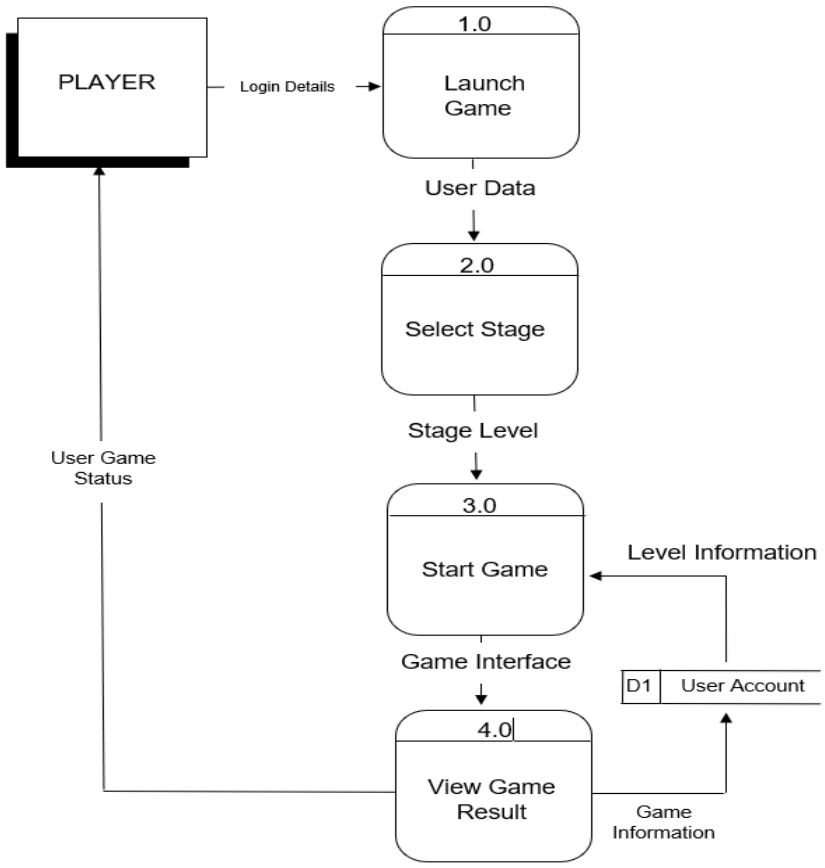

Figure 3

Data Flow Diagram of the Game

As shown in Figure 3, the data flow diagram of the study “The Veil of Secrets: Cave of Mystery” This diagram shows that the players’ immersive journey through the captivating Cave of Mystery. Players must create an account first before he can launch the game.

Upon signing into their user account, players are presented with various stages and levels of the exciting cave game. They can then embark on their gameplay adventure.

The players have the option to customize their gaming experience through the settings menu. This includes adjusting elements such as the music volume, sound effects, and control/button configurations, even while immersed in gameplay. After completing each level or stage, players have the opportunity to view the game result. These details are recorded in the players' user account history, allowing them to track their progress over time. Once they have reviewed their performance, players can then progress to the next level and continue their thrilling journey through the game.

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