

UTILIZATION OF 3D UNITY IN COMPUTER-AIDED ENROLLMENT PROCEDURE OF ONE UNIVERSITY

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Abstract

This study aimed to develop a computerized system using the Unity game engine to simulate the enrollment process of Central Philippines State University (CPSU) - Hinigaran Campus. The project was designed to provide students with a step-by-step virtual orientation of the enrollment process, allowing them to familiarize themselves with the procedures and the university's campus layout. By leveraging Unity, the system offers an optimized, user-friendly interface capable of running on older computer systems, enhancing accessibility for a wider audience.

The system's development focused on functionality, design, and effectiveness, evaluated through a Likert Scale by Bachelor of Information Technology students and other CPSU enrollees. Results indicated "Very Good" performance in functionality (mean = 4.06), design (mean = 4.15), and effectiveness (mean = 4.34), with an overall evaluation of "Very Good" (grand mean = 4.2).

The study highlighted the potential of game engine technology as an educational tool, providing an engaging and interactive medium for guiding students through administrative processes. Recommendations include systematic dissemination, regular maintenance, and future upgrades, with the possibility of extending the system's implementation to other CPSU campuses. This research underscores the importance of leveraging modern technology to enhance user experiences and streamline institutional processes.

Keywords: Unity Game Engine, Enrollment Simulation, Educational Technology, Virtual Orientation, User-Friendly System, Optimization, Campus Navigation, Central Philippines State University (CPSU), Interactive Learning Tool, System Evaluation.

Introduction

A game is a software that provides game creators or programmers with the necessary set of features to build games or simulator quickly and efficiently. It was very essential as it helps builds imaginations into augmented or virtual reality that can be used as a vessel to share experience from others. (Ward, n.d.)

According to Jeff Ward (n.d.) the concept of a game engine is fairly simple: it exists to abstract the details of doing common game-related task, like rendering, physics, and input, so that developers, artists, designers, scripters and, yes, even other programmers can focus on the details that make their games unique. Game engine is also a framework for development that supports and brings together several core areas. A crucial part of game engines is represented by scripts which you can use to define the logical of your game components by adding behaviors. With pre-build scripts, a solution provided by some game engines, and the animation system which can be used to control character animation. (Ward, n.d.)

The researchers were able to enhance their skill in using the game engine as it is not just a simple tool used for creating a video game, it can also use as learning tool to provide knowledge to others by means of creating a software that can help in providing the necessary requirements for the tool to be functional and effective that will be provided for the targeted users.

Objectives of the Study

The main concern of the project is to create a system that will utilize the enrollment process of one university. The agency that can benefit from the project is any university wanted to adopt this program. Through this system, it will be easier for the students to familiarize the enrolment process as the system were designed to be having the detailed step-by-step enrollment procedure. The project was started in June 2022 up to February 2023. The project was implemented in CPSU-Hinigaran Campus. The researchers aimed to give learnings and insights to students on how the enrolment process conducted and taken place. The project development was conducted through the use of

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computers, TV monitors and cell phones. (Singh & Gupta, 2019)

The purpose of this project was to create an environment and stimulate the process of enrollment in the Central Philippines State University with the use of game engine, specifically the Unity Engine. With this project, students will be oriented on the flow of enrollment without having to explore the entire vicinity of the university.

This research study aimed to utilise a unity in computer aided enrollment procedure of one university specifically Central Philippine State University - Hinigaran Campus. Specifically; (1) to develop a program that stimulates the enrolment process of CPSU from step 1 unit step 9. (2) to stimulate the environment of CPSU to enable students and enrolees to explore the vicinity of the university.

Methodologies

Product Specification

According to Banks (2001), simulation is a major technology used to imitate a process or operation of a system. Simulation has many uses such as performance optimization, testing, training, education, education, safety engineering, and video games. Simulation was (Banks, 2001; Fernández & Maldonado, 2020) also used specific modelling of natural systems or human systems to gain insight into their functions. The developers of this program used a game engine called UNITY which were one of the top leading software in the video games industry. It uses high programming code such as JavaScript and C# to produce and build games or simulators. (Unity Technologies, 2020)

Requirements Specification

Minimum System Requirements:

- Processor: Dual-Core CPU (e.g., Intel Core 2 Duo or equivalent)
- Memory (RAM): 2 GB
- Graphics: Integrated GPU with DirectX 10 support
- Storage: 500 MB available disk space
- Operating System: Windows 7, 8, or 10 (64-bit)
- Input Devices: Mouse and keyboard
- Display: 1024x768 resolution or higher

A program was created efficiently in order to accommodate older system. Dual Core CPSU is the minimum requirement with GB of RAM. The required software and hardware were considered during the system development to ensure total functionality and effectiveness.

Pieces Evaluation Framework

Table 1: PIECES Evaluation Framework

PERFORMANCE	The performance of the system is optimized to the degree that it can be run on older computer systems. The feedback was positive from range of users.
INFORMATION	Information regarding the user-interface was approved through different feedback gathered from users.
ECONOMY	The cost of the system was not that expensive as work time was more of a basis in constructing the system.
CONTROL/ SECURITY	The system was open for all users as there are no explicit content that was used in creating the system. No security has been added as it was intended as a freeware.
OFFICIENCY	System's output was satisfactory as it provided info in the user-interface as intended to be. No security has been added as it was intended as a freeware.
SERVICE	The new procedure of the enrolment that will be used for the next academic year was not adopted in the system as the OSSA was not able to release the new procedure that will be used in the next academic year.

This evaluation presents the evaluation of the orient enrollment procedure of the Central Philippines State University - Hinigaran addressed by the system developed by the researchers. (1) The performance of the system is optimized to the degree that it can be run on older computer systems. The feedback was positive from range of users. (2) Information regarding the user-interface were improved through different feedbacks gathered from users. (3) The cost of the system was not that expensive as work time was more of a basis in constructing the system. (4) The system was open for all the users there are no explicit content that were used in creating the system. No security has been added as it were intended as a freeware. (5) System output was satisfactory as it provides info in the user-interface as intended to be no game breaking bugs has been discovered so far. (6) The new procedure of the enrolment will be used for the next academic year were not adopted in the system as the OSSA were not able to release the new procedure which will be used in the next academic year.

Cause and Effect Analysis

A technique that helps identify all the likely causes of a problem. This means that the user can find and fix the main cause, first timer, without the problem running on and on. It was developed by Professor Kaoru Ishikawa, a pioneer professional in the field of quality management in the year 1960.

Table 2: Cause and Effects Analysis

	Problems/ Opportunities	Cause and Effects	System Objectives	System Constraints
PERFORMANCE	System cannot run on older computer	C-The system was not optimized. E-Older computer were unable to run the system.	To use pre-build scripts in order to optimized system build.	Older computers produced before 21 st century was not supported to run the system.
INFORMATION	Lack of information	C-Data was not imported in the system E-Some data are not present on user-interface.	To develop a program that simulates the enrollment process of CPSU from step 1 to step 9	Not all data will be presented in the final system
ECONOMY	Time management	C-time was very limited due to OJT E-Work in the system was piled up	To finish the system before the end of February 2019	Some features were not added such as exploring indoors.
CONTROL/SECURITY	Lacks security for the system	C-system's security was not installed. E-Easier access for any users.	To be release for public used without installed security system.	System is prone for software stealing.

EFFICIENCY	Wall Bug	C-Character speed allows him to bypass E-walls Playable character passes through building walls.	To use scripts which can use to define the logic of the system components by adding behaviors	The imported playable character speed is beyond normal speed.
SERVICES	Enrollment Procedure not updated	C-OSSA was unable to release the new enrollment procedures. E-Slightly outdated procedures in the system.	To make students and new enrollees be familiarized in the process of enrollment using the created system.	System might not be updated by the researchers by the time the new enrollment will be used.

Functional Requirements

Utilization of 3d unity in computer-aided enrollment procedure of One University has little functional requirements needed to run the system. It doesn't system security but the users will need to have an authorization before he/she can access the system.

Regular/Compliance Requirements

Listed below are the authorized persons who can access the systems:

- Technical Staff
- Enrollees
- CPSU student in any level
- School Faculty and Staff

Non-Functional Requirements

Built as a user-friendly system. The system needs less non-functional requirements. This is a freeware intended for the benefit of every authorized users.

Security

The system has no security requirements as the developers are quite confident that authorized users will not abuse the system functionality.

Performance

The system optimized which makes it very functional most of the time. Older computer systems can run the system due to its optimized performance. Necessary requirements should be met before

applied. A dual core required in running the program efficiently.

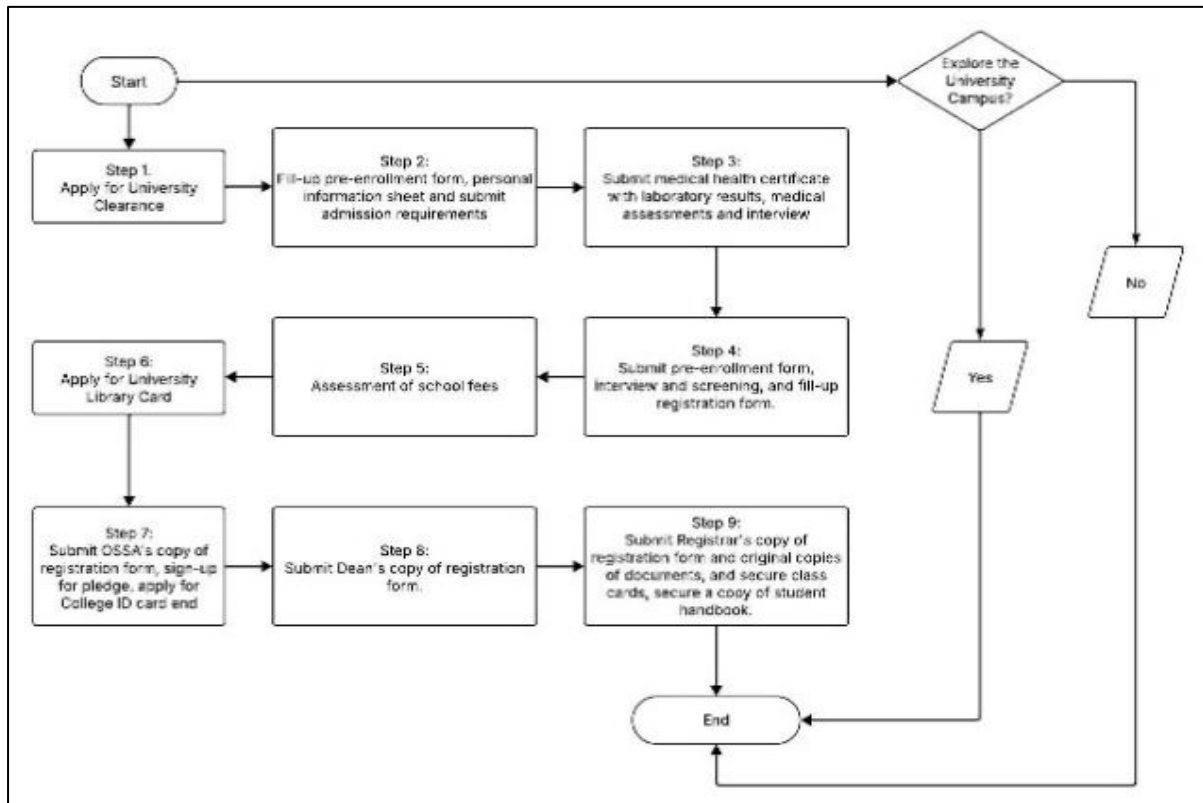
Capacity

Although the program was highly optimized. The researchers advised to terminate other programs such as web browser in order for the system to run lag-free and to prevent crashing in desktop. The system has a definite selection in running the program from ultra to low graphical settings in order to cater different computer systems according to their capacity. This researcher project was intended

for all the students and enrollees of all State University. This will help and guide the users of the program about the enrolment process of the institution. For interested students in the program, the researchers wanted to encourage to attend the orientation prior to the implementation.

Hierarchical Input-Process-Output

The chart below shows represent the step-by-step procedure of the Enrollment Process of One University (Singh & Gupta, 2019)



Design of the Software System

The system was specifically designed to be user-friendly to all kind of users. It was created with the intention showing the enrollment flow of CPSU in a visually clearer way through the use of modern technology. Further, it includes personal desktop computers and maximization on the use of unity computer aided.

Description of Prototype



Result and Discussion

This section presents the gathered recommendations conducted by the researchers for the implementation of the program. Findings of the application as assessed by the end-users were also discussed in this paper. The research project were subjected for evaluation primarily by the Bachelor of Information Technology Students and other students that are enrolled in the Central Philippines State University - Hinigaran Campus. The students evaluated and tested the program with the following criteria; Functionality, Design, and Effectiveness which were explained carefully for them to understand better about the program. The Likert Scale were used in rating the program with the following scale; 1-Poor; 2- Fair; 3-Good; 4-Very Good; 5-Excellent. In summary of result of the said conduct in terms of system capability in functionality, it were identified 4.06 mean Very Good. In terms of Design, it were

found out Very Good with the mean of 4.20. In addition, in terms of effectiveness the researcher found out Very Good with the mean of 4.43. Overall, the result of the evaluation concluded with the grand mean of 4.2 and identified very good.

SYSTEM CAPABILITIES	RESULT S THE EVALUATION	MEAN RATING	DISCRIPTIVE INTERPRETATION
Functionality		4.06	Very Good
Design		4.20	Very Good
Effectiveness		4.34	Very Good
GRAND MEAN		4.2	VERY GOOD

Functionality

To determine the applications functionalities whether it meets the user's satisfaction, the end-users were provided a questionnaire to rate the system. The results revealed that the end-users found out Very Good with the mean of 4.06. This explained that the users' satisfaction is significant in the assessment of the program and information system.

Table 4: Evaluation Results of the System's Functionality is Rated by the End-Users

INDICATORS	MEAN RATING	DESCRIPTIVE INTERPRETATION
1. I can fully understand how the system works.	4.24	Very Good
2. I can easily locate the buttons when I need to play or pause.	4.43	Very Good
3. I feel very comfortable of using it.	4.02	Very Good
4. I find the animation suitable to each presentation	4.02	Very Good
5. I am able to hear the narration clearly.	3.62	Good
TOTAL MEAN	4.06	Very Good

Design

Evaluation was essential to determine if the users like the program built-in features that suit them comfortably, especially with the design of the program user interface. Designs are very crucial for programs as it provides outer impression of what makes comfortable the users. With this statement, the researchers of the program intended to make use of their imagination in order to enhance and boost the face of the program. The result revealed that the end-users found very good with the mean of 4.15. This implied that the researchers design on program meets the expectation of the user.

Table 5: Evaluation Results of the System's design is Rated by the End-Users

INDICATORS	MEAN RATING	DESCRIPTIVE INTERPRETATION
1. The overall design of the system is pleasant to the eyes of the users.	4.49	Very Good
2. The background colors and figures in the system are suitable to the target users.	4.34	Very Good
3. Voices and sound effects are triggered on purpose.	3.62	Good
4. The placement of every step is well organized	4.08	Very Good
5. Text is organized using different types of sizes, colors and transitions	4.22	Very Good
TOTAL MEAN	4.15	Very Good

Effectiveness

The effectiveness of the program is significant in determining the applications necessary learning for the users. Based on the evaluation conducted results revealed that application is the best educational tool for students and enrollees in giving knowledge about the enrollment process of the university. the result revealed that the end-users found very good in terms of effectiveness with the mean 4.34. This only

implied that the system were fully recognized in the university specifically CPSU-Hinigaran. (Almeida & Santos, 2021) (Singh & Gupta, 2019)

Table 6: Evaluation Results of the System's Effectiveness as Rated by the End-Users

INDICATORS	MEAN RATING	DESCRIPTIVE INTERPRETATION
1. I have learned something in the system	4.25	Very Good
2. I found the lessons in the system accurate and precise.	4.3	Very Good
3. I am entertained	4.45	Very Good
4. I have enough to finish the enrollment procedures presentation conveniently.	4.25	Very Good
5. I find it easy and challenging to know more about the enrollment process.	4.48	Very Good
TOTAL MEAN	4.34	Very Good

Conclusion & Ethical Consideration

This passage effectively highlights the ethical standards and careful considerations essential to conducting responsible research. For novice researchers, the journey was often emotionally charged, with both excitement and anxiety playing a role. Hence, determination and a positive outlook can fuel the successful completion of the study. For structured approach, including regular face-to-face and online meetings with both team members and advisers, ensures transparency and alignment in understanding the study scope, research questions, and methodology. By addressing each component from entry strategies to methodological tools you emphasize not only thoroughness but also adaptability in navigating the research process.

Moreover, the emphasis on grasping essential research concepts and ethical standards were crucial for novice researchers. Recognizing the importance of confidentiality and anonymity safeguards respondent privacy, ensuring that personal

information and data remain protected. This practice not only reinforces ethical integrity but also mitigates potential conflicts of interest, building trust among researchers, respondents, and any associated parties. This approach promotes a respectful and ethical research environment that upholds the core values of academic integrity and professionalism.

Conflicts of Interest

The authors declare no conflict of interest in the conduct of this study. All stages of the research - including system development, data collection, analysis, and reporting - were carried out independently and without any financial, professional, or personal relationships that could influence or bias the results.

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