GRACEAN TAMBAYAN: A WEB APPLICATION FOR GRACE CHRISTIAN ACADEMY

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Abstract

Grace Christian Academy is a private school located at Baliwag, Bulacan they offer different academic levels from pre-kindergarten, elementary, and junior high school. The project consists of a website where the user can view what the school features and a virtual tour featuring the school.

Keyword: Virtual Reality

Our generation today is a world and lifestyle of endless possibilities, in this technological era the help of modern technology made a gradual transformation in our lives. Modern technology is simply an advancement of old technology, back then technology was less apparent; whereas today, technology is everywhere and is constantly growing and as time passes by, it has a more important role in people's daily lives. The impact of technology on modern life is unmeasurable; the internet, for instance. Internet access is a basic requirement of modern life. People around the globe relies on fast, reliable access to the internet for their job or personal uses.

With all the existing types and strategies of mobile and web application. Web applications are known to be any computer program that may perform specific functions by using a web browser. While mobile applications are specifically developed for smaller devices, such as smartphones and tablets, this contrasts to web applications which runs on desktop computers.

The main purpose of this project is to give the user the accessibility to tour Grace Christian Academy with the use of virtual reality. What makes the project unique is that the walk-through replaces the time-consuming process of touring multiple properties with a simple virtual reality experience and since virtual reality undergoes active development it is possible that the use of virtual reality experience in this tour will be a huge benefit for the school being more attractive to users. Not everyone in this current generation has a smartphone nor access to the internet, but majority of the people who has access to the internet and has a smartphone may have access to the application. With the use of their smartphones the user may put their phone on a head-mount display (HMD) to view the virtual reality tour, but if the user doesn't have an HMD the user still has the access to the virtual reality tour through a mobile or web application.

Objectives of the Study

This study aims to create a web and mobile application that shows the website of the school and the different facilities of Grace Christian Academy for users who prefer not to have a personal tour or are distant from the school.

Specific Objectives

The project aims to:

1. Develop a virtual reality tour that views Grace Christian Academy through a mobile or web application that is connected to the website.
2. Develop a responsive website with virtual reality tour for both mobile and web applications.
3. Provide the right information about the school. Present the school through the reality-like environment and a video presentation.
4. To feel the school through telepresence.

Significance of the Study

Students – the users could have a view of the school with semi-immersive and desktop virtual reality through mobile and web applications.

School – this project benefits the school because it may attract more students for Grace Christian Academy. It may also provide an overview of the different facilities of the school.

For Future Developers – this study may be used as a reference for the future developer. This study will provide ideas on how to create and improve a responsive website that has an embedded semi-immersive virtual reality walk-through for both mobile and web applications.

Scopes and Limitations of the Study

The project covers a website presenting the school and virtual tourrepresentation of Grace Christian Academy, this project gives the user access to the website through their own device (desktop, laptop, tablet, or smartphone) that provides the information of the school and a virtual walk-through of the school, which allows the user to move around and see the different facilities within the school.

The limitations of the project show that the virtual tour features the highlighted and accessible facilities which were shown of the virtual reality tour, some offices, inappropriate rooms (CR's), non-accessible areas (storage rooms), and facilities that the proponents weren't granted permission to access are not shown in the virtual tour, also the virtual tour lacks function for Bluetooth gamepad and touch-to-move controls.

Definition of Terms

360° Panoramic images. It is a panoramic image

that surrounds the original point from which the shot was taken, it simulates being in the shoes of the photographer and looking around as desired.

Architecture Visualization (ArchViz). This is the process of computer generated visualization of any structure showing how it will look like.

Desktop Virtual Reality. This refers to 3D format that is displayed on screen (as opposed to immersive virtual reality).

Game Engine. This is a software development tool that is designed to build video games.

Tambayan. This refers to a place where people hangout.

Head Mount Device (HMD). This is a display device, worn on the head or as part of a helmet.

Immersion. It refers to the act of diving into another (virtual) world.

Immersive reality. It is the presentation of an artificial environment that replaces users' real-world surroundings convincingly enough that they are able to suspend disbelief and fully engage with the created environment.

Mobile application. It is asoftware application developed specifically for use on small, wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers.

Semi-immersive Virtual Reality. It is a virtual reality system that affects 2 to 3 sensory systems.

Telepresence. This refers to a set of technologies

which allow a person to feel as if they were present.

Virtual Reality. It is an interactive computer-generated experience taking place within a simulated environment, that incorporates auditory, visual, haptic, and other types of sensory feedback.

Web application. It is a client–server computer program which the client (including the user interface and client-side logic) runs in a web browser.

Related Literature and Systems

"Baliuag University ITB Virtual Reality Tour: A Mobile Application" is a capstone project that gives a virtual reality tour in the Information Technology Building in Baliuag University using a virtual box and a controller. The said project is a walkthrough virtual reality where you can go to rooms in the different floors and have a quick view to the interior and objects inside the areas." **(P. Carillo, F. Bautista, D. Ting, A. Ngo, October 2016)**

The two projects, "Baliuag University ITB Virtual Reality Tour: A Mobile Application" and "Gracean Tambayan: A Web Application for Grace Christian Academy with Virtual Tour" are both applications that promotes a school through the use of virtual reality. What differentiates the project is that Baliuag University ITB Virtual Reality Tour is a mobile application where the user needs to download the application to view the virtual reality tour unlike Gracean Tambayan which is a school website where the virtual reality tour may be found, which gives the user the ability to view the application through an internet browser using a smartphone, tablet, or desktop.

"Web and Mobile App for ABRU Beach Front Resort" is a commercial website that includes a 3D virtual reality walkthrough of the resort. It promotes the whole package that the resort offers and handles transactions between the

clients and the admin/owner.

In additional twist for the website, it has a virtual reality experience tour for the clients who want to take a quick view of the place to give them the idea of what they can get when they come to the resort." **(N. Toribio, R. Nagayo, S. Romero, A. Marantan, 2017)**

The proposed project is similar to "Web and Mobile App for ABRU Beach Front Resort" because both websites has a virtual reality tour used to advertise a certain place. Although both websites has a virtual reality tour it differs from the proposed project by the virtual reality tour itself. "Web and Mobile App for ABRU Beach Front Resort," created their virtual reality tour with 180° panoramic images to present the resort, while the proponents created a 3D version of the school, combined with 360° panoramic images, and video presentations to present the school.

Technical Background

The web application was programmed and developed in a hardware with specifications of AMD E2-6110 APU with AMD Radeon R2 Graphics Processor 4.0 GB (ram memory) of memory and a 12 GB dedicated memory in using A-Frame, Blender and SketchUp.

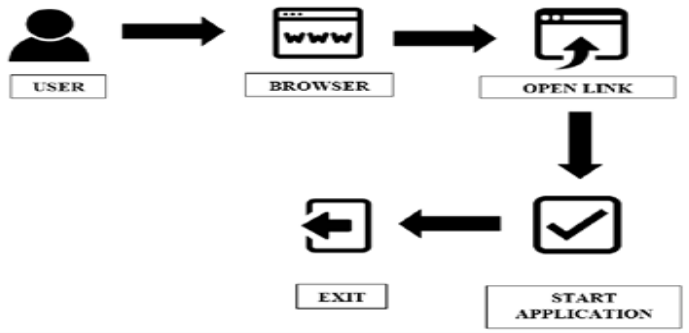


Figure1. WorkFlow Diagram

During the process of creating this program, Material design for Bootstrap is used to give the website a professional minimalist look to the website, Notepad++ was used to code the website with HTML, CSS, PHP, and JavaScript. XAMPP is used for the database of their website, phpMyAdmin. A-Frame is used to create the virtual reality experience with the help of Blender to render and give environment's details, as well as creating the structures of the buildings in Grace Christian Academy by using SketchUp. The proponents programmed the visual interface and the controls for the user with the use of HTML and entity-component.

The facilities of Grace Christian Academy can be viewed by using the web application so that the users will know how well and accommodating the school facilities are. This will help Grace Christian Academy in promoting, encouraging and advertise to their students and prospective students.

Methodology

Concept

The user may search for the website in a search engine with the domain name of the school's website. The website consists of the school's information, and pictures about their activities. The virtual reality tour consists a 3D environment of the school and 360° panoramic images for offices of the school. The virtual reality tour also includes videos featuring the physical appearance of the

Analysis

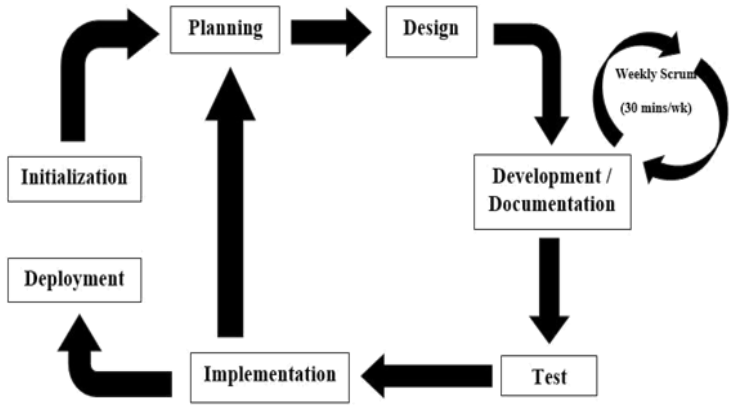
Grace Christian Academy's source of promotion is through Facebook advertisements and their Facebook page. The proponents gained the idea to create this project to advertise the school and to increase its marketing strategy.

The proponents thought that it would be a unique feature to attract new students or transferees at Grace Christian Academy. They created a website with virtual reality tour where the user can view the school.

Design

In designing, the proponents used SketchUp Pro 2018 for the three-dimensional perspective view of the university, A-Frame for creating the WebVR, Sony Vegas Pro 15 for the video editing, Blender for rendering and animating the virtual reality tour, Adobe Photoshop CS6 for the photo editing, Blender for the icons, and Bootstrap Material Design to create a user-friendly website which is an addition to the hard-codes design made in Notepad++ with HTML, CSS, and JavaScript.

Data Gathering



During the gathering of information for this project the proponents interviewed the administrator of Grace Christian Academy, Enrique T. Hernandez, about the history of the school and other information that will be included in the website.

For the virtual reality tour, the proponents used actual measurements for the 3D structure of the school.

Development Model

Scrum development process is known to be the most popular agile methodologies to date. This is an agile way to manage a project. The scrum development process involves breaking down the projects progress via a series of sprints; breaking down the development of a web and mobile application into a smaller module. This development process relies on a self-organizing team, meaning to say issues are divided by the team as a whole because there is no overall team leader who would decides which person will do a problem to solved or task. Though there may be a scrum master in the team, the scrum master is there only to coach the team and deeply understands the work being done by the team and can help optimize their delivery flow. This development process is favorable and efficient for the development of the mobile and web application.

Software Development Tools

In developing the web application, the proponents used Bootstrap Material Design for designing the website, HTML, CSS, and JavaScript for the codes of the website.

In creating the virtual reality tour, the proponents used A-Frame, overall terrains, and codes, SketchUp Pro 2018 for the 3D perspective of the Grace Christian Academy itself, and Blender was used for the buttons for the user to select.

Results and Discussion

CRITERIA	E	V	G	F	P	Mean
I. Website Design						
1. Is the website design consistent throughout the website?	38	41	20	0	1	4.15

Continuation

CRITERIA	E	V	G	F	P	Mean
2. The videos and pictures are high definition.	32	44	18	5	1	4.01
Ease of Use						
3. The website responses well to the user's device (desktop, tablet, or smartphone).	31	44	24	1	0	4.04
4. Is the website user-friendly?	33	43	23	1	0	4.07
Functionality						
5. Does the information support the purpose of the site?	35	41	21	3	0	4.08
II. Virtual Reality Tour						
6. The VR tour runs smoothly and is easy to use.	34	45	20	0	1	4.11
7. The 3D environment structure is clear	31	42	21	5	1	3.97
8. The VR tour is realistic.	31	44	24	1	0	4.04
9. The compatibility to the user's device (desktop, tablet, or smartphone)	32	43	25	0	0	4.07
10. The VR tour helps the user to navigate around the building.	36	42	19	3	0	4.11
Grand Mean						**4.07**

The grand mean of 4.07 indicates that the website design, ease of use, functionality, and virtual reality tour is acceptable.

Discussion

According to Table 3, the evaluation was divided in to two parts, the website and the virtual reality tour. The design of the website has been evaluated, 70% of the respondents said that the design was excellent, 85% said it was very good, 38% said it was good 5% said it was fair, and 2% said it was poor. The overall result of the design, the respondents like the user interface of the website of Grace Christian Academy.

In ease of use, 64%answered that it was excellent, 87% said it was very good, 47% said it was good, 2% said it was fair, and no one said it was poor. The response from the respondents was very good for the ease of use of Grace Christian Academy's website.

For the functionality of the website, 35% answered that it was excellent, 41% said it was very good, 21% said it was good, 3% said it was fair, and none said it was poor. The response to the
functionality of the website shows that the information does support the purpose of the website.

Likewise, the other half of the evaluation which is the virtual reality tour was also evaluated by the respondents where 64% answered that it was excellent, 74% said it was very good, 90% said it was good, 9% said it was fair, and 2% said it was poor.

Conclusion

Based on the results of the evaluation, the proponents therefore conclude the following:

1. The design of the website is consistent, and its content is high quality.
2. The website responds well to the user's device.
3. The information does support the purpose of the website.
4. The virtual reality tour is compatible, realistic, and clear.

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