How the Mixed Reality Effects the Modern Education System

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Abstract - *Mixed Reality Technology, one of the emerging technologies can be defined in simple words as the combination of the Virtual reality technology (VR) and Augmented reality Technology (AR). The main purpose of this project was to create an application that would provide a real-life experience in a physical space. This environment would help the students to not just gain knowledge but also learn about things in deep and get better understanding. Also, it would enable users to navigate through the real and virtual world at the same time. Instead of replacing the real world mixed enhances it, offering access to digital information on top of the world in front of us, through the VR headsets and VR gears. But again, only a small population owns these kinds of gadgets, but today almost everyone has a Smartphone, which is enough to experience the mixed reality application features. The focus is put on some opportunities, challenges and dead ends of implementation faced by the existing system. At this point of time virtual reality could be the future of creative learning, however it has it limits in terms of practical experiments, learning by doing, which is still more effective as virtual ones and this would be the main aim and concern.*

Key Words: Virtual reality, Augmented reality, VR headsets, VR gears, Mixed Reality.

1. INTRODUCTION

Education has changed its forms, from books, pencils and pens to the use of interactive technologies to help impart knowledge and understanding. E-learning technology can't solve all problems that exist in traditional education although it improved traditional teaching techniques. E-learning platform in combination with technologies such as information, multimedia alters the traditional learning style and learning environment. Teachers can give a lecture at any time and from anywhere. E-learning changes the relationship between teachers and students in traditional education and provides a platform for students and teachers to communicate and have a better learning.

Figure -1: Various AR Devices

2. Literature Review

Here are few research papers on the related domain which consists the description of the respective system and the drawbacks:

Marios M. Giakalaras (2020), The author here wants to convey that the Graphics, advanced AI, challenging scenarios and improved gameplay were the first things that someone would look into to find what makes a game addictive. Bringing new factor into an already developed gaming world is a good aspect for the coming future of gaming. Giving the player new experience and new options is surely awesome, given the fact that players are ready to embrace a new way of experiencing videogames. The author has doubts whether the world is ready for such videogames as there have been a number of accidents in the past due these games mainly pointing out Pokémon go. The main drawback in the paper was that it was theoretical and there has nothing is practically tested.

Hou Dou and Jiro Tanaka (2020) , The authors want the users about the how important is the environment for consumer shopping. In-store features such as store set-up, design, music and store employee are the attributes of customers shopping experience. However, the current online shop system lacks environment information and in-store characteristics, which are very important for consumers shopping experience.

Adrian H. Hoppe, Leon Kaucher, Florian van de Camp (2020), The authors highlight about the various advantages that the MR devices offer. e.g. simulation, communication or training purposes. Local multiple user applications like Beat Saber allow users to engage with virtual worlds simultaneously, while being in the same physical space. A shared synchronized system is necessary for this association.

However, current mixed reality mediums do not offer a standard way to compute multiple devices.

3. Proposed System

Usability and effectiveness were the two main quality attributes. The standard definition for usability is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. Effectiveness is defined as: the accuracy and complete-ness with which users achieve specified goals. The other major objectives of the proposed work is to enhance students to learn and take-in information, To use the 3D projections and simulated based learning, To interact and manipulate objects to attain real world experience, To provide extremely content related information in physical space
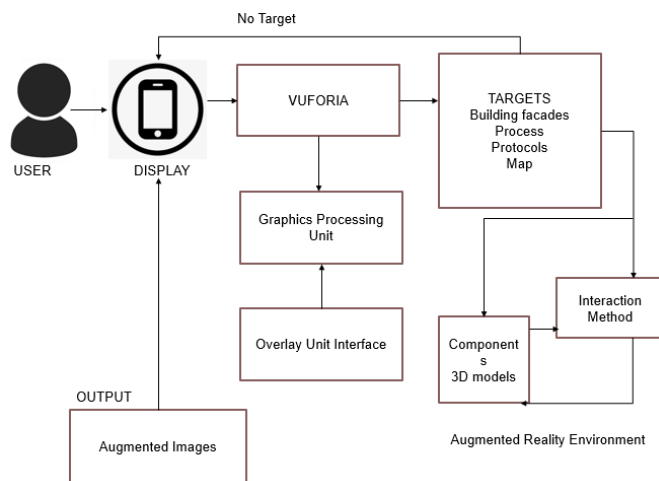

Figure -2: General Architecture of the proposed System

3.1 Proposed Algorithm

Step 1) Start.
Step 2) Get a development license key from the Vuforia developer portal.
Step 3) Create and add a new dataset from the Vuforia portal
Step 4) Download the Vuforia package for unity.
Step 5) Import the dataset and packages in the new project of the unity editor.
Step 6) Assign the prefab 3d models and position them accordingly and code for the moving camera.
Step 7) Build settings and switch platform for the respective device and create the apk.
Step 8) Run the app
Step 9) Stop.

4. Result Analysis

The implementation of this application includes three main software components, that is Vuforia developer portal for the backend design, the unity editor which was where the frontend design took place where all the essential packages and datasets were imported as per the requirement and for the scripting of the camera movement and controller, C# was used.

The backend design consists of license manager and target manager. The license manager is responsible for providing a unique key which later was used by the unity editor for identification, and then the target manager which is responsible for creating a database which also was imported into the unity editor. That Image Targets are affected by sleekness and reflections from lighting sources. To create the best experience, the Image Target should be viewed under moderately bright and evenly distributed lighting. Image Targets can be created using JPG or PNG images in RGB or grayscale. The size of the input images must be maximum 2.25 MB and have a minimum width of 320 pixels.
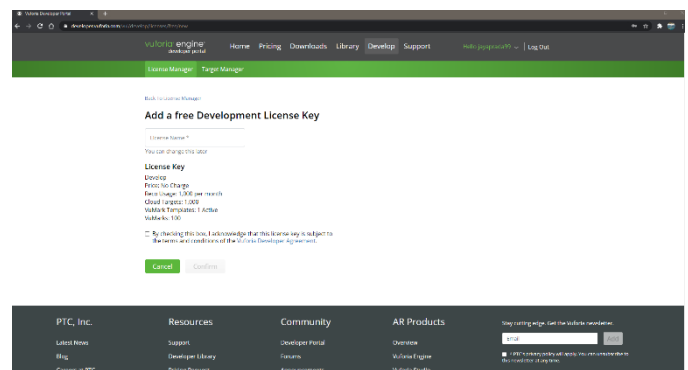

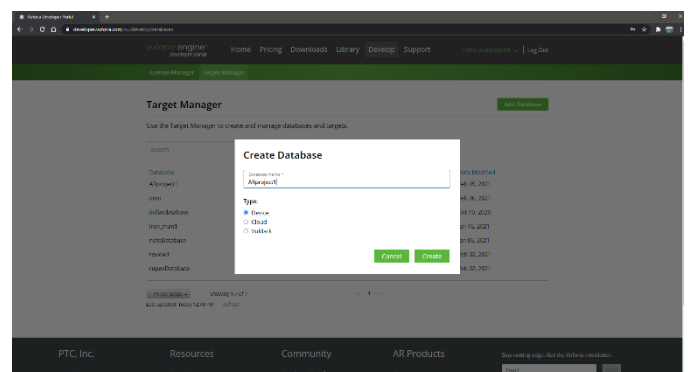**Figure -3: Adding of the Development License key**

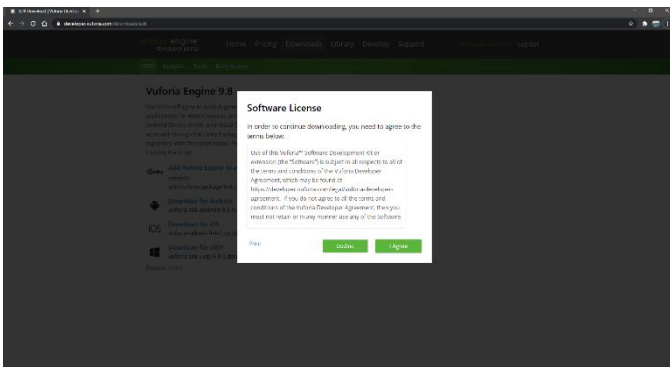**Figure -4: Creating and Adding the database**

Figure -5: Adding Vuforia package for Unity Project.

The frontend part includes the unity3d editor and C# scripting. Unity editor platform allows quick editing and iteration in your development cycles, with real-time samples of the work. It enables the user to create 2D or 3D scenes, animations or cinematics directly.

Scripting is a very part of creating even the simplest of games. These small pieces of code work together to do all sorts of things: From moving a character around the screen to keeping track of your archive. Game developers use C# scripting in Unity.
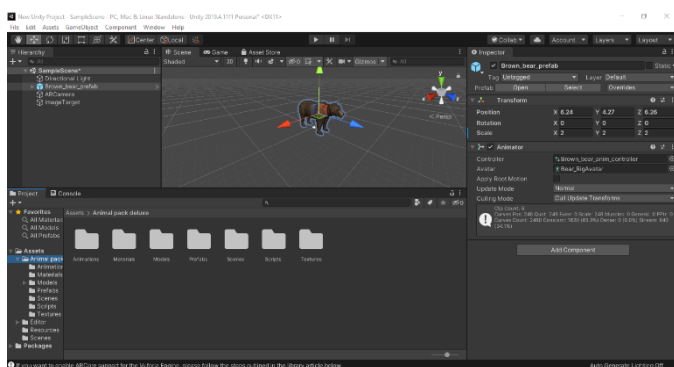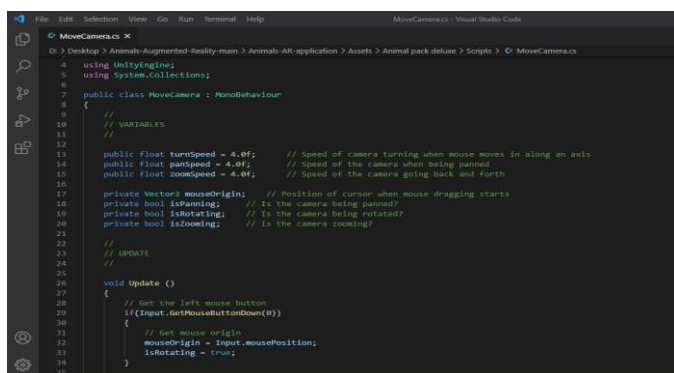

Fig -6: Model in Unity Editor.

Fig -7: Coding for moving camera.

Fig -8: Working model of the application.

5. CONCLUSION

The goal of this project was to provide a platform where the learning experience would get more interesting and more attentive. As the technology is evolving everyday in every field an AR application would be one of them through its less cost efficient and more reliable techniques this would in near future could really be seen as an asset.

6. Future Scope

The project could be further developed for various other fields such as medical, entertainment, military and so on. Using the 3d models for various such objects such as the anatomy of human body, missiles, guns or other military equipment etc. Not just using the technologies mentioned above such as Vuforia portal and unity 3d there are many more components available for building the AR app.

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