

Training Junior Doctor's Using VR

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Introduction:

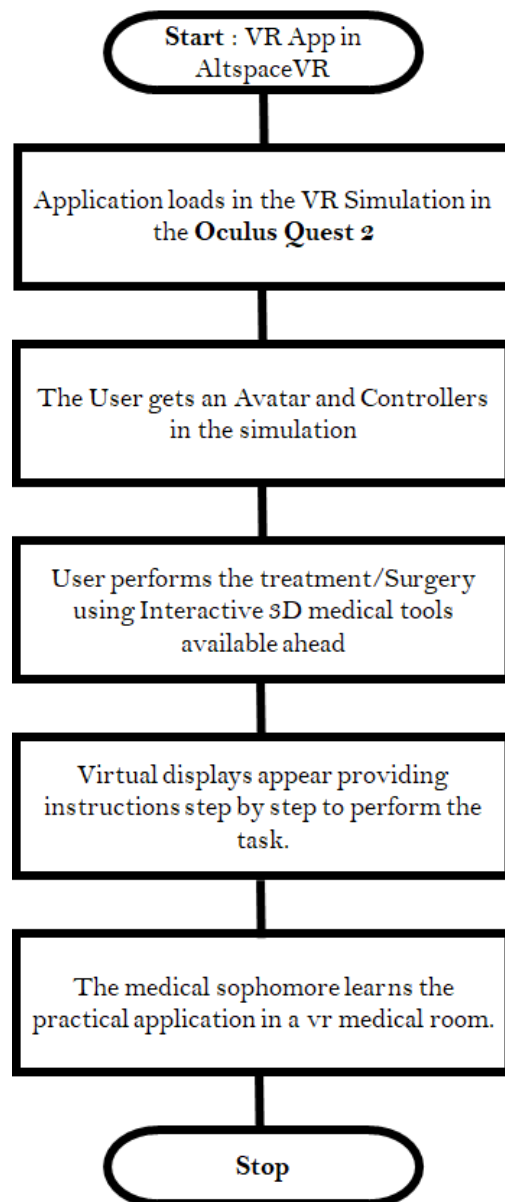
- Researches have stated that people remember 80% of what they see, as human brain process visuals better. As Virtual Reality simulations comprises visuals completely with the feature of interactivity giving realistic experience, hence it effects on retention and understanding capability of students in a greater impact.
- This project provides advance technology in medical education system, and aims to reach numerous disciples of learning in an interesting and engaging way.
- The **Virtual medical room** is designed using certain 3D Modeling software's, developed in Unity 3D and implemented on Oculus Quest 2(an advanced standalone virtual reality HMD).
- Medical trainings are generally carried out in real world, hence which have got a break or inconvenience to be done during pandemic. Hence an application which lets an individual learn at self-pace with instructions is a great way to enhance traditional learning methods.
- And this project shall serve not just in growth of learning methods in medical disciple but also for the growth of the most increasing technology "**Virtual Reality**" in the country.

Objectives:

- Aiming to explore various different, interesting and interactive ways to implement the virtual reality based supplementing methods in education and growth.
- By making use of the most emerging technology, it also serves in educating people of its usage and future with VR, in addition to being a great way to let people reach their institutions virtually amidst the Pandemic.
- Specific to our project, letting sommophores with respect to medical field learn practically during this period, gives it a perfect reason of being one of many advantages in the Covid era.
- Develop a supplementing method to be implemented in training and education system in the discipline of medical studies.
- Exploring and researching a developing and currently one of the most emerging technology, **the Virtual Reality**.
- Implement the project to enhance the learning-by-doing method for remarkable results.

Methodology:

- In the development of the project various technologies like 3D Modeling, Unity 3D, C#, and few related SDK's and APIs like Android SDK, Oculus Integration, ProBuilder, etc are used for developing a Realtime immersive VR simulation.
- And on the Hardware end, a standalone VR Headset with controllers and link cables are being used.
- The Simulation content is developed on a moderate specification holding PC and deployed on a standalone headset through the link cable.
- For the deployment purpose a test app is created in the AppLab on the oculus developer's portal through which the created application gains a unique App ID.
- Further the app is pushed on the VR HMD device through a supportable link cable to be view the developed simulation in the standalone VR Headset (HMD+Controllers).



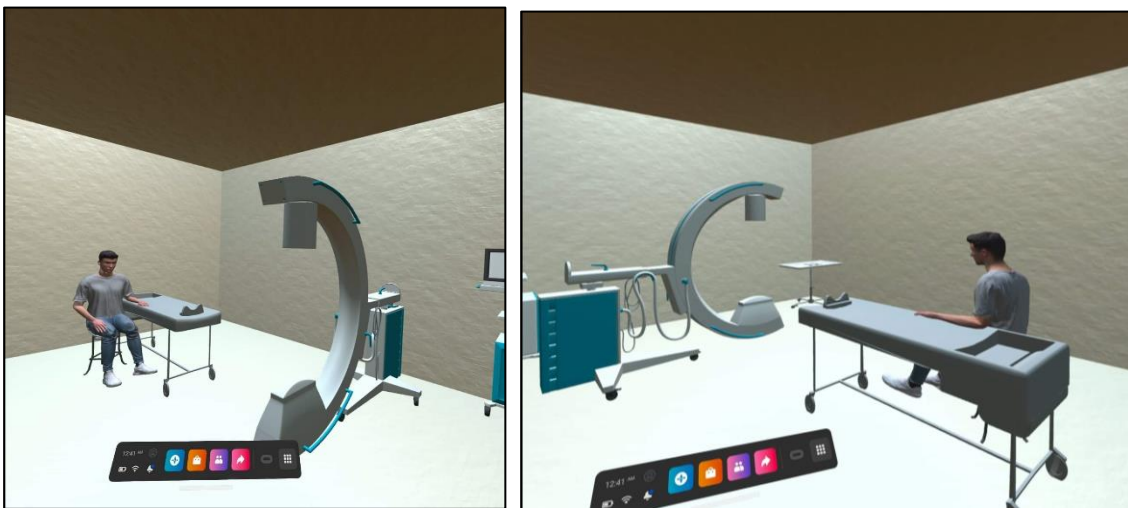
Flow chart of the Project outcome

Implementation:

The development was clearly done following the above design flow using the listed requirements. Steps on the way of implementation are as follows:

- Gather software and hardware resources, which includes software installations, hardware availability and setup.
- Draw out the structure of the virtual environment representing the real training room scenario.
- Place the 3D models following the right co-ordinates which suites the best to match a real-life simulation.
- Implement the planned mechanism to enhance the usability of the application using the scripted language.
- Deploy on an HMD to test the results and experience the immersive and interactive Virtual Reality (VR) simulation.

Results:



A 3D Environment encompassing the **radiography laboratory** with its medical equipments were received as an outcome to the VR application deployed on an advance standalone virtual reality headset with controllers.

Steps to perform the diagnostic task was much more understandable than compared to theoretical steps being read. The patient's diagnosis, method of performing, results and the overall procedure was practiced to fulfil the radiography procedure practices, which was done with a facilitate real environment of the student's place remotely.

Conclusion:

In this project a virtual reality training application for medical students is presented which is designed and developed to enhance the traditional learning methods and acquire experimental learning.

- In order to provide flexibilities and self-learning opportunities to students in a remote setting in addition to optimized time, cost and efforts for medical institutions to setup the physical simulation for practicing purposes is also achieved.

- The research and development showed that the requirement of such technology aspects of interaction and guidance in a learning-by-doing method of education giving a real-life experience at a personal space holds a huge amount of scope to be implemented further with a wide array of disciplines to work on, specifically in the field of medical education.

Future Scope:

As a part of future work to this project, we can research and implement different concepts of medical training, from basic simple anatomy to advance surgical procedures, from clinical disinfection process to other forms of radiography giving us a whole new tray of inventions to be clubbed under a single VR application, in which each concept has its own simulation designed accordingly. Such an application holds a scope to cover an entire educational curriculum of medical institutions providing ease of method and also making the Virtual Reality Technology to be one of the most emerging.