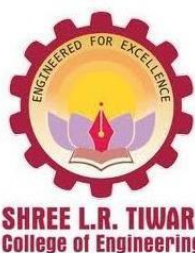


Mini Project Report on

“EDUCATION WITH XR(EXTENDED REALITY)”

- 1. SUMIT SINGH (61)**
- 2. SHREERAJ SANGLE(57)**
- 3. SUNIDHI VISHWAKARMA(66)**

UNDER GUIDANCE OF
DR. SHEETAL MAHADIK



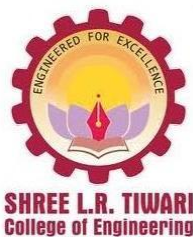
**DEPARTMENT OF ELECTRONICS AND COMPUTER SCIENCE
ENGINEERING**

SHREE L. R. TIWARI COLLEGE OF ENGINEERING,

KANAKIA PARK, MIRA ROAD (E) – 401 107

UNIVERSITY OF MUMBAI

Academic Year 2022–2023



CERTIFICATE

This is to certify that the requirements for the Mini Project entitled “**EDUCATION WITH XR(EXTENDED REALITY)**” have been successfully completed by following T.E. ECS students.

- 1. SUMIT SINGH (61)**
- 2. SHREERAJ SANGLE(57)**
- 3. SUNIDHI VISHWAKARMA(66)**

in partial fulfillment of Mumbai University in the Department of Electronics and Computer Science Engineering, Shree L. R. Tiwari College of Engineering, Mira Road (E) – 401107 for Academic year 2022 - 2023.

Internal Examiner

External Examiner

HOD
(ECS/ETRX Department)

PRINCIPAL
Shree. L.R. Tiwari College Of Engineering

ACKNOWLEDGEMENT

Special thanks to our Guide ***Dr. Sheetal Mahadik*** for assisting us to partially complete our Mini Project on ***“EDUCATION WITH XR(EXTENDED REALITY)”***.

Her expertise and talent in designing and troubleshooting projects helped us effectively to partially complete this project.

We'd like to express our gratitude to ***Dr. Sheetal Mahadik*** Madam, our Project Coordinator (Mini Project), for guiding us through the process to fulfil Mumbai University's Mini Project requirements.

Special thanks to Head of Department ***Mrs. Manjiri M. Gogate*** madam for her constant motivation, without which this work would not have become successful.

We are also thankful to our Principal ***Dr. Deven Shah*** sir for his continuous encouragement throughout the process.

We would also like to thank our **Electronics and Computer Science Engineering Department** for providing us online/offline facility and labs, which helped us constantly in increasing our technical knowledge, and to write this report.

INDEX

SR. NO.	CONTENT	PAGE NO.
1.	ABSTRACT	5
2.	INTRODUCTION Objective	6 7
3.	SOFTWARE SCHEME	8
4.	USE CASE DIAGRAM	9
5.	FLOWCHART Blueprint	10 11
6.	RESULT	12
7.	APPLICATION AND FUTURE SCOPES	14
8.	CONCLUSION	15
9.	REFERENCES	16

ABSTRACT

The education industry has been allegedly quite slow to embrace new technologies. While other fields have started climbing up the ladders using technological aids, it feels like education being the base of predominantly every other sector needs to consider a boost as well. Technology in the field of education can influence students to learn actively and can motivate them, leading to an effective process of learning. Some types of research have recognized the problem that technology in education will lead to a passive learning process if the technology used does not encourage critical thinking, meaning-making or metacognition. Working more upon these concerns, a certain kind of technology, namely XR-a combination of Augmented and Virtual Reality, AR and VR respectively has shown to have a good perspective in making the learning process more active, understandable and meaningful. This is primarily because AR works to bring an interactive experience of a real-world environment and VR works to simulate a completely different interactive graphical environment. In a nutshell, both these technologies crave to bring us a digital interactive experience. AR and VR can allow students to practically understand concepts digitally that cannot be done using traditional methods. For instance, using Microsoft Hololens, students can build virtual mechanical devices, robots and make them work without having physical appliances. They can go on a space-trip to understand astronomy better or swim into the oceans to understand marine-biology more practically. While the best thing here is this can be done without actually going out of the classroom.

INTRODUCTION

Virtual Reality is a replica of an environment that simulates a physical presence in the real or virtual world, allowing users to interact in that virtual world. Digital screens such as a television (TV) or a deeply immersive head-mounted display (HMD) device can render VR experiences. The first HMD was created in 1968 by Ivan Sutherland. HMDs enable a stereoscopic, 360-degree visual of the environment. Currently, the most popular HMDs are Oculus Rift and the much more economical option, the Google Cardboard. Augmented Reality (AR) is a form of virtual reality where the real-world is enhanced through virtual elements by adding them to the view of the real world using a display device. AR devices consist of a display, sensor, processor, and input device. The display device could again be a TV, HMD, computer screen, or even devices as sophisticated and compact as eyeglasses or contact lenses. Mixed reality is merging the real and virtual worlds in a process to produce a new environment with virtual and realworld objects that can co-exist and interact with each other in real-time. Mixed Reality (MR) can be visualized as a continuum or a spectrum where, depending on the amount of virtuality or reality in the environment, we can classify it as being partly in the real world or entirely in the virtual world. Extended Reality (XR) is a broader term which encapsulates everything from AR to VR. The most relevant applications of XR in today's date are in the Engineering, Entertainment, and Healthcare industries, and as covered in more detail in this paper, the Education industry. We are presenting education with the help of extended reality. Extended reality or XR, is a collective term that refers to immersive technologies, including virtual reality, augmented reality and mixed reality. The purpose of this XR application is to create a simulated learning environment where learners can complete realistic interactions with objects and people. With the help of this XR application we will be able to help students to understand difficult concept easily and in a more better long lasting and interactive format.

OBJECTIVE

The XR application aims to provide learners with an interactive way to learn concepts with the help of virtual reality and augmented reality. The objective of the project are:-

- The objective is to provide educating industries with low cost and high performance XR application.
- One of our objectives is to provide students and learners an immersive learning experience.
- The final objective of our application is to help learners/students the ability to travel anywhere virtually.

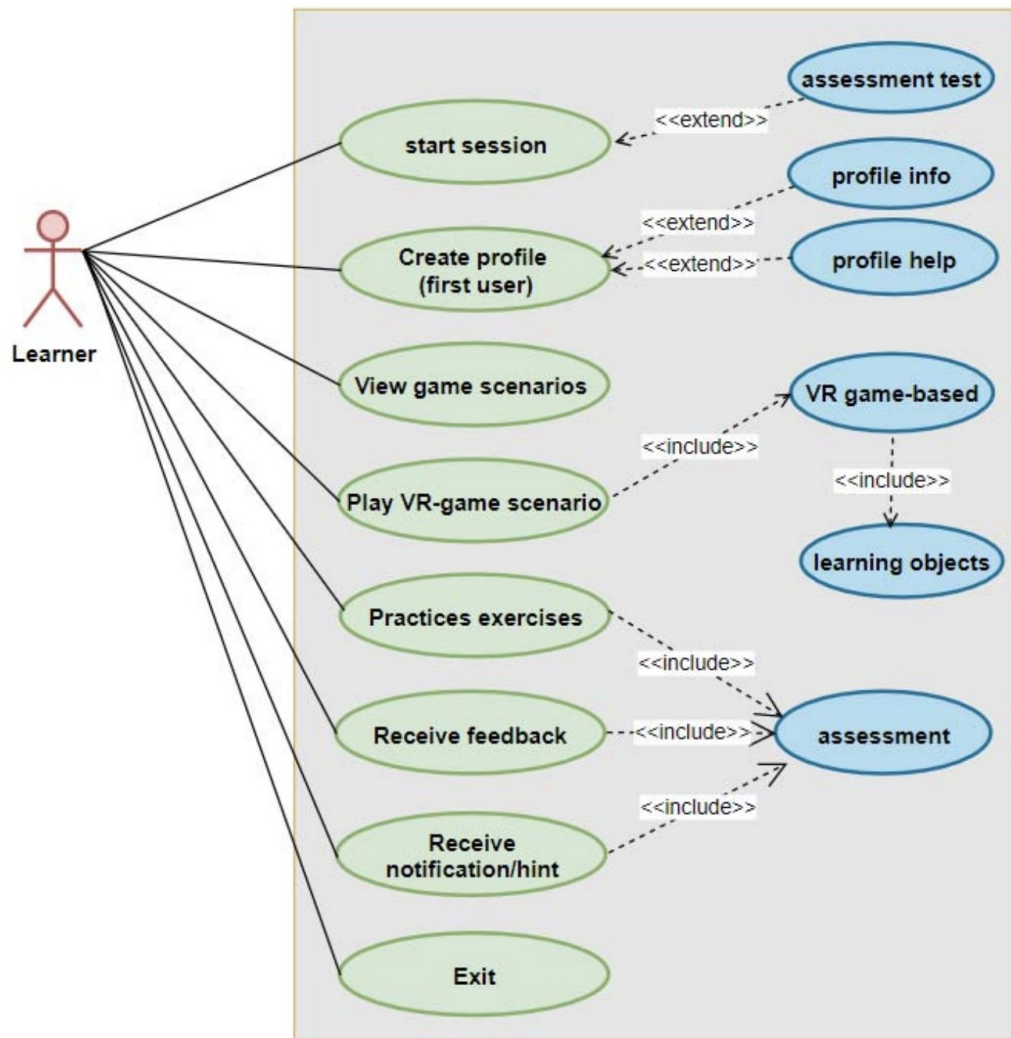
SOFTWARE SCHEME

This Project is made using :

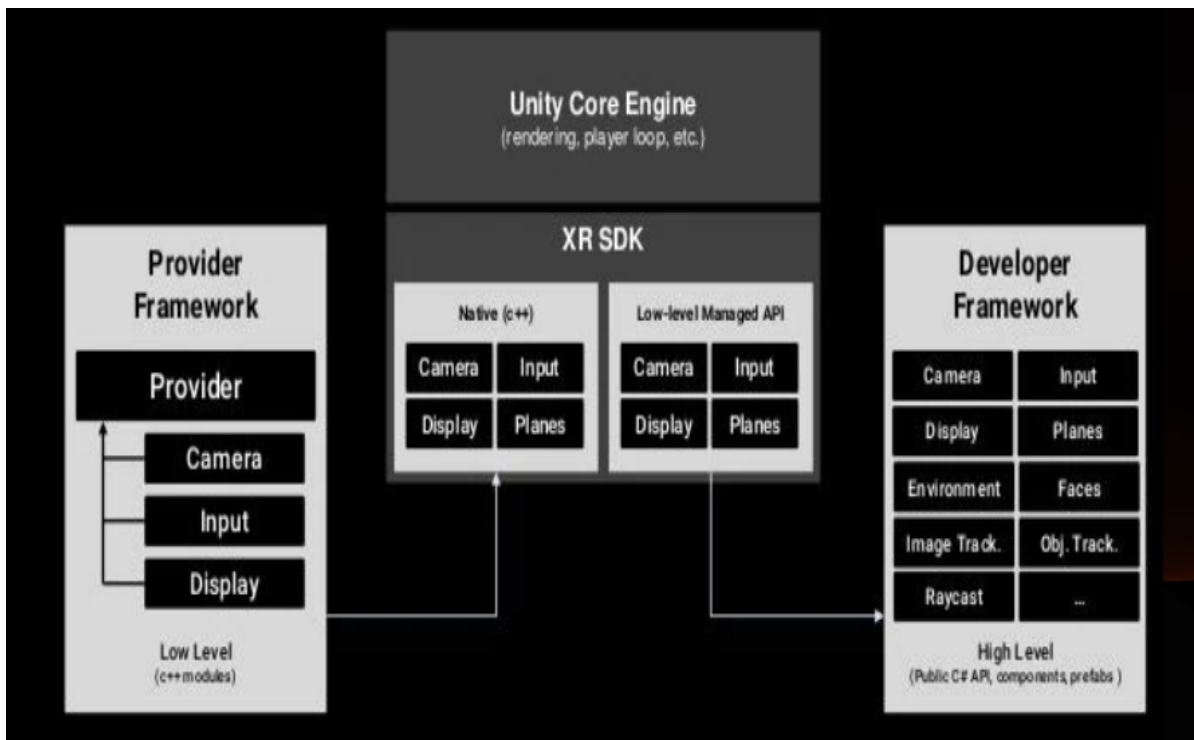
- Unreal engine
- Unity engine
- Amazon AWS
- Android Studio
- Visual Studio

- 1) Unreal Engine is the world's most open and advanced real-time 3D creation tool for photoreal visuals and immersive experiences.
- 2) We are using Unity Engine to Create Mobile AR Projects as it gives a much easier UI to work with.
- 3) Amazon Web Services, Inc. is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis. These cloud computing web services provide distributed computing processing capacity and software tools via AWS server farms.
- 4) Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems.
- 5) Visual Studio is an integrated development environment from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps.

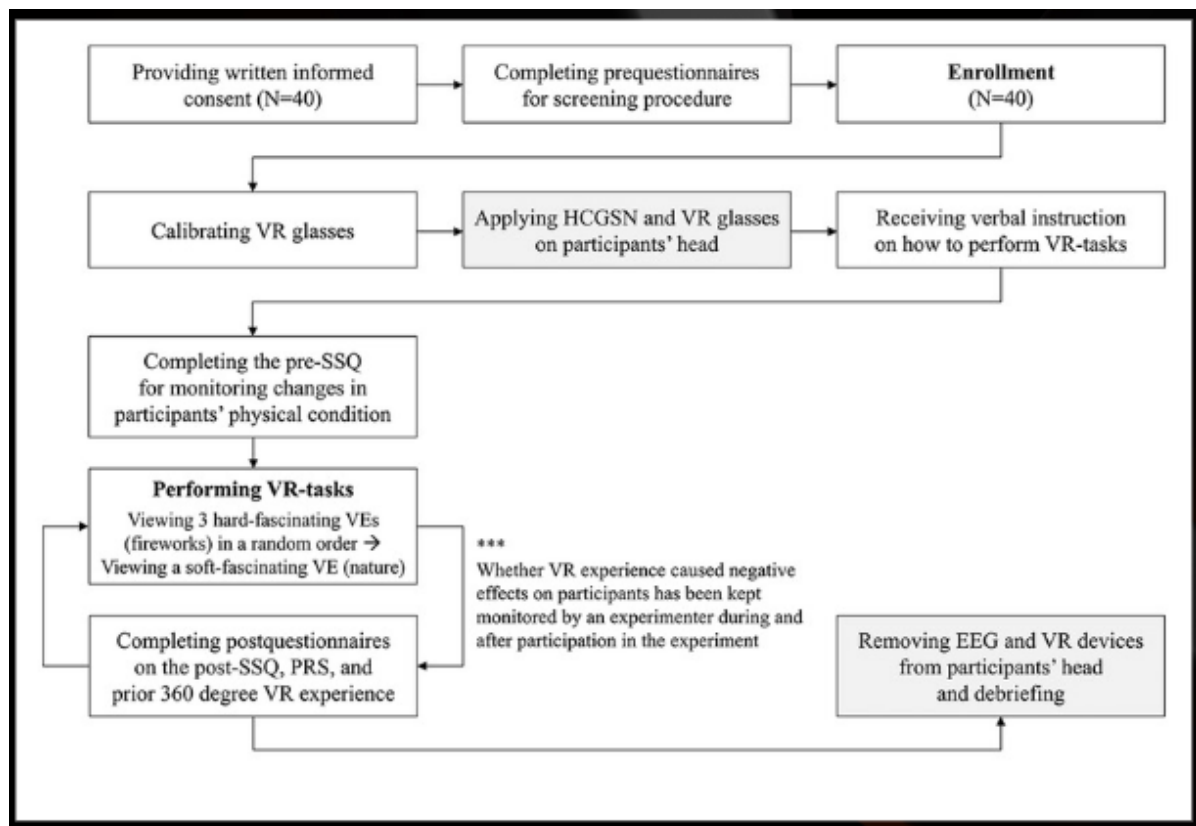
USE CASE DIAGRAM



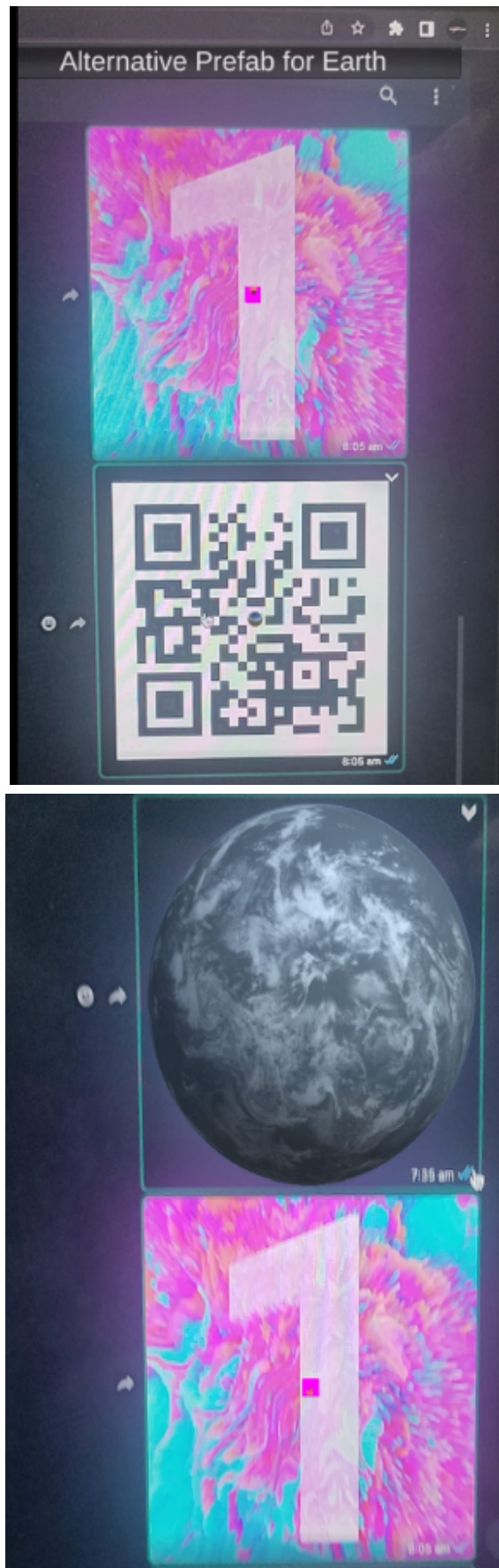
FLOW CHART



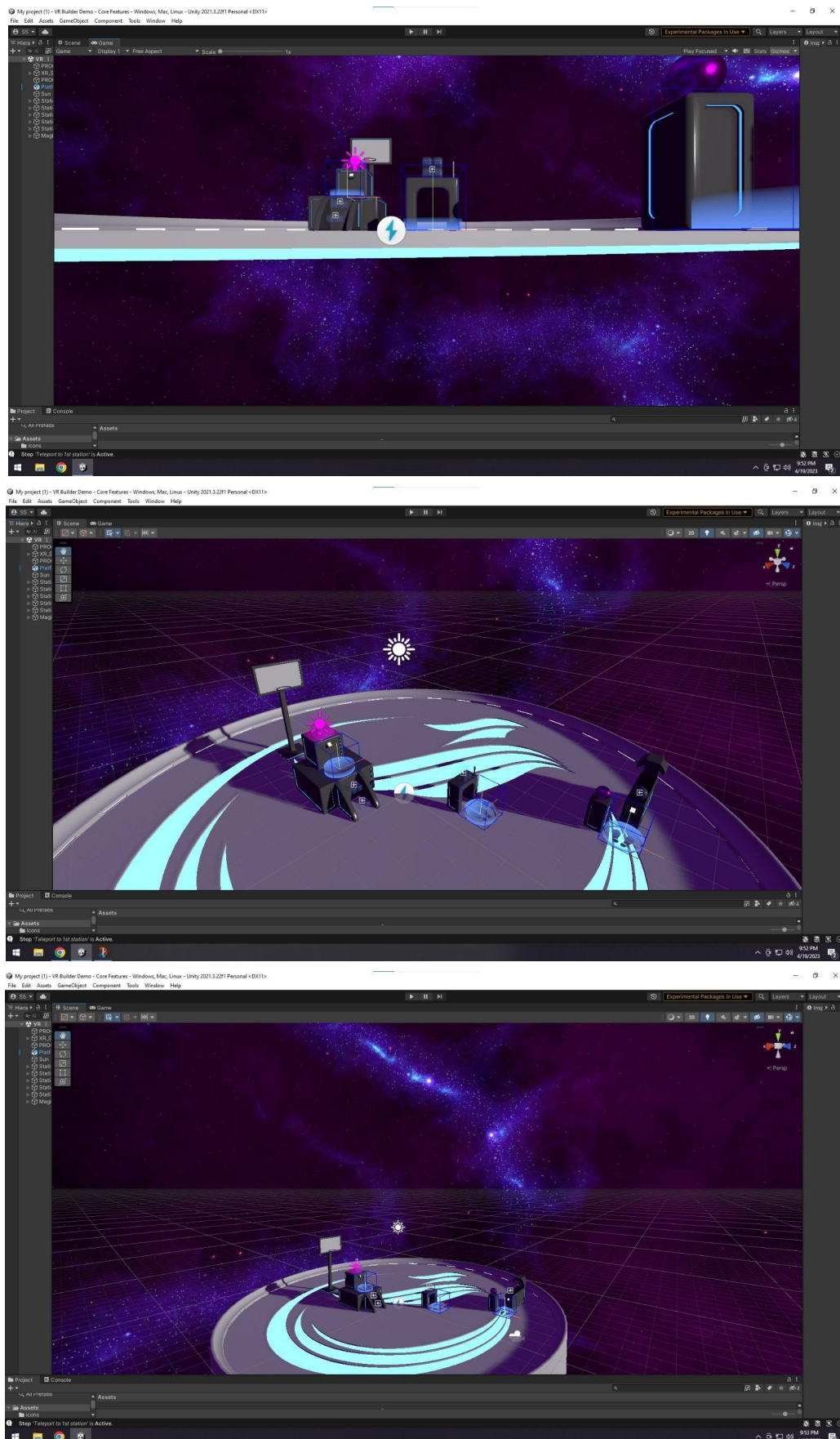
BLUEPRINT OF THE VR APPLICATION



RESULT OF AR MODEL



RESULT OF VR MODEL



APPLICATION AND FUTURE SCOPE

Applications:

- With the use of our application schools and colleges can provide their students and trainees with online training simulations by completely immersing them in a virtual environment.
- Our application can provide better learning and highly immersive real-world experiences to students by using the concept of gamification.
- Our application can also allow eLearning platforms to customize online courses for students.

Future scope:

- It will also enable institutes to move away from the traditional teaching methods and online courses to more advanced courses, more like a video game where students are placed in a virtual world and go through real-life experiences to test their decision-making abilities.
- Education is arguably one of the largest sectors to benefit from collaborating with the XR industry.
- The technology can help students to visualise what they learn, create immersive experiences, go on a virtual tour of places without having to leave the comfort of their classrooms or homes, and enjoy improved training.
- It also helps to improve the learning experience of differently-abled students

CONCLUSION

We believe that the modernization of education through the use of XR can be quite a productive accomplishment. With the ability to act as a medium in several fields, and provide its users with endless hours of entertainment, learning, and discovery, the world should be pushing for an increased presence of this product, just the same as it did in the 1990s. This is because the advantages and beneficial uses of XR features are able to engage students in learning and help improve their visualization skills. These features of XR can also help teachers to explain the students in a better way while making the students easily understand what they are taught.

REFERENCE

- [1] Zhao jianzhong, "VR and applied for mining[D]",
[Master's degree thesis], 2003.5.
- [2] Li Qing, "The visual of mining industry square and development of virtual environment [J]",
China Ming University Transaction, vol. 1, no. 1, pp. 28-29, 2002.
- [3] Hua Zhi and Fan Hui, "Research on mining airiness system visual based on virtual
reality[J]", *Metal Ming*, vol. 7, no. 1, pp. 53-56, 2003.