Flipkart GRID 4.0

2022 Campus Challenge

MetaCommerce - The Future of Shopping with Metaverse

Team Name: TriStars

Institute Name: Indian Institute of Technology, Ropar

Team members details

Team Name	TriStars		
Institute Name	Indian Institute of Technology, Ropar		
Team Members >	**1 (Leader)**	**2**	**3**
Name	Amit Kumar	Mohit Kumar	Raj
Batch	2024	2024	2024

(Functionality that we have implemented)

- We have created a web-based metaverse that anyone can access and explore utilising pre-built Avatar generating tools.
- We have created a multi-user, concurrently shared 3D area on the web.
- In shared 3D area, a person can log in using their username and room id.
- Via the use of light effects, music spots, a skybox, a television, and various animations, the scene was made to appear more stunning and lifelike.
- It has the capability to see products in 3D in shared spaces and supports VR and AR..
- We have added positional audio talking that is fully immersive..
- We have displayed the description of the products when rays falls on it.
- We have implemented Add to Cart functionality for the products.
- When users entered the metaverse, random avatars are created for them..

Use-cases

- Virtual businesses and work markets.

  People are having trouble finding excellent locations to set up stores as the population grows. The metaverse is now a perfect spot for other shoppers to open their shops, and customers may buy it while enjoying an exciting time in the metaverse.

- Virtual work and learning spaces.

  Due to the lack of real-time audio and visual interactions, video conferencing platforms have been quite popular during the covid era, however many applications fall short of offering a compelling, engaging experience. Through its graphically detailed virtual surroundings, 3D avatars, and immersive meetings, Metaverse offers consumers a more engaging experience to overcome this constraint.

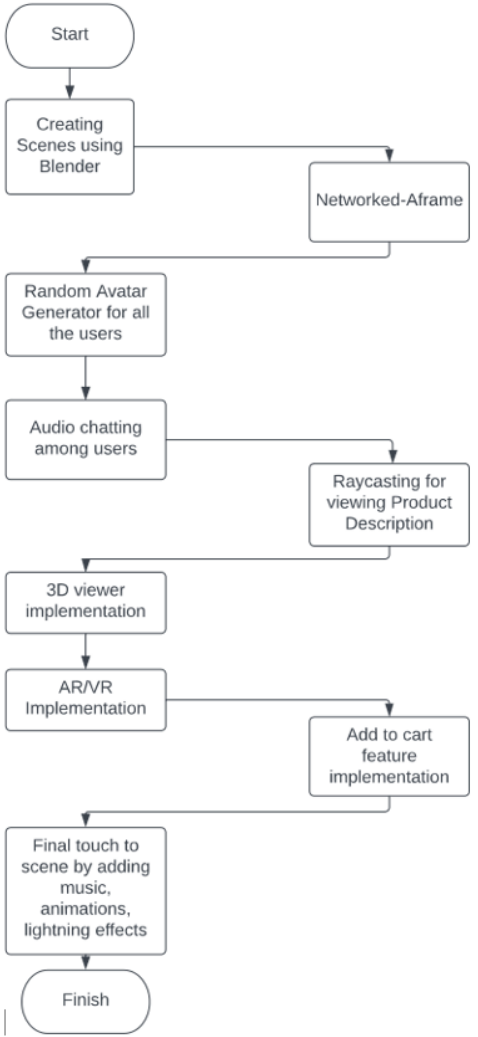
- Expansion of social media platforms.

  We can give social media users a more immersive experience with the help of the metaverse by using 3D avatars, as opposed to the current alternatives, which are confined to viewing people on computers or mobile devices and hearing their voices.

- Advanced blockchaing use cases.

  With the help of metaverse, businesses can create NFT markets that are more engaging and realistic, allowing consumers to connect with one another, browse desired NFTs, and make smarter purchasing decisions. These cutting-edge online games are created by blockchain-based game creators using the metaverse.

Flow of progress



=> Blender tools were utilised to create the entire metaverse scene, which was then rendered to give it a realistic appearance utilising a variety of 3D models from websites like Sketchfab.

=> Aframe(0.7.0), a web framework for creating 3D/AR/VR experiences, was used to create the projects in their entirety. Parts of the code were developed in Glitch.com, which also deployed our model.

=> Utilised networked Aframe for constructing shared 3D spaces (dynamic rooms), where users can join a room using their login and room id.

=> We used glb 3D model formats whenever they were necessary for our project because Aframe's 0.7.0 version didn't support gltf models.

=> The user will have a random avatar when they join the metaverse, which may change when the user rejoins. We created several cool avatars from external websites and used them in our project. The avatars of other people are visible to us, but not our own. WASD key controls are used to control the avatar.

=> Positional audio has been implemented using webrtc and the appropriate network adaptor to provide a realistic experience. When two avatars are close to one another and converse, they will hear a loud sound, and when they are farther apart, they will hear a quieter sound.

=> Add to Cart functionality has been introduced. Each product has a display button, which the user must click using rays before the item is added to the cart, which is visible in the bottom left corner of the scene. Additionally, we provided the ability for the +/- button to change the quantity of the products, correspondingly.

=> When a user clicks a product to examine it in 3D from any angle, the product is instantly redirected to another web page that we generated using Aframe so that the user may view the product in 3D. Additionally, using the glb model's URL, we may examine additional items on those web pages.

=> A VR experience has been developed so that users of VR headsets can experience the metaverse in a way that immerses them in a 3D shared area.

=> Implemented the augmented reality (AR) experience of the model, allowing us to position our 3D model in our environment and interact with it in real time. It zoom out as we get closer to the model in our virtual environment to simulate getting closer to a person in the physical world. Similarly, we must move like we would in the actual world if we want to observe that model from various perspectives.

=> We've included a various musical spots in our scene to prevent user boredom as they enjoy the metaverse. Also included a television in the picture so viewers may enjoy the scenic views.

=> Imported 3D model for the product for sale in metaverse scene, and added a description box for each products as when ray pointer hovers that product, it’s description will be shown otherwise it will be invisible via using the concept of raycasting and cursor components of Aframe.

=> Added the finishing touches to our setting by creating stores with various sections, including those for groceries, women's apparel, men's traditional dress, rakhis, and gifts, all of which feature 3D products from various domains. Added skybox and lighting effects to our scene.

Limitations

=> We are unable to implement the video calling functionality since older versions of Aframe are not compatible with other libraries, such as networked Aframe.

=> Due to the Aframe version(0.7.0), the Gltf model won't be uploaded in our scene.

=> Camera position difficulties, The model and camera are not syncing.

=> We are not able to implement collider to our scene (Which means every 3D model isn’t being solid), because of navMesh issues and Solid property of glb model gets outdated in version 0.7.0 of Aframe, so Avatar is able to cross any object.

=> Since the functionality of the try-ons experience could not be implemented on users, a 3D model viewer and an AR/VR experience for the model were instead developed.

Future Scope

=> Adding video calling functionality to our scene.

=> Adding chatting experience via text.

=> Using portals to travel to another world.

=> Feature for the products' checkout.

=> Connect products to the Flipkart website so that users can purchase them there as well.

=> Including a feature that allows users to select their own avatar when they join the metaverse.

=> More animated models can be added, and using the light feature, more realistic metaverse scenes can be produced.

=> Adding try-on functionality to avatars so that people may realistically try products on.