Virtual Shopping Mart

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Abstract **With advancing technology, people have started preferring online shopping over traditional shopping, that is shopping from physical marts. But still there are people who find online shopping not trustworthy as it does not deliver the same as it appears on the screen. So, to bridge the gap between the two, virtual reality can be used as the customers will have the benefit of both traditional and online shopping where they can have the 360-degree view of the product. Virtual Shopping Mart is a web application which helps customer to make better decisions as they can have true to life representation that is three-dimensional view of the products, from groceries to apparels. Virtual Reality can create rich, immersive and memorable customer experiences. VR Headset is not required for this web application.**

Keywords —Designing, 3D Modeling, User Experience, User Interface, Virtual Reality, Web Application.

I. INTRODUCTION

Shopping has made easier and convenient for the customer through internet. Customers can purchase items from the comfort of their own homes or workplace. Companies display the whole range of products offered by them to attract customers with different tastes and needs. The online e-commerce websites have infinite scroll UI, which provides a wide range of products. In online shopping, consumers find a product of interest by visiting the website of the retailer directly or by searching among alternative vendors, which displays the same product's availability and pricing at different e-retailers.

All the e-commerce websites are stale and monotonous UI/UX. User cannot experience a true to life experience that is 3D representation of all the products. This enables the buyers to choose from a variety of models after comparing the finish, features and price of the products on display. But shoppers miss the realistic window-shopping experience in 2D sites. In traditional shopping, they have to buy shelf space because of physical space limitation. They also have to pay high rents. Marts are often crowded during peak hours or days which makes the customer very difficult to shop. In the physical shopping marts such as D-mart, Walmart, etc., where shoppers often tend to purchase more than online shopping, as per various surveys. So virtual shopping mart will help to solve this problem. Virtual shopping is gradually setting up its place in the modern way of shopping. People are very much interested in buying online more than ever. This is being backed by the constant evolution of networking and digital technology. This is a mix of both traditional shopping and online shopping. With Virtual shopping user can experience a true to life i.e a 3D representation of the products.

II. RELATED WORK

[1] In this paper, the author, Dr. Anand Byram explained about the new technology application that creates composition of traditional shopping experience may give rise to a rapid momentum in the e-commerce sector. In virtual reality (VR) stores customers can not only virtually walk anywhere, but they can also interact with the virtual reality store by, right, left, up and down and looking around thereby viewing the shop. Virtual Reality in shopping and retailing is a whole new proposal that helps the customer to look around the store with a complete 360-degree view of the mart along with all the products It keeps the customers entertained and help them give a whole new experience. It gives customers a better information and knowledge which helps the consumers to make more informed and better decisions that make them increase their satisfaction in the online shopping process.

[4] In this paper, the system proposed by the authors Liangchao Xue, Christopher J. Parker, and Helen McCormick was that the the format of VR shopping experiences that consumers and retailers best respond to because this will allow designers to create virtual retail environments which efficiently encourage buying behaviours. The ways VR shopping can offer retail experiences of higher value to target consumers than

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current retail environments because this will allow designers to focus on the retail areas that may profit most. The barriers and enablers of VR adoption for fashion retailers because all commercially viable designs must overcome technological issues to diffuse in the marketplace.

[8] In this paper, the author, Marco Speicher evaluated a comparative study between the main features of online and offline shopping. Various factors such as shopping behavior, customer frequency was considered by the author. WebVr online purchasing environment was created retaining perks of online shopping such as search function, availability of products. VR shop was compared to the Virtual Reality Shopping Experience (VRSE) Model. Furthermore, the author did a detailed study about generations of VR shops.

[11] In this paper, the system proposed by the authors Hayet Hadjar, Abdelkrim Meziane, Rachid Gherb, Insaf Setitra is that they have made comparisons between A-Frame and Web-VR. The advantages, disadvantages and the working of both the framework has been mentioned in the paper. It explores three data methods viz VR: using "A-Frame and D3.js", using "A-Frame and R (Shiny, Ggplot2)", and using "A-Frame and Node.js". All elements of the proposed methods are free and open source; developers can then create, modify and implement easily custom web Virtual reality data viz by adding new features as needed. In this paper, they have chosen open health data as an area of application, however the system can be extended to several other fields. A-Frame can also be used with other software like Blender or Unity 3D to create 3D objects, which can be used in several areas like online games, Marketing and teachings.

III. VIRTUAL REALITY IN E-COMMERCE

Virtual Reality has become very popular in the past few years. Unlike prior years in the development of virtual reality, there are now products that can accessible by almost everyone. There are many different systems to achieve virtual reality and they all come at a wide range of price ranges. With the ongoing development of virtual reality, customers and producers have started seeing much more pros than cons, even though there still are some. The shopping experience itself facilitates purchasing decisions. Retailers have been manipulating customers for a very long time and that's why we hear energetic music in our favorite shop in the mall.

Virtual reality offers a new experience and medium, which might excite the users all sorts of demographics. People usually get irritated because of the rush during weekends, and thus people started preferring online shopping. So, for such people virtual reality will be of great benefit. Using this platform users can potentially experience retailers' offerings without actually visiting the store. Amazon is trailing behind, but its VR investments are already popping up, with tons of rumors and speculations surrounding them. VR provides the perfect platform for creating experiences that brands want to be associated with. Given the interactive nature of the experience, it can be a lot more impactful than typical viral videos or guerilla marketing campaigns that consumers have gotten used to. VR empowers a whole new approach to brand storytelling that has never been available before.

IV. METHODOLOGY

People are now preferring online shopping over traditional shopping so it's important to still give the customers a reason to physically come into the store. For many of them, shopping can be dull and more like a chore than a fun, personal experience. VR can change this point of view. It helps the customers to engage with a particular brand and products in a whole new way and a very different experience.

Visualizing products online with an added element of personalization lets people fully engage and invest in your business. People want to see what a product will look like in relation to quality and style before they spend their hard-earned money on it.

V-Mart is a Web Application where a user can shop just like traditional shopping. Once the user opens the web application, he/she can stroll around the mart to see the products. If a user wants to add products to the cart, then, he/she has to login and provide the required details first. Once the login is successful, the user can shop and add the products to the cart. The user can have a 360-degree view of the product. The user can also remove the products from the cart if they want. Once the shopping is done user can checkout and select the payment mode that is Cash on delivery or Card payment. After the payment, the user can see the order summary in their profile where each product has an order id.

V. DESIGNING

Adobe Dimension is used to design the mock version of the products. It is used to compose, adjust and render the photorealistic 3D images as shown in Fig 5.1. Adobe Photoshop is used to make the structure of the product containers to create the virtual environment of the mart as shown in Fig 5.2. A-frame is a web framework used to create virtual reality experiences. The products can be exported in .gltf, .obj , .stl , .fbx , .skp etc as shown in Fig 5.3. Firebase is used for database which is efficient for saving data about users. The 3D products take a lot of space, so the loading time will be more if the server is not good and hence the user experience will be not good enough.

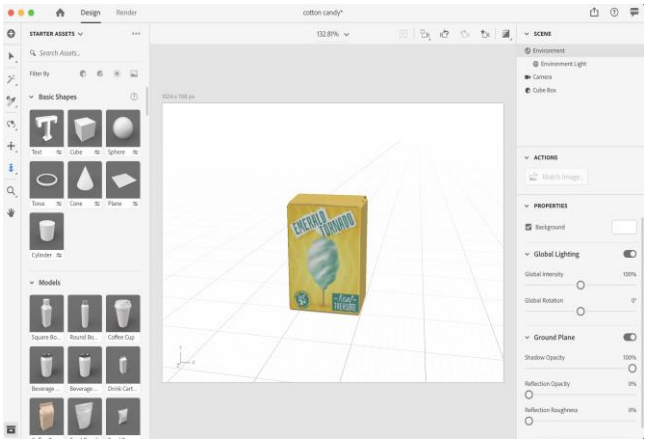

Figure 5.1 Adobe Dimension

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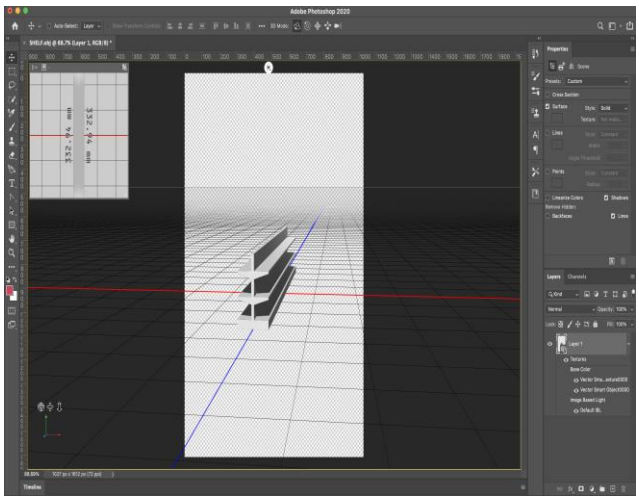

Figure 5.2 Adobe Photoshop

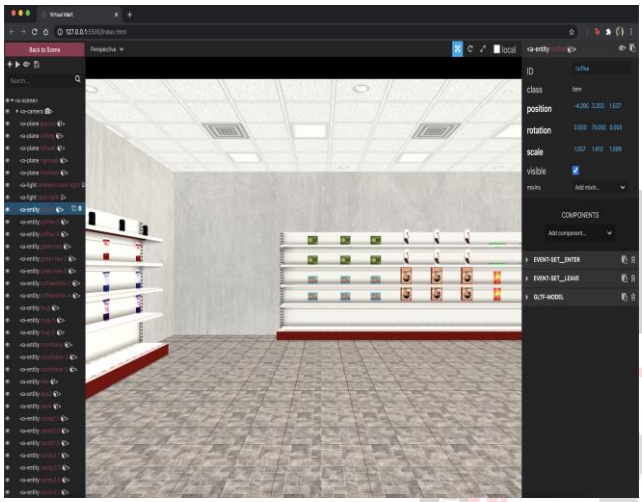

Figure 5.3 Visual Inspector of A-Frame

VI. RESULTS

The web application developed helps the customer to have a new experience which adds a new level of intrigue to the online shopping experience and retailers can build virtual showrooms or virtual stores. These platforms offer customers a virtual experience which is as close to heading out to a physical store as you can get from the comfort of your own home.

Following are the instances of the web application developed: -

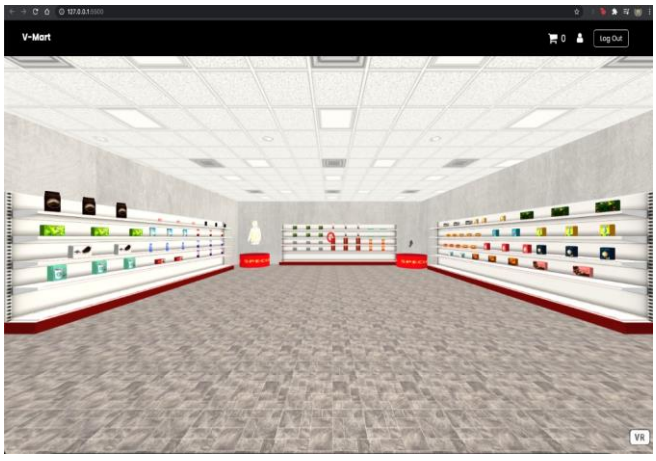

Figure 6.1 Interface of the web application

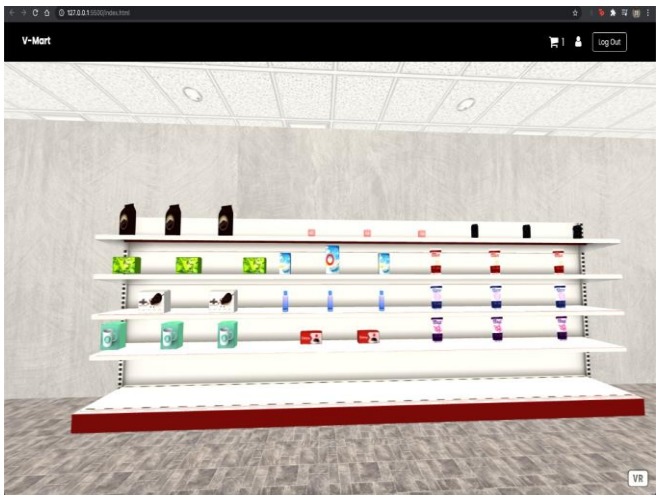

Figure 6.2 Virtual Representation of shelf and products

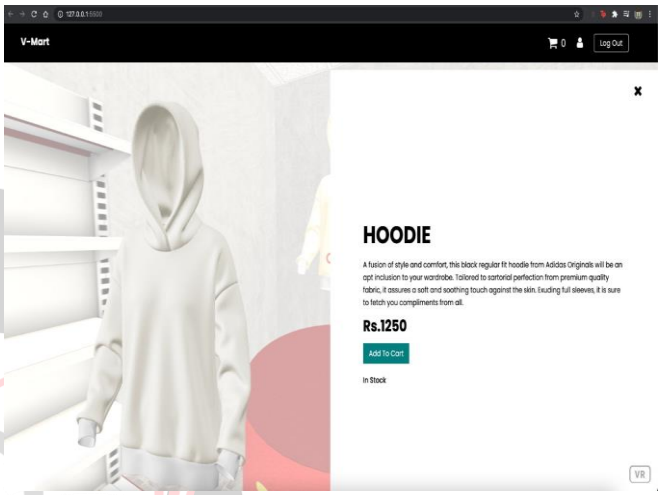

Figure 6.3 3D Representation of Apparel

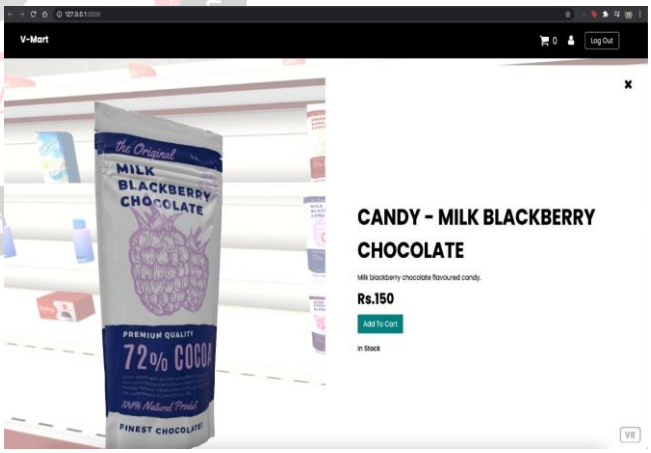

Figure 6.4 3D Representation of Product

VII. CONCLUSIONS AND FUTURE SCOPE

Virtual reality has the potential to make shopping a much better experience than traditional shopping, not merely in terms of providing a virtual substitute for the shop assistant, but also in terms of its ability to recognize and provide what each individual user seeks from his/her shopping. The range of virtual reality-enhanced online shopping venues today are still comparatively limited, although a number of experiments in applying virtual reality to online shopping have already been attempted. Two ways in which virtual reality will transform E-commerce are: -

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1. Giving consumers the chance to visualize how a product would look before they actually purchase it is the very "try before you buy" novelty which many companies are trying to tap into.

2. It gives consumers a new reason to visit your store. Many consumers stated that they preferred in-store experiences compared to buying their products online on eBay or Amazon. While the eCommerce market is showing no signs of slowing down, the trend has much more to do with convenience than it does with how customers ideally want their shopping experience to be. This presents eCommerce leaders with something of a problem. What they need to do is make the act of online shopping more like physically being inside a store.

VIII. ACKNOWLEDGMENT

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