A New Approach For Virtual Reality Shopping

Ms. T. Gowrisankari[1], Harish D[2], Swathi S[3], Manikandan S[4]
[1]Assistant Professor, Dept of Computer Science and Engineering
[2, 3, 4]Dept of Computer Science and Engineering
[1, 2, 3, 4] Dr. Mahalingam College of Engineering and Technology, Pollachi-642003.

Abstract- *Human-Computer Interaction (HCI) is the study of creating computer-based applications that assist people in their jobs or other tasks while demonstrating a high level of usability. The framework mostly focuses on using interactive technologies (Virtual Reality) for shopping and rendering information material more appealing to the general public. The system's key aim is to bring virtual reality (VR) technology into shopping, allowing consumers to try on products and have a rewarding and hassle-free experience. It just takes a few seconds because the procedure is so fast. Often explored were the benefits and drawbacks to presenting traditional and modern approaches as well as the techniques used to create them.*

Keywords- Virtual Reality, Shopping, AR, 3D Modeling

I. INTRODUCTION

Retailers began to use new technology in both their traditional and online shops in the early 2000s to improve both the store atmosphere (i.e. the location where the merchandise is purchased or consumed) and the shopping experience (Pantano, 2015). This is especially relevant for what is known as "consumer-facing technology," which applies to software and gadgets that the customer communicates with explicitly while in the shop, such as interactive displays, online product visualisation and customization, digital signage, and so on. Augmented reality (AR) and virtual reality (VR) implementations are among these innovations that are quickly emerging and being more widely adopted in retail environments (Javornik, 2016; McCormick et al, 2014). 'To merge natural and computergenerated visual knowledge into the user's experience of the physical world in such a way that they behave as one place,' according to Olsson et al (2013, p.288). AR (Huang and Liao, 2015) integrates the virtual and actual environments via a virtual layer that can add pictures, textual content, videos, or other virtual elements to the user's real-time viewing of the physical universe (Carmigniani et al, 2011). AR normally uses a digital camera in a webcam or a cell phone to capture real-world results. AR may offer a new and inventive way to grab customers' interest by allowing them to engage with simulated goods through gadgets such as smartphones or laptops, wearables (headsets), projectors, or fixed interactive displays (McCormick et al, 2014; Reitmayr and Drummond, 2006). Experiential value is generated by product emulation, media richness, music, GPS details, and videos (McCormick et al, 2014). The AR shopping experience allows customers to engage seamlessly with virtual goods, thus enhancing their visualisation of products and, ideally, their eventual impression of the brand, which in turn, improves customer purchasing intentions (Jiyeon and Forsythe, 2008).

Virtual Reality Retail simulates the real-world consumer environment by recreating the same social experiences, through which people share the same buying room and experience in real time with others. It enhances the web presence by including a three-dimensional online shopping experience. It offers consumers the chance to check out items. With our idea, which has not yet been implemented, we are about to have an interactive experience. Virtual Reality is an interactive experience technology that allows users to experience real-world events. This technology incorporates a number of concepts, resulting in a new level of computational evolution all around the world. This technology largely seeks to offer high-level interactivity and thereby provide consumers with a real-world interface under one roof. The key aim of this project was to create a virtual world that would improve the experience and make shopping more convenient. An improved, online edition of an initial shopping experience was created using multimedia, 3D graphics, and virtual reality (VR) technology.

Objective

The system's main objective is to implement VR technologies into shopping, thereby enabling the user with try-on features, leaving the customer with a satisfied and hassle-free experience. The process is so efficient that it's only a matter of seconds.

Interactivity will be enhanced, and the graphical effect standard will be increased. Usability efficiency has been carried throughout the project for the ease of the users.

II. BACKGROUND STUDY

AR has come a long way from its roots in cinematography in the 1950s. Mobile AR and wearable computers, along with VR, 3-D technology, and mobile technologies, have been evolving and being used since the 1990s, attracting growing interest in computer science fields (Javornik, 2016).

Consumers' utilitarian success expectancy (e.g. comfort, mental, economical, and social values) is favourably linked to user intentions and hedonic performance, according to Kang's (2013) research on AR use for apparel e-shopping. Other research shows that AR has a positive effect on users' experiences, happiness, reality perception, and overall an enjoyable, welcoming, and personalised experience (Poushneh and Vasquez-Parraga, 2017). This was further confirmed by Pachoulakis and Kapetanakis' (2012) results, which showed that augmented reality (AR) used for virtual fitting rooms from the user's screen or phone camera (allowing users to digitally see how a dress will suit on them from a virtual dressing room from their homes – see Kumari and Bakan, 2015; Kang, 2013) was regarded as adding to the 'joy aspect' of shopping (Pachoulakis and Kapetanakis, 2012). Following that, mobile AR experienced a meteoric rise, owing to the widespread availability of personal mobile technology such as smartphones and tablets (Craig, 2013; Javornik, 2016). This involves consumer-led experiences, personalisation, customisation, and virtual reality (Magrath and McCormick, 2013). For example, IKEA's AR software will "measure the width and height of the real-life space viewed from the camera's objective and then make a very realistic piece of furniture, in comparison to the rest of the actual surrounding area." According to studies of smartphone applications for AR shopping, usage is on the rise owing to reasonably high customer loyalty related to experiential benefits as well as benefits to retailers (Dacko, 2016). Furthermore, big AR mirrors in stores are a form of AR use (Craig, 2013).

III. METHODOLOGIES

Digital Reality Shopping can use a real-time immersive experience that connects with the customer and supports them in buying and discovering items. The app will be compatible with VR glasses, and users will be able to use it from the web using this computer..

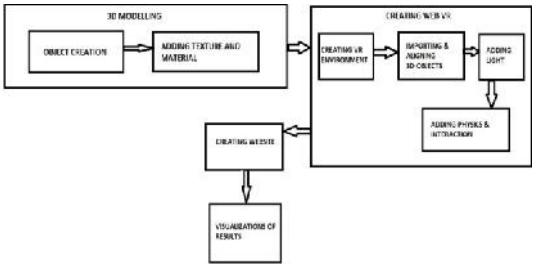

Figure 1 Block Diagram of Virtual Reality Shopping System

3.1 3D Modelling

3D Modelling is the process of developing a mathematical representation of any surface of an object Starting with the first module,3D modelling consists of two main steps are:

Object Creation–Creation is based on the product.3D object VRs are interactive movies that allow viewers to rotate the object 360 degrees.The products to be put on the shopping site is made in view with creating 3d objects.

Texture and Material -For the objects created appropriate texture and materials are added, so that the user will have a great exposure of the product. The user can have a wide range of exposure in the texture and material used, giving a real time shopping feel.

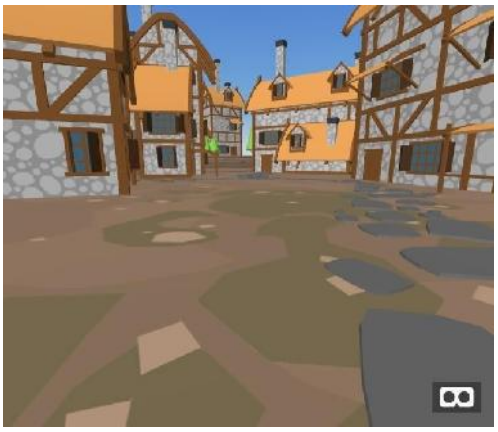

Figure 2: VR Environment

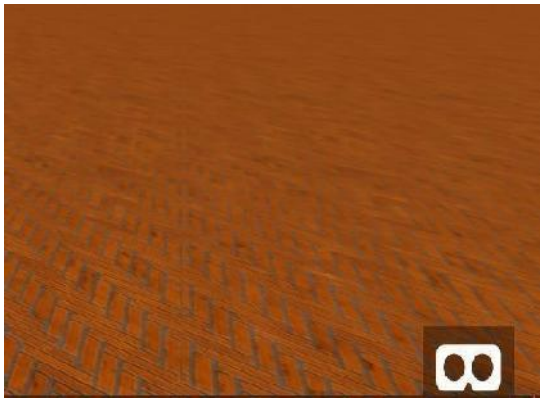

Figure 3 VR Envirnoment

Figure 4 3D Object Designing

3.2 Web VR

Initially by creating the VR environment and importing the 3d objects, we add up on lighting for the objects and required alignment. There are three steps involved in this module. They are:

Creating VR Environment - The environment has to be created for the user to have a real-time experience of the product so that the user can go around 360 degrees and look at the product the user wants to try.

Importing and Aligning 3D Objects - The products have to be aligned properly for attractive look.

Adding Light- Proper light effects are added to the environment and the object.

Adding Physics and Interaction - For a proper interaction and communication physic and interaction has to be added which is a mandatory aspect in this module.

3.3. Creating website

We create User Interface for shopping website. It is a platform for the user to have a look on the products as like the normal shopping website but with the virtual experience. Websites are an essential tool for businesses to establish their credibility and build trust with their customers.

3.4 Visualization of Result

The shopping website will be implemented using Virtual Reality. Virtual Reality Shopping will be set. Interactions will be enhanced between the user and the system.

IV. RESULTS AND DISCUSSIONS

Variety of input data - Input instruments provide consumers a feeling of immersion and dictate how they interact with computers. It assists consumers in exploring and communicating with augmented reality worlds in order to render them as intuitive and realistic as possible. Unfortunately, technology is not mature enough to enable this at this time. Joysticks, force balls/tracking balls, controller wands, data gloves, trackpads, on-device action keys, pressure trackers, bodysuits, treadmills, and motion platforms are the most widely used input items (virtual omni).

Motion input - Accelerometer-based motion controls are used as virtual reality controllers, enabling the user to actively communicate with the virtual environment with little to no abstraction and an omni-directional treadmill with greater bodily activity flexibility, allowing the user to conduct locomotive motion in either direction.

4.1 Indicators of Presence

Tools that each stimulate a sense organ are referred to as interactivity. Users are presented with VR material or environments via output devices, with the goal of creating an interactive experience. Visual, sound, and haptic displays are examples of these. Output devices, like input devices, are underdeveloped since the existing state-of-the-art VR system does not provide for optimal stimulation of human senses. The majority of devices have visual input, with only a few adding audio or haptic details.

Support for control and navigation - Build VR navigation based on what the users want to do. Users should be allowed to utilise their bodies as easily as possible in virtual reality. But, inside a comparatively narrow region, this can be helped by discovering a greater room, something broader than physical space; in fact, they are..

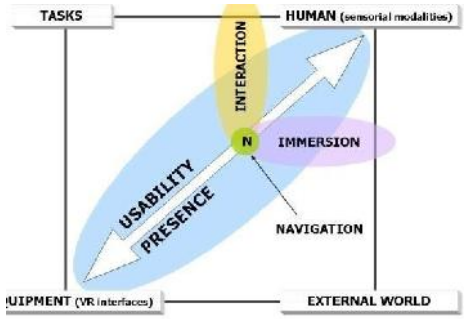

Figure 5 A schema of human computer interaction

4.2 Experiments & Results

Each consumer is given the task of navigating the entire art gallery using controls, and their input is gathered. The results are focused on Virtuality-enabled contact between users and artefacts in and around the Shopping site. The empirical research looked into the applicability of a metrics-based method in a real-world environment. The findings illustrate how the approach can be used to determine VR output in 3D.

V. CONCLUSIONS

A virtual reality (VR) e-commerce framework was created for this research, and a usability study was performed to equate the VR e-commerce system to the standard e-commerce system. The virtual reality e-commerce device was created as an Internet plug-in that can be used on a variety of computers. The findings indicate that through integrating physical world knowledge with virtual product models, the VR e-commerce framework will offer more information and more direct interactions to online consumers. When browsing online, customers will "try on" items to learn more about them. Customers would be able to make smarter buying choices and would have a better chance of purchasing the "best" goods as a result. The stage will be prepared for Virtual Reality Shopping. Interactions between the customer and the device can be strengthened. A complete navigation module will be built using controllers. Throughout the initiative, augmented reality applications would be available for use.

REFERENCES

[1] Carmigniani, J., Furht,B., Anisetti,M., Ceravolo,P., Damiani,E. & Ivkovic,M. (2011). Augmented reality technologies, systems and applications, Multimedia Tools and Applications. 51:341–377.

[2] Craig, A. B. (2013). Understanding augmented reality: concepts and applications. Newnes.

[3] Dacko, S. G. (2016). Enabling smart retail settings via mobile augmented reality shopping apps, Technological Forecasting and Social Change.

[4] Huang, T.-L. & Liao, S. (2015). A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness, Electronic Commerce Research. 15(2):269-295.

[5] Javornik, A. (2016) .Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour, Journal of Retailing and Consumer Services. 30:252-261.

[6] Jiyeon, K. & Forsythe, S. (2008). Adoption of Virtual Try-on technology for online apparel shopping, Journal of Interactive Marketing, 22(2):45-59.

[7] Javornik, A. (2016) .Augmented reality: Research agenda for studying the impact of its media characteristics on consumer behaviour, Journal of Retailing and Consumer Services. 30:252-261.

[8] Kang, M. J.-Y. (2014). Augmented reality and motion capture apparel e-shopping values and usage intention, International Journal of Clothing Science and Technology, 26.6:486-499.

[9] Kumari, N. & Bankar, S. (2015). A Real Time Virtual Fitting Room Application, International Engineering Research Journal (IERJ), 1(4):122-125.

[10] McCormick, H., Cartwright, J., Perry, P., Barnes, L., Lynch, S. & Ball, G. (2014). Fashion retailing – past, present and future, Textile Progress, 46(3):227-321.

[11] Magrath, V. & McCormick, H. (2013). Marketing design elements of mobile fashion retail apps, Journal of Fashion Marketing and Management: An International Journal, 17(1):115-134.

[12] Pantano, E. (2014). Innovation drivers in retail industry, International Journal of Information Management, 34(3):344-350.

[13] Poushneh, A. & Vasquez-Parraga, A. Z. (2017). Discernible impact of augmented reality on retail customer's experience, satisfaction and willingness to buy, Journal of Retailing and Consumer Services ,3:229-234.

[14] Pachoulakis, I. & Kapetanakis, K. (2012). Augmented reality platforms for virtual fitting rooms, The International Journal of Multimedia & Its Applications, 4.4:35.