

## Augmented Reality (AR) and Virtual Reality (VR) in Marketing

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### ABSTRACT

Technology has brought up a revolution in the ways we think, act and perceive things. In our day to day lives, technology plays a very important role. All the traditional ways of working are taken over by modern ways due to new technological innovations every day. One such innovation is the use of Augmented reality, virtual reality and mixed reality in almost all fields of operation whether it is spots, entertainment, health, education or marketing. These technologies have given consumers the level of satisfaction that they never experienced before. They take the consumers in almost altogether a new realm of imagination. Shopping for the consumers becomes fun filled with emotions and personalisation. Whether it is marketing through AR, VR or MR companies are able to earn more profits as well as satisfy their customers. The evolutions of these technologies is not new but their usage in marketing field is somewhat in early stage, but it is growing each day with a mix of creativity in the way businesses interact and attract customers. There are few considerations while using these techniques in marketing to make the impact strong and long lasting in the minds of consumer, if followed, it may reap more profits for the companies. The future of these technologies contains many more surprises for consumers and seems very bright.

**Keywords:** business, consumers, experience, marketing, technology

## I. INTRODUCTION

The current era is the era of digitalisation, technology has slowly and gradually taken over human life in just a few years of its evolution. From dawn to dusk, human beings make use of several technological tools in their personal and professional lives. It has become an inseparable part of our existence. We are used to technology so much so that now life without technology seems impossible. This swift transformation has occurred because technology has made our lives easier and therefore everyone is keen to adopt it quickly. It fits so well in all our day to day activities that we now consider it as essential and wonder how we survived without it for so long! Before 2019, the businesses were thinking upon introducing technology in various aspects of marketing to provide an unforgettable shopping experience to consumers. Due to COVID 19, it became difficult for businesses and consumers to meet in a physical space and this gave rise to a sudden upsurge in selling products through digital marketing application called e-commerce or e-retailing. During two years of COVID era, the consumers had no choice but to shop for necessities from home, but now they prefer e-shopping out of choice, therefore companies are continuously experimenting with new avenues to provide improved shopping experience to their consumers. Information and communication technology (ICT) has led to extensive marketing research in this direction. Growing sophistication in technology, has provided businesses with the facility to reproduce objects, persons and environments in order to give their consumers a real life experience of the products and services even before buying them. This has been possible due to new and promising technological tools like Augmented Reality (AR), Virtual Reality (VR) and Mixed Reality (MR) which, as a part of Extended Reality (XR) technique, are able to deliver a real life interactive experience to the consumers as if they were physically present at the market space to try the product. This paper is aimed at finding out the concept of these new technologies and to find out how and where these tools are used in marketing of products. We would also discuss the considerations to be kept in mind while planning to use these tools for marketing and what lies ahead in future of marketing in this digital era.

## II. LITERATURE REVIEW

### Augmented Reality (AR)

Augmented reality as defined by Faust et. Al. (2012: 1164) is “the superposition of virtual objects (computer generated images, texts, sounds, etc.) on the real environment of the user”. Augmented reality was introduced for the first time in the year 1950 by a cinematographer, Morton Heilig, who thought that cinema had the ability to effectively capture all senses

of the audience. So in 1955, he built Sensorama, a prototype based on his thoughts and vision, and called it “The cinema of the Future” (Wikipedia, 2009). Followed by this, in 1968, Ivan Sutherland for the first time used augmented reality system in his creation, which was a head mounted display (Arth, Clemens; Grasset, Raphael; Gruber, Lukas et al., 2015) by an American computer artist, Myron Krueger in 1974. He prepared a laboratory called Videoplace, with projectors and video cameras that released shadows or shapes onscreen, which would appear real and interactive to the user. In the year 1999, Hirokazu Kato, from Nara Institute of Science and Technology in Japan, developed the AR Toolkit, which was an open source software for creating applications based on AR which overlaid virtual images in the real world (Wikipedia, 2017b). After this, in 2009 AR was used in print media for the first time by Esquire magazine, where if one scanned the cover of the magazine, Robert Downey Jr. would appear alive on that page to introduce the issue to the reader. (Augment, 2016b), also, the content of the magazine would be different when the reader saw it after the midnight (Mashable, 2009). AR also began to be used in vehicle service manuals in 2013 by Volkswagen through an application which gave repair assistance to the service technicians (Augment, 2016a). The credit of bringing AR into mainstream use is given to the gaming application Pokémon Go. In 2016, this location based free gaming application was introduced, which used GPS to locate the user and gave him a gaming experience at his own location. (Wikipedia, 2017d). This application took the gaming industry and the gaming experience to the next level. In April 2017, Mark Zuckerberg, the CEO of Facebook (now known as Meta), announced that from now onwards, Facebook will also be using Augmented reality in order to add digital effects to its videos and still images (Wired, 2017). Big giants like Facebook, Apple and Microsoft are heavily investing in their AR development. Augmented reality has accelerated in use in many fields but its use in marketing is most promising as it gives the buyers and sellers a new dimension. It surely will make huge advancements in the coming future (Augment, 2016b)

### **Virtual Reality**

“Virtual reality is the use of computer technology to create the effect of an interactive three dimensional world in which the objects have a sense of spatial presence” (Bryson, 2013 p. 4). When we think of virtual reality, the image coming to our minds is of a very modern scientific tool in the form of a VR headset but its origin dates very back to 1930s. Since ages, human race has been experimenting on the art of story telling and have been tirelessly working in making the viewers and listeners of the story to feel like a part of it. Virtual reality is one such technique to make the viewer feel their ‘presence’ in the story and experience it being the part of it. Therefore an important feature of “a great VR experience is the feeling of ‘presence’ — users feel like they are truly in the synthetic environment being presented” (eMarketer, 2016). As per Oxford English Dictionary, virtual reality is “ The computer generated simulation of three dimensional image or environment that can be interacted with a seemingly real of physical way by a person using special electronic equipment such as a helmet with a side screen inside or gloves fitted with sensors.” The evolution and birth of VR began in 1936 with the invention of “Tel eyeglasses” by Hugo Gernsback, also known as the father of science fiction. The invention came into public in 1963 (O’Neill, 1963). It was portable head-mounted display which was battery operated. Gernsback was sure that his invention would go a long way (Novak, 2012). In 1930s a science fiction writer named Stanley G. Weinbaum also talked about a where the player watched the holographically recorded virtual stories with the help of goggles using the senses of smelling and touching (Filmora, 2017). For the first time in 1950, a device named Sensorama was created by Morton L. Heilig, which gave its users a simulated experience, stimulating multiple senses. Also known as the father of VR (Carlson, 2007), Heilig created the device with a thought that we can learn better and effectively when we experience things instead of reading or hearing about them (Heilig, 1962 p.2). It was head mounted display which gave its users vibratory senses, 3D visuals, olfactory stimuli and an immersive experience. (Boas, 2013; Martirosov& Kopeck, 2017). He even got his device patented and as per his patent, “The Telesphere Mask consisted of: A hollow casing, a pair of optical units, a pair of united television tubes, a pair of ear phones, and a pair of air discharge nozzles, all co-acting to cause the user to comfortably see the images, hear the sound effects and to be sensitive the air discharge of said nozzle.” U.S. Patent No. 2955156 (1960). The First computer based VR headset was developed in 1960 by an American computer scientist Ivan Sutherland, it was mainly used in military training exercises to combat various situations these VR tools are used even today in flight exercises and military operations (Filmora, 2017). In the year 1975, Myron Krueger invented “Videoplace” in which a person’s (user’s) shadow was captured and processed into an image digitally and was displayed on the screen (Krueger, Gionfriddo and Hinrichsen, 1985). It was Krueger’s invention which later on led to creation of Augmented reality. Data gloves and Data Suit appeared in years 1970 and 1987 respectively by companies like Sayre Glove, DataGlove, Mattel’s PowerGlove and VPL Research Inc. (Sturm and Zelter, 1994; Lasko-Harvill, Blanchard, Smithers, Harvill and Coffee, 1988). For the first time in late 1986, a massively multiplayer, online role playing (MMORPG) named Habitat was created for commercial purpose which had the feature of communication and interaction among users (Morningstar and Farmer, 1991). The technology has been continuously improving in VR and giving its users more and more appealing and immersive experiences. Later in the year 2012, Google glass was launched, in the coming years 2014 and 2015, a device named Oculus Rift was introduced in two versions, DK1 and DK2 respectively, which came with motion tracking system where the software responded to the actions by the user. Year 2016 brought a new device Oculus Touch, which allowed the user to navigate in the virtual world (Oculus, 2017). When Facebook acquired Oculus in 2014,

suddenly all big players like Sony, Samsung and Microsoft got interested in VR and brought up new proposals (Parkin, 2014). The current year expects the consumer expenditure on AR/VR to move up to \$72 Billion, as mentioned in VR statistics.

### Mixed Reality

Mixed reality (MR), also known as hybrid reality “refers to the merging of real world virtual constructs with computer generated that are either real or possible” (Farshid et.al, 2018 p.4). Putting in simple words, MR is a mix of AR and VR. It gives its users a chance to experience something which does not even exist. Mixed reality is being used widely in many fields these days and one the examples is its use in healthcare industry where mannequins used of medical purpose are made alive for training purposes and also to train healthcare professionals on empathy with their patients (DeSouza, n.d.). Another aspect of MR was explained by Milgram et al., where he said that there is a valid relationship between AR and VR and they can rightly be considered together and therefore they looked at both AR and VR concepts not as inverse but rather being at both the ends of a continuum, which they named as the “Reality- Virtuality (RV) continuum” (Milgram et al., 1994:283). This clearly explains that AR adds on to reality instead of replacing it and thus it demonstrates the coexistence of real and virtual objects at the same time and same place to the user.

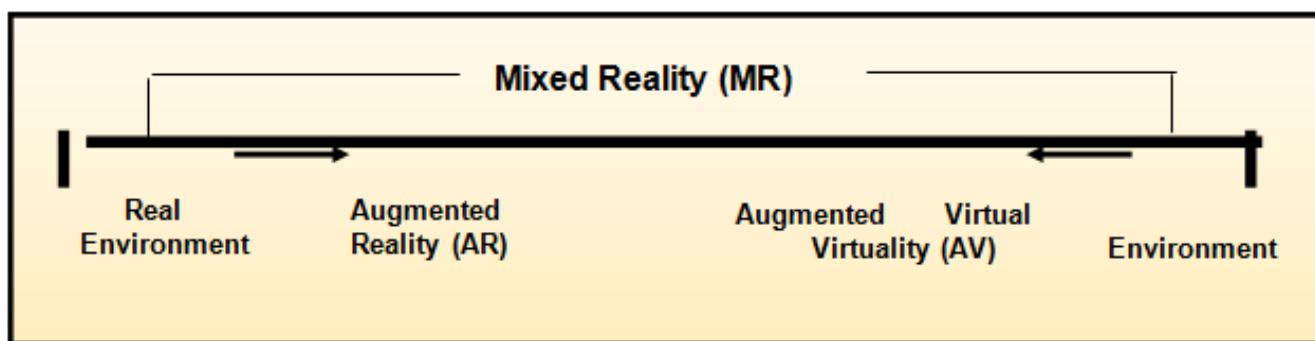


Figure 1: RV Continuum. Source: Milgram et al. (1994)

Therefore in MR, both the realities (AR and VR) are clubbed together and it gives rise to new spaces and visuals where both digital and physical objects exist together and even interact with each-other in real time. (Reality Technologies, 2016). MR technology is used in modern day smart glasses like Microsoft HoloLens and Google Glass 2.0. Later on, Google, with its parent company named Alphabet, created a startup named Magic Leap, which was a mixed reality venture (Bercovici, 2017). With such big companies taking step towards these new technologies, the future looks bright for their development and use.

In short, Augmented Reality adds up to the real world, Virtual reality replaces the real world and mixed reality adds virtual cues to the real world which appear as if they truly exist.

### III. OBJECTIVES OF THE STUDY

- To study the history of development of AR, VR and MR technologies
- To find out the use of AR/VR/MR technologies in marketing field in India and abroad
- To know about things to be considered while using AR/VR/MR technologies in marketing field
- To know about the future trends in AR/VR/MR technologies in marketing

### Use of VR/AR/MR Marketing in Different Industries in India and Abroad

In the current digital era, all the companies are trying very hard to attract consumers' attention virtually. The technologies like AR/VR/MR give these companies excellent opportunities to engross their consumers in thrilling ways and also give the audiences the experiences, that they never thought of and would like to explore further. Porter and Heppelmann (2017: 53) say that “the fact that customers can visualise how products will look or function in a real setting before buying them, they have more accurate expectations, more confidence about their purchase decisions, and greater product satisfaction”. The concept of real time or moment marketing has also evolved due to these technologies, which allows the companies to communicate in real time with their customers by engaging in real time dialogues. This gives these companies many advantages like developing bond with their target customers, but at the same time pose challenges like providing quick and customised solutions to their problems at the same moment. (Parise et al., 2016). Virtual fitting rooms became quite popular during COVID era, as the customers were afraid of trying the product physically. Some people even find issues like hygiene and privacy while using physical fitting rooms Luce, 2018). These days consumers during their buying process prefer

interaction with the companies in real time rather than passive communication which happened earlier. Indians on an average spend a lot of time over mobile phone and computer screens these days (Singh and Pandey, 2014) The biggest advantage being trying the products in the comforts of their homes without even stepping out. The most extensive use of these technologies in marketing the products is witnessed in industries selling cosmetics, jewellery, furniture, eye glasses, footwear etc. some of the examples of companies using AR technology in marketing are as follows:

1. Furniture companies like Wayfair and IKEA provide thousands of 3D images and applications to view various furniture items that integrate them with actual room setting so that the consumers can see where and how the furniture or piece of decor would look like in their actual home or room (Porter and Heppelmann, 2017).
2. Famous toy company LEGO uses AR to sell their toy kit called "Lego Hidden Side" where the user can play with the toy, using an AR app which gives the user an immersive experience (Wilson, 2019)
3. Big sportswear companies like Puma, Nike, Adidas and Gucci use AR in order to help their customers find the proper footwear size which fits them perfectly (Alvarez, 2018). With the help of AR apps, the customers can now customise their own shoes as per their preference of colour and material. TOMS shoe company, with its "one for one" slogan, donates a pair of shoes to a child who cannot afford one, every time a customer purchases its shoes. With the help of VR they even take the customers to the tour of places like Peru, where the needful children are about to receive a pair of new shoes, thereby emotionally connecting the customers to the company's motto.
4. E-commerce giants like Alibaba, Amazon and Walmart also use AR to increase their sales (Wu and Gereffi, 2018)
5. Beauty brands like L'Oreal and Sephora use AR to help potential customers try their makeup products sitting at home through mobile apps.
6. Real estate dealing companies like Airbnb use VR to enable potential renters to virtually visit accommodations and give them the experience of physical presence at the place. This facility of virtual tour has helped in improving their booking experience manifold.
7. Skype uses MR for its marketing campaigns where the user can immediately video chat with anyone by just putting on a headset, and the person on the other side could look at everything as they are present physically with user.
8. Giant hotel brand like Marriott incorporate VR experience by allowing their potential customers to virtually visit the Marriott locations anywhere in the world, just by sitting at home.
9. AR also helps the users to get knowledge about location based deals and discounts which allows customers to save money while buying the products.
10. Biscuit manufacturing company Oreo gives its customers a 360° virtual tour to the world of flavoured cookie and dream up their favourite cookie flavour and see how their Oreos are prepared.
11. A luxury fashion brand called Michael Kors used AR to help customers choose a pair of sunglasses through virtual mode.
12. Automobile manufacturing company Volvo also used VR and provided the potential customers of their cars with an experience of driving the car, understanding its features and also feeling the experience of driving through beautiful landscapes with 360° view with the help of immersive technology. Big automobile brands like Jaguar, XQ Avatar Porsche use MR for their car test drives.
13. One of the famous fashion brand Topshop uses VR immersive technology to allow its customers to attend the fashion show of its products through virtual mode and giving them an experience of enjoying the fashion show by sitting in the front row, even without being physically present there.
14. Popular travel agency Thomas Cook also uses VR to help its potential customers to have a virtual holiday with the help of their 360° VR films - Try Before You Fly so that the potential vacationers may explore places even before they visit them physically.
15. Starbucks used AR to create Tmall, an online marketplace where the customers can purchase and experience specially curated coffee.
16. PepsiCo used AR screen for advertising
17. Famous jewellery brand of India- Tanishq also uses AI to help its potential customers to try their gold, silver and diamond jewellery and see how well it looks on them, just by sitting at home.
18. Indian eyeglasses and lens selling company Lenskart also allows its buyers to try and see how a glass frame looks on their face, this also is possible with the help of AR technology.

#### IV. CONSIDERATIONS IN PLANNING THE USE OF VR/AR/MR MARKETING

Though the usage of AR/VR/MR is becoming quite popular these days and companies want to encash this opportunity but before making a decision of using these techniques in marketing, it is wise to first think about which technology would appeal which group of customers and how. Since these technologies are quite different from each other, so it is always suggested to choose them wisely. For example if one wants to communicate with the customers storytelling that is immersive,

it would be best to go with VR. But in case one wants to create an experience that a lot of people would love to come back to, AR would be suitable.

While AR involves being interactive, engaging, helpful, entertaining and useful at the same time, VR offers the element of story telling while being present there, and gives its users an immersive experience thereby adding personal touch to the interaction.

With VR technology marketers can create an immersive and interactive tour of any place, adding video and audio cues to have greater impact on the minds of potential customers. During the virtual tour, the companies can even hide some clues somewhere and if the customer finds them, he/she would get some amount of discount when they actually visit the store physically. VR advertising may be designed based on customer's unique needs which would be personally appealing to him/her and persuade him/her to shop. In short, a never before experience may be created with VR technology as far as marketing of products and services is concerned.

AR technology allows marketers to communicate with potential customers in real time, which helps them make better and quicker buying decisions, its just like accompanying a friend while shopping. AR applications even allow the customers to try the products virtually and see how it would look when it reaches to them, so this technology might be helpful for jewellery, clothing, accessories, furniture etc.

With the help of these technologies, companies can provide their potential customers with important information through interactive technology, which is not on the product label, this would help build trust among the customers and the company and would also help customers make better decisions.

The above are only some of the considerations marketers can make in order to provide customers with satisfaction and earn profits, loyalty and brand value in return.

## V. FUTURE TRENDS IN USE OF AR/VR/MR IN MARKETING

- The future sees increase in role of virtual celebrities in the form of AR avatars like Kizuna AI of Activ8 and Lil Miquela of Brud, virtual influencers like these would be used in marketing more in order to appeal the customers. They would not only help customers make purchase decisions but also would make their purchasing experience memorable by giving them personalised assistance.
- AR technology based user manuals, product displays and business cards will quite impressively attract customers to the business. What is needed is more innovation and creativity.
- In future it is possible that the consumers will have their personal virtual shopping assistants based on VR technology, who would help them make purchases based on their budget and taste.
- Consumers will be able to virtually visit the farms and factories where their favourite product is prepared and will know how it is made.

## VI. CONCLUSION

The biggest advantage AR/VR/MR technologies provide is personalised experience, improved customer engagement, increased customer satisfaction, better shelf management. As consumers we got familiar to these technologies during covid times when our movement was restricted and we had to shop things sitting at home. It was during this time that companies came up with the idea of these technologies and now they have become an inseparable part of our purchasing experiences. The future looks great for companies using these technologies in design, manufacturing and marketing of their products and services. No wonder these technologies offer a never before experience to the users, but if designed creatively, they may bring astonishing results in every sector.

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