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Research Paper on Augmented Reality

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ABSTRACT

We all have heard the term "Augmented Reality Technology", but actually we don't know much about it. Definition of Augmented Reality in a very simple term is "Real time use of real-world object in digital form with interactive experience in real world" and Augmented reality provides a platform which uses computer generated sound and images to improve real world experience. Examples of Augmented reality are popular applications such as Snapchat, Instagram, Tik Tok, etc. Basically, in almost all of the mobile cameras AR filters are used. Augmented Reality are used in various sectors such as medical, Retail, logistic, tourism industry, education, entertainment and many more. Augmented Reality are mostly use in mobile development technology and this technology is getting advanced day by day with futuristic features. AR application helps to increase attention, satisfaction andconfidence the learning of person.
The approach of technology has boost in rise of "Mobile Augmented reality" and Technology uses many two popular devices such as Tablets and Smartphones.

1. INTRODUCTION

The use of Augmented Reality(AR) in business, healthcare and education is a very important. It will help to do our task easily and in a transparent way. Augmented reality enables digital object interaction with real world in real time. Augmented reality isa technology that have a huge future scope and huge research is required.

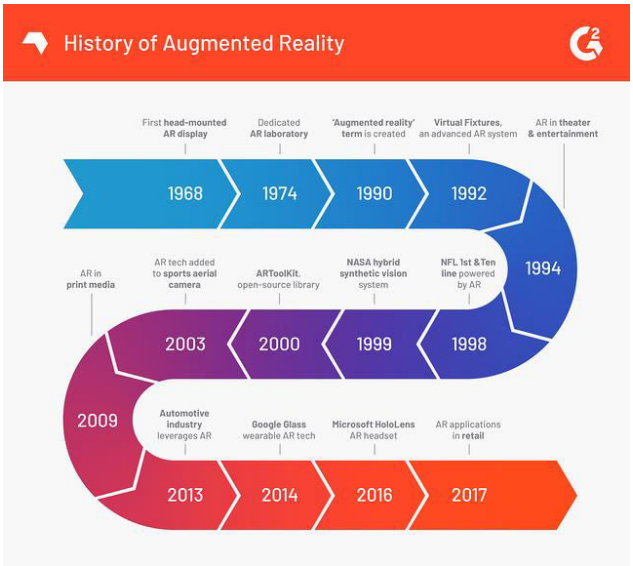

Figure – 1 History of Augmented Reality

Over the 50 years of Augmented reality search is reshaped the consume in real world. Above image show the "How was Augmented reality search is developed and research by over time" and decade of decades in this field search is continuously increasing or making more simplicity. AR development and research has been moving from laboratories research or innovation to widespread availability on device of consumer. Now from last decades rapid growth in AR technology adoption had seen. The main reason behind rapid growth of AR technology is android phone and now android phone is available in each and every hand in a family. Augmented reality plays major role in teaching field because itprovides real time visualization of information(i.e product) and its helpsin concentration and better understanding. Augmented reality is widely used in many sectors like education, medical, construction, retail, manufacturer and etc. AR technology also boost gaming industry.Gaming industries are also

creating AR applications which helps to satisfy customer and increase engagement.

2. LITERATURE REVIEW

2.1 Augmented Reality

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated emotive information, sometimes across many sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. There are three main key requirements in AR technology, combination of virtual and real object in real environment, aligning of virtual object and real object with each other, and real time interaction.

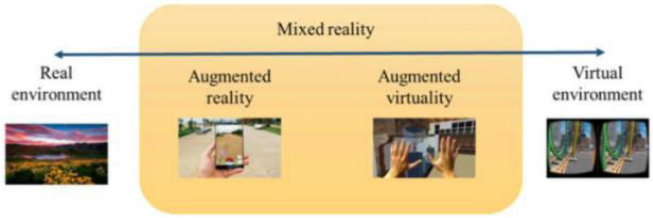

Figure – 2. Milgram's Mixed reality continuum.

In 1994 the "Reality-Virtuality Continuum" purposed by Milgram and Kishion. The continuum is classification rages from real environment to virtual environment. Virtual environment is basically computer generated environment in which digital objects actually doesn't exist. As we can seen in figure 2;the Augmented reality is side of real environment. Augmented reality provides different experience in real time. Example is Pokemon Go; it is game based on Augmented Reality which searches Pokemon animations in different locations.

2.2 Augmented Reality Hardware

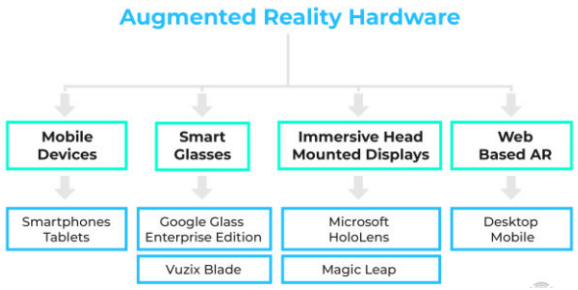

Figure – 3 Augmented Reality Hardware

Basically, Augmented Reality hardware are of four types

- Mobile Devices
- Smart Glasses
- Immersive Head Mounted Displays
- Web Based AR

2.2.1 Mobile Device:

Mobile devices in which smartphone and Tablets are included.

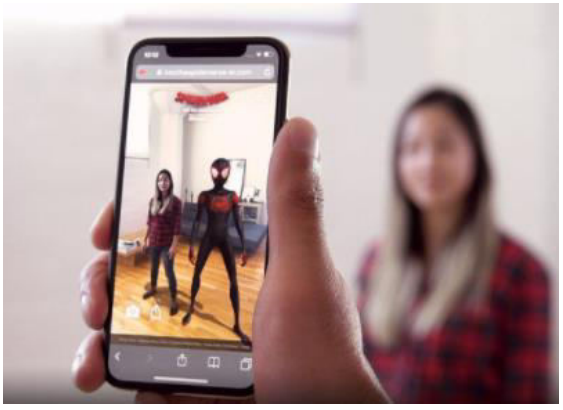

Figure – 4 Mobile device AR

Above figure-4 shows how AR application works. AR application mixes virtual object with real world in real time. It provide better user experience.
Example Google AR

2.2.2 Smart Devices:

"Google Glass" is one of the most well known example of Smart Devices/Smart Glass. Feature of Google Glass is; touchpad is present beside the glass as shown in the figure 5.Its control timeline or interface of display.

Camera have ability to record video and click photo. Display is based on liquid crystal silicon.

Figure –5 Google glass

2.2.3 Immersive Head Mounted Displays:

Figure – 6 Microsoft holo lens

Immersive Head Mounted Displays (IHMD) is used in Microsoft Holo lens. This project is still under development. This is actually Mixed Reality head set and designed to help in solving real business problems.

2.2.4 Web based AR:

It is similar to mobile device AR. In this, use of internet comes into picture to gather information from website of other resources.

Figure – 7 Example of Web based AR

This is trend mixed reality using for exploring new things and expanding imagination. There is algorithm which works when specific type of instructions are given. It can be image or real objects.

2.3 Augmented Reality x Virtual Reality

Figure –8 Virtual reality and Augmented Reality

AR adds digital element to a live view often by using the camera on a smartphone. Example of AR experience include the game Pokemon Go and Snapchat lenses.

Rather than provide a completely immersive virtual experiences, AR enhances the real-world with text, images, and other virtual information via device such as heads-up display, tablets, smart lenses, smartphones and Augmented reality glasses.

AR is useful for more than just entertainment. With an AR technology app, you could just point your phone at the buildings, and all the detail are forecast in your line of sights.

Virtual reality (VR) involve a whole immersion experiences that shut out the physical world. Using Virtual Reality device such as Oculus Rift, HTC Vive or Google Cardboard, user can be transported into a number of real-world and visualized environments such as Cartoon world.

VR may be artificial, such as an animated scene, or an real place that has been photographed and add in a VR app.

You can view VR through a special Virtual Reality viewer, such as the Oculus Rift. Other VR viewer use your phone and VR apps, such as Daydream View or Google Cardboard.

Virtual Reality application are now used in many organizations and industry including the construction, military, engineering and education, business, healthcare and more.

3.RESEARCH AND METHODOLOGY

3.1 Purpose of Research

The purpose of this research is to analyse the impact of Augmented reality technology in daily life. Augmented Reality mainly use in education, gaming, social entertainment fields.

3.2 Data collection

Since the study usesQualitative data collection methods. This methods are based on old data and experiences. In this method basically concepts, thoughts and experiences are included. The sources of data isprevious research papers on Augmented reality and current affairs about augmented reality technology. The aim of research and data collection is gathering more information about augmented reality.
Articles, magazine and blogs from already collected information about Augmented Technology are used.

4. MOBILE AR

Augmented reality is the fastest growing technology. It is possible because of the smartphones. In smartphone there are all required component like Hardware, Ram, sensors(GPS, motion sensor, accelerator) and camera.

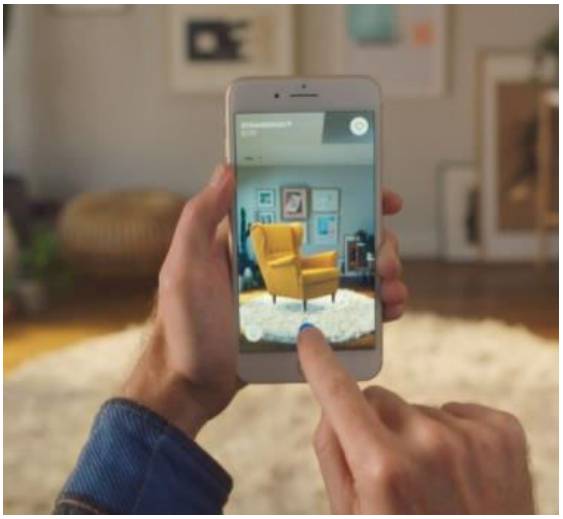

Figure –9 AR application

The smartphone is easy to use and portable. It helps to work in daily life. The main advantage of Mobile AR application is experience anywhere and anytime.

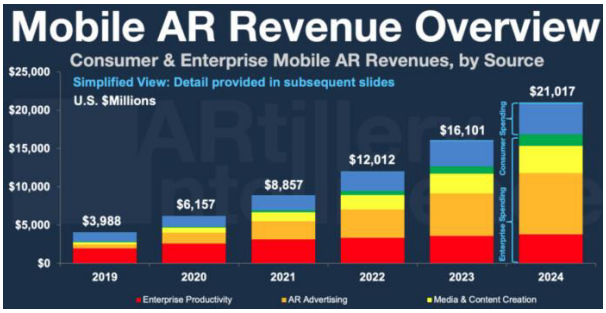

Figure -10 Estimate of Mobile Revenue.

Prediction of Mobile AR revenue is fastest growing technology in one of them. This current year 2021 in Fifty percent increased by last year in the terms of revenue.
Mobile AR used in various domain like retails, Marketing, teaching etc.
Better AR can help to make better interaction with consumer and increasefocus time and helps in decision making. In general AR technology is booming in business world.
AR users in world wide is around 2.2 billion. According to survey it will be increased in years by years. This Augmented Technology is untouched in past few decades because of lowest number of resources and this technology not developed as much.

4.1 Applications of Mobile AR

Mobile based AR is new but fasted growing segment of mobile applications. Basically, Its allow to integration of information based real world physical reality and virtual reality.
The Mobile devices are smartphone and tables. AR technology act like magic window , through viewer can seen 3-D object models. AR allow to rotate or resize of object in Smartphone.
There are some application of Mobile based Augmented Reality

- Enhanced Advertisement
- Interactive games
- Virtual assembly
- Educations
- Medical
- Logistics

The Augmented reality application continuously increasing and out come in various fields.

5. APPLICATIONS OF AUGMENTED REALITY

5.1 Retail:

It's always been hard to visualise what a piece of furniture would look like in your home, so it's not a big surprise that 60% of customers want to use AR when they shop for furniture. IKEA and Wayfair are just two retailers that are helping customers visualise furniture and products in their home thanks to augmented reality technology. Offering augmented reality can also boost sales: 72% of customers purchased products they hadn't planned on after using augmented reality while shopping according to the study, "The Impact of Augmented Reality on Retail."

5.2 Tourism:

Travel brands can provide potential visitors with an even more immersive experience from a destination before they travel thanks to augmented reality technology. With AR solutions, agents and destinations can give visitors more information and signposts to their destinations. AR apps can help holidaymakers navigate through resorts and learn about points of interests at destinations.

5.3 Education:

While there's still much to explore regarding how augmented reality can support education, the possibilities are significant. EdTech is expected to grow 17% each year to reach $252 billion by 2020, and it can support every age group and education level. Augmented reality could help educators engage students in the classroom with dynamic 3D models, overlays of fun facts and more regarding the topics they are learning about. Visual learners would benefit from the visualisation capabilities of AR that can bring concepts to life (or at least 3D) via digital renderings. Students can access information anywhere and anytime without any special equipment as is the case with Mondly, a language-learning app.

6.FUTURE SCOPE OF AUGMENTED REALITY

6.1 Future of augmented reality:

We are increasingly becoming highly dependent on AR-based software and Apps, which is why Apple, Amazon, Facebook, Microsoft, Google, are investing more in augmented reality. The market value of AR mobile devices will touch past $115 million in the near future.
So, the future of augmented reality is set to redefine ours!

6.2 AR and shopping:

An upcoming future retail trend is the use of AR based shopping apps. 1 Billion people are expected to be using this AR technology in the next upcoming months. Fifty percentage of people surveyed in a study said that most liking shop from retailers who use AR technology.
This integration of Augmented Reality into shopping has been made possible by the fastest growth in the sale of Augmented Reality-supported mobile device and the retail industry

can now employ reliable and unfailing Augmented Reality technology, which will benefit retailers, customers and the distributors and the makers of the products .

6.3 Robust presence of AR in navigation:

Google maps leading the navigation market. Indoor navigation for not having so much application.

One may be thinking why indoor navigation is such a big deal.

But, if you have been to a large hospital, airport, a towering office building or a sprawling university campus, with confusing signs, you will know that people get flustered try to find their way to their Target.

But, Augmented Reality can provide you details directions and people who find reading maps hard can use it because the AR technology will offer a 3D model rendering of the place with meticulous set of instructions on which turns to take, arrows, and distance indications.

6.4 The future of AR brings a promise of safety:

Structural failings, the incapability to expect possible flaws in architectural plans, and the deficient imposition of safety rule lead to serious injuries and casualty. But such destructive accidents can be avoided with the help of augmented reality.

When towns are being increase range or new constructions plan are drawn ups, AR can help the architect visualize where things can go mistake. Similarly, manager in profession such as timbering, mining, and fishery or in assembly lines and factories will be able to intercept and hence remove workplace injurie with Augmented Reality.

6.5 Digital Marketing:

This will be fully different and change the experience of customers. Augmented Reality technologies will make the users experiences more exciting when attracting with any brand. Marketing Augmented Reality will possible be seen in packaging, through gaming apps, on street signs, and interaction with other product.

6.6 Geolocation:

Finding a nearby restaurant on your smartphone isn't a new good. But yes, Augmented Reality will notably deliver service. On a real-time basis, the advisories will definitely come to the suggestion.

Augmented Reality could profit everything from real-time travels advisories to restaurants suggestion.

6.7 Healthcare:

Amidst this pandemic time the healthcare industries has ramp up, but still, there are many area, by which, the procedure of treatment can be transformed. Indeed, Augmented Reality has the Capability to change the healthcare sectors.

It almost creates a 3D image by disengage users from reality that could be a driving forces in the future.

6.8 Educational Resources:

As we are fully into a virtual bowl. This will allow researcher to use Augmented Reality in training situation. Military and healthcare industry, in particular, will be work on powerful Augmented Reality simulation.

7. CONCLUSION

The objective of thisresearch was to understand the Impact of Augmented reality on the various domain and especially Mobile base Augmented Reality which is the fastest growing technology.

The literature review shows the use of Augmented Reality in various domain and such as education, medical, retail, marketing, architect, etc.

Augmented reality provides better experience to user and helps more focus by attractive graphics. Future of AR is fastest growing technology and it will be contribute major role in better tech future.

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