# AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY

**WEEKLY PROGRESS REPORT 4**

**Enrollment No.** – A2305222498

**Program** – B.Tech C.S.E

**Batch** – 2022-2026

**Student Name** – Atia Naim

**Faculty Guide’s Name** –Dr NEHA TYAGI

# Project Title:

Analysis of Augmented and Virtual Reality

# Target set for the week:

applications of AR applications of VR social and ethical impact of AR

social and ethical impact of VR

# Progress/Achievements of the week:

Successfully Researched and made report applications of AR and VR, social and ethical impacts of AR and VR

# Future work plans:

Moving forward, our plan involves summarizing the report with a conclusion, organizing the final compilation, conducting a plagiarism check, and ultimately submitting the completed report Regards

# Atia Naim

# 3-CSE 8X

**WPR-4**

**Application of AR**

The potential of augmented reality applications is immense, as they can transform the way we learn, explore, and communicate, breathing life into knowledge and imagination in extraordinary ways. Here are some important applications of augmented reality:

* **Gaming:** By providing captivating and engrossing encounters, augmented reality has brought a revolutionary shift to the gaming industry. A prime illustration of this is seen in Pokémon Go, a widely popular game where players utilize their smartphones to capture virtual Pokémon creatures that seamlessly blend into real-world surroundings through an overlay of digital elements.
* **Entertainment:** AR is used in theme parks, museums, and sports events to create interactive and engaging experiences. For instance
* Disney's Magic Kingdom incorporates AR technology into various experiences, such as interactive games and character interactions like "Sorcerers of the Magic Kingdom," where visitors use their devices to interact with virtual characters in the park.
* Museums like the Smith-sonian National Museum of Natural History use AR to provide additional facts and details.
* At historical sites like the Acropolis Museum, AR is employed to reconstruct ancient structures, transporting visitors back in time.
* Zoos and aquariums like the San-Diego Zoo, uses AR to deliver interactive and educational experiences by superimposing virtual creatures onto real animals.
* **Education and Training**: AR has the potential to transform education by making learning more engaging and interactive. For instance, anatomy classes can utilize AR to project 3D models of the human body, allowing students to explore and interact with various organs and systems. This hands-on experience enhances understanding and retention.
* **Retail and E-commerce:** Retailers are utilizing augmented reality (AR) to elevate the shopping experience, empowering customers with innovative visualization tools.
* A prime example is IKEA's Place app, which grants users the ability to virtually position furniture within their rooms, offering a glimpse of how it fits and complements their existing decor hence enabling the users to preview furniture and home decor items in their own spaces before committing to the purchase.
* **Lenskart,** a popular eyewear retailer, has used augmented reality (AR) technology to enhance the shopping experience for their customers. Through their AR-powered virtual try-on feature, users can virtually try on different glasses and sunglasses from the Lenskart

collection using their smartphones or devices. This technology allows customers to see how various frames look on their face in real time, providing an accurate representation of how the glasses would appear when worn.

* **Medical Applications:** AR has proven valuable in medical fields, such as surgery and medical training. Surgeons can use AR to utilize patient data, such as CT scans, onto the surgical field, providing real-time guidance during procedures. Medical students can also benefit from AR by practicing virtual surgeries or studying detailed anatomical models.
* **Industrial Design and Manufacturing:** AR is utilized in design and manufacturing to streamline workflows and minimize errors. Designers can visualize and manipulate 3D models in real-world environments, enabling informed decisions about product design. AR-guided assembly instructions assist workers in complex manufacturing processes, reducing training time and enhancing accuracy.
* **Navigation:** AR in navigation uses augmented reality technology to overlay digital information onto the real world, enhancing the navigation experience. It provides real-time guidance through visual markers and arrows superimposed on the user's field of view, directing them along the route. Contextual information, such as ratings, reviews, and menus of nearby places, can also be displayed. AR navigation apps can leverage real-time data, such as traffic conditions or public transportation schedules, to provide up-to-date information. The most common example of ar navigation is google maps.
* **Fashion:** An example of AR in the fashion industry is the use of virtual fitting rooms. With AR-powered apps, customers can virtually try on clothing items without physically being present in a store. By overlaying virtual garments onto the customer's image in real-time, AR allows them to see how different styles, sizes, and colors would look on their body. Through this alternative implementation of AR, organizations can streamline their operations, improve efficiency, and ensure higher quality outputs in design and manufacturing**.**
* **Architecture**: AR in architecture allows architects and designers to visualize and present designs in an immersive and interactive manner. Through AR applications, virtual 3D models can be overlaid onto real-world environments, providing clients and stakeholders with a realistic view of proposed structures. An example of augmented reality (AR) in architecture is the use of AR visualization tools like the Microsoft HoloLens. Architects can utilize the HoloLens headset to superimpose virtual 3D models of buildings onto physical spaces in real-time
* **Social Media:** AR in social media allows users to apply filters, effects, and interactive digital elements to their photos, videos, and stories. It adds creativity, fun, and self-

expression to social media content. Users can choose from a variety of filters that modify their appearance or apply virtual objects, characters, or animations to their posts. some examples of social media apps that use AR are snapchat, Instagram and tik-tok.

# APPLICATIONS OF VR:

The versatility of Virtual Reality (VR) extends Across diverse industries. From healthcare to education and beyond, VR proves invaluable in how we approach various sectors, unlocking new possibilities and enhancing experiences. here are some key applications of VR:

* **Gaming and Entertainment:** VR provides immersive gaming experiences by placing the player in a virtual world. Users can interact with the virtual environment, explore new worlds, and have a more engaging gaming experience.
* **Training and Simulation:** VR is extensively used for training purposes in industries such as aviation, military, healthcare, and manufacturing. It allows trainees to practice in realistic virtual environments, reducing costs and risks associated with real-world training scenarios. For example, pilots can practice flight simulations, surgeons can perform virtual surgeries, and soldiers can undergo combat training in a safe environment.
* **Education and E-Learning:** VR is increasingly being used in education to enhance learning experiences. Students can explore historical sites, visit museums, or even travel through space, providing a more immersive and interactive learning environment.
* **Architecture and Design:** Virtual Reality (VR) presents a transformative solution by enabling architects and designers to construct virtual prototypes of buildings, interiors, and landscapes. Clients can then explore and experience these designs before they are built, allowing for better visualization and decision-making.
* **Healthcare and Therapy:** VR has applications in healthcare for pain management, physical therapy, and mental health treatment. It can help distract patients from pain during medical procedures or provide simulated environments for therapeutic interventions.
* **Real Estate and Tourism**: VR allows potential buyers to take virtual tours of properties, saving time and resources. Similarly, in the tourism industry, VR enables people to explore travel destinations and attractions virtually before making travel plans.
* **Engineering and Prototyping**: VR aids engineers in designing and testing prototypes virtually, reducing the time and cost associated with physical prototypes. It allows for better visualization, collaboration, and identifying design flaws early in the product development process.
* **Sports and Fitness**: VR can be used to enhance sports training by creating realistic simulations and scenarios for athletes. It can also be used for virtual fitness classes, gamifying workouts, and providing motivation for users.
* **Social and Communication:** VR provides a platform for social interactions and communication in virtual environments. Users can meet, interact, and collaborate with others from different locations, fostering virtual communities and enhancing remote collaboration.
* **Art and Design:** VR opens up new possibilities for artists and designers to create immersive and interactive artworks. It allows users to engage with art in unique ways and explore virtual exhibitions and galleries.

Some real-life application of vr are:

# Manufacturing and Product Design:

* Ford: The automotive giant uses VR to create virtual prototypes, allowing designers and engineers to visualize and test different vehicle designs before building physical prototypes.
* Boeing: The aircraft manufacturer employs VR to simulate assembly processes, enabling workers to train and optimize production workflows in a virtual environment.

# Construction and Architecture:

* Mortenson Construction: This construction company utilizes VR to create immersive walkthroughs of building designs, enabling clients to experience and provide feedback on the planned structures before construction begins.
* AECOM: The architecture and engineering firm employs VR for virtual collaboration, allowing teams spread across different locations to meet virtually and review design plans in a shared 3D environment.

# Healthcare and Medical Training:

* Cedars-Sinai Medical Center: The hospital uses VR simulations to train medical professionals in complex procedures, such as minimally invasive surgeries, improving their skills and reducing risks during actual surgeries.
* AccuVein: This medical technology company offers a VR-based device that helps healthcare professionals locate veins for blood draws and IV insertions, enhancing accuracy and minimizing patient discomfort.

# Oil and Gas:

* Chevron: The energy company utilizes VR for safety training, creating realistic simulations of hazardous environments and emergency scenarios to train employees on proper protocols and response procedures.
* BP: The oil and gas company employs VR for immersive visualization of complex drilling operations, enabling engineers and geologists to plan and optimize exploration processes.

# Retail and E-commerce:

* IKEA: The furniture retailer offers a VR app that allows customers to visualize and place furniture in their homes, helping them make informed purchasing decisions and reducing the need for physical store visits.
* Alibaba: The e-commerce giant uses VR to create virtual shopping experiences, enabling customers to browse and interact with products in a virtual store environment. **Training and Education:**
* Walmart: The retail corporation employs VR for employee training, providing simulations of various scenarios like customer interactions and emergency situations to enhance skills and knowledge.
* SimSpray: This VR training system is used in vocational schools and trade programs to teach painting techniques, reducing material costs and providing a safe environment for learners.

# Social and Ethical Impacts of Augmented Reality

Augmented Reality has the potential to significantly impact society and raise a considerable amount of social and ethical considerations. While AR offers exciting possibilities for enhancing human experiences and improving various sectors, it also presents challenges and risks that need careful consideration.

Some key aspects of the social and ethical impacts of AR:

* Privacy: AR technology often requires access to personal data for location tracking, user preferences, and behaviour analysis. This data can be valuable for targeted advertising or personalized experiences, but it raises concerns about privacy violations. Users may not have full control over the collection, storage, and use of their data. To discourse this, developers and AR platforms should prioritize user consent, transparency in data practices, and robust data protection measures.
* Security and Safety: As AR blurs the restrictions between the physical and digital worlds, there are potential security risks. Malicious actors could exploit vulnerabilities in AR systems to manipulate information, create misleading experiences, or launch cyberattacks. It is vital to implement robust security measures, such as encryption, authentication protocols, and vulnerability testing, to protect users and prevent unauthorized access or manipulation of AR experiences.
* Psychological and Emotional Impact: AR experiences can be immersive and appealing, but excessive use or reliance on AR can impact users' mental and emotional well-being. Addiction, detachment from reality, and increased anxiety are some of the potential risks. Balancing AR usage with real-world experiences, promoting digital wellness, and providing user education on responsible consumption is significant to mitigate these impacts.
* Digital Divide and Accessibility: AR technology relies on devices such as smartphones, smart glasses, or headsets. The cost and availability of these devices may create a digital divide, where certain individuals or communities have limited access to AR experiences. Bridging this gap and ensuring equitable access to AR technology is important to prevent exacerbating social inequalities. Additionally, considering accessibility needs, such as designing AR experiences for individuals with disabilities, is crucial for inclusivity.
* Ethical Content and User Interaction: AR content can raise ethical concerns, such as promoting violence, explicit content, or spreading misinformation. Developers and platforms must establish clear guidelines and policies to ensure responsible content creation and user interaction within AR environments. Implementing moderation mechanisms, empowering users to report inappropriate content, and enforcing content standards are necessary to mitigate ethical challenges.
* Impact on Real-world Interactions: The immersive nature of AR experiences can impact real-world interactions. Users engrossed in AR may become less aware of their physical surroundings, leading to accidents or social disconnection. It is important to educate

users about responsible AR usage, such as using AR in appropriate contexts and maintaining situational awareness, to ensure safety and social cohesion.

* Workplace and Economic Disruptions: AR has the potential to revolutionize industries and workflows, bringing increased efficiency and new opportunities. However, there may be concerns about job displacement and economic inequalities resulting from the adoption of AR technologies. Preparing the workforce through upskilling and reskilling initiatives, ensuring fair employment practices, and fostering a supportive transition to AR-enabled

workplaces are important to minimize disruptions and promote inclusive economic growth.

Addressing these social and ethical impacts requires collaboration among various stakeholders. Developers should prioritize responsible design, incorporating privacy and security measures, and consider potential psychological and social effects. Policymakers can establish regulations and guidelines to protect user rights, promote accessibility, and address ethical concerns. User education and digital literacy initiatives are crucial to empower individuals to make informed decisions and engage responsibly with AR technology. Finally, fostering open dialogue and ongoing ethical considerations within the AR community can drive positive change and mitigate potential risks.

# Social and ethical impact of VR

The technology of virtual reality has impacted our surroundings and has changed the way we see and experience things. Not only has it brought to us a new immersive experience but has also impacted us socially and ethically.

# Benefits of VR

* **Try before you buy:**

VR technology aids the customer by giving them a virtual experience of the product and enabling them to fully get a hands-on experience.

# Prototyping

Earlier the development of certain products was difficult and expensive. Now due to the presence of technology, prototypes are produced faster and at a cheaper rate.

# Health Sector

It can help patients with stress and anxiety by making them experience those situations virtually and thus helping overcome them.

# Tourism

VR technology can enable people to visit different locations of the world from the comfort of their homes.It's usage can be seen in Google Street View; where we are able to have a 360° view of a place.

Despite having numerous benefits, this technology has certain drawbacks as well.

# Drawbacks of VR

* **Sensory Vulnerability**

Since they use headsets that often cover our sensory organs such as eyes and ears; they can make is prone to accidents.

# Social isolation

Technologies like these can make us oversee the need to be physically present at a place and thus can make us more habitual to isolation which would lead to loneliness. Meta is a prime example where with he help of virtual spaces it provides it’s users to interact with other people over the virtual space without actually having to be together.

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