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VIRTUAL REALITY ROLES IN THE SOCIETY USING WEB TECHNOLOGY AND DISTRIBUTED SYSTEMS

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Abstract

The term "virtual reality" refers to the practise of simulating real-world environments using computer technology. Interactive multimedia and computer simulations typically fall under this category. This provides support for the theory that the designer was the one who was responsible for the creation of the whole image. The software that is used to create virtual worlds may be used in a variety of enjoyable contexts, such as video games, in addition to the more serious settings that call for a greater degree of focus from the user. The concept of "augmented reality" refers to one more example of a particular kind of technology that functions in a manner that is comparable to that of Virtual Reality (VR). For instance, the photo-sharing app Snapchat provides its users with the option to experience a kind of augmented reality in the form of a filter that can be applied to their own faces. This filter may alter the appearance of the user's face in a way that simulates the effects of virtual reality. Nevertheless, when it comes to Augmented Reality (AR), this suggests that you will be immediately visible while simultaneously having a sensation of three-dimensionality and visual components in the world around you. In other words, you will be immersed in a hybrid reality. And the technical equipment, such as a head covering with a screen included inside it or gloves coupled with sensors that let a person to interact with a computer-generated three-dimensional picture or scene in a manner that is real or significant. Virtual reality headsets and augmented reality gloves are two examples of this kind of technology. The use of augmented reality gloves and virtual reality headsets are two examples of the sort of technology that falls under this category. People will, in the not too distant future, wear glasses or headsets that are furnished with intelligent technology and use them in combination with other intelligent gadgets. These will be known as augmented reality devices (Phones, tablets). Putting on a virtual reality headset is all it takes to be transported into the world of simulated reality.

1. INTRODUCTION

The use of virtual reality is becoming more commonplace in people's regular routines on a daily basis. People were able to make their first ventures into the world of virtual reality as early as the 1950s. Virtual reality was initially developed in the 1960s. After then, at the turn of the century, they began to have an influence on the video game industry. The successful functioning of the World Wide Web is growing more dependent on the creation of innovative new technologies. (W.W.W) The use of virtual reality (VR) technology not only in the area of medical but also in the sphere of military conflict. For example, persons who have been diagnosed with autism may find that they are able to connect to the experiences of the people who are in their local area. Who actually has autism, and how does someone with autism see the world around them? It would seem that he reacts in this manner anytime there is any kind of mistake made in your company, no matter how little. To add insult to injury, he has not been executed as of this very point in time. When they experiment with new sounds, they will also produce a significant amount of additional noise. This includes noises of objects being dropped,

such as money and shoes that other people do not even detect. You may get a sense of how quickly, for example, autistic persons may change from being calm to frighten in a certain situation. A broad range of supplementary components, also known as add-ons and attachments, may be used with virtual reality because to the technology's support. Because mobile devices and desktop computers lack the sensors that would ordinarily be situated on the left and right sides of the device, users are unable to participate in virtual reality experiences on any kind of device. This is the case even if the experiences are available. Users may, for example, create all of the material on the computer first, and then transfer it to the gadget in order for it to be shown there.

The concept that is referred to as "augmented reality," which is reduced to "AR," is one that is completely distinct from the concept that is referred to as "virtual reality." In addition, it would seem that everyone believes that when augmented reality becomes popular, it will bring about a considerable amount of change in the areas of advertising and administration. This is a widespread belief [1]. The abbreviation VR may be disassembled into its component elements in a very straightforward manner, and AR. The user's own creative processes are responsible for the development of every single component that is viewed during the whole of a virtual reality VR experience. Last but not least, there is a concept known as AR, in which the viewer is supplied with a simultaneous display of the video collected in the actual world as well as the appropriate graphic. In this kind of augmented reality, the viewer may interact with both the video and the graphic.

Emerging technology, such as smart glasses or headsets used in tandem with mobile devices, that improves or enhances the actual environment in which a person is placed. Examples of such technologies include augmented reality and virtual reality. Augmented reality and virtual reality are two examples of technology that fall within this category. To provide you with an example, Snapchat is an excellent illustration of augmented reality. This indicates that when you are using the programme with a filter linked to your face, you will be watched directly, and in addition to the visual, you will also feel a sense of three-dimensionality. This will take place while you are using the application with a filter attached to your face. To put it another way, you will have an experience that is similar to augmented reality. Figure 1 presents an example of augmented reality for your viewing pleasure.



Figure (1): AR (Augmented Reality)

The distinction between VR and AR is straightforward. Figure 2 depicts the distinction between them.

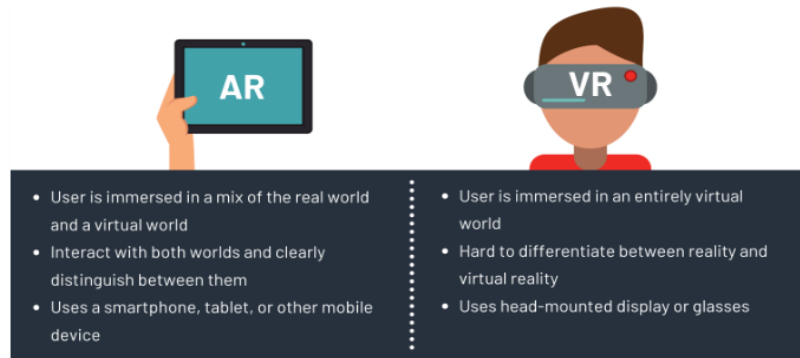


Figure (2): Virtual Reality (VR) VS Augmented Reality (AR)

2. BACKGROUND THEORY

Along with (a) the delivery of prepackaged computing services via the internet as a service, (b) the ability for end-users to supply the resources they need, and (c) a pricing model in which consumers pay only for the cloud resources they use, one of the most important characteristics of cloud computing is the adaptability for end-users to quickly supply the resources they need. Cloud services may achieve economies of scale by sharing computer resources [2]. This is possible but unknown. After then, cloud services may transmit these savings to commercial information technology. It's hardly surprising that cloud computing's potential cost benefits would drive interest in the topic at the time. Cloud services combine huge processing power in centralised pools to make data mining at scale possible. Only conventional data mining methods allowed this. This makes large-scale data mining possible. This approach produced a wide range of innovative programming models and development techniques, all of which are now collectively known as "cloud computing." These technological advancements allow massive computations and greatly improve the software development process. They enable smaller computations than ever before. These technologies enable massive computations [3].

Cloud computing has skyrocketed in popularity in recent years, therefore many international organisations are revamping their IT strategies. Big data, IoT, and ML have been introduced, along with new mobile goods and services. The "as a service" model's unmatched investment, distribution time, and scalability have led to this conclusion. "As a service" is directly accountable for these recent technology advances. Emerging computer and networking technologies employ international infrastructure to provide users the best possible experience [3, 4]. This maximises customer satisfaction. Due to the delay in responding, which can range from very short to nonexistent, monitoring the quality of a service provided to end users in a multi-cloud environment is difficult. (QoS). Due of SLM's growing importance in this area, large suppliers need it more [5]. Conclusions the greatest impact of environmental factors on SMEs' adoption of cloud-based services is external, not organisational or technical. This best summarises environmental influences on Indian SMEs' adoption of new technology. This method is the most effective at describing the relevance of environmental consequences in the process by which small and medium-sized firms (SMEs) in India accept new technology, illustrates the importance of data, and analyses the cloud storage load capacity. The numerical investigation provided some insight into the chilling factor[6]. Explore strategies to improve

QS models with queues in their real implementations. Statistics are crucial to determining which services are needed to attain the desired result. A global network of data centres provides processing power. However, it is sometimes stated that rates are based on data use, therefore the cost of this service may vary depending on the provider and the amount of data handled [7].

"Cloud computing," sometimes known as "on-demand computing" or "platform computing," encompasses several areas, including information storage, server and database administration, and device deployment. "On-demand computing" and "platform computing" are additional names for this kind of computing. "Computing on demand" and "computing platforms" both describe this paradigm. Both expressions are feasible. A cloud service company using physical servers must build new infrastructure, which takes time and money [8]. Cloud computing is a means of providing information technology services in which end-users have easy, on-demand access to a shared pool of computer resources that may be updated. End users may customise shared computer resources. (Such as data storage and processing power). "Utility computing" is another term for cloud computing. Cloud computing has several names. Instead of preserving data on a hard drive or backup device, users should save it online where it can be accessed from any device. This simplifies data retrieval. Keeping data online makes it more accessible [9]. Cloud computing is internet-based computer services and resources. SaaS and IaaS are also used to describe this concept. (IaaS). Clouds may be private, public, or hybrid networks depending on the design of the underlying computer systems [10].

Cloud computing services may increase significantly. Cloud computing has shown the limitations of traditional IT infrastructure. Businesses are having a harder time adapting to market and technological changes because their technical environments are not ready to identify and implement solutions. This makes enterprises less competitive. This makes adaptation harder. This makes it tougher for firms to adjust to the changing environment, which is a difficulty. Cloud-based solutions assist corporate growth by providing a more flexible and effective IT infrastructure. Cloud-based systems have several implementations [11].

Access to cloud data by different groups and teams increases interoperability. Because of this, organisations can cooperate better. This system speeds up data collection and management communication for remote workers. Reduce regular IT process lag time to accomplish this. Delays may lower remote workers' productivity. It simplifies methods to create more in less time [12]. Since industry customer requirements change, performance and scalability are vital. Thus, the cloud architecture was designed to evolve with your organisation. A growing organisation requires extra space and capacity to accommodate new customers and market activities. This change is due to a larger corporate workforce. Auto-scaling allows enterprises to increase or decrease their cloud resource use to fit their operational needs. This flexibility helps firms satisfy operational needs. Cloud computing has reduced website load times and internet outages [13]. Some cloud service providers update their product lines to accommodate the latest software that powers their services. This helps businesses meet client requests. Cloud servers are monitored and maintained 24/7, which may save man hours and money compared to on-site work. If done locally, it would have been. Cloud-based solutions are also sustainable for CSR-focused and carbon-conscious enterprises. Many sectors use cloud-based solutions. As cloud storage becomes more popular, businesses may need fewer on-premises servers and other gear. This is possible when cloud storage becomes more popular. Cloud storage services may eliminate the need for physical storage devices, hence they may be to fault for the incident.

Cloud service companies employ "pay as you go" to charge businesses only when they use their services. This prevents enterprises from overspending on cloud services [14]. You'll pay per use. This alleviates the financial pressure of recurring payments. Rising organisations may use the scalability of their storage systems to suit their rising data storage needs. As long as they have internet and network connection at work, employees may work from practically anywhere. This is feasible because cloud data is kept on a distant area of the internet. A provider's cloud deployment may be used to categorise clouds [15].

Secret Cloud

Private clouds provide less support than IaaS but are cheaper than on-premises deployments. Today, internal features are called "internal cloud" or "corporate cloud." These words are used more. This term is becoming more popular. These properties are different from those of a "private cloud," which are regulated individually. Private clouds provide flexibility, stability, and greater administration and security options. Outsourcing to the public cloud increases data security, but only if firms build their own internal firewalls. Public cloud outsourcing saves money. Using a private cloud requires a lot of time and resources from the company to utilise and maintain the servers. The company may suffer. Private clouds always have this disadvantage [16].

Open Cloud Storage

The "digital cloud" refers to third-party-hosted server space that may be accessed online. This server space can store data. Public clouds allow anybody to use or buy them, unlike private clouds. Private clouds restrict access. Private clouds, however, limit access. These programmes may be free or priced according to time, space, or data. Businesses may save on server hardware, software, and upgrades by adopting cloud services instead of developing their own. Cost reductions are likely. Due to memory and storage scalability, businesses can better handle growing data loads [17].

Hybrid Cloud

Special cloud computing is needed to blend public and private cloud resources. "Cloud voodoo" states that private and public clouds can adapt to changing data processing and storage needs. Companies must increase network capacity to meet rising demand for cloud and on-premises storage as this traffic isn't from a public cloud. This keeps firms competitive. Firms must do this to survive in today's economy. Services are commonly purchased à la carte in multi-tenant cloud computing infrastructures. In many cases, you may profit from a decentralised cloud without having to worry about data security. Decentralized clouds have grown in popularity, making this conceivable [18].

The exponential growth of global data sets has put the information technology industry at a critical crossroads. According to International Data Corporation's white book "Data-Age 2025," the universe's data will treble from 33 zettabytes in 2018 to 175 in 2025. In the next years, cloud service demand is expected to rise. Cloud storage may solve some of the challenges caused by data's exponential expansion. Cloud storage uses a network to pool data centre resources. It connects several storage devices. Cloud users may backup, share, and recover their data from any computer connected to a network, usually the Internet. "Cloud computing" allows people to exchange data [19].

Cloud computing involves storing and accessing data online rather than on a local server. Cloud computing, often known as "online computing," is the technology that enables this process.

The company's migration to the cloud will provide customers many more perks. This decision was taken because it would directly benefit the company's consumers. Benefits include scalability, reliability, high performance, availability, and a pay-as-you-go pricing mechanism. Scalability is crucial to cloud computing. Other advantages exist. Outsourcing services increases the risk of security vulnerabilities, data loss, and service outages [20]. Several popular cloud storage options are available. OpenStack Swift, Ceph, Dropbox, Google Drive, and Microsoft OneDrive are among the numerous alternatives. This has led the cloud computing sector to prioritise data secrecy. Consumers want their CSPs to secure their data, ensure service reliability, and comply with all security requirements on their behalf [21].

Cloud service providers' security is difficult to assess due of their intangibility. Customers can better assess the security of services they're evaluating, which speeds up cloud computing adoption. The material's durability and uniformity may have influenced their assessments. Thus, more people adopt the practise faster. Both parties are currently negotiating a Security Service Level Agreement, which will regulate the relationship between security service providers and their customers in security administration. The agreement will regulate the interaction between security service providers and their consumers in security administration. A mechanism that will serve as a mechanism that will serve as a mechanism that will serve as a mechanism that will serve as a mechanism. This agreement protects each party's interests and requires them to cooperate to avoid security breaches and their financial and technical consequences [22]. To prevent security breaches, this agreement asks each participant to collaborate. Cloud service providers face several issues with "cloud computing." The most critical concerns include ensuring production, restricting resources, preparing disaster recovery, work allocation, and regulatory constraints. Internet-based computing is getting increasingly popular. The concerns raised might be solved by federating numerous clouds. CSPs may outsource certain user requests to third-party service providers while still monitoring and controlling them. This is possible because CSPs may outsource queries. When simplified, cloud services fall into three general groups [23]:

Cloud customers that utilise SaaS may access a large library of useful apps. No programme may be accessed without a web browser. Notepad, Paint, and Microsoft Word may benefit from usage-based pricing. Google, ZOHO, Intuit, and Salesforce.com provide SaaS [23]. A platform-like operating system controls end-user service delivery in this arrangement. PaaS—Platform as a Service—is the operating system's abbreviation. An integrated development environment (IDE) has tools for designing frameworks. Framework development. These tools include a compiler, editor, and other useful tools in one compact package. Google Apps, Force.com, and Bungee Connect are PaaS firms [24].

"Infrastructure as a Service" (IaaS) describes how cloud computing users may access the infrastructure. Servers, networks, and storage are these infrastructures. IaaS is an abbreviation. People may select the services they need and only pay for the ones they utilise. People may choose. The user controls the operating system and application deployment, but not the cloud infrastructure. EMC Atmos and Amazon EC2 demonstrate IaaS [25]. The Internet of Things (IoT) has garnered the most interest in recent years. Due to the fast growth of mobile phones, RFID, Wireless Sensor Networks (WSN), and cloud computing, Kevin Ashton conceived the Internet of Things in 1999. Technological advancements including mobile phones, RFID, and

cloud computing inspired Kevin Ashton's proposal. This inspired Kevin Ashton to create the Internet of Things. The rapid growth of technology motivated Kevin Ashton to create the Internet of Things (IoT) [26]. First, he had the idea. The Internet of Things' growth has simplified communication. Connected gadgets may share information and actions. Connected devices cause this. In the Internet of Things (IoT), many electrical gadgets of various sizes are linked. These electronic gadgets include personal computers, laptops, smartphones, PDAs, tablets, and other devices of various shapes and sizes [26]. Due to their powerful wireless communication networks and sensors, these devices can communicate and provide vital data to the system that regulates them. They also do it alone. The backend processes, analyzes, and distributes Internet of Things data [27]. In parallel. The rapid growth of communication and Internet technologies has caused a slow but ubiquitous transition from the physical world to the virtual one. VR and AR are driving this change. The fast advancement of these technologies caused this occurrence. Real life includes work, socializing, and shopping. Real-life activities include: (including keeping plants and pets in the virtual environment offered by the network). Thus, the shift to a fully automated world in which individuals are rendered superfluous is difficult and challenging. Change will be hard [28].

Due to these limits, the Internet may soon be unable to provide the same amount of services. This might happen. The Internet of Things succeeded in uniting many physical world components under the digital cosmos. Time achieved this aim. The Internet of Things aims to make it easier for inanimate objects to become self-aware and perform their duties without human intervention. AI applications include smart health, lifestyle, commodities, and cities. AI may be used in many ways [28].

IoT devices are increasingly widely used and linked to the internet. This tendency will likely continue. "The internet of things" describes this phenomenon. This tendency should continue for a long time. Since statistics support this perspective, remember this. By 2020, 30 billion linked gadgets will have earned 700 billion euros. In a short time, the Internet of Things will affect every part of our lives, including our careers. Even our residential settings will be affected. In an ideal world, people and their gadgets should be able to communicate through any service or network at any time. The Internet of Things aims to improve human life in the future [29]. It's unfortunate that most of these devices and apps can't survive assaults on consumer privacy and security. Because of this, IoT networks must address authentication, privacy, data integrity, and many other issues. Every day, hackers and other cybercriminals use operating system flaws to compromise the security of Internet of Things devices. A recent study found that hackers may easily hijack over 70% of internet-connected devices [30]. This emphasises the need for a comprehensive and efficient plan to prevent unauthorised access to and exploitation of internet-connected devices. System model development is one of several systematic studies. Many fields have conducted this study. This research examined many facets of fog computing's proliferation. Computing in the fog, computing in the cloud with computing in the fog, and computing in the fog with computing in the fog are interconnected topics that must be studied together to understand this developing technology's opportunities. After reviewing the results, additional study is recommended [31].

A "distributed" system has its elements on various computers connected via a network. This is what we mean when we say a system is "distributed." Since each computer can send and receive messages independently of the network to which it is connected, they can communicate efficiently even though they are on different networks. Distributed computing science studies

decentralised systems [31]. "Distributed computing science" and "distributed computing" are frequently used interchangeably. Distributed computing science and distributed computing are frequently used interchangeably since they have similar meanings. To fulfil their goals, dispersed system components must coordinate and cooperate. Distributed systems must keep all their components operating, retain precise time without a central clock, and recover from component failures individually. Distributed systems face several problems, including synchronisation [32]. Distributed systems have several challenges, including synchronising all its pieces. Distributed systems have several issues, such as keeping all components in sync, keeping precise time, and others. How a single system failure may bring the entire edifice down is hard to imagine. Distributed systems include peer-to-peer applications, large-scale online games, and service-oriented architectural systems. Other forms of distributed systems include: A "distributed programme" is software designed for usage in a networked environment, and its production is called distributed programme creation. Distributed programmes may also refer to software. Distributed software needs a network [33]. The "distributed programme" can also be used to refer to the software itself. Any of the many types of software available on the market can be used to send messages. These apps are available now. This communication includes message queues, RPC-like connections, and sockets. HTTP is one of the systems that fall under this category. Distributed computing may imply employing several computers to solve a computational problem [34]. Distributed computing involves breaking a problem into a number of smaller sub problems, then assigning one computer or a group of computers to solve each sub problem. Repeat until the issue is solved. Distributed computing begins at this step. Since they can communicate, text, and engage, these gadgets can exchange data [35].

"Distributed system," "distributed programming," and "distributed algorithm" were formerly used interchangeably to describe computer networks with machines spread over a large area. Distributed system, distributed programming, and distributed algorithm are examples of these conceptualizations. These expressions may now represent separate apps functioning on the same system while communicating. These terms now have a broader connotation. Despite the lack of agreement on what characterises a distributed system, the following are commonly considered to be its hallmarks:

Each node in a distributed computing system may store data in its own RAM and CPU. Each node has its own RAM and CPU [36]. Entities interact by sending and receiving messages. Because the distributed system is striving to solve a widespread issue, the user may think the processors are a single entity. Eliminating a widespread computer issue is an example. The system is working together to achieve the goal. Multi-node architectures are becoming increasingly frequent. The distributed system might also coordinate resource consumption or offer communication services. The distributed system might suit each user's computer-specific needs. Other devices may fail these conditions [37]. Other distributed system characteristics include:

The system must tolerate hardware defects to function properly. System architecture—including network topology, latency, and number of computers—is unplanned. Distributed programmes may require many machines and network connections. System design may change at any time. Each computer's limited view of the network reduces its usefulness. It appears unlikely that computers will give out incomplete information in response to input [37, 38].

Distributed systems are networks of computers working together on a project. These machines want to finish the job. Nodes are clusters of linked computers. "Concurrent computing,"

"parallel computing," and "distributed computing" are all the same and have minimal differences. These concepts refer to "distributed computing," which involves several computers. This notion is called concurrent, parallel, or distributed computing. Both terms may be used to describe a distributed system since its processors work concurrently and in parallel. It is feasible to use both terminology to describe the same system. Because this system may operate in either mode, any phrase can be used to describe it. Computation is either a general parallel computing or a highly specialised distributed computing with very tight node connections. Both forms of computing are feasible simultaneously. Computation is distributed computing regardless. Computation is distributed computing, whatever. However, parallel computing may be spread [39].

"Cloud computing" refers to using shared networked computer storage and processing capability through the Internet rather than storing data locally on each user's device. Cloud computing is also a strategy. "Cloud computing" is another title for the approach. The activities of a massive cloud are often performed across many "data centres" to speed up the process. This paradigm emphasises collaboration and resource sharing since cloud computing relies on them. It commonly uses "pay as you go," which may save clients' money in the short term but may lead to large ongoing costs if they don't cancel before the contract ends. This cost-reduction solution reduces spending [40].

Public and hybrid cloud advocates claim that their services allow organisations to decrease expenses and enhance profits by removing or considerably decreasing the need to invest in IT infrastructure. Public and hybrid cloud proponents believe this. Cloud computing simplifies corporate processes, according to proponents. Cloud computing is based on the premise that consumers should be able to benefit from a variety of technologies without having to master each one. AWS and MS Azure created cloud computing [41]. AWS and Azure developed cloud computing. Cloud computing frees clients from technological constraints. Cloud computing reduces operating costs as much as feasible. This allows customers to focus more on company growth. Virtualization is the most crucial cloud computing technology. Cloud computing is impossible without virtualization. Virtualization software may turn actual computer hardware into numerous "virtual" components. Recent computer technology advances make this possible. Operating system virtualization allows for better utilisation of underutilised computer resources [42]. Microsoft created virtualization. Because of this, it is theoretically conceivable to design a scalable system from several computers. Virtualization gives IT operations flexibility, and improved infrastructure utilisation saves money. Virtualization also reduces data loss. Virtualization also provides flexibility to speed up IT procedures. Autonomous computing may automate the donation of resources at the right moment. It's possible. Automation makes a process more efficient, requires fewer workers, and reduces the likelihood of human error [43]. Productivity increases these advantages. Cloud computing uses utility computing techniques to quantify its services. This computing is older. Cloud computing was developed to address grid computing's quality of service and reliability challenges. This was done to solve grid computing model issues. This was one of the things that kept me going, which finally led in the invention of the concept. In part. These technologies function like cloud computing and have many similarities:

Client-server computing is any distributed programme that differentiates service providers (servers) from service requesters. Client-server architecture describes this computing. This

distinction helps the two groups communicate. Clients are exemplified by the client-server paradigm [44].

A "computer bureau" provides a number of IT-related services to its clients. This kind of agency thrived from the 1960s through the 1980s. Grid computing is a type of distributed and parallel computing that pools the resources of many computers connected by a network but only loosely coupled to create a "super and virtual computer." After that, you may utilise this "super and virtual computer" to do a job that normally takes much longer [45].

Due to the IoT, daily routines have changed. These alterations caused these changes. Despite its many benefits, the Internet of Things presents serious threats to our privacy and safety. Despite its many positive consequences. Most security breaches risk exposing sensitive data or disrupting key services. The IoT contains several security issues that endanger people and their possessions in non-networked areas. IoT software, hardware, and communications protocols have these problems. User preferences matter since the Internet of Things has many devices and platforms and sends a lot of personally identifiable information [46, 47]. Thus, an effective data security system is essential. Having this is crucial. If devices use Internet of Things services, they may connect via a variety of network topologies. This enhances the bundle. Because of this, many people worry about both network security and privacy. Situation caused this.

The scenario will determine how many electrical devices in this area communicate and exchange data. Change is expected. Since this improvement was made, safety must remain high. For instance, home network gadgets and sensors should connect securely with equipment outside the house. This protects the house. This prevents data theft and ensures privacy. This prevents data from being stolen or used immorally [48, 49].

"Cloud storage" refers to a paradigm of data storage in several data centres throughout the globe. "Cloud storage" refers to computer storage in this sense. This model, called "cloud storage," stores data on several servers in different data centres. These servers store data and monitor servers. The cloud service provider is responsible for data accessibility, facility security, maintenance, and efficiency [50]. The cloud service provider also ensures data availability. The provider must also check the data for any changes. Instead of building their own storage facilities for user, corporate, and application data, many firms and individuals rent or purchase storage space from third-party suppliers. Renting or purchasing storage is cheaper. Leasing or buying a storage space usually saves money. APIs, collocated cloud computing services, and web service APIs allow clients to connect to cloud storage providers. Local cloud computing services are another possibility. Desktop cloud storage, gateways to cloud storage, and web-based CMSs are examples [51, 52].

Cloud storage protects data from natural disasters. Cloud storage prevents data loss from harmful intrusions. Cloud storage uses several global backup servers to make this feasible. Users may quickly backup their data. This enables fast and reliable data backup regardless of location. WebDAV lets users access their online storage like a local disc [66]. Users may utilise cloud storage the same way. Companies with several locations might utilise it as a central file server to make data transfer easier. Companies would find this useful. This will save businesses time and money. Thus, the company would operate more efficiently. Potential Issues: Protecting cloud-stored data is a challenging issue that needs more study. If you store sensitive

data outside of your office, hackers are more likely to find it and use it against you. This makes you susceptible [53, 54].

Distributing data increases the danger of physical harm. Data is stored in more locations, increasing redundancy. Cloud-based architectures, which need constant data replication and transmission, increase the risk of illegal data recovery. The cloud's non-modifiable data storing mechanism is the problem. This may happen when a hard drive is recycled, a computer is reused, or storage space is reallocated. Reusing a computer, recycling a hard disk, or redistributing storage space are some examples. The customer's data replication strategy will depend on their new service provider and promotion to a higher replication tier [55]. Encryption may secure critical data while preserving users' anonymity. It needs careful examination. Encryption has several advantages, including this. Crypto-shredding, a kind of disposal, may be used to destroy sensitive data. Cryptographic shredding is crypto-shredding. This is one disc-based method [56, 57].

More people accessing sensitive data increases the risk of it being misused or stolen. As information is shared, this danger rises. This hazard increases as more people get access to the information. Cloud storage companies have a bigger technical staff with physical and technological access to almost all of the data kept in the facility or organisation. The cloud storage provider's hybrid approach will provide this access. Multi-factor authentication, which needs a password to access data, will enable this access. User gets access. This is an unusual amount of administrators, network engineers, and technicians to be responsible for a single organisation's data [58]. The number of persons accountable for a company's data is far fewer than the number responsible for it. When the user has the decryption keys instead of the service provider, the staff has far less data access. Users must provide several decryption keys across encrypted channels before sharing cloud-stored data sets with others. Users must complete this step before sharing data sets. This must be done before users may cooperate on varied data sources [59]. Users must finish this step before sharing data. To protect these keys, clients must install a reliable method on their devices [72]. Maintaining the security of these keys may cost more, but it is crucial and should never be overlooked. If done properly and with attention to detail, key aggregation may solve this issue and mitigate its effects. It increases data delivery channels. To connect all cloud bits and bytes, you need a WAN. This network—LAN or SAN—must be more reliable than either [60, 61].

Unauthorized access to consumers' data is possible when a big number of users share networks and data storage. Data storage and network users heighten this danger. Unauthorized third parties may access client data, creating this danger. It is possible that malicious intent caused it, but it is also possible that a technology error or a mistake by the connected parties caused it. It might have been caused by one of these two things or by malevolent intent. Both views are viable [62, 63]. Both concepts are plausible. Since risk is inherent to all data storage systems, including the cloud, eliminating it is impossible. This reduces solution feasibility. Encrypting data before transit reduces the risk of unauthorised persons seeing sensitive data. Encryption makes sensitive data harder to decipher, reducing probability. Encrypting data transferred from your mobile device to a cloud storage provider adds an extra degree of security. Encrypting your phone allows this. Data stored by a service provider is encrypted "at rest" to prevent unauthorised access. This protects sensitive data [64]. When data is protected on-premises and connected to a cloud service, users have access to both levels of encryption security. Data

security is maximised. This is because users may employ both encryption kinds at once. On-premises and cloud-based encryption are the major types [65, 66].

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3. LITERATURE REVIEW

There have been a great number of research done in order to investigate not just the potential beneficial impacts that virtual reality (VR) may have, but also the potential negative consequences that it may have. The method outlines a system that encourages users to engage in contact with their surroundings, regardless of whether the surroundings are genuine or not. This is the case whether the environment is an exact picture of the actual world or an artificial one. This activity has the potential to take place both in a virtual environment and in the physical world, which is where we really live. By using this strategy, one may have a look into the future while also reliving their own past all at the same time. This is how one can do both at the same time. Think of it as a means for creating anything that can be used to create one's own reality; thus, think of it as a method for making your own reality because it is a method for producing anything that can be used to construct one's own reality. Consider it a way to build your own world because it is a technique for generating anything that can be used to construct one's own reality. It is possible to use virtual reality for everything, including the creation of a video game, the discovery of life on other planets, the investigation of extra-terrestrial intelligence, the construction of a dream house, and even the goal of obtaining perspective on the most frightening and difficult of circumstances [1, 67]. Inside their vision of virtual reality, these authors included computer technologies that utilise software to generate realistic sights, sounds, and other feelings. These technologies mirror and duplicate an environment, as well as the actual presence of the users inside that environment. The collective name for these kinds of technology is "simulation technologies. VR refers to the technology breakthroughs that make it feasible for users to have these kinds of experiences [68]. On the other hand, the research presents a way that enables an experienced operator to be stationed in one zone to control a robot located in another location remotely using a virtual reality headset. This is made feasible thanks to the approach shown in the study. From this location, the robot may be operated if necessary. During the course of the investigation, this approach to methodology emerged in my head. It is feasible for the operator to view and operate Valkyrie by using a combination of these two pieces of equipment, the first of which is a piece of headgear known as the HTC Vive, which can be purchased, and the second of which is a pair of gloves known as Manus VR. Both of these pieces of hardware may be acquired independently of one another if desired. The HTC Vive is a virtual reality (VR) headset that includes head tracking as a built-in feature for the purpose of determining location and heading. Using this feature of the HTC Vive, the user is able to freely navigate a digital representation of the real world, even if they are seated in a posture that is both comfortable and private [67, 69]. The purpose of this article is to provide an overview of the present status of augmented, virtual, and mixed-reality systems with the intention of highlighting the potential uses of these technologies in the field of cultural heritage. The purpose of this article is to provide examples of some of the possible applications that these systems may have. In addition, researchers analyse which technical strategies are the most suited for certain applications involving digital cultural assets in order to choose which of these methods should be used. Because of this, it is of the highest necessity to conduct study into these breakthroughs while keeping the cultural history of our civilization in mind. AR, VR, and MR (mixed reality) are the three types of

technology that Cultural Heritage (CH) utilises for a wide range of jobs and objectives. AR stands for augmented reality, while VR and MR stand for virtual reality and mixed reality, respectively. A few examples of these applications are educational purposes, displaying purposes, exploring purposes, and reproducing historical places. Virtual field trips to museums are another example. As a consequence of recent advancements in technology, it is now feasible to have digital access to historical records as well as other forms of cultural assets. This opens up a whole new world of possibilities. This is of the utmost importance in areas where access to such resources is restricted because of the physical positioning of such resources. These are places where this limitation exists [70]. This article examines virtual reality (VR) from a variety of perspectives, including as its history, technology, and psychology, with the goal of providing some eye-opening insights on human nature. Continue reading the following article for more information on the topic. They wrap up their discussion by offering some last thoughts on the direction that virtual reality will go in the wake of the growing conflicts that exist between the academic and commercial spheres of society[70]. According to the results of the study project, the fast development of immersive technology over the course of the previous few years has led to the creation of (new) chances for "education," "communication," and "entertainment" in public cultural settings. These opportunities may be found in public cultural settings such as museums and theatres. These types of opportunities often come up in public cultural spaces all across the world. Mixed reality (MR) and virtual reality (VR) may play an important role in the presentation of the past and polysemic cultural activities. These activities make it possible to generate new sensations and meanings. The abbreviations for mixed reality (MR) and virtual reality (VR) are, respectively, MR and VR. (MR) [71]. In the meantime, we examine properties and interactions pertinent to educational use in social learning spaces, as well as several learning theories such as constructivism, social cognitive theory, connectivism, and activity theory, through the lens of CSCL, in order to provide a theoretical foundation for future educational frameworks that make use of virtual reality and augmented reality. Specifically, we are interested in providing a theoretical foundation for future educational frameworks that make use of virtual reality and augmented reality because these technologies are becoming increasingly popular. Because it is anticipated that virtual reality and augmented reality will play an increasingly significant role in education, our primary objective is to create a theoretical groundwork for the development of future educational frameworks that include these technologies. In particular, we are interested in developing educational frameworks that make advantage of virtual reality and augmented reality given the growing popularity of these technologies. More specifically, we are interested in the development of instructional frameworks that make use of both virtual reality and augmented reality. Constructivism, social cognitive theory, connectivism, and activity theory are just a few of the numerous educational philosophies that we take into account among the many others. These are only few of the numerous different philosophies that exist [72]. One additional advantage of augmented reality is that it has the potential to fundamentally disrupt the competitive settings of a number of different business sectors, including marketing and management. This is one of the many benefits of augmented reality. Both of these sectors could stand to benefit from something like this. The purpose of this article is to conduct research on the degree to which buyers are receptive to holographic stand-ins for genuine physical objects that are rendered using augmented reality (AR) technology. Particularly, we are interested in the level of performance shown by these stand-ins. Other product categories, on the other hand, have very low adoption rates, in contrast to those that

have extraordinarily high adoption rates, such as those for manuals, technology for navigation, and Post-it notes. Those product categories have exceptionally high adoption rates [1].

4. METHODOLOGY

4.1 Virtual Reality (VR) Controls

At this stage, the operator may communicate with the robot using any one of a wide range of various approaches that they have available to them. The user may "grab" one of Valkyrie's hands in the virtual world by pushing a button on the Vive wandss or forming a fist while wearing the Manus glove, and then they can move their own hands into the appropriate position. This is accomplished by making a fist while wearing the Manus glove. To do this, press the button located on the Vive wands or make a fist while wearing the Manus glove. Following that, the robot will begin to plot its path to each site, and the human will be able to see the process as it unfolds in real time. It gives users the option of monitoring in real time or providing a batch of many instructions all at once. Through the use of the joystick or the gloves, the user has the ability to provide an egocentric perspective on the robot. In addition to this effect, it also assists in maintaining mental control, which is quite helpful. The user of the Vive headset has the ability to switch to an egocentric perspective and control the robot's gaze by starring in the direction they wish it to move while wearing the headset. This may be done while the user is wearing the headset. Alternatively, the user may physically grip the head and tug it in the desired direction [69]. Figure 3 depicts a user using the Manus VR glove in order to control Valkyrie's hand. This is done using the user's own hands.



Figure (3): Shows the utilizing the Manus VR glove to control Valkyrie's hand

4.2 Robot State Information

The current state of the robot is the one piece of information that the operator has access to, and it is also the piece of information that is both the single most important and the most essential. It is possible that the model of the robot that is currently being used in the simulation will need to be altered in order for the data to be visualised. Changing the model of the robot allows one to see the information that is collected from the overwhelming majority of robots that are constructed with the capability of monitoring the movements of their own joints. (as illustrated in Figure 1). The operator not only has access to the sensor data, which will be covered in more detail in the coming paragraphs, but also has a crystal clear visual of the position of the robot as it travels through its surroundings. This information will be addressed in more detail in the following paragraphs[70] . Figure 4 illustrates a broad variety of camera viewpoints taken from a variety of cameras. The live footage is being captured by cameras that are positioned on the outside of the robot, and it is being shown on both displays at the same time.



Figure (4): Viewing a multiple camera view-points

4.3 Virtual Reality Examples

There are some examples about: Headsets, Glasses and Devices. For Virtual Reality which includes (HTC Vive, Samsung Gear, Google Cardboard, Sony PS4, Google Glass, Microsoft HoloLens).

4.4 Communications and Virtual Reality

Virtual reality (VR) is a style of communication that gives the impression that the abilities being shown are genuine and have not been manipulated in any way. The word "virtual reality" (VR) refers to this mode of communication. Virtual reality (VR) has been put to use for a variety of reasons dating back to the 1960s, some of which include "military training," "medical training," and "simulations." On the other hand, it has also developed into a fruitful platform for analysing the social and psychological dynamics that are present in academic environments. This is the case because of the rise of social media. For instance, journalists utilise virtual reality to immerse readers in tales; educators use virtual technology for empirical learning; and psychiatrists use virtual reality to reduce the harmful implications that mental diseases have on the lives of their patients [71].

4.5 (VR) Virtual Reality and (MR) Mixed Reality

As a direct consequence of the broad availability of the aforementioned technologies, cultural institutions now have access to (new) opportunities in the areas of education, networking, and entertainment, respectively. In the event that polysemic cultural activities continue to build new kinds of experiences and interpretations, virtual reality (VR) and mixed reality (MR) may play an essential role in the presentation of newly generated sensations and meanings. This might be due to the fact that these two forms of reality can combine the best of both physical and digital worlds. When we are presented with the chance to see a mixture of real and virtual components interacting with one another in real time, we refer to this as a "mixed reality," and we say that we are having this experience. The term "mixed reality" refers to a fusion of real life and computer-generated imagery. The explanation for this may be found here. (MR). Mixed reality is the term given to the newly generated reality that is the consequence of the collision between the actual and the virtual worlds. This collision creates a new reality that combines aspects of both worlds. (MR) [71].

4.6 (MR)-Mixed Reality vs (AR) Augmented Reality

Augmented reality (AR) and mixed reality (MR) are two examples of technologies that concurrently fulfil their duties while transporting the user into a new world. On the other hand, they are two completely separate creatures in their own right. Mixed reality is an extension of augmented reality that defines the scenario in which real and virtual objects coexist in the same

place. Mixed reality depicts the situation in which real and virtual items coexist in the same location [73].

5. CONCLUSION

This section provides an overview of virtual reality, sometimes abbreviated as VR. Virtual reality may be thought of as a substitute for the real world. Interacting with computer-generated simulations of one's physical environment is a common component of "virtual reality" (VR), which is an abbreviation for "virtual reality" experiences. To put it another way, the designer was accountable for the aesthetics of the product as a whole, including how it appeared to the general public. The term "augmented reality" refers to a subset of the virtual reality (VR) technology that combines aspects of both of these other technologies. (AR). (AR). One good illustration of this would be the fact that just a minority of the female students who attend this school have Snapchat accounts. Snapchat is a kind of augmented reality (AR), in which users have the ability to apply a filter to their faces that imitates the appearance and feel of 3D photographs and video while still being immediately visible to other users of the app. This allows users to communicate with one another in a manner that is more immersive than traditional two-dimensional communication. This gives viewers the impression that they are experiencing 3D content even if they can still see everything clearly in front of them. In addition, discussions were held on several other elements of virtual reality technology, including monitors and headgear, amongst others. Figure 3, which was also shown, drew attention to the contrast between augmented reality and virtual reality that is considered to be the more important of the two. (Augmented Reality).

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