Scope of Metaverse Technology in Central Library, Rajiv Gandhi University

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The era of the twenty-first century is all about the internet. It's high time that we are moving from Web 2.0 to web 3.0. With the advent of the pandemic, there has been a push toward access to technology in the education sector, one such technology which is the future of the internet of things is 'the metaverse. Technology can be best merged with technologies to reach the last miles of the country. As this paper focuses on the scope of metaverse or virtual world technology in Central Library, Rajiv Gandhi University, Arunachal Pradesh. As Arunachal is situated in one of the toughest terrains in the country, it become important to understand how we can connect to the student communities in a virtual world, how it will benefit the students, and what are the obstacles that will come in our path to transform the library into the virtual library. Lastly, the paper discusses the need for a librarian in the virtual library.

Introduction

The era of the twenty-first century is all about the internet. Every task can be completed with the help of smartphones and internet-connected. Now we are gradually moving towards web 3.0 from web 2.0. Virtual worlds are computer-generated, persistent immersive settings where people interact by generating avatars, thanks to the growth of digital networking. Avatars are customized representations of oneself that are used to interact in virtual worlds or video games. Finding educational groups and resources is a challenge that fits in nicely with the fundamental principles of librarianship.

A hypothetical synthetic environment connected to the physical world is described by the term METAVERSE, which combines the prefix "meta" (implying transcending) with the word "universe." In 1992, Neal Stephenson published a work of science fiction called Snow Crash, which is where the term "metaverse" first appeared. The metaverse is described by Stephenson in this book as a vast virtual environment that exists side by side with the real world and in which people communicate via digital avatars. Since its initial appearance, the concept of the metaverse as a computer-generated universe has been defined through a wide range of ideas, including lifelogging, collective virtual space, embodied internet/ spatial internet, a mirror world, and an omniverse: a space for collaboration and simulation. In more simple words we can understand that each user in the metaverse is the owner of their avatar, which functions as a virtual representation of their physical selves and allows them to experience a different existence.

The US-based National Science Foundation estimates that 80 percent of the new occupations developed worldwide in the upcoming ten years will require some knowledge of math and science. The labor market in India likewise reflects this STEM (science, technology, engineering, and mathematics) development. The

number of STEM-related job openings nationwide has grown by 44% between 2016 and 2019. Despite the growing demand from the labor market, STEM-based teaching and learning strategies are not yet widely used in the Indian educational system. Even if improving the infrastructure and quality of human resources appears to be a massive effort, Metaverse can help.

Virtual world libraries are a component of the immersive 3D environment that may be utilized for both educational and entertaining reasons. Some librarians are introducing libraries to virtual services in Second Life and other virtual worlds as a result of growing interest in digital services. Immersive learning environments include Second Life libraries. The services allow users to engage with them in real-world ways, including by moving about a virtual environment. Digital displays are a common feature of libraries in Second Life. The purpose of virtual library services is to connect with librarians from all over the world and draw new patrons to regular libraries. Currently, volunteers operate the majority of these programs.

2. Objective

The main objective of this paper is to explore the scope of metaverse technology in a library at Rajiv Gandhi University (RGU), Arunachal Pradesh. The paper will answer what are the scope of implementation of virtual technology in libraries along with how can library will use metaverse technology to revolutionise the education system in RGU.

3. Review of Literature

In his paper – 'Metaverse', Stylianos Mystakidis described the Metaverse as a permanent and persistent multi-user environment that combines physical reality with digital virtuality. It is the post-reality cosmos. It is built on the convergence of technologies, such as virtual reality (VR) and augmented reality that allows for multimodal interactions with digital items, virtual surroundings, and people (AR). As a result, the Metaverse is a permanent multiuser platform that connects a network of socially interactive, networked immersive worlds. It allows for fluid, real-time user-embodied communication as well as dynamic interactions with digital artifacts. Avatars could travel between several virtual worlds in their initial incarnation. The current incarnation of the Metaverse includes social, immersive VR platforms that work with open game worlds, MMORPGs, and AR collaborative spaces (Mystakidis, 2022).

A paper published on a website –Library of the Future with a title -'Virtual Reality', author has focused that the libraries have always acted as places for the public's initial introduction to new technology, and they might again play that role with virtual reality. If we want everyone to have a chance at participating in those new VR-based jobs and economies, we must assist people to understand what's coming, said Oculus (owned by Meta), which started a project in California to deploy 100 Oculus Rift headsets and VR-ready PC systems in 90 libraries around the state. With many innovators concentrating on the collections and spaces of libraries, two of the primary functions of libraries, there is a growing drive to introduce virtual reality to education. One of Oculus's co-founders, Brendan Iribe, highlights the possibilities of scanned digital

collections, saying that users "could see those artifacts and you could look around and you could see it so beautifully and so clearly, and it would track so flawlessly that your brain would believe it."(Virtual Reality, n.d.)

4. Methodology

The research approach used in this study is a blend of qualitative and case study research methods. In this paper, numbers of metaverse library across the world has been studied thoroughly and on the basis of that an idea is presented how the central library can be transformed in to a virtual library with the availableresources and requisites. The Paper is trying to explore the scope to set up a virtual library with technologies best suited for the central library with the help of secondary data.

5. Advantages and Features of virtual world

Beyond webinars and online learning environments like MOOCs or SWAYAM, virtual worlds offer the "shared sensation of presence" that comes from engaging in real-time with other students while appearing as an avatar. Three forms of presence—place presence, social presence, and co-presence—have been found in the research to improve learners' pleasure in virtual settings. For educators, librarians, and students, a virtual world is like 'Second Life' and provides a variety of resources. Researchers identified 14 technologies, including virtual field excursions and interactive media. These tools offer benefits for synchronous and asynchronous distant learning and collaboration. A person may work and study alone or with others since a virtual world is permanent, meaning the simulated environment remains precisely the same after one log out.

Workshops, seminars, and conferences are all forms of professional development that may be had in virtual environments. Across distances, educators offer resources in a variety of dynamic ways. It is affordable to attend conferences, exhibits, book discussions, and events in a virtual environment. There is no need for a flight, hotel stay, transportation, or roadside lunches. In addition, walking up and down convention center halls in search of interesting programs does not leave one with aching feet! In virtual worlds, research displays and posters are shown similarly to how they are at academic conferences or university symposiums.

Experiences that are either too risky, too expensive, or just plain impossible to have in the real world can be enjoyed in virtual environments. For instance, one can explore different civilizations, move into space, or enter a human body. Reliving events that may have contributed to PTSD (Post Traumatic Stress Disorder) can help soldiers recover by allowing them to perceive things differently. "Virtual worlds platforms, like Second Life, provide unique affordances that may eliminate certain obstacles to obtaining psychological health education and care," say the builders. First responders may learn how to save lives through disaster training simulations, and individuals can use them to make safety plans. A 3D virtual environment role-plays emergency rescue scenarios and offers participants an immersive experience in a life-or-death simulation, which may be categorized as serious gaming, according to researchers. Future immersive learning

environments will require the abilities that librarians are taught to acquire, organize, and provide high-quality content for specific user populations. Finding instructional simulations and groups in many virtual worlds is challenging since the search tools are not topic-organized. As Second Life has received recognition from several educators and organizations like ISTE (International Society for Technology in Education). They have registered for 'Second Life' groups and the 'Second Life' listserv to collaborate through email. Although many educators and librarians recognize the advantages of immersive learning, the future is still unknown as technology rapidly advances, making it crucial to plan for change.

6. Implementation of virtual library in RGU

Rajiv Gandhi University (formally Arunachal University is a premier institution for higher education in the state of Arunachal Pradesh and has completed 37 (thirty-Seven) years of its existence. Late Smt. Indira Gandhi, the 10th Prime Minister of India laid the foundation stone of the university on 4th Feb 1984. The library was established with a short number of books. At the time there were a few departments. Now the university has 27 departments. Presently 75400 books and subscribes to various national and international journals for users. Central Library has also recently inaugurated an institutional repository with 20,000 e-books that can be accessed by students, research scholars, and other users from the place of their choice. The library also provides access to the different online journals under UGC INFONET, DELNET, E-library, and a consortium of more than 10,000 e- journals full-text articles may be browsed and accessed. A total of 541 Ph.D. thesis and 536 dissertations are displayed in a separate section for consultation. Rajiv Gandhi University Central Library is equipped with RIFD technology.

In the broad sense of the Metaverse, a virtual library is a digital entity that provides online services to complement, enhance, or supplement the library experience through personalization, interaction, and content richness. To understand the scope of a metaverse library in RGU, we have to go a step further to know the steps to be taken, so that a virtual library can be a reality.

6.1. Build a virtual library

Without taking away from the experience of visiting a physical library, our implementation of a virtual library can have a direct link with it, the two complementing each other. We can develop a 3D virtual library that the user may utilize as an instructional tool to accomplish their needs. The goal of our library's design is to create visitors' curiosity by establishing a practical, reachable, and engaging setting. There can be the option to create a virtual library agent that welcomes visitors as they enter the premises, which will add more to a user-friendly environment. Virtual library setup can be designed in various ways that it can be more helpful, user-friendly, and give the feel of a physical setup –

6.1.1. Virtual Library tour

To become familiar with the various areas, the user can take a tour of the virtual library. The tour will address many of the user's basic questions regarding the library, explaining how various procedures such as book borrowing, indexing, and accessing the library function.

6.1.2. Book lending

Users can browse and pick the electronic books or proceedings they wish to read or borrow. The overall goal is to faithfully recreate the book lending process in virtual reality; users can read the book's contents or portions of it in a peaceful area of the virtual library or designated places.

6.1.3. Attending and organizing a virtual seminar

Pandemic has exhibited the usefulness of virtual seminars which are not constrained by space. There can be two choices available at the library: signing up for a virtual seminar or conference that has already been arranged, or renting a seminar space that can accommodate virtual attendees. The seminar room may be utilized for a variety of events, including lectures or presentations by university instructors, homework presentations by students, and expert talks by businesses.

6.1.4. Guidance

Through the implementation of a virtual mentor booking platform, users will be able to schedule appointments with mentors (experts in their field, such as librarians, scientists, and academics) from a list of carefully curated researchers who are working with the library.

6.2 Study the potential of the user

To complete the successful implementation of the virtual library it is very important to understand the potential of the users who are going to access the virtual library. There is a need to study the level of technological knowledge, popularity, and utility of visiting and using a virtual library. As the technology of VR is at its initial stage, it is important to modernize academic institutions with VR technologies.

6.3 Provide training to access Virtual Library – The study of user's potential will give a detailed idea of user's capability in VR technology, which will help us to mould our training and management according to the needs and requirements of the users. Apart from training users, it is very important to train the library staff in this new technology so that they can help the users in their day-to-day access to a library.

6.4 Monitoring

There is a need for continuous monitoring of the technology so that librarians can help the user in the day-to-day access and help them where ever user is facing problems. Monitoring can also help a librarian study user behavior in a virtual setup. Many times, monitoring can be seen as a threat to privacy, but librarians should draw a line between positive monitoring of the users and maintaining user privacy.

6.5 Feedback

There is a need to collect feedback from the users from time to time to improve the service of a virtual library. Many times, users have a better idea about the required changes in the library, so that the user experience can be improved and made more user-friendly.

7. How can Metaverse revolutionise the education system in RGU?

The COVID-19 pandemic, the widespread use of smartphones and the internet, the advancement of blockchain technology, and the expansion of Web 3.0 have all contributed to the emergence of the metaverse. In India, more than 70% of adults believe that over the next ten years, the development of metaverse applications like virtual learning, entertainment, gaming, socialization, and tourism will change the way people lead their lives, according to a study of 29 countries by international consulting firm Ipsos. As we have already discussed that a US-based National Science Foundation estimates that 80 percent of the new occupations developed worldwide in the upcoming ten years will require some knowledge of math and science. This is a great opportunity for RGU to boost its infrastructure and promote online education so that students can get a better learning experience and understanding. Currently, RGU follows the traditional teacher-student learning system which has been obstructed by various manmade and natural disasters in the past few years. Additionally, it is expensive for individual departments to build up infrastructure for STEM-related instruction. Existing STEM projects in India might be accelerated and strengthened by giving students and research scholars an immersive learning experience that transports them to the Metaverse, a virtual environment where they can learn about science and technology through engaging user experiences. To overcome the issue of infrastructure, the Indian govt. has developed an app – 'DIKSHA'. DIKSHA (Digital Infrastructure for Knowledge Sharing) is a nationwide framework for education that is currently limited to schools, and there is a chance that it will be updated to higher education levels in the coming future. If we discuss the role of DIKSHA in school education, the platform has the potential to significantly improve the high-quality user experience and quicken STEM education in India. The platform and architecture are already in place, and they connect to offline books through QR codes. Students may access the online world of DIKSHA, where they can study and understand subjects through videos and visuals, by simply scanning QR codes found on NCERT books. The platform can make the objective of STEM universalization a reality if it is linked to the Metaverse universe. The metaverse in education is also a great chance to enhance girls' education in particular and how their involvement in STEM subjects can be increased. According to Swedish Science Counsellor Fanny von Heland, even though women make up around 43% of STEM graduates in India, just 14% of STEM professions are held by them. Upskilling is another way to decrease the gender wage gap in STEM fields, and Metaverse can again play a significant part in this. It can effectively address the issue of women's employability thanks to the most cutting-edge AR and VR technologies.

8. How can we connect to the communities?

Although research has shown the promise of learning in immersive settings, it has been challenging to locate and develop methods for looking for and recalling communities and landmarks. In Second Life, neither the landmarks nor the search tool is subject-organized or content-evaluated. Although several groups and individuals have made spreadsheets and lists, a searchable database has not yet been released. To connect with the communities i.e. students, research scholars, and faculty members of RGU, we can

adopt various methods like acquiring, presenting, and maintaining high-quality educational materials inside virtual worlds, librarians may be able to contribute to the connectedness of virtual communities as skilled information professionals. However, librarians should encourage participation and collaboration across various communities to contribute to assisting people in finding communities and resources throughout the world and the metaverse, rather than " spinning the wheel " by making spreadsheets and lists in isolation. Another way is the idea of archiving and preservation has taken center stage since librarians first started investigating virtual worlds more than ten years ago across the world. One illustration is how librarians produce machinima (virtual reality videos) to capture events and simulations. There is a need to emphasize in the future if educators and librarians archive their achievements in virtual environments. Many scholars have examined the potential for maintaining virtual worlds, but many viewed their efforts to preserve Second Life as a failure. A poor response rate for requesting permission from intellectual property owners was one of the challenges that prevented their preservation from progressing.

9. Obstacles

One of the biggest hurdles is the infrastructure and internet connectivity. Being situated in the vicinity of the Himalayas, internet connectivity is one of the major problems. Because the metaverse blurs the distinction between virtual reality and reality and is mostly unmanaged and uncontrolled, harassment can occur in the virtual world if it is not used with prudence. As individuals utilize immersive technology more often, early user protection will benefit both the platform and individual users while addressing the trust gap. Another difficulty is the possibility that a small group of Big Tech firms, such as Google, Amazon, Meta, Apple, and Microsoft, may come to dominate the metaverse. The collection of user data will then be connected to the metaverse's economy, making privacy protection a huge concern. To date, India doesn't have data protection laws to regulate the personal as well as non-personal data of students and research scholars, and universities will not risk the critical data of students. High processing power that increases electricity consumption and the occurrence of "cyber syndrome" are two unresolved problems in the metaverse. For maintaining and validating the ledger, NFT and blockchain technologies in the metaverse economy require a lot of processing.

10. Do We Need a Librarian in a Metaverse?

The popularity of the virtual world is continuously rising due to exciting platforms provided by different companies. But, in academia, especially in the library this is a very valid question to ask – Is there any need for a 'librarian' in the metaverse? Given several considerations, it is understandable that there is hesitation to accept virtual worlds as a legitimate platforms for educational information. First, regardless of how great the potential for discovery learning is, school officials will not put students in circumstances that pose risks since privacy and security are of the utmost importance to them (Hill, 2010). Though this is not made much of the headlines in recent times in Second Life, a virtual environment, a vast number of librarians and educators are networking. Second Life, a 3D virtual world introduced by Linden Lab in 2003, was created by its users, known as residents. While highlighting the enormous advancements the Alliance Library System

has made in a short period, Barton Spencer also discusses the advantages (pioneering virtual opportunities that will undoubtedly expand shortly) and drawbacks (concerning the fact that the seedy side of Second Life is only a few clicks away). A year later, the library organization had over 800 librarians, and there were more than 50 libraries in the world (Bell, 2007). Children and teenagers are the largest groups consisting of 35% population of active users of the virtual world across the globe, with the US leading with 78% (Kzero Report, 2021). Concerned about the security and privacy of their students in virtual environments, (as the Right to Privacy is a fundamental right enshrined in Article 21 of the Indian Constitution) teachers and librarians are currently looking into open-source software options like Reaction Grid. With islands referred to as sims, Reaction Grid remarkably resembles Second Life in appearance. In reality, a tool called Second Stuff allows these educators to transfer the Second Life inventory to another virtual environment. To upload in Reaction Grid or another virtual environment, any virtual objects, scripts, textures, avatars, and other construction elements can be saved on a hard drive.

Although some adults find this new medium revolutionary, youngsters are already developing these abilities and building new habitats in virtual worlds. Through commercial virtual worlds and games like Disney's Pirates of the Caribbean, where kids may make their pirate avatars, even young children can access immersive surroundings. It quickly becomes clear that this new generation of students' computer skills and searching methods differ from those of earlier generations as they enter libraries. How can the overworked librarians of today, who are already straining to keep up with social networking platforms like Facebook, Twitter, Ning, blogs, RSS, Wikipedia, and a deluge of information, fulfill these evolving requirements and demands?

There are many associations are formed worldwide to exploit the upcoming technologies which are affecting libraries and librarians directly and indirectly. One such association is Texas Library Association. Virtual reality is only one of the many emerging new trends. Most librarians are so busy overseeing employees and collections that they have little free time to acquire the knowledge necessary to navigate a virtual world, such as second despite criticism for having a "steep learning curve," life but there are already librarians all around the state of Texas interacting virtually through Reaction Grid, Second Life, and other digital environments. According to these librarians, the ideal at the current brisk speed at which it is being addressed is by accepting the challenge of going virtual (approaching) and sharing that knowledge with other people through libraries.But, still there are ways by which a librarian can respond to various upcoming technologies in the field of education. These are –

(a) Creating a virtual library or library simulations which includes interaction with a virtual library resources and librarians.

(b) Virtual Classrooms, Workshops, and Conferences can be conducted so that students get more experience in virtual world.

(c) Historical simulations of various drama series can be conducted virtually

(d) Apart from this book discussions and storytelling can also be included.

11. Conclusion

For more than the last ten years, librarians have been forerunners in virtual worlds and are still at the forefront of educational technology. It's crucial for information workers to be familiar with new media tools and platforms, even if not all librarians may opt to use virtual worlds. The expectation for students in the twenty-first century is that they will cooperate and create global learning systems. Since communities may be regarded as educational resources and are effective teaching aids, connecting learning communities ought to be an aim for librarians. The metaverse can open up an infinite number of options. The education institutions like RGU and new government rules must work together to permit early adoption of the metaverse. It could take some time for the metaverse to realize its full potential, but once it does, it might be a goldmine for the new education system. One of the provisions of the National Education Policy, 2020 is equitable and inclusive education for all can be achieved better with upcoming technologies like a metaverse. India has the chance to take full advantage of the metaverse thanks to its growing technical impact and population advantage.

Various limitations cannot be ignored in our case study. As virtual technology is upcoming technology there is a need for more research in the field of education regarding libraries to enhance the student experience. Apart from this availability of technologies like VR sets will act as a hurdle in the successful implementation of a virtual library. As of now, VR sets are expensive for the maximum population especially, if you are a student. Another limitation is uninterrupted internet connection is needed which is a problem in a hilly area like Arunachal Pradesh. The absence of a proper internet connection can act as an obstacle to enhancing user experience.

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