Review of augmented reality in academic and research libraries

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Introduction

Augmented is a Latin word derived from "Augere", which means add or increase. Augmented reality (AR) is modern technology in which a digital object is shown in physical reality or an existing environment. This technology is also called mixed reality because of particular virtual objects in life real-world. Libraries are changing agents of modern technologies, it adopts the latest technologies from time to time and is regarded as the hub of fascinating technology. Hussain (2022). AR has been implemented in world libraries because it organized the information in a sequential order for easy access. AR is somewhat related to virtual reality, in which the object is seen as artificially made. In today's age of information technologies, it has been embedded with library services in developed countries. This technology is adopted to give more information in a more conducive environment. It has been introduced to provide access to the right information and knowledge in less time. It is a perfect blend of the digital world; AR apps are developed for mobile or desktop to connect the people in the real world. AR and virtual reality are the most usable technologies of the present world, and it has been implemented in educational and library sectors to get quick information.

The question arises of how AR can be executed in academic and research libraries. The answer is straightforward: AR technology's job is to display score overlays on telecasted sports games and 3D photos, e-mails and text messages. It has been executed on smartphones or tablets. In 1968, a Harvard professor named Ivan Sutherland invented the Sword of Damocles, the first AR device shared with his student Bob Sproul. It is assumed that AR is closer technology to virtual reality.

In the contemporary world, the technology explosion has significantly impacted libraries. The use of these technologies has brought a massive shift in library services. We have witnessed that libraries are changing agents of the 21st century, and it has always hugged new and robust technology to foster the right information in the least possible time. We also know that technologies evolve with alarming speed, and both libraries and librarians are experiencing these latest technologies to provide their end-users maximal services in minimal time. In developed countries like the USA, UK and Germany, the libraries are adopting and implementing new technologies for learning research and information to extend the services to the present and prospective users. Leading and innovative IT industry organizations are often called "cutting edge". The cutting edge is also known as leading-edge technology or state-of-the-art technology. Libraries are struggling more to deploy these technologies and reach their end-users. Hussain (2020). Among these cutting-edge technologies, the role of AR is highly admirable. AR is based on combining digital with reality, and people working in libraries are curious to implement the same technologies in modern libraries. The libraries are becoming fourth-generation and require the necessary facilities and equipment to run them successfully as technologies have transformed manual services into modern information technology networking.

Augmented reality in library services

Emerging technologies are shaping the world on a large scale. Libraries of the 21st century adopt these latest technologies to expand their services. AR is the most popular tool of the fourth generation and future libraries. AR combines three characteristics in a system: a combination of real and virtual worlds, being interactive in real-time and being registered with 3D. AR is a robust technology that combines physical books with technological features. Azuma (1997), The primary purpose of AR is to bridge the physical paper and digital technologies to promote interaction and immersions, etc.

AR services, which support libraries with instructional applications. AR helps to search, navigate and locate with the help of an intuitive digital interface in physical space. Innovative technologies have doubled the role of library services; hence, AR is a robust technology that increases the existing outreach of contemporary libraries. Unlike virtual reality, which is a bit restrictive, AR can help improve library services' efficiency. Shelv AR is one of the best example of AR which indicate the misplace book in the shelves. There are numerous other applications, most of which are prototypes or designed for specific libraries. However, some suitable applications which are highly important for all sorts of libraries are apps supporting librarians for identifying books and apps providing cultural assets associated with library/archive. It also helps the patrons to learn about the library; it gives a variety of field apps to maintain data in the library. Hussain (2019). It helps in fostering the learning process in the libraries. It offers innovation and continuous learning to know about library services. Masreka and Husseinb (2021). AR enables the library staff to the accuracy of library statistics. It can be used to increase user knowledge and information in the libraries. Many people can share their experiences with the libraries over long distances, so this helps the reader to find new materials on the bookshelf. It can help the users

easily identify genres and book classification. AR also allows the library patrons to find the next book on the shelf that is to be read next. This technology also helps in reaching out to more users. AR is highly commendable in enhancing library workflow.

The future of augmented reality

AR is the heightened real physical world achieved through digital visual elements, sounds or other sensory stimuli delivered via technology. This technology is the next step after smartphones. AR technology has been adopted in various trades. It has been incorporated into our lives and cannot be ignored. Some cars tell you your speed through global positioning system routes. Google glass describes the factory environment as a means of efficiency. It helps automobile mechanics to find the maintenance parts. It allows the medical professionals to find where to treat. These kinds of technologies are heading us in the right directions. AR can transform our lives for the better. Libraries are service agents of the 21st century which spread information in alarming rate. AR can help better the library realm, which excels the service in more robust ways after deployment.

Like other technologies, librarians face specific challenges while executing these technologies in academic and research libraries. Every technology has some pros and cons. Similarly, AR has also some flaws that should be considered before implementation. The first and foremost flaw is the lack of training for librarians. Hussain (2020). Most librarians struggle to implement these new technologies, but their inadequate training does not allow them to know more about them. Librarians ought to be trained by open-minded instructors to overcome the drawbacks during deployment. They should also be educated about future consequences.

Another big challenge for librarians is the knowledge about proprietary companies which offer these applications at certain costs before deployment. Although some companies also offer a free account with certain limitations, librarians should go for the better options. In this case, they should give preference to paid services.

The features of AR services will be dependent on what is being offered by the platform, so librarians should know the importance of various platforms. Unlike QR Codes, no single AR application can read all AR Digital overlays. Librarians should keep these issues in mind. Implementation of AR in academic and research libraries requires mobile devices with good cameras and internet connections. Librarians should have a keen strategy before moving ahead.

Concluding remarks

Students of today's ages are using mobile phones, so, we can implement AR with mobiles without spending costs. Users should also be granted access to download the mobile applications on their respective instruments. AR is easy to learn technology; librarians should consult various online instructional videos. Giving students simple instructions, they should guide the students to follow the instructions for digital overlays on their cellular phones

AR is an instructional technology, so the librarians should overlay additional information on physical objects through AR. Librarians should use manuals, posters and brochures for the user to discover instructions followed by the AR. Through AR, Librarians can make their respective libraries more interactive, which is highly valued in today's concept of library spaces and commons. It is the moral duty of librarians to make it fun for both implementation and use.

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ABOUT THE AUTHOR

Abid Hussain is a veteran librarian based in Islamabad, Pakistan. Currently, he works as Deputy Director Library at the Institute of Strategic Studies Islamabad (ISSI).

His research interests include library leadership, Digital Library services, Web-based Technology, information

literacy and bibliometric and information services. Before his current position, he served as a Digital Library in charge at National Defence University Islamabad (April 2009 to April 2017) and Assistant Librarian at Air University Islamabad (May 2005 to September 2007). He has contributed 27 research papers to National and International reputed journals, whereas three of his articles are in the pipeline. He also has published more than 70 columns, essays and opinion articles in various English dailies, magazines and blogs pertaining to library issues in Pakistan and abroad. He is regularly writing for five English dailies those are Pakistan observer, Daily Times, Pakistan Today, The News and The Nation. His whole contributions can be viewed here: https://scholar.google.com/citations?view_op=list_works&hl=en&hl=en&user=GdVB77sAAAAJ. He also contributes regular articles to the quarterly newsletter of the International Association of school libraries (IASL).

He designed, implemented, coordinated and assessed the library instruction program; he also trained fellow librarians

Master's in instructional theory and methods. He is an MPhil Scholar at the Department of Library and Information Science, the University of Peshawar in batch 2021–2022 and earned his Master's degree in Library and Information Sciences from the same university in 2006; for dealing with social science scholars, he completed his Master's Degree in Political Science in 2011 from the university of Peshawar; for the instruction of library customers, he attained a Bachelor of Education (BEd) degree from the Sarhad University Peshawar in 2016.

He is an active member of the American Library Association (ALA), the Chinese American Librarians Association (CALA), International Association of School Librarianship (IASL), International Federation of Library Associations and Institutions (IFLA), Association of College and Research Libraries (ACRL), Canadian Library Association (CLA), Association for Information Science and Technology (ASIS&T), Pakistan Library Association (PLA), etc.

He raises library issues through TV Programs, Radio talk shows and other social blogs. He keenly raises Pakistan's role in

library scenario at National and International conferences, Webinars and seminars.

During his career, he completed many projects by digitizing various libraries in Pakistan. His few praiseworthy projects are as follows:

(1) Islamabad Policy Research Institute, Islamabad, Pakistan (IPRI).

Website: http://iprilibrary.org.pk/

(2) Institute of Strategic Studies Islamabad, Pakistan.

Website: http://issilibrary.org.pk/

(3) National Defence University Library Islamabad-based.

Website: http://111.68.99.107/libmax/opac/index.aspx

(4) Ghazi Library Command & Staff College Quetta.

Website: https://cscquetta.gov.pk/library/

(5) Islamabad Business School Library, Pakistan (IBS).
https://ibs.edu.pk/library/

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