

The Role of 5G in Enhancing Information Services in Libraries

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The advent of 5G technology marks a transformative era for information services, particularly within the domain of Library and Information Science (LIS). As the fifth generation of mobile communication, 5G introduces ultra-fast data speeds, low latency, and the ability to connect a vast number of devices simultaneously. These features hold tremendous promise for revolutionizing library operations, enhancing digital content delivery, supporting immersive learning environments, and fostering equitable access to information. This study explores the multifaceted applications of 5G in libraries, focusing on its capacity to modernize library services, support real-time digital interactions, and facilitate smart library infrastructures powered by the Internet of Things (IoT). Through an analytical review of both primary and secondary data sources, including scholarly literature and case studies, this research investigates the specific features of 5G, such as millimeter (mm)-wave frequency, massive MIMO, network slicing, beam-forming, and edge computing and assesses their practical implications for LIS. Key findings showed that 5G enabled rapid access to e-resources, supported interactive services such as virtual and augmented reality (VR/AR), and enhanced remote access to library facilities. It also allowed for intelligent inventory tracking, personalized user experiences, and environmentally responsive library spaces. However, the integration of 5G into library ecosystems was not without challenges. High infrastructure costs, limited mm Wave coverage, increased cyber security risks, and potential data privacy concerns presented significant hurdles. Furthermore, the digital divide remained a critical issue, with unequal access to 5G networks exacerbating existing disparities in information access. This paper provides targeted recommendations for libraries, including strategic planning for 5G deployment, investment in staff training and digital literacy programs, adoption of IoT-based library solutions, and the establishment of ethical data practices to ensure user privacy and security. Collaborations with telecommunication providers, educational institutions, and community organizations are also emphasized to maximize outreach and impact. In conclusion, 5G holds the potential to reposition libraries as dynamic, inclusive, and tech-driven hubs of knowledge. By thoughtfully navigating implementation challenges and embracing emerging technologies, libraries can harness 5G to redefine their role in the digital age, ensuring continued relevance and service excellence in a rapidly evolving information landscape.

Keywords: *5G; Augmented reality; Information services; Libraries; Virtual reality*