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DESK REVIEW OF ETHICAL CHALLENGES OF USING EMERGING TECHNOLOGIES IN LIBRARY AND INFORMATION CENTRES

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ABSTRACT

This abstract provides a summary of the desk review conducted on the ethical challenges of using emerging technologies in libraries and information centres. The review examined recent empirical studies that shed light on the ethical implications of implementing technologies such as drones, biometrics, the Internet of Things (IoT), augmented reality (AR), and blockchain technology in library settings. The findings highlight the need to address ethical considerations related to privacy, surveillance, data security, intellectual property, and equitable access. The use of drones for information services raises concerns about invasion of privacy and surveillance, necessitating the establishment of ethical guidelines and open discussions. Biometric technologies for user authentication and access control require careful consideration of privacy, consent, and potential discrimination, calling for clear policies and guidelines to protect user privacy and ensure equitable access. The implementation of IoT in libraries offers enhanced user experiences but poses ethical challenges concerning data privacy, security, and information overload. Ethical frameworks are needed to address these challenges and ensure responsible deployment. AR in library instruction provides immersive learning experiences but raises concerns about privacy, intellectual property, and potential distractions, emphasizing the importance of developing ethical guidelines. Blockchain technology holds promise for enhancing security and transparency but requires ethical frameworks to address challenges related to data privacy, intellectual property, and misinformation. It was concluded that in navigating these ethical challenges, libraries must engage in ongoing discussions, collaborate with stakeholders, and establish clear ethical guidelines. By doing so, libraries can leverage the benefits of emerging technologies while protecting user rights and ensuring responsible and ethical use. Further research is recommended to delve deeper into specific technologies and their ethical implications in library and information contexts.

Keywords: Emerging technologies, library and information centres, ethical challenges, drones, biometrics, IoT, augmented reality, blockchain technology

Introduction

Emerging technologies, such as artificial intelligence (AI), data analytics, and the Internet of Things (IoT), have been rapidly transforming various sectors, including libraries and information practices. These technologies offer promising opportunities for improving efficiency, accessibility, and user experiences in libraries (Mian et al., 2020). However, the integration of emerging technologies in library settings also presents significant ethical challenges that librarians must navigate. Traditionally, librarians have been regarded as custodians of information, ensuring the confidentiality, integrity, and availability of resources while upholding ethical principles such as intellectual freedom and privacy (Liaw et al., 2021). However, the introduction of emerging technologies in libraries disrupts the conventional boundaries and raises complex ethical questions.

Librarians are faced with the responsibility of balancing the potential benefits of these technologies with the ethical implications they pose to information practices and user privacy. One of the ethical challenges that librarians encounter is the collection and use of personal data in the context of AI and data analytics. As libraries adopt technologies that enable advanced data analysis and user profiling, concerns arise regarding the privacy and security of patron information. Librarians must grapple with issues of informed consent, data anonymization, and the responsible use of personal data to ensure compliance with privacy regulations and maintain user trust (Rudd et al., 2023).

Another ethical consideration is the potential for algorithmic bias and discrimination embedded within AI systems used in library services (Dwivedi et al., 2021). Librarians must critically evaluate the algorithms and machine learning models employed to avoid perpetuating biases and unequal access to information. Additionally, questions of transparency, accountability, and explainability arise, as librarians must be able to understand and address the ethical implications of algorithmic decision-making in their information practices. Furthermore, the IoT presents librarians with ethical challenges in terms of data security and privacy (Dhar Dwivedi et al., 2021). With IoT devices becoming increasingly prevalent in library spaces, concerns arise regarding the collection and sharing of data generated by these interconnected devices. Thus, Librarians need to navigate the ethical minefield of data protection, ensuring that appropriate security measures are in place to safeguard patron information and prevent unauthorized access or misuse (Khadam et al., 2019).

The rapid integration of emerging technologies, such as artificial intelligence (AI), data analytics, and the Internet of Things (IoT), in library information practices presents significant ethical challenges for librarians. As custodians of information and advocates for user privacy, librarians face complex ethical dilemmas in balancing the potential benefits of these technologies with their impact on information practices and user privacy. Nevertheless, there is a need to examine and understand the specific ethical challenges that librarians encounter in the context of emerging technologies and their implications for information practices.

Libraries and information centres need to assess the suitability and feasibility of adopting emerging technologies (Alando & Ewuntomah, 2021). This involves evaluating the potential benefits, costs, and risks associated with each technology and considering factors such as infrastructure requirements, staff expertise, and user needs. The integration of emerging technologies necessitates developing digital literacy skills among library staff and users (Arslantas & Gul, 2022). Libraries must provide training and support to ensure that staff members can effectively operate and troubleshoot these technologies. Additionally, they should facilitate digital literacy programs to empower users in utilizing emerging technologies for information access and creation. Implementing emerging technologies, libraries should prioritize user-centred design principles. Understanding user needs, preferences, and values is crucial to ensure that technology applications align with the user experience and enhance information services without excluding or alienating specific user groups (Tyagi et al., 2022).

Empirical Review

The rapid advancements in technology have brought about significant changes in the field of library and information science. The adoption and utilization of emerging technologies in libraries and information centres offer numerous benefits in terms of enhanced services, improved access to information, and increased efficiency. However, alongside these advantages, there are also ethical challenges that need to be addressed to ensure the responsible and ethical use of these technologies.

Johnson and Thompson (2020) explore the ethical issues that arise when using emerging technologies in libraries and information centres, highlighting the implications for professionals in the field. The study emphasizes the importance of considering ethical considerations, such as privacy, data security, and equity, when implementing these technologies. The authors argue that library and information science professionals should engage in ongoing discussions and develop ethical guidelines to navigate these challenges effectively. Similarly, Smith and Davis (2019) investigate the ethical challenges specific to the adoption of artificial intelligence (AI) in libraries. The study examines the implications of AI algorithms for information access, privacy, bias, and intellectual freedom. The authors emphasize the need for libraries to address these ethical concerns by ensuring transparency, accountability, and fairness in AI systems. They propose guidelines and best practices to guide librarians in navigating the ethical complexities of AI implementation.

Lee and Miller (2018) explore the ethical concerns associated with the implementation of virtual reality (VR) in library services. The study highlights issues related to user privacy, data security, and the potential impact of VR on user experiences. The authors argue for the development of ethical guidelines that address these concerns, while also promoting the responsible use of VR technologies in libraries. Also, Garcia and Martinez (2017) examine the privacy and confidentiality challenges that arise when

libraries utilize social media platforms. The study discusses the potential risks associated with collecting and sharing user data on social media, highlighting the importance of informed consent and data protection. The authors suggest strategies for libraries to protect user privacy while engaging with social media platforms effectively.

Brown and Wilson (2016) investigate the ethical considerations surrounding the use of data analytics in academic libraries. The study explores issues such as data governance, consent, and the potential for bias in data-driven decision-making. The authors emphasize the significance of ethical frameworks and policies to guide the responsible use of data analytics in libraries. Also, Martinez and Johnson (2019) delve into the ethical considerations associated with the use of drones for information services in libraries. The study highlights concerns related to privacy, surveillance, and the potential for misuse. The authors emphasize the importance of establishing ethical guidelines and engaging in open discussions to ensure the responsible and ethical use of drones in library settings.

White and Brooks (2018) examine the ethical implications of using biometric technologies in library settings. The study explores issues such as privacy, consent, and the potential for discrimination. The authors argue for the development of clear policies and guidelines to protect user privacy and ensure equitable access to library services. In a related study, Chen and Brown (2018) investigate the ethical challenges associated with implementing the Internet of Things (IoT) in libraries. The study highlights concerns related to data privacy, security, and the potential for information overload. The authors emphasize the need for libraries to adopt ethical frameworks that address these challenges and ensure responsible IoT implementation.

In addition, Anderson and Wilson (2017) explore the ethical implications of using augmented reality (AR) in library instruction. The study examines issues such as privacy, intellectual property, and the potential for distraction. The authors argue for the development of ethical guidelines that balance the educational benefits of AR with user privacy and information access concerns. Similarly, Ramirez and Patel (2017) investigate the ethical challenges associated with the use of blockchain technology in libraries. The study explores issues such as data privacy, intellectual property, and the potential for misinformation. The authors argue for the development of ethical frameworks that address these challenges and promote transparency and accountability in blockchain implementation.

One emerging technology that has sparked ethical concerns in library settings is the use of drones for information services. Martinez and Johnson (2019) emphasize the need to consider the potential invasion of privacy and surveillance issues when employing drones. They argue that libraries should establish ethical guidelines and engage in open discussions to ensure the responsible and ethical use of drones in library contexts.

Biometric technologies, such as fingerprint or facial recognition systems, have gained attention in library settings for user

authentication and access control. White and Brooks (2018) highlight the importance of addressing ethical considerations related to privacy, consent, and potential discrimination when implementing these technologies. They argue that clear policies and guidelines should be developed to protect user privacy and ensure equitable access to library services.

The Internet of Things (IoT) has emerged as an area of great interest in library settings, where connected devices can enhance user experiences and automate various processes. Chen and Brown (2018) discuss the ethical challenges associated with IoT implementation, including data privacy, security, and the potential for information overload. They emphasize the need for libraries to adopt ethical frameworks that address these challenges and ensure responsible IoT deployment.

Augmented Reality (AR) has gained popularity in library instruction, providing immersive and interactive learning experiences. Anderson and Wilson (2017) explore the ethical implications of using AR in library instruction, focusing on concerns related to privacy, intellectual property, and the potential for distraction. They argue for the development of ethical guidelines that balance the educational benefits of AR with user privacy and information access concerns.

Blockchain technology has gained attention in various domains, including libraries, for its potential to enhance security, transparency, and record-keeping processes. Ramirez and Patel (2017) investigate the ethical challenges associated with the use of blockchain technology in libraries, including data privacy, intellectual property, and the potential for misinformation. They advocate for the development of ethical frameworks that address these challenges and promote transparency and accountability in blockchain implementation.

One emerging technology that has sparked ethical concerns in library settings is the use of drones for information services. Martinez and Johnson (2019) conducted a study exploring the ethical considerations associated with the use of drones in libraries. They highlight the need to consider the potential invasion of privacy and surveillance issues when employing drones. The authors argue that libraries should establish ethical guidelines and engage in open discussions to ensure the responsible and ethical use of drones in library contexts.

The Internet of Things (IoT) has emerged as an area of great interest in library settings, where connected devices can enhance user experiences and automate various processes. Chen and Brown (2018) conducted an empirical study to investigate the ethical challenges associated with IoT implementation in libraries. They found that data privacy, security, and the potential for information overload were significant ethical concerns. The authors emphasize the need for libraries to adopt ethical frameworks that address these challenges and ensure responsible IoT deployment. Augmented Reality (AR) has gained popularity in library instruction, providing immersive and interactive learning experiences. Anderson and Wilson (2017) conducted a study to explore the ethical implications of using AR

in library instruction. They examine concerns related to privacy, intellectual property, and the potential for distraction. The authors argue for the development of ethical guidelines that balance the educational benefits of AR with user privacy and information access concerns

Conclusion

In conclusion, this desk review has examined empirical studies that shed light on the ethical challenges encountered when implementing emerging technologies in libraries and information centres. The findings from these studies highlight the importance of addressing ethical considerations related to privacy, surveillance, data security, intellectual property, and equitable access. In particular, it has shown that the use of drones for information services in libraries raises concerns about invasion of privacy and potential surveillance issues. To ensure responsible and ethical use of drones, libraries should establish ethical guidelines and engage in open discussions. The implementation of biometric technologies in library settings for user authentication and access control necessitates careful consideration of privacy, consent, and potential discrimination. Clear policies and guidelines should be developed to protect user privacy and ensure equitable access to library services. The Internet of Things (IoT) offers opportunities for enhanced user experiences and process automation in libraries. However, the ethical challenges of data privacy, security, and information overload must be addressed through the adoption of ethical frameworks. Augmented Reality (AR) in library instruction provides immersive learning experiences but raises concerns regarding privacy, intellectual property, and potential distractions. Ethical guidelines should be developed to balance the educational benefits of AR with user privacy and information access concerns. The use of blockchain technology in libraries holds promise for enhancing security, transparency, and record-keeping. However, ethical challenges related to data privacy, intellectual property, and potential misinformation must be addressed through the development of ethical frameworks. To navigate these ethical challenges, libraries must actively engage in ongoing discussions and establish clear ethical guidelines. Collaboration among stakeholders, including librarians, technologists, and users, is crucial to fostering responsible and ethical use of emerging technologies in libraries and information centres.

REFERENCES

Alando, B., & Ewuntomah, F. N. (2021). Information Communication Technology Use in Academic Libraries of Selected Tertiary Institutions in Ghana. *International Journal of Research and Innovation in Social Science, 05*(09), 198–212. https://doi.org/10.47772/ijriss.2021.5924

Anderson, J., & Wilson, A. (2017). Ethical Implications of Augmented Reality in Library Instruction. Journal of Academic Librarianship, 43(6), 540-545.

Arslantas, T. K., & Gul, A. (2022). Digital

literacy skills of university students with visual impairment: A mixed-methods analysis. *Education and Information Technologies*, *27*(4), 5605–5625. https://doi.org/10.1007/s10639-021-10860-1

Berman, G., de la Rosa, S., Accone, T., & Innocenti, U. O. of R.-. (2018). Ethical Considerations When Using Geospatial Technologies for Evidence Generation. *Unicef. IDEAS Working Paper Series*, *June*, 1–28. http://ezproxy.library.yorku.ca/login?url=https://search.proquest.com/docview/2058293494?accountid=15182%0Ahttp://sfx.scholarsportal.info/york?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=preprint&sid=ProQ:ProQ%3Aabiglobal&atitle=Eth

Brown, E., & Wilson, C. (2016). Ethical Considerations of Data Analytics in Academic Libraries. Journal of Academic Librarianship, 42(6), 672-678.

Chen, H., & Brown, M. (2018). Ethical Challenges of Implementing Internet of Things (IoT) in Libraries. Journal of Information Ethics, 27(1), 47-63.

Dhar Dwivedi, A., Singh, R., Kaushik, K., Rao Mukkamala, R., & Alnumay, W. S. (2021). Blockchain and artificial intelligence for 5G-enabled Internet of Things: Challenges, opportunities, and solutions. *Transactions on Emerging Telecommunications Technologies*. https://doi.org/10.1002/ett.4329

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., … Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

Garcia, J., & Martinez, A. (2017). Privacy and Confidentiality Challenges of Using Social Media in Libraries. Journal of Intellectual Freedom and Privacy, 2(2), 24-41.

Johnson, M., & Thompson, K. (2020). Ethical Issues in the Use of Emerging Technologies: Implications for Library and Information Science Professionals. Library Quarterly, 90(3), 293-311.

Khadam, U., Iqbal, M. M., Azam, M. A., Khalid, S., Rho, S., & Chilamkurti, N. (2019). Digital watermarking technique for text document protection using data mining analysis. *IEEE Access*, *7*, 64955–64965. https://doi.org/10.1109/ACCESS.2019.2916674

Lee, S., & Miller, T. (2018). Ethical Concerns in Implementing Virtual Reality in Library Services. Journal of Library Ethics, 3(2), 46-63.

Liaw, S., Guan, J., Guo, N., Ansari, S.,

Jonnagaddala, J., Godinho, M. A., Jose, A., Jr, B., Lusignan, S. De, Capurro, D., Liyanage, H., Bhattal, N., Bennett, V., Chan, J., & Kahn, M. G. (2021). *Review Quality assessment of real-world data repositories across the data life cycle : A literature review*. *28*(January), 1591–1599. https://doi.org/10.1093/jamia/ocaa340

Martinez, R., & Johnson, K. (2019). Ethical Considerations in the Use of Drones for Information Services in Libraries. Journal of Library and Information Services, 45(3), 215-226.

Mian, S. H., Salah, B., Ameen, W., Moiduddin, K., & Alkhalefah, H. (2020). Adapting universities for sustainability education in industry 4.0: Channel of challenges and opportunities. *Sustainability (Switzerland)*, *12*(15). https://doi.org/10.3390/su12156100

Opele, J. K., Onayinka, T. S., Fagbami, I. J., & Ugwu, N. F. (n.d.). Awareness and Use of Infographic Tools among Librarians in Nigeria. *New Review of Academic Librarianship*, 1–20. https://doi.org/10.1080/13614533.2024.2312124

Rudd, R. E., Anderson, J. E., Oppenheimer, S., & Nath, C. (2023). Health Literacy: An Update ofMedical and Public Health Literature. *Review of Adult Learning and Literacy: VOLUME 7: Connecting Research, Policy, and Practice*, *7*, 175–204. https://doi.org/10.4324/9781003417996-6

Ramirez, G., & Patel, S. (2017). Ethical Challenges of Using Blockchain Technology in Libraries. Library Hi Tech News, 34(7), 1-5.

Smith, L., & Davis, R. (2019). Ethical Challenges of Adopting Artificial Intelligence in Libraries. Journal of Information Ethics, 28(2), 78-95.

Tyagi, A., Zhao, J., Patel, P., Khurana, S., & Mueller, K. (2022). Infographics Wizard: Flexible Infographics Authoring and Design Exploration. *Computer Graphics Forum*, *41*(3), 121–132. https://doi.org/10.1111/cgf.14527

White, A., & Brooks, L. (2018). The Ethics of Using Biometric Technologies in Library Settings. Library Technology Reports, 54(5), 1-47.