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Ethical aspects using AI in CRIS

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Abstract

The integration of artificial intelligence (AI) into current research information systems (CRIS) is becoming increasingly prevalent, driven by the need for enhanced operational efficiency and data accessibility. While AI offers promising opportunities for improving CRIS functionalities, it also raises significant ethical challenges that must be addressed. This paper examines the ethical implications of AI implementation in CRIS, focusing on issues such as autonomy, discrimination, data protection, and user rights. Drawing on insights from machine, technology, digital, and robot ethics, the paper explores strategies for mitigating these challenges and fostering responsible AI use in CRIS. Additionally, it highlights the impact of AI technology on CRIS staff and emphasizes the importance of considering societal and personal effects alongside technological advancements. By raising awareness of ethical considerations and promoting ethical AI practices, this paper aims to contribute to the development and acceptance of AI technologies in CRIS, particularly in the light of forthcoming regulations such as the EU AI Act.

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Keywords: Artificial intelligence (AI), current research information systems (CRIS), ethics, data protection, user rights, responsible AI.

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1. Introduction

Artificial Intelligence (AI) has rapidly emerged as a transformative force in various sectors, significantly shaping our way of life, work, and interactions with technology (Dagnaw, 2020; Li, 2020). Its influence extends from personalized recommendations on streaming platforms to sophisticated medical diagnoses and autonomous vehicles (Pal et al., 2023). The pervasive nature of AI's influence underscores its potential to revolutionize industries, economies, and societies at large. One significant impact of AI lies in its ability to augment human capabilities and enable us to perform tasks more efficiently and accurately (Jarrahi et al., 2023). Moreover, AI is reshaping the workforce by automating routine tasks and supporting human decision-making processes. Ethical considerations play a crucial role in the discussion of AI's influence, particularly concerning issues of bias, transparency, and accountability (Akinrinola et al., 2024) (Fig.1). AI systems are trained on extensive datasets that may reflect societal biases and exacerbate inequalities if not carefully curated and monitored (Illia et al., 2023). Ensuring fairness and transparency in AI decision-making processes is essential for building trust and minimizing potential harm (Akinrinola et al., 2024).

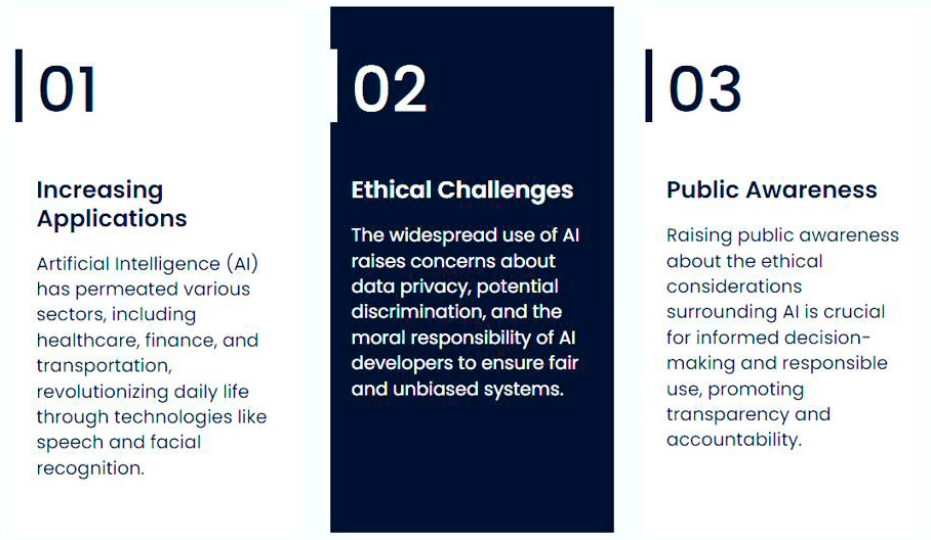

Fig.1. The Impact of AI.

The exponential progress of AI technologies has led to their widespread integration into various areas of modern society, including research information management systems (cf. Xu et al., 2021; Collins et al., 2021). Current Research Information Systems (CRIS) play a crucial role in facilitating the organization, storage, and dissemination of scientific data within academic and research institutions (Schöpfel & Azeroual, 2021). Given the increasing demand for operational efficiency and data accessibility, many CRIS providers are turning to AI to enhance the capabilities of their systems.

The integration of AI into CRIS has the potential to significantly improve the efficiency, accuracy, and performance of research information management. By leveraging AI technologies, CRIS can conduct more comprehensive data analyses, provide intelligent decision support, and develop innovative applications to optimize research processes (Fig.2). While the integration of AI into CRIS offers promising opportunities for streamlining processes and enhancing user experiences, it also raises significant ethical concerns that require careful consideration (Schöpfel et al., 2022; Schöpfel & Azeroual, 2023). With the increasing complexity and proliferation of AI technologies, questions of

autonomy, discrimination, data privacy, and user rights are coming to the forefront of discussions about the implementation of AI in CRIS.

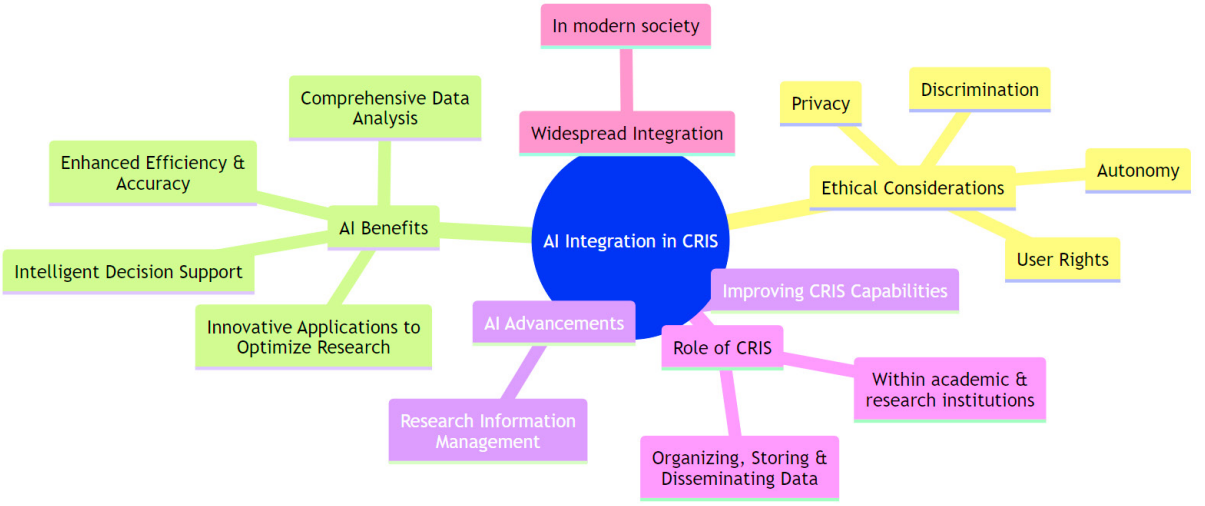

Fig. 2. Issues of AI Integration in CRIS.

The aim of this paper is to examine the ethical challenges associated with the deployment of AI in CRIS and to propose strategies for the responsible handling of these challenges. By exploring the interface between AI, ethics, and research information management, this paper aims to shed light on the impact of AI integration for CRIS stakeholders and advocate for the adoption of ethical AI practices in CRIS. Through an analysis of existing literature and insights from machine, technology, digital, and robot ethics, this paper aims to provide guidelines for addressing the ethical complexity of AI implementation in CRIS.

Given impending regulations such as the EU AI Act†, which will establish new rules and obligations for AI providers and users, the need for ethical considerations in AI integration has never been more urgent. By proactively addressing these issues, this paper seeks to contribute to the responsible development and deployment of AI technologies in CRIS and ultimately promote trust, transparency, and accountability in research information management.

Our paper is structured into five sections. The first section provides an overview of the research paper and highlights the significance of AI in CRIS as well as the associated ethical challenges. In the second section, we examine the role of AI in CRIS and emphasize its relevance for enhancing operational efficiency, data accessibility, and system performance. We analyze how AI technologies are integrated into CRIS to optimize database queries, improve system resources, and promote the development of AI-enabled applications. The third section addresses the ethical considerations associated with the implementation of AI in CRIS. Here, we identify key challenges such as autonomy, discrimination, data protection, privacy, manipulation, and user rights and discuss their implications for research information management. In the fourth section, we explore various approaches to addressing the ethical challenges arising from the implementation of AI in CRIS. We propose strategies for reducing ethical risks and promoting responsible AI use, drawing on insights from machine ethics, technology ethics, digital ethics, and robot ethics. The fifth section shifts the focus on the societal and personal impacts of AI developments and the need for ethical considerations in AI implementation. The conclusion emphasizes the importance of ethical guidelines in the

† see https://artificialintelligenceact.eu/the-act/

integration of AI in CRIS and discusses the implications of the EU AI Act for AI development in CRIS. We offer insights into future research and policy developments in the field of AI ethics in CRIS.

2. The Promise of AI

AI has proven to be a transformative technology with significant potential to revolutionize various domains, including research information management systems like CRIS (Azeroual & Koltay, 2023). The integration of AI into CRIS holds the promise of enhancing the efficiency, accuracy, and functionality of these systems, enabling more effective management of research-related data and processes (Fig.3).

Fig.3. Importance of AI in CRIS.

One of the main roles of AI in CRIS is to enable advanced data analysis capabilities. AI algorithms can analyze vast amounts of research data, ranging from publications and funding sources to project information and collaboration networks, to extract valuable insights and patterns. By employing techniques such as machine learning (ML) and natural language processing (NLP), AI-driven CRIS platforms can uncover hidden correlations, identify emerging research trends, and provide predictive analytics to support strategic decision-making in research institutions and funding agencies. Furthermore, AI enables intelligent decision support in CRIS by automating repetitive tasks and optimizing administrative workflows. For example, AI-driven recommendation systems can suggest potential funding opportunities or collaboration partners based on researcher profiles and past activities. Similarly, AI-powered data curation tools can assist in the automatic extraction, normalization, and enrichment of research metadata, enhancing the accuracy and completeness of information stored in CRIS databases.

In addition to data analysis and decision support, AI facilitates the development of innovative applications within CRIS ecosystems. For instance, AI-powered virtual assistants or chatbots can provide researchers with personalized support, answer questions, guide them through system functionalities, and even offer real-time research consultation. Furthermore, AI-driven semantic search capabilities enable more efficient information retrieval within CRIS, allowing users to explore complex relationships between research entities and concepts.

However, alongside its transformative potential, the integration of AI into CRIS raises significant ethical concerns that must be carefully addressed. Concerns regarding data privacy, algorithmic biases, and responsible use of AI-

driven technologies require robust governance frameworks and ethical guidelines to ensure fair and transparent deployment of AI in CRIS environments (Zendulková & Azeroual, 2022). Moreover, continuous efforts are needed to ensure inclusivity, diversity, and equity in AI-driven research management systems and prevent potential biases or discrimination in decision-making processes.

In summary, the role of AI in CRIS extends beyond enhancing operational efficiency and fundamentally shapes how research information is managed, analyzed, and utilized. By harnessing the power of AI, CRIS platforms can unlock new opportunities to accelerate scientific discoveries, promote interdisciplinary collaboration, and foster knowledge creation across various research domains. However, to fully realize the benefits of AI in CRIS, it is essential to address ethical concerns, promote responsible AI practices, and ensure equitable access to AI-driven capabilities within the research community.

3. Ethical Challenges

The implementation of AI in CRIS poses a variety of ethical challenges that need to be carefully examined and addressed. This section will illuminate the main themes of autonomy and discrimination, the impact on data protection and privacy, as well as the dangers of manipulation and the protection of user rights in the context of AI in CRIS (Fig.4).

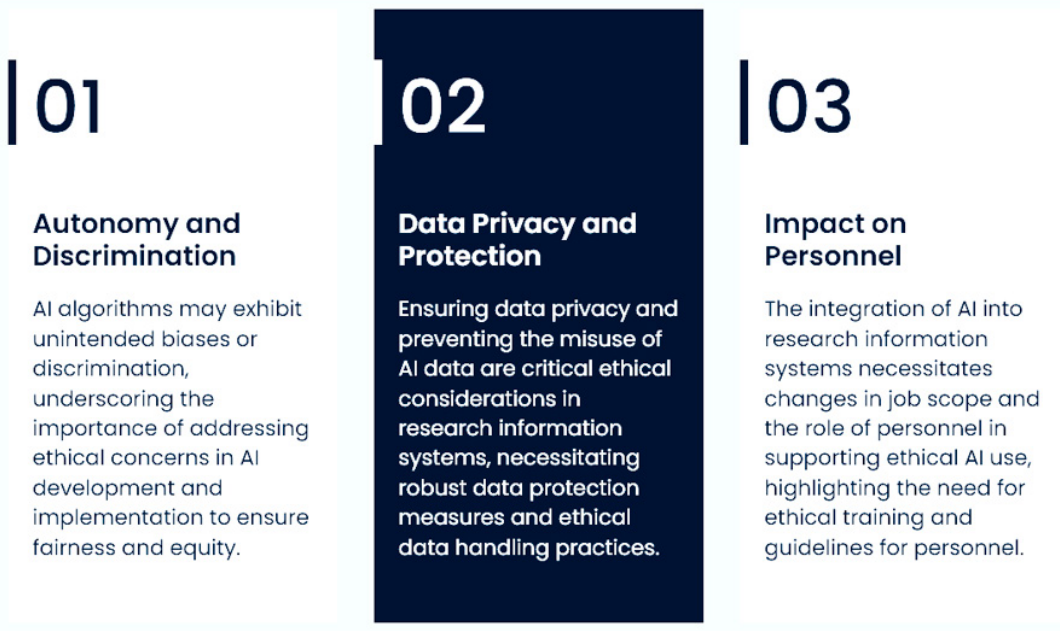

Fig.4. Ethical Challenges of Integrating AI in CRIS.

The autonomy of AI systems in CRIS can raise ethical concerns, especially when they make unforeseen decisions that restrict or challenge human autonomy. There is a need to develop clear guidelines and mechanisms for monitoring and controlling the autonomy of AI systems to ensure that they operate in line with ethical standards and societal values. Additionally, the risk of discrimination by AI algorithms in CRIS is a significant concern, as these systems can be trained on research information containing inherent biases. It is crucial to ensure that AI in CRIS does not exacerbate existing inequalities or create new ones, and to take measures to identify and correct discriminatory practices.

The integration of AI into CRIS can have significant implications for data protection and privacy, as these systems often process large amounts of sensitive data. Ensuring user data protection and privacy while maximizing the benefits

of AI use is challenging. This requires robust data protection policies, transparent data collection and usage practices, as well as mechanisms for user consent and the right to informational self-determination.

The potential manipulation of AI systems in CRIS poses a serious threat, as it can lead to disruptions, damages, or even security risks. It is essential to implement mechanisms for detecting and thwarting manipulation attempts and ensuring the integrity and reliability of AI systems. Additionally, user rights must be protected, including the right to information, transparency, and control over the use of their data and the decisions derived from AI systems.

Addressing the ethical challenges of AI implementation in CRIS requires a holistic approach that considers technological, legal, social, and ethical aspects. It is crucial for stakeholders from government, industry, research, and civil society to collaborate in developing guidelines, standards, and best practices to ensure that AI in CRIS is deployed for the benefit of society, in compliance with ethical principles, and respecting human rights.

4. Addressing Ethical Challenges

Ethical considerations are paramount in the integration of AI into research information systems such as CRIS. Various approaches have been proposed to address the ethical challenges associated with this integration, drawing insights from machine ethics, technology ethics, digital ethics, and robot ethics (Bleher & Braun, 2023).

One approach involves the development and implementation of ethical guidelines and frameworks specifically tailored to the use of AI in CRIS. These guidelines outline principles and best practices for ensuring the responsible development, deployment, and use of AI technologies, taking into account the unique ethical considerations inherent in research information management.

Another approach focuses on the design of AI systems with built-in ethical considerations, known as "ethical by design" or "value-sensitive design" (Brey & Dainow, 2023). This approach entails integrating ethical principles and values into the design and development process of AI systems from the outset, thereby promoting ethical behavior and decision-making throughout the system's lifecycle.

Furthermore, ethical education and training programs can empower CRIS staff with the knowledge and skills needed to navigate the ethical complexities of AI integration. These programs may include training on ethical decision-making, bias detection and mitigation, privacy protection, and accountability mechanisms, equipping staff with the tools to address ethical challenges as they arise.

- *Insights from Machine, Technology, Digital, and Robot Ethics*

Insights from machine ethics, technology ethics, digital ethics, and robot ethics offer valuable perspectives for addressing the ethical challenges of AI integration in CRIS. Machine ethics explores the ethical behavior of artificial

agents and systems, considering questions of moral responsibility, autonomy, and decision-making (Nath & Sahu, 2020).

Technology ethics examines the ethical implications of technological advancements, including AI, on individuals, organizations, and society as a whole (Ashok et al., 2022). It considers issues such as privacy, fairness, transparency, accountability, and the distribution of benefits and risks associated with AI technologies.

Digital ethics focuses on the ethical dimensions of digital technologies and their impact on human well-being, autonomy, and societal values. It considers questions of digital rights, online privacy, data governance, and the ethical use of algorithms and AI systems in digital environments (Janssen et al., 2020).

Robot ethics delves into the ethical considerations surrounding the design, deployment, and use of robots and autonomous systems (Liang et al., 2024). It addresses questions of safety, accountability, autonomy, and the societal impact of robotic technologies, offering insights into the ethical challenges posed by AI-powered robots in CRIS.

- *Impact on CRIS Staff and Societal Change*

The integration of AI into CRIS has significant implications for CRIS staff and broader societal change. On one hand, AI technologies can enhance the efficiency and effectiveness of research information management, enabling CRIS staff to streamline processes, access and analyze data more effectively, and make more informed decisions.

However, the adoption of AI in CRIS also raises concerns about the potential displacement of jobs, changes in job roles and responsibilities, and the need for reskilling and upskilling of CRIS staff to adapt to the evolving technological landscape. Moreover, AI integration may exacerbate existing inequalities in access to and use of CRIS, particularly in resource-constrained settings.

At the societal level, the widespread adoption of AI in CRIS has the potential to drive broader societal changes, including shifts in research practices, collaboration patterns, and knowledge production. It may also raise ethical and social questions about data ownership, privacy, surveillance, and the responsible use of AI technologies in research contexts.

Overall, addressing the ethical challenges of AI integration in CRIS requires a multidisciplinary approach that draws on insights from machine, technology, digital, and robot ethics. It also necessitates careful consideration of the impact of AI on CRIS staff and broader societal change, with a focus on promoting ethical behavior, safeguarding human values, and advancing the public good.

5. Accompanying the Implementation of AI in CRIS

The literature on AI in CRIS provides valuable insights into the societal and personal effects of AI advancements and underscores the need for ethical considerations in AI implementation.

- *Societal and Personal Effects of AI Advancements*

Numerous studies have examined the societal and personal impacts of AI advancements in CRIS. At the societal level, AI integration has been found to catalyze significant changes in research practices, collaboration patterns, and knowledge production. For example, AI-enabled analytics tools have facilitated the processing and analysis of vast amounts of research data, leading to more efficient discovery and dissemination of knowledge (Kovalerchuk et al.,

2022). Additionally, AI-driven recommendation systems have facilitated collaboration among researchers by suggesting potential collaborators and relevant literature (Cheng et al., 2022; Tavakoli et al., 2022).

On a personal level, AI advancements in CRIS have influenced the roles and responsibilities of individuals involved in research information management. While AI technologies have automated routine tasks and streamlined processes, they have also raised concerns about job displacement and the need for reskilling (Sofia et al., 2023). Moreover, the increased reliance on AI-driven decision-making systems has prompted discussions about accountability, transparency, and bias in research information management (Rezaei et al., 2024).

- *Need for Ethical Considerations in AI Implementation*

The literature highlights the importance of integrating ethical considerations into the implementation of AI in CRIS. Ethical concerns such as bias, transparency, privacy, and accountability have emerged as critical issues that must be addressed to ensure the responsible development and use of AI technologies.

Studies have emphasized the need for transparent and accountable AI systems that mitigate biases and uphold ethical principles. For instance, researchers have proposed methods for auditing AI algorithms to identify and address biases in data and decision-making processes (Patel & Uddin, 2022). Additionally, there have been calls for the development of ethical guidelines and frameworks specific to AI in CRIS, outlining principles for ethical AI development, deployment, and use (Nikolinakos, 2023). Furthermore, ethical education and training programs have been recommended to empower individuals involved in research information management with the knowledge and skills needed to navigate the ethical complexities of AI integration (Akgun & Greenhow, 2022). These programs aim to promote ethical decision-making, foster awareness of ethical issues, and cultivate a culture of responsible AI use in CRIS.

Overall, the literature underscores the importance of ethical considerations in AI implementation in CRIS and calls for interdisciplinary efforts to address the societal and personal effects of AI advancements while upholding ethical standards and promoting the public good.

6. Conclusion and Outlook

In conclusion, the integration of AI into CRIS holds immense potential to revolutionize how research data is managed, analyzed, and utilized. However, this transformative journey comes with significant ethical considerations that cannot be overlooked. Throughout this paper, we have examined the ethical challenges associated with AI implementation in CRIS, including issues of autonomy, discrimination, data protection, privacy, manipulation, and user rights. These issues are not fundamentally new and more or less similar with the identified potential harmfulness of research information management for persons and organizations (Schöpfel et al., 2022) but they are amplified by AI.

One of the key takeaways from our discussion is the critical importance of establishing and adhering to ethical guidelines in AI integration. Ethical guidelines serve as essential frameworks for guiding the development, deployment, and use of AI technologies in CRIS environments. By promoting transparency, fairness, accountability, and respect for human values, these guidelines help mitigate ethical risks and foster trust among stakeholders. Yet, we should be conscious that the fast development and acceptance of AI technology may run ahead of ethical awareness-raising, especially because of its perceived utility and ease of use.

Furthermore, the recent introduction of the EU AI Act has significant implications for AI development in CRIS. This regulatory framework aims to establish clear rules and obligations for AI providers and users, ensuring that AI technologies are developed and used in a manner that is consistent with fundamental rights and values. The EU AI

Act introduces requirements for risk assessment, data governance, transparency, and human oversight, which will undoubtedly influence the development and deployment of AI solutions in CRIS.

Looking ahead, it is imperative for stakeholders in the CRIS community to proactively engage with ethical considerations and regulatory developments to ensure the responsible and ethical use of AI technologies. Collaboration among policymakers, researchers, industry leaders, and civil society organizations is essential for developing robust ethical frameworks, fostering innovation, and advancing the societal benefits of AI integration in CRIS.

Yet, the success of Google has shown that quality gaps and lack of transparency ("black-box") are not sufficient arguments against acceptance; people (like authorities) like it "quick and dirty" (Stone, 2022), and this may be one of the main challenges for CRIS managers committed to quality and integrity.

In conclusion, while AI integration in CRIS offers tremendous opportunities for advancing research capabilities and knowledge discovery, it is essential to navigate these advancements with a strong commitment to ethical principles, human rights, and societal well-being. By prioritizing ethical guidelines and embracing regulatory frameworks such as the EU AI Act, we can harness the transformative power of AI in CRIS while safeguarding against potential risks and ensuring a more equitable and sustainable research ecosystem.

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