Adoption and everyday use of artificial intelligence by NHS knowledge and library professionals in England
Part I: context and support

Emily Hopkins (a), Susan Smith (b) and Hannah Wood (c)
(a) NHS England Workforce, Training & Education, Manchester, UK
(b) Mid Cheshire Hospitals NHS Foundation Trust, Crewe, UK
(c) NHS England Workforce, Training & Education, Bristol, UK

Abstract
Knowledge and library professionals in the UK are exploring the use of generative artificial intelligence (AI) tools and contributing to discussions concerning data and knowledge, in the context of a country keen to drive forward the adoption of data driven services and digital technologies. In this article we introduce the drivers towards adoption of AI within NHS Knowledge and Library Services (KLS) in England, and the methodologies employed to upskill staff in new technologies. This is set against the backdrop of the ethics and risks associated with AI, which provide opportunities for KLS to improve services and support the safe and effective adoption of AI. In the follow up article we provide practical use case studies, to help inspire experimentation and adoption.

Key words: *artificial intelligence; machine learning; information literacy; knowledge management; education, continuing.*

Introduction

Artificial Intelligence (AI) technologies offer a collection of tools with the potential to alleviate various pressures in the healthcare system. The UK Government is currently exploring a "pro-innovation" approach (1) to AI regulation, including establishing the Office for Artificial Intelligence to regulate and oversee the growing adoption of AI tools, although challenges around information governance and intellectual property remain.

The NHS Digital Academy (2) defines AI as "systems capable of performing tasks commonly thought to require intelligence". This broad definition covers many different tools. It is worth understanding that AI is not a single concept, but an umbrella term for various technologies including broad and narrow AI, machine learning, natural language processing and automation, which all attempt to mimic a human approach to the task they are designed for. For the purposes of this article, we are using the term AI in this general sense, but we would encourage those interested in pursuing this topic to explore these various technologies to understand which is best for a specific task.

There is continuous, exponential growth of medical knowledge, (3) and as noted by the Knowledge for Healthcare Framework, healthcare is a knowledge industry (4). The #amilliondecisions campaign highlights how critical knowledge and library professionals are in this knowledge industry; knowledge being accessible and shared in the right place at the right time saves lives every day (5). Journals are publishing more and more every year (6). With this ever-growing body of knowledge, knowledge and library professionals are seeking out new tools and methods of sharing knowledge to adapt to this growing challenge.

AI is impacting numerous arms of the knowledge and library profession, from knowledge management to health literacy and search discovery. Its impact is changing the knowledge and library service (KLS) land-

Address for correspondence: Susan Smith, Mid Cheshire Hospitals NHS Foundation Trust, Smithy Ln, Crewe CW1 4QJ, UK. E-mail: susan.smith2@mcht.nhs.uk

Journal of EAHIL 2024; Vol. 20 (2): 6-10. doi: 10.32384/jeahil20618

scape; the Topol Review suggests that a greater number of knowledge specialists will be required to serve the expanding knowledge needs of the healthcare workforce (7). Likewise, CILIP's recent report concerning AI recommends that library and information services should actively engage with AI to explore the benefits to their end users (8).

With the mainstreaming of generative AI, KLS professionals are uniquely qualified to highlight the importance of AI literacy, the appropriate use of generative AI tools, and encouraging dialogue around the ethical use of AI. Copyright and intellectual property, research transparency and academic integrity are all long-standing concepts, which will see greater challenges as these tools become increasingly available.

Our profession is seeing a growing number of new skills to add to its diverse portfolio. The Chartered Institute of Library and Information Professionals' (CILIP) Professional Knowledge and Skills Base (PKSB) already has items dedicated to AI and algorithmic literacy (9). Acquiring the specialist skills to engage with AI is no different to our specialist knowledge of advanced search databases; the tools will only be as good as the skills to use them effectively, and the resources we have to hand. A well-structured search strategy in a well-chosen database achieves better results than a poor search strategy in an unsuitable database. The same rules apply to using AI tools.

Developing the workforce

Information is data, explained; data is the foundation of information (10). KLS professionals already have many of the necessary skills to take lead in the data revolution. This hasn't yet translated into widespread practice, due to the evolving language of technology. Where KLS professionals teach critical appraisal, this could be expanded with a complementary offer of courses in clinical data bias. Where we hold collection development policies, there are opportunities in expanding to data curation.

For the profession, the key drivers were the Topol Review (7) and the CILIP AI Impact Report (8) which prompted discussion around the future skills required to develop the workforce.

Initial training was delivered using Library Carpentry courses (11) to train on data cleansing, working with data, managing files, and automating processes. Work also began with the National School of Healthcare Science (12) and the University of Manchester to develop a Clinical Data Science PG Cert (13) for KLS professionals and clinical staff as an introduction to clinical data skills. Some funded places are provided by NHS England for KLS in England to enrol. The course is designed to encourage the development of a project, with an assessment including the application for funding for the project. There is an aspirational aim for the course to develop a lasting community of practice for alumni, where KLS staff will be able to work with and support clinicians.

As well as formalised training there was a recognised need for collaboration, shared learning and experience. In 2017, a community of practice formed to look at Current and Emerging Technologies. This group was repurposed for KLS professionals to share digital projects, personal learning, and additional training opportunities. A sub-group later formed to develop four training sessions: Getting started with AI, Prompt engineering, The ethics of AI and How to spot AI content. The presentations were the cumulation of shared research, testing and specialist knowledge. The group discusses current projects and experiences with AI and machine learning.

A Digital Competency Framework for KLS staff is currently being developed, building on the existing framework for the healthcare workforce by NHS England, presenting those skills and competencies through a KLS lens. It will empower those self-directed learners to upskill themselves in practical ways and encourage building on existing skills.

Ethics

People-centred practice needs to be at the heart of all digital transformation. Without consideration and collaboration with the end user, and ultimately the patients and service users, there is a serious risk of harm. When considering how we use AI it is critical to understand how AI can impact workstreams and people.

Algorithmic transparency is a key concern. Like any database, the information contained within AI systems can create and exacerbate bias (14). Without knowing the scope of the content and the purpose, we cannot be sure of the quality of the response returned. There is also the risk that the content used to train AI products like Large Language Models is copyrighted material and may be undermining creative industries.

Many health care technologies fail due to non-adop-

tion, abandonment, scale-up, spread and sustainability (15). Getting ethics right in AI supports building trust and adoption of technology. Getting it wrong is something that leads to wasted time, money and can end up in the news. KLS professionals have an essential role in teaching AI literacy and instructing people in the principles of critical evaluation.

The Department of Health & Social Care has begun a pilot of the Algorithmic Impact Assessment which aims to tackle biases and improve transparency in the data (16).

There are other types of bias that shape AI effectiveness. Our cognitive bias is dependent on how we view technology and is shaped by our optimism, scepticism, and our alert fatigue of incorrect cases. It is easy to agree with a system where the output matches your own view and dismiss an output if it is something you disagree with (17). We can support in good practice in data stewardship, understanding how the use of historic data, or data selection may lead to health inequalities in rare diseases and minoritised groups.

There needs to a clear responsibility and accountability for the decision, and machine autonomy should not undermine that of a human (18). We need to foster awareness to mitigate future risks and encourage transparent use of AI tools. We also need to communicate that patients and service users continue to be at the heart of decision-making processes.

KLS professionals have a key role in the education around AI ethics, supporting good practice in data stewardship and supporting the balance between digital systems and human needs.

Risks and the importance of using AI effectively

It is critical that we treat generative AI as a tool like any other, rather than an infallible system. Generative AI tools are only as good as the skills of the person using them. With the regular release, and re-branding, and development of tools, keeping up to date can be difficult.

Poor practice and misuse of generative AI is filtering into healthcare research. Bader et al. (19) states "I'm very sorry, but I don't have access to real-time information or patient-specific data, as I am an AI language model". This not only displays a lack of due diligence and undermines confidence in the peer-review process, but it also highlights a lack of fundamental AI literacy. KLS professionals have been asked to source non-existent articles generated by Large Language Models (LLMs) which have been prompted to list articles pertaining to various topics, even though the LLMs used do not have search capabilities. LLMs can be prone to generating untruthful content (14), especially if they are not used correctly.

Differentiating between generative AI tools that can perform accurate searches for knowledge, and tools that are better suited to language-based tasks (such as generating Boolean search strategies) will become increasingly important as more tools are made available. Alongside the safety risks, there are potential long-term impacts to our workforce through deskilling via automation. Without basic knowledge of how AI tools work and the importance of quality data curation, we may not be able to detect when things go wrong or provide solutions to resolve errors as they arise.

There is also a growing awareness of the human need to balance routine and complex tasks for good mental health. Without building this into job roles there is a risk of cognitive overload (20).

Conclusion

The growing knowledge and technology landscape brings both challenge and opportunity. The exponential growth of medical knowledge gives the potential for a health sector more well informed than ever before but requires the right tools to capitalise on this and use knowledge and data well. The tools themselves bring their own problems and risks and need to be used appropriately to avoid creating new problems around ethics, reliability and quality. Knowledge and library professionals are well placed to address this challenge, bringing information and digital literacy skills which can be honed for the world of AI technologies, with appropriate workforce development opportunities. This involves adapting our skills and understanding the particular challenges of AI technologies, and learning from our allied professions too, drawing on learning from data, digital and technology, but also offering our expertise in information literacy, access and use, to ensure the technologies are used to best effect and to enhance knowledge access and mitigate negative effects of the technology itself.

Many KLS teams are already making good use of various technologies, using them to enhance existing services and improve skills. In our accompanying article,

we explore some of these real-life use cases from a variety of organisations, and the opportunities they have brought, offering suggestions and practical considerations for those looking to enhance their service offers by taking advantage of these technologies.

Submitted on invitation.
Accepted on 7 June 2024.

REFERENCES

1. UK Government. A pro-innovation approach to AI regulation: UK Government response to consultation. 2024; Available at: https://assets.publishing.service.gov.uk/media/65c1e399c43191000d1a45f4/a-pro-innovation-approach-to-ai-regulation-amended-governement-response-web-ready.pdf. Accessed 16/04/2024.
2. NHS England. Building a digital workforce: 1.5 Terminology. 2023; Available at: https://digital-transformation.hee.nhs.uk/building-a-digital-workforce/dart-ed/horizon-scanning/understanding-healthcare-workers-confidence-in-ai/chapter-1-introduction/terminology. Accessed 16/04/2024.
3. Densen P. Challenges and opportunities facing medical education. Transactions of the American Clinical and Climatological Association. 2011;122:48-58.
4. Health Education England. Knowledge for healthcare framework. 2021; Available at: https://www.hee.nhs.uk/our-work/knowledge-for-healthcare. Accessed 15/04/2024.
5. NHS Knowledge and Library Services. Making a positive impact. Available at: https://library.nhs.uk/our-work/making-a-positive-impact/. Accessed 15/04/2024.
6. Ioannidis JPA, Pezzullo AM, Boccia S. The rapid growth of mega-journals: threats and opportunities. JAMA. 2023;329(15):1253-4.
7. Health Education England. The Topol Review. 2019. Available at: https://topol.hee.nhs.uk/. Accessed 15/04/2024.
8. Chartered Institute for Library and Information Professionals. The impact of AI, machine learning, automation and robotics on the information professions. 2021. Available at: https://www.cilip.org.uk/general/custom.asp?page=researchreport. Accessed 15/04/2024.
9. Chartered Institute for Library and Information Professionals. The professional knowledge and skills base. Available at: https://www.cilip.org.uk/general/custom.asp?page=PKSB. Accessed 05/04/2024.
10. Dammann O. Data, information, evidence, and knowledge: A proposal for health informatics and data science. Online J Public Health Inform. 2019;Mar5;10(3):e224.
11. Library Carpentry. Library Carpentry. No date; Available at: https://librarycarpentry.org/about/. Accessed 03/05/2024.
12. NHS England. National School of Healthcare Science. 2024; Available at: https://nshcs.hee.nhs.uk/. Accessed 03/05/2024.
13. University of Manchester. PGCert Clinical Data Science. 2024; Available at: https://www.manchester.ac.uk/study/masters/courses/list/20306/pgcert-clinical-data-science/. Accessed 03/05/2024.
14. Bender E, Gebru T, McMillan-Major A, Shmitchell S. On the dangers of stochastic parrots: can language models be too big? FAccT '21: Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency 2021.
15. Greenhalgh T, Wherton J, Papoutsi C, Lynch J, Hughes G, A'Court C, et al. Beyond adoption: a new framework for theorizing and evaluating nonadoption, abandonment, and challenges to the scale-up, spread, and sustainability of health and care technologies. J Med Internet Res. 2017;19(11):e367.
16. Department of Health and Social Care. UK to pilot world-leading approach to improve ethical adoption of AI in healthcare. 2022; Available at: https://www.gov.uk/government/news/uk-to-pilot-world-leading-approach-to-improve-ethical-adoption-of-ai-in-healthcare. Accessed 05/04/2024.
17. NHS England. Understanding healthcare workers' confidence in AI. 2022; Available at: https://digital-transformation.hee.nhs.uk/building-a-digital-workforce/dart-ed/horizon-scanning/understanding-healthcare-workers-confidence-in-ai. Accessed 05/04/2024.

18. World Health Organisation. Ethics and governance of artificial intelligence for health. 2021; Available at: https://www.who.int/publications/i/item/9789240029200. Accessed 05/04/2024.
19. Bader R, Imam A, Alnees M, Adler N, ilia J, Zugayar D, et al. Successful management of an Iatrogenic portal vein and hepatic artery injury in a 4-month-old female patient: a case report and literature review. Radiology Case Reports. 2024;19(6):2106-2111.
20. Rutkowski A, Saunders C. Emotional and cognitive overload. 1st Edition ed. London: Routledge; 2018.