

Adoption and everyday use of artificial intelligence by NHS knowledge and library professionals in England

Part II: practical application

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Abstract

In part I of this article, published in this same issue of the Journal of EAHIL, we set the background for the NHS in England context looking at the drivers, strategy, and actions taken to develop the Knowledge and Library Services (KLS) workforce. In this piece we provide a snapshot of how services are testing and beginning to adopt artificial intelligence (AI) in their practice. It also reflects on the role of KLS in educating the workforce and provides the challenge to adopt AI and skilfully weave into all we do until it becomes business as usual.

Key words: artificial intelligence; machine learning; information literacy; library services; education, continuing.

Introduction

KLS professionals are adapting. In smaller and larger services alike, we are beginning to see the prioritisation of artificial intelligence (AI) literacy skill development. Some are seeking qualifications via data bootcamps, clinical data apprenticeships, and postgraduate clinical data science courses.

There is greater interest in attending training, sharing practical knowledge and engaging with communities of practice. Even without formal education, KLS professionals are experimenting and using self-directed learning to try various generative AI applications to assist with day-to-day tasks, such as refining search strategies and carefully summarising literature searches.

There is a growing understanding that generative AI tools are a useful addition to the plethora of tools available to the KLS professional. Much like advanced search databases, skills and knowledge are required to use generative AI tools effectively and safely.

There have been failures around adoption of voice-controlled systems based on natural language processing

e.g. Siri, Alexa or chat bots integrated in resource management systems. Many of these systems have faded into the background and the lessons learned are not always captured. It is important we share our failures and learn, as well as celebrate the successes. Use our communities of practice to test ideas, even if they are not yet fully formed.

KLS professionals have skills that support digital data development, and we are beginning to see the evolution of data librarianship alongside hybrid informatics roles. We already widely understand taxonomies and ontologies, tools which are also used develop bespoke AI products. In the way we curate our online and print collections, we can support the curation of datasets; and in the way we teach critical appraisal of literature, we can teach the impact of bias in data (1).

AI generated content is passing some peer review processes; there are growing calls for greater transparency, and appropriate use of generative AI tools in research, as well as more vigorous peer-review processes (2). Most journal publishers now have guidance about the

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use of generative AI in their publications. KLS professionals can support embedding the importance of transparency and advocating the ethical use of AI. Students are generally being encouraged to experiment ethically with generative AI, and to ensure that they reference their work appropriately (3). This will have an impact on KLS professionals, who may be asked questions related to the use of generative AI in research and university assignments.

People need space not only to be taught, but to build confidence and hone their skills. Libraries are the ideal hosts for digital makerspaces. A physical place where people can meet to network, experiment, work in partnership with others and hone their skills to innovate. As digital leaders, KLS professionals can encourage and support these projects in partnership and ensuring lessons are captured and shared to inform others.

AI in the everyday

Suppliers of many of the systems we use are of course embracing AI technologies and integrating into systems such as search engines and databases, offering enhanced capabilities and functionality. Whether we realise it or not, the technologies are already impacting on search products, with examples already appearing such as Ask NT from the Nursing Times (4) offering summarised responses tailored to users' specific questions, rather than simply retrieving matching items from the database.

However, these capabilities and integration into products also bring risks and ethics issues to add into data privacy impact assessments when procuring products and call for new approaches to procurement assessment to ensure products still meet the needs of the end user without requiring additional skills or exposing them to risk.

The KLS professional's role in AI literacy

A large group of KLS professionals worked together to share their experiences of using different generative AI tools and examined them through their Community of Practice (CoP). This developed the skills, knowledge, and confidence of members and produced much-needed educational resources concerning AI tools for both professional development and supporting user education.

The outputs at present are four presentations which can be repurposed and shared, with more topics in development. The topics currently covered are:

- *Getting started with AI: what is it.* Looks at the definition and different types of AI, with examples of use within healthcare. It also introduces some of the terminology like Large Language Models and the use of tokens in generative AI. It also challenges misconceptions around job loss.
- *Ethics of AI.* This considers what good and poor implementation of AI looks like, and its impact. It introduces a range of ethical frameworks, copyright considerations, the health data ecosystem, impact assessments for workforce and around digital inclusion, bias and health inequalities. It also provides advice on preparing for change and frameworks to ensure quality project planning.
- *Generative AI and prompt engineering.* Highlights good practice principles like transparency, human oversight and consideration for the environment. Introduces some popular tools, differentiating between tools useful for searching, and tools useful for search strategy generation, guidance for structuring prompts and practical examples to experiment with. This presentation encourages users to purposefully prompt tools to hallucinate, thus enabling them to spot how tools can hallucinate if they are not used correctly.
- *How can I tell if it is AI generated?* Introduction to the SIFT health literacy framework, tools to support fact checking, how to spot deepfake videos, assignment submissions, job applications, journal articles and images. It also re-introduces good practice when using AI to ensure content is ethical and of high quality.

Practical examples

Large Language Models (LLMs) excel at language-based tasks. Knowing how to use these tools effectively is a skill well-suited to KLS professionals (5). The use of generative AI tools is an enhancement of core skills which are already predominant in the KLS profession; thinking critically about the information we read, collating knowledge for our service users, and ensuring the continuation of evidence-based practice.

Semantic search is distinct from keyword searching and offers context-specific results, using an underlying model to map relationships between words to give

more context and improve accuracy, compared with traditional keyword searching which matches words accurately, but may not disambiguate multiple meanings. Models may include an LLM or vector database to expand on hierarchical taxonomy structures, by mapping relationships between concepts and phrases. With medical subject headings, this may include relationships such as “is a treatment of” or “is a test for”. This may reduce the need for, for example, generating large list of synonyms as the context will ensure results are accurate. However, it may also contribute to bias and discourage the searcher from thinking more broadly about the topic and different contexts and culturally dependent terminology.

Much like individual search behaviours, KLS professionals have developed their own methods of using generative AI tools to support their work.

Using generative AI may be a new skill, but the responsibilities remain the same. While generative AI tools can save time and improve quality, it is imperative that KLS professionals continue to diligently check their work for error, and reference source material appropriately. All information uploaded or inputted onto generative AI tools must not contain identifiable information and must be freely available online. Tools must be used transparently, and in line with any available guidance.

Generative AI tools can assist with generating search strategies, improving evidence summaries, and developing communicative content for service users.

Prompts, and inputs, can greatly impact the quality of generative AI responses (6). The more defined the prompt, the more defined the response. For example, asking a generative AI tool to summarise the Advanced Practitioner workforce will provide a generic response, likely with bias favouring US Advanced Practitioners, which is a slightly different role to the UK.

Uploading a list of journal article abstracts to a generative AI tool on the topic of Advanced Practitioner roles and asking pertinent questions such as “what is an Advanced Practitioner?” and “List some challenges faced by Advanced Practitioners” will provide a richer, more evidence-based response.

Asking tools to use UK English, drawing solely from the material you share with them, will also enhance the quality and relevance of responses for the target audience.

Ultimately, remembering that the responsibility lies

with the searcher to check results are accurate and relevant, and understanding enough about how the search operates to fix common mistakes and help users refine queries will still be needed. Seeing the tools as support, and not a substitute for our expertise, is also important. For example, when creating an evidence summary, using a prompt to draw out key details or suggest categories can help this stage of the summary, but it does not truly ‘understand’ the response. The KLS professional has ultimate ownership of the summary creation, applying their expertise and domain knowledge to produce this.

Case studies

Screening and classifying search results

Amy Finnegan (senior information specialist), NICE

At the National Institute for Health and Care Excellence (NICE) the in-house reference management software (EPPI R5) is based on the University College, London (UCL) version of EPPI reviewer (7). The Digital and Information Technology Team incorporated two machine learning elements into EPPI R5:

1. *priority screening*: uses machine learning to order references in a review, presenting the ones most likely to be included studies first. This allows the analyst to stop the sifting process earlier once they have reached a threshold of irrelevant results. Additional checks are performed to ensure relevant results are not missed by terminating the screening process early;
2. *classifiers*: the randomised controlled trial (RCT) classifier allows the information specialists at NICE to further refine the search results for trial records. At NICE the classifier is used as an additional refinement, on top of using database RCT filters (e.g. the McMaster Balance RCT filter for use in OVID Medline and Embase). To use the classifier, the RCT results are exported in a separate file to the rest of the results, this is so other study types are not excluded by the RCT classifier. The results are then imported into EPPI R5, and the classifier is then run on the RCT files only. Records that have already been processed by a classifier (e.g. Cochrane CENTRAL records) are also excluded from this step. The classifier then provides a report of the number of records identified as either an RCT or a non-RCT. The non-RCT results are automatically assigned an exclude code but are still vis-

ible to the analyst sifting the review. The information from the report is then incorporated into the PRISMA-S write up of the search approach taken during a guideline search.

These are two examples of machine learning that are currently embedded into the search practices at NICE. Information Services continues to explore other ways machine learning can be used to reduce the overall sifting burden for analysts (e.g. custom classifiers and pattern matching). This approach demonstrates that machine learning can be used as a useful tool for information professionals, enhancing rather than threatening roles.

Using AI to support article selection for systematic reviews

Sophie Castle (clinical librarian) and Richard Pemberton (KLS strategic manager), Medway NHS Foundation Trust
A part of the KLS role is to assist NHS staff and students who are undertaking systematic reviews. The library identified ASReview as a potential support tool. ASReview is a Scandinavian AI system that will assist with screening the literature and reduce the time spent finding the most relevant documents for a study topic. The library presented the tool to Medway NHS Foundation Trust Consultants as part of a research group meeting. This led to the training of Junior Doctors and other NHS staff, within the library, on how to use ASReview as part of a systematic review process. As part of implementation, permission was granted to install Python on all site PCs to run the system.

This has led to staff and students being able to complete systematic reviews in weeks, rather than months. It has raised the library profile within the hospital, especially regarding provision of research support. Potentially this system could be applied to any other evidence-based documents.

AI as a learning tool

Josiah Richardson (senior library assistant), West Suffolk NHS Foundation Trust

The library team had no expertise in Excel and found it difficult to translate online tutorials into the specific data and tasks. A combination of ChatGPT4 and Bard was used to guide through functions such as COUNTIF, COUNTIFS, and referencing cells across multiple sheets. A description was provided of the worksheet layouts and terminology without sharing sensitive data.

When initial formulas failed, the AI application provided troubleshooting tips on checking parts step-by-step, verifying date formats, and fixing typos. In a similar exercise, AI helped to organise data into a format that made it easier to extrapolate the required information.

The conversational style of the AI helped to boost Excel skills and improved confidence in working with complex functions and pivot tables. It supplemented current knowledge and taught effective problem solving. AI can be used in a collaborative way as a personal learning assistant on many topics.

Process automation of a continuous improvement repository

Susan Smith (KLS manager), Mid Cheshire Hospitals NHS Foundation Trust

When people want to do a continuous improvement (CI) project they submit form, PowerAutomate creates process “flows”, which means that the form is sent automatically to CI team (to approve), the KLS team (to conduct a search or link with other people with similar interest) and project sponsor (to approve). Once approved the project is automatically added to a SharePoint repository with a folder created with all the necessary files and templates (including automatic naming). When the A3 project summary is completed, a certificate is issued, and the CI Team is notified to promote. A PowerBI dashboard was created by the library monitor the process and breakdown the submissions and stages of projects against the divisions.

The repository now has over 300 completed projects, reports into CI Facility meetings and integrates the library within the system process. Similar processes are now being used in the Trust to create a process for managing agendas and meetings through Microsoft Teams. Committee members are responsible for timely addition of reports and content for agenda creation and distribution.

Assistance with mapping the discovered literature and generating search strategies

Hannah Wood (knowledge specialist), NHS England Workforce, Training & Education (WT&E)

GPT-4 is being used to pull out key themes of literature searches. By asking it questions about searches, such as identifying common themes in abstracts found as part of a literature search, it has proven useful in

quickly identifying themes which can then be presented alongside the search as a “map” of the evidence. GPT-4 is also a useful tool for generating Boolean searches for Google, expanding on phrases and synonyms. It produces strategies and terms, which might not be previously considered.

It has enabled the provision of higher quality searches and evidence products. Sharing the knowledge with other KLS colleagues and showing service users how these tools can be used to effectively enhance searching.

Conclusion

When this work first began, one of the first questions asked was around how KLS professionals would use this technology. There was resistance; people feared job losses and could not identify how the technology could be applied to their work. However, KLS professionals are creatively adapting, and case studies are developing.

There are still many barriers to overcome.

Often project investment can be ad hoc. We need to work in partnership and create concrete business cases for investment to develop new services. We can also learn from others and share business cases to support implementation in other organisations. Our current approaches can be opportunistic, dependent on systems we can access by procurement, licence allocation, other tools may be blocked by IT departments.

There are barriers to copyright and a nervousness about the impact on the creative industries. We need to work in partnership to ensure that progress can happen in a way that is fair. There is a need for us to research and evaluate, so we understand the impacts.

Jobs are unlikely to disappear, but they are likely to change. How do we effectively work with our staff and our organisations to create these new digital – data librarian roles?

We know that this is a very fast changing field. How

do we as a profession keep on top of the development to ensure we have the right people with the right skills, using the right tools and right information to deliver a fast efficient service for the benefit of the workforce and ultimately the patients we care for?

How will you personally learn, adapt, celebrate and share progress made in this field within your service?

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