Developing a library strategic response to Artificial Intelligence

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Introduction

Artificial Intelligence (AI) is 'the defining technology of our generation' according to a recent joint statement by the UK and US governments (UK Government, 2024). We all understand that it is likely to impact library and information work profoundly, so it is important to try and be more than reactive and think strategically about the opportunities and problems it is creating. However, it's a unique strategic challenge for several reasons.

Firstly, unlike most technologies it has deep cultural associations, not just from the many, mostly dystopian, Science Fiction movies we have seen, but from a profound worry about artificially created life that appears to go back to Greek mythology (Mayor, 2019). Not surprisingly, given its cultural associations AI produces an emotive response. It certainly promises much (Bankhwal *et al.,* 2024) and threatens many problems too (Fergusson *et al.,* 2023). The nature and risk of AI is hotly contested. While the big tech companies offer a story of techno-utopianism, technological determinism and techno-solutionism, an equally strong voice is articulating the ethical issues and societal impact from a socio-technical perspective. The fact that many reports suggest significant changes to work, reinforce the emotionality that clouds our ability to make clear decisions (Jung and Desikan, 2024).

Another challenge to responding to AI strategically is that as a general-purpose technology it appears in many contexts but looks different in each one. Sometimes it is about turning 'stuff' to data (words, text, handwritten manuscripts or images), sometimes finding patterns in such data, sometimes it offers adaptivity and sometimes it seems to be about predicting future behaviour. As a result, it is hard to define AI except at the abstract level in terms of computers doing things we think of humans doing. This is not very helpful and may distract from AI doing things humans cannot do and doing things that humans do in non-human ways. Furthermore, AI is often hidden within other applications or within infrastructures, so it is hard to know where and how AI is in use. Furthermore, even though it is a broad set of technologies, AI might also be considered to be part of an even broader set of technologies such as Social, Mobile, Analytics, Cloud, Internet of Things ('SMACIT') and the digital transformation agenda (Brooks and McCormack, 2020).

The speed of change in technology makes responding hard. Generative AI has rapidly reshaped our expectations of what AI means. But generative AI has not stood still either.

Developments around Large Language Models (LLMs) have been incredibly fast, from the launch of ChatGPT in November 2022, to the emergence of many commercial and open rivals and widespread interest in Retrieval Augmented Generation (RAG) (Gao *et al.,* 2023).

To make our decision making around AI even harder, the technology developments are set in a wider strategic and policy context that is also in transition, with significant divergences, such as between US, EU and Chinese government agendas (Papyshev and Yarime, 2023).

So, in a sense responding strategically to AI is almost impossible. But it seems equally true that a merely passive 'wait and see' posture is inadequate. In this context the IFLA Special Interest Group (SIG) on AI has developed a guide to 'Developing a library strategic response to Artificial Intelligence' (Cox 2023a). Extending these thoughts, in this article I want to suggest that we can develop a library strategic response to AI by setting up a process around answering nine questions. Such a discussion is not intended to be a simple linear process. The questions are organised to develop a cumulative understanding, probably in the context of a wide discussion in library leadership teams, with staff and external stakeholders. We will return to reformulate earlier answers as we understand the issues better. The questions are interconnected. We probably will not have a definitive answer to any of the questions in the near future. But the value is that the process of trying to answer the questions teases us into a more strategic posture.

Nine questions

Question 1: What is a definition of AI and how is AI changing?

The introduction has explored some of the complexity here. AI is not a simple to understand set of technologies and it is changing fast.

Question 2: How will AI impact your library?

The complexity of AI gives rise to complexity in any answer to how it might impact libraries, a question which encompasses both possible uses by the library and impacts through wider developments, such as how users adopt it. As a starting point I suggest that among the possible impacts are:

1. Descriptive AI to enable searching of collections as data in new ways, and at scale.
2. Chatbots (or AI assistants) for 24/7 enquiry response or to support administrative processes.
3. AI in everyday knowledge work, e.g. using generative AI to drafting policies, reports and marketing communications.
4. Generative AI in professional tasks such as summarisation or metadata creation
5. AI for routine data processing as in Robotic Process Automation of data processing tasks.

6. Supporting the choice and use of AI applications by users. An increasing number of AI based tools are available to support such processes as literature searching (Baytas and Ruediger, 2024).
7. Supporting emerging data science communities, could take many forms relating to finding, using, sharing and preserving data. For example, data search remains complex, so librarian search skills could be very useful. The librarian instinct to share data in ways that allow it to be found easily by others is a valuable perspective.
8. Promoting AI literacy (including data and algorithmic literacies) for users.
9. Building smart spaces (even Automated Storage and Retrieval Systems).
10. Robots for shelving or user information services.
11. Analysing and predicting user behaviours.
12. Library involvement in wider institutional licensing or development of AI services.

In our paper Cox and Mazumdar (2022) we expand on these uses: there is not space to do so here. I have also written about how the likelihood of different paths for academic libraries in Cox (2023b). But suffice to suggest that AI has the potential to impact almost every aspect of library services, sometimes in the pursuit of efficiency, sometimes to enhance personalisation or access to knowledge, and sometimes in transformational ways.

In any consideration of these uses, their informational and ethical challenges should also be considered. AI promises greater access to knowledge through new types of search, recommendation and adaptivity, summarisation and translation. It has many benefits from an ethical perspective. Yet we have also seen in the case of services such as ChatGPT serious failings in terms of information ethics (Fergusson *et al.,* 2023; Anwar *et al.,* 2024; AIAAIC, 2024). I have elaborated on the ethical issues of AI from an information perspective elsewhere (Cox, 2022). We can summarise them as revolving round:

- Low information quality. Early versions of ChatGPT are notoriously inaccurate, providing out of date information, hallucination of answers and invented citations.
- Damage to the information culture. The potential of AI to degrade the information culture through generating more information overload, homogenisation of writing and degradation of sincerity.
- Malicious use of information. Actively malicious uses of AI for misinformation such as deepfakes.
- Inequality of access to information. The existence of subscription AI services has led to the potential for exacerbating inequities in access to knowledge.
- Violation of Intellectual property rights. The legality of the extensive use by commercial generative AI of copyrighted material remains unclear, especially in the context of complex international property law.

- Privacy, safety and security concerns. The misuse of private data and its use without consent has been an increasing concern around social media.

- Bias. Choice of the wrong algorithm and biases in data can lead to unwanted effects such as the reproduction of discriminatory assumptions and stereotypes.

- Opacity. The explainability of AI is important to transparency and accountability. Opaque, black boxed systems make it impossible to understand results or attribute responsibility when things go wrong.

The depth of these sorts of issues, leaves libraries with a dilemma around how to offer a balanced response to AI: to grasp the benefit but warn about the risks. Libraries need to find out how to talk about AI in a way that works in their context. It is rarely successful to adopt a completely anti-technology stance.

We can pose some sub-questions to question 2, that will help thinking about the reader's own context:

Which applications of AI are key for your library? Which are mostly likely? Which are most transformational? Which are the most pressing ethical issues, and why? How would you articulate a balanced response to AI?

Question 3: How should the library position itself in relation to wider strategies and context of AI?

Here we shift focus away from the technology for itself onto the strategies of bodies libraries relate to and wider contextual factors. Again, we can only scrape the surface here, but we know that AI is a focus for international organisations such as UN and UNESCO, and for national policy. UK national policy is currently focussing on a pro innovation approach that encourages adoption with a safeguard of 'AI safety'. But the EU is taking a very different approach with a greater focus on protecting society from harm. It will be hard for AI developers in the UK not to consider EU requirements. There are sector policies too that can influence how libraries might respond to AI, such as UKRI's (2021) AI strategy or library specific statements such as Association of Research Libraries' (2024) principles. There will also be institutional level policies, such as the university for an academic library or local authority for a public library (Robert, 2024). Libraries must think about how their own strategic response can be positioned most successfully in relation to these layers of strategy and policy.

In addition, libraries will want to think through how AI might impact traditional focuses of library strategy such as: collections, physical space, user experience, digital literacies, collaboration and open science (Huang, Cox and Cox, 2024).

These complex issues can be articulated as sub questions: *What are the relevant aspects of strategies at any of these levels: institution, sector, national, international? How do we*

position the library's response to AI in relation to such strategies? How if at all does AI relate to common areas of library strategy?

Further, we must reflect on the wider context within which AI strategies are emerging. Certainly, for the UK we would be thinking about contextual issues such as: Brexit, COVID, the cost-of-living crisis, growing global conflict, cybersecurity challenges, political change and environmental crisis. The evolution of AI and its use are shaped by these wider contexts. For example, how does AI impact exposure to increasing concerns around cyberattack? AI increases the reliance on technology and data, so heightening risk, yet could also be used to avoid or detect threats. We know generative AI is greedy in terms of power and other material resources, so it has a sustainability issue (Crawford, 2021; Vipra and Myers West, 2023). Sector specific issues need consideration too, such as in the UK higher education context: a university funding crisis and the strengthening of the EDI agenda. For example, will AI be deployed to cut academic staff costs in the context of a financial crisis? How might the AI agenda interact with calls for growing equality, diversity and inclusion?

All these factors impact how we might see AI likely to develop, leading to another sub-question:

What is going on in the wider environment that is likely to shape how AI is adopted?

Question 4: What are the drivers and barriers to use of AI, at the library and institutional levels?

Question 5: What are libraries strengths and weaknesses, and opportunities and threats in relation to AI?

Question 6: What are libraries' AI capabilities and contribution to institutional capabilities?

These three questions all support understanding a library's capacity to respond to AI in context. This first question prompts us to animate our sense of how contextual factors are playing out in the local context. A classic SWOT analysis (Strengths, Weakness, Opportunities, Threats) can also help us pinpoint opportunities and anticipate vulnerabilities. There is not space to fully develop these analyses here, but it might be useful to expand on the third question and the notion of AI capability.

According to Mikalef and Gupta (2021) the AI capability of any organisation can be evaluated under three headings: material resources, where there is a need for data, infrastructure, time and money; human resources, consisting of technical skills and business skills; and intangible resources: the ability to coordinate a response, ability to change, and a willingness to take risk. Analysis of both the library and the organisation it sits in through consideration of these resources helps us understand the potential response to AI. Thus, libraries arguably bring some significant resources to the equation such as data, data related technical skills,

business skills and probably an ability to coordinate a response. This may enable them to develop AI or contribute to the wider organisation's capability. They are often weaker in terms of sheer time and monetary resources, technical skills and the willingness to take risk. Reflecting how to address these challenges, perhaps through collaboration gives us a sense of how the library relates to AI.

Question 7: What are the main strategic options for libraries?

Here we are thinking in more depth about what the different applications of AI in libraries involve. Again, there is not space to fully develop these thoughts, but the prompt here is to imagine in detail where a strategic focus might be placed:

- Education libraries are likely to focus on generative AI literacy for students and staff.
- National libraries and research libraries have developed wonderful applications of AI to their unique collections.
- Another focus could be supporting data science through data skills.

As more experience emerges, we should be able to provide case studies of many different sorts of application.

Question 8: What tactics do we have at our disposal and how do we organise them into a roadmap?

Having thought something more about where one wants one's library to get to, the question turns to tactics to get there. There seem to be four types of tactic.

Firstly, there are information gathering tactics. By horizon scanning the development of AI and library applications, we can get a feel for the changing landscape. Gathering information about how our users are starting to use AI tools and this is changing information behaviours is vital to informing decision making.

Secondly, there are workforce development tactics. As the primary resource of any organisation, these are ways to build human capacity. We might be able to recruit staff with new skills, but it is perhaps more likely that we develop the skills of existing staff. Institutions can build capacity through internal communities of practice that share readings and learning. Giving staff permission to experiment or sending them on formal training courses are other obvious approaches.

Thirdly, are organisational tactics, such as appointing a working group or AI lead to coordinate responses. Pilot projects seem another approach to build capacity and manage risk and expectations.

Fourthly, there are alignment tactics. This is about building collaborations. These could be internally focussed at IT services or researchers who are using AI. It could be building external collaborations with suppliers, other libraries, or other types of institution to build collective capability.

Considering these different types of capability building, we need to think about a roadmap. Bibliothèque Nationale de France's (BnF) (2020, 2021) wonderful digital roadmap and AI roadmaps offer a model here; as does the Library of Congress approach to AI governance (Manchester, 2023), albeit few libraries have the resources of the BnF or Library of Congress. It is about assembling tactics into phases towards, for want of a better term, maturity.

Question 9: What is your future vision for the AI enabled library?

It may seem illogical to close by posing a question about a vision for the AI enabled library, but unless we can at least partially answer most of the other eight questions, I think it is hard to be clear what a realistic vision is.

I have some suggestions of what this vision could be. One might be the 'automated library', where AI handles much of the routine of processing of data and even of stock. Perhaps robots to perform tasks such as returns sorting and shelf checking. It leaves humans to focus on the human centric activities and more complex tasks that require an understanding of context. This is something akin to a utopian vision of the AI powered library. An aspect of this or a vision in its own right might be something like the 'living systematic review' where we have constantly updated evidence (Elliott *et al.,* 2017). In the health context the living review would be informing the most up to date practice guidelines. We may be sceptical about full automation of the literature review but given the scale of academic publishing and the rate it is growing at, more automated approaches to literature reviewing seem to be needed. Another more human vision is of the 'speaking collection', where generative AI trained on a special collection of material is animated so that users can interact with it. This is a specific version of the vision we articulated as the 'Intelligent library', a library where you interact with the collections rather than search for an item to read (Cox, Pinfield and Rutter, 2019). It is an extension of the distant reading idea.

As a profession we need to have such visions to work towards, or we are likely to find ourselves following other actors on paths they define.

Conclusion

The full impact of AI is likely to unfold much more slowly than we might think (Wilcocks, 2020). We will not be able to answer these nine questions definitively for some time. We are operating in a fluid environment. What we might hope will be the answers, may not materialise. But posing these nine questions and reflecting on the answers support a more strategic approach.

The full 'Framework for libraries to respond strategically to Artificial Intelligence' related to this paper is available at: https://doi.org/10.15131/shef.data.26067841.v1.

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