Group Work: Discussion of Scenarios

May 13, 2023

1 Introduction

We are focusing on the editorial process of an academic journal, which are typically published by large commercial publishing houses (such as Elsevier, Springer Nature, Wiley, etc.). Such academic publishing houses publish several hundreds of journals. They hire professional *in-house* editorial staff to coordinate the editorial process for manuscripts, while external academic editors (typically university professors) take the important editorial decisions on manuscripts based on peer-review comments. Peer-review is the process of letting other experts in the field review and comment on a manuscript. Based on the results from peer-review, the academic editor will make a decision on whether to accept for publication, reject, or request revisions to the manuscript.

We are interested to explore and discuss why and how *adaptive* and hybrid AI systems could help such a commercial publisher *to gain a competitive advantage* over other publishers. We focus on use cases that are *hybrid and adaptive* and can learn from the user, adapt to the user, or adapt to the environment (e.g., through continuous training / learning). We are particularly interested in the **types of competitive advantages** that such AI systems could provide to the publisher. Ho, Gan, Jin, and Le (2022) have identified the following types of competitive advantages from AI reported in the literature between 2016–2021:

- reduced costs
- improved performance
- better decision-making
- higher customer satisfaction
- better customer segmentation
- improved customer experience
- better products & services
- business innovation

In the following you will find a short description of the editorial process of a journal, a simplified BPMN diagram of the same process, and a table that lists possible use cases for AI in each of the steps of the editorial process. The table also includes a column that describes the adaptability aspect of the AI use cases. This should guide your discussion, but you are free to come up with your own use cases and ideas how adaptive AI could be used in this process. Each of the 4 groups will work on a different part of the process. Please only

work on the part assigned to your group: the numbers refer to the number in BPMN diagram in Figure 3 and in the Table 1. Please fill in the results from your discussion in the PowerPoint template provided in the teams channel $> Files > Workshop\_Didi > Group\_[1, 2, 3, 4].pptx$

Discussion Groups

- **Group 1**, process step 1 – writing the manuscript – hint: how and why would a company offer an AI that adapts to the author to write a paper (think of writing your paper for Emerging Topics)? Hint: `https://www.mdpi.com/2673-687X/3/2/9`
- **Group 2**, process steps 2-3 – searching for journal, formatting – hint: how and why would a company offer an AI to learn author's preferences (think of a recommender system like Netflix)?
- **Group 3**, process step 6 – desk review of manuscript (ethical checks) – hint, e.g., check the graphics on how ethical problems change over time `http://doi.org/10.1126/science.aav8384`
- **Group 4**, process step 7 – searching for reviewers – hint: focus e.g. on slides 11–12, 15–17, 20–21 `https://github.com/rordi/aaai-make-2023/blob/main/slides.pdf`

2 Costs of the Editorial Process

Figure 1 shows that the editorial processing (incl. production such as typesetting and copy-editing) is the most expensive aspect of publishing a journal. The processing of a manuscript costs ca. 800 CHF – which includes the costs for processing manuscripts that are finally rejected. A rejected manuscript does not generate any revenue for the publisher. In the case of open access publishers, the publisher cannot charge publication fees for a rejected article, while a subscription based publisher can not charge pay-per-view fees or create value for annual subscribers from rejected manuscripts. Figure 2 shows an example of data on manuscript submissions and rejections.

3 The Editorial Process

A simplified, typical editorial process for a manuscript submitted to a journal – from writing the manuscript to the final decision of acceptance or rejection – is shown in Figure 3. The process includes at least three parties: the author who writes the manuscript, the editor of the journal (or conference chair) that coordinates the peer-review process, and the peer-reviewers that review and comment on a manuscript. For some journals the editor could be two persons: an academic editor, such as an *Editor-in-Chief*, taking the decisions on manuscripts after peer-review, and an internal editorial staff coordinating the editorial process.

The typical editorial process involves several steps that must be completed in a particular order. First, the author writes the manuscript with the research results. Once the manuscript is complete, the author searches for an appropriate journal to submit it to. Next, the author formats the manuscript according to the specific instructions of the chosen journal, i.e., edit and format the Microsoft Word or LaTeX document to fit the style of the journal and references style used. The author then submits the manuscript files to the journal for consideration and peer-review.

Once the journal receives the manuscript, the editor performs a desk review to assess whether the manuscript meets the journal's requirements and stated scope. Desk review includes checking the manuscript for a number of ethical issues, including detecting plagiarism, checking for tortured phrases ("paraphrased plagiarism"), generated / fake papers, biased or inappropriate language, off-topic references, fabricated or manipulated images, potentially inappropriate authorship, controversial topics, etc. If the manuscript passes the desk review, the editor will search for potential reviewers who have expertise in the manuscript's subject. Depending on the journal and publisher, this task could be performed by the editorial staff of the journal or

by an external academic editor. In cases where the editor is an academic editor, they will typically search for reviewers themselves. In cases where the editor is an internal editorial staff, they will typically use a reviewer recommendation system to search for potential reviewers. Reviewer candidates are typically selected based on their expertise, previous publications, and after checking their conflicts of interests (e.g., if they have co-authored a paper with the author in the past). The editor will then invite reviewers that passed the screening to evaluate the manuscript, i.e., invite them to peer-review the manuscript. If the reviewers accept the invitation, they will be granted access to the manuscript, read it and write a review report that details their feedback and recommendations (typically split into a part addressed to authors, and another part addressed to the editors of the journal).

After all review reports have been received, the editor will read and assess each one. Based on the reviews, the editor will make a first decision on whether to accept, reject, or request revisions to the manuscript. If revisions are required, the author will revise the manuscript according to the review reports and asked to resubmit the revised version to the journal. The editor will then check the revised manuscript and make a final decision on whether to accept it for publication in the journal.

Figure 1: Example of a cost breakdown in journal publishing (public data from: MDPI, Annual Report 2021).

SERVICE FUNCTIONS	% OF TOTAL		AMOUNT (SWISS FRANCS, CHF)	
	CHF 2000	CHF 1000	CHF 2000	CHF 1000
1. Publishing Operations and Projects	17%	34%	336	336
2. Journal Publication	40%	79%	790	790
3. Editorial Fees	1%	2%	22	22
4. Marketing and Communication	4%	4%	80	40
5. General	6%	12%	118	118
6. Discounts and Waivers	19%	19%	370	185
7. Surplus	13%	-50%	284	-491
Total publication fee per article (CHF)			2000	1000

Figure 2: Example of submission versus publication numbers in journal publishing (public data from: MDPI, Annual Report 2023).

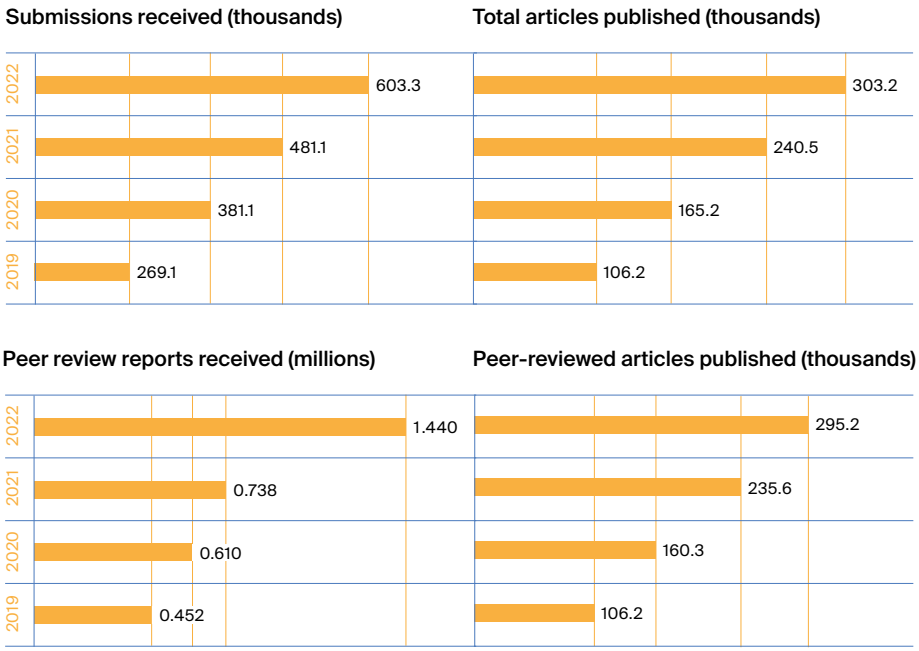

Figure 3: A simplified, typical editorial process from writing the manuscript to the final decision of acceptance or rejection for publication (in BPMN 2.0). For better understanding, the process steps performed by outside parties are also modelled and the process starts with the outside party (author) writing the manuscript. The numbers indicate the sequence flow of the process.

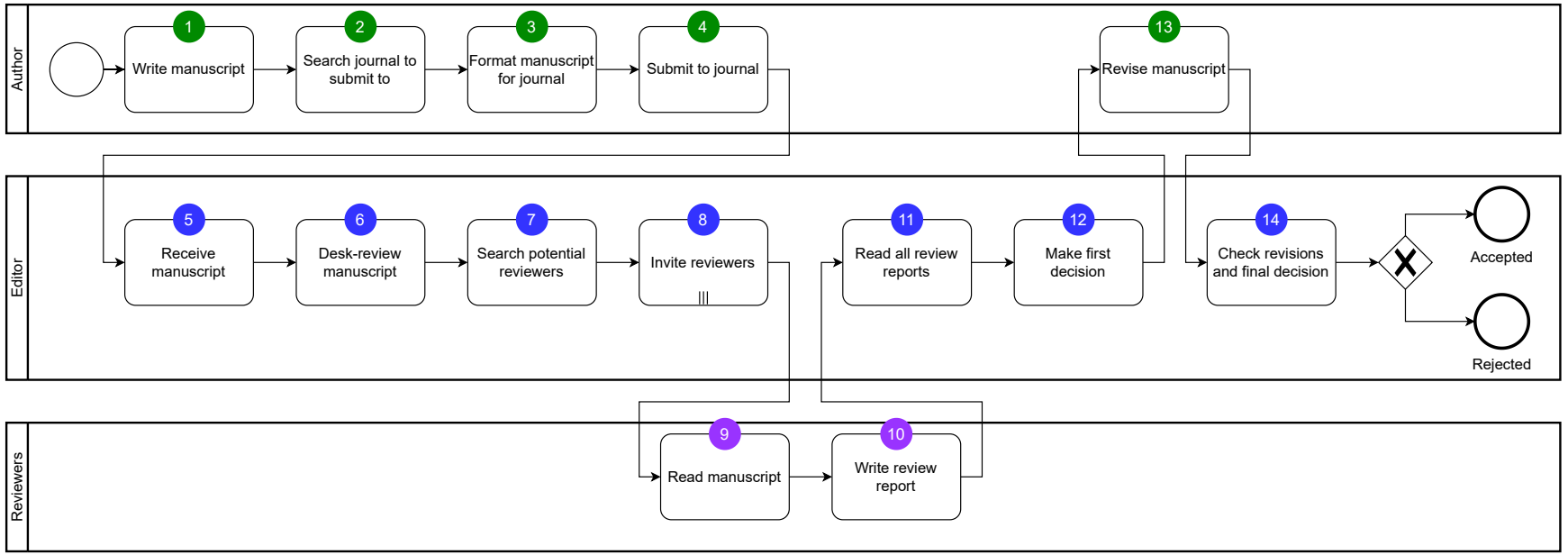

Table 1: Typical editorial processing steps and use cases for (hybrid) AI for a scholarly journal.

Step	Role	Task	AI Use Cases	Adaptability Aspect
①	Author	Writes manuscript	Literature search, literature recommendation, summarization of key findings, writing (auto-completion), translating, grammar and spell-checking	AI adapts to user by learning what papers are relevant, recommends more similar papers, and expands to related concepts. AI suggests auto-completions and corrections based on the *user's writing style* and the context of the manuscript.
②	Author	Searches for journals to submit to	Journal recommendation	AI adapts to user by learning what journals are relevant to the user (journals read / cited, and journals previously published in) and recommends more similar journals.
③	Author	Formats paper to meet journal's requirements	Manuscript conversion and styling	AI learns styles of journals and adapts its output to the journal selected by user
④	Author	Submits paper to a journal	Extraction of metadata	(Adaptability not required)
⑤	Editor	Receives manuscript submission	Summarization of key findings	(Adaptability not required)
⑥	Editor	Conducts desk review of the manuscript	Checks of the manuscript, including detecting plagiarism, tortured phrases ("paraphrased plagiarism"), generated papers, biased or inappropriate language, off-topic references, fabricated or manipulated images, potentially inappropriate authorship, controversial topics, etc.	AI needs to adapt to recent literature (e.g., plagiarism check needs to account for latest literature) and detecting new methods of generating papers.
⑦	Editor	Searches for potential reviewers	Semantic search (in vector space using word embeddings), graph embeddings, review assignment algorithms using e.g., knowledge graph to exclude potential reviewers with conflicts of interest	AI needs to adapt to recent literature and previous reviewer preferences of the editor
⑧	Editor	Invites potential reviewers to review	E-mail writing, generate summary of the manuscript	AI should learn the user's writing style and typical wording from previous examples.
⑨	Reviewer	Reads the manuscript	Summarization of key findings, checking of the content of cited references	AI needs to adapt to recent cited literature.
⑩	Reviewer	Writes review report	Writing (auto-completion) of qualitative review report: help reviewer to avoid biases, inappropriate feedback, lack of specificity	(Adaptability not required)
⑪	Editor	Reads all review reports	Checking of the quality of the peer-review report: detect biases, inappropriate language, generic / non-specific feedback, ad hominem criticism, off-topic comments, etc.	(Adaptability not required)
⑫	Editor	Makes decision on manuscript	Summarization of peer-review outcome for decision letter to author	AI should learn the user's writing style and typical wording from previous examples.
⑬	Author	Revises manuscript	Checking that reviewer concerns are being addressed, writing (auto-completion) of rebuttal letter to the reviewers & editors	AI should learn the user's writing style and typical wording from previous examples.

References

Ho, L. T., Gan, C., Jin, S., & Le, B. (2022, July). Artificial Intelligence and Firm Performance: Does Machine Intelligence Shield Firms from Risks? *Journal of Risk and Financial Management*, *15*(7), 302. doi: 10.3390/jrfm15070302