GRC Discussion Paper

Research Management in the Era of Artificial Intelligence (AI)

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1 Introduction

1.1 GRC and AI

In 2012, several research funding agencies worldwide joined to establish the Global Research Council (GRC) and collaborate to enhance the quality of science. One of the purposes of the GRC, as stated in its foundation document in article 1.1. (d), is "*to respond to opportunities and address issues of common concern in the support of research*" [1]. Artificial Intelligence (AI) has recently been recognized as an opportunity to advance various fields of science, and an issue in terms of ethical standards (such as authorship rights) has arisen.

The GRC carried out a foresight survey for its participant organizations in 2022 to explore the global changes in science in the next five years. One of the main findings of the foresight report was that the rapid global changes are focused on technical advancements such as artificial intelligence [2]. These findings are supported in worldwide economic forums such as G7 and G20. In 2024, at the event held in Brazil by S20/G20 (i.e., Science for Global Transformation), artificial intelligence was chosen as one of the five selected themes due to its global importance [3]. In prior years, the leaders of G7 addressed artificial intelligence in 2018 and reaffirmed its importance globally in 2023 by releasing the "statement on the Hiroshima AI Process" [4].

Next year (2025), the GRC's 13th annual meeting will be held in Riyadh, Saudi Arabia, and one of the two priority areas of the meeting will be dedicated to artificial intelligence. This will be hosted by the Research, Development, and Innovation Authority (RDIA), King Abdulaziz City for Science and Technology (KACST), and the Scientific and Technological Research Council of Türkiye (TUBITAK) [5].

1.2 Acknowledgment

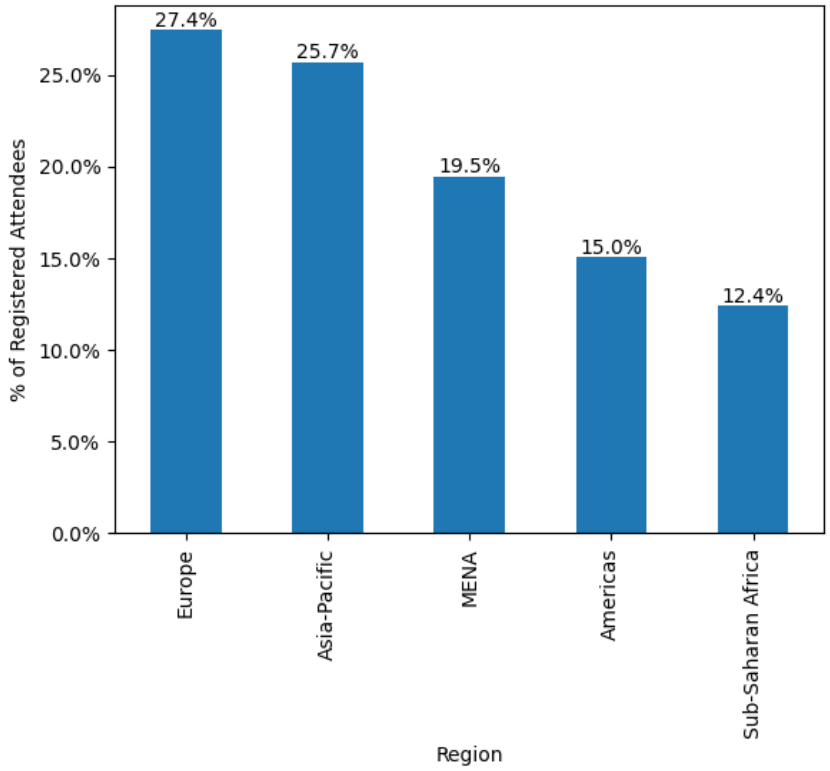
The authors of this discussion paper have utilized various tools based on Artificial Intelligence to generate and enhance the quality of this paper.

1.3 The GRC 2024 Side Event "Research, Development & Innovation in the Era of Artificial Intelligence"

In the 12th GRC annual meeting, held in Switzerland in 2024, a side event was hosted in the GRC 12th annual meeting in the subject of "Research, Development & Innovation in the Era of Artificial Intelligence (AI)" [6, 7, 8]; organized by the MENA region under the GRC, particularly by the King Abdulaziz City for Science and Technology (KACST) and the Research Development and Innovation Authority (RDIA). This event aimed to investigate the transformative potential of AI in research management, discuss opportunities and challenges, and gather insights from participants through a structured survey. The event brought together key stakeholders from various fields to share their experiences and perspectives on integrating AI into research processes.

The event was structured to maximize engagement and provide a comprehensive overview of AI's role in global and regional research efforts, fostering a comprehensive dialogue among stakeholders from all the GRC regions. 113 participants registered to attend the event, representing a diverse cross-region of the global research community. The regional distribution of registered attendees was as follows:

By region	Europe	Asia-Pacific	MENA	Americas	Sub-Saharan Africa
Attendees	31	29	22	17	14



This diverse representation ensured that the discussions and survey results captured various perspectives, providing valuable insights into AI adoption in research management. More information about the side event is presented in Appendix D.

1.4 Interlinkages and Alignments with the Other Discussion Paper

In terms of the linkages and alignments between the subject of AI in research management and the subject of co-creation to address global challenges, there could be a linkage in using AI in research management to reflect the importance of global challenges (such as climate change, pollution, biodiversity, and sustainability) in the research management processes (such as reviewing the

research proposals)[1]. In the future, sustainability aspects might be considered when using AI in research management.

Emerging AI tools and technologies may play a role in supporting researchers and decision-makers in addressing global challenges, by enabling the analysis of complex and big data and identifying several useful patterns from the data. It could address the sustainable development goals (SDGs) in many applications, such as climate change prediction, energy consumption production, and natural resource optimization. These might assist governments in finding clean energy solutions, sustainable food protection, and reducing carbon footprint.

Increased levels of co-creation and co-collaboration between research funders worldwide can further foster innovation by facilitating the pooling of innovative knowledge and practical expertise in machine learning and feeding algorithms used in building AI.

The co-creation and co-collaboration between the research councils worldwide will foster innovation by facilitating the pooling of innovative knowledge and practical expertise in machine learning and feeding algorithms used in building AI.

To sum up, research councils could play a role in shaping the future of AI by developing frameworks, guidelines, and policies for co-creation and collaboration in using AI to enhance the effectiveness of research management processes and in developing criteria to fund future research that uses AI to solve global environmental challenges.

[1] Using AI for that purpose needs to be restricted to challenge-driven research only.

1.5 Purpose and Scope

Based on the insights gained from the GRC 2024 AI side event, this paper aims to:

1. **Identify Opportunities:** Highlight how AI can enhance efficiency and effectiveness in various stages of research funding management, including proposal screening, data analysis, and decision-making processes.
2. **Address Challenges:** Discuss the technical, legal, and ethical considerations and potential risks associated with AI integration in research funding, such as bias, transparency, accountability, and the need for human responsibility.
3. **Provide Policy Recommendations:** Offer strategic recommendations for research funding agencies on effectively integrating AI into their processes while maintaining ethical standards and promoting responsible AI use.
4. **Promote International Collaboration:** Emphasize the importance of global partnerships and standardized policies governing AI use in research, drawing on insights from international organizations like the Global Research Council (GRC).

2 AI and Research Funding

2.1 AI General Background

Artificial Intelligence (AI) is a field of computer science dedicated to creating systems capable of performing tasks that usually require human intelligence. These tasks include learning, reasoning, problem-solving, perception, and language understanding [9]. AI technology has disrupted various domains, leading to significant advancements and efficiencies. In the last two decades, the field of AI witnessed a breakthrough and experienced significant advancements, primarily driven by the rise of Deep Learning [10].

Generative AI, often called GenAI, refers to a class of AI systems that can generate new content, such as text, images, and music, by learning patterns from existing data [11]. This technology is considered disruptive due to its ability to create content previously the exclusive

domain of human creativity [12], e.g., text generation, image synthesis, and music composition.

2.2 AI in Research Funding

Most research funding agencies worldwide are engaging in at least one of the following management processes for research funding, with slight differences in implementations:

- Prioritizing research themes,
- Designing Research Funding programs,
- Formulating calling for proposals,
- Building databases for scientific examiners,
- Selecting examiners for proposals,
- Helping in the peer-reviewing /merit-reviewing process,
- Fund awarding process and research contracting,
- Examining periodic research reports,
- Measuring the impact of funded research,
- Establishing policies/guidelines for research funds,

These various management processes are essential for the global research-funding ecosystem, and they have been conducted by humans for decades. In the era of artificial intelligence, research funding agencies might explore the usefulness and limitations of AI in conducting these research funding management processes.

However, it is crucial to consider the principles of ethical AI (c.f. 3.3.1) when AI is applied to the research funding processes. Moreover, these principles need to be aligned with the following merit review principles issued by the GRC [13]:

- Transparency
- Impartiality
- Appropriateness
- Confidentiality
- Integrity and ethical considerations
- Gender equality and diversity

According to this alignment, research and innovation governing bodies need to regulate the adoption of AI in research funding. In addition, these principles should also align with the 11 Dimensions of GRC Responsible Research Assessment (RRA)[2]. Also, there could be a standalone dimension on the responsible use of AI in research assessment – currently, it is mentioned in Dimension 5 “Responsible administration and monitoring of research assessment processes” on the administration of RRA:

"Funders should establish well-supported and sustainable organizational framework to explore, analyze, develop, implement, monitor, and evaluate responsible research assessment practices. This includes the provision of sufficient resources and support to staff charged with developing, administering, and monitoring research assessment activities, so that they can effectively guide those carrying out the assessment and ensure they follow best practices and do not resort to implicit biases or irresponsible metrics during the assessment process. As appropriate, funders should also consider the responsible use of technology, such as artificial intelligence, as an integral part of these processes."

3 AI in Research Funding: Opportunities & Challenges

As Artificial Intelligence (AI) becomes increasingly integrated into research management, it presents a unique blend of challenges and opportunities.

This section discusses the opportunities and challenges of utilizing AI in research management. The aim is to provide a comprehensive understanding of how AI can be both a powerful tool and a complex challenge in the evolving research ecosystem.

[2] https://globalresearchcouncil.org/about/responsible-research-assessment-working-group/dimensions-of-rra/

These opportunities and challenges were discussed during the AI side event at the GRC 2024 annual meeting [8]. In particular, the second session of the side event, "Regional Perspectives", offered a deep dive into regional perspectives on AI in research management, featuring insights from Head of Research Councils (HORCs) and representatives from all five GRC regions. This session was followed by an open discussion with the participants.

Moreover, the open discussion session allowed participants to engage with the speakers and explore various perspectives on AI in research management. The event also featured a dedicated Questionnaire Session, which aimed to gather structured feedback from participants regarding AI adoption, benefits, risks, and challenges in research management (Appendix A). This session provided valuable quantitative and qualitative data, which has been analyzed and integrated into the findings presented in this paper. Additional information can be found in Appendix B and Appendix C for those interested in a more detailed analysis of the survey results.

3.1 Summary of the GRC 2024 AI Side Event

The discussions during the side event revealed a consensus on AI's potential to drive innovation and efficiency in research processes and the need for international collaboration to address common challenges.

However, divergent views emerged on specific issues, such as the role of AI research funding like in peer review. Some participants advocated for AI's potential to enhance objectivity and reduce bias, while others expressed concerns about new biases that AI might introduce and the importance of human oversight.

This session also touched on ethical considerations, emphasizing the need for transparency, accountability, and fairness in AI-driven research funding.

Participants engaged in lively discussions, highlighting several areas of agreement and disagreement regarding the role of AI in research management.

- **Areas of Consensus:**
    - **Ethical Considerations:** There was broad agreement on the importance of addressing ethical issues related to AI, such as data privacy, bias, transparency, confidentiality, and accountability. Participants emphasized the need for robust ethical frameworks to guide the development and deployment of AI systems.
    - **International Collaboration:** The necessity of international collaboration to advance AI and more particularly the usage of AI in research and development and research management was unanimously agreed upon. Sharing best practices, resources, and expertise across borders was seen as crucial for global progress in AI.
    - **AI Literacy:** Improving AI literacy among researchers and stakeholders was highlighted as essential for responsible AI use and maximizing its potential benefits. Participants stressed the importance of education and training programs to enhance understanding and proficiency in AI technologies.

- **Areas of Disagreement:**
    - **AI in Peer Review:** Mixed opinions were expressed about the role of AI in peer review processes.
    - **Data Quality and Accessibility:** There were differing views on data accessibility and the quality of AI tools. Some participants emphasized the need for high-quality data and highlighted barriers to data access. In contrast, others focused on the importance of developing robust AI tools even with existing data limitations.

3.2 Opportunities in Using AI in Research Funding

AI has shown significant potential to enhance accuracy, efficiency, and innovation across various stages of the research funding process, from proposal screening to funding decisions and data analytics. The AI side event at the GRC 2024 annual meeting revealed how different regions and organizations are already leveraging AI to streamline their operations and improve outcomes, showcasing real-world applications and success stories.

3.2.1 Enhancing Efficiency in Research Funding Management

- **Proposal Screening**: AI can significantly streamline the proposal screening process by rapidly analyzing large volumes of submissions against predefined criteria. AI systems can flag proposals that align with strategic research priorities or those that require further scrutiny, thereby optimizing the allocation of review resources [14, 15]. Springer Nature has incorporated AI into its peer review platform Snapp (Springer Nature's Article Processing Platform) to improve the publication process. The tool incorporates AI to improve the alignment of reviewers with manuscripts, ensuring that submissions are assessed by the most qualified experts in the relevant field. Additionally, AI technologies are employed to conduct integrity checks (or formal requirement screening), automatically identifying potential issues like plagiarism, data manipulation, and ethical concerns, thereby upholding high standards in the scientific publication process [16].

- **Data Analysis and Insights**: AI can be employed to analyze historical funding data, identify successful research strategies, and better understand their funding portfolio, to identify gaps in their funding. This capability can support funding agencies in making data-driven decisions, ultimately improving the impact of their investments [17].

3.2.2 Improving Objectivity

- **Automating Administrative Tasks**: AI can automate routine administrative tasks, such as scheduling review meetings, managing reviewer assignments, and tracking project milestones. This automation not only improves efficiency but also reduces the likelihood of human errors, ensuring that administrative processes are completed accurately and on time.

- **Identifying Bias in Peer Review**: One of the significant challenges in peer review is the potential for unconscious bias. AI could help mitigate this by providing objective assessments based on data-driven algorithms. While AI cannot wholly replace human judgment, it can serve as a valuable tool in ensuring that reviews are consistent and free. This can enhance the fairness of the review process, leading to more equitable funding decisions [14]. Funders can explore whether or to what extent AI can be used to reduce specific biases in peer review, but must take into account other potential biases inherent in AI (e.g., due to the material on which the system was trained).

3.2.3 Supporting Innovation and Collaboration

- **Identifying Emerging Research Areas**: AI's ability to analyze vast amounts of scientific data might help funding agencies identify emerging research areas that may not yet be widely recognized. By detecting early signals of new scientific trends, AI might guide funding agencies in strategically allocating resources to cutting-edge research that has the potential to drive significant advancements [14, 18].

- **Facilitating International Collaboration**: AI tools could assist in matching researchers with complementary expertise across different countries, fostering international collaborations that are crucial for addressing global challenges. By leveraging AI to connect researchers with shared interests, funding agencies can promote cross-border partnerships and enhance the global impact of their research initiatives. However, this will be limited to the accessible databases to the AI agents and might not include researchers outside these databases.

3.3 Risk and Challenges in Using AI in Research Funding

The adoption of AI in research funding and management raises critical ethical, technical, and operational challenges that must be carefully addressed to ensure its responsible and beneficial use for all stakeholders involved. The discussions during the AI side event at the GRC 2024 annual meeting highlighted concerns about transparency, the potential for amplifying existing biases in AI-driven decisions, the risk of over-reliance on AI without human oversight, the assurance of the privacy and security of sensitive research data, and the need for robust governance frameworks to oversee AI's application in research funding. Moreover, regional disparities in AI adoption, resource constraints, and the digital divide further complicate the landscape, underscoring the need for tailored strategies and international collaboration. Careful implementation of AI in research funding processes, with robust governance frameworks and human-in-the-loop processes, will be crucial to upholding the integrity and ethics of the research enterprise [19].

3.3.1 Ethical and Governance Issues

- **Bias and Fairness**: While AI offers opportunities to reduce human bias, it also introduces new risks related to algorithmic bias. Ensuring fairness in AI-driven decisions requires careful consideration of the data used to train AI models and ongoing monitoring to detect and correct any potential biases [19, 20, 21].

- **Transparency and Accountability**: Understanding how AI systems make decisions is difficult. This lack of transparency can reduce trust in AI-driven processes, especially in critical areas like research funding. It is essential to develop mechanisms for explaining AI decisions and establishing clear accountability frameworks to ensure responsible AI use [20].

- **Privacy and Data Security**: The use of AI throughout the research funding processes often involves handling sensitive data, including personal information and proprietary research ideas. Protecting this data from unauthorized access is crucial. Funding agencies must implement robust cybersecurity measures and data governance policies to protect the confidentiality and integrity of the data.

3.3.2 Technical and Operational Challenges

- **Data Quality and Accessibility**: The effectiveness of AI systems depends heavily on the quality and accessibility of the data they use. In many regions, especially developing countries, there may be significant challenges related to data collection, standardization, and sharing. Funding agencies must invest in building data infrastructure and establishing data-sharing protocols to ensure that AI tools can make good research practices.

- **Integration with Existing Systems**: Incorporating AI into research funding processes requires seamless integration with existing IT systems and workflows. This can be a complex and resource-intensive process, particularly for agencies with legacy systems.

- **Cost and Resource Constraints**: Developing, implementing, and maintaining AI systems can be costly, and not all research funding agencies have the necessary resources to invest in AI. Smaller agencies, in particular, may face financial and technical barriers to adopting AI. Addressing these constraints requires strategic planning, potentially including partnerships with private-sector technology providers or collaborative funding models.

3.3.3 Impact on the Research Ecosystem

- **Job Displacement and Skill Gaps**: The automation of tasks using AI can result in job displacement within research agencies (as it has been in other field), particularly for roles that are heavily focused on routine administrative tasks. At the same time, there is a growing need for new skills in AI and data science, which may require reskilling and upskilling of the existing workforce. Ensuring a smooth transition for affected employees and preparing the workforce for new roles in the AI-driven research ecosystem is a critical challenge [19].

- **Over-Reliance on AI**: There is a risk of over-reliance on AI systems, which could undervalue human expertise and intuition. It is important to strike a balance between leveraging AI for its strengths and maintaining human oversight to ensure that research funding decisions are well-rounded and consider multiple perspectives [19].

- **Strengthening Mainstream Bias of the Research System:** The integration of AI in research funding and decision-making can reinforce existing biases within the research ecosystem, especially when relying heavily on conventional, quantifiable metrics of research assessment, such as the number of publications, h-index, journal impact factors, or citation counts. AI models are often trained on historical data, which may reflect past biases and prevailing preferences within mainstream scientific paradigms. As a result, there is a risk that funding priorities may continue to favor well-established research areas and institutions, potentially marginalizing innovative, interdisciplinary, or non-traditional approaches. This bias can create barriers for underrepresented researchers or emerging fields, limiting diversity in research outputs. To address this, it is essential to develop transparent AI systems with built-in mechanisms for bias detection and correction. Encouraging a more inclusive dataset collection and involving a diverse group of stakeholders in the AI development process can help mitigate these issues. Additionally, regular audits and human oversight are critical to ensure AI-driven processes do not inadvertently favor mainstream views at the expense of research diversity and inclusivity.

3.4 International Collaboration and Policy Frameworks

In the rapidly evolving field of Artificial Intelligence (AI), international collaboration has become a cornerstone for advancing technology and addressing global challenges. AI's impact is inherently global, influencing various sectors such as healthcare, climate change, and economics. This section explores the critical role of international partnerships, the need for standardized policies and ethical guidelines, and the contributions of organizations like the Global Research Council (GRC) in fostering responsible AI development.

Global partnerships are essential for maximizing AI's potential, as they enable the pooling of resources, expertise, and data across borders. These collaborations help tackle complex, interdisciplinary challenges that no nation can address alone. For instance, international efforts

AI-driven healthcare have led to significant advancements in disease prediction and personalized medicine, benefiting from diverse datasets and collective knowledge.

However, international collaboration has its challenges. Differing regulations, cultural contexts, and resource disparities can complicate these efforts. It is crucial to establish frameworks that facilitate collaboration while respecting the unique needs and capabilities of participating countries.

The role of funding agencies in this ecosystem is evolving. Beyond providing financial support, funding agencies are positioned to shape the ethical and practical landscape of AI development by setting guidelines, establishing evaluation criteria, and promoting transparency in AI usage. Agencies can establish a culture of openness, where researchers and institutions are encouraged to disclose when and where AI has been used, emphasizing the importance of ethical considerations in AI applications. Additionally, funding agencies can play a crucial role in advancing holistic evaluation systems, as seen with initiatives like CoARA[3], and aligning AI integration with future-oriented research assessment practices.

The GRC "Responsible Research Assessment — Global Research Council (GRC) Conference Report 2021" [22] highlights that global collaboration is key to enhancing research quality and addressing issues that can only be solved by working together. Collaboration helps avoid unnecessary duplication, provides economies of scale, and allows for the sharing of best practices. However, it is important that these global efforts must be mindful of local context, culture, and language to truly create a vibrant and inclusive research ecosystem. The report also shows that responsible research assessment (RRA) is also a key factor in shaping research practices globally. Funders and policymakers are encouraged to develop broad and inclusive assessment criteria that support diversity, avoid bias, and promote transparency. These criteria should be regularly

[3] https://coara.eu/

reviewed and updated to ensure they remain relevant and effective in promoting ethical AI practices.

As AI continues to permeate various aspects of society, the need for standardized policies and ethical guidelines has become increasingly urgent. Standardization ensures that AI technologies are developed and deployed in a manner that is consistent with global ethical norms, thereby reducing the risk of misuse or harm.

The "Leaps and Boundaries" report [23] emphasizes the importance of harmonizing AI policies across nations. By aligning regulations on issues such as bias, data privacy, and transparency, countries can work together more effectively to mitigate the risks associated with AI. Ethical guidelines are particularly crucial in ensuring that AI systems are transparent, accountable, and fair. However, achieving consensus on these policies can be challenging due to varying national priorities and values.

Due to the global importance of using AI in research, there has been several global efforts in regulating the use of AI in research including the efforts of Science Europe for releasing principles for the use of AI in applications/reviews [24] and the statement by executive committee of the German Research Foundation on the influence of generative models of text and images [25].

4 Conclusion and Recommendations

The Global Research Council (GRC) should play a pivotal role in advancing global cooperation in AI governance. The GRC is uniquely positioned to influence international AI policies by promoting best practices, facilitating research collaborations, and advocating for ethical AI development. Public research funders act as stewards of the research system. Therefore, the GRC, with its global reach, is well-placed to convene and facilitate the best practices, ensuring that ethical considerations are integrated into AI development worldwide. Collaboration among funders, researchers, and other stakeholders is essential to driving systemic change and ensuring

that research and development are aligned with societal values. The GRC can contribute to the establishment of global standards for AI in research by bringing together researchers, policymakers, and industry leaders to develop frameworks that guide AI research and development. By doing so, the GRC helps ensure that AI technologies are not only innovative but also aligned with societal values and ethical principles. In summary, international collaboration and standardized policies are fundamental to the research development and deployment of AI. Global partnerships enable the sharing of resources and expertise, while standardized policies and ethical guidelines ensure that AI technologies are developed in a way that is consistent with international norms. GRC has a crucial role in facilitating these efforts, helping to shape the future of AI in a way that benefits all of humanity.

The recommendations might be summarized below:

1. AI is an important area that is expected to reshape the research and innovation sector. There are potential opportunities for research funding to improve the research management processes. A key opportunity lies in using AI to reduce the administrative burden in research management, offering a low-hanging fruit for improving efficiency. However, caution is needed when applying AI to more complex tasks, such as peer review, where concerns about bias and fairness require careful consideration and reflection. Also, there are concerns on the job displacement caused by the automation of tasks using AI.
2. AI needs to be governed by humans and used ethically as well as trustworthy. Practical guidance for research and funding organizations on how to integrate AI responsibly into their processes is also needed.
3. There should be an alignment on the employment of AI in research and research funding within the GRC members.
4. There are many advantages and challenges in adopting AI in the research funding process but their extent is yet to be understood.
5. The digital divide AI may cause is due to the resources, human, and computation demanded by AI systems, which need to be considered and resolved.

6. There is a need to either form a dedicated AI working group among the GRC members or engage existing working groups (WGs), such as the EDI and RRA groups, to address AI-related considerations. The Equality, Diversity, and Inclusion (EDI) working group could focus on equity and bias issues associated with AI, while the Responsible Research Assessment (RRA) group could support the dissemination of case studies related to the use of AI in research assessment.

5 Discussion Questions

1. How can AI enhance efficiency and objectivity in research funding management, including proposal screening, data analysis, decision-making, and fostering innovation and international collaboration?
2. In what ways can AI both reduce human bias in the peer review process and funding decisions and potentially introduce or amplify other types of biases, and what strategies can be implemented to mitigate these risks and ensure fairness?
3. What are the key ethical and governance challenges associated with integrating AI into research funding—such as transparency, accountability, privacy, and data security—and how can these challenges be effectively addressed to ensure responsible use of AI?
4. How might the adoption of AI impact job roles and skill requirements within research funding agencies, and how can organizations support staff in adapting to new AI-related roles while preventing over-reliance on AI and maintaining essential human oversight in decision-making processes?
5. What roles should international collaboration, standardized policies, and ethical guidelines play in developing AI governance for research management, and how can funding agencies and organizations like the Global Research Council (GRC) facilitate responsible AI use across different regions and cultures? Specifically, should the GRC establish a dedicated AI working group, or integrate AI considerations into existing groups like Equality, Diversity, and Inclusion (EDI) and Responsible Research Assessment (RRA), and how can these groups address specific issues such as equity, bias, and responsible research assessment in the context of AI?
6. How does the digital divide affect the ability of different regions to adopt and benefit from AI in research funding, and what strategies can be implemented to ensure equitable access to AI technologies and infrastructure globally, thereby reducing disparities and promoting inclusivity?
7. What are the potential long-term implications of AI integration into the research landscape including technological dependence and ethical misuse—and how can we proactively address these issues by enhancing AI literacy, establishing robust governance frameworks, and implementing effective monitoring and evaluation systems to ensure fairness and human oversight in AI-assisted funding decisions?

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7 Appendix A

Description of the Survey:

The questions in this survey were used during the side event at the GRC 2024 annual meeting. The survey aimed to capture insights into AI adoption and its challenges in research management across all the five GRC regions. The survey, consisting of 15 questions, was divided into pre-survey questions and four main sections. The sections addressed various aspects of AI, including its utilization in research management, governance, and ethics, future directions, and the enhancement of AI literacy and transparency. The survey aimed to capture a wide range of perspectives, reflecting the diverse backgrounds of the participants.

The Survey Sections:

- **Pre-Survey Questions: Participant Demographics,**
- **Section I: Utilization of AI in Research Management:** This section of the survey focused on participants' perceptions of AI's role in research management:
- **Section II: AI Governance and Ethics:** This section explored participants' views on the governance of AI in research management
- **Section III: Future Directions and Monitoring:** This section delved into how AI could be utilized in the future for monitoring and evaluating ongoing research projects
- **Section IV: Enhancing AI Literacy and Ensuring Transparency:** This final section addressed the need for enhancing AI literacy and ensuring transparency in AI-driven processes
- **Additional Views:** The survey concluded with an open-ended question allowing participants to share any additional views on AI applications in research management.

8 Appendix B

The survey Questions

Interactive Survey

Side event Title: Research, Development & Innovation in the Era of Artificial Intelligence
Organized by: Research Councils in the MENA region of the Global Research Council
Date: 28 May 2024
Time: 13:00 -15:30

Artificial Intelligence (AI) has witnessed significant progress recently. This has led to using it to automate many content generation and decision-making processes. However, this advantage does not come without challenges. Decisions made by AI systems can be biased based on the data on which they have been developed. Contents generated by AI systems may violate copyrights and data privacy agreements. In many cases, AI systems need special infrastructure that might not be available in many countries, putting them at a disadvantage. These challenges motivated many countries and organizations to call for governing the use of AI systems. Using AI systems in research and research management is no exception. This survey aims to gather views and insights on the potential applications of AI in research management from different perspectives including but not limited to challenges, opportunities, and ethical and regulatory considerations. This survey consists of (15) questions divided into (5) sections.

Pre-survey questions:

1- Which part of GRC's five-world regions do you belong to?

A) Americas
B) Asia-Pacific
C) Europe
D) MENA
E) Sub-Saharan Africa

2- Have you applied AI in managing research?

A) Yes
B) No

3- What is your main role?

A) Researcher: I am actively engaged in conducting research.
B) Reviewer: I participate in peer review processes for research proposals and publications.
C) Funding Agency Staff: I am involved in the operations of a funding agency, focusing on grant allocation and funding decisions.

D) Research Administrator: I oversee or manage research operations at a research institution or university.
E) Policy Maker: I develop or contribute to research policy at any level.
F) Other (please specify): For participants whose roles do not fit into the above categories.

- **How familiar is your organization with the applications of AI in research management?**

a. Not familiar
b. Somewhat familiar
c. Moderately familiar
d. Very familiar
e. Extremely familiar

Section 1: Utilization of AI in Research Management

To what extent do you agree to the following statements?

1. AI is a useful and unbiased way to evaluate research proposals and can replace human reviewers.
   A) Strongly agree
   B) Partially agree
   C) Neutral
   D) Partially disagree
   E) Strongly disagree

2. AI assists in the peer review process management of research proposals:
   A) Entirely.
   B) Aid in initial screening only
   C) Assist editors in reviewer selection and plagiarism detection
   D) Be involved in the peer review process
   E) Other (please specify)

3. AI could be used in the decision-making process for funding research projects.
   A) Extensively – as the primary decision-maker
   B) Complementary to human decision-makers
   C) Only for preliminary screening
   D) Should not be used in funding decisions

4. AI could contribute to a better distribution of research funds.
   A) Entirely, by analyzing funding patterns and suggesting corrective measures
   B) Partially, by supporting human decisions with data-driven insights
   C) Rarely, funding decisions should remain a human task to avoid algorithmic biases
   D) The impact of AI is still uncertain and requires more research

E) Other (please specify)-irrelevant to the statement, what do you think?

5. Major challenges of AI adoption in research management are: (rank challenges descendingly).
   A. Insufficient hardware infrastructure
   B. High cost of technology
   C. Limited access to quality data
   D. Ethical, privacy, and security concerns
   E. Insufficient expertise in AI
   F. Funding constraints
   G. Workforce replacement
   H. Low quality of AI tools for research management
   I. Other (please specify)

Please add multi-selection answers.

Section 2: AI Governance and Ethics

To what extent do you agree to the following statements?

6. The main role of the GRC Research Councils in forming global AI ethics policies could be:
   A) Leading role in policy formation
   B) Advisory role only
   C) Focus on local/national policies
   D) No role – should be left to other entities

7. The main regulatory frameworks that are deemed necessary by the GRC Research Councils to govern AI in research management are:
   A) National regulations
   B) International guidelines
   C) Sector-specific standards
   D) Voluntary codes of conduct
   E) Regulation is not necessary.
   F) All of the above

Please add multi-selection answers.

8. Principles that are deemed necessary to the GRC Research Councils in governing the application of AI in research management
   A) Transparency
   B) Accountability
   C) Fairness and non-discrimination
   D) Respect for privacy
   E) Beneficence (doing good)
   F) Autonomy

G) All of the above

Please add multi-selection answers.

9. Measures that should be implemented to ensure data privacy and security when applying AI in research management
   A) Regular audits and compliance checks
   B) Data anonymization techniques
   C) Strict access controls
   D) Transparent data usage policies
   E) Other (please specify)

Please add multi-selection answers.

Section 3: Future Directions and Monitoring

To what extent do you agree to the following statements?

10. Potential utilization of AI tools in the evaluation and monitoring of ongoing research projects are:
   A) Extensively, for continuous project assessment
   B) Moderately, for periodic check-ins
   C) Minimally, only for administrative tasks
   D) Not at all, to preserve academic independence
   E) Other (please specify)

11. Major roles and responsibilities of the GRC Research Councils to advance the safe and efficient application of AI for research and research funding should include:
   A) Investing in AI research and development
   B) Establishing partnerships with tech companies
   C) Training research management staff in AI competencies
   D) Monitoring AI

Please add multi-selection answers.

12. The long-term implications of AI integration into research management that the GRC Research Council is most concerned about are:
   A) Job displacement
   B) Ethical misuse of AI
   C) Technological dependence
   D) Lack of human oversight
   E) None

Please add multi-selection answers.

Section 4: Enhancing AI Literacy and Ensuring Transparency

13. Actions taken to maintain transparency in AI-driven processes that ensure trust and accountability in research management are:

A) Creating clear logs and reports of AI decision-making processes
B) Implementing open-source AI solutions to allow auditability
C) Requiring AI systems to provide explanations for their decisions
D) Transparency is not as crucial as the efficiency of AI systems
E) Other (please specify).

Please add multi-selection answers.

14. AI-based training programs for research managers and staffs in research funding organizations should be:

A) Formal educational programs
B) On-the-job training
C) Online courses and workshops
D) No specific training
E) Other (please specify)

Additional views:

15. Please add any additional views about the potential applications of AI in research management". Answer: free text writing.

9 Appendix C

The survey revealed several key findings:

1. **Participant Demographics:**

   Regions Represented: The survey had diverse participation from the GRC's five-world regions: Americas, Asia-Pacific, Europe, MENA, and Sub-Saharan Africa.

   Roles of Participants: The participants included Researchers, Policy Makers, Funding Agency Staff, Research Administrators, and others involved in various capacities in research management.

2. **Familiarity with AI:**

   The survey showed varying levels of familiarity with AI among participants, ranging from not familiar to extremely familiar. The majority of participants indicated moderate familiarity with AI, highlighting a need for continued education and training.

3. **Current Applications and Perceptions:**

   AI in Peer Review: Participants had mixed responses, with some supporting AI's role in aiding initial screenings and reviewer selection, while others were cautious about replacing human judgment.

   AI in Decision-Making: AI was seen as a complementary tool to human decision-making rather than a replacement, particularly in funding decisions and proposal evaluations.

4. **Challenges Facing AI Adoption:**

   Ethical, Privacy, and Security Concerns: These were top challenges identified, along with insufficient expertise in AI and high costs associated with AI technologies.

   Limited Access to Quality Data: Another significant barrier to AI adoption.

   Low Quality of AI Tools: Concerns were raised about the quality and reliability of current AI tools.

5. **AI Governance and Ethical Principles:**

Regulatory Frameworks: There was strong support for both national and international regulations, sector-specific standards, and voluntary codes of conduct to govern AI in research management.

Ethical Principles: Key ethical principles identified included transparency, accountability, fairness and non-discrimination, respect for privacy, and beneficence (doing good).

Role of GRC: There was strong support for the Global Research Council (GRC) to take a leading role in developing and promoting ethical AI policies and guidelines. Participants believed that GRC's involvement would help ensure that AI technologies are used responsibly and effectively across different regions.

6. **Future Directions and Monitoring:**

AI Utilization: Participants were open to the extensive use of AI for continuous project assessment and periodic check-ins, but emphasized the need for human oversight.

Long-Term Implications: Concerns were raised about job displacement, ethical misuse of AI, technological dependence, and lack of human oversight.

7. **AI Literacy and Transparency:**

Training Programs: There was a strong recommendation for formal educational programs, on-the-job training, and online courses to enhance AI literacy.

Transparency Measures: Suggested measures included creating clear logs and reports of AI decision-making processes, implementing open-source AI solutions, and requiring AI systems to provide explanations for their decisions.

Ethical Principles Highlighted in the Survey

The survey aimed to gather insights on the ethical principles that should guide the use of AI in research management. The survey covered several key areas including fairness, transparency, accountability, privacy, safety, and autonomy. Here are the main results and detailed explanations for each ethical principle:

8. Fairness and Non-Discrimination:

Survey Focus: The survey examined participants' views on the importance of ensuring AI systems do not introduce or perpetuate biases.

Main Results:

A significant majority of participants agreed that AI systems must be developed to be fair and inclusive, avoiding discrimination based on gender, race, ethnicity, or other protected characteristics.

Participants emphasized the need for algorithms to undergo bias testing and validation.

9. **Implementation:**

a. Develop and test algorithms to ensure fairness.

b. Avoid discriminatory practices during the development and deployment of AI systems.

10. **Monitoring:**

a. Conduct regular audits and reviews to detect and address biases.

b. Implement feedback mechanisms for users to report any biased outcomes.

Transparency:

Survey Focus: The survey explored how transparent AI processes and decision-making should be to all stakeholders.

Main Results:

a. Transparency was highlighted as crucial, with participants advocating for clear documentation and explanations of AI operations, including data sources and algorithms used.

b. Ensuring that AI decisions are understandable by non-experts was deemed essential.

Implementation:

a. Provide detailed documentation and explanations of AI systems.

b. Ensure AI decision-making processes are clear and accessible.

Monitoring:

a. Maintain and review logs and reports regularly.

b. Conduct periodic assessments to ensure transparency.

Accountability:

Survey Focus: The survey investigated the need for accountability frameworks for AI-driven decisions.

Main Results:

a. Participants strongly supported the establishment of clear guidelines defining responsibility for AI decisions.

b. Mechanisms for tracing decision paths and holding relevant parties accountable were seen as necessary.

Implementation:

a. Establish guidelines for accountability in AI decision-making.

b. Implement traceability of decision-making processes.

Monitoring:

a. Create processes for challenging and appealing AI decisions.

b. Regularly review accountability measures.

Respect for Privacy:

Survey Focus: The survey addressed concerns about protecting individuals' privacy in AI systems.

Main Results:

a. Ensuring data privacy was a top priority, with participants advocating for data anonymization techniques and strict access controls.

b. Compliance with international data privacy standards was emphasized.

Implementation:

a. Apply data anonymization techniques and strict access controls.

b. Develop and enforce robust data privacy policies.

Monitoring:

a. Regularly review data handling practices.

b. Conduct privacy impact assessments.

Safety and Security:

Survey Focus: The survey covered the need for safety and security in AI systems to prevent misuse and attacks.

Main Results:

a. Safety and security measures were deemed essential, including robust protections against hacking and misuse.

b. Regular updates to address new security vulnerabilities were recommended.

Implementation:

a. Incorporate strong security measures.

b. Update AI systems regularly.

Monitoring:

a. Conduct security audits and updates.

b. Monitor for breaches and respond promptly.

Autonomy and Beneficence:

Survey Focus: The survey explored how AI systems can promote well-being and support human autonomy.

Main Results:

a. Ensuring that AI systems enhance human capabilities and align with principles of doing good was important to participants.

b. Avoiding harm and supporting positive outcomes were key considerations.

Implementation:

a. Design AI systems to enhance human decision-making and capabilities.

b. Align AI applications with ethical principles of beneficence.

Monitoring:

a. Assess the impact of AI on human well-being.

b. Collect feedback to ensure AI systems are beneficial

10 Appendix D

The side event "Research, Development & Innovation in the Era of Artificial Intelligence (AI)" consisted of several key sessions:

1. **Welcoming Remarks and Introduction:** Opening the event with high-level perspectives on the significance of AI in research.
2. **Global Perspectives of AI in Research:** A keynote speech discussing AI's impact on research across various domains, focusing on healthcare.
3. **AI in Research Management from Regional Perspectives:** Providing insights from all GRC regions on how AI is integrated into research management.
4. **Open Discussion:** This is a session where the participants engage directly with the speakers and explore divergent views on AI in research.
5. **AI Questionnaire Session:** Gathering structured feedback from participants to assess AI adoption, benefits, risks, and challenges.
6. **Final Remarks and Conclusion:** Summarizing the key takeaways and setting the stage for future collaborations.

The second session of the side event, "Regional Perspectives", offered a deep dive into regional perspectives on AI in research management, featuring insights from Head of Research Councils (HORCs) and representatives from all five GRC regions:

Americas: Prof. Alejandro Adem, President of the Natural Sciences and Engineering Research Council (NSERC) of Canada, represented the Americas GRC region, emphasizing the importance of treating AI as a public good. He highlighted Canada's Pan-Canadian Artificial Intelligence Strategy and the need for policies that ensure equitable access to AI's benefits while mitigating risks such as bias.

Europe: Prof. Hasan Mandal, President of the Scientific and Technological Research Council of Türkiye (TUBITAK), provided insights into how AI is being integrated into research management in Europe, particularly in enhancing the efficiency and transparency of research funding processes. He discussed Türkiye's initiatives in developing AI tools

for proposal evaluation and project management, stressing the need for responsible AI adoption.

Asia-Pacific: Dr. Patamawadee Pochanukul, President of Thailand Science Research and Innovation (TSRI), offered insights from the Asia-Pacific region and shared the region's approach to leveraging AI for research management. She highlighted Thailand's strategy to develop AI capabilities while addressing challenges related to data quality and infrastructure. Dr. Pochanukul emphasized the importance of ethical considerations in AI-driven innovation.

Sub-Saharan Africa: Prof. Anicia Peters, CEO of the National Commission of Research, Science, and Technology (NCRST) of Namibia, discussed the unique challenges and opportunities faced by Sub-Saharan Africa in adopting AI for research management. She highlighted the region's efforts to use AI to address issues like climate change and healthcare while stressing the importance of building local expertise and infrastructure.

MENA: Dr. Ramy Niyazi, the Vice Governor of the Research, Development, and Innovation Authority (RDIA) from Saudi Arabia, provided insights into the MENA region's ambitious plans to integrate AI into research management. He discussed RDIA's focus on leveraging AI for proposal screening, data analytics, and resource optimization, aligning these efforts with the Kingdom's Vision 2030 goals.

This session highlighted the diverse approaches and challenges faced by different regions in integrating AI into research management, providing a global overview of AI adoption and its implications.

Moreover, the open discussion session allowed participants to engage with the speakers and explore various perspectives on AI in research management. The event also featured a dedicated Questionnaire Session, which aimed to gather structured feedback from participants regarding AI adoption, benefits, risks, and challenges in research management (Appendix A). This session provided valuable quantitative and qualitative data, which has been analyzed and integrated into

the findings presented in this paper. Additional information can be found in Appendix B and Appendix C for those interested in a more detailed analysis of the survey results.