Joint Committee of Public Accounts and Audit

Inquiry into the Use and Governance of Artificial Intelligence Systems by Public Sector Entities

Geoscience Australia

25 October 2024

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Executive Summary

Geoscience Australia thanks the Joint Committee of Public Accounts and Audit for its invitation to provide a submission to the inquiry into the use and governance of Artificial Intelligence (AI) systems by Australia's public sector entities.[1]

Geoscience Australia plays a fundamental role empowering government, communities and industry as a trusted source of Australia's Earth science information. We provide advice to the Australian Government to support national priorities and interests for Australia, covering the Australian continent, our maritime jurisdiction, and Antarctic territories. In capturing, processing, synthesising and delivering diverse Earth science information, we utilise a wide range of technologies to effectively support government, communities and industry to meet the variety of challenges and opportunities facing Australia now and in the future. Geoscience Australia is in the early stages of exploring and using AI technologies in providing an enhanced level of support and efficiencies within our scientific disciplines and work practices.

This submission addresses the current and potential future adoption and use of AI systems and processes in relation to the inquiry's Terms of Reference. The topics covered complement and update the responses to questions from the Joint Committee of Public Accounts and Audit (June 2024), provided through the Australian National Audit Office (see Attachment). Those responses formed part of the Committee's deliberations during its Inquiry into Commonwealth Financial Statements 2022-23.

Geoscience Australia leverages AI to boost staff efficiency and handle scientific data, using both commercial solutions and custom tools. This includes targeted upskilling where needed and security measures to address regional concerns. While Generative AI aids research and content creation, employees must verify AI-generated content against original sources to ensure ethical standards are met. This maintains the entity's integrity and safeguards sensitive information. Geoscience Australia is committed to using and exploring AI advancements to improve its scientific outputs.

[1] Inquiry into the use and governance of artificial intelligence systems by public sector entities: https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Public_Accounts_and_Audit/PublicsectoruseofAI

Introduction

Geoscience Australia is Australia's national geoscience public sector organisation. Our work covers the Australian landmass, marine jurisdiction, and external territories. We deliver advice and data of enduring value that enables evidence-based decisions by government, communities and industry to address challenges and enhance opportunities facing Australia now and into the future.

Geoscience Australia's work plays a foundational role supporting Australia's national interests, providing leadership, support, advice and information on Australia's Earth sciences. Our impacts focus on a number of science and business areas:

- Building Australia's resources wealth,
- Supporting Australia's community safety,
- Securing Australia's water resources,
- Managing Australia's marine jurisdictions,
- Creating a location-enabled Australia,
- Enabling an informed Australia,
- Ensuring a high performing organisation.

Our work is aligned to a number of government priorities, guided by the organisation's *Strategy 2028*, *Science Strategy 2028* and *Data and Digital Strategy 2028.*[2] Our data and digital capability strategic objectives focus on sustainability enabling high-quality science outcomes, as well as ensuring data is secure, discoverable, accessible and effectively managed. The diversity of scientific information captured, processed, synthesised and delivered by Geoscience Australia is both extensive and complex, as well as wide ranging in its use. Examples include: data from our observatory network, which is acquired, quality controlled, and delivered 24 hours a day, 7 days a week in near real-time and distributed to support warning services and global initiatives; and processing and delivery of geodetic and geophysical information such as geochemical, geodetic, seismic, geomagnetic and infrasound observatories, sea-bed mapping, topography, location information, etc. The extensive range and size of the information managed presents both challenges and opportunities when considering emerging technologies such as AI.

Geoscience Australia's use of AI systems, in relation to the Terms of Reference, covers:

- Purposes for which AI is currently being used and whether there are planned or likely future uses (updated from our previous response),
- Internal capability to effectively adopt and utilise AI into the future,
- Sovereign capability issues to consider given that most AI tools currently used in Australia are sourced from overseas, and
- Other related matters.

[2] Geoscience Australia 2028 Strategies: https://www.ga.gov.au/about

Use and Governance of Artificial Intelligence Systems

Geoscience Australia is investigating the possibilities and employing AI systems for both scientific research and business capabilities. The following terms of reference supplement the responses to questions submitted through the Australian National Audit Office to the Joint Committee of Public Accounts and Audit (June 2024) (see Attachment).

1. ***Purposes for which Artificial Intelligence is currently being used and whether there are planned or likely future uses (update on previous response).***

Work Process Improvement AI

Building on the successful trial by the Digital Transformation Agency, Geoscience Australia is progressing with the deployment of Microsoft Office 365 Copilot to all employees. This initiative will be supported by information and training sessions utilising material provided by the Digital Transformation Agency during the Pilot, focusing on the user's responsibility to ensure the outputs are thoroughly quality checked. The aim is to streamline manual tasks and workflows for the staff, allowing them to dedicate more time to complex responsibilities.

Scientific Information AI / Machine Learning

Geoscience Australia has long been engaged in the exploration of innovative AI techniques, with recent intensification of efforts spanning Generative AI and Machine Learning (ML) for processing and delivering scientific information. These advancements encompass multiple scientific disciplines such as Critical Minerals, Satellite Imagery, UnCover,[3] Passive Seismic, Marine, Earthquakes, etc.

The investigation of Generative AI technologies seeks to enhance user experience and improve access to Geoscience Australia's scientific resources. By allowing users more direct interaction, complex scientific data can be tailored to meet specific needs and understanding levels. For example, users could query earthquake data over several years and receive results in formats like text, graphs, or maps, at an elementary, general or highly technical level. This approach not only simplifies information access for government, communities and industry but also innovatively delivers data to meet user requirements.

Over the years, Geoscience Australia has applied ML to analyse and synthesise scientific data, particularly in Satellite imagery and Geological information. Tailored ML products are made available for both internal and external stakeholders. In support of Critical Minerals initiatives, current investigations include building covariate libraries, large dataset analyses, geochemical and geophysical modelling, all utilising the High-Performance Computing capabilities at the National Computational Infrastructure.

2. ***Internal capability to effectively adopt and utilise AI into the future.***

Geoscience Australia possesses several unique capabilities supporting a range of scientific, strategic and operational objectives, which lend itself to investigate the potential benefits of AI. Current abilities were built and are primarily centred on the current utilisation of ML for scientific data processing. Geoscience Australia intends to develop an internal community of practice to foster collaboration and knowledge sharing in this evolving field. This initiative includes re-establishing a Science Technology Committee that will report to our internal ICT Steering Committee. The Committee will comprise subject matter experts across the organisation who will provide guidance and support for these communities and advise on the Policy for the responsible use of AI in government, as released by the Digital Transformation Agency, along with related policies.

[3] Case study 2: Stripping the Earth bare using machine learning: *https://www.ga.gov.au/news/news-archive/australias-world-leading-precompetitive-geoscience-looking-deep-undercover*

3. ***Sovereign capability issues to consider given that most AI tools currently used in Australia are sourced from overseas.***

Considerations for the use of AI and related tools, particularly when sourced from overseas, are considered under the same framework as other information technologies. As such they should adhere to the same security review and considerations as per the relevant legislative, regulatory and policy frameworks (such as the Australian Government Information Security Manual, etc.). This is particularly relevant to Commercial off the Shelf or Software as a Service, with enabled AI tools. Each level of the AI capability needs to be considered, such as input information storage, reference data access and tenancy, agent/models configuration (including considerations of bias, manipulation, etc.), when undertaking the review. Due to commercial considerations, visibility of these elements for assessment may be not feasible, in which case the provider may need to be required to be security accredited and/or meet both external [Infosec Registered Assessors Program (IRAP)] and internal security risk assessments. For example, Microsoft Copilot 365 is IRAP assessed to the PROTECTED level.[4]

Geoscience Australia addresses issues of sovereign capability as well as addressing science specific subject matter gaps in AI technologies, by investing internally in the exploration and development of capabilities, particularly in Machine Learning. Custom tools are being developed on Australian based compute and storage, with open and published data used when trailing other AI technologies.

4. ***Other related matters.***

Authoritative Source and Individual Responsibility

Geoscience Australia has emphasised the importance of training and communication regarding AI, particularly Generative AI, focusing on individual responsibilities. As a government entity, there is an expectation to serve as an authoritative source of knowledge and information, especially when presenting or delivering critical data to the government, community and industry sectors.

It is crucial for officials to perform rigorous quality assurance checks when employing AI technologies. This ensures the integrity and reliability of AI systems.

Generative AI is well-suited for research, summarising information, or creating new content based on known sources. However, it should not be used to author messages or summarise facts that have not been fully reviewed and verified, or where consent from the data/source owner is lacking.

Individuals are accountable for any material generated and utilised from AI products and services and must conduct thorough quality checks before use. Therefore, it is advised that outputs from AI should not be considered as the final source of truth. Instead, generated information should be verified against the original source, which should then be cited. Quality assurance measures also foster transparency and accountability, ensuring the responsible and ethical use of AI tools.

[4] *https://learn.microsoft.com/en-us/compliance/anz/blueprint-copilot-overview*

Conclusion

Geoscience Australia employs and actively explores AI to enhance staff efficiency, as well as to process, analyse, synthesise and deliver scientific information. This effort involves utilising commercial AI/Machine Learning capabilities and developing custom tools tailored to user needs. Support for this initiative includes selective or targeted upskilling as necessary. Security assessments address sovereignty concerns, with custom development executed within the Australian region.

Despite the benefits of Generative AI for research and content creation, government employees must exercise caution and diligence. Ensuring AI-generated content is verified against original sources and adheres to ethical standards allows Geoscience Australia to maintain its integrity as a trusted authority. This approach protects sensitive information while reinforcing the entity's dedication to transparency and accountability in its operations.

Geoscience Australia remains dedicated to utilising and investigating advancements in Generative AI and Machine Learning to enhance the value of its scientific products and services.

Attachment

Geoscience Australia's response to questions from Joint Committee of Public Accounts and Audit (June 2024), provided through the Australian National Audit Office.

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Use and Governance of Artificial Intelligence Systems by Australian Public Sector Entities

Questions

1. **For what purposes do you currently use AI in your entity, and do you have planned or likely future uses? Please summarise.**

Geoscience Australia has participated in the Digital Transformation Agency Generative AI trial, testing the potential benefits of Microsoft Office 365 CoPilot. The trial demonstrated potential benefits through the reduction of manual activities and workflows of staff, the organisation plans to license and use the technology going forward.

Geoscience Australia also has used for many years, and continues to use, Machine Learning models in the analysis of scientific geological and geographical data.

2. **Which legislative, regulatory and policy frameworks (including cross-Government policies) are relevant to your entity's use of AI?**

The *Privacy Act 1988*, Australian Government Information Security Manual, *Data Availability and Transparency Act 2022*, Digital Transformation Agency's AI Ethics Principles, APS code of conduct, *Archives Act 1983*.

3. **What are your internal framework/policies for assessing the risks associated with the use of emerging technologies such as AI, specifically in the areas of security, privacy, ethics, bias, discrimination, transparency and accountability?**

Use of AI in Geoscience Australia is governed by the Digital Transformation Agency Interim Guidance on AI for Government Principles:

- AI should be deployed responsibly
- Transparency and explainability
- Privacy protection and security
- Accountability and human centred decision making

In addition, Geoscience Australia established the following principles for using AI within the organisation:

- Never share classified or personal information unless otherwise specified by Geoscience Australia.
- Always adhere to relevant legislation and principles such as the APS Code of Conduct or relevant Geoscience Australia policies.
- Geoscience Australia holds the expertise – check the work.

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Use of AI is also covered by the ICT Conditions of Use and all use of AI is required to be logged in an AI Register detailing the use case, technologies and risks. The Science Technology Committee provides operational oversight.

4. **What are the supply chain risks when using existing AI solutions or software?**

Supply chain risks include reliability and quality of data sources; security and privacy of accessed data; compliance and accountability of the service to laws, standards, ethics, etc.; stability and reliability of the service; and the ability to integrate and maintain systems, platforms and data required for successful and secure use of the AI solution or software.

5. **What additional controls been developed by your entity to manage:**
    a. **the broad risks associated with AI**
    b. **the risks associated with the design and implementation of systems using AI**
    c. **the risks associated with change management policies that arise from the use of AI**

Geoscience Australia has developed interim guidance for the use of AI for staff, including referencing the Digital Transformation Agency guidance. There have been awareness activities, in addition to the introduction of an AI register, where staff identify AI usage. A risk assessment was conducted to identify and record the treatment of risks associated with the CoPilot trial.

6. **How do you manage regular updates to AI and supporting data?**

Geoscience Australia is predominantly using commercial AI solutions. Regular updates to the AI service/software are managed by the software company, which provides security patches, bug fixes, and new features. Geoscience Australia ensures that its software environment is compatible with the latest version and tests the functionality and performance of the tool before deploying it to the staff. Updates to supporting data is the responsibility of the creator, as the current usage scenarios for AI in Geoscience Australia only generate outputs at a single point in time.

7. **What considerations or planning do you undertake for any additional capability required to implement AI?**

Geoscience Australia provides staff access to technical training modules for the effective use of Microsoft Office 365 CoPilot. The organisation is assessing various options for the level of capability support would be required for the size of the entity and limited accessibility of AI tools by staff. A register is also established to monitor and review business cases for new AI tools/modules/extensions for existing licensed software.

8. **What frameworks have you established to manage bias and discrimination in any of your systems that use AI?**

All staff obtaining an AI licence are made aware of their responsibilities in ensuring outputs meet quality standards. This includes meeting APS codes of conduct.

9. How do you ensure that that the use of AI meets government security and privacy requirements?

Microsoft Office 365 CoPilot is only available for internal use, with access managed through enterprise identity management software. AI generated material will build its recommendations only from information the individual staff member has existing permissions to access.

10. What briefings are given to your audit and risk committees, or boards, on the use of AI?

Updates on AI trials are provided to the Science Technology Committee and the ICT Strategy Committee.

11. How does your internal audit program consider the robustness of controls for AI to provide assurance around mitigation or risks?

The entity has established a feedback mechanism for staff to report any issues or errors with AI tools.

12. As part of your system design process, how do you audit and trace the output of, and decisions made through, AI?

The entity tracks the changes made using version control software, which records the date, time, author, and content of each change.

13. Are the AI platforms in use at your entity:

a. off the shelf products
b. customised from other products
c. systems developed in-house?

The entity uses off the shelf products, where AI functionality has been added by the software company.

14. Who has ownership and possession of the source code for your AI, and can you understand this code, including its capacity to learn and innovate? How?

The software company has ownership and possession of the source code.