Our Ref: Inquiry into safe and responsible AI in Australia

4 August 2023

To the Department of Industry and Science

Laing O'Rourke thanks you for the opportunity to participate in the Federal Government's consultation with industry to support safe and responsible AI practices in Australia.

Background

Laing O'Rourke is a global engineering and construction company. In Australia, we focus on delivering major transport infrastructure projects, buildings at the transport interface, and infrastructure for the Department of Defence. Laing O'Rourke is committed to the responsible use of AI and predictive analytics in our business and industry, and we offer our comments to contribute to the design of an Australian AI policy that can cover general principles, but that can also respond to each industry's specific requirements.

Background

Our company recently formulated and adopted an AI and predictive analytics strategy for our Australian Hub, which aims to use these emerging technologies and techniques to better understand and control risks for our people, projects and business portfolios, delivering support and more certainty for decision-making and execution. AI is already being deployed across our sector for a myriad of purposes, including mitigation of risks, understanding and measuring site progress, planning and designing, financial and operational forecasting, administration and support services productivity and to advance the decarbonisation of buildings and infrastructure, among other uses.

Thus, the value of AI for our company lies primarily in its predictive capabilities, which go beyond traditional statistical methods, and its ability to make sense of vast amounts of complex data at a speed, scope and accuracy that was not previously possible. It is essential to recognise in this context that leveraging the described advantages of AI is not intended to supplant human resources, but rather to enhance their overall well-being and productivity in areas where their expertise and capabilities thrive.

The recent Australian Chief Scientist report on generative AI[1] noted that "the strongest business cases for investment in AI are likely to emphasise the creation of additional value to products or services rather than savings in labour costs." We indeed share this view.

[1] Generative AI: Language models and multimodal foundation models (2023) https://www.chiefscientist.gov.au/sites/default/files/2023-05/Rapid%20Response%20Information%20Report%20-%20Generative%20AI.pdf

Laing O'Rourke Australia Pty Limited
Level 21, 100 Mount Street
North Sydney, NSW, 2060, Australia
tel: +61 2 9903 0300 **www.laingorourke.com**
ABN: 71 111 023 431

Concretely, AI can serve as a support tool for decision-making at various levels. It can empower individuals and teams to make better and safer use of their physical skills and leverage their contextual awareness, ingenuity, emotional intelligence, and other distinctive human qualities in their jobs, fostering more efficient and rewarding work.

Potential industry impact

AI technologies and their applications can lead to significant transformations in the construction industry, as they possess the potential to change the nature of physical and knowledge work. But the extent of this transformation has yet to be discovered and realised. As such, forecasts about net job gains and losses should be regarded as hypothetical only, and subject to both socio-economic context and socio-psychological swings. The most recent Future of Jobs Report[2] by the World Economic Forum, which is informed by a survey to large global companies, provides an example of such swings. It reveals that businesses have revised down their expectations for automation and potential job displacement compared to the previous study three years ago, despite having a market with more mature and capable technology. Similarly, the expectations on jobs creation and destruction as an impact of AI vary widely, with 50% of the surveyed organisations expecting it to create job growth and 25% expecting it to create job losses[3].

The construction industry in particular requires a workforce with an ample set of skills, especially in the delivery of major infrastructure projects, which is often overlooked by economy-wide forecasts relating to AI. In addition, construction work typically crosses many interfaces, such as the environmental, community, heritage, labour laws, and more, so assessing the impacts of AI in construction is more complex than in appearance.

The bottom line is that the impact of AI in constructions jobs and the businesses that make up our industry could indeed be considerable, but its direction and scope is still unclear.

In the meantime, as a managing contractor company that provides thousands of jobs and delivers buildings and critical infrastructure, it is our responsibility to understand AI and leverage it to benefit our people, our clients, and the broader industry; and to contribute to the current policy discussion and to the rules for AI that may result from it.

In the following pages, we offer our comments from a construction industry perspective to questions #3 and #14 outlined in the discussion paper on the responsible use of AI.

[2] Future of Jobs Report 2023: Up to a Quarter of Jobs Expected to Change in Next Five Years https://www.weforum.org/press/2023/04/future-of-jobs-report-2023-up-to-a-quarter-of-jobs-expected-to-change-in-next-five-years/
[3] These are the jobs that AI can't replace https://www.weforum.org/agenda/2023/05/jobs-ai-cant-replace/

Question #3: Are there any non-regulatory initiatives the Australian Government could implement to support responsible AI practices in Australia? Please describe these and their benefits or impacts.

We believe there are significant non-regulatory opportunities that could support responsible AI across different sectors. The following comments provide specific suggestions to support the development and use of AI in construction and engineering.

I. Develop industry specific responsible AI standards

While the development of high level and generically applicable principles [4] is an important step towards the responsible use of AI, there are specific situations, practices and applications that operate within each industry that should be considered at a more refined level. It is crucial to accurately address these specific applications, as they represent the primary points of interaction between industry and AI technology.

In construction, specific standards to be developed should relate to:

1. **Safety process**: The construction industry has some inherent risks for workers on site, which are typically managed through a hierarchy of controls. These controls include eliminating the hazard or risk from the activity (not doing the task at all or removing the hazard, if possible), and reducing the risk through substitution, isolation, or engineering changes around the risk of the activity. AI-based applications are starting to be used today to support decision-making and enhancing people's ability to perform these controls.

   In this context an important point around risks needs to be made. People, unlike AI, are naturally equipped with an ability to respond to scenarios of risk that goes beyond the cold processing of data. Intuition and emotions such as empathy play a big role in how workers look after their colleagues on a site. AI will therefore never replace people's ability to make safety decisions; it can merely support them.

   With that in mind, for AI to have a profound and industry-wide impact in the reduction of risks, our industry needs a shared and consistent understanding of how it can be effectively and responsibly applied, including deciding what margin of error we can tolerate in safety support systems as well as in automated decision-making systems. Such margins of error would not only look different for different industries, but also for different use cases. For example, in collision avoidance systems an AI-based computer vision incorrectly classifying an excavator as a truck is a type of error our industry can tolerate, since it still warns the worker due to the proximity to heavy plant. Whereas an accident involving a worker on site caused by an AI is a scenario for which the tolerable margin of error is zero. These nuances, we suggest, should be considered in designing AI policy.

[4] Australia's AI Ethics Principles. https://www.industry.gov.au/publications/australias-artificial-intelligence-ethics-framework/australias-ai-ethics-principles

Some examples of the major outstanding issues relating to the application of AI to safety in construction include the following:

a. **Reliability**: What is an acceptable rate or margin of error for an AI safety system in construction? How consistent should the reliability of AI in different applications be across varying scenarios, such as different types of work, time of day, or other variables? AI applications in our industry are highly varied and include computer vision tools used for people detection to avoid collisions through to environmental analytics tools used to estimate noise levels on a site. Both use cases relate to safety. An AI policy that is applicable to safety in construction should consider these use cases and many others, following ample stakeholder consultation.

b. **Accountability**: How does the use of AI influence accountability when a safety incident unfortunately occurs despite all the controls in place? How would it be different for an AI that solely provides or generates information as output compared to one that is paired with an Automated Decision-Making (ADM) system? Do the people responsible for certain company controls and outcomes change depending on how AIs are applied? These are still open questions that need ample discussion from knowledgeable industry participants.

2. **Privacy**: Construction sites are typically highly active areas of work, with numerous people from different organisations (contractors, subcontractor employees and sole traders, sometimes organised through unions) working together in a transient manner. This poses some questions about the responsible use of AI:

a. **Worker tracking**: In the course of their work, a typical sub-contracted construction worker could move between many work sites, controlled by various managing entities. What is the acceptable standard to which a worker can be identified and tracked between these sites and contractors or employers to feed a data pipeline for an AI system? Where would unions draw the line in terms of an AI system's ability to gather data through new methods? Extensive engagement with these stakeholders would be required. We would suggest that managing personally identifiable information should be guided or restricted by industry specific standards.

b. **Data ownership:** Do the workers on a construction project own the data that is associated with their work, or otherwise have some control over how it is used? For example, is it responsible to perform detailed work-in-motion

studies on workers to train an AI on how that work is performed? Once again, this is a question that requires ample discussion with stakeholders.

c. **Consent**: Are future construction workers going to exist in a world where they would be required to participate either actively or passively in AI studies and programs to earn a living through their trade? What level of consent should the industry engage with on each construction project, and will it be possible for a worker to not consent and still perform their work? This problem of consent is compounded by the large number of sites a typical subcontracted worker may work within over a short period.

   It is important to consider the rigidity of any standards around this issue too, as consent is subject to the cultural and historical context of an individual and can never be assessed in isolation. Today, no worker would be concerned with a site manager or a Protection Officer using the Internet or a computer to find information that would help them perform some risk controls or for administrative reasons. AI will likely head in the same direction in the not-so-distant future. Thus, how the industry approaches consent should be reviewed with some periodicity.

d. **Health**: How can organisations responsibly use AI systems such a real-time heath monitoring and predictive systems of health risks? What type of biometrics could be included as input into an AI system? Some wearable devices are already being tested in heavy industry, though most of these technologies are still not mature enough for ongoing deployment. Issues around size, weight and comfort still abound. But these technologies, which perform analyses on the data they capture using AI, will eventually mature. The pros and cons of these use cases needs close consideration.

II. Facilitate data and model sharing mechanisms

The construction industry is highly diverse and fragmented. It brings together a large number of people with different skills, trades and experiences, as well as different business models, priorities and value propositions. These individuals engage with a complex network of data, information and standards to deliver real-world outcomes. A challenge with the construction industry is that all of this data is highly disjointed, scattered, patchy, not very organised and – most importantly – incomplete. Each organisation from small to large, including clients and third parties such as consultants and vendors, oversees only a small part of the data that forms the larger picture.

Facilitating methods to allow industry participants to collaborate through anonymised data sharing and joint AI model development through a government-led data clearing house, for example, would significantly aid in breaking down these information silos.

A secure data clearing house mechanism (and others) would help accelerate the development of responsible AI practices as they would allow for industry specific models to be trained on larger, more diverse datasets (and not just those owned by a specific industry participant), helping to optimise foundational models and to combat undesired organisation-specific biases.

Careful consideration must be made about what data for AI modelling could be of genuine public utility, such as material quality and specifications, design characteristics and energy efficiencies, and what data must be kept private, such as financial performance of private organisations or workers' personally identifiable information. Work that involves matters of national security, critical infrastructure, or other sensitive affairs would be inappropriate for this process.

Currently, some of the data that could be considered public utility only lives in the silos where it originated and only shared within commercial arrangements with partners or vendors. Such data could be shared, if anonymised, with a larger pool of industry data to generate foundation AI models that could benefit the entire industry. This would be especially beneficial for use cases considered industry-wide hard-to-solve issues.

III. Develop a client-driven responsible AI metric and practices

The construction industry is highly responsive to market signals from clients and will strive to meet client expectations to win work. Both Federal and State Governments are major and perhaps the most significant clients, and through their market signaling can have a significant role to play in the development of responsible AI in the construction industry. One such signal could be a program designed to assess the appropriateness of a deployed AI system as it relates to security, privacy and transparency standards. Such a signal could be graduated, for example, on a scale from 1 to 5. This would allow clients to specify standards for the use of AI and it would give providers a well-articulated set of targets to strive for.

A potential program like this could learn from the domain of environmental management and sustainability. The development of targeted metrics assessing performance and compliance in this space, known as the IS Rating[5] for infrastructure and the Green Star Rating[6] for buildings, has been very successful. These ratings provide a tangible and visible benchmark to assess what is built. Having clients, such as state governments,

[5] https://www.iscouncil.org/is-ratings/
[6] https://new.gbca.org.au/green-star/rating-system/

prioritising performance on such metrics provides an incentive to strive towards improving their ranking. AI could do with similar incentives to be used responsibly.

Question #14: Do you support a risk-based approach for addressing potential AI risks? If not, is there a better approach?

If tailored to each specific industry, a risk-based approach for the governance of AI could work, but we suggest it would be best to pair this with an ethics-based approach.

We offer some definitions:

- **Risk-based approach:** A risk-based approach is the practice of evaluating the scale or scope of specific risks associated with AI systems and prescribe proportionate control measures to mitigate these identified risks. This approach quantitatively assesses the impact surface and the degree of potential issues, imposing regulatory burdens only when the AI systems are found to pose high risks. An example of such approach would be the EU AI Act passed on 14 June 2023[7].
- **Ethics-based approach:** An ethics-based approach is where a set of human-centred ethical principles are incorporated into the development process of AI, enabling the proactive identification and mitigation of underlying ethical concerns that may be caused by such AI. One such control includes not using AI at all in some cases. These principles may differ across countries and industries but would often include as a baseline fairness, transparency, and accountability[8][9][10].

Using an ethics-based approach for AI allows us to decide as a society what is acceptable and what is not acceptable at this point in time, based on the potential consequences for human well-being as well as social well-being. For example, through this approach the agreed form of governance (mandated or otherwise) could forbid AI from automatically choosing the best candidates for a job within a pool of applicants. The experience so far of such cases has shown that AI can amplify existing societal biases towards minority groups, when using historical data to train a model[11]. An ethics-based approach could also determine that AI should not be used in the systematic evaluation of an employee. Previous experiences in this space have also demonstrated to be flawed[12].

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[7] https://artificialintelligenceact.eu/documents/
[8] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-by-design-and-ethics-of-use-approaches-for-artificial-intelligence_he_en.pdf
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[11] Amazon ditched AI recruiting tool that favored men for technical jobs. https://www.theguardian.com/technology/2018/oct/10/amazon-hiring-ai-gender-bias-recruiting-engine
[12] Dawson D and Schleiger E, Horton J, McLaughlin J, Robinson C, Quezada G, Scowcroft J, and Hajkowicz S (2019) Artificial Intelligence: Australia's Ethics Framework. Data61 CSIRO, Australia. p. 34 https://www.csiro.au/-/media/D61/Reports/Artificial-Intelligence-ethics-framework.pdf

An ethics-based approach also allows for greater sensitivity in how AI may be applied to diverse systems of knowledge. For example, the Indigenous Data Sovereignty (ID-SOV) framework provides significant guidance as to how the values, needs, practices and rights of Aboriginal and Torres-Strait Islander peoples can be evaluated and protected in systems using AI. An ethics-based approach to risk can emphasise that engagement with ID-SOV, and similar frameworks, is a fundamental requirement of working with AI, rather than simply being part of a risk mitigation strategy.

We would like to stress that beyond the principles that could be used to manage potential risks from AI (i.e., undesired consequences), controls for behavioral compliance also need to be designed into organisations' systems and processes. For example, in a construction environment Fatal and Severe Risks (FSR) and their respective FSR Controls are identified through industry shared as well as company specific methodologies. Identifying the risks, however, is not enough. Construction projects have ongoing safety training and employ Protection Officers to ensure the safety of every person on the site. No amount of discussion solely based on principles (risk or ethics-based) can make up for the lack of controls.

Further, all controls need deep contextual understanding of the hazardous or risk scenario in every industry. Scenarios such as using AI for hiring are generic enough and applicable to all sectors in the Australian economy. But each industry and state or territory jurisdiction in some instances, has its own specific requirements, so general principles need to be translated for each industry. What scenarios are of higher risk and what are the appropriate measures need to be considered on an industry-by-industry basis.

If you would like to discuss any of our suggestions, please contact Laing O'Rourke's Head of Technology and Innovation, Georgina North (GNorth@laingorourke.com.au); our Predictive Analytics and AI Lead, Rowan Braham (RBraham@laingorourke.com.au); or our Head of Government Relations, Umesh Ratnagobal (URatnagobal@laingorourke.com.au).

Yours sincerely,

Dr Regan Crooks

Director of Strategy, Transformation &
Innovation at Laing O'Rourke