

Supporting Responsible AI: Discussion Paper



Department of Industry, Science and Resources



Australian
Institute of
Architects

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INFORMATION ABOUT THE INSTITUTE

- The Australian Institute of Architects (Institute) is the peak body for the architectural profession in Australia. It is an independent, national member organisation with more than 13,500 members across Australia and overseas.
- The Institute's vision is: *Everyone benefits from good architecture.*
- The Institute's purpose is: *To demonstrate the value of architecture and support the profession.*
- At the time of this submission the National President is Stuart Tanner FRAIA and the Chief Executive Officer is Cameron Bruhn.

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The Australian Institute of Architects recognises the unceded sovereign lands and rights of Aboriginal and Torres Strait Islander peoples as the First Peoples of these lands and waters. This recognition generates acknowledgement and respect for Aboriginal and Torres Strait Islander Countries, Cultures and Communities, and their ways of being, knowing and doing. Caring for Country practices including architecture and place shaping have existed on this continent since time immemorial.

The Institute recognises a professional commitment to engage and act meaningfully through reciprocal partnership and relationships with Aboriginal and Torres Strait Islander peoples. Together we will support and develop the emergence of new possibilities for our shared future.

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INTRODUCTION

The Australian Institute of Architects (the Institute) welcomes the opportunity to provide a submission in response to the *Supporting Responsible AI: Discussion Paper*. AI has the potential to drastically alter the world we live in and will impact every aspect of modern society. While the Institute does not believe we should fear AI, the Australian government should ensure that there is an appropriate regulatory environment to mitigate the potential downsides.

Like many professions, the architecture profession is starting to grapple with the potential (and real) risks and rewards of using AI. Our members have expressed a mix of concern and excitement involving AI, both as it relates to the profession and in everyday life.

The areas that raise the most concern amongst members in relation to the profession are:

- The future role of the architect
- Employment prospects, particularly for future generations
- Loss of skills and knowledge, particularly in future generations, from over-reliance on AI to accomplish steps in the architecture process
- Liability when AI gets it wrong
- Who owns the IP from architectural drawings, plans and renders through the use of AI
- Unrealistic expectations of clients who have used AI to generate “ideal home” that is not functional to build and/or to code

Benefits our members see in AI for the profession:

- Speed up manual-intensive work
- Reduce time and costs to develop simple renders for clients based on the client’s wishes and for architects to ponder different design solutions
- Greater ability to show clients the impacts of changing design through visualisation tools. E.g. changing the window size or orientation of the home to maximise light and solar energy, etc
- Quick calculation of technical data such as energy efficiency, condensation, light, and how changing materials impacts such data
- identification of potential code or design problems early in the process
- allow for quicker approval from local governments

The Institute appreciates that the Discussion Paper poses 20 consultation questions to direct submissions. However, the Institute has determined it would be more effective for us to identify specific issues of concern for the architecture profession, as well as potential regulatory mechanisms to address or mitigate these.

(1) ***LIABILITY WHEN AI GETS IT WRONG***

At the moment the use of AI in building design is still considered to be novel. Most of those using it are using it to test its potential and work out weaknesses. As yet, it is not being used, to our knowledge, for final design and documentation. That day will come, though, and we need to be prepared for the legal implications.

Compliance with Australian design rules

Australia's National Construction Code (NCC) is a set of technical design and construction provisions for buildings that apply specifically to Australia. It sets the minimum required level for the safety, health, amenity, accessibility and sustainability of certain buildings. States and even local governments also have specific requirements that must be complied with.

Most AI, however, is developed overseas, using overseas data and requirements. As AI is only as good as the data it uses and the algorithms written for it, if it uses non-compliant datasets, it will create non-compliant buildings. This non-compliance would likely be difficult to detect by someone who is not architecturally trained.

Not only are there strict construction codes, but these codes are also constantly being updated. Private ownership of some of these standards may create an issue as well. These requirements cannot be simply scraped from the internet; their use has cost and legal implications.

If the AI gets the answers wrong by not applying the appropriate Australian standards it can lead to expensive outcomes such as:

- redoing and resubmitting designs that are compliant
- rectification of buildings that are built but not to code
- building failures
- fines
- litigation

It is, therefore, important that measures are put in place to ensure AI uses Australian standards and that users are aware of the need to ensure the AI they use is compliant.

Problems relying solely on an AI and not using a registered architect

The role and skills of an architect are often misunderstood and underplayed. It involves a lot more than design. It requires understanding the client, the location, the NCC and a multitude of other factors that are not simple rules-based approaches.

Even where the AI is deemed to be compliant, the outcomes cannot always be assured to be fully compliant. For example, if the person inputting the design parameters leaves out important requirements, who is to blame if the AI design is faulty? Should the system have defaults to ensure that missing requirements or data are sent back for further input before rendering is started?

If a builder or architect uses AI to generate the building design, the issue of who is liable for any defects is as yet unclear. New laws are likely to have to be drawn up to address this issue of liability.

Regardless of whether the AI used is compliant with Australian requirements, any design must also be mindful of its location. It must take into account issues such as bushfire resilience, flooding, slope and other land constraints.

An AI that is designed primarily with city or suburban locations as data sets may not be optimised for such locational issues and offer up designs that would be compliant in one location but not the actual site the building is to be located.

An architect is able to understand these issues. However, non-architect users of AI are unlikely to understand this. This could result in designs that are not fit for the local conditions.

The Institute is concerned that owner-builders or construction firms may feel they can dispense with the architect and simply get the AI to do all the work. They may see the role of the architect as an expense that can be done away with. However, as they are unaware of all the potential issues raised above, we risk an approach that delivers buildings that look great but are either non-compliant or do not fit their local conditions.

Potential solutions

Certification of AI platforms for Architectural purposes:

Certification may be required to ensure that AI used in architecture meets Australian design standards. A certification process would involve the owners of the AI to have their AI reviewed and certified as using Australian standards and rules.

While it will not reduce all the liability concerns relating to AI in architecture, it will at least comfort Australian architects that the AI they are using complies with Australian standards.

Certification of AI is not something the profession has the skills or capabilities to undertake on its own and, therefore, would require government intervention.

Informing clients, consumers and the public when AI is used in a building design.

It is not always clear when AI has been used or the extent to which it has been used or relied upon. Clients and consumers should be made aware of when and how AI has been used in a building, the potential risks of reliance on AI and any liability that may accrue as a result of relying on the AI.

Furthermore, any building design AI software or systems that are made available for use in Australia should come with clear and upfront consumer warnings about the use and reliance on AI, and the recommendation that they seek professional advice before relying on an AI design.

Sign off certain buildings by a Design Review Panel:

Buildings are designed to last for decades. They are complex, with many interrelated layers dependent on each other. The best way to ensure a quality building is at the design stage. This requires designs that are compliant.

Compliance, though, is time-consuming and costly, and when margins are tight, as they are in the construction sector, there may be some who will seek to cut corners. AI could be seen as a cheaper and quicker alternative to an architect. However, AI is only as good as the data provided and the design parameters inputted. Builders may not appreciate or be aware of all the parameters they need to input into a design for the AI.

Compliance with all standards is more than a box-ticking exercise. It should ensure a building is safe, is appropriate for its use and is built to last. Failure in any of these can be catastrophic as the cladding fires and other building failures around the world attest to. While AI could assist in reducing the incidences of such failures, that is only so where those using it have the expertise to do so.

Therefore, governments in Australia need to ensure that the designs being developed by AI, particularly where an architect has not been part of the process, meet all necessary regulatory requirements and are fit for purpose.

The most effective means to do this is to require that certain types of buildings be signed off by a design review panel.

A design review panel (DRP) is a group of professional design professionals such as architects, landscape architects, urban designers and engineers. Their job is to ensure that a building is up to code, works within its environment and is designed appropriately.

A DRP would be most effective in certain types of buildings, such as multi-residential buildings, shopping centres and medical facilities.

Legislation to identify liability when AI is used

Uncertainty as to liability can be a major problem in any construction project. It increases costs, leads to risk minimisation behaviour and can cause delays. Architects already bare a disproportionate risk in many construction contracts. Any additional liability or confusion over liability from AI use in building design would be problematic for architects. Addressing liability through legislation is one potential means to reduce the problem of identifying and apportioning liability when AI is used in a building design.

(2) *ELECTRONIC BUILDING MANUALS*

Electronic building information models or a “building manual” are increasingly being pursued as the means to have more detailed information about a building to:

- Be able to remedy defects
- Undertake future modifications or upgrades
- Program planned maintenance and asset replacement or refurbishment schedules
- Operate and optimise complex building systems such as:
 - heating, cooling and ventilation,
 - security and building access systems,
 - public areas lighting,
 - fire alarm and sprinklers management,

Recently, with the passage of the building legislation amendment bill, the Victorian Government legislated the requirement for building manuals to be prepared and updated by owners and updated by owners corporations in respect of certain buildings.

Defining the problem

While AI platforms are used to create these manuals and will have many benefits, there are a range of issues around ownership of the data and what happens if the AI platform becomes defunct or the owner goes into liquidation. There are also concerns in relation to the potential for foreign actors to gain control of information about security infrastructure and the potential for terrorists or other maligned non-state actors to access or damage the data. The data could become subject to ransom attacks. To address these issues, legislation will be required to protect the data and the users of the data.

Another potential problem is that as technology advances, the AI platform may become surpassed by other technology. It will therefore be important that there is the ability to access the data and that be kept in a form that can be easily extrapolated for future storage technology in a way that is efficient.

Potential solutions

A range of legislative changes will be required to address these issues, including:

- That the Government has an ownership right to data held by Building Manuals that are in an AI or other software-dependent format. This will ensure that the State can access building manuals as needed. It would ensure ownership could transition should the AI platform become defunct or its owners cease to exist,
- Barring or limitations on the rights access to building manuals to foreign state actors. As noted above AI is often developed and owned overseas. If those overseas owners of the AI also have ownership rights over the building manual data, there is the threat that such data could be accessed by foreign nations. Laws would need to be written to ensure that such data cannot be accessed by a foreign State except in limited circumstances and as approved by the Federal Government.
- De-identification of individuals to protect privacy (other than responsible parties who bare legal liabilities)
- Requirement that AI systems must continue to be able to be used even after the end of support for the AI platform. AI platform data must also be able to be easily transferred in digital form so as to avoid it becoming trapped on an obsolescent system.

(3) IMPACT OF AI ON THE STUDY OF ARCHITECTURE AND SKILLS DEVELOPMENT

Defining the problem

AI and other software-enabled solutions are already being experimented with in some of our member's practices, this is particularly amongst the younger cohort of practice members. It is also being used, to varying degrees, by universities that teach architecture.

One concern raised by our members is the potential for AI to degrade core skills required by architects. As with any profession, architecture is learned both through formal tertiary education and then additional post-graduate training and on-the-job experience.

One of the potential early uses of AI in architecture is likely to be in doing some of the more mundane jobs, such as the design of floor plans. This work can be laborious and is often done by junior architects. This work provides them with core training in the real-world application of their skills. However, AI is likely to be able to do this work quickly and for near-zero costs. The use of Generative AI will allow for the dimensions and other factors to be inputted through text (and eventually speech) rather than time-consuming drawing and CAD software.

For an architect to advance from a graduate to a registered architect they must do at least 3,500 hours of supervised work. However, if much of this work is taken over by AI (due to the time and cost savings), it could leave future generations of architects unable to advance their careers.

The financial pressures on architecture firms already make taking on junior architects difficult. The cost advantages of using AI to do much of the work that is often used to train junior architects, means that AI could lead to future generations where few architects are able to progress through to a registered architect.

Potential solutions

Government-funded graduate positions in practices.

Graduate architects can experience difficulties in getting the required supervised training to become a registered architect. They have to undertake 3,500 relevant hours of experience with a registered architect before they can be considered for their own registration. This can be difficult to achieve, particularly as the cost pressures on architectural firms are high. These cost pressures, plus the cost saving AI may provide in relation to the work traditionally given to graduate architects, is likely to see a reduction in the ability of graduate architects to progress their careers.

The federal and state governments provide financial assistance to apprentices and the firms that employ them. This is in recognition of the need for new tradespeople but also the difficulty for many smaller contractors to take on an apprentice. We believe the same consideration should be provided to architect graduates, particularly given the threat that AI will pose to their ability to gain necessary on the job training.

By financially supporting both the graduate architect and the firm employing them, the government can ensure that there will be future generations of architects and that they will be properly skilled.