

COVER STORY

IWBI's AI Framework for Advancing Healthy Buildings

Excitement around artificial intelligence (AI) has reached the building sector, with applications now found in architectural design, building modelling and in market valuation. Given that people spend approximately 90% of their lives indoors, buildings have the potential to significantly enhance people's health and wellbeing, writes *Jodie Pimentel, Chief Counsel, International WELL Building Institute PBC (IWBI).*



As Chief Counsel, IWBI, Jodie Pimentel counsels the IWBI team on legal matters, negotiates global transactions, liaises with key strategic partners and customers, guides strategic policies to protect proprietary assets and develop new products, and advises on technology and data protection matters.

for building operators. However, the design, development and deployment of AI in buildings must be executed responsibly and thoughtfully in order to support – rather than inhibit – health and sustainability goals.

This is the premise of the IWBI's *AI Framework for Advancing Healthy Built Environments*, which seeks to showcase the thoughtful design,

development, adoption and governance of AI technologies throughout the architecture, engineering, construction and facilities operations industry. The IWBI developed the AI framework with the aim of uniting industry stakeholders around a set of common principles and well-informed practices that enable AI to promote health and wellbeing in the built environment.

Rise of AI in buildings

While pervasive AI news headlines are only a recent phenomenon, the technology is far from new. The term “artificial intelligence” was coined for “[a] Proposal for the Dartmouth Summer Research Project on Artificial Intelligence” in 1955, proposing “a study to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can be in principle so precisely described that a machine can be made to simulate it.”

What is new is the increasing accessibility of many “generative AI” tools. These tools output different sorts of media – images, video, audio – with simple prompts. Example generative AI tools include ChatGPT, Google Gemini and Midjourney, and they often come in free and premium versions. Both their availability at no fee to anybody who has an internet connection, and their variety of applications, have made them appealing to many people across various industries. Indeed, one study found that 75% of the 3,000 global chief executive officers who were questioned believe that advanced generative AI tools can bring competitive advantage.

However, the growing interest in AI also reflects what has become known as “AI hype,” which refers to exaggerations that distort our expectations and understandings of AI. Notably, AI tools have been developed, deployed and used in ways that seem to hinder human wellbeing and sustainability

goals. For instance, facial recognition technologies in buildings have led to push-back from tenants who were not engaged. The technology continues to be scrutinised as facial recognition software has been found to pose substantial risk of bias, leading to serious ramifications such as false arrests depending on a person's race or demographics, with the highest rates of inaccuracies among people of colour.

Need for guidance

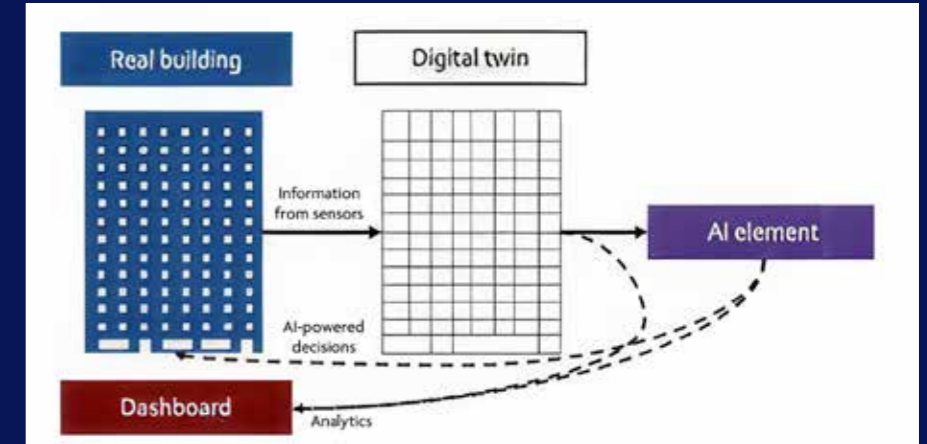
In addition to the practical value of targeted guidance for the building sector, pending or new AI regulation will no doubt impact the building industry. Existing laws pertaining to privacy and intellectual property already apply to the use of data in the inputs for, and outputs generated, by AI tools, and the regulatory landscape specifically addressing AI is evolving.

Consider the EU's *AI Act*, officially published June 2024, with potential consequences for companies with global footprints and operating within various components of the AI development chain. The new Act takes a risk-based approach, categorising AI systems as either unacceptable or of high, limited or minimal risk. Examples of prohibited uses relevant to buildings include emotion recognition in the workplace or educational settings (with exceptions for certain safety circumstances), and biometric categorisation around sensitive characteristics (which would include political views, sexual orientation, religious or philosophical beliefs and ethnicity).

Further, deploying AI in critical infrastructure could be considered high risk, potentially warranting heightened controls. Other governments and governing bodies across the world have issued guidance and standards, as have the National Institute for Standards and Technology and UNESCO.

Applying the AI Framework

To illustrate how the AI framework works in practice, let us return to digital



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twins powered by AI technology in a building management system. Consider HVAC systems that send a live feed of data from an entire building into a computational model of that building – a digital twin. By integrating AI in the digital twin system, its vast amounts of data can be monitored, short-term predictions made and remediations taken. What steps should we take in order to provide assurances this technology will be deployed in a manner that prioritises people and sustainability goals? The Framework provides three interrelated steps.

Adhere to existing codes of conduct – Existing organisational codes of conduct and standards should apply to AI as they would for any new technology being introduced. IWBI’s AI Framework considers the UN Global Compact Principles as the baseline to which organisations must adhere. Addressing human rights, environment, labour and anti-corruption, these principles are relevant given AI tools have already demonstrated risks to human rights and environmental initiatives, with data

centres requiring a tremendous amount of energy. Thus, a threshold step is to confirm that the design, development, deployment and use of the digital twin solution adheres to the UN Global Compact principles.

Use AI intentionally and responsibly to progress towards goals and priorities – Instead of buying into the “hype,” AI should be used to purposefully solve well-defined problems and progress towards specified goals. The AI Framework looks at various ways AI can specifically help promote sustainable development goals (SDGs) such as good health and wellbeing (Goal 3), quality education (Goal 4), gender equality (Goal 5) and climate action (Goal 13).

For instance, to strive for the climate action goal, our AI-enabled building management system can help reduce energy consumption and carbon emissions by suggesting new efficiencies. Conversely, the underlying AI technology may require a tremendous amount of power, which hinders progress towards this goal. Thus, deeper understanding about AI (e.g. power efficiency per chip) must go hand-in-hand with well-established practices, such as drawing on renewable energy sources.

Adopt the four pillars of responsible AI – For each SDG to which an AI tool may contribute, the AI Framework sets out examples of how to implement good practices using Kairoi’s four pillars of responsible AI. Each pillar provides practical guidance to help organisations improve their use of AI according to their particular priorities and circumstances:

- **Better communications:** Articulate AI-related decisions to diverse stakeholders – from investors and funders, to policy makers and the broader public – in accurate ways to promote AI literacy and combat AI hype. *In our case, the digital twin solution should be clearly articulated to building occupants;*
- **Relevant technical solutions:** Follow practices for the safe, secure and robust design, development and deployment of AI tools and research to meet industry standards and develop effective tools and systems. *In our case, relevant standards may include ISO/IEC 30173 on digital twin concepts and terminology, and the more widely applicable “model cards” for comprehensively capturing technical information;*
- **Meaningful public engagement:** Enable diverse stakeholders to take part in AI-related decision-making processes to foster trust in industry actors developing and adopting AI and to address actual needs. *For example, periodical performance reports about our digital twin could be regularly discussed by building occupants;*
- **Robust governance:** Comply with applicable laws, engage with AI-related policy making processes and document decisions for transparent lines of responsibility to enable innovations consistent with societal values. Governance regarding an AI-enabled building management system will involve a comprehensive data management plan, among other mechanisms for compliance and better accountability.

Conclusion

Artificial Intelligence can play a pivotal role in promoting human health and wellbeing in built environments, but rushing to deploy AI is not the answer. Instead, it is important to act thoughtfully, intentionally and responsibly. The IWBI AI Framework can help building owners and operators do this. It can also help them innovate with purpose. ■



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