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The convergence of BIM and AI with its transformative potential for the QS, but why the lack of QS engagement.

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Welcome to the CitA BIM Gathering

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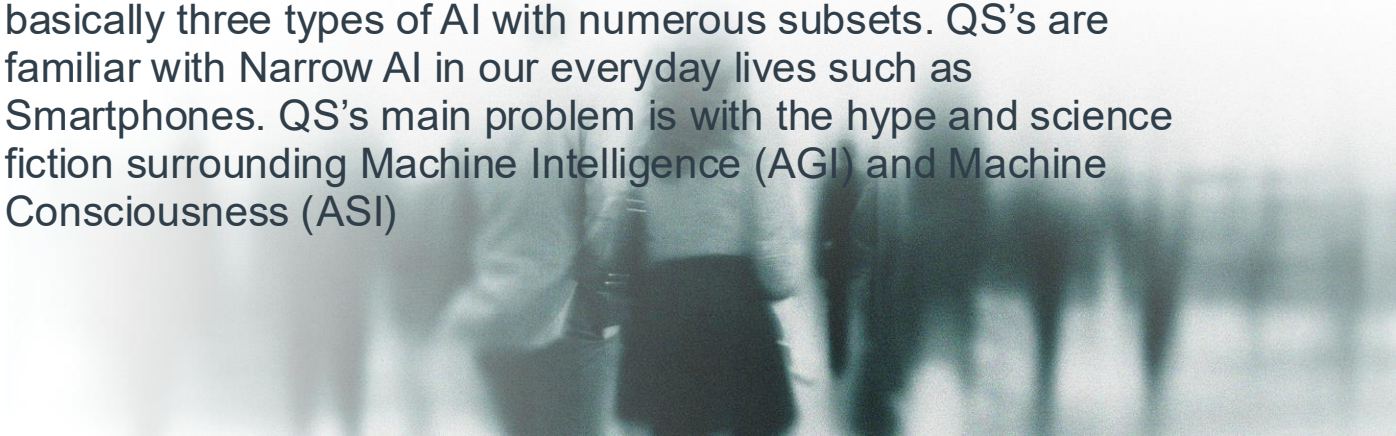
The convergence of BIM and AI with its transformative potential for the QS but why the lack of QS engagement

What transformative impact will AI have on the future role of the QS in this digital era. Literature reviews on the interactions of BIM and AI with the QS are limited in this field having only been carried out in the last five years (Seidu, Young Clack, Adamu & Robinson, 2020); (Emaminejad, North & Akhavian, 2022) and more recently(Yin, Zuo, Jennings, Jain, Cartwright et al., 2025). There have been a number of industry-reviews and commentary papers for example “What impact will AI have on Quantity Surveying” RICS.

There are significant gaps with systematic literature reviews & empirical studies of QS professionals adopting AI/ML

This paper looks at the reasons why Quantity Surveyors are reluctant to adopt AI and ML. The reasons often stem from practical, professional and psychological factors. This paper sets out to address these factors by demystifying AI and providing clarity on what AI can and cannot do, its potential value, it limitations and most importantly what QS’s need to be aware of when using AI.

What is AI, put simply AI is a list of instructions for computers, utilising algorithms to identify patterns in data, leveraging these patterns to understand and address specific tasks. There are basically three types of AI with numerous subsets. QS’s are familiar with Narrow AI in our everyday lives such as Smartphones. QS’s main problem is with the hype and science fiction surrounding Machine Intelligence (AGI) and Machine Consciousness (ASI)



How can AI assist the QS

The use of AI can greatly assist the QS in adding value in the following areas:-

1. Enhanced efficiency and accuracy.
2. Automating repetitive tasks.
3. Automated data collection and analysis.
4. Predictive cost modelling.
5. Real-time cost tracking.
6. Optimisation of resource allocation.
7. Lifecycle assessment.
8. Cost benefit analysis.
9. Risk management.
10. The creation of a Bill of Materials (BOM)
11. Collaboration and communication.
12. Enhanced transparency.

What are the limitations of QS's engaging with AI

When QS's understand what AI cannot do, it exposes its limitations, reduces the fear and manages their expectations.

1. AI as with all forms of digitisation, including BIM needs to ne used properly, it is only ever as good as its inputted data.
2. Human make AI work, they write the codes, the algorithms, they operate and repair the machines/robots.
3. AI lacks emotional intelligence (EQ), which is the distinguishing factor that makes us humans "human".
4. AI doesn't have "soft skills" which is a must have in the workplace, such as teamwork
5. AI has no physical form, for example AI cant handle tasks requiring hand-eye coordination.
6. AI still needs fact checking. There is a lot of information created by AI that needs to be fact checked, data from susceptible sites.
7. AI is inflexible. Automation and AI are programmed to follow strict rule sets or algorithms to produce specified results.
8. AI and Humans have different limits and capabilities. Humans get tired, must eat, need the company of other human beings to thrive and interact with to achieve great things.AI will endlessly do whatever it is programmed to do and do only that.
9. AI does not have the physical agility or dexterity that a human has.

What are the limitations of QS's engaging with AI

10. AI has no moral compass and is not sensitive to the needs of others .
11. AI cannot match human creativity , it is impossible for AI to be as creative as humans as not all human creativity can be rule based.
12. AI can't understand causation. AI machines can accurately identify patterns and data associations , however what AI can't grasp Humans, understanding causation is an innate ability, we know the reasons behind specific actions.
13. AI should complement Humans. The purpose of AI is to help humans and not replace them.
14. Unclear business value, many AI applications are developed for general construction management, not QS-specific workflows etc.
15. Fear of job displacement as AI will automate core QS functions, this will reduce demand for QS professionals with the fear of losing professional identity.
16. Lack of trust in AI outputs, in today's market where cost estimates form the basis of multimillion euro decisions, often affecting the viability of a project. QS's are trained to justify every figure, would find it difficult to justify an algorithm that cant explain why the number is right.
17. Low digital and data literacy. Previously QS training focuses on traditional core functions, like measurement , cost planning and contract administration, not on data science or coding. Many Professional QS's especially senior QS's lack data literacy and confidence in understanding in AI/ML principles and their outputs.
18. Resistance to change together with a generational divide, your QS's are more open to AI being digital natives whilst older professional often prefer trusted methods

Barriers the QS needs to be aware of when using AI.

1. Bias and discrimination. AI is only as good as the data it is fed, Biases in AI applications can have far reaching consequences, reinforcing existing societal inequalities as AI does not possess emotional intelligence.
2. Dependence on technology, but when the system goes down or fails, it leads to the vulnerability of a practice. Over reliance on AI technology by QS's may lose the ability or suffer a decline in professional skills and ability
3. Implementation barriers, high upfront costs for AI tools and training can be prohibitive , especially for smaller QS firms
4. Ethical and moral concerns, cover a wide range of concerns including fairness, transparency, accountability, human rights, regulation, explainability and data ownership, especially when sensitive project or client information is involved.
5. The AI process comes with legal risks including intellectual property (IP) infringement, it presents major challenges over patents, copyright, trademark infringements IP ownership such as who owns the AI generated content..
6. Poor quality fragmented data.. AI /ML models need large clean datasets on which to train, however generally QS data are often siloed, inconsistent, or held in prosperity formats. Without reliable data , AI models can produce unreliable results, reinforcing QSs' lack of trust in AI outputs.

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7. AI can have unpredictable and unforeseen consequences and can get out of control, Autonomous vehicles or self-driving vehicles have been involved in accidents
8. AI like all digital tools is subject to security risks. AI systems are vulnerable to data breaches, to hacking and all classes of cyber-attacks. The more complex the AI System, the more difficult it is to secure, as it operates in an increasingly interconnected world.
9. Professional liability and risk, who is liable if the AI Model produces an incorrect estimate or forecast is it the QS or the software vendor?.
10. QS's are cautious because errors in costing can have severe financial and legal implication's with the QS PI insurance called into play
11. AI comes at a cost, SME QS practices and SME AEC businesses may not have the resources to invest in AI compared to Tier 1 counterparts, and this can lead to a digital divide in the construction sector such advancements which could lead to monopolies in some circumstances and a skewed market.
12. Professional Indemnity insurance, contract law professional codes of conduct and practice haven't yet caught up with AI usage. QS's question whether relying on AI might erode professional judgement and ethical accountability through lack of transparency.

Barriers the QS needs to be aware of when using AI.

13. The long-term adverse effect AI will have on Human interaction. AI social media platforms and chatbots are already altering human interactions, resulting in decreasing face to face interactions affecting social skills and emotional intelligence not to mention the detrimental effect on our mental wellbeing.
14. The carbon impact AI has on the environment. Future QSs need to be aware and consciously reduce the carbon footprint of training large AI models, where it compares to significant real-world activities like flights.
15. Need for good governance and tighter regulation, this is an area that requires regular updating to keep abreast of rapid unprecedented digital accelerations
16. Lack of standardisation ands regulation. There are no universally accepted standards that define how AI should be applied to the QS profession for example AI –based cost estimation validation protocols.
17. QS's rely on professional QS such as RICS who have not yet published standalone AI guidelines but has incorporated AI-related considerations into their broader ethical and professional standards. QS's rely on professional bodies such as AIQS, ICEC and others for professional guidance but professional frameworks for AI are still emerging and without these adoption is risky and unregulated.

Conclusion

What measures need to be put in place to assist QS's in overcoming their lack of engagement in AI.

1. Training and upskilling , embed data and digital literacy and AI concepts , in QS education , in CPD events.
2. Transparent AI tools Develop explainable AI models that QS's can interrogate and validate.
3. Professional Bodies such as RICS, AIQS, SCSI & others should issue clear frameworks for ethical and responsible AI use.
4. Encourage small scale pilot trial projects to show tangible benefits.
5. Emphasise augmentation , not replacement through Human-AI collaboration where AI handle routine data tasks and QS's handle interpretation and judgement .

The number of academic papers that explicitly combine the role of QS and AI/ML is still quite limited; a gap analysis shows that much research is needed in these specific areas.

The role of the Future QS will be impacted using AI. However, we QSs are one of the "Lucky Few" whose role will be enhanced using AI. Our skillset will evolve to include more digital skills as we become more AI literate and learn how to operate in a rapidly advancing digital complex world of data intelligence. The use of AI and BIM will create a digital synergy with the promise of even more innovation within the QS Profession.

Useful resources for QS's using AI

RICS Draft Standard, Professional conduct and the responsible use of AI
https://www.rics.org/profession-standards/rics-standards-and-guidance/conduct-competence/rics-conduct-standards-programmes/responsible-use-of-ai

Understanding the EU AI Act 2025: Strategies, and Compliance Guide.
https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

Department of Public Expenditure, NDP Delivery and Reform, "Government commits to using trustworthy AI in the Public Service," gov.ie, https://www.gov.ie/en/department-of-public-expenditure-infrastructure-public-service-reform-and-digitalisation/press-releases/government-commits-to-using-trustworthy-ai-in-the-public-service/

Future QSs take note of the initiatives included in the Governments "refreshed" 'AI Here For Good' published July 2021 and it introduces the implementation of the new EU AI Act.

QSs should familiarise themselves with this EU Act as the regulations cover four different risk categories from unacceptable risk to high risk to limited risk to minimal risk. Unacceptable risks will be banned with stiff penalties for breach thereof. High risks such as the use of AI in critical infrastructure will require human oversight of the technology in use as well as strict security controls. Small QSs practices should refer to this document as it details how it supports the adoption of AI for micro-enterprises and SMEs.

Useful resources for QS's using AI

European Commission, "Commission publishes the Guidelines on prohibited artificial intelligence (AI) practices, as defined by the AI Act.,"
Commission publishes the Guidelines on prohibited artificial intelligence (AI) practices, as defined by the AI Act. | Shaping Europe's digital future

European Parliament, "EU AI Act: first regulation on artificial intelligence,"
EU AI Act: first regulation on artificial intelligence | News | European Parliament

United Nations, "Governing AI for Humanity," September 2024.
governing_ai_for_humanity_final_report_en.pdf

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Thank you