Level of Awareness and Potential Application of Artificial Intelligence Subfields in the Nigerian Construction Industry

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Introduction

Given the distinctiveness and intrinsic complexities of the construction industry, Artificial Intelligence (AI), having been successfully applied to other sectors like manufacturing, retail and telecommunications, is needed to revolutioniseits procedures and enhance overall performance and competitiveness (Adeloye et al., 2023). Machine Learning (ML), Knowledge-based Systems, Natural Language Processing (NLP), Computer Vision, Robotics and Autonomous Systems, Automated Planning and Scheduling and Optimisation Algorithms are seven subfields of AI applicable to the construction industry that were identified in Abioye et al. (2021). However, there is limited research on the level of awareness and potential application of these subfields in the Nigerian construction industry. Thus, this study fills the knowledge gap by examining construction professionals' level of awareness and application of AI subfields in the Nigerian construction industry.

Methodology

The study employed a quantitative research design using a closed-ended questionnaire to elicit data from construction professionals across Nigeria using convenience sampling. The questionnaire was designed using Google Forms and was divided into three sections. The first section contained respondents' background information. The second section addressed the awareness of AI subfields on a 5-point Likert scale, while the third section evaluated the level of agreement of respondents to the potential application of AI in various construction processes. The questionnaire was administered through the various WhatsApp platforms of the professional bodies. Mean item score (MIS), frequency, percentages and Kruskal-Wallis H-test were used to analyse the collected data.

Results and Discussions

Major findings indicated respondents are highly aware of the AI subfields, at p-value ≤ 0.05, there was no significant difference in respondents' level of awareness based on professional background, work organisation and regional location. This result is consistent with Owolabi et al. (2022). However, a significant difference exists based on respondents' years of working experience, the mean rank indicated that professionals with 11-15 years of working experience are statistically different from those with 1-5 years of experience. Professionals with more experience may have had more opportunities to encounter and learn about AI applications, leading to higher awareness. This finding aligned with Basaif et al. (2020). Further, respondents strongly agree with the potential application of AI in the construction industry, with design, 3D printing, project planning, site monitoring and performance evaluation, offsite assembly and wearable sensors for site workers topping the list.

Conclusion

The result indicated an appreciable awareness and application of AI in the construction industry. Nonetheless, respondents with 1-5 years showed the least awareness level. The study recommended the introduction of AI applications to build environment undergraduates to enhance their understanding. Although this study provided some empirical evidence, it is, however, limited based on the sampling technique used. Future research can consider using a probability sampling method to increase the generalisability of the findings.

Keywords: Application, Artificial Intelligence, Awareness, Construction Industry, Construction Professionals Nigeria.