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Corporate Digital Responsibility in Construction Engineering-Construction 4.0: Ethical Guidelines for Digitization and Artificial Intelligence

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Abstract : Digitization is developing fast and has become a powerful tool for digital planning, construction, and operations. Its transformation bears high potentials for companies, is critical for success, and thus, requires responsible handling. This study provides an assessment of calls made in the sustainable development goals by the United Nations (SDGs), White Papers on AI by international institutions, EU-Commission and German Government requesting for the consideration and protection of values and fundamental rights, the careful demarcation between machine (artificial) and human intelligence and the careful use of such technologies. The study discusses digitization and the impacts of artificial intelligence (AI) in construction engineering from an ethical perspective by generating data via conducting case studies and interviewing experts as part of the qualitative method. This research evaluates critically opportunities and risks revolving around corporate digital responsibility (CDR) in the construction industry. To the author's knowledge, no study has set out to investigate how CDR in construction could be conceptualized, especially in relation to the digitization and AI, to mitigate digital transformation both in large, medium-sized, and small companies. No study addressed the key research question: Where can CDR be allocated, how shall its adequate ethical framework be designed to support digital innovations in order to make full use of the potentials of digitization and AI? Now is the right timing for constructive approaches and apply ethics-by-design in order to develop and implement a safe and efficient AI. This represents the first study in construction engineering applying a holistic, interdisciplinary, inclusive approach to provide guidelines for orientation, examine benefits of AI and define ethical principles as the key driver for success, resources-cost-time efficiency, and sustainability using digital technologies and AI in construction engineering to enhance digital transformation. Innovative corporate organizations starting new business models are more likely to succeed than those dominated by conservative, traditional attitudes.

Keywords : construction engineering, digitization, digital transformation, artificial intelligence, ethics, corporate digital responsibility, digital innovation
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