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IMPLEMENTATION OF 3D PRINTING TOWARD INDUSTRY

REVOLUTION

IR 4.0: FROM CONTRACTOR PERSPECTIVE

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ABSTRACT

This abstract concentrates on the perspective of contractors and examines the challenges they face, the impact of 3D printing, and its perception. Incorporating 3D printing into construction practises presents difficulties for contractors. These obstacles include the need for specialised knowledge, cost considerations, and regulatory compliance. Contractors must acquire the skills necessary to operate 3D printing systems proficiently. Additionally, they must resolve initial costs and make 3D printing equipment more cost-effective. Additionally, safety regulations and building codes must be followed. The impact of 3D printing on the construction industry is substantial. It minimises formwork and on-site material removal, thereby reducing waste. Additionally, it enhances supply chain management and operational effectiveness. However, contractors should be aware that 3D printing increases energy consumption and maintenance costs. Perception is a crucial factor. Contractors must comprehend the advantages of 3D printing and promote a favourable perception. This can be accomplished via awareness campaigns and partnerships. By educating contractors and stakeholders about 3D printing, misconceptions will be dispelled, and confidence will increase. A questionnaire survey was distributed to the contractor company, and 108 valid responses from respondents were analysed. This study's findings are presented using quantitative analysis, specifically frequency and percentage analysis. It can be concluded that 3D printing has had an impact on the construction industry that leaves a varied perception from the respondents.

Keywords: 3D printing construction, construction management, contractor perspective

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INTRODUCTION

1.0 INTRODUCTION

We are living in the Fourth Industrial Revolution "4IR" (or Industry 4.0) era, in which three-dimensional (3D) printing-based production technologies are widely employed across the globe to address a variety of needs in industrial, scientific, educational, and domestic domains. 3D printing has emerged as one of the most critical instruments of Industry 4.0, significantly easing the manufacturing process for firms. 3D printing, or additive manufacturing (AM), is a technology for fabricating objects by successively connecting layers of material based on a three-dimensional model (Baumers et al., 2020), and 3D printing is a process that utilizes data from a virtual model to create physical models, with full goods or components of them being printed (Straub, 2017).

Furthermore, 3D printing has grown exponentially in popularity to the point where it is now considered one of the primary pillars of Industry 4.0 (Henning, 2013). Because the finished product's characteristics and properties are dependent on a multitude of criteria, AM requires an interdisciplinary understanding of the relevant domains. Recently, the notion of quality control was introduced in the realm of 3D printing. It has garnered considerable attention from the manufacturing industry in order to ensure that items developed for practical use adhere to established standards, particularly in terms of quality and dependability.

"Industry 4.0 is the application of digital technologies to alter manufacturing, production, associated industries, and value creation processes." The colloquial term "Industry 4.0" refers to the fourth industrial revolution. "Industry 4.0 refers to the fourth

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