TESTING THE APPLICABILITY OF INNOVATIVE TECHNOLOGIES IN IMPROVING CONSTRUCTION SAFETY IN SRI LANKA

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Safety concerns within the Sri Lankan construction industry are heightened by troubling statistics, as accidents and fatalities frequently arise from site negligence and are amplified by the absence of technology-driven hazard identification tools. Despite advancements, the implementation of such innovative technologies remains suboptimal. Hence, this research study addresses this gap by exploring how innovative technologies can bolster safety in the Sri Lankan construction industry. Considering the extensive research conducted over the past decade, our research was exclusively concentrated on technologies like Building Information Modelling (BIM), Augmented Reality (AR), Virtual Reality (VR), Geographic Information Systems (GIS) and gaming technologies. The research methodology involved conducting a literature review, a desk-based study, and distributing two questionnaires to both civil engineering undergraduate students and professionals. The desk-based study was an extensive literature review, covering facilitators and barriers to innovative technology adoption in construction, potential applications, and implementation benefits. The two questionnaire surveys were strategically designed to enrich insights progressively. The first survey was conducted to assess the readiness and potential for adoption, while the second was designed specifically for professionals to explore the findings in greater detail. This approach ensures a well-rounded perspective, from knowledge assessment to applicability and barrier evaluation. In the first survey, a total of 69 participants joined, comprising 31 professionals and 38 civil engineering undergraduate students. The second survey was directed towards 32 professionals within the Sri Lankan construction industry. As per the results, all five technologies were identified as potential enhancers of hazard identification, safety management, and planning. Furthermore, participants acknowledged that these technologies contribute to improved safety (92%), heightened productivity (85%), and cost efficiency (78%). However, barriers to implementation include stakeholder unawareness (73.9%), financial constraints (69.6%), and limited accessibility (52.2%). Therefore, the recommended measures encompass raising awareness, encouraging teamwork, creating standards for the sector, offering financial incentives, improving technical assistance, and removing barriers with focused tactics. By adhering to these recommendations, the construction industry can expedite the effective integration of innovative technologies, ultimately bolstering its risk management and safety procedures.

Keywords: Construction safety, Technology adoption, Innovative technologies

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Construction Safety

Safety concerns in construction are exacerbated by alarming statistics and a lack of technology-driven hazard identification tools.

AIM

Testing the applicability of innovative technologies in improving construction safety in Sri Lanka by conducting a technology readiness assessment.

Innovative Technologies Addressed

- BIM
- Virtual Reality
- Augmented Reality
- GIS
- Gaming Technologies

Methodology

DESK STUDY

It covers topics such as facilitators and barriers to implementing innovative technologies, potential applications, and past implementation advantages.

SURVEY 01

- It gauges readiness and adoption potential
- 69 participants joined, including 31 professionals and 38 undergraduates

SURVEY 02

- It tailored for professionals, delves deeper into findings
- It targeted 32 professionals in the Sri Lankan construction domain

Findings

Barriers in Implementation

- Stakeholder unawareness (73.9%)
- Financial constraints (69.6%)
- Limited accessibility (52.2%)

Applications

- Hazard identification
- Safety management
- Safety planning

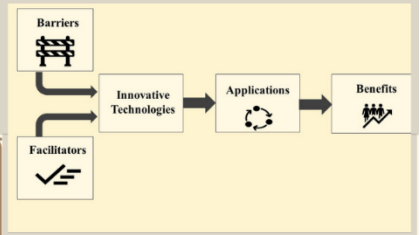
Benefits of Implementation

- Improved safety (92%)
- Heightened productivity (85%)
- Cost efficiency (78%)

Facilitators in Implementation

- Raising awareness
- Encouraging teamwork
- Creating standards for the sector
- Offering financial incentives
- Improving technical assistance

Implementation Framework



Conclusion

By adopting the facilitators proposed in this study, the construction industry can enhance safety and harness the potential advantages offered by innovative technologies.

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