Chapter 18
Industry Views on BIM for Site Safety in Hong Kong

Allen Chi Kong Wan
Farspeed Group of Companies, Hong Kong

Sambo Lyson Zulu
https://orcid.org/0000-0002-2724-1192
Leeds Beckett University, UK

Farzad Khosrow-Shahi
Victoria University, Australia

ABSTRACT

The construction industry continues to be a high-risk industry in comparison to others. It is imperative therefore that the industry should continue to seek ways to improve its safety performance. Technological developments and in particular building information modelling is seen to be a promising catalyst for improving safety outcomes in the construction industry. The discussion in this chapter focuses on the perception of professionals in the Hong Kong construction industry of the application of BIM for site safety. Given that sizable capital projects in Hong Kong are now using BIM and site safety continues to be a concern for the local construction stakeholders, it is timely to explore their perceptions of the use of BIM for construction safety. The findings show that there is strong support for using BIM to improve safety outcomes. Participants saw potential use in planning, visualization, and communication as the main reasons for supporting BIM for safety. Issues such as data accuracy, BIM competence, and resource implications were raised as some of the concerns with BIM for safety.

INTRODUCTION

The construction industry remains a high-risk industry (Mohammadi et al., 2018; Shi et al., 2018) and has one of the highest fatality statistics of any other sector (Hafsia et al. 2018). Therefore, it should be the case that health and safety performance should be considered one of the key performance indica-

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tors. While the construction industry has traditionally measured performance based on time, cost, and quality, others have proposed expanding these KPIs over time. Albert and Ada (2004) considered that KPIs to reflect successful construction projects should cover eight different factors: quality specification, commercial value, environmental impact, user expecation, participant's satisfaction, health, and safety performance time, and cost. Gould and Joyce (2009) pointed out that workers expect site safety management practoces in workplaces in the US, including construction sites.

The construction industry is a key sector of Hong Kong, representing between 4.2% to 5.2% of gross domestic product between 2015 and 2019 (Census and Statistics Department, 2020). Unfortunately, and despite all effects, Hong Kong still has a relatively high number of accidents. During 2010-2014, the construction industry accidents accounted for 25% of the total number of industrial accidents in Hong Kong. In fact, the construction industry accounted for 74% of all industry fatalities in Hong Kong over the same period (Labour Department Hong Kong Government, 2015). The high incident rates are also reflected in many other countries. For example, in the UK, the construction industry contributes about 25 per cent of all fatal injuries in the United Kingdom (HSE, 2018). While many initiatives have been proposed to improve health and safety performance, technological innovations offer great potential as a catalyst for health and safety performance. In particular, building information modelling is seen to offer this potential. Therefore, it is unsurprising to see the push by governments and industry leaders to expand the use of building information modelling, including for health and safety purposes. The UK's HSE recognises BIM's potential to improve health and safety outcomes in the construction industry (HSE, 2018). The development of BIM standards for health and safety [PAS1192-6, BSI, 2018] is another demonstration of the potential for improving health and safety outcomes through BIM. BIM for safety has also been a subject of research. See for example Ganah, A., & John, G. A. (2015); Martinez-Aires et al. (2018); Malekitabar et al. (2016); Alizadehsalehi, et al. (2018); Zhang et al. (2018); Kim et al. (2016); Park et al. (2016) among others.

Hong Kong is not an exception in driving the BIM agenda. To "build a better 2030", the Construction Industry Council in Hong Kong issued the challenge of the construction industry manpower, productivity, safer, greener and collaboration including consideration of adopting Building Information Modelling (BIM) for safety McKinsey & Company (2015). The Hong Kong's Construction Industry Council (2020) draft BIM standard also includes mechanisms for the application of BIM to health and safety management on construction projects. The use of BIM for health and safety is an on-going development in the construction industry. This chapter focuses on the perception of industry practitioners in Hong Kong on the potential for BIM to be a catalyst for improved health and safety performance.

IMPROVING CONSTRUCTION SAFETY

The construction sector has a poor health and safety performance record compared to other major industries (Li et al. 2018). The construction industry in Hong Kong is not an exception with an accident rate of about 20% in 2017, a rate similar to other major economies such as the USA, Japan and the United Kingdom (Shafique, & Rafiq, 2019). Chiang et al. (2017) noted that over 21 years from 1995 to 2015, there was an increase in the ratio of fatal accidents per thousand workers with the gross value of work performed per worker. Therefore, it is essential that efforts need to be hard to improve the construction industry's health and safety performance. There are many different tools to improve OSH, including a combination of mandatory and voluntary measures. Ju (2014) listed the tools to include a mix of