Adopting BIM Standards for Managing Vision 2030 Infrastructure Development in Qatar

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ABSTRACT

This research was designed to assess the significance of using Building Information Modeling (BIM) standards to enhance efficiency in the Qatari construction industry. The need for more efficient processes arose in part from the Qatari government’s increased level of investment in infrastructure and the accompanying desire to secure the country’s 2030 vision. A questionnaire was used to collect primary data from the Qatari construction industry. Three questions guided this research: (i) What are the current challenges facing the Qatari construction industry in the smooth deliverance of projects? (ii) What strategies does the industry use in the promotion of an integrated business model that is technological centric? (iii) What are the possible challenges that the industry would face if it were to adopt BIM as a standard for all projects in the Qatari construction industry? The outcome of the research shows that using BIM as a standard could not reduce the inefficiencies faced by the industry. While the respondents to the survey had realised that the industry had challenges, the implementation of BIM seemed not to be in line with the difficulties experienced in the industry. This finding was supported by a Pearson correlation coefficient of 0.001 for many survey questions. While the industry could be using BIM in general, it still does not form part of the strategy to promote collaborative working. The research did not emphasise the process of implementing BIM standards because most contracts did not require the use of BIM; neither do regulators. The research highlights the challenges of implementing BIM as a standard in a modern construction industry that is facing inefficiency. Even though clients have the capacity to apply innovative strategies, they are stifled by complex business structures and processes. Inefficient delivery of facilities raises questions about the management structures used by the industry. With a large expatriate workforce, Qatar needs systematic tools and approaches such as BIM for managing construction processes regardless of the level of experience and exposure of its managers. Adopting BIM could significantly improve working relations on projects. The research shows that the construction industry would

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INTRODUCTION

BIM is an approach to building life-cycle information management that streamlines data sharing in a collaborative work environment and provides a reliable basis for decision-making (Morris et al., 2011). BIM standards are being adopted by many countries across the world in order to promote efficiency (Howard & Björk, 2008) and enhance both lean productivity (Arayici et al., 2011) and transparent management of project resources (McAuley et al., 2012). The growing trend towards offsite construction adoption has also highlighted the need to have a platform like BIM which can facilitate communication and transparency in the process (Goulding & Arif, 2013).

The proposal to introduce BIM standards in Qatar results from pressure felt by the Qatari construction industry in its effort to support the Government’s 2030 vision, which aims to deliver constructed facilities in keeping with demands of a 21st century lifestyle. Estimated expenditure on construction projects in Qatar for the period 2011-2022 is $170 billion (US) (BNC Network, 2011). Planned major infrastructure projects over the next 10 years include the Qatar Railway Network, the Doha Metro, new Doha Port, new Doha International Airport, 55,000 new hotel rooms in 140 new properties, and 12 stadiums with a capacity of 605,000 (MEED, 2012). Timely delivery of such major projects is paramount; any failure would dent the “Qatar branding” strategy which aims to develop postmodern infrastructure that could facilitate greater economic prosperity and competitive leverage for the country internationally (Peterson 2006). It is envisaged that, with a world class built environment, Qatar can participate effectively in attracting visitors to the country through tourism and hosting international sporting events (MEED, 2012).

Despite the availability of financial resources from the government and various investors, the Qatari construction industry has recently struggled to meet cost, time, quality, and performance targets. Like construction industries across the world, delays, disputes, procurement, communication and contractual problems typify the Qatari construction industry and pose a threat to achieving the Qatar Vision 2030 goals (GSDP, 2008). Review of various recent major construction projects (e.g. infrastructure development for 2006 Asian Soccer Cup) reveals that project delivery was strained. Prudence suggests that without a paradigm shift in the project delivery mechanism, the Qatari construction industry will struggle to deliver the post-modern built environment facilities envisioned in the 2030 strategy.

The purpose of this research was to assess the significance of using Building Information Modeling (BIM) technology and processes as a means to enhance efficiency in the Qatari construction industry.

LITERATURE REVIEW

BIM has been defined differently in current literature including “a) a software application, b) process for designing and documenting building information, and c) an approach to practice and advance the profession which requires implementation of new policies, contracts, and relationships amongst project stakeholders” (Aranda-Mena et al., 2009). There is a sense in which it is necessary to accept all three ways of understanding BIM, if one is looking at it from the industrial perspective. For example, the concept of using BIM as a vehicle to integrate industrial operations on a project would bring forth professionals who would use (a) a variety of software applications; (b) tools and applica-
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