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### Identifying Current BIM Practices in Qatar and Proposing a Framework for Whole Life Cycle BIM Processes

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The research is part of a wider project aimed to develop a whole lifecycle information flow approach enabled by BIM protocols and technologies for Qatari construction industry. We consider the lifecycle information flow as enabler of a consistent and continuous use of building information from design, through construction, to the facility management stage. Building Information Modeling (BIM) is increasingly used by the Architecture, Engineering, Construction and Operation (AECO) professionals around the world. BIM has proven and potential benefits to facilitate Whole Life Cycle (WLC) information flow described above. It is generally accepted fact that AECO industry is fragmented in nature. Using BIM for WLC information flow is seen as one of the potential solutions to contribute towards a more cohesive AECO industry.

Within the global construction sector, Qatar's construction market is one of the fastest growing in the world throughout the next decade in alignment with the Qatar National Vision 2030. Currently ongoing and planned construction projects exceed US\$220 billion (Kilani, 2014), e.g. Lusail City projects, new Doha Port, new Hamad International Airport, Qatar Rail project, Qatar National Museum project as well as construction of stadiums and related infrastructure projects ahead of the Qatar 2022 FIFA World Cup.

This paper aims to identify current BIM related practices, existing procedures, technology and standards being used in Qatar using qualitative data collection and analysis technique and then proposes a framework for BIM processes across whole life cycle of the project to facilitate whole life cycle information flow. 28 semi-structured interviews were conducted with different stakeholders (clients, contractors, consultants) involved mainly in design and construction project lifecycle stages in Qatar. Results of the conducted interview analyses are presented in relation to policy, people, process and technology (3P + T) pillars that have been proposed for use in Qatar.

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The following key findings were reported by majority of the interviewees (values in brackets indicate the agreement percentage): (Vukovic, Hafeez, Chahrour, Kassem, & Dawood, 2015)

- Usage of FIDIC contract template (67%) and BS 1192:2007 BIM standards (60%) is prevalent on projects in Qatar. However, specific BIM information/standards should be developed at a government level for the Qatari construction industry (86%), including standard project stages with clear process maps (82%). Also in comparison to the situation in other countries, based on the examined literature, Qatari government should do more to drive the construction industry transformation by undertaking BIM related initiatives.
- BIM competency is usually a criteria for prequalification and selection during the procurement process (71%).
- Organizations in Qatar mostly use in-house BIM trained staff (75%).
- BIM roles are specifically defined in the contract (86%), BIM standards are required by contracts (68%), and should be enforced by contracts (75%).
- There is no need to create more BIM specific roles/positions (64%), but there is a need to upgrade the skills of people on BIM specific positions (89%). There is also a need to educate other project participants how to collaborate using BIM (96%). Such identified needs are similar to the situation in other countries covered by the literature review.
- LOD 300 is mostly required in design/construction stages of ongoing projects in Qatar (64%), which is the owners' responsibility (71%). The owner usually also initiates design changes (68%).

In alignment with the above findings this paper proposes a framework (Figure 1) consisting of 'Project DNA', BIM Processes and Whole Life Cycle of the projects and their inter relationship. Future work will elaborate on the BIM processes and protocols and validate the proposed framework using case studies.