



Doctoral Workshop on Contemporary Advances in Research Methodology in Construction Management

Workshop conveners: Dr Craig Thomson, Professor Lloyd Scott, Dr Nicola Callaghan

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## A LEAN CONSTRUCTION OVERLAY TO RIBA PLAN OF WORK

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### INTRODUCTION

This short paper describes an on-going research into developing a new overlay to RIBA (Royal Institute of British Architects) Plan of Work (PoW) for adopting lean principles and techniques in construction project across work stages. The research was defined to answer an identified research question, which has been identified with regard to not only adding new knowledge but also making useful contributions to further research and practice.

**Research question.** It is noticed that overlays on sustainability (Gething, 2011), building information modelling/management (Sinclair, 2012), and designing for manufacture and assembly (Sinclair et al., 2016) have been added to the RIBA PoW to support practitioners to pursue technical enhancement. In the meantime, the attempt to adopt lean principles and techniques in construction project has been initiated in research and practices. With regard to current progresses in adopting lean construction (Sarhan et al., 2019), limitations in terms of approaches adopted in research and practice were identified, and these include

- Predominance of a limited customer-focused perspective of value,
- Little focus/attention on the management of project lifecycle requirements, and
- The prevailing conceptualisation of waste.

It is therefore a research question regarding whether and how lean construction could be integrated with the RIBA PoW to comprehensively use lean principles and techniques across lifecycle work stages.

**Research aim and objectives.** The research aim is established to find appropriate answers to the research question, and it focused on the development of a lean construction overlay to the RIBA PoW. In order to achieve this overall aim, three objectives, as illustrated in Figure 1, were established to focus on review, development and validation respectively.

### METHODOLOGY

A research roadmap (See Figure 1) was designed to clarify research methods chosen for specific research objectives. For achieving aim and objectives, the four methods will be used for various purposes in this research. It is expected that the three sets of research outcomes will be completed within three years.

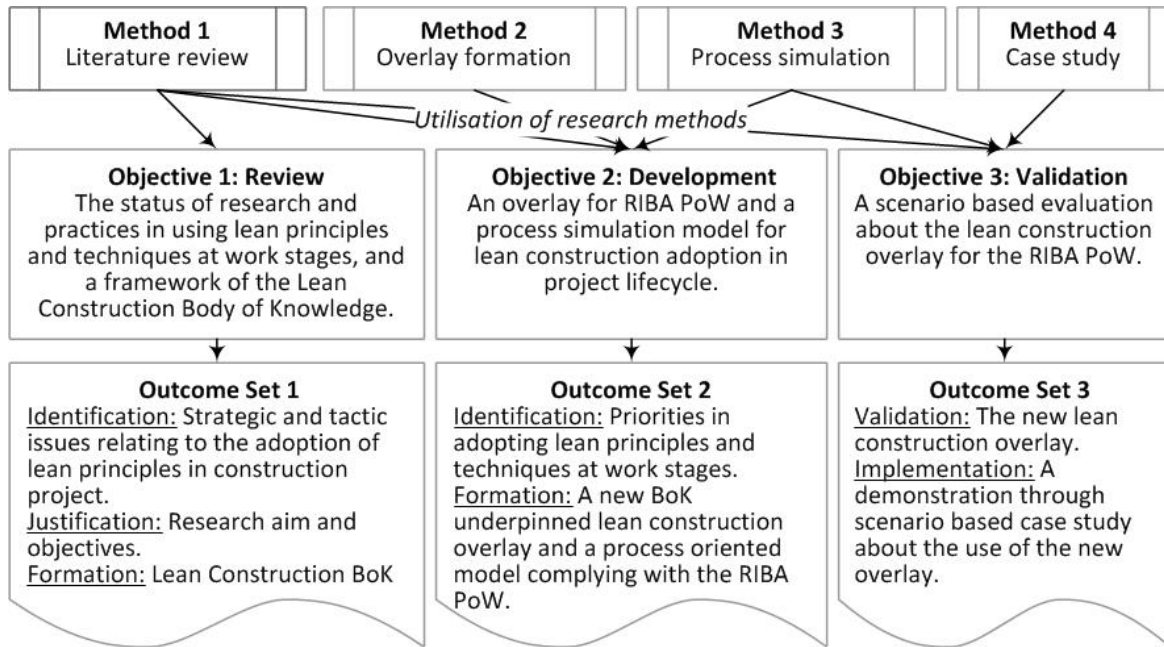


Figure 1: Research roadmap.

**Search terms.** A preliminary research was conducted by using relevant search terms in order to identify the scope of the described research, and details about strategic and tactic issues relating to the adoption of lean construction. Key words and terms are used to form search terms, and these include “lean construction”, “lean principles”, “lean thinking”, “lean strategy”, and barriers, etc. The search for relevant publications is being deployed to use major databases, including academic databases such as the Web of Science and the ScienceDirect, professional databases at ASCE and ICE, in addition to Google.

**Literature review.** While it is generic to use literature review to justify research aim and objectives, this research also relies on this method to identify critical issues such as the barriers (Enshassi et al., 2019; Hussain et al., 2019; Bayhan et al., 2019; Bajjou and Chafi, 2018; Thoumy et al., 2018; Sarhan et al., 2018; Tezel et al., 2018; Khaba and Bhar, 2017; Small et al., 2017; Omran and Abdulrahim, 2015; Sarhan and Fox, 2013) and the their frequency in identification from adopting lean principles and techniques in construction project. It is therefore expected that an extensive literature review will ensure a thorough consideration and an effective use of evidence on strategic and tactic side to form the lean construction overlay.

## CONCLUSIONS

This paper describes a methodological consideration to initiate a new research into lean construction overlay for the RIBA PoW. Based on preliminary research, it looks that an extensive literature review into published research is an effective and efficient approach; in addition, a further research can be conducted to establish the lean construction body of knowledge (LCBoK), and eventually a new lean construction overlay for the RIBA PoW that can be considered as a new technical solution for construction project management.

## REFERENCES

- Bajjou, M S and Chafi, A (2018a) Lean construction implementation in the Moroccan construction industry: Awareness, benefits and barriers. "Journal of Engineering Design and Technology", 16(4), 533-556. DOI: 10.1108/JEDT-02-2018-0031.
- Bajjou, M S and Chafi, A (2018b) Barriers of lean construction implementation in the Moroccan construction industry. Proceedings of the International Conference on Electrical, Electronics, Materials and Applied Science, Swami Vivekananda Inst Technol, Secunderabad, India, 22-23 December 2017. 020056. DOI: 10.1063/1.5032018.
- Bayhan, H G, Demirkesen, S and Jayamanne, E (2019) Enablers and barriers of lean implementation in construction projects. 3rd World Multidisciplinary Civil Engineering, Architecture, Urban Planning Symposium, 18–22 June 2018, Prague, Czech Republic. 022002. DOI: 10.1088/1757-899X/471/2/022002.
- Enshassi, A, Saleh, N and Mohamed, S (2019) Barriers to the application of lean construction techniques concerning safety improvement in construction projects. "International Journal of Construction Management", DOI: 10.1080/15623599.2019.1602583.
- Gething, B (2011) "Green Overlay to the RIBA Outline Plan of Work". London: RIBA Publishing Ltd.
- Hussain, K, He, Z, Ahmad, N, Iqbal, M and Mumtaz, S M T (2019) Green, lean, Six Sigma barriers at a glance: A case from the construction sector of Pakistan. "Building and Environment", 161, 106225. DOI: 10.1016/j.buildenv.2019.106225.
- Khaba, S and Bhar, C (2017) Modeling the key barriers to lean construction using interpretive structural modelling. "Journal of Modelling in Management", 12(4), 652-670. DOI: 10.1108/JM2-07-2015-0052.
- Omran, A and Abdulrahim, A (2015) Barriers to prioritizing lean construction in the Libyan construction industry. "Acta Technica Corviniensis – Bulletin of Engineering", 8(1), 53-56.
- Sarhan, J, Xia, B, Fawzia, S, Karim, A and Olanipekun, A (2018) Barriers to implementing lean construction practices in the Kingdom of Saudi Arabia (KSA) construction industry. "Construction Innovation", 18(2), 246-272. DOI: 10.1108/CI-04-2017-0033.
- Sarhan, S and Fox, A (2013) Barriers to implementing lean construction in the UK construction industry.
- Sarhan, S, Pasquire, C, Elnokaly, A and Pretlove, S (2019) Lean and sustainable construction: A systematic critical review of 25 years of experience. "Lean Construction Journal", 2019, 01-20.
- Sinclair, D (2012) "BIM Overlay to the RIBA Outline Plan of Work". London: RIBA Publishing Ltd.
- Sinclair, D et al. (2016) "RIBA Plan of Work 2013: Designing for Manufacture and Assembly". London: RIBA Publishing Ltd.

- Small, E P, Hamouri, K A and Hamouri, H A (2017) Examination of opportunities for integration of lean principles in construction in Dubai. "Procedia Engineering", 196, 616-621. DOI: 10.1016/j.proeng.2017.08.049.
- Tezel, A, Koskela, L and Aziz, Z (2018) Lean thinking in the highways construction sector: motivation, implementation and barriers. "Production Planning & Control", 29(3), 247-269. DOI: 10.1080/09537287.2017.1412522.
- Thoumy, M, Harh, A and Hajj, C (2018) Exploring barriers in the implementation of lean construction management. Proceedings of the 31st International Business Information Management Association Conference, Milan, Italy, 25-26 April 2018. 4695-4705.

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