UNIVERSITY OF CAMBRIDGE
Department of Engineering

CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT

The Relationship between Productivity, Scheduling, and Data Analytics

Construction projects are frequently procured and ultimately judged upon their ability to produce a product within a specified timeframe. An enduring challenge that has faced the industry is an inability to accurately forecast project durations from the outset and throughout. It is therefore reasoned that this is in part due to an over reliance on heuristic scheduling methods in the absence of empirical data. And so, in the primary context of the delivery phase of UK building projects, this paper asks, “Why doesn’t the construction industry utilise productivity data to improve schedule certainty?”.

A series of semi-structured interviews with a range of industry professionals were conducted to establish the status-quo in scheduling, determine what tools the construction industry has available to measure productivity, if the tools are used, and what outputs are generated from this exercise.

The planners creating schedules were found to rely heavily on heuristics, with a characteristic distrust of quantitative methods of scheduling, principally due to the complexities in accounting for project specific circumstances and influencing factors. In this way, scheduling has remained unchanged since earlier studies with productivity rates only having a weak link with scheduling practice.

The organisations that were able to commercialise the benefits of more advanced construction data analytics largely exist on the periphery of the industry as service providers, with increasingly advanced tools coming to market that are in many cases constrained by the quality of the data provided by contractors. Construction contractors were protective of their data, irrespective of its coherence, with some now beginning to level focus on the collection of data, but yet to capitalise on any benefits that may be leveraged.

The inference is that in practice, construction organisations should increase their focus on process improvement at the industry and enterprise levels, including increased investment in data science and the collection of empirical data. This may be done by actively engaging with industry initiatives to coordinate and develop best practice data strategies and data pools. Specifically, this includes a requirement for more research into how best to embed more advanced data capture procedures into practice to contextualise activity level productivity data, therefore increasing its reliability.

The above improvements to the quality of data sets, combined with the ability of skilled planning professionals to correctly interpret and communicate critical data to decision makers, may yet augment and improve scheduling practices in the future.

Keywords: *Schedule, Programme, Construction, Productivity, Data Analytics, Planning*

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