



## Value-added analysis of the construction submittal process

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### ABSTRACT

Construction contracts require builders to reproduce and certify paper documents that attest to the quality and or functionality of the systems, equipment, products, and materials planned for inclusion in a finished facility. Once submitted these documents are approved or acknowledged as part of a quality control process prior to placing purchase or fabrication orders. Despite widespread advances in other areas of information technology, the submittal process remains mired in paper-based procedures that add unnecessary cost to construction projects. This paper describes current practice and then highlights lessons-learned from selected interviews with those adopting innovative technology to streamline that process. The authors discuss their submittal process simulation model. Construction teams may adapt this model to reflect their specific context to justify and monitor the application of new technologies aimed at eliminating submittal transmission, routing, and handling costs within the context of existing contracting processes.

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### 1. Introduction

Business process analysis is often complicated because managers frequently are not responsible for processes affecting other business units outside their span of control [10]. In large corporations, top management must create staff-level, cross-organizational teams to quantify how self-optimizing behavior of individual business units that decreases overall organizational effectiveness. Once the team is in place, there are a number of different methods used in business process studies. While these methods often evaluate a variety of metrics [20] common denominators will be familiar to construction managers – reducing cost and time. In practice, improved business process based on new technology is typically restricted to improvements of existing workflows [5] since the manager is unable to control the broader contractual and business environment beyond their span of control.

The analysis of cyclic process waste was the basis for the total quality management and business process reengineering movements that spread throughout virtually all major industry segments, with the exception of construction and agriculture, in the late twentieth century. The resulting business processes, such as the logistics management prowess of Wall Mart, are widely recognized as the basis for the success of these firms. Recognition of the value of business process even went so far as to view business process as patentable intellectual property. A recent study by the National Research Council stated that one effective way to motivate improve-

ments within the construction industry might be to focus not on productivity increases but on decreasing waste [17].

All public projects, regardless of size, have a set of contract specifications that identify the quality and/or functionality of systems, equipment, products, and materials used for that project. Bidders, contractors, sub-contractors, suppliers and manufacturers use these specifications during the initiation and execution of construction contracts. Operators and maintenance staff use these specifications to determine characteristics of required replacement systems and equipment. Renovators use these specifications to determine the “typical” existing conditions within a facility they are preparing to modify.

While there are a number of different ways to approach specifications, the most common types are performance-based and proprietary. Performance-based specifications stipulate a product based on performance criteria. Performance specifications typically include three commercial products meeting the required criteria or allow the contractor to substitute an equivalent product. Proprietary specifications identify individual product by specific manufacturer and model number. Proprietary specifications may also allow for an “or equal” product. Proprietary specifications lead to more contract disputes, with performance based specifications being “a more absolute and inviolable technique than trying to reference a standard by naming a competitor’s model” [11]. This is because the phrase “or equal” leaves the specification open for a wider interpretation than if the product is selected based on performance.

In addition to the specification of products through either performance or proprietary requirements, specifications also define the process through which evidence of specification compliance is documented. U.S. federal contracts use the Unified Facilities Guide Specification “UFGS 01-33-00 Submittal Procedures” [15], or similar, to

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