

Exploring Enablers for Deploying an Integrated Rebar Inventory Tool to Enhance Contractor-Client-Supply Chain Relationships



Abdullah Bhalli, 2025

The construction sector has consistently underperformed relative to manufacturing in adopting advanced planning and digital inventory control tools. This lag has led to persistent inefficiencies in material management, reduced productivity, and missed opportunities for data-driven decision-making. This study addresses the enduring challenge of implementing an integrated material management system for rebar procurement, leveraging 3D design information to enhance inventory efficiency. While manufacturing has long benefited from well-established material requirements planning (MRP) systems, the construction industry presents unique challenges. The unique, often one-off nature of construction projects, along with strict traceability requirements (in the sample project), makes it difficult to apply standard planning methods used in manufacturing. These key differences show there might be a need for digital tools designed specifically for the construction industry.

This study analyses procurement and stock data from an ongoing megaproject to explore the potential impact of the proposed rebar tool on inventory usage, including effects that differ from its original purpose i.e use as spare part or interchangeable part. Insights into these potential alternative uses will be further developed through a series of semi-structured interviews with key project stakeholders- contractors, designers, clients, and suppliers.

The aim is to explore stakeholder perspectives on alternative opportunities to enhance rebar inventory management, such as reducing procurement times and repurposing existing stock. The analysis of material stock usage serves to ground the qualitative insights in actual project practices, revealing how inventory trends align with or contradict organizational attitudes, technological readiness, and resistance to change.