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TITLE OF DIPLOMA THESIS:

Supply chain management in construction projects

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ABSTRACT

The dissertation deals with construction supply chain management and presents an integrated optimization model for the construction supply chain. Construction supply chain management comes up as a new management tool that offers fundamental improvement of construction projects' effectiveness and efficiency in terms of cost, time and quality, as well as the opportunity of gaining competitive advantage. Construction industry is often ineffective, high fragmented, instable and unreliable so many problems in CSC can be identified. A majority of these problems are supply chain management problems, which originate at the interfaces of different actors or stages involved in the CSC. Time overruns problems in construction industry and the need of combining supply chain management with construction projects schedule are underlined. A theoretic frame configuration with critical management tactics is suggested in order to make a robust supply chain, which accounts for construction industry special characteristics and ensures that all supply chain members (general contractor, subcontractors, suppliers and customer) are allied with the common goal of supplying value added services. The dissertation is completed with the creation of a dynamic, deterministic, multi-echelon, multi-period, multi-product and multi-site, mixed-integer non-linear programming model with the objective of supply chain profit maximization. The optimization model deals with procurement cost, transportation cost, inventory holding cost, shortage cost, relationship-contractual cost and other fixed costs. The model is tested with a numerical example using Premium Solver Platform v12.

KEYWORDS

construction supply chain management, construction industry, optimization, modeling, mixed-integer non linear programming