ABSTRACT

Supply Chain Management is a major concern in all industries as Companies realize the importance of creating an integrated relationship with their suppliers and customers. Streamlining the supply chain has become an effective way of improving competitiveness by reducing uncertainty & improving service. One aspect of successfully managing the supply chain requires that Industries understand their logical strategies & practices.

Materials are one of the areas that require very special attention while creating a project's master plan as well as during the daily manufacturing & fabrication process. The absence of materials when needed is one of the main causes of loss of productivity at a jobsite. Inefficient materials management can lead to an increase of 50% in work hours, financial losses and bad name to any industry. As a result, a detailed plan for the materials management of each Manufacturing industry is necessary. A lot of material management solutions are available for big Manufacturing and fabrication industries, however same is not the case with small scale manufacturing and contracting industry, Because of some inherent characteristics of small scale industry.

The critical role of materials management in the success of a small scale contracting & manufacturing industry motivates the concept of development
of a new framework for the process of materials management for the small scale industry, specifically the electrical contracting & fabrication industry. Materials management problems have a great impact on general industries, but are more critical for specialty small scale manufacturing & fabrication industry such as electrical contracting industry. Since most of the time this industry comes into play when the project is almost 70 -80% complete and there is always a pressure from the owner to cut the cost and complete the work on time.

Currently materials management functions in the small scale manufacturing & construction industry are often performed on a fragmented basis with minimal communication & no clearly established responsibilities among the parties involved. In addition, the collaboration required among departments has not been considered seriously & implemented. The fragmentation creates gaps in information flow which leads to delay in material ordering & receiving, expediting costs, excessive inventories of some items & project delays.

However, model-based, computerized solutions to materials management problems are proliferating. Unfortunately, the typical small scale industry may be overwhelmed by the technology required by these solutions and the challenges of implementing them into their business
practices. A way out of this dilemma is presented by designing an industry-specific framework for the development of decision support systems for the supply chains of the small scale electrical contracting industry. Decision models are ever-present in the materials management processes of industries other than construction and have proven their worth in improving productivity and profitability. Supply chain management concepts are applied to develop an integrated, effective system of decision framework for materials-management decisions of a small scale electrical manufacturing industry.

The framework developed is valuable in two fundamental ways. First, the framework identifies and describes all phases of materials management for an integrated, holistic view of all factors that affect the total cost of materials and material shortages. The research created detailed mappings of the essential decisions, decision nodes that are required to support supply-chain activities of electrical industry throughout a project life cycle.

Second, the framework differentiates those steps in the materials management process that are straightforward applications of methods from those steps that are decisions. This phase of the research developed a structured systems design of distributed,
integrated decision support systems for materials management of the electrical industry. The research derives the optimal integration of people, decision processes, decision support systems and data that are required to support efficient and effective systems for acquisition, procurement, transport, storage and allocation of material in the small scale manufacturing and contracting industry.