

## Chapter 5

# Information Technology in Materials Management

### ABSTRACT

*Ensuring proper supply and timely delivery of materials during every stage of construction is crucial for overall project success. The task of managing materials is difficult and requires considerable effort on the part of engineers, project planners, supervisors, logistics teams, and storekeepers. This chapter explains the problems associated with materials management and how information technology can help in solving those issues. The authors discuss the use of RFID and the role that this technology can play in tracking shuttering components, such as Mivan, and many similar high-value raw materials and even smaller items. They also discuss how bar and QR codes can help in materials management.*

### INTRODUCTION

Construction projects are dependent on assorted and large volumes of raw materials. Controlling, regulating, procurement, storing, deploying, and disposing unused raw materials are essential processes that constitute bulk significance for construction companies. Management of materials, or Material Management, is critical to success of any construction project. The management of materials can throw a number of challenges to engineers, project planners, storekeepers beginning with material shortages cropping up at unexpected times, delays by suppliers, rise in rates of supplies, wastage and damage, to

DOI: 10.4018/978-1-7998-5291-9.ch005

lack of holding space for storing raw materials. Maintaining a paper-based trail to keep track of inventory and managing materials (Arnold, Chapman, 2004) prove not only difficult and cumbersome to maintain, but also prone to errors, delays, insufficient information, and in general an inefficient process unsuited in modern construction sector where time is of the essence and cutting down on wastage could mean survival for the construction company itself.

Information Technology has been harnessed to aid in construction materials management (Harris, MacCaffer, 2001). Sophisticated IT solutions such as Radio Frequency Identification (RFID) for tagging materials, bar coding, and wireless communications are already widely in use. An appropriate IT solution (New Strait Times, 2007 targeted at making materials management in construction projects effective is considered an integral part in any construction materials management planning exercise. It is already evident through research and practical implementation that a well-planned and advanced materials management solution can help improve inventorying and tracking of materials at a construction site. That materials management is of immense significance in boosting productivity in construction sector, is undeniable. Materials management takes into account that all materials should be carefully accounted for at all stages and phases of construction. Improper management of materials can and does lead to deterioration in quality of construction besides slowing down construction works and adversely affecting budget and schedules. It, therefore, becomes critical that the right amount of raw materials of appropriate quality standards are available in time at every stage and process of construction. The cost of materials, too, is also a part of consideration while engaging in materials management processes. While many organizations often still rely on manual methods for keeping track of materials (Kasim, Peniel, 2011), this leads to wastage and cost overruns. Paper-based techniques are ill-suited in modern construction environment.

Information Technology has the capacity to improve and advance materials management at construction projects. Already software applications form the core support of all business processes in construction companies big and small. Software applications are known to facilitate in collaborating, sharing knowledge, and procurement practices in many construction companies. With the aid of IT, it is possible to extend product procurement (Sarshar, Isikdag, 2004) features involving direct or indirect purchasing, making payments electronically, and managing movement of materials. Such can not only eliminate paper work, but also aid in lowering procurement and operational costs while cutting down cycle times and reducing waste. With the help of Information Technology, construction companies today, are not only able

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