

AA048

A review of spatial considerations in project scheduling

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Abstract

Project scheduling is considered as a study of the relations between activities and time, it is well known, however, that for certain types of projects spatial considerations (e.g. site layout, facility planning, site congestion etc) should also be taken into account. In this paper a literature investigation is performed with the purpose of indentifying all methodologies and techniques that take into account "space" as an entity in producing construction schedules and the practical implications of this approach are discussed. It is argued that it is mainly a lack of perception and not a scarcity of tools that by and large lead to spatial considerations not being taken into account in most project time schedules.

Keywords

Space management, Construction planning, Construction scheduling

1. Introduction

The definition of space in the construction domain is hardly evident or explored (Mallasi and Dawood 2002); throughout this paper is assumed that construction space consists of: Workspace (the location where activities are executed), Product Space (the space that occupy the components of the construction; i.e. walls), Resource Space (materials', equipment's space), Storage Space (contains temporary/permanent storage areas; e.g. staging areas) and Path Space (contains the loading/unloading path for materials delivery and possibly equipment path; e.g. crane rail) (Georgiou 2009).

Construction space management is a challenging task, as space is complex and changes dynamically throughout the construction process, namely workspaces are generated when a floor is built; while workspaces are limited when walls are built. It is argued that effective space management has significant impact on construction cost, productivity, safety and leads to schedule compression and space conflicts avoidance (El-Rayes and Said 2009). Yet in construction, relatively little formal attention is paid to the allocation of tasks to spaces and no standard tools, comparable to those available for the sequencing of tasks provided by critical path analysis and its derivatives, have gained acceptance among construction. The