CONSTRUCTION PROJECTS SCHEDULING USING GIS TOOLS

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Abstract

Commercially available scheduling tools such as Primavera and Microsoft Project provide a construction execution schedule, but activities in such schedule have no direct link with the corresponding components in 2D or 3D drawings. Hence, researchers suggest the use of Four Dimensional (4D) modelling or Building Information Modelling (BIM) to create the graphical simulation of the construction process by linking the execution schedule with the 3D model of the facility to be developed. Although 4D modelling and BIM tools allow planners to generate a graphical simulation of the execution sequence, they lack features like: generation and updating of schedules, 3D components editing, topography modelling and geospatial analyses within a single platform which is now a requirement of the construction industry. Programmes in GIS environment for Critical Path Method (CPM) scheduling and linking its activities with the corresponding components of a 3D model have been developed. The dynamic linkage between the activities of a schedule and corresponding 3D components in GIS has been established. This link makes it possible to detect incompleteness and logical errors in a project schedule. GIS allows planners to understand a schedule quickly by viewing its buildability on a computer screen. The database management capabilities of GIS have also been utilised to maintain and update the construction resource database (like material type and quantity, labour requirements, safety and quality control recommendations, etc.) to facilitate construction project planning. Such non-spatial information corresponding to various activities may be extracted from the database and linked with respective activities in a schedule developed in GIS.

Keywords

4D CAD, Construction scheduling, CPM, GIS.

INTRODUCTION

Primavera and Microsoft Project provide a non-spatial schedule that lacks the spatial aspects of a construction project. To visualize the construction sequence, the planner uses 2D drawings and mentally associates its components with the corresponding activities present in a schedule (Koo and Fischer, 2000). There is no dynamic linkage between a schedule and 2D or 3D drawings; this makes schedules difficult to check for completeness. Interpretation of such schedules varies with individual project team