TITLE OF MASTER THESIS

Tools and techniques for the time and cost planning of construction projects

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ABSTRACT

As it has been shown, after long years of applying traditional methods of time scheduling (Gantt, CPM, PERT) for the management of technical projects, we are heading often to deviations from the original design, resulting in the need for frequent revisions to the project's timetable which is a particularly demanding process. This results in the recording finally of both the time and the cost overruns in the design of a project, which in combination with the stagnation observed in these methods over the last decades and with the ever-increasing needs and demands of modern social life, it has led to the need for search of a new approach to project management. Covering these needs was attempted with the method of Critical Chain Project Management (CCPM), which was later known after the publication of the homonym book "Critical Chain" (1997) and which, is specifically called upon to address the uncertainty of determining the execution duration of a task, human factors, resource constraints, the lack of procedures for managing multiple projects at the same time, the problems associated with the often changing critical path, the wrong or incomplete focusing of project activities as a whole, as well as the ineffective monitoring procedures regarding the above. However, after the passage of two decades and more, of the CCPM theory’s formulation and despite the large number of scientific publications that refer an increased reduction in the execution duration of a project (about 40%), the theory did not succeed in becoming competitive in the field of application comparing with the traditional programming methods. For this reason, and because this method is not widely applied, with the present Master’s degree dissertation and through the implementation of 15 projects in the construction sector, which have been grouped into 3 distinct important categories of the industry (building renovation, construction and transport projects), we are attempting to prove CCPM’s primacy in usefulness in reducing the duration of completion as well as cost savings of a construction project, compared to the traditional programming methods used. Therefore, the objective of this Master's degree dissertation is to come into view with the most emphatical way all those elements in which the critical chain method is advantageous compared with the traditional programming methods, achieving far better results by reducing time and cost in executing a project.

KEYWORDS

Project management, Projects’ time scheduling, Critical chain, Critical path, Resources constraints.