



## **ACADEMIC YEAR 2013 – 2014**

### **TITLE OF DIPLOMA THESIS:**

Valuation of CCPM (Critical Chain Project Management) and ECM (Event Chain Methodology) in Project Scheduling and Project Management

**AUTHOR:** Stylianos Tsilikas

### **ABSTRACT**

The non-completion of a project within a planned duration is one of the greatest problems in construction project management. This phenomenon may have serious impacts, such as increasing the costs of the project, its delayed delivery and loss of income for the owner or client. Some of the most important reasons for the delay of projects relate with uncertainty, resource constraints and human behavior. In traditional project management, Gantt chart, CPM and PERT, remain the three more common methods for project planning and control, although they often fail to effectively deal with the aforementioned reasons of project delay. Goldratt (1997) introduced Critical Chain Project Management (CCPM), based on his Theory of Constraints (TOC). Introducing a buffer mechanism and an alternative method of project scheduling, CCPM attempts to deal with the issues of resource constraints, uncertainty and human behavior. Event Chain Methodology (ECM) uses quantitative schedule risk analysis methods that enable project managers to assess how uncertainty will affect the project schedule. ECM focuses on events that affect projects and attempts to improve the accuracy of project planning simplifying the modeling and analysis of uncertainty in the project schedule. In the present study, the characteristics and potential of CCPM and ECM are investigated. CPM, CCPM and ECM are applied into residential construction, in an environment of single and multiple projects using appropriate software, such as MS Project, Exepron, Lynx and RiskyProject. Last but not least, the results of the three methods are compared and CCPM and ECM are evaluated. The results demonstrate that CCPM and ECM can be valuable complements or alternatives to CPM, in order to support the manager of a project.

### **KEYWORDS**

Project management, Project scheduling, Critical Chain Project Management (CCPM), Event Chain Methodology (ECM), Quantitative risk analysis, Theory of Constraints (TOC).