

Chanwit Kangpanit 2013: Optimizing Individual Working Timetable for Multiskilled Workforce: A Case of Finish to Start Relationship. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Suneerat Kusalasai, Ph.D. 101 pages.

Nowadays, there is limited number of research related to the assignment of multi-skilled workforce and none of computer program can allocate such resources properly. Most of resource allocation techniques focus on the shape of the resource profile and the total number of resources required on a daily basis without considering the working timetable of an individual workforce. Generally, in a small to medium construction project, a foreman is responsible for assigning resources to a particular activity. Most of the time, this assignment is done when an activity is about to start. Therefore, working timetables of an individual resource cannot be known in advance. Although most foremen can allocate resources at low cost, there are many occasions that workers are forced to be idle between jobs or to suddenly change to different tasks. These could result in inefficiency and affect worker's income and their learning process.

This thesis proposes a framework of using genetic algorithm and a prototype of computer program to assist the search for the most cost-effective working timetable of an individual resource in a construction project with unlimited resources. In this study, the efficiency is measured in three dimensions including: the number of releases and re-hires, the number of resource idle days and the total number of resources required. The prototype program is tested with a small size project and the validation is done by comparing the result from the prototype and that from developing a worksheet to be solved by Microsoft excel solver.

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