AUTOMATIC GENERATION OF CONSTRUCTION PROJECT NETWORKS FROM ACTIVITY LISTS

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Abstract
This paper describes a research project to assist construction professionals to produce better programmes of work with wider applicability. In particular, it presents an automated method of obtaining the connections between the activities of a bar chart thereby enabling the user to obtain the benefits of network techniques with less input from specialist project planners. This is achieved by through the examination of activity names, and their treatment using knowledge base systems and artificial neural networks. A description of the theory employed is included together with a description of the analysis of project data that was necessary for the development.

INTRODUCTION

Uncertainty is identifiably inherent in construction and changes to construction projects are a fact of life; the ground conditions will never be known with certainty until after excavation has taken place. As projects become more complex, the detailing of such items as mechanical and electrical installations becomes more and more difficult. When clients want the project completed in as short a time as possible, it is advantageous to overlap the design and construction phases but this naturally gives rise to variations being required.

When changes do occur, it is important for all members of the project team to be able to evaluate their effects in cost and time in order that the participants can pays and be paid on an equitable basis. The quicker the effects can be evaluated, the better the use that can be made of the information. Indeed, if the potential effects could be evaluated before the actual construction were carried out, then the client or other person initiating the variation could use the information to make informed decisions as to whether or not to request the alteration.

In order to evaluate the effects of changes, project staff must rely on plans of work and evaluate deviations from these programmes. All too frequently, the programmes are presented in a very basic form even for relatively large and complex projects. The most common form of programme for construction is still the Gantt chart despite the availability of many powerful computer packages to perform network planning techniques. Construction staff find the modelling of projects using networks difficult; they are unable and unwilling to link the activities of the project together.