

THE NEW SOUTH WALES INSTITUTE OF TECHNOLOGY

AN INVESTIGATIVE STUDY OF COMPUTER GUIDANCE  
SYSTEMS FOR PROJECT COST CONTROL

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Abstract

The problem under investigation is the failure of current project cost control processes in Australia to adequately examine alternative design solutions due primarily to the imposition of time and cost constraints. Hence project optimisation does not occur--the cost of a design is controlled but rarely is a design formulated to comply with a pre-determined budget allocation. This thesis attempts to improve current practice through the introduction of a computer guidance system called "COSTPLANNER" devised to enable implementation of complex optimisation and control procedures between the stages of conception and tender while simultaneously improving speed and accuracy.

In order to arrive at a workable solution the investigative study is subdivided into three main sections. First, traditional methods of project cost control are discussed in order to ascertain the basic philosophies which will need to be preserved. Second, current levels of computer involvement are analysed to arrive at the essential elements which any computer-based system must

possess. Third, a framework for a complete computer-guided cost planning package, incorporating the necessary mechanisms to enable more thorough investigation and overcome restrictions currently imposed by insufficient time, is designed in detail.

The investigation has highlighted that design optimisation must be initiated at an early stage before valuable time and money is spent documenting a scheme that is inherently cost expensive. Also, to enable proper exploration of alternative solutions either the number of areas to be investigated must be reduced or the speed with which such areas are examined increased. The use of computers to undertake cost control activities means that the latter is an achievable goal that does not resist acknowledged attempts by the National Public Works Conference (N.P.W.C.) in Australia to encourage industry standardisation.

The major conclusion reached is that current practice can be significantly improved through the utilisation of computer guidance systems at all stages in the design of a project. Preparation time of feasibility reports can be reduced by ninety-three percent, sketch design cost plans by forty-five percent and tender document cost plans by thirty-four percent--an overall reduction in time and cost of fifty percent<sup>1</sup>. In addition to the

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<sup>1</sup>Based on project valued at five million dollars with eighty percent of cost identified as building work.

obvious benefits of making instantaneous changes to cost information, full reports including life cycle costing, value analysis and cost-benefit analysis studies as applicable are automatically prepared. Implementation of computer guidance systems to improve efficiency is not only desirable but absolutely essential, although it is an area which to date has been suprisingly ignored.

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## PREFACE

The scope of this thesis is designed to form the second stage in a long-term objective related primarily to the production of a successful and commercially suitable cost planning package that covers all aspects of economic investigation from the time of conception to that of contract tender for all types of buildings.

The first stage, already completed, involved the gathering of experience pertaining to computerised cost planning techniques for a specific field, which was defined as primary and/or secondary public schools in New South Wales<sup>1</sup>. The third and final stage will be required to achieve the above long-term objective based on the information and experience compiled in stages one and two.

The second stage is without doubt a vital step in the establishment of a complete cost planning package for use by quantity surveyors, architects and others in the project team. It draws on the experience obtained during previous investigations, researches traditional practices

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<sup>1</sup>Craig A. Langston, "Computerised Cost Planning Techniques", 2 Vols. (B.App.Sc. project, New South Wales Institute of Technology, 1982).



and gathers together available information about computerised cost planning systems currently under development.

From this wealth of practical and theoretical data a framework can be prepared that builds on the advantages and avoids the disadvantages that have been identified therein. Such a framework can then form the basis for the design and construction of the requisite computer instructions that will evolve through testing and further experience into the ultimate cost planning system.

This thesis was prepared in accordance with Kate L. Turabian, A Manual for Writers of Term Papers, Theses and Dissertations, 4th ed. (Chicago: University of Chicago Press, 1973) and the requirements of the New South Wales Institute of Technology. The text was written and edited on a Zardax wordprocessor using an Apple //e micro-computer and reproduced on a Brother HR-1 letter quality daisy wheel printer.

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