

CHAPTER ONE

INTRODUCTION



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CHAPTER ONE

INRODUCTION

1.1 BACKGROUND

Estimating in construction context is the art and science of predicting cost of construction works. Prediction of any thing involves thinking and acting on future. The quality, reliability and consistency of outcome can be attributed to quality, reliability and consistency of the information with which the prediction is exercised.

In the building construction the design consultants predict and control costs of proposed construction works at progressive design stages. This is to keep the Client informed on cost sector of the design.

Unlike in the past, clients today expect more incisive cost advice with respect to appraisal of alternative decisions. The outcome of this advice critically affects the design, building costs and financial viability of the project.  Electronic Theses & Dissertations
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Practitioners use different techniques to predict cost of a facility. Such techniques can be broadly classified as traditional techniques, life cycle cost techniques, value related techniques, knowledge based techniques, statistical techniques resource processed based techniques and risk analysis techniques (Fortune and Lees,1994).

Need for predicting costs at design stages has evolved different techniques. Each technique has its own capabilities and limitations. Body of knowledge in this area is considered very important since 80% of the cost of a building project is committed as the Sketch design stage decisions are formalized (Ferry and Brandon, 1991).

The requirements of design stage cost models are characterised by their capability to optimally facilitate user interaction, capability to manage large amount of cost and design information accurately and with reasonable speed. Tabtabai and Diekmann (1992) suggest that good forecasting technique should work on following premises:

1. Good forecasting technique will account for both past behaviour and predictable future events.
2. Predicting future events is a judgemental activity.
3. Some people have better judgement than others.
4. It is useful to make good judgement available to those with bad judgement.

The cost forecasting in building construction is coupled with design procedure, design information management, historical design and cost information and predicting future events. All these tasks involve information. The requirement, in the context of cost forecasting, is to manipulate information to predict construction costs more efficiently and reliably. In this respect computer aided cost models are promising.

The research carried out recently for RICS into university courses on forecasting techniques has showed the need for quantity surveyors to become expert at forecasting. Simple model building, Non linear modeling, Econometrics, Linear programming, Delphi method, Scenarios, Modern portfolios theory and Duration are the techniques/methods taught at universities (Martin,1994). The research stresses the importance of forecasting skills. Suitable forecasting techniques are required to exercise forecasting skills.



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According to the “Egan report” that clients are dissatisfied with the service they get from the construction industry. The service doesn’t add value for money to the client’s as expected. Application of value management has been prescribed among others. Value management is a structured approach to ensure value for money (Cited by Smyth,1999). Reliable estimating/forecasting techniques are required to ensure value for money.

Therefore, this research is aimed at formulating frame work for a computer aided cost model which provides means to access design and cost databases for information. Low speed in managing large amount of information is overcome by incorporating computer database management facility.

1.2 OBJECTIVE OF THE RESEARCH

The objective of the research is to formulate framework for a computer aided cost model linked to Standard Method of Measurements for construction cost forecasting at Briefing stage with the idea of using the model at Sketch design and Working drawing stages.

1.3 RESEARCH METHODOLOGY

1. Literature Review and conceptualization

Literature review was carried out in pre contract estimating, cost modelling, design methods, design techniques, design processes, Information technology application in estimating, product and process modelling in building industry and expert systems to grasp the essence of the pre contract cost forecasting.

2. Questionnaire survey



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A questionnaire survey was conducted to obtain an insight into the local pre contract estimating practice. Questionnaires were distributed between 37 local practices. A selected sample was used in the research survey.

3. Case study

A case study was carried out to assemble cost and design information which form a part of the database of the proposed model.

4. Research prototype

Stage I of the research project develops the framework for a computer aided cost model. A prototype will be developed at stage II of the research project to demonstrate the concept of the research cost model.

1.4 SCOPE OF THE RESEARCH

Building Construction includes many different types of buildings, simple to very complex..... This research project narrows down its study into office type buildings within building construction. This is due to time availability and practicality of the research schedule.

Databases created for the research cost model were limited to requirements of office buildings. Information in the databases do not reflect all options, occurrences which can cope with any design situation. Design and cost information of six building elements are used to explain how the proposed cost model performs.

The research project comprises two stages. The submission is limited to stage I where framework is formulated for a computer aided cost model. Stage II of the research project aims to develop a prototype to demonstrate the model.

1.5 MAIN FINDINGS OF THE RESEARCH




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1. The approximate estimating techniques used by the local organizations were limited to functional unit method, cost per floor area method at the early stages, and approximate quantities estimating technique, elemental cost estimating and pricing bill of quantities at later stages. Application of alternative estimating techniques such as KBES systems, resource based techniques etc. were not evidenced.
2. Application of Information Technology in approximate estimating is at very basic level. Use of spreadsheet packages for data storage, retrieval and calculation was the common application. Integrated use of computer technology to manage approximate estimating tasks was not evidenced.
3. Design stage cost planning and control were not in the agenda of the respondents.
4. Users (local) of the approximate estimating techniques were not aware of the strengths and weaknesses of the traditional cost models. Accuracy, reliability and bias of predicted outputs of traditional cost models have not sufficiently been addressed.

5. Revolutionary changes in the practice of pre contract estimating can hardly be expected. New techniques which closely fit with present way of working by practitioners are likely to be commercially adopted.
6. The research formulates framework for a computer aided cost model which is capable of forecasting construction cost of a project based on Client's Brief. Model links element and sub element information(cost and design) of a project with bill of approximate quantities. Research model identifies the importance of the experience and human judgment in forecasting, and optimally facilitates this requirement. Model is expected to perform in local practice without changing the way of working. It is considered that cost advisers with average computer skills can understand and put the model into practice.

1.6 GUIDE TO DISSERTATION

This research dissertation contains 7 chapters. Contents of the chapters are briefly as follows:

- Chapter 2** This chapter details design process, design techniques, design stage cost advice and design context in cost modeling.  University of Moratuwa, Sri Lanka
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- Chapter 3** This chapter details the design stage cost control aspects. Purposes and principles of cost control are analysed and their applicability to traditional approximate estimating techniques and to proposed research cost model is investigated.
- Chapter 4** This chapter examines the local practice in organizations with respect to use and application of approximate estimating techniques.
- Chapter 5** This chapter explains the need for a new approximate estimating technique in local practice. Characteristics of a new estimating tool are discussed in the chapter.
- Chapter 6** This chapter explains the conceptual overview, system architecture and problem solving strategy of the proposed cost model. Steps in using the

research cost model are explained in detail. Structure of reports and forms to be produced by the proposed model is comprehensively described.

Chapter 7 This chapter is devoted to conclude on research findings. Benefits of proposed research cost model are discussed. The chapter also identifies directions for future research.



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