

**A STUDY ON COSTS OF QUALITY
IN BUILDING PROJECTS**

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ABSTRACT

The knowledge of quality costs makes the difference between costly way and beneficial way in achieving quality. These include costs associated with the achievement or non achievement of product quality as defined by requirements established by the company and its contracts with customers and the society. Such quality costs are made up of three components namely prevention, appraisal and failure costs. Prevention cost is the cost of any action taken to prevent the risk of defects. Appraisal costs incorporate costs of evaluating the achievement of quality requirements such as inspection and testing performed at any stage. Losses associated with nonconformity/defects will accumulate as failures that detected during the process through inspections (internal failures such as rework) or once the client has accepted (external failures such as claims and replacements). Economic logic of above quality cost categories is to allow minimal quality cost applicable to each company by constructing a self correction quality cost system which will seek optimum cost for any business situation.

Literature shows that quality costs make up 8-15% of total construction costs and most contractors can cut 25% of costs of buildings from a good quality cost management program. Hence, the problems of quality and related costs has been of a major concern to any building contractor running on a restricted budget. And it applies to clients/developers and society as large as much it does to builders. The research reviews the use and significance of issues of cost of quality in construction and concludes with a precise of a survey done on the usage in actual practice to get the perception of the industry on quality costing. It is aimed to devise inappropriate strategy to improve the quality of strategic decision making as well as with regard to quality cost management in an uncertain and risky environment in firms. A Simplified model (COQQS) is developed to assess the costs of quality that is incorporated in a software tool called "contractor's guide.

The proposed model (COQQS) consisted of an improvement made to the Quality Cost Matrix for quantification and handling based on the Quality Cost Model and reviews done by Abdu IRahman (1997). In Case Study-I, the contractor had incurred nearly Rs.125Million as the quality and related costs that contributed 17.66% to the actual work done. Out of total quality costs failure costs represents nearly 90 % whilst weight given to prevention/appraisals is 10%. Prevention has got the least priority (less than 3%) of the costs expended for the project. The highest frequency of quality failure against the type of associated cause was for design.

related issues. Similarly communication problems, planning and coordination, subcontractor related, construction, material/plant/ labour related issues, client interventions and third party/other causes had accounted for high frequency of occurrences respectively as the causes of quality losses. The cost effect on above was analyzed in a pare to diagram, giving the direction to which areas to consider most in terms of both cost effect and frequency of occurrence .In conclusion, it suggested that an increase on prevention activity would make these costs minimized, thereby achieving an optimum level in efficiency and effectiveness of operations. In that regard, the need for a structured and formal system of quality cost management to address the aspects of performance has arisen as a direct result of deficiencies and problems in design, construction, materials, workmanship, cost and time overruns

The similar conclusions were made in Case Study -2 which involved construction of a power Station that incurred Rs 28 million as mere quality losses comprising 13 % contract sum of Rs 54 Million (for the reference period of 6 months) as quality costs consisting 99% cost on Quality losses and less than 1% on prevention and appraisals quality costs. This represented a 50.4% cost on quality failures and related costs making a 33.54 % contribution of total cost Occurred on project to the contractor so far during the study period. According to the pare to chart, both projects had a significant contribution of quality costs due to design and construction related issues.

The simplicity that was enough to validate the significance and consequences of quality costing is a key feature of these cases. This would unveil the gap of the absence of quality related cost data in Sri Lankan construction sector to a certain extent. Specially the failure cost, which is avoidable is researched further to identify steps to be taken to tackle problems off ailure and other quality costs.

The possibility of application in Sri Lankan context as a tool is highlighted from key Findings made on the survey. The feedback of a questionnaire survey and interviews were used to get an idea on Sri Lankan construction industry, conceptual application, opportunities, constraints and obstacles over the suggested system for "quality cost quantification and collection". A system was proposed to trace the position of a company in the process of development of quality system in terms of both quality management and quality cost management. Accordingly, the survey on the adoption process for a case study fin revealed that the firm was still in the initial stage of development of quality management system using tools of quality costing. Further, several applications of the model and future work a head are identified to present conclusions and recommendations.

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DECLARATION

I hereby declare that this submission is my own work and that to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent, has accepted for the award of any other degree or diploma of a university or other institute of higher learning except where an acknowledgement is made in this text.



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Finally, the words fail to express the spiritual support given by my mother, husband and the little daughter.

ABBREVIATIONS.

Annex	- Annexure
ASQC	- American Society for Quality Costs
BOQ	- Bill of Quantities
BS	- British Standard
CIDB	- Construction Industry Development Board (UK)
COQ	- Cost/s of quality
COQQS	- Costs Of Quality Quantification System
Conc	- Concrete
Drg	- Drawing/diagram
Fdn	- Foundation
Fig	- Figure
ICTAD	- Institute for Construction Training & Development in Sri Lanka.
Int Ext	- Internal and External
ISO	- International Organisation for Standardisation.
LCC	- Life Cycle Cost
No/s	- Number/s
PAF	- Prevention-Appraisal-Failure
P	- Part
Pg	- Page/s
PIMS	- Profit Impact of Market Strategies.
Q Cost	- Quality Cost
QPMS	- Quality Performance Management Systems.
Rfi	- Request for inspection
Ref	- Refer
Rs	- Rupees
Sec	- Section
TQM	- Total Quality Management
UK	- United Kingdom.
USA	- United State of America.

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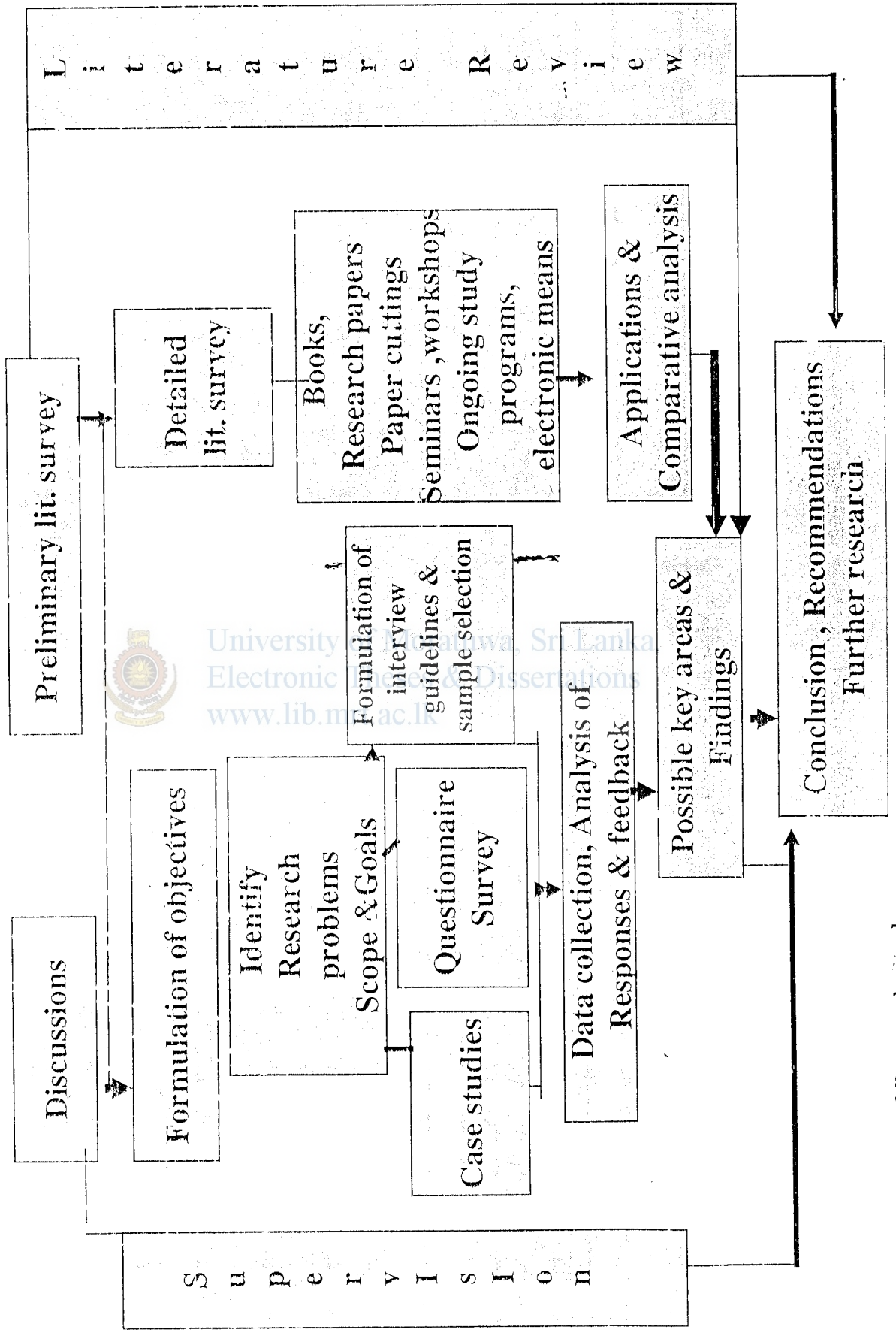


Figure 1 - Frame Work of Research Study.