

A Computer Application to Study Engineering Projects at the Early Stages of Development

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ABSTRACT

This paper describes a computer software application, the Qualitative Engineering System (QES), which the engineer can use to perform qualitative and semi-quantitative analysis of preliminary engineering designs. In engineering practice, many situations arise in which the engineer wishes to perform a logical, objective comparison between conceptual or preliminary design options. Although there exist many applications which can be used to perform detailed numerical analysis to justify detailed final designs, relatively few useful programs are available to validate designs at the preliminary stages. The early stages of design are characterized by higher levels of uncertainty than the latter stages. Established qualitative and semi-quantitative reasoning techniques may be used to detail with uncertainty and incomplete information in a sound, logical manner. The QES application utilizes a unified framework, which is used to implement a number of qualitative and semi-quantitative reasoning techniques. This paper gives an explanation of qualitative and semi-quantitative analysis in the context of the QES application. In addition, the paper gives some practical examples of how the QES program can be used in the engineering environment.

KEYWORDS

Computer application, design uncertainty, conceptual design, decision evaluation, qualitative reasoning, semi-quantitative reasoning, interval technique.
