

FILTERING ALGORITHM FOR CLASSIFYING THE FEASIBLE SOLUTIONSPACE FROM DESIGN SPECIFICATIONS AND COMMITMENTS

1.0 Abstract

It has become common practice for engineering designers to adopt a concurrent engineering design approach whereby products are being designed with consideration for their whole life-cycle not just for their use phase. This means that fabrication and assembly issues, product servicing, product disposal and other issues of the product from conception to grave are also taken into account for the product to be competitive in the market during the early stages of design. Products are becoming very complex because of their miniaturization in size and incorporation of a number of disciplines, that are not only engineering related but include other disciplines. Thus engineering design has become a very knowledge-intensive activity, with designers requiring support when taking design decision commitments as they have become too complex for the designer to handle on an individual basis. Several computer aided Decision Support Systems (DSSs) have, as a result, been developed to aid designers in their work. However, a major shortcoming of these systems is that they first allow the designer to take a decision and *afterwards* provide support in the form of consequences of these decisions on the product life-cycle. This tends to result in a lot of iterations and consequently loss of design time until the designer arrives at a life-oriented solution. The aim of this invention is therefore to provide support to the designer *before* a decision is taken so that a lot of iterations are eliminated. The novelty lies in the approach that is adopted to assist the designer and its implementation in an algorithm and eventually in a framework for a DSS. The approach, together with its algorithm and framework implementation, are applicable not only in the field of engineering design but also in other areas involving the processing of specifications and related decision making such as software design, architecture design, service design, planning, etc.

1.1 Abbreviations

ABBREVIATION	DEFINITION
CAGM	Computer Aided Geometric Modelling
DSS	Decision Support System
LCC	Life-cycle Consequence
LCPE	Life-cycle Phase Element
PDE	Product Design Element
PDS	Product Design Specification
PLS	Product Life-cycle Specification
SLS	Sub-assembly Life-cycle Specification
CLS	Component Life-cycle Specification