

# **DFSS MADE EASY: THE MIXED APPROACH AXIOMATIC DESIGN AND QFD, THEORY AND CASE STUDY**

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## ***Summary***

*The objective of this paper is to show how the Axiomatic Design and QFD analysis could be merged together in order to speed up the DFSS approach for the development of a market competitive product. DFSS approach rely heavily on the result of the QFD analysis in order to understand the critical features of a product and to define the optimal strategies to attain the technical result. This is the most critical part of the approach due to the subjective nature of such analysis. The idea is to merge together QFD and Axiomatic Design in order to create a more objective set of results and to simplify the application of QFD. The two approaches are operated consequently in order to create a design solution that could satisfy all the expectations of the customers. On one hand the QFD analysis provides to the designers the data regarding the competitors and the market expectations, on the other hand this provides also a strong background for the development of the solution. The AD approach is focused on the high-level structure of the product, so allow the choice of the best technical solutions regarding decoupling (Axiom I) and expected performances (Axiom II) while the QFD could be used to minimize the manufacturing costs evaluating the detailed product needs in terms of components and machining quality level. The advantages of this approach are the reduction of product cost and the better adequacy to the market expectations. This joint approach will be applied to the design of a reverse engineering system that could be used to evaluate the wear of cutting tools. The general idea is to develop a system able to evaluate the tool wear and to provide the set up for the regrinding machine in a very reduced time, raising so the productivity of the machine.*

**Keywords:** DFSS, Axiomatic Design, QFD, Machine Vision, Tool Regrinding, Tool Life