



“Design – To – Cost in Engineering”

Is this just a new buzzword?

The authors Dr.-Ing. H. Sippel and Prof. Dr.-Ing. E. Schelkle believe
“It Is Not”.

Therefore, the reader of this book is encouraged to think about the trade-off between the achievement of necessary or desired “Functional Improvements” and related “Cost” whether these are Direct Costs or Indirect Costs.

Necessarily, there is a distinction between estimates in different design phases and in terms of “new innovative concepts” or “re-designs”.

In difficult economic times innovation and economic performance is one of the key issues for design engineers. Understanding the impact of critical cost elements on desired design features is becoming vital.

Several enabling techniques have been developed during the past years. These include:

- Design performance and design improvement models like conceptual modeling, e.g. based on “FE techniques“ or “Computer Algebra”
- Both commercial or in-house cost estimating tools

In this book some of these tools and methods will be reviewed and illustrated by examples. Applications have been selected from:

- The Automotive Industry
- Consumer Products Industry
- Renewable Energy Generation and Exploitation.

There is a common understanding in industry that approximately 70% of “Life Cycle Cost” are committed to Conceptual Design. Therefore, “Design-To-Cost“ estimates offer the opportunity to achieve cost targets while still satisfying functional requirements.

As a consequence this means “Cost” needs to be included as another independent design variable as early as possible in the design process besides the “classical ones” like displacements, stresses, or eigenfrequencies, etc..

Porsche already gained a lot of experience in that respect either via PES (Porsche Engineering Services) or via the Porsche AG directly. There were e.g. 2 publically funded projects carried out where Porsche invested significant effort: These were the **ULSAB** (Ultra Light Steel Auto Body) project and the **SLC** (Super Light Car) project. Both projects are excellent references and will be discussed in more detail in the subsequent chapters.

For other companies who just started considering Design-To-Cost in Engineering the authors would like to promote the idea to include “cost” as an independent design variable in the design loop. The corresponding workflow and optimization procedures need to be set up adequately.

Times where cost are just being considered as the responsibility of a manufacturing or purchasing department are gone.

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