

An Enterprise Decision Model for Optimal Vehicle Design and Technology Valuation

by

Adam B. Cooper

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Master's Thesis Committee:

Professor Panos Y. Papalambros

Dr. Michael Kokkolaras

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ABSTRACT

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Chair: Panos Y. Papalambros

Design optimization traditionally deals with engineering design decisions. Yet it is well understood that optimal product decisions must be based on engineering as well as marketing and production considerations. An Enterprise Decision Model attempts to link these aspects of the product development enterprise so that the value of the designed product to the enterprise can be assessed. The model also values new product technology in accordance with the enterprise's current operations to increase the likelihood of commercialization success before committing to a new strategy. The valuation technique uses comprehensive engineering simulation to provide a preliminary understanding of the technology's market and design potential. The model represents the enterprise in a mathematical formulation that simultaneously optimizes initial product design, product pricing, operating costs associated with capacity allocation and design decisions, and the value created by new products. The Enterprise Decision Model is demonstrated for optimal vehicle design in a medium truck market, experiencing hybrid penetration.