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Editorial

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1. Introduction

It gives me great personal pleasure to present this first edition in a series of works to be published on the growing field of Value Driven Design (VDD).

I first met up with Paul Collopy a decade ago through our American Institute of Aeronautics and Astronautics (AIAA) connections and his subsequent support for a research center at Belfast. We immediately had a connection on driving the design process forward on a truly optimization based goal (no compromise Paul!) and on the absolute necessity to establish cost or money as proper design variable. Like many experts we were primarily passionate about these major failings in the current approach and the lack of analytical reasoning driving the systems engineering process, which was going more and more off radar according to us in devolving design power and ending up with a compromise design that no-one really liked and had so much self-induced contingency at multiple levels of design requirement compliance that only the administrators were happy at the end of the delivery. This is a good time to mention the position of Paul's paper in this edition on 'the elephant in the mist' that starts to explain the need for VDD.

The term Value Driven Design was coined by James Sturges at Lockheed Martin as he organized a first workshop of what became, in 2006, the Value-Driven Design Program Committee of the AIAA. All of the main authors herein are members of this Committee but all of us have used it in one form or another for many years. The point here is that VDD fits certain people like a glove and when these people, like us, hear that VDD is roughly about ascertaining one's value function (or objective function in optimization terms) and then establishing an analytical framework for this to be implemented and solved, then we all go, yes that's what I do. This is the power of VDD in that it is common sense to some and revolutionary to others. When I say common sense, I mean that when a VDD study is presented or one looks back on it, it then makes perfect common sense. It captures the expectation of the industrialist for the sort of tools and methods that we academics should be investing our time in, and for the savvy academic it presents an immediately consolidating and integrating framework for the research problems of this nature that we like to solve.

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This all begs the question but what is VDD? What is your engineering definition of 'Value'? How from a methodological standpoint can value be 'driven' by design? Why does 'design' need to be driven by value? And not least, how can this all be integrated into some cohesive methodology or approach? Back in the Annual General Meeting of AIAA in Reno 2007 I remember making a commitment to Paul that we would try and capture the essence of what VDD is in an international publication. We first envisaged an explanatory book but VDD has continued to grow in many ways and with that our understanding of what it means, including for example Value Operations Methodology (VOM) as the application of VDD principles in the operations sphere. Many VDD publications have been published, and it has been included in the Encyclopedia of Aerospace Engineering, but this is the first collection of material in a package that offers snap-shot in what VDD is.

The contents from the seven articles that make up the first of this series on VDD are presented as an initial guide but this is just the first of a series on the role of value and optimization within the engineering process. This first special edition is organized as follows in terms of the papers:

1) establishes the need for VDD (Collopy).
2) addresses the strategic options for VDD development (Soban).
3) explores the concept of surplus value as a driver (Hollingsworth).
4) addresses the needs of life cycle value analysis as a driver (Price).
5) introduces a case study for UAV integrated design based on the VDD approach (Scanlan).
6) introduces a case study for digital manufacture based on the VDD approach (Butterfield).
7) extends the concept of VDD into the operations sphere through VOM (Curran).

Enjoy and don't hesitate to get in touch with us or to join our community through the AIAA VDD Program Committee.

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