

Textbook Authorship: A Half-Century Overview

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I have had the privilege to help prepare several textbooks, both as author and editor, over the last 50 years. In this overview, I will attempt to explain the motivation for my involvement with textbook authorship, placing secondary emphasis on my own books, in favor of emphasizing the insight that these books could provide readers and authors alike.



It is important to distinguish between books and textbooks. Books include textbooks, but textbooks are intended for academic adoption, for student use. Textbooks should contain both problems and exercises. Publishers require textbook authors to provide supplements such as instructor's guides, solutions manuals, and web-based supporting material. Instructors also appreciate projectable materials from the textbook, usually figures and tables.

Textbooks on industrial and systems engineering have been my exclusive forte. They inadvertently clustered into three categories: engineering and operations economy, industrial and operational research, and systems engineering and analysis.

My first contract (*Engineering Economy*, 1962). I signed my first textbook contract in 1962 for *Engineering Economy* and embarked on a lifetime of authorship. That contract was fashioned by Professor H. G. Thuesen at Oklahoma State University, where I was finishing my PhD, and where I had just accepted an assistant professorship. It was an honor to be asked to take over a textbook already in its second edition, and it has been a privilege to advance this book into its ninth edition (2001). Thuesen wanted to disconnect and pass the authorship obligation on, with the provision that his son Jerry could coauthor when ready.

Why me? I studied from and later taught the subject of engineering economy from the Thuesen book when an instructor at the University of Arkansas, and I helped Thuesen some in his teaching at Oklahoma State. I was also able to get our IBM 650 to produce accurate interest-factor tables.

My motivation? I was motivated largely by the opportunity to advance an important core subject in the education of engineers, but it was also part flattery and part "publish and prosper" (with prosper including royalties in prospect). I recall Thuesen saying that he hoped the student price would not exceed USD 10. The ninth edition of *Engineering Economy*, like most engineering textbooks, now has a suggested retail price well over ten times that.

Over the years, I published adaptations of *Engineering Economy* with coauthors.

Economic Decision Analysis appeared in 1974, coauthored with Jerry Thuesen, and its third edition in 1998 added Dinesh Verma as another coauthor. This book was a broader and less rigorous counterpart to *Engineering Economy*, intended for use in engineering technology, agricultural economics, industrial management, and related.

With the growing interest in lifecycle costing, Ben Blanchard and I published *Life-Cycle Cost and Economic Analysis* in 1991. The adaptation was natural due to the congruence of money-flow modeling over time and the system lifecycle. This book formalized the process of converging system-design decisions to the economic interests of the customer.

My second contract (*Operations Economy*, 1964). While still at Oklahoma State, I teamed with Paul Torgersen to coauthor an extension of *Engineering Economy* into the domain of operations; this new book was entitled *Operations Economy*. It appeared in 1966, with subsequent editions under the title *Industrial Operations Research* (1972), which received the American Institute of Industrial Engineers Book of the Year Award in 1973, and then again as *Applied Operations Research and Management Science* (1984), with Prab Ghare as the third author. *Industrial Operations Research* concentrated on decisions for industrial operations, while *Applied Operations Research and Management Science* concentrated on understanding and applying the general mathematical form of operations research models, which had been introduced (though largely ignored) in the classic 1957 *Introduction to Operations Research* by C. W. Churchman and others (New York, US-NY: Wiley).

Applied Operations Research and Management Science made available, for the first time, a comprehensive mapping of the work of Churchman and his coauthors onto most of the categories of operations research and management science models. This book made parameters explicit in operations research models as a basis for choosing from among optimized operational alternatives. The book was focused exclusively on the improvement and optimization of ongoing operations. But design and design-dependent parameters as a distinct paradigm had not yet come into my consciousness.

My explicit recognition of dependent parameters should have occurred in about 1961, during my dissertation research at Oklahoma State on *Optimal Inventory Policy for the Multisource Item*. There I extended the category of operations research models for inventory operations beyond "when to order" and "how much to order" to incorporate determination of "from what source." This was formalized by iden-

tifying and instancing on source-dependent parameters. Then, teaming with my doctoral advisee Jerry Banks in 1964, who added multi-item considerations to the multisource concept, we published *Procurement and Inventory Systems Analysis* in 1967 and 1987.

My third contract (*Systems Engineering and Analysis*, 1981). During 1979, Ben Blanchard and I concluded that his textbook authorship and mine had potential for convergence, due to a wealth of related ideas in our prior works. Ben's expertise in the systems engineering process and engineering management merged with my engineering and operations economy and systems analysis capability, allowing us to collaborate on a comprehensive textbook focused on bringing human-made systems into being. *Systems Engineering and Analysis* was our chosen title.

In this textbook, we continue to define and describe systems engineering as a technologically based interdisciplinary process for bringing technical systems and their products into being. While the main focus is nominally on the product, systems engineering offers private and public organizations an improved strategy. Systems engineering is inherently oriented to thinking about "the end before the beginning" and concentrating on what the entities are intended to do before determining what the entities are, with form following function.

This book is now in its fifth edition (2011) with exactly 500 questions and problems and a 160-page instructor's guide to problem solutions. System design continues to be the focus and the prime mover behind systems engineering, with system design evaluation being its compass (based on the design-dependent parameter paradigm). Each edition of this textbook has improved the design-dependent-parameter concept and improved the integration of multiple criteria, all within a complex process that coordinates synthesis, analysis, and evaluation over the system's life cycle.

My coming magnum opus (anticipated 2014). My textbook-publication endeavors over the years have produced continuities in intellectual content, but have also revealed opportunities for enhancement. Systems thinking within systems engineering is a topic which my previous publications largely neglected, and this topic seemed to offer the highest potential for advancing systems engineering as a profession. Accordingly, my current title, *Systems Thinking, Engineering, and Analysis* is consuming my best effort. In this connection, I am coming to realize that this synthesized approach is potentially science, technology, engineering, and mathematics (STEM) for grownups!

This coming textbook is first and foremost about systems. But it will concentrate on and impart systems thinking for the engineering of human-made systems within the context of sustainability (a contemporary design-dependent parameter). Instead of a focus on systems or system elements and products per se, this compre-

hensive textbook will concentrate on designing, delivering, and sustaining functionality, a capability, or a solution. This strategic approach is gaining the attention of forward-looking enterprises in both the private and public sectors worldwide.

Advancing in tandem with technological progress, systems thinking has few limits. It is particularly suited for the interdisciplinary field of systems engineering. Orchestrating known elements from relevant disciplines to advance the effectiveness of systems engineering in service to humankind is an exciting and worthwhile academic and authorship challenge for me.

Working with the publisher. Authors who write a single book with one publisher are most common. The author finds a publisher or a publisher finds the author. But some authors of multiple books diversify their publication outlets. Publishers contribute to this by searching out and attempting to sign authors that have proven to be successful.

There exist both intangible and tangible benefits in working with only one publisher. My only publisher has been Prentice Hall, now Pearson Prentice Hall. I began with Executive Editor for Engineering Matthew Fox, who, with his associates, launched my earliest titles. For the past quarter century, my editorial leader has been Marcia Horton, vice president and editorial director for engineering and computer science. I also had the opportunity to work with many associate editors under these quintessential executives. As mentors at my beginning and as an anchor to this day, Matthew Fox and Marcia Horton have my professional respect.

I was pleased to be retained as an editor when the Prentice Hall International Series in Industrial and Systems Engineering was established in 1972. Joe Mize began as co-editor with me and served until 2010. Marcia Horton commissioned the publication, "The Making of a Classic Series," which told the story of this book series and its authors. This recognition was an inspirational boost for me, Joe Mize, and the numerous authors involved.

My authorship has clustered into three categories, as I have described. Many of my titles have enjoyed global exposure through translation into other languages. Additionally, the broader cluster of titles comprising the Prentice Hall Industrial and Systems Engineering Series gave Joe Mize and me the opportunity to interface with authors internationally. For this unique opportunity, and for the partnership with Pearson Prentice Hall over a half-century, I will be forever grateful. ①