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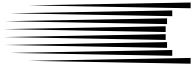
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NEW BOOKS IN REVIEW

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PRINCIPLES OF FORECASTING: A HANDBOOK FOR RESEARCHERS AND PRACTITIONERS, J. Scott Armstrong, ed., Boston: Kluwer Academic Publishers, 2001, 849 pages, $190.00 (hardback), $95.00 (paperback).

In the late 1970s, Professor Armstrong wrote a treatise on long-range forecasting that many readers considered irreverent and humorous, albeit very insightful and highly readable (Armstrong 1978). On the basis of a detailed review of the extant empirical research, Armstrong identified, described, and provided an evaluation of the various subjective and objective methods used in forecasting. Without mincing words, he clinically dissected the relative effectiveness and usefulness of each technique. Although readers can disagree with Armstrong's strong opinions and conclusions, there can be no disagreement on the overall impact the book had on the science of forecasting. In his new magnum opus, Armstrong continues his tradition of extending the frontiers of knowledge on forecasting by incorporating 39 other experts as coauthors and contributors.

In his inimitable style, Armstrong explains the need for "principles in forecasting" by narrating a personal experience. He writes (pp. 4–5):

> A blood test showed that my cholesterol was too high; it was 260, with a ratio of 4.3. To determine the best course of action, my doctor had to forecast the effect that recommended changes would have on my cholesterol level. Next, he needed to forecast how closely I would follow his advice. Finally, he had to forecast how reducing my cholesterol level would affect my health and quality of life. He made these forecasts in his head, all very quickly, and prescribed a low-fat and low-cholesterol diet.... The issue then [became] whether to follow advice based on the judgmental forecasts of my doctor, or whether to rely on the more objective evidence from my experiment [on varying my diet] and on findings in the published literature. I chose the latter.

Although Armstrong's example has a happy ending and communicates nicely the relevance of forecasting principles in day-to-day life, his approach toward controlling cholesterol is not to be tried by the fainthearted.

Principles of Forecasting: A Handbook for Researchers and Practitioners is an ambitious, well-executed undertaking that is certain to make a lasting contribution to the field of forecasting. As Armstrong describes (p. 3) in the introductory chapter, "the purpose of this book is to summarize knowledge of forecasting as a set of principles. These 'principles' represent advice, guidelines, prescriptions, condition-action statements, and rules." Armstrong and his 39 contributors admirably achieve this goal, fascinating the reader by their ability to succinctly translate complex issues into simple, easy-to-understand principles.

Armstrong identifies several target audiences for the handbook, including (1) forecasting practitioners and government agencies, (2) forecasting researchers, (3) educators, and (4) lawyers and expert witnesses. Potential purchasers should recognize that the handbook assumes that readers will have a basic level of knowledge of forecasting techniques and experience with applications. Therefore, despite the clarity of the writing, this book is not necessarily intended for the novice forecaster or as an introduction to the forecasting field.

Armstrong and his expert contributors represent multiple disciplines, including marketing, economics (population and agricultural), information systems, psychology (cognitive and experimental), statistics, decision sciences, public policy, operations management, strategic management, and logistics. They also represent a variety of countries, including the United States, the United Kingdom, Australia, New Zealand, Canada, and The Netherlands. By bringing together such a powerful brain trust, Armstrong not only ensures a top-quality production but also bridges the gap that normally exists because of interdisciplinary differences in the use of forecasting terminology. Furthermore, all of the 31 essays have undergone a rigorous review process by both the contributors and 123 outside reviewers. On average there were more than 8 reviews per paper, and some received more than 20 reviews—much more than a typical research manuscript undergoes before being published in the best academic journals.

In all, the 849-page handbook comprises 31 essays, organized in 20 sections. Armstrong sets the stage for the book in the introductory chapter by presenting a "methodology tree" that depicts the various methods and techniques available to the forecaster divided along the lines of judgmental and statistical sources. In the last section of the handbook, Armstrong provides a summary of 139 key principles, most of which are derived from the individual essays, organized along the lines of the major tasks confronting a forecaster: problem formulation, obtaining information, implementing forecasting methods, evaluating forecasting

methods, and the use of forecasts. Armstrong ends this section with a comprehensive forecasting standards checklist that can serve as a useful tool for forecasters and decision makers. The remaining 18 sections comprise essays that address topics that include role playing; intentions; expert opinions; conjoint analysis; judgmental bootstrapping; analogies; extrapolation; rule-based forecasting; expert systems; econometric methods; selecting methods; integrating, adjusting, and combining forecasts; evaluating methods; assessing uncertainty; gaining acceptance; monitoring forecasts; applications of forecasting principles (population forecasts, diffusion of innovations, market share, and trial sales for new products); and diffusion of the principles through textbooks and forecasting software.

Armstrong has in the past expressed a strong preference for objective and empirical research–based forecasting approaches; for example, in his 1978 book he concludes that the primary advantage of the popular but subjective Delphi method is that it is a gimmick that is acceptable to organizations. Nevertheless, he devotes a substantial portion of the handbook to judgmental methods. Indeed, judgment-based methods garner eight chapters compared with six for statistical-based methods. I enjoyed reading the chapters on role playing and judgmental bootstrapping (by Armstrong), intentions (by Vicki Morwitz), and improving judgment in forecasting (by Nigel Harvey). Given my personal bias for marketing topics, I also found Wittink and Bergestuen's treatment of forecasting with conjoint analysis interesting.

Among the chapters dealing with the statistical methods for forecasting, I found Armstrong, Adya, and Collopy's treatment of rule-based forecasting and Allen and Fildes's discussion on econometric forecasting fascinating and personally satisfying. Also, Remus and O'Connor and Collopy, Adya, and Armstrong have done a terrific job in simplifying two relatively complex subjects: neural networks and expert systems, respectively. In general, though, given that the statistical-based methods for forecasting are relatively more complex to discuss without involving the technical nuts and bolts and to summarize as set principles, I would have preferred to see a more elaborate treatment of these sections. Parts of this section lack the lucidity and depth prevalent in the rest of the book. Readers who are relatively new to the field will find it particularly difficult to traverse through some of these chapters.

Although the core positioning and objective of the handbook—to discuss, analyze, and summarize knowledge as a set of principles—is prevalent across the 30 essays, the style and approach differ. For the most part, Armstrong begins his essays with a global problem or a scenario from everyday life that serves as a useful tool to introduce the concept or issue addressed by that particular paper. For example, in his chapter on role playing he describes the Falkland situation in the mid-1970s and U.S. military strategies during the Vietnam War, to highlight the importance of role-play and the negative consequences of poor forecasts. His chapter on judgmental bootstrapping begins with a narration of an interesting personal experience during a flight from Denver to Philadelphia, and his "Whodunit murder mystery" scenario nicely sets the stage for the discussion on combining forecasts. This style is also present in essays by several of his contributors. For example, Gregory and Duran introduce the concept of scenarios and acceptance of forecasts in their introductory narration of "The Plumber and the Case of the Missing Ring." Such an approach helps the authors communicate complex concepts in an effective and often entertaining manner. However, several of the other essays adopt very different styles. For example, Morwitz's chapter on intentions starts with a listing of the nine key principles to be discussed and then proceeds to provide evidence in support of those principles. Although this could be a bit disconcerting for some readers who would like to see a consistent style of treatment across chapters, I found the differences refreshing.

Certain interesting and useful approaches in some of the chapters should perhaps have been adopted throughout the book. One such useful tool is the conclusion section of some of the essays that had specific subsections discussing the implications to researchers and practitioners. Such explicit implication sections provide completion to the method or issue addressed in the essay and put a proper perspective on its usefulness. Likewise, I found Brodie and colleagues' exhibit on evidence to support principles for market-share forecasting useful, and I would have liked similar exhibits in other chapters.

Cox and Loomis's examination of the diffusion of forecasting principles through books and Tashman and Hoover's discussion of diffusion through forecasting computer programs show that not all principles are created equal in terms of their emphasis by authors and software creators. It would be interesting to do a survey of forecasting researchers and practitioners to identify the relative importance they place on the 139 principles and to compare their evaluations with the results reported in these two chapters.

A useful online supplement to this handbook is the Forecasting Principles Web site (http://fourps.wharton.upenn.edu/forecast/). It includes such features as a comprehensive list of future research needs pertaining to the 139 principles identified in the handbook, which would have been a useful addition to the book itself. It also contains Armstrong's summary of which principles are used in available forecasting software and how other principles could be incorporated. This table would have fit well in Tashman and Hoover's software discussion. The handbook's dictionary of forecasting terms is also available at this site.

In conclusion, Armstrong's book goes beyond its stated goal of presenting the state of the art of forecasting research in the form of concrete principles; it sets the tone and direction for all future work in this area. The book has earned its place as the bible for forecasters and is a "must have" in every forecaster's library.

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REFERENCES

Armstrong, J. Scott (1978), *Long-Range Forecasting: From Crystal Ball to Computer*. New York: John Wiley and Sons.

OPTIMAL DATABASE MARKETING: STRATEGY, DEVELOPMENT, AND DATA MINING, Ronald G. Drozdenko and Perry D. Drake, Thousand Oaks, CA: Sage Publications, Inc., 2002, 398 pages, $54.95.

This book evolved out of the authors' collaboration with the Direct Marketing Educational Foundation to develop a