

Preface

In many situations the decision makers are concerned with choosing a preferred alternative, considering conflicting objectives and different attributes, which require them to develop a rating system or model to enable to consider all these elements in the decision-making process.

Unquestionable is the importance of building models that allow greater objectivity and confidence in the decision-making process. Professionals in various fields, from engineering and administration have sought to increase their knowledge about such models, given that currently, the information is a fundamental resource to support the decision makers in this context.

Hence, my interest in the topic emerged when I began my Ph.D. in Production Engineering at the University of Pernambuco, Brazil, in which I researched multicriteria decision models applied to partnerships management in the supply chain. Moreover, on this occasion I had the opportunity to meet researchers applying various methods in different contexts of decision. Therefore, I was excited with the possibility of adding to any decision context, methods and models that would make this process more efficient, without losing the inherent subjectivity that cannot be disregarded.

Therefore, when the Springer Publisher asked me to organize a book on decision models for engineering and administration, I sought colleagues from various universities and research institutions, experts in this matter, in order to bring together in a single book different decision situations illustrating how these methods can be applied. It is important to highlight that the intention of this book is not to present the modeling of problems through decision analysis only in terms of technical and analytical characteristics, but also in terms of the support and insight given to the decision makers.

The 16 chapters of this book bring together the knowledge and perceptual experience of professionals from diverse areas as Engineering, Management, Mathematics, Economics, Statistics, and Accounting. These different points of view contribute when they present models with different features suiting the various contexts of decision making at operational, tactical, and strategic levels. Thus, it will be possible to the reader to realize that it is not the problem that should suit the

method, but the method should be appropriate to the problem at hand. This aspect becomes essential because every decision must take into account certain variables, hence there is no rule or recipe that applies to all cases. In addition, it should be emphasized the importance of this process when it involves the ideal choice in the case of decisions that will have long-term consequences, configuring strategic decisions.

The purpose of this book is to bring a holistic vision of decision models applied to engineering and management, with special focus on methods of multicriteria decision aid, addressing issues as financial management; production and management processes; supplier selection and management of partnerships; public policies; waste management; energy and water industry; civil engineering and agribusiness.

Although this book is of a theoretical nature, it is also practical because it presents numerical applications and real cases that illustrate the role of decision models presented in the chapters. I emphasize that this book is aimed at students, professionals, and researchers in the various areas cited. A public that is interested in, and at the same time deepens its theoretical knowledge on decision models focused on areas of engineering and management, as well as accessing the applicability of these models in different contexts of decision.

Finally, I would like to take this opportunity to thank to all the contributors of this book, considering the high quality of their chapters. Also, I would like to gratefully acknowledge the funding received from the Brazilian science, technology, and innovation funding agencies, which support some of the research presented in this book.

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