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Practical Decision Making

An Introduction to the Analytic Hierarchy
Process (AHP) Using Super Decisions v2

 Springer

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Preface

Since the landmark publication of “Decision Making for Leaders” by Thomas L. Saaty in 1980, there have been several books on the topic. Some of them deal with the theory of the analytic hierarchy process (AHP) and others discuss its applications. The question is whether a new book on AHP is needed and why. The answer is based on our own experience as academic and practitioner of the AHP methodology.

First, AHP appeared as an intuitive and mathematically simple methodology in the field of multi-criteria decision-making in operations research (OR). Because of this, most AHP books assume the reader has basic OR mathematical background. Even books that claim to be extremely simple to understand usually demand from the reader “basic linear algebra and familiarity with vectors” as a prerequisite. Truthfully, these books are very simple to understand if you have the requested mathematical background. However, the problem starts when we try to teach AHP to decision-makers outside the OR field. AHP simplicity suggests that decision-makers from all disciplines can take advantage of the methodology if they can learn it without having to struggle with the mathematical jargon, no matter how simple it can be for an OR professional.

Teaching AHP fundamentals and applications to non-OR students requires a different approach from the one offered by traditional books. Similarly, when explaining and teaching the AHP method to corporate executives, it becomes clear that these professionals are in the best position to take advantage of using the AHP method, but at the same time they lack the time or interest to learn the math behind it. An approach that could provide them with a quick understanding of the method and most importantly, learn it well enough to use it in their business decisions is needed.

This book aims to fill in this need. It provides a quick and intuitive understanding of the methodology using spreadsheet examples and explains in a step-by-step fashion how to use the method using *Super Decisions*, a freely available software developed by the *Creative Decisions Foundation*. The level of math used in this book is at high-school level and we have avoided using

sophisticated terms to make the procedure easy to understand. This book is based on a 15-year experience practicing and teaching AHP to executives and non-OR students and is based on class notes developed for this purpose over time. Because of this, we are also indebted to our AHP students for inspiring us to write this book.

Pittsburgh
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Acknowledgments

An Introductory book on the analytic hierarchy process (AHP) would not have been possible without the creation of this methodology. The first author has been blessed with the opportunity to work with and being mentored by the AHP creator himself, Dr. Thomas Saaty, and for this reason he is very grateful. In addition, our work together with Rozann Whitaker in the International Journal and Symposium of the Analytic Hierarchy Process (IJAH/ISAHP) has been invaluable to make us understand the need to disseminate the “How-To” of AHP to potential practitioners. Also, we thank Heriberto Ortega, a passionate AHP student, who reviewed the examples, and Emily Shawgo who was key for the development of the supplementary material. Finally, without AHP students and practitioners, there would not have been the need and motivation to write anything in the first place and for this reason they deserve credit for bringing this book to life.

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Introduction

Human beings are required to make decisions at individual and collective levels. Initially, the decision-making process was studied as a rational process of analyzing a problem and seeking solutions; however, in recent years it has become clear that human beings are far from making decisions in a rational way, either as an individual or as part of a group.

Psychological studies have found cognitive anomalies or biases experienced by human beings when making decisions (Kahneman 2011). These cognitive biases and the increasing complexity of modern problems make it extremely important to adopt a methodology for making straightforward (easy to use and understand), effective (making the consistent decisions according to our criteria and interests), and safe (proven methodology) decisions.

The analytic hierarchy process (AHP) meets all these requirements and since its appearance in 1980, it has been adopted and used by a large number of institutions all over the world. For these reasons, this is the method that will be presented here for practical decision-making.

There are several books dealing with AHP theory and practice. This book is different in the sense that it intends to provide you with a practical introduction of AHP. In other words, upon reading this book you will be able to start using AHP in practical applications.

Reference

Kahneman, D. (2011). *Thinking fast and slow*. New York: Farrar, Straus and Giroux.