

# THE HANDBOOK OF FORECASTING: A MANAGER'S GUIDE

EDITED BY  
SPYROS MAKRIDAKIS  
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# THE HANDBOOK OF FORECASTING

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## A Manager's Guide

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## PREFACE

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The past decade has seen a number of major developments in the field of forecasting and planning. These have included an increasing number of sophisticated methodologies for preparing forecasts, experience in using such methodologies in a broader range of planning situations, and a deeper understanding of the psychological and organizational considerations that determine forecasting's impact on planning and decision making.

In addition, the events and environmental changes of the late 1970s and 1980s have presented managers with both significant challenges and significant opportunities in the field of forecasting. Some of the critical challenges have included:

1. Increasing economic uncertainty, not just in relation to basic factors like inflation, interest rates, and unemployment, but in the underlying relationships among economic factors.
2. Increasing complexity of econometric and time series forecasting techniques, requiring more data, better expertise, and more computations for their application.
3. Recognition that management judgment applied to problem identification and problem formulation must be matched with analytical skills if forecasting is to be effective.

Some of the developments that provide significant opportunities for dealing with these challenges include:

1. Technical and data communication advances that provide better access to improved data bases in several areas important to forecasting.
2. Better and cheaper access to computing power through time sharing, minicomputers, and "home" computers.
3. Increasing numbers of management students trained in the analytical techniques of forecasting who are eager and willing to work with experienced managers in forecasting and planning jobs.

In forecasting, as in all fields of systematic endeavor, applications in practice have lagged behind the development of both theory and technique. However, in the past 5 years a number of organizations and managers have gained solid experience in what seems to work and why. The purpose of this book is to bring together that knowledge and experience in a manner that will be most helpful to managers.

Three main guidelines have been used by the editors in preparing this volume. First, it is intended to be a handbook; that is, it is meant to serve as a reference book—to provide broad coverage, to be up to date, to be easy to read, and to be organized in a manner that makes it easy for the reader to find information. The Glossary, the detailed Subject Index, and the basic structure of the book were developed with this “handbook” role in mind.

A second major aspect of the book, highlighted by the title, is its intended audience. Not only have chapters been outlined and included on the basis of what managers need, but the individual orientation, topic coverage, and presentation of materials have all been geared to a management audience. The style of writing, the coverage of organizational issues and decision-making processes as they interact with forecasting, and the use of numerous practical illustrations, for example, are all in keeping with the needs of a management audience.

Finally, as the title makes clear, the book is about forecasting. However, in keeping with both the handbook role of the volume and the management audience, the definition that the editors have given to forecasting is much broader than that provided in most books on forecasting. It is the editors’ view that forecasting is not solely a staff function, separable from the management tasks of planning and decision making. Rather it is an integral part of those tasks, and while it often involves the use of staff to complement the manager’s time and abilities, the successful impact of forecasting is tied directly to the manager’s involvement, understanding, and need for forecasts. Unless managers are directly involved in preparing the forecasts, the chances that these forecasts will be incorporated into planning or decision making are slim. Thus several of the chapters in this book highlight the context within which forecasting must be applied and what both the manager and forecaster need to understand about each other’s roles to have the greatest impact on the organization’s performance.

This volume could not have been prepared even just a few years ago because of the lack of sufficient integrated experience among practitioners, analysts, and academics. Significant advances in the field, however, now make this handbook possible. The editors are the first to admit that several major limitations still exist, as highlighted in Chapter 33. Nonetheless, we do anticipate continued progress at an increasing pace during the next few years. If that assessment is correct, a second edition of this handbook will be able to report on the next

generation of developments and provide further support to management needs and efforts. This specific forecast by the editors is intended both to encourage those who don't find all the answers in this edition and to express our commitment to the field and its future.

The editors would like to give special thanks to the many authors who contributed to this handbook both in their individual chapters and in the overall structure and philosophy. We also appreciate the work of many managers who were willing to review the concepts in specific materials included in the handbook and hope that their efforts will make the book much more useful to its intended audience.

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*Fontainebleau, France*  
*Stanford, California*  
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PART

1

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ROLE AND  
APPLICATION OF  
FORECASTING IN  
ORGANIZATIONS



## CHAPTER

# 1

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## INTRODUCTION TO MANAGEMENT FORECASTING

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### Status and Needs

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While forecasting has always been an integral part of virtually all types of management decision making, as a discipline it has grown tremendously during the past two decades. Forecasting became a full-fledged field for both practitioners and academicians by the late 1970s as its importance to all forms of planning and decision making became apparent in such diverse areas as business, government, nonprofit institutions, and military organizations.

It is the editors' belief that forecasting is not just a statistical area, but the domain of psychology, sociology, politics, management science, economics, and other related disciplines. A major goal of this handbook is to provide an up-to-date summary of these perspectives and the progress that has been made in the forecasting field in recent years. These developments have been impressive, and their consequences for organizational decision making are of significant importance to managers and forecasters alike.



The purposes of this introductory chapter are three: First is to provide an overview of some of the major perspectives on forecasting that have appeared in the literature in the past two decades. These perspectives can serve as useful reference points for practitioners seeking to broaden their understanding of available approaches to forecasting and the challenges and issues being addressed at the present time. A second purpose is to provide an overview of the various sections of this handbook and to suggest some of the interrelationships among individual chapters. Finally, the management role in recognizing forecasting needs and developing procedures for meeting them in a manager's own organization is highlighted.

### ALTERNATIVE PERSPECTIVES ON FORECASTING

It is perhaps ironic that during the 1960s, when economic and political conditions were relatively stable for the industrialized countries of the world, there was little interest in forecasting among practitioners. In contrast, in the turbulent environment of the early 1980s, the need for forecasting has become widely recognized. The irony is that when forecasting is accurate, the need for it is limited, and few praise its successes. On the other hand, when forecasting is inaccurate, everyone complains about it; its potential usefulness is substantial, but its performance is less than satisfactory.

Formal forecasting started as a technical area dominated by statistical methods applied solely to historical data. In recent years, this emphasis has shifted, and while statistics and quantitative data still play important roles, the psychological and organizational aspects of forecasting have become increasingly important. In addition, it has become clear that many standard methodologies are not adequate for dealing fully with such areas as political forecasting, new product forecasting, long-term environmental forecasting, or with special events. In the 1980s, this set of circumstances has made the forecasting field particularly frustrating for practitioners seeking sound advice about which methods will give the best results for their specific needs. There is no single answer to such questions. However, an understanding of some of the alternative frameworks useful in viewing the forecasting field can help managers to develop their own guidelines. One such framework is summarized in Chart 1-1.

While Chart 1-1 simply summarizes examples of various combinations of these two dimensions of forecasting possibilities, understanding the pros and cons of each is one way to develop a reference point for planning forecasting applications. Let us first examine the rows in Chart 1-1. "Intuitive" forecasting refers to processes that are internal to the planner(s) or decision maker(s). Thus, while the same person may do the