OPTIMIZATION AND STRATEGIC DECISION MODELS IN INDUSTRIAL ENGINEERING

Editor

Assoc. Prof. Dr. Yunus EROĞLU

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Yayıncılık

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PREFACE

Industrial engineering provides methods for understanding complex systems, evaluating alternatives, and improving the use of limited resources. These tasks require careful attention to uncertainty, conflicting objectives, and the conditions under which decisions will be implemented.

Optimization and Strategic Decision Models in Industrial Engineering brings together eleven chapters addressing these concerns across different sectors. The contributions cover supply chain analytics, digital warehouse performance, pharmaceutical supply chains, capacity planning, green vehicle routing, maintenance contractor evaluation, industrial location selection, remanufacturing, occupational safety, post-disaster transportation networks, and generative artificial intelligence product development in healthcare.

The chapters employ a range of approaches, including mathematical optimization, multi-criteria decision-making, machine learning, cooperative game theory, queueing models, and scenario analysis. Some develop and apply decision models; others present conceptual frameworks or review existing research. Together, they illustrate how the choice of method depends on the problem, the available evidence, and the purpose of the analysis.

A recurring concern throughout the book is the relationship between operational decisions and broader organizational objectives. Routing decisions affect costs and emissions; capacity choices depend on how uncertainty is represented; technology investments require meaningful performance measures; and safety and resilience assessments influence how resources are prioritized. These connections give the volume its common direction while preserving the distinct focus of each contribution.

This book is intended for researchers, graduate students, and practitioners working in industrial engineering and related fields. I hope that the studies presented here provide useful examples for research, teaching, and practice, and encourage further work on the problems they address.

I thank the contributing authors for their work and the publishing team for their support in preparing this volume.

Assoc. Prof. Dr. Yunus EROĞLU

Editor

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