Introduction To Operations Research Tenth Edition

Incorporating a number of the author's recent ideas and examples, Dynamic Programming: Foundations and Principles, Second Edition presents a comprehensive and rigorous treatment of dynamic programming. The author emphasizes the crucial role that modeling plays in understanding this area. He also shows how Dijkstra's algorithm is an excellent example of a dynamic programming algorithm, despite the impression given by the computer science literature. New to the Second Edition Expanded discussions of sequential decision models and the role of the state variable in modeling A new chapter on forward dynamic programming models A new chapter on the Push method that gives a dynamic programming perspective on Dijkstra's algorithm for the shortest path problem A new appendix on the Corridor method Taking into account recent developments in dynamic programming, this edition continues to provide a systematic, formal outline of Bellman's approach to dynamic programming. It looks at dynamic programming as a problem-solving methodology, identifying its constituent components and explaining its theoretical basis for tackling problems.

This book constitutes revised and selected papers from the 18th International Conference on Mathematical Optimization Theory and Operations Research, MOTOR 2019, held in Ekaterinburg, Russia, in July 2019. The 40 full papers and 4 short papers presented in this volume were carefully reviewed and selected from a total of 170 submissions. The papers in the volume are organised according to the following topical headings: ?combinatorial optimization; game theory and mathematical economics; data mining and computational geometry; integer programming; mathematical programming; operations research; optimal control and applications.

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This book provides a comprehensive introduction to nonlinear programming, featuring a broad range of applications and solution methods in the field of continuous optimization. It begins with a summary of classical results on unconstrained optimization, followed by a wealth of applications from a diverse mix of fields, e.g. location analysis, traffic planning, and water quality management, to name but a few. In turn, the book presents a formal description of optimality conditions, followed by an in-depth discussion of the main solution techniques. Each method is formally described, and then fully solved using a numerical example.

The Defense Science Board (DSB) Advisory Group was asked to examine the use of operations research (OR) methods to support Intelligence, Surveillance and Reconnaissance (ISR) decision making within the DoD. The DSB was asked to survey the departments and agencies to determine how much OR is being performed; assess how the results of OR are being used in decision making; recommend a test cases(s) for using OR methodologies; and recommend steps DoD can take to institutionalize the use of OR in future DoD decision making. Illustrations.

A single source guide to operations research (OR) techniques, this book covers emerging OR methodologies in a clear, concise, and unified manner. Building a bridge between theory and practice, it begins with coverage of fundamental models and methods such as linear, nonlinear, integer, and dynamic programming, networks, simulation, queuing, inventory, stochastic processes, and decision analysis. The book then explores emerging techniques including multiple criteria optimization, meta heuristics, robust optimization, and complexity and large scale networks. Each chapter gives an overview of a particular methodology, illustrates successful applications, and provides references to computer software availability.

The field of industrial engineering continues to advance at a rapid rate due to innovative technologies such as robotics and automation that improve performance and efficiencies. Emerging research on these latest trends, strategies, and techniques is needed to ensure that industry professionals remain up to date on the best practices for success. Optimizing Current Strategies and Applications in Industrial Engineering is a pivotal reference source that provides vital research on the development, improvement, implementation, and evaluation of integrated systems in engineering. While highlighting topics such as engineering economy, material handling, and operations management, this book is ideally designed for engineers, policymakers, educators, researchers, and practitioners.

For over four decades, Introduction to Operations Research by Frederick Hillier has been the classic text on operations research. While building on the classic strengths of the text, the author continues to find new ways to make the text current and relevant to students. One way is by incorporating a wealth of state-of-the-art, user-friendly software and more coverage of business applications than ever before. The hallmark features of this edition include clear and comprehensive coverage of fundamentals, an extensive set of interesting problems and cases, and state-of-the-practice operations research software used in conjunction with examples from the text. The ninth edition introduces a new partnership with the Institute for Operations Research and Management (INFORMS). These two pillars of the OR world have come together to showcase some of the award-winning applications of operations research and integrate them with this text.

Problems with multiple objectives and criteria are generally known as multiple criteria optimization or multiple criteria decision-making (MCDM) problems. So far, these types of problems have typically been modelled and solved by means of linear programming. However, many real-life phenomena are of a nonlinear nature, which is why we need tools for nonlinear programming capable of handling several conflicting or incommensurable objectives. In this case, methods of traditional single objective optimization and linear programming are not enough; we need new ways of thinking, new concepts, and new methods - nonlinear multiobjective optimization. Nonlinear Multiobjective Optimization provides an extensive, up-to-date, self-contained and consistent survey, review of the literature and of the state of the art on nonlinear (deterministic) multiobjective optimization, its methods, its theory and its background. The amount of literature on multiobjective optimization is immense. The treatment in this book is based on approximately 1500 publications in English printed mainly after the year 1980. Problems related to real-life applications often contain irregularities and nonsmoothnesses. The treatment of nondifferentiable multiobjective optimization in the literature is rather rare. For this reason, this book contains material about the possibilities, background, theory and methods of nondifferentiable multiobjective optimization as well. This book is intended for both researchers and students in the areas of (applied) mathematics, engineering, economics, operations research and management science; it is meant for both professionals and practitioners in many different fields of application. The intention has been to provide a consistent summary that may help in selecting an appropriate method for the problem to be solved. It is hoped the extensive bibliography will be of value to researchers.

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This textbook teaches the basic concepts and methods of project management but also explains how to convert them to useful results in practice. Project management offers a promising working area for theoretical and practical applications, and developing software and decision support systems (DSS). This book specifically focuses on project planning and control, with an emphasis on mathematical modeling. Models and algorithms establish a good starting point for students to study the relevant literature and support pursuing academic work in related fields. The book provides an introduction to theoretical concepts, and it also provides detailed explanations, application examples, and case studies that deal with real-life problems. The chapter topics include questions that underlie critical thinking, interpretation, analytics, and making comparisons. Learning outcomes are defined and the content of the book is structured following these goals. Chapter 1 begins by introducing the basic concepts, methods, and processes of project management. This Chapter constitutes the base for defining and modeling project management problems. Chapter 2 explores the fundamentals of organizing and managing projects from an organization's perspective. Issues related to project team formation, the role of project managers, and organization types are discussed. Chapter 3 is devoted to project planning and network modeling of projects, covering fundamental concepts such as project scope, Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), Cost Breakdown Structure (CBS), project network modeling, activity duration, and cost estimating, activity-based costing (ABC), data and knowledge management. Chapter 4 introduces deterministic scheduling models, which can be used in constructing the time schedules. Models employing time-based and finance-based objectives are introduced. The CPM is covered. The unconstrained version of maximizing Net Present Value (NPV) is also treated here together with the case of time-dependent cash flows. Chapter 5 focuses on the time/cost trade-off problem, explaining how to reduce the duration of some of the activities and therefore reduce the project duration at the expense of additional costs. This topic is addressed for both continuous and discrete cases. Chapter 6 discusses models and methods of scheduling under uncertain activity durations. PERT is introduced for minimizing the expected project duration and extended to the PERT-Costing method for minimizing the expected project cost. Simulation is presented as another approach for dealing with the uncertainty in activity durations and costs. To demonstrate the use of the PERT, a case study on constructing an earthquake-resistant residential house is presented. Classifications of resource and schedule types are given in Chapter 7, and exact and heuristic solution procedures for the single- and multi-mode resource constrained project scheduling problem (RCPSP) are presented. The objective of maximizing NPV under resource constraints is addressed, and the capital-constrained project scheduling model is introduced. In Chapter 8, resource leveling, and further resource management problems are introduced. Total adjustment cost and resource availability cost problems are introduced. Various exact models are investigated. A heuristic solution procedure for the resource leveling problem is presented in detail. Also, resource portfolio management policies and the resource portfolio management problem are discussed. A case study on resource leveling dealing with the annual audit project of a major corporation is presented. Project contract types and payment schedules constitute the topics of Chapter 9. Contracts are legal documents reflecting the results of some form of client-contractor negotiations and sometimes of a bidding process, which deserve closer attention. Identification and allocation of risk in contracts, project control issues, disputes, and resolution management are further topics covered in this Chapter. A bidding model is presented to investigate client-contractor negotiations and the bidding process from different aspects. Chapter 10 focuses on processes and methods for project monitoring and control. Earned Value Management is studied to measure the project performance throughout the life of a project and to estimate the expected project time and cost based on the current status of the project. How to incorporate inflation into the analysis is presented. In Chapter 11, qualitative and quantitative techniques including decision trees, simulation, and software applications are introduced. Risk phases are defined and building a risk register is addressed. An example risk breakdown structure is presented. The design of risk management processes is introduced, and risk response planning strategies are discussed. At the end of the Chapter, the quantitative risk analysis is demonstrated at the hand of a team discussion case study. Chapter 12 covers several models and approaches dealing with various stochastic aspects of the decision environment. Stochastic models, generation of robust schedules, use of reactive and fuzzy approaches are presented. Sensitivity and scenario analysis are introduced. Also, simulation analysis, which is widely used to analyze the impacts of uncertainty on project goals, is presented. Chapter 13 addresses repetitive projects that involve the production or construction of similar units in batches such as railway cars or residential houses. Particularly in the construction industry repetitive projects represent a large portion of the work accomplished in this sector of the economy. A case study on the 50 km section of a motorway project is used for demonstrating the handling of repetitive project management. How best to select one or more of a set of candidate projects to maintain a project portfolio is an important problem for project-based organizations with limited resources. The project selection problem is inherently a multi-objective problem and is treated as such in

Chapter 14. Several models and solution techniques are introduced. A multi-objective, multi-period project selection and scheduling model is presented. A case study that addresses a project portfolio selection and scheduling problem for the construction of a set of dams in a region is presented. Finally, Chapter 15 discusses three promising research areas in project management in detail: (i) Sustainability and Project Management, (ii) Project Management in the Era of Big Data, and (iii) the Fourth Industrial Revolution and the New Age Project Management. We elaborate on the importance of sustainability in project management practices, discuss how developments in data analytics might impact project life cycle management, and speculate how the infinite possibilities of the Fourth Industrial Revolution and the new technologies will transform project management practices.

?????Introduction to Operations Research with Student Access CardMcGraw-Hill Science/Engineering/Math

"This book offers the latest research in IS/IT applications related to business and operations management, with contributions in the form of case studies, methodologies, best practices, frameworks, and research"--Provided by publisher.

This book presents the Multiple Criteria Decision Making (MCDM) paradigm for modelling agricultural decision-making in three parts. The first part, comprising two chapters, is philosophical in nature and deals with the concepts that define the underlying structure of the MCDM paradigm. The second part is the largest part consisting of five chapters, each of which presents the logic of a specific MCDM technique, and demonstrates how it can be used to model a particular decision problem. In the final part, some selected applications of the MCDM techniques to agricultural problems are presented and thus reinforce the development of an understanding of the MCDM paradigm. The book has been designed for use at different levels: as a textbook for final year undergraduate and postgraduate courses in modelling for decision-making; as a manual for researchers and practising modellers; and, as general reference on the application of MCDM techniques. Readers with basic appreciation of algebra and linear programming can easily follow the contents of this book.

The integration of accounting and the economics of information developed by Joel S. Demski and those he inspired has revolutionized accounting thought. This volume collects papers on accounting theory in honor of Professor Demski. The book also contains an extensive review of Professor Demski's own contributions to the theory of accounting over the past four decades.

This book constitutes the proceedings of the 8th International Heinz Nixdorf Symposium, IHNS 2010, held in Paderborn, Germany, April 21-22, 2010, under the title "Changing Paradigms: Advanced Manufacturing and Sustainable Logistics". The 27 full and two short papers presented in this book were carefully reviewed and selected from a total of 63 submissions. They are grouped in five parts on Supply Chain Management, Production Logistics and Industrial Engineering, Operations Research Techniques, Humanitarian Logistics, and Simulation. The presentation is completed by nine invited keynote papers from renowned international experts in these fields.

For over four decades, Introduction to Operations Research by Frederick Hillier has been the classic text on operations research. While building on the classic strengths of the text, the author continues to find new ways to make the text current and relevant to students. One way is by incorporating a wealth of state-of-the-art, user-friendly software and more coverage of business applications than ever before. The hallmark features of this edition include clear and comprehensive coverage of fundamentals, an extensive set of interesting problems and cases, and state-of-the-practice operations research software used in conjunction with examples from the text. The tenth edition includes new section and chapters, updated problems, and state-of-the-practice operations research software used in conjunction with the examples from the text. McGraw-Hill is proud to offer Connect with the tenth edition of Hillier's, Introduction to Operations Research. This innovative and powerful system helps your students learn more efficiently and gives you the ability to customize your homework problems simply and easily. Track individual student performance - by question, assignment, or in relation to the class overall with detailed grade reports. ConnectPlus provides students with all the advantages of Connect, plus 24/7 access to an eBook. Hillier's Introduction to Operations Research, tenth edition, includes the power of McGraw-Hill's LearnSmart--a proven adaptive learning system that helps students learn faster, study more efficiently, and retain more knowledge through a series of adaptive questions. This innovative study tool pinpoints concepts the student does not understand and maps out a personalized plan for success.

A practical, step-by-step guide to total systems management Systems Engineering Management, Fifth Edition is a practical guide to the tools and methodologies used in the field. Using a "total systems management" approach, this book covers everything from initial establishment to system retirement, including design and development, testing, production, operations, maintenance, and support. This new edition has been fully updated to reflect the latest tools and best practices, and includes rich discussion on computer-based modeling and hardware and software systems integration. New case studies illustrate real-world application on both large- and small-scale systems in a variety of industries, and the companion website provides access to bonus case studies and helpful review checklists. The provided instructor's manual eases classroom integration, and updated end-of-chapter questions help reinforce the material. The challenges faced by system engineers are candidly addressed, with full guidance toward the tools they use daily to reduce costs and increase efficiency. System Engineering Management integrates industrial engineering, project management, and leadership skills into a unique emerging field. This book unifies these different skill sets into a single step-by-step approach that produces a well-rounded systems engineering management framework. Learn the total systems lifecycle with real-world applications Explore cutting edge design methods and technology Integrate software and hardware systems for total SEM Learn the critical IT principles that lead to robust systems Successful systems engineering managers must be capable of leading teams to produce systems that are robust, high-quality, supportable, cost effective, and responsive. Skilled, knowledgeable professionals are in demand across engineering fields, but also in industries as diverse as healthcare and communications. Systems Engineering Management, Fifth Edition provides practical, invaluable guidance for a nuanced field.

Operations Research (OR) began as an interdisciplinary activity to solve complex military problems during World War II. Utilizing principles from mathematics, engineering, business, computer science, economics, and statistics, OR has developed into a full fledged academic discipline with practical application in business, industry, government and military. Currently regarded as a body of established mathematical models and methods essential to solving complicated management issues, OR provides quantitative analysis of problems from which managers can make objective decisions. Operations Research and Management Science (OR/MS) methodologies continue to flourish in numerous decision making fields. Featuring a mix of international authors, Operations Research and Management Science Handbook combines OR/MS models, methods, and applications into one comprehensive, yet concise volume. The first resource to reach for when confronting OR/MS difficulties, this text – Provides a single source guide in OR/MS Bridges theory and practice Covers all topics relevant to OR/MS Offers a quick reference guide for students, researchers and practitioners Contains unified and up-to-date coverage designed and edited with non-experts in mind Discusses software availability for all OR/MS techniques Includes contributions from a mix of domestic and international experts The 26 chapters in the handbook are divided into two parts. Part I contains 14 chapters that cover the fundamental OR/MS models and methods. Each chapter gives an overview of a particular OR/MS model, its solution methods and illustrates successful applications. Part II of the handbook contains 11 chapters discussing the OR/MS applications in specific areas. They include airlines, e-commerce, energy systems, finance, military, production systems, project management, quality control, reliability, supply chain management and water resources. Part II ends with a chapter on the future of OR/MS applications.

Clear, concise instruction for all CFA Program Level I concepts and competencies for the 2020 exam The same official curricula that CFA Program candidates receive with program registration is now publicly available for purchase. CFA Program Curriculum 2020 Level I, Volumes 1-6 provides the complete Level I curriculum for the 2020 exam, delivering the Candidate Body of Knowledge (CBOK) with expert instruction on all 10 topic areas of the CFA Program. Fundamental concepts are explained in-depth with a heavily visual style, while cases and examples demonstrate how concepts apply in real-world scenarios. Coverage includes ethical and professional standards, quantitative analysis, economics, financial reporting and analysis, corporate finance, equities, fixed income, derivatives, alternative investments, and portfolio management, all organized into individual sessions with clearly defined Learning Outcome Statements. Charts, graphs, figures, diagrams, and financial statements illustrate concepts to facilitate retention, and practice questions provide the opportunity to gauge your understanding while reinforcing important concepts. Learning Outcome Statement checklists guide readers to important concepts to derive from the readings Embedded case studies and examples throughout demonstrate practical application of concepts Figures, diagrams, and additional commentary make difficult concepts accessible Practice problems support learning and retention CFA Institute promotes the highest standards of ethics, education, and professional excellence among investment professionals. The CFA Program curriculum guides you through the breadth of knowledge required to uphold these standards.

One of the most well-known of all network optimization problems is the shortest path problem, where a shortest connection between two locations in a road network is to be found. This problem is the basis of route planners in vehicles and on the Internet. Networks are very common structures; they consist primarily of a ?nite number of locations (points, nodes), together with a number of links (edges, arcs, connections) between the locations. Very often a certain number is attached to the links, expressing the distance or the cost between the end points of that connection. Networks occur in an extremely wide range of applications, among them are: road networks; cable networks; human relations networks; project scheduling networks; production networks; distribution networks; neural networks; networks of atoms in molecules. In all these cases there are "objects" and "relations" between the objects. A n- work optimization problem is actually nothing else than the problem of ?nding a subset of the objects and the relations, such that a certain optimization objective is satis?ed.

This book provides an overview of the main methods and results in the formal study of the human decision-making process, as defined in a relatively wide sense. A key aim of the approach contained here is to try to break down barriers between various disciplines encompassed by this field, including psychology, economics and computer science. All these approaches have contributed to progress in this very important and much-studied topic in the past, but none have proved sufficient so far to define a complete understanding of the highly complex processes and outcomes. This book provides the reader with state-of-the-art coverage of the field, essentially forming a roadmap to the field of decision analysis. The first part of the book is devoted to basic concepts and techniques for representing and solving decision problems, ranging from operational research to artificial intelligence. Later chapters provide an extensive overview of the decision-making process under conditions of risk and uncertainty. Finally, there are chapters covering various approaches to multi-criteria decision-making. Each chapter is written by experts in the topic concerned, and contains an extensive bibliography for further reading and reference.

Manufacturing systems have become increasingly complex over recent years. This volume presents a collection of chapters which reflect the recent developments of probabilistic models and methodologies that have either been motivated by manufacturing systems research or been demonstrated to have significant potential in such research. The editor has invited a number of leading experts to present detailed expositions of specific topics. These include: Jackson networks, fluid models, diffusion and strong approximations, the GSMP framework, stochastic convexity and majorization, perturbation analysis, scheduling via Brownian models, and re-entrant lines and dynamic scheduling. Each chapter has been written with graduate students in mind, and several have been used in graduate courses that teach the modeling and analysis of manufacturing systems.

As the age of Big Data emerges, it becomes necessary to take the five dimensions of Big Data- volume, variety, velocity, volatility, and veracity- and focus these dimensions towards one critical emphasis - value. The Encyclopedia of Business Analytics and Optimization confronts the challenges of information retrieval in the age of Big Data by exploring recent advances in the areas of knowledge management, data visualization, interdisciplinary communication, and others. Through its critical approach and practical application, this book will be a must-have reference for any professional, leader, analyst, or manager interested in making the most of the knowledge resources at their disposal.

Although several books or monographs on multiobjective optimization under uncertainty have been published, there seems to be no book which starts with an introductory chapter of linear programming and is designed to incorporate both fuzziness and randomness into multiobjective programming in a unified way. In this book, five major topics, linear programming, multiobjective programming, fuzzy programming, stochastic programming, and fuzzy stochastic programming, are presented in a comprehensive manner. Especially, the last four topics together comprise the main characteristics of this book, and special stress is placed on interactive decision making aspects of multiobjective programming for human-centered systems in most realistic situations under fuzziness and/or randomness. Organization of each chapter is briefly summarized as follows: Chapter 2 is a concise and condensed description of the theory of linear programming and its algorithms. Chapter 3 discusses fundamental notions and methods of multiobjective linear programming and concludes with interactive multiobjective linear programming. In Chapter 4, starting with clear explanations of fuzzy linear programming and fuzzy multiobjective linear programming, interactive fuzzy multiobjective linear programming is presented. Chapter 5 gives detailed explanations of fundamental notions and methods of stochastic programming including two-stage programming and chance constrained programming. Chapter 6 develops several interactive fuzzy programming approaches to multiobjective stochastic programming problems. Applications to purchase and transportation planning for food retailing are considered in Chapter 7. The book is self-contained because of the three appendices and answers to problems. Appendix A contains a brief summary of the topics from linear algebra. Pertinent results from nonlinear programming are summarized in Appendix B. Appendix C is a clear explanation of the Excel Solver, one of the easiest ways

to solve optimization problems, through the use of simple examples of linear and nonlinear programming.

Whether you are a novice investor or an experienced practitioner, Quantitative Investment Analysis, 4th Edition has something for you. Part of the CFA Institute Investment Series, this authoritative guide is relevant the world over and will facilitate your mastery of quantitative methods and their application in today's investment process. This updated edition provides all the statistical tools and latest information you need to be a confident and knowledgeable investor. This edition expands coverage to Machine Learning algorithms and the role of Big Data in an investment context along with capstone chapters in applying these techniques to factor modeling, risk management and backtesting and simulation in investment strategies. The authors go to great lengths to ensure an even treatment of subject matter, consistency of mathematical notation, and continuity of topic coverage that is critical to the learning process. Well suited for motivated individuals who learn on their own, as well as general reference, this complete resource delivers clear, example-driven coverage of a wide range of quantitative methods. Inside you'll find: Learning outcome statements (LOS) specifying the objective of each chapter A diverse variety of investment-oriented examples both aligned with the LOS and reflecting the realities of today's investment world A wealth of practice problems, charts, tables, and graphs to clarify and reinforce the concepts and tools of quantitative investment management Sharpen your skills by furthering your hands-on experience in the Quantitative Investment Analysis Workbook, 4th Edition—an essential guide containing learning outcomes and summary overview sections, along with challenging problems and solutions.

Of the more than $300 billion spent on plant maintenance and operations, U.S. industry spends as much as 80 percent of this amount to correct chronic failures of machines, systems, and people. With machines and systems becoming increasingly complex, this problem can only worsen, and there is a clear and pressing need to establish comprehensive equi

Due to its societal and economic relevance, Project Management (PM) has become an important discipline and a concept critical to modern organizations, public and private. PM as an academic discipline is discussed both in Management Science and in Operations Research. Management Science tends to focus on quantitative tools and the soft skills necessary to manage projects successfully. Operations Research gives the essential scientific contribution to the success of project management through the development of models and algorithms. In Management Science, Operations Research and Project Management, José Ramón San Cristóbal Mateo fills the gap between scientific research and the practical application of that research. Project managers need formal training in decision-making but sometimes, they do not have an in-depth knowledge of Operations Research or they lack the necessary theoretical background. This book, with its focus on the quantitative models of Operations Research and Management Science applied to Project Management, provides project managers with the tools and methods necessary to manage projects successfully. Project managers operate in a complex global environment, in which numerous factors need to be considered, such as minimizing total project costs, meeting contracted dates, and ensuring that activities achieve certain quality levels. The focus here on the application of quantitative models of Operations Research and Management Science applied to Project Management provides them with the tools and methods necessary to make sound decisions.

Cognition-driven decision support system (DSS) has been recognized as a paradigm in the research and development of business intelligence (BI). Cognitive decision support aims to help managers in their decision making from human cognitive aspects, such as thinking, sensing, understanding and predicting, and fully reuse their experience. Among these cognitive aspects, decision makers' situation awareness (SA) and mental models are considered to be two important prerequisites for decision making, particularly in ill-structured and dynamic decision situations with uncertainties, time pressure and high personal stake. In today's business domain, decision making is becoming increasingly complex. To make a successful decision, managers' SA about their business environments becomes a critical factor. This book presents theoretical models as well practical techniques of cognitiondriven DSS. It first introduces some important concepts of cognition orientation in decision making process and some techniques in related research areas including DSS, data warehouse and BI, offering readers a preliminary for moving forward in this book. It then proposes a cognition-driven decision process (CDDP) model which incorporates SA and experience (mental models) as its central components. The goal of the CDDP model is to facilitate cognitive decision support to managers on the basis of BI systems. It also presents relevant techniques developed to support the implementation of the CDDP model in a BI environment. Key issues addressed of a typical business decision cycle in the CDDP model include: natural language interface for a manager's SA input, extraction of SA semantics, construction of data warehouse queries based on the manger's SA and experience, situation information retrieval from data warehouse, how the manager perceives situation information and update SA, how the manager's SA leads to a final decision. Finally, a cognition-driven DSS, FACETS, and two illustrative applications of this system are discussed.