
Application Of Ahp Method For The Selection Of Srce

10th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions - ICSCCW-2019

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Introduction to the Analytic Hierarchy Process

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Advances in Research and Applications

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ELLISON ISABEL

10th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions - ICSCCW-2019 Springer Science & Business Media

Strategic Decision Making provides an effective, formal methodology that provides help with decision making problems, especially strategic ones with high stakes involving human perceptions and judgements. Focusing on applying the AHP to decision-making problems, Strategic Decision Making covers problems in the realms of business, defence and governance. Using case studies drawn from years of experience, the book discusses decision making for real life problems and includes many worked examples and solutions to problems throughout. The reader will gain comprehensive exposure to the extent of assistance that a formal methodology, such as AHP, can provide to the decision maker in evolving decisions in complex and varied domains.

Practical Decision Making Springer Nature

The purpose of this book is to provide an introduction to the theory and applications in the field of decision making, especially focused on Analytic Hierarchy Process, a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Prof. Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. The idea of the book is to expand the reader's consciousness to deal with problems regarding the decision making. This book presents some application examples of Analytic Hierarchy. It contains original research and application chapters from different perspectives, and covers different areas such as supply chain, environmental engineering, safety, and social issues. This book is intended to be a useful resource for anyone who deals with decision making problems.

Readings in Multiple Criteria Decision Aid Springer

In two volumes, this new edition presents the state of the art in Multiple Criteria Decision Analysis (MCDA). Reflecting the explosive growth in the field seen during the last several years, the editors not only present surveys of the foundations of MCDA, but look as well at many new areas and new applications. Individual chapter authors are among the most prestigious names in MCDA research, and combined their chapters bring the field completely up to date. Part I of the book considers the history and current state of MCDA, with surveys that cover the early history of MCDA and an overview that discusses the "pre-theoretical" assumptions of MCDA. Part II then presents the foundations of MCDA, with individual chapters that provide a very exhaustive review of preference modeling, along with a chapter devoted to the axiomatic basis of the different models that multiple criteria preferences. Part III looks at outranking methods, with three chapters that consider the ELECTRE methods, PROMETHEE methods, and a look at the rich literature of other outranking methods. Part IV, on Multiattribute Utility and Value Theories (MAUT), presents chapters on the fundamentals of this approach, the very well known UTA methods, the Analytic Hierarchy Process (AHP) and its more recent extension, the Analytic Network Process (ANP), as well as a chapter on

MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique). Part V looks at Non-Classical MCDA Approaches, with chapters on risk and uncertainty in MCDA, the decision rule approach to MCDA, the fuzzy integral approach, the verbal decision methods, and a tentative assessment of the role of fuzzy sets in decision analysis. Part VI, on Multiobjective Optimization, contains chapters on recent developments of vector and set optimization, the state of the art in continuous multiobjective programming, multiobjective combinatorial optimization, fuzzy multicriteria optimization, a review of the field of goal programming, interactive methods for solving multiobjective optimization problems, and relationships between MCDA and evolutionary multiobjective optimization (EMO). Part VII, on Applications, selects some of the most significant areas, including contributions of MCDA in finance, energy planning problems, telecommunication network planning and design, sustainable development, and portfolio analysis. Finally, Part VIII, on MCDM software, presents well known MCDA software packages.

Application of Analytic Hierarchy Process in Supplier Selection Process - A Case Study of Company A's Server Division Springer

The book is a collection of high-quality peer-reviewed research papers presented in the Second International Conference on Computational Intelligence in Data Mining (ICCIDM 2015) held at Bhubaneswar, Odisha, India during 5 - 6 December 2015. The two-volume Proceedings address the difficulties and challenges for the seamless integration of two core disciplines of computer science, i.e., computational intelligence and data mining. The book addresses different methods and techniques of integration for enhancing the overall goal of data mining. The book helps to disseminate the knowledge about some innovative, active research directions in the field of data mining, machine and computational intelligence, along with some current issues and applications of related topics.

Decision Aids for Selection Problems John Wiley & Sons

One of the most important tasks faced by decision-makers in business and government is that of selection. Selection problems are challenging in that they require the balancing of multiple, often conflicting, criteria. In recent years, a number of interesting decision aids have become available to assist in such decisions. The aim of this book is to provide a comparative survey of many of the decision aids currently available. The first chapters present general ideas which underpin the methodologies used to design these aids. Subsequent chapters then focus on specific decision aids and demonstrate some of the software which implement these ideas. A final chapter provides a comparative analysis of their strengths and weaknesses.

Multicriteria Decision Making Applications and Theory of Analytic Hierarchy Process Decision Making for Strategic Decisions

The Analytic Hierarchy Process (AHP) and its generalization to dependence and feedback, the Analytic Network Process (ANP), are methods of relative measurement of tangibles and intangibles. Being able to derive such measurements is essential for making good decisions. This book is based on the Analytic Network Process and lays out a new approach for making decisions in light of their

benefits, opportunities, costs and risks (BOCR) shows how to include the strategic criteria of the decision-maker that must be satisfied regardless of the particular decision being undertaken. This book includes all the important background material from the earlier book, *The Analytic Network Process: Decision Making with Dependence and Feedback*, published in 2001, and goes farther with new examples of estimating market share of companies based on the intangibles of customer perception, and new applications involving Benefits, Opportunities, Costs and Risks.

Theory and Applications in Decision Making Springer Science & Business Media

This book comprises select peer-reviewed papers from the International Conference on Emerging Trends in Electromechanical Technologies & Management (TEMT) 2019. The focus is on current research in interdisciplinary areas of mechanical, electrical, electronics and information technologies, and their management from design to market. The book covers a wide range of topics such as computer integrated manufacturing, additive manufacturing, materials science and engineering, simulation and modelling, finite element analysis, operations and supply chain management, decision sciences, business analytics, project management, and sustainable freight transportation. The book will be of interest to researchers and practitioners of various disciplines, in particular mechanical and industrial engineering.

Developments in Healthcare Information Systems and Technologies: Models and Methods Springer

This book describes a wide range real-case applications of Multi-Criteria Decision Making (MCDM) in maritime related subjects including shipping, port, maritime logistics, cruise ports, waterfront developments, and shipping finance, etc. In such areas, researchers, students and industrialists, in general, felt struggling to find a step-by-step guide on how to apply MCDM to formulate effective solutions to solving real problems in practice. This book focuses on the in-depth analysis and applications of the most well-known MCDM methodologies in the aforementioned areas. It brings together an eclectic collection of twelve chapters which seek to respond to these challenges. The book begins with an introduction and is followed by an overview of major MCDM techniques. The next chapter examines the theory of analytic hierarchy process (AHP) in detail and investigates a fuzzy AHP (FAHP) approach and its capability and rationale in dealing with decision problems of ambiguous information. Chapter 4 proposes a generic methodology to identify the key factors influencing green shipping and to establish an evaluation system for the assessment of shipping greenness. In Chapter 5, the authors describe a new function of fuzzy Evidential Reasoning (ER) to improve the vessel selection process in which multiple criteria with insufficient and ambiguous information are evaluated and synthesized. Chapter 6 presents a novel methodology by using an Artificial Potential Field (APF) model and the ER approach to estimate the collision probabilities of monitoring targets for coastal radar surveillance. Chapter 7 develops the inland port performance assessment model (IPPAM) using a hybrid of AHP, ER and a utility function. The next chapter showcases a challenging approach to address the risk and uncertainty in LNG transfer operations, by utilizing a Stochastic Utility Additives (UTA) method with the help of the philosophy of aggregation-disaggregation coupled with a robustness control procedure. Chapter 9 uses Entropy and Grey Relation Analysis (GRA) to analyze the relative weights of financial ratios through the case studies of the four major shipping companies in Korea and Taiwan: Evergreen, Yang Ming, Hanjin and Hyundai Merchant Marine. Chapter 10 systemically applies modern heuristics to solving MCDM

problems in the fields of operation optimisation in container terminals. Arguing that bunkering port selection is typically a multi-criteria group decision problem, and in many practical situations, decision makers cannot form proper judgments using incomplete and uncertain information in an environment with exact and crisp values, in Chapter 11, the authors propose a hybrid Fuzzy-Delphi-TOPSIS based methodology with a sensitivity analysis. Finally, Chapter 12 deals with a new conceptual port performance indicators (PPIs) interdependency model using a hybrid approach of a fuzzy logic based evidential reasoning (FER) and a decision making trial and evaluation laboratory (DEMATEL).

Advances in Electromechanical Technologies Pearson Education

Clear and effective instruction on MADM methods for students, researchers, and practitioners. A Handbook on Multi-Attribute Decision-Making Methods describes multi-attribute decision-making (MADM) methods and provides step-by-step guidelines for applying them. The authors describe the most important MADM methods and provide an assessment of their performance in solving problems across disciplines. After offering an overview of decision-making and its fundamental concepts, this book covers 20 leading MADM methods and contains an appendix on weight assignment methods. Chapters are arranged with optimal learning in mind, so you can easily engage with the content found in each chapter. Dedicated readers may go through the entire book to gain a deep understanding of MADM methods and their theoretical foundation, and others may choose to review only specific chapters. Each standalone chapter contains a brief description of prerequisite materials, methods, and mathematical concepts needed to cover its content, so you will not face any difficulty understanding single chapters. Each chapter: Describes, step-by-step, a specific MADM method, or in some cases a family of methods Contains a thorough literature review for each MADM method, supported with numerous examples of the method's implementation in various fields Provides a detailed yet concise description of each method's theoretical foundation Maps each method's philosophical basis to its corresponding mathematical framework Demonstrates how to implement each MADM method to real-world problems in a variety of disciplines In MADM methods, stakeholders' objectives are expressible through a set of often conflicting criteria, making this family of decision-making approaches relevant to a wide range of situations. A Handbook on Multi-Attribute Decision-Making Methods compiles and explains the most important methodologies in a clear and systematic manner, perfect for students and professionals whose work involves operations research and decision making.

Application of the Neutrosophic AHP Method for the Development of a Training Project on the Adoption Process in Ecuador Springer

Managing Organizations for Sustainable Development in Emerging Countries focuses on the main challenges and opportunities of managing firms and emerging economies in the light of sustainable development. One of the key questions of sustainable development is how organizations from developing countries are achieving their economic goals while considering, simultaneously, environmental issues like conservation of natural resources, eco-efficiency, biodiversity conservation, and climate-change mitigation. These questions are relevant for government, industry, and urban sustainability. However, in the modern literature that discusses organizational management for sustainable development, few studies focus on the reality of organizations from

emerging countries. Moreover, changing environmental legislation in emerging countries (such as China and Brazil) will affect organizational managers. In this context, this book may contribute to organizational management in the search for more sustainable organizations, as well as deal with the challenges of managing organizations in the context of increased social problems, degradation of natural resources, loss of biodiversity, and climate change. This book was published as a special issue of the International Journal of Sustainable Development & World Ecology.

A Non-Mathematical and Rational Analysis Springer

One of the best-known methods of multi-criteria decision-making is the Analytic Hierarchy Process (AHP). This method provides a convenient and versatile framework for modeling multi-criteria decision problems, evaluating alternatives, and deriving final priorities. Rather than imposing a "correct" decision, AHP allows the user to create a ranking of alternatives, then choose the one which is the best (or among the best). At the core of AHP is a pairwise comparisons (PC) method. This is an old technique known in various forms since at least the Middle Ages. AHP uses and develops the PC method. The aim of *Understanding the Analytic Hierarchy Process* is to provide the reader with a critical guide to AHP. In this book, the AHP method is considered primarily as a mathematical technique supporting the decision-making process. Key Features Collects the ideas underpinning the AHP method and discusses them together with many improvements and extensions present in the literature. As a result, the reader will receive a much more complete picture of the method. Aimed at theorists and advanced practitioners from a wide range of scientific fields, including the social, management, and technical sciences. Highlights the intuitive assumptions underlying the mathematical methods that make up AHP and the pairwise comparisons method. Provides software code for readers who wish to practice AHP analysis using the Wolfram Language.

Models and Methods Routledge

Applications and Theory of Analytic Hierarchy Process Decision Making for Strategic Decisions BoD – Books on Demand

Fuzzy Analytic Hierarchy Process BoD – Books on Demand

Management science is a discipline dedicated to the development of techniques that enable decision makers to cope with the increasing complexity of our world. The early burst of excitement which was spawned by the development and successful applications of linear programming to problems in both the public and private sectors has challenged researchers to develop even more sophisticated methods to deal with the complex nature of decision making. Sophistication, however, does not always translate into more complex mathematics. Professor Thomas L. Saaty was working for the U. S. Defense Department and for the U. S. Department of State in the late 1960s and early 1970s. In these positions, Professor Saaty was exposed to some of the most complex decisions facing the world: arms control, the Middle East problem, and the development of a transport system for a Third World country. While having made major contributions to numerous areas of mathematics and the theory of operations research, he soon realized that one did not need complex mathematics to come to grips with these decision problems, just the right mathematics! Thus, Professor Saaty set out to develop a mathematically-based technique for analyzing complex situations which was sophisticated in its simplicity. This technique became known as the Analytic

Hierarchy Process (AHP) and has become very successful in helping decision makers to structure and analyze a wide range of problems.

Application of AHP Method for Optimal Selection of the IT System Supporting Business Operations in the Logistics Enterprise Springer

The book covers the domain of multi-criteria decision making, a topic which has gained significant attention of researchers and practitioners spanning a variety of disciplines for enhancing their decision making in real life situation. The topics in this volume help readers understand the techniques in the model building and analysis stage. The chapters cover a variety of techniques and their applications for interesting problems. This book will be of interest to readers in diverse disciplines such as engineering, business, management, humanities, psychology and law. ^

Adaptation and Value Creating Collaborative Networks Springer Nature

The Analytic Hierarchy Process (AHP) has been one of the foremost mathematical methods for decision making with multiple criteria and has been widely studied in the operations research literature as well as applied to solve countless real-world problems. This book is meant to introduce and strengthen the readers' knowledge of the AHP, no matter how familiar they may be with the topic. This book provides a concise, yet self-contained, introduction to the AHP that uses a novel and more pedagogical approach. It begins with an introduction to the principles of the AHP, covering the critical points of the method, as well as some of its applications. Next, the book explores further aspects of the method, including the derivation of the priority vector, the estimation of inconsistency, and the use of AHP for group decisions. Each of these is introduced by relaxing initial assumptions. Furthermore, this booklet covers extensions of AHP, which are typically neglected in elementary expositions of the methods. Such extensions concern different numerical representations of preferences and the interval and fuzzy representations of preferences to account for uncertainty. During the whole exposition, an eye is kept on the most recent developments of the method.

Pairwise Comparisons Method World Scientific

This book examines the Analytical Hierarchy Process (AHP) method, its varied uses, as well as its limitations for solving real-world scenarios. While the simplicity of the method compels users to find shortcuts to a real-world problem, it also leads to obtaining wrong results that do not represent reality. By alerting practitioners about the core necessities of a new scenario, this book helps solve this problem, as well as contribute to the field of Multicriteria Decision Making Method (MDCM). The authors use a demonstrative, rather than a theoretical approach, and examine 30 subjects that displays the shortcomings and drawbacks of the AHP. Each one is examined in-depth, discussed, debated and reasoned, using examples, some of them numeric. The book highlights the rationality and common sense of the subjects, and in most cases, validates the criticism by showing through numerical examples, the impossibility of the AHP method to address, let alone solve real-world projects. At the conclusion of each subject, a table is built comparing the similarities and differences between the opinions of the authors and other experts, along with the respective pros and cons.

Select Proceedings of TEMT 2019 Springer Science & Business Media

Starting from the benefits that can contribute to the people who go through an adoption process, having an adequate knowledge of the current legislation in this respect and a general culture about

the impact of this decision in their daily life, their family and especially in the adopted one, this research proposes a training project in child adoption issues in Ecuador. In order to determine precisely which topics the course should be made up of and how much of the total time available should be assigned to each topic, the use of the Analytic Hierarchy Process (AHP) with a neutrosophic approach was used. This approach is justified by the subjective nature of the experts' assessments of the weight of the alternatives for each criterion considered.

ANALYTIC HIERARCHY PROC _1 RWS Publications

Multiple Criteria Decision Aid is a field which has seen important developments in the last few years. This is not only illustrated by the increasing number of papers and communications in the scientific journals and Congresses, but also by the activities of several international working groups. In 1983, a first Summer School was organised at Catania (Sicily) to promote multicriteria decision-aid in companies and to encourage specialists to exchange didactic material. The second School was held in 1985 at Narnur (Belgium) and I am pleased now to present the selected readings from the "Third International Summer School on Multicriteria Decision Aid: Methods, Applications and Software", which took place in Monte Estoril (Portugal), in 1988. was the quality of the contributions presented by the Such during the Summer School that I have decided to take lecturers advantage of this opportunity to produce a more carefully prepared and homogeneous book rather than a simple volume of proceedings. All the initial versions of the selected papers were revised and some, although not included in the programme of the School, were written in order to give a more complete overview of the MCDA field.

The Analytic Hierarchy Process Springer

The purpose of this study was twofold: to determine whether Master of Science in Nursing (MSN) students find the AHP process helpful when choosing the topic for their three credit point capstone project; and to test the utility of an open source software package for conducting AHP (the Business Performance Management Singapore AHP Online System). Four students participated in the AHP process. All four students found the process helpful when choosing a project topic. One of the

participants qualified this by stating only if the student was unsure about the choice of topic. The BPMSG was easy to use and resulted in individual and group decision making hierarchies. All four students thought that the AHP process would be useful for other students because it helps to recognize personal interests and priorities and to organize ideas. "Relevance to my current job" was found to be the top priority when deciding on project topic, followed by "relevance to my future career". In descending order of importance other influences on selection of project topic are: "Interest in the study population"; and "Help me to get a better job". Neither the workload involved in completing the study nor the ease of writing up the results was a major influence on choice of project topic. Overall the findings of the study suggest that the AHP process may assist MSN students to prioritize potential topics when deciding on a focus for their capstone projects and that the BPMSG AHP Online System is suitable software for the analysis of AHP decision making processes; although some students will require assistance to use the software. It should be noted that the study was limited by the small sample size.

Decision By Objectives: How To Convince Others That You Are Right Springer Nature

This book constitutes the refereed proceedings of the 12th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2011, held in Sao Paulo, Brazil, in October 2011. The 61 revised papers presented were carefully selected from numerous submissions. They provide a comprehensive overview of recent advances in various collaborative network (CN) domains and their applications with a particular focus on adaptation of the networks and their value creation, specifically emphasizing topics related to evolution from social networking to collaborative networks; social capital; value chains; co-creation of complex products; performance management; behavioral aspects in collaborative networks; collaborative networks planning and modeling; benefit analysis and sustainability issues, as well as including important technical and scientific challenges in applying CNs to areas such as advanced logistics networks, business process modeling, service orientation, and other emerging application domains such as ageing, tourism, crisis, and emergency scenarios.

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