
Introduction

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Biographical notes: Alessio Ishizaka is Reader in *Decision Analysis*, Research Lead at the Portsmouth Business School and Deputy Director of the CORL of the University of Portsmouth. He has held visiting professorships in more than ten universities. His research is in the area of decision analysis, where he has published more than 30 papers. He is regularly involved in large European funded projects. He has been the chair, co-organiser and guest speaker of several conferences on this topic. Alongside his academic activities, he acts as a consultant for companies in helping them to take better decisions.

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Multiple criteria decision aid continues to advance both in methodologies for accurately representing decision maker preferences and in terms of depth and breadth of applications. This special issue is based originally on a selection of papers which were presented and discussed at the 76th Meeting of the European Working Group 'Multiple Criteria Decision Aiding' (EWG-MCDA) held in Portsmouth (UK), the 13–15 September 2012, chaired by the guest editors. The workshop was attended by 46 participants from 12 countries. This bi-annual meeting has continued a tradition, established four decades ago, in 1975. The special issue has also been open to the broad MCDA community.

The seven papers included in this special issue have been selected after a rigorous refereeing process among the 16 submitted papers. The set demonstrates both theoretical and applicational advance across a range of techniques and fields including production planning, renewable energy, environmental management, disaster management, organisational management, and public sector planning. The geographical range of the case applications also demonstrates the international nature of multiple criteria decision aid research with contributions from Iran, France, Belgium, Italy, Greece, and Mexico.

Rolando (2015) describes an application of the strategic choice approach to the problem of constructing of a new bypass around part of the city of Turin, Italy. This case study concentrates on structuring the problem and defining the range of criteria to be considered in the multi-criteria optimisation. Special attention is paid to the identification and incorporation of public opinion into the MCDA problem alongside environmental, cost, and traffic flow considerations. The author notes the potential of combining the strategic choice approach with other MCDA methods.

Berrah and Cliville (2015) explore the combination of MCDA methods with group decision making techniques in order to provide coherence between decisions taken across different decision centres in an organisation. The ELECTRE III method is used as the MCDA method and the concepts of communication, co-ordination, and co-operation are explored within this context. An industrial case study with production and maintenance decision centres is used to illustrate the methodology and conclusions drawn.

Kapoor and Tak (2015) continue the theme of production planning by presenting a multi-criteria facility layout model. The authors demonstrate the complexity of the problem situation and then develop a heuristic for its solution based on clustering methods. Single and multiple criteria versions of the algorithm are presented. The practical nature of the algorithm is discussed and directions for future research are given.

Azizi et al. (2015) give a multiple criteria facility location model for furniture factories. The AHP method is used to consider a wide range of criteria including economic, product related, infrastructure, and social considerations. A fuzzy version of the TOPSIS method is then used to rank the potential locations. In the example section, the Iranian regions of Qom, Tehran, and Razavi Khorasan are assessed by the methodology and conclusions drawn as to their capacity for furniture facility locations.

Chew Hernández et al. (2015) present a multi-criteria model for the placement of networks of small hydro-turbines in polluted streams. A set of technical, economical, environmental and social criteria are used as appropriate for the type of environmental management and renewable energy problem under consideration. A utility function approach is utilised and comprehensive utility functions are built for each of the four criteria. A numerical example is given in order to demonstrate the methodology.

Macharis et al. (2015) give an analysis of the use of the PROMETHEE method in group decision support systems (GDSS). Fourteen papers are reviewed that represent a range of different problem situations. A SWOT analysis is conducted for the overall use of PROMETHEE in GDSS. Suggestions for future improvement based on recent advances on the techniques are PROMETHEE and GPSS are given.

Nivolianitou et al. (2015) present a use of the AHP for the evaluation of the quality of emergency flood response systems. Criteria relating to physical features, organisational aspects, and contextual features are considered. The authors demonstrate the methodology on a tri-national flooding situation with the major area falling in Northern Greece. The authors note the use of AHP for quality evaluation as opposed to more direct forms of decision aiding and recommend further investigation of this type of usage.

Considering the collection of seven articles in this special issue, it can be seen that MCDA techniques can be applied to a wide range of currently important societal and economic topics. It is also reassuring to see a range of MCDA techniques used that reflect the breadth of the discipline. The trends for combining MCDA with other techniques from with the fields of operational research or artificial intelligence and soft computing in order to increasing modelling power and flexibility can be seen in several of the articles.

Overall, we commend this set of articles to the reader as a representation of applied MCDA research over a range of disciplines.

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