



Based Evaluation Technique), a well-known sociotechnical approach for multicriteria evaluation of options using non-numerical value judgements.

As a co-founder and process consultant at BANA Consulting, he helps managers, policymakers and other stakeholders evaluate and prioritize public projects, policies, and strategies by using MACBETH. An example is the IMPACT HTA project, developed in collaboration with colleagues from CEGIST and MTRG, in which they applied MACBETH to assess health technologies under a collaborative value modelling (CVM) framework involving groups of diverse stakeholders in healthcare. CVM is a sociotechnical framework, the application of which was recognised as an outstanding contribution to the practice of decision analysis with the 2023 Decision Analysis Practice Award, jointly sponsored by the Decision Analysis Society and the Society of Decision Professionals.

In 2018, Professor Bana e Costa was also awarded with the Herbert Simon Award for Outstanding Contribution in Information Technology and Decision Making, by the International Academy of Information Technology and Quantitative Management (IAITQM).

## Influence and Opinion Change in Networks. Application in Group Consensus Reaching

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### Abstract:

While working towards my PhD on integrating several representations of preferences in group decision making, one of the research issues that was investigated by many researchers on preference modelling was the modelling transitivity of preferences, which is referred to as consistency property and linked to the idea of 'rationality' of preferences. As it is the case in frameworks based on the concept of fuzzy set theory, the fuzzification of transitivity property of crisp preferences to fuzzy preferences is not unique, and many properties have been proposed to model transitivity of preferences. However, when a preference relation is multiplicative in the sense of Saaty's AHP framework, consistency of preferences is defined uniquely with a property known as multiplicative transitivity property. Since there is a bijection between the set of fuzzy preference relations and the set of multiplicative preference relations, then it is natural to use such bijection to transpose concepts from one preference structure to the other. Saaty's multiplicative transitivity becomes Tanino's additive transitivity for fuzzy preference relations. The key aspect this analytic formulation of the concept of consistency of preferences resides in the possible developing of approaches to measure 'levels of consistency' of preference relations,



which could be potentially exploited in designing 'rational' group decision making. For example, it can be used to assign importance degrees to experts on a group based on their levels of consistency of preferences/opinions on the problem at hand. Also, the transitivity property can be used in building a consistent preference relation from a minimum set of preferences and, in doing so, it can be interpreted as a propagation of preferences between alternatives via intermediate or indirect alternatives. In other words, the consistency property permits to propagate preferences via alternatives linked indirectly through alternatives 'consistently.' Therefore, this mechanism of propagation of preferences can be used to estimate preference values that are unknown or not given by a person when asked, or to feedback inconsistent experts with their most inconsistent preferences and potential values to consider for repairing their inconsistency. What does this have to do with social network? People use social networks for sharing information, which leads to diffusion of information and influence propagation. Both are closely related to building consensus in decision making. If disagreement exists in a GDM and all individuals in the group are committed to group consensus, then they would be willing to change initial opinions to achieve group consensus. This is normally done in what is referred to as the 'feedback process' of a consensus group decision making model. Since people are influenced by others, influence can be used to design a process leading to the formation of interpersonal agreement and consensus when opinions disagree. So, influence based feedback processes are worth investigating in consensus GDM, and social influence network could be useful in designing consensus reaching processes: consensus 'feedback processes' could be devised modelling influence that one person/group have in others whose opinions or preferences are 'too' far away from the group, i.e. contribute 'less' to group consensus. This talk aims at presenting how two models of influence applied in social networks are linked to research on methods to build consensus in group decision making.

**Bio:**

Professor of Computational Intelligence and Decision Making in the School of Computer Science and Informatics at De Montfort University (DMU, Leicester, UK). He joined DMU in August 2003, and before that he received the BSc and PhD degrees in Mathematics from the University of Granada (Spain) in 1989 and 2000, respectively. He was a Mathematics secondary school teacher during 13 years in Spain (September 1990 – July 2003).

Prof. Francisco Chiclana coordinates the University research submission to the UK Research Excellence Framework (REF) for UoA11: Computer Science and Informatics, and his role includes the mentoring and supervision of research staffs to enhance their research contribution. Prof. Chiclana was the Faculty Interim Associate Dean of Research and Innovation for period September 2018 – July 2019; an Honorary Professor in the Department of Mathematics at the University of Leicester for period July 2015 – June 2018; and a Visiting Professor in the Andalusian Research Institute on Data Science and Computational Intelligence at the University of Granada (Granada, Spain) for the period May 2019 – April 2023. Prof. Chiclana is a Fellow of the Higher Education Academy, UK.



## XV Reunión del GEDM. Oviedo, 4, 5, y 6 abril 2024



Universidad de Oviedo

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Prof. Chiclana is a Highly Cited Scientist in Computer Science (2018, 2019, 2020, 2021, 2022, 2023), and has published extensively on research areas relevant to social network, preference modelling, decision-making, decision support systems, consensus, recommender systems, social networks, rationality/consistency, information aggregation (a complete list of publications is available at <http://www.tech.dmu.ac.uk/~chiclana/publications.html>). He is the Editor in Chief of Mathematics (MDPI) (ISSN 2227-7390) (from January 2021); the Specialty Chief Editor of the Fuzzy Systems section of Frontiers in Artificial Intelligence (from 2018), and Associate Editor/Member of the Editorial Board for several JCR ISI indexed journals.