

## **Multicriteria Decision Making as Interdisciplinary Research**

Enrique Mu, PhD  
*IJAHP* Editor in Chief

In their excellent recounting of the development of multiple criteria decision making (MCDM) from its early history to the 21<sup>st</sup> century, Koksalan et al. (2011) proposed that MCDM is both old and new. It is old because decision makers have always had to make tradeoffs with objectives when making decisions; the authors refer to Benjamin Franklin's approach to making decisions by trading off benefits and costs during the 1700's. However, MCDM as an important sub-field of Management Science or Operations research is rather new and began in the late 1950s. The elements of decision making fundamentally consist of the "decision", a "decision-maker" and a "decision analysis methodology." This is the reason that the MCDM field is inherently interdisciplinary. While applied mathematics is used for the decision quantitative analysis; the decision at hand, its content, needs to be addressed with tools of the corresponding discipline. This is further complicated because the decision topic may correspond to fields as diverse as medicine, sociology, or a variety of other fields. The multiple fields tackled by MCDM can easily be appreciated by taking a quick look at the list of articles that comprise the current [IJAHP](#) issue and noticing the variety of disciplines involved in the target decisions. Because of this, Wallenius and Wallenius (2023) argue in this issue for the MCDM profession to focus on important problems ranging from the risk of future pandemics to climate change. This need to focus on the discipline where the decision takes place is an important contingent aspect of MCDM that must be carefully considered and many times is not, in particular, by emerging scholars. This is one reason why the MCDM section of INFORMS evaluates research candidates for the MCDM Junior Best Paper Research Award, by allocating 30% value to the relevance of the decision and 20% to its potential impact on society while the remaining 50% considers the theoretical and methodological value of the MCDM analysis. That is, half the value of the research study (50%) focuses on aspects related to the decision itself (Slowinski, 2023).

In summary, since being an MCDM methodological expert does not make us decision-discipline experts, it is necessary to recruit expert participants from the disciplines in which we are focusing. Different methodologies offer various ways to incorporate these experts into the decision-making process. In particular, the AHP/ANP has proved to be quite accessible as a method to the inclusion of the judgments and preferences of discipline experts and stakeholders who do not need to understand MCDM or the nuts and bolts of a specific method such as AHP/ANP (they just state their preferences in pairwise comparisons answering questions such as, "Do you prefer A or B? and How strongly?"). Still, even the AHP/ANP requires that the MCDM analyst pay careful attention to the discipline on which the analysis is focusing. An example of the wide interdisciplinary nature of MCDM and the broad use of discipline experts is the recent International Symposium of the Analytic Hierarchy Process with the theme of "Decision Making in Business Practice." Presentations at this symposium ranged from topics such as the Middle East conflict to the best ways to allocate human organs for transplants ([ISAHP, 2022](#)).

Another strategy to deal with the dichotomy of “decision content” and “decision-making analysis” is a bottom up approach. This involves giving discipline experts a simple method to learn and understand and the tools to tackle the decision problem with which they are so familiar. AHP/ANP creator, Thomas L. Saaty (1980), dreamed of an MCDM tool so easy that anyone, even those without sophisticated mathematical knowledge, could use. The simplicity of the method is also the reason why disciplinary conferences in the areas of finance, economy and management, for example, are now including the AHP/ANP as specific tracks, as in the case of the recent [ICEFM2022](#) conference in Krakov, Poland (Ujwary-Gil et al., 2023). In an ideal world, we would expect many other disciplinary conferences (e.g. medicine, law) to promote the AHP/ANP as part of the toolkit of decision-making for the specific discipline.

In conclusion, “decision-content” and “decision analysis” are two of the three intertwined but different dimensions of decision-making and can be approached with a MCDM analyst consulting with experts about the decision or with decision experts learning a friendly MCDM methodology, like the AHP/ANP, to perform their own analysis. The third aspect of MCDM is the “decision-maker” and this recognition has led to the development of behavioral decision-making in the case of individuals (Simon, 1955), group decision-making in the case of groups or teams (Saaty & Peniwati, 2008) and public decision-making in the case of decisions affecting a large number of stakeholders (Gonzalez-Urango et al., 2021); however, this constitutes a topic for future discussions.

## REFERENCES

- Gonzalez-Urango, H., Mu, E., & García-Melón, M. (2021). Stakeholder engagement and ANP best research practices in sustainable territorial and urban strategic planning. In M. Doumpos, F. Ferreira, & C. Zopounidis (Eds.), *Multiple Criteria Decision Making for sustainable development*. Springer Nature. Doi: [https://doi.org/10.1007/978-3-030-89277-7\\_5](https://doi.org/10.1007/978-3-030-89277-7_5)
- ISAHP. (2022). Decision-making in business practice. *International Symposium of the Analytic Hierarchy Process*.
- Koksalan, M., Wallenius, J., & Zionts, S. (2011). *Multiple Criteria Decision Making: from early history to the 21st Century*. London: World Scientific. Doi: <https://doi.org/10.1142/8042>
- Saaty, T. L. (1980). *Decision making for leaders: The Analytic Hierarchy Process*. McGraw-Hill.
- Saaty, T. L., & Peniwati, K. (2008). *Group decision making: Drawing out and reconciling differences*. Pittsburgh, PA: RWS Publications.
- Simon, H. A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics*, 69, 99-118.
- Slowinski, R. (2023). MCDM Junior Researcher Best Paper Award. *International Journal of the Analytic Hierarchy Process*, 14(3). <https://doi.org/10.13033/ijahp.v14i3.1068>.
- Ujwary-Gil, A., Florek-Pazkowska, A., & Koziol, A. (2023). AHP/ANP applications in economic policy, business, and management with the T. L. Saaty Decision Making Hackathon at ICEFM 2022. *International Journal of the Analytic Hierarchy Process*, 14(3). <https://doi.org/https://doi.org/10.13033/ijahp.v14i3.1071>
- Wallenius, H., & Wallenius, J. (2023). Focusing on important problems. *International Journal of the Analytic Hierarchy Process*, 14(3). <https://doi.org/https://doi.org/10.13033/ijahp.v14i3.1066>