

## Introduction to ANP

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Analytic Network Process (ANP) is one of the most powerful methodologies for combining and evaluating judgments of the decision-makers to effectively rank alternatives, choose a compromise solution, and predict outcomes. ANP, developed by Thomas L. Saaty, is a widely used technique for structuring, modeling, and analyzing complex decisions based on mathematics and psychology.

Decision-makers are poor at assimilating large quantities of information on their problems. They cope with cognitive overload by employing heuristics that simplify the problem. This can lead to the selection of suboptimal alternatives. The participants of the workshop will carry out an experiment on cognitive psychology and learn Miller's "the magical number seven, plus or minus two: some limits on our capacity for processing information".

In complex decisions, there may be dependence and feedback. We will discuss how network modelling improves the priorities derived from judgments and makes predictions much more accurate.

We will go through the arrangement of paired comparison judgements in a matrix, the calculation of eigenvector and inconsistency of the pairwise comparison matrix, and then, the formation of the supermatrix, weighted supermatrix, and limiting supermatrix. Last but not least, we will examine Saaty Compatibility Index.

### SHORT BIO



Y. Ilker Topcu is a Professor of Decision Sciences at Industrial Engineering Department of Istanbul Technical University (ITU). He visited Leeds University Business School from 1998 through 1999 as a visiting researcher and received his Ph.D. degree in Engineering Management from ITU in 2000.

He held visiting professor position at University of Pittsburgh The Joseph M. Katz Graduate School of Business from 2018 through 2019.

He is an executive committee member of International Society of Multiple Criteria Decision Making since 2015.

He was the general chair of the 25th International Conference on Multiple Criteria Decision Making (MCDM 2019) which took place in Istanbul, Turkey from June 16 to June 21, 2019.

His research interests include multiple criteria decision making, decision analysis, and operations research/management science. He has published several journal papers, book chapters, and conference proceedings. He edited a book for Springer entitled "OR Applications in Health Care Management".