

MCDA METHODS FOR ERP SYSTEM SELECTION

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ABSTRACT

In this paper, we present a comparative review of Multi-Criteria Decision Analysis (MCDA) methods used in the selection of Enterprise Resource Planning (ERP) systems. ERP selection is inherently complex and involves multiple organizational and technical factors that must be evaluated simultaneously. MCDA methods provide a structured framework to support such decisions by handling diverse and sometimes conflicting evaluation criteria. Our study focuses on four widely recognized MCDA methods (AHP, ANP, TOPSIS, ELECTRE), analyzes their core logic, how they process multiple criteria and their ability to rank or filter ERP alternatives. Each method is evaluated based on four well-defined criteria: complexity of application, transparency of results, flexibility, practical relevance. Rather than applying these methods to a specific case study, we try to provide a side-by-side comparative framework that draws on the existing theoretical and applied research. The analysis is also supported by a comparative table and a methodological flowchart, which together enhance clarity, reproducibility and decision-making utility. By identifying the contextual strengths and limitations of each method, we want to assist practitioners to select the most appropriate tool for ERP system evaluation, based on their specific organizational constraints and decision environments.

Keywords: ERP System Selection, AHP, ANP, TOPSIS, ELECTRE

INTRODUCTION

Enterprise Resource Planning (ERP) systems have become essential tools for the organizations that seek to integrate and optimize their business processes. These systems support core functions, such as finance, supply chain management, human resources, operations etc., while they provide a unified and centralized data infrastructure. As companies rely increasingly on digital tools in order to enhance efficiency and competitiveness, selecting the right ERP system has become a mission-critical decision.

ERP system selection is inherently complex because of the multitude of criteria involved, which include functional fit, scalability, cost, vendor support and organizational readiness (Wei et al., 2005). Making such decisions without structured guidance can lead to suboptimal outcomes, high implementation costs or even to project failure (Kumar et al., 2003). In order to support this process, Multi-Criteria Decision Analysis (MCDA) methods offer a structured framework for evaluating alternatives across multiple dimensions.

MCDA methods such as the Analytic Hierarchy Process (AHP), Analytic Network Process (ANP), Technique for Order Preference by Similarity to Ideal Solution