Chapter 2
Deploying OR/MS Tools for Decision Making in the Age of Artificial Intelligence and Sustainable Development Goals:
Social, Behavioral, and Technological Perspectives

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ABSTRACT

Operations Research and Management Sciences (OR/MS) methodologies have shown significant promise as well as success in solving and unraveling a variety of operational and tactical problems. However, this success is not matched in solving complex political, social, socio-technical, and strategic decision problems. Such an apparent lack of efficacy has been attributed to a variety of factors. We take behavioral and technological perspectives of opportunities and impediments in the adoption of OR/MS tools in a wider realm of problem-solving and decision-making. We also look at various limitations, and sources of limitations, of OR/MS approaches. We discussed some ideas on how to make OR/MS tools more effective through a combination of OR/MS with systems thinking, soft decision-making, and Artificial Intelligence (AI). We discuss how using AI in conjunction with OR/MS can help make decision-making more efficacious, leading to fair, equitable, robust, and sustainable development choices.

1. INTRODUCTION

The disciplines of Operations Research and Management Sciences (OR/MS) have been defined in various ways by various researchers and organizations. One concise definition is: "[OR/MS are the disciplines] of applying advanced analytical methods to help make better decisions" (INFORMS, 2025). For about a century, OR/MS has been growing in complexity and usefulness. Indeed, OR/MS brought with it new technologies and paradigms to aid effective decision-making (Taylor, 2018). More importantly, various decision-making paradigms and technologies have enhanced the effectiveness of interdisciplinary problem-solving teams and added value and efficacy of OR/MS tools (INFORMS, 2025). The proliferation of information technology further facilitated the use of OR/MS tools by more people, rendering an increased capability to add value through OR/MS tools. This impact of information technology on OR/MS discipline is aptly expressed by the manner in which The Institute for Operations Research and the Management Sciences (INFORMS) defines OR/MS: "[OR/MS are] the professional disciplines that deal with the application of information technology for informed decision-making" (INFORMS, 2025).

Factually, OR/MS disciplines are deemed responsible for substantial improvement in efficiency, efficacy, and sustainability of industry, government, and R&D (INFORMS, 2025). Nevertheless, the traditional style of preaching and teaching OR/MS made many people perceive OR/MS as a panacea in real-world problem-solving. Ironically, some OR/MS practitioners may even advocate it as the rational

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