

Chapter 91

Artificial Neural Networks and Other AI Applications for Business Management Decision Support

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ABSTRACT

Artificial intelligence (AI) in general and artificial neural networks (ANN) in particular provide a tremendous amount of knowledge to improve managerial decision making. Additionally, these same ANN and AI techniques also serve as knowledge repositories and distribution schema for organizations that facilitate managerial leadership responsibilities. This article examines how various ANN and other AI applications may be adapted to facilitate managerial leadership, improve manager performance and in some cases perform management activities. Further research that classifies leadership styles and the desired qualities of leaders is reviewed.

INTRODUCTION: DEFINING MANAGEMENT TASKS AND THE ROLE OF AI

What is management and how can artificial intelligence (AI) impact managerial leadership? We define a manager as someone who directs people and processes and makes decisions to optimize organizational performance. A manager may operate at any level from a team leader through middle management to C-level executives. Managers perform a vast array of duties for their respective organizations, divisions, groups, and teams. “A manager’s job should always be based on ... task[s] necessary to attain the company’s objectives” (Drucker & Maciariello, 2008, pg. 239). While an exhaustive examination of the various responsibilities of managers is beyond the scope of this text, it will be beneficial to survey some of the common requirements. The duties and responsibilities that managers are responsible for in the day to day operation of their organizations include:

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- Knowledge Management (Drucker & Maciariello, 2008; Hicks & Gullett, 1974)
 - Knowledge acquisition – having the right knowledge
 - Knowledge access – at the right time
 - Knowledge sharing – for the right people
 - Develop knowledge repositories
 - Knowledge creation
- Staffing and Human Resources (HR) Management (Dubrin, 1989; Greene, 1984; Hicks & Gullett, 1974; Kimball, 2004)
 - Hiring new staff
 - Terminating staff
 - Evaluating staff
 - Forming project teams
- Resource Planning and Management (Greene, 1984)
 - Resource acquisition
 - Resource scheduling/logistics
 - Process management
 - Disaster recovery
- Financial Planning and Allocation Management (Greene, 1984; Hicks & Gullett, 1974)
 - Budget – assets and liabilities
 - Investments
- Customer Service Management (Hicks & Gullett, 1974)
 - Keep customers satisfied
 - Keep customers informed
- Strategic Management (Harvey, 1982)
 - Policy and procedures
 - Business goals
 - Development of business heuristics

As may be seen from the non-exhaustive list above, management requires numerous task responsibilities. Action theory implies that managers must be actively engaged in their environment (Freese, 2005). These tasks are part of the day to day performance of managers that end up occupying most of their time (Drucker & Maciariello, 2008).

The tasks defined above map to Drucker's five basic operations of management: setting objectives, organizing objectives, motivating and communicating, performs measurements, and developing people (Drucker & Maciariello, 2008, pp. 7-8). Setting objectives utilizes both knowledge management and strategic management. Organizing objectives utilizes human resource management, resource planning management, financial management tasks, and customer service management. Motivation and communication involves both human resources and adequate knowledge management strategies. Measurement, which involves determining measurements and success of each of the areas, is primarily focused on organizational processes and knowledge management. Finally, the developing people operation of management is primarily concerned with human resource management, acquiring the right people and utilizing them in an effective manner, but also relies heavily on the knowledge sharing aspect of the knowledge management process.

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