PROSPECTS FOR THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN MANAGERIAL DECISION-MAKING: ADVANTAGES AND CHALLENGES

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Artificial Intelligence in Managerial Decision-Making

- Digital transformation is changing how organizations make decisions.
- Managers face increasing volumes of data, uncertainty, and technological complexity.
- Artificial intelligence (AI) offers new opportunities for information processing, forecasting, and analytical support.
- Effective implementation requires balancing technological capabilities with human judgment and organizational responsibility.

- **Research focus:** How can AI improve managerial decision-making while minimizing its limitations and risks?

•Objective of the Research

- To examine the prospects for applying artificial intelligence in managerial decision-making and identify its key advantages and limitations.

Research tasks:

- Examine the role of AI in modern management.
- Identify the principal advantages of AI-supported decisions.
- Analyze technological, ethical, and organizational limitations.
- Explore approaches to responsible AI governance.
- Determine promising directions for future research.

From Data Processing to Decision Support

AI technologies can support managerial activities through:

- Automated information processing and extraction.
- Pattern recognition and predictive analytics.
- Forecasting and scenario analysis.
- Knowledge management and information retrieval.
- Generation of analytical summaries and recommendations.

A structured literature review of 204 peer-reviewed publications identified forecasting, classification, knowledge management, and information extraction as important research areas in AI-supported management decision-making [1].

Key message: AI is becoming an integral component of organizational decision infrastructure.

How AI Can Improve Managerial Decisions

1. Faster information processing

- Analyzes large volumes of structured and unstructured data.
- Integrates information from multiple sources.

2. Improved forecasting

- Supports demand, sales, financial, and operational predictions.
- Enables scenario analysis and early risk identification.

3. Better knowledge management

- Helps retrieve relevant information from documents, databases, and internal reports.

4. Wider access to analytics

- Enables employees to interact with analytical tools using natural language.

5. Enhanced operational efficiency

- Automates repetitive analytical tasks and supports process improvement.

EMPIRICAL EVIDENCE: PRODUCTIVITY GAINS

Generative AI in the Workplace

- Brynjolfsson, Li, and Raymond studied 5,179 customer-support agents using a generative AI conversational assistant [3].

Main findings:

- Average productivity increased by approximately 14%.
- Productivity gains were substantially larger among novice and less-skilled workers.
- The study also identified improvements in customer sentiment and employee retention.

Management implications:

- AI can accelerate knowledge transfer.
- Less-experienced employees may benefit from access to AI-generated guidance.
- Productivity effects depend on the work context and how AI is integrated into workflows.

Important qualification:

Results from one organizational setting should not automatically be generalized to all industries or managerial tasks.

Why Human Judgment Still Matters

According to Jarrahi [2], humans and AI possess different but complementary capabilities.

Artificial Intelligence	Human Decision-Makers
Processes large datasets	Interpret organizational context
Detects statistical patterns	Exercise judgment under uncertainty
Generates predictions	Evaluate ethical and social implications
Automates repetitive analysis	Manage ambiguity and competing interests
Provides analytical recommendations	Retain responsibility for consequential decisions

Core principle: The strongest decision-making models combine AI's analytical capabilities with human judgment, contextual understanding, and accountability.

The “Jagged Technological Frontier”

- Dell'Acqua et al. conducted a field experiment involving 758 knowledge workers [4].
- Their findings demonstrated that AI can improve performance on tasks within its capabilities, but can also impair performance on tasks beyond those capabilities.

Implications for management:

- AI performance varies across different tasks.
- Fluent and confident outputs do not guarantee accuracy.
- Managers must determine whether a task is appropriate for AI assistance.
- Independent verification is essential for consequential decisions.

Key message: AI should be applied selectively, based on task suitability and verified performance.

What Can Go Wrong?

Data quality

- Incomplete, outdated, or inaccurate data can produce unreliable recommendations.

Algorithmic bias

- Biased data or model design can generate unfair or discriminatory outcomes.

Limited explainability

- Managers may struggle to justify AI-generated recommendations to stakeholders.

Overreliance on AI

- Excessive trust can reduce critical evaluation and independent judgment.

Privacy and cybersecurity

- Sensitive financial, employee, customer, and strategic information may be exposed.

Accountability

- Organizations must establish clear responsibility for decisions supported by AI.
- Trustworthy AI requires fairness, transparency, privacy, reliability, and human oversight [5, 6].

From Experimentation to Responsible Implementation

Organizations need systematic mechanisms to manage AI-related risks.

NIST AI Risk Management Framework [6]

- **Govern:** Establish policies, roles, responsibilities, and oversight.
- **Map:** Identify the context, intended use, stakeholders, and potential risks.
- **Measure:** Evaluate performance, reliability, bias, and other risks.
- **Manage:** Prioritize risks, implement controls, and monitor outcomes.

Additional governance frameworks:

- OECD AI Principles [5] — responsible and trustworthy AI.
- EU Artificial Intelligence Act [7] — risk-based regulatory requirements.
- ISO/IEC 42001:2023 [8] — requirements for an AI management system.

FUTURE RESEARCH DIRECTIONS

What Should Researchers Investigate Next?

- **Decision quality:** How does AI affect the accuracy and long-term effectiveness of managerial decisions?
- **Trust calibration:** How can organizations prevent both excessive distrust and overreliance on AI?
- **Human–AI collaboration:** Which combinations of human judgment and algorithmic analysis produce the best results?
- **Organizational context:** How do industry, culture, leadership, and organizational structure influence AI outcomes?
- **Performance measurement:** How should organizations measure the costs, benefits, and risks of AI-supported decisions?
- **Responsible governance:** Which governance mechanisms best support transparency, accountability, and sustainable value creation?

Future research should move beyond productivity metrics to examine decision quality, organizational outcomes, and the long-term consequences of AI adoption.

Balancing Innovation and Responsibility

- AI offers significant opportunities to improve the speed, scale, and analytical depth of managerial decision-making.
- Its benefits include forecasting, knowledge management, information processing, and productivity improvement.
- AI outcomes are task-dependent; unreliable outputs, bias, limited explainability, and overreliance remain important challenges.
- Effective implementation requires data governance, risk management, transparency, and continuous performance evaluation.
- Human oversight and clear accountability are essential for consequential managerial decisions.