Adopting Agentic AI: Challenges and Opportunities for Information Management Research

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Abstract —The emergence of Agentic Artificial Intelligence (AI) systems represents a paradigm shift from passive tools to autonomous, goal-directed entities capable of planning, tool use, and sequential decision-making. This transition presents profound implications for information management (IM) research and practice. While current AI applications in IM largely focus on pattern recognition and decision support, agentic systems promise active information seeking, dynamic resource allocation, and adaptive organizational processes. This paper provides a comprehensive analysis of the challenges and opportunities in adopting agentic AI for information management. We develop a framework characterizing agentic capabilities along dimensions of autonomy, reasoning, and interaction, and identify critical research directions across technical, organizational, and ethical domains. Key challenges include verification of agent behavior, integration with legacy systems, and establishing appropriate human-AI collaboration patterns. Simultaneously, agentic AI creates opportunities for transformative applications in enterprise search, knowledge base curation, compliance monitoring, and strategic information governance. We argue that information management research must evolve to address the unique requirements of these systems, particularly in areas of information provenance, trust calibration, and organizational policy adaptation. The paper concludes with a research agenda positioning IM as a critical discipline for enabling responsible and effective deployment of agentic AI in organizational contexts.

Keywords —Agentic AI, Autonomous Systems, Information Management, AI Governance, Human-AI Collaboration, Knowledge Management, Organizational AI Adoption, AI Ethics, Digital Transformation.

1. Introduction

The field of information management stands at a critical juncture with the advent of sophisticated artificial intelligence systems capable of autonomous action and goal-directed behavior. Termed "Agentic AI," these systems represent a fundamental departure from traditional AI applications that primarily function as tools or assistants [1]. Unlike conventional machine learning models that process data upon request, agentic systems proactively identify problems, formulate plans, execute multi-step tasks using available tools, and adapt their strategies based on environmental feedback [2].

The implications for information management are profound. Organizations have spent decades developing IM frameworks for human-centric information processes, but agentic AI introduces autonomous actors that consume, process, and generate information at unprecedented scale and speed [3]. This creates both extraordinary opportunities and significant challenges that demand immediate scholarly attention. Agentic systems could revolutionize enterprise search by not merely retrieving documents but synthesizing answers from multiple sources while citing evidence [4]. They could maintain knowledge bases by actively identifying gaps and seeking updated information [5]. They could enforce information governance policies at scale by monitoring data flows and access patterns [6].

However, these capabilities raise fundamental questions for IM research: How do we verify that autonomous agents are handling information appropriately? What governance frameworks ensure accountability when AI systems make independent decisions about sensitive data? How should human roles evolve in organizations where AI agents manage substantial portions of the information lifecycle? Current IM theories and practices, developed for human information behavior and passive systems, may be inadequate for this new paradigm [7].

This paper makes three primary contributions:
1. We provide a comprehensive framework for understanding agentic AI capabilities and their implications for information management.
2. We identify and analyze critical challenges across technical, organizational, and ethical dimensions.
3. We outline a research agenda with specific opportunities for advancing information management theory and practice in the age of agentic AI.

The paper proceeds as follows: Section 2 reviews relevant literature and defines key concepts. Section 3 presents our analytical framework. Section 4 details major challenges, while Section 5 explores promising opportunities. Section 6 proposes a research agenda, and Section 7 concludes.

2. Theoretical Background and Related Work

2.1. Evolution from Passive to Agentic AI
Information management has progressively incorporated AI capabilities, beginning with expert systems in the 1980s, progressing to machine learning for classification and prediction in the 2000s, and more recently adopting large language models for content generation and analysis [8]. Throughout this evolution, AI primarily served as a tool invoked by human users for specific tasks [9]. The emergence of agentic capabilities marks a significant shift toward systems that operate with substantial autonomy, pursuing goals through sequential decision-making and tool use [10].

2.2. Defining Agentic AI in IM Contexts
We define Agentic AI for information management as: Artificial intelligence systems that autonomously perceive organizational information environments, formulate and pursue goals related to information handling, utilize available tools and resources, and adapt their behavior based on experience and feedback, while operating within defined constraints and accountability frameworks.

Key characteristics distinguishing agentic from traditional AI in IM contexts include:
- Proactive Goal Pursuit: Identifying information-related problems and opportunities without explicit human direction [11]
- Tool Use and Composition: Leveraging multiple software tools and APIs to accomplish complex information tasks [12]
- Multi-step Reasoning: Breaking down complex information problems into sequences of actions [13]
- Adaptive Learning: Improving information handling strategies based on outcomes and feedback [14]

2.3. Relevant Theoretical Foundations
Several theoretical domains provide foundation for understanding agentic AI in IM:
- Organizational Information Processing Theory [15] must be extended to account for AI agents as information processors
- Principal-Agent Theory [16] requires reconsideration when the "agent" is artificial
- Knowledge Management Theories [17] need adaptation for environments where AI actively curates organizational knowledge
- Information Governance Frameworks [18] must evolve to address autonomous decision-making about information resources

3. An Analytical Framework for Agentic AI in IM

We propose a multidimensional framework to characterize agentic AI systems in information management contexts along three primary dimensions:

3.1. Autonomy Spectrum
Agentic systems vary in their level of independence from human oversight: -
Assisted: Human approval required for significant actions
- Supervised: Operating within tightly constrained domains with human monitoring
- Directed: Pursuing human-defined goals with periodic check-ins
- Autonomous: Self-directed within broad ethical and operational boundaries [19]

3.2. Reasoning Capabilities
The cognitive capacities that enable sophisticated information management:
- Reactive: Responding to immediate stimuli and requests
- Deliberative: Engaging in planning and forecasting
- Reflective: Evaluating and modifying own reasoning processes [20]
- Social: Understanding and adapting to organizational norms and relationships [21]

3.3. Interaction Modalities
How agents engage with organizational information ecosystems:
- Tool Usage: Ability to leverage existing software and APIs
- Communication: Natural language interaction with human colleagues
- Coordination: Collaborating with other AI agents and human teams
- Negotiation: Resolving conflicts over resources and priorities [22]

This framework helps categorize agentic systems and identify appropriate governance approaches for different configurations.

4. Key Challenges in Adopting Agentic AI for IM

4.1. Technical and Architectural Challenges
- Verification and Validation: Ensuring agent behavior aligns with organizational policies across diverse scenarios [23]
- System Integration: Incorporating agentic capabilities into existing information infrastructure without disrupting operations [24]
- Information Provenance: Maintaining reliable audit trails for decisions made and information synthesized by AI agents [25]
- Scalability and Performance: Managing computational resources as autonomous agents operate at organizational scale [26]

4.2. Organizational and Human Factors
- Role Transformation: Redefining human information professions in agent-augmented environments [27]
- Skill Gaps: Developing new competencies for managing and collaborating with AI agents [28]
- Change Resistance: Overcoming organizational inertia and skepticism toward autonomous systems [29]
- Collaboration Patterns: Establishing effective human-AI teamwork protocols for information-intensive tasks [30]

4.3. Ethical and Governance Challenges
- Accountability Gaps: Determining responsibility when AI agents make erroneous information decisions [31]
- Value Alignment: Ensuring agent behavior reflects organizational ethics and priorities [32]

- Transparency Requirements: Making agent reasoning comprehensible to human stakeholders [33]
- Privacy Implications: Managing agent access to sensitive personal and proprietary information [34]

4.4. Strategic and Economic Considerations
- Cost-Benefit Analysis: Quantifying returns on investment in agentic AI infrastructure [35]
- Vendor Lock-in Risks: Navigating proprietary ecosystems versus open-source alternatives [36]
- Strategic Alignment: Ensuring agentic capabilities support rather than distort organizational objectives [37]
- Competitive Dynamics: Responding to industry adoption patterns and first-mover advantages [38]

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5. Opportunities for Advancing Information Management

5.1. Transformative Applications
- Intelligent Enterprise Search: Agents that understand context and synthesize answers from multiple systems [39]
- Dynamic Knowledge Base Curation: Autonomous identification and resolution of knowledge gaps [40]
- Adaptive Information Governance: Real-time policy enforcement and anomaly detection [41]
- Proactive Compliance Monitoring: Continuous assessment of regulatory requirements and organizational practices [42]

5.2. Theoretical Advancements
- Extended Information Behavior Models: Incorporating AI agents as organizational information actors [43]
- New Valuation Frameworks: Assessing the economic impact of autonomous information management [44]
- Evolution of IM Capabilities: Redefining core organizational competencies in agentic environments [45]
- Information Ethics Expansion: Developing moral frameworks for AI-mediated information decisions [46]

5.3. Methodological Innovations
- Agent-Centric Research Designs: Studying organizations as human-AI collective systems [47]
- Simulation Approaches: Modeling agentic IM scenarios before implementation [48]
- New Metrics and KPIs: Measuring the effectiveness of agentic information management [49]
- Longitudinal Studies: Tracking the co-evolution of organizations and their AI agents [50]

6. Research Agenda for Information Management

Based on our analysis, we propose a focused research agenda organized by timeline and priority:

6.1. Immediate Priorities (0-2 years)
1. Foundation Development: Creating taxonomies, frameworks, and baseline theories for agentic AI in IM [51]
2. Use Case Identification: Documenting and analyzing early implementations across industries [52]
3. Ethical Guidelines: Developing initial principles for responsible agentic AI deployment [53]
4. Skill Requirements: Mapping the evolving competencies needed by information professionals [54]

6.2. Medium-Term Initiatives (2-5 years)
1. Governance Models: Designing organizational structures for overseeing agentic systems [55]

2. Integration Patterns: Establishing best practices for combining human and AI information work [56]
3. Performance Metrics: Creating validated measures for assessing agentic IM effectiveness [57]
4. Policy Adaptation: Analyzing and recommending regulatory updates [58]

6.3. Long-Term Vision (5+ years)
1. Theoretical Unification: Developing comprehensive theories of information management in human-AI organizations [59]
2. Ecosystem Design: Creating architectures for multi-agent organizational information environments [60]
3. Evolutionary Dynamics: Understanding long-term organizational transformation through agentic AI adoption
4. Cross-Disciplinary Synthesis: Integrating insights from computer science, organizational theory, and ethics

7. Conclusion

The adoption of agentic AI represents neither an incremental improvement nor a distant speculation, but rather an imminent transformation that demands proactive engagement from information management scholars and practitioners. This paper has outlined both the significant challenges and substantial opportunities presented by these systems. The challenges are formidable—spanning technical verification, organizational adaptation, ethical governance, and strategic alignment. However, the opportunities for enhancing organizational information capabilities are equally profound.

Information management research has a critical role to play in shaping this transition. By developing new theories, empirical insights, and practical frameworks, the field can help ensure that agentic AI enhances rather than undermines organizational information practices. The research agenda outlined here provides a starting point for this essential work.

As agentic capabilities become increasingly sophisticated and accessible, organizations that successfully navigate this transition will gain significant advantages in information responsiveness, knowledge utilization, and decision-making quality. Those that fail to adapt risk both competitive disadvantage and potential harm from poorly governed autonomous systems. The time for information management research to address the agentic AI revolution is now.

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